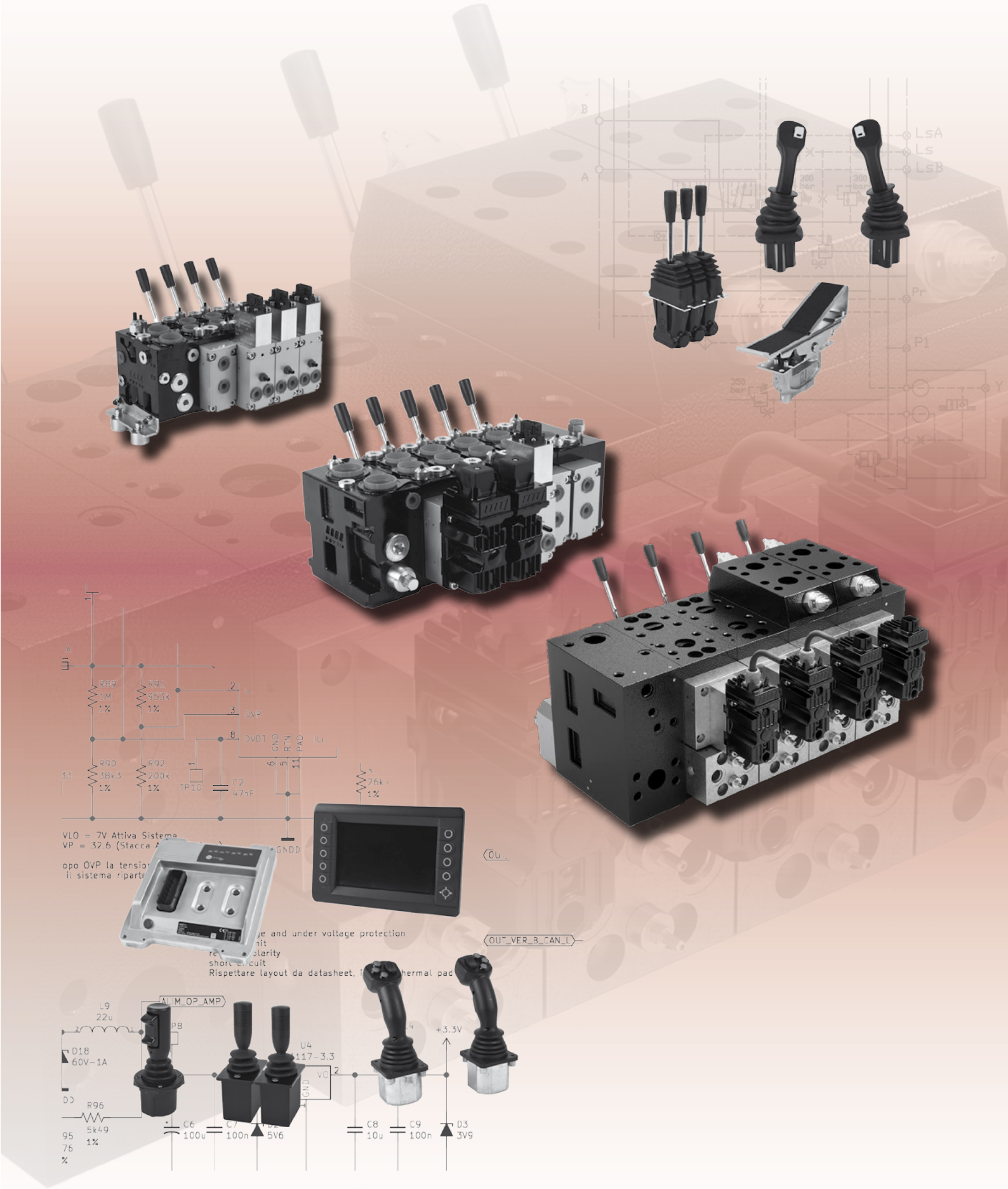
OMFB
HYDRAULIC POWER CONTROL

Proportional Directional Valves series:
PDV74 - PDV114 - PDV315
Electronics & Accessories



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Proportional Directional Valves series: PDV74 - PDV114 - PDV315

Contents

General

The **PDV** technology platform, is the latest step in proportional directional valves configuration.
It takes mobile machine control to next level of performance, reliability, and feature stringent technical demands, exacting quality standard, and safety regulations.
Based on load sensing technology, are new breakthrough products with up-grated hydraulic functions that fulfil the ever increasing market demands for improved machines productivity, safety requirements, energy efficient and environmental operations.
They provides also a wide choice of control options, and are meant to be used in hazardous area also, according to **Atex 2014/34/UE Directive and IECEx** protocol.

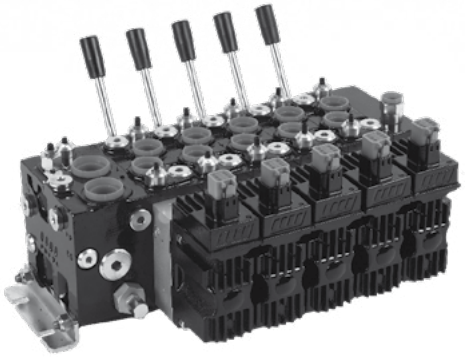
Safety Conformity assessment

FMEA and **FMEDA**, (failure modes effects and diagnostic analysis), are systematic analysis technique applied in early phases of a given system development, in order to detect weak points early.
When it comes to more complex products and assemblies involving a combination of both electrical and hydraulic parts, the need to ensure that adeguate surveillance over the design and manufacturing of key parts is paramount, to be compliance with the on-going series Standards **IEC 61508**.

Evaluation of the achieved performance level PL and relationship with SIL

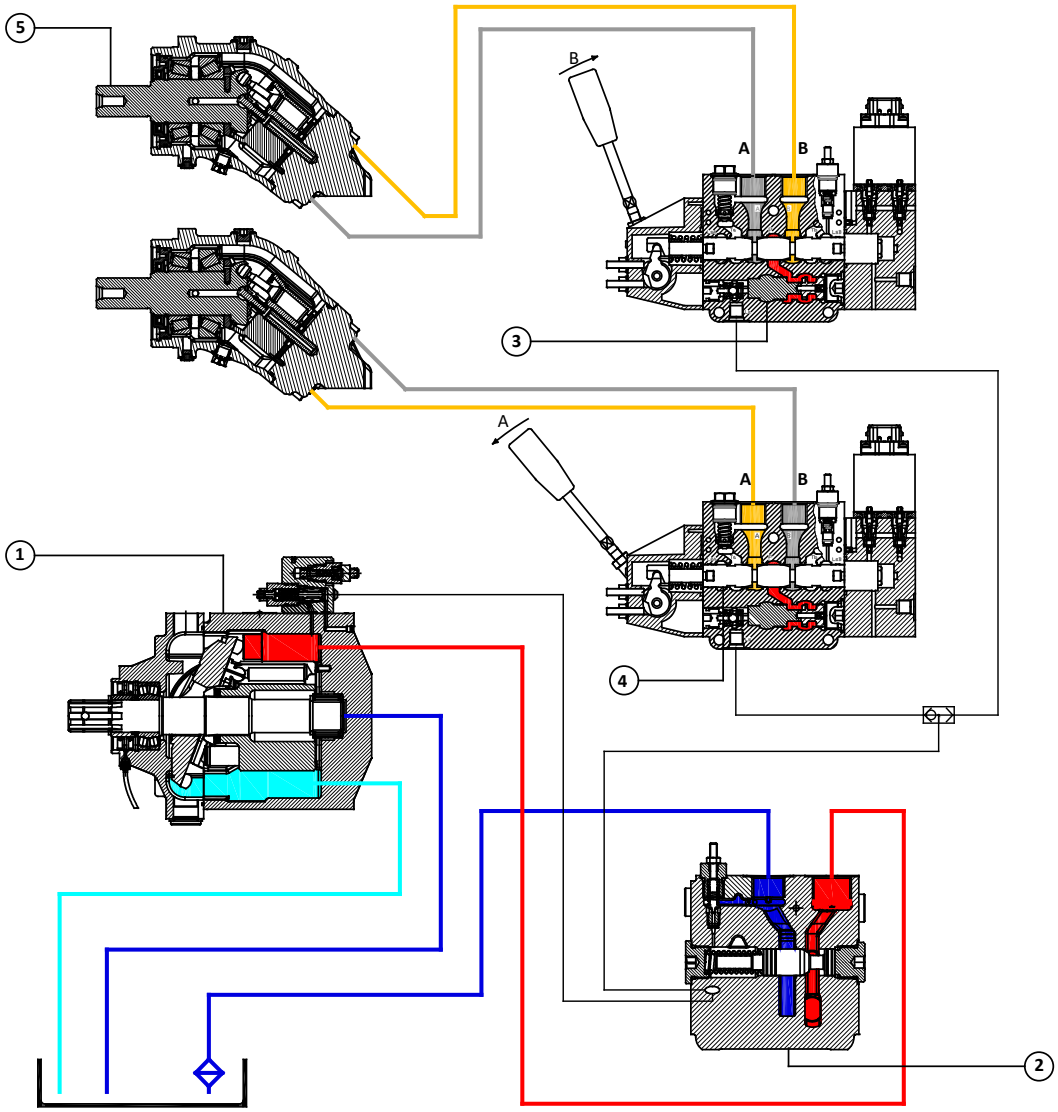
Parts of machinery control systems that are assigned to provide safety functions are called safety-related parts of control systems and these can consist in hydraulic valves with hardware and software, and can either be separate from the machine control system or an integral part of it.
PDV units, can be requested to be applied as " logic units to ensure safety functions in accordance with Machine Directive EN 13849 ".
For the purpose of this part of Machine Directive, the ability of safety- related parts to perform a safety function is expressed through the determination of the performance level.
To make the assessment of the quantifiable aspects of the PL easier, this part of EN 13849 provides a simplified method based on the definition of five designated architectures that fulfil specific design criteria and behaviour under a fault condition.
Therefore, the machine builder or system integrator have full accountability for making the final products selection and assuring that all performance, safety and warning requirements of the application are being met.

PDV74 is a hydraulic proportional directional valve, designed to offers a wide range controls options and flexibility.
The **PDV74** modular system enables bankable groups to perform many individual tasks, to meeting and exceeding the changing control needs of the off-highway machines of today, and well into the future to maximize the efficiency, controllability and reliability of vehicles.



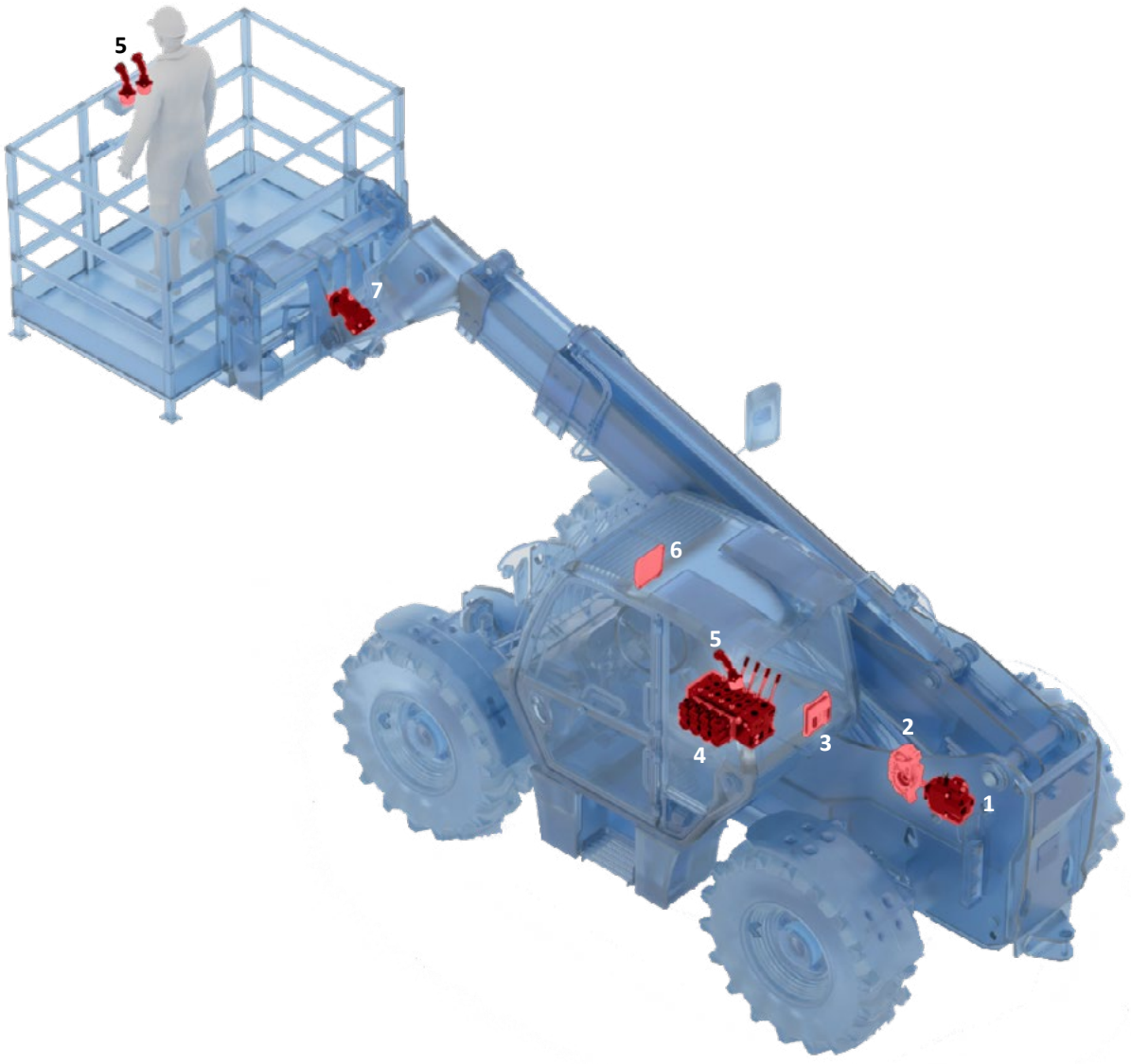
PDV74 main features:

- Load sensing up-stream pressure compensation
- High flow/low pressure drop capability in a compact size
- Integrated pump unloading system
- Integrated cut-off pump system
- Open/closed centre shifting system
- Precise metering capabilities
- LSA-LSB electrical unloading
- LSA-LSB electrical working pressure remote control
- Constant flow regardless of pressure
- Working sections symmetrical flow
- Optional priority inlet for steering or different priority functions
- Optional dual hydraulic pilot and electrohydraulic control
- ATEX and IECEx configuration
- CAN-Bus comunication
- EMC immunity ensures high safety with regard to electro-magnetic compatibility



High pressure port of **PPV** piston pump ① supply the closed centre inlet section of **PDV74** proportional valve ② which in turn feeds the down-stream working sections.
The **PDS** spool neutral position ④ unload the LS pump signal to tank, so that the swashplate angle is towards the minimum displacement and pressure in stand-by setting.
The spool position determines the flow demands (speed rotation) of the two **HPM** motors ⑤.
The PDS main spool compares the pressure drop before and after the spool notches (differential pressure Δp), and therefore, the pump flow remain constant.
If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

Actuators load determines the working pressure, and the built-in pressure compensator ③ enable simultaneously function regardless of different working pressure.



1. PPV90 load sensing piston pump

2. Pump slitter gear box

3. I/O controller PHSI7101008

4. PDV74/6 closed centre inlet

5. Electronic double axis joystick PEJD

6. Graphic display PDHI703000

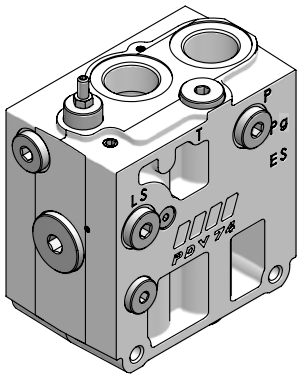
7. PPM40 piston motor

The hydraulic features listed in this chart, are typical measured data obtained by using mineral based hydraulic oil according to DIN 51524 with a viscosity of 21 mm²/sec [102 SUS] and a temperature of 50 °C [122 °F]

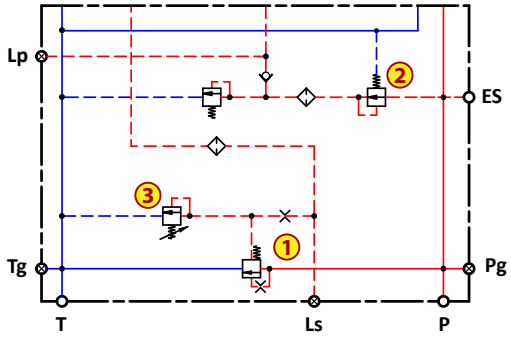
Oil flow rate	PDI inlet section, P port		**160 l/min (max)**	**42 US gal/min**
	PDIM - Mid inlet section, P port		**250 l/min**	**66 US gal/min**
	A, **B** port with pressure compensator		**130 l/min**	**34 US gal/min**
	A, **B** port without pressure compensator		**140 l/min**	**37 US gal/min**
Max. pressure	**P** port	Pressure relief valve setting	**400 bar**	**5800 psi**
		Working pressure	**370 bar**	**5370 psi**
	A, **B** port		**370 bar**	**5370 psi**
	Ty port, directly to tank			
	T port	Static	**25 bar**	**363 psi**
		Dynamic	**37 bar**	**537 psi**
Max. pilot pressure oil supply			**18 ÷ 22 bar**	**260 ÷ 320 psi**
Oil temperature	Recommended		**30 ÷ 65 °C**	**86 °F ÷ 149 °F**
	Min		**-30 °C**	**-22 °F**
	Max		**90 °C**	**194 °F**
Ambient temperature			**-30 ÷ 60 °C**	**-22 ÷ 140 °F**
Oil viscosity	Operating range		**12 ÷ 75 mm²/sec**	**65 ÷ 347 SUS**
	Min		**4 mm²/sec**	**39 SUS**
	Max		**460 mm²/sec**	**2128 SUS**
Spool stroke	Standard		**7 mm**	**0,28 in**
	Flow control proportional range		**5,5 mm**	**0,22 in**
	Pressure control propotional range		**6 mm**	**0,24 in**
Daed band spool	Flow control		**1,5 mm**	**0,06 in**
	Pressure control		**1 mm**	**0,04 in**
Max internal leakage A/B port at 100 bar [1450 psi] and 21 mm²/sec		**A/B T** without shock valves	**21 cm³/min**	**1,28 in³/min**
		A/B T with shock valves	**25 cm³/min**	**1,53 in³/min**
Filtration	Max. contamination: class 9 according to NAS 1638 (20/18/15 according to ISO 4406)			

PDH module - hydraulic control		
Pilot pressure	Spool start movement	4 bar / 58 psi
	Spool end stroke	15 bar / 218 psi
Max. pilot pressure		30 bar / 436 psi

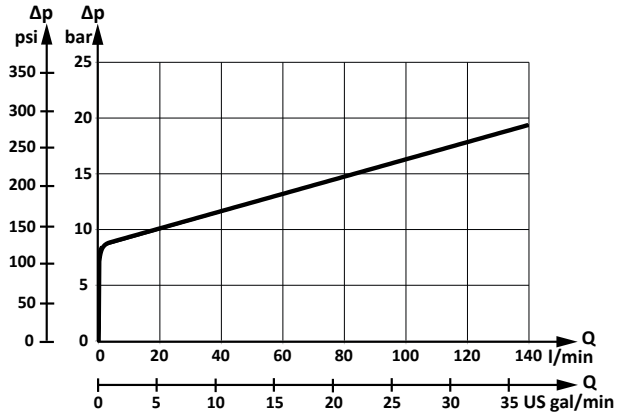
PDV74 internal filters, mesh 100 µm
Mineral oil hydraulic fluid: according to DIN 51524 and 51525 or ISO 6743/4 PDV74 can also be used with phosphate esters (HFDR), water-glycol (HFC) or water oil (HFB) mixes, subject to our Technical Dept. approval



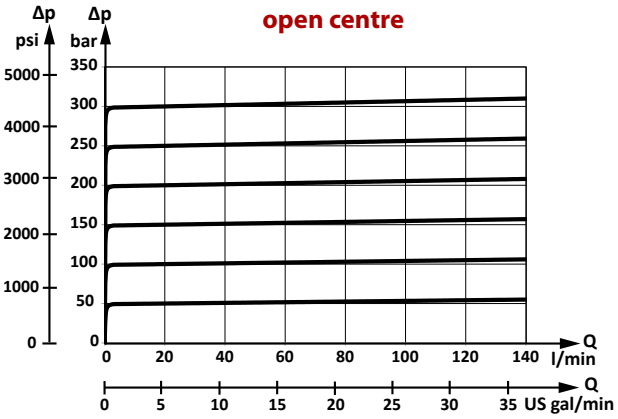
Hydraulic diagram



Neutral flow-pressure drop in PDI, open centre



Pressure relief valve characteristic in PDI, open centre

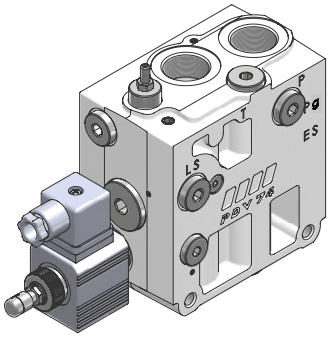


Designed for use with fixed displacement pumps.

Inlet comes standard with pressure compensated 3-way flow regulator (1), that when pump is started and working sections spools are in neutral position, it's unloaded to tank, and the oil flow being supplied from the pump, passes through the 3-way flow regulator to tank with minimal off-load pressure drop (see diagram below).

When one or more of the spools are actuated, the highest working pressure signal is fed to the 3-way flow regulator, that maintains the Δp at a constant level, so that the flow rate is independent of the load, and proportional to the opened spool area.
The built in pressure reducing valve (2), act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.
When the main PDS spools are actuated, the exceeding pump flow is being sent to tank at the highest load pressure value.
If the working pressure reaches the setting of the upstream max pressure pilot relief valve (3), the 3-way flow regulator will be opened to tank, thus limiting the working pressure inside the complete PDV.

On this configuration, the level of safety degrees for the complete PDV valve is really low, therefore, operator's great supervision is strictly request.



Designed for use with fixed displacement pumps.

Inlet comes standard with pressure compensated 3-way flow regulator ①, that when pump is started and working sections spools are in neutral position, it's unloaded to tank, and the oil flow being supplied from the pump, passes through the 3-way flow regulator to tank with minimal off-load pressure drop (see diagram below).

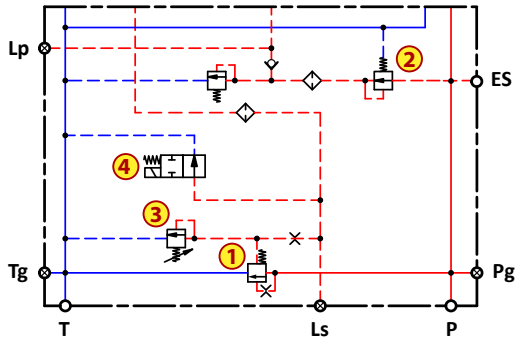
When one or more of the spools are actuated, the highest working pressure signal is fed to the 3-way flow regulator, that maintains the Δp at a constant level, so that the flow rate is independent of the load, and proportional to the opened spool area.
The built in pressure reducing valve ②, act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.
When the main PDS spools are actuated, the exceeding pump flow is being sent to tank at the highest load pressure value.
If the working pressure reaches the setting of the upstream max pressure pilot relief valve ③, the 3-way flow regulator will be opened to tank, thus limiting the working pressure inside the complete PDV.

According to an electrical signal coming from the remote controls or I/O controller, the PDU solenoid unloading valve ④, enable the LS signal to be relieved to tank, and the effect of this configuration is an almost pressureless system, where the activated actuators will be automatically catted off.
The pressure in the system will be reduced to the sum of the tank port pressure, plus the neutral flow pressure drop through the 3-way flow regulator.

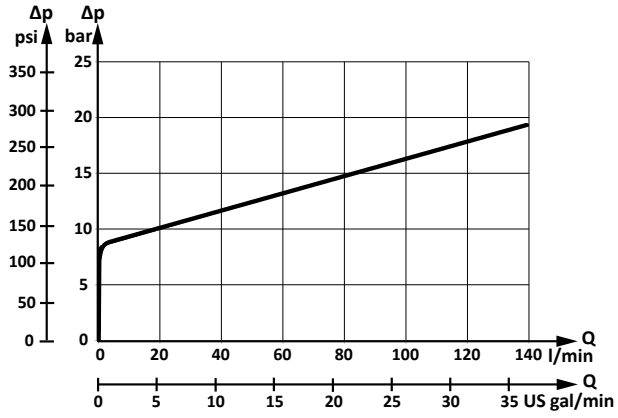
Care must be given, because all the actuators whose working pressure is lower than the pressure drop through the 3-way regulator, might be still operated.

Also with the use of PDU emergency solenoid unloading valve, the level of safety degrees for the complete PDV valve is quite low, therefore, operator's supervision is required.

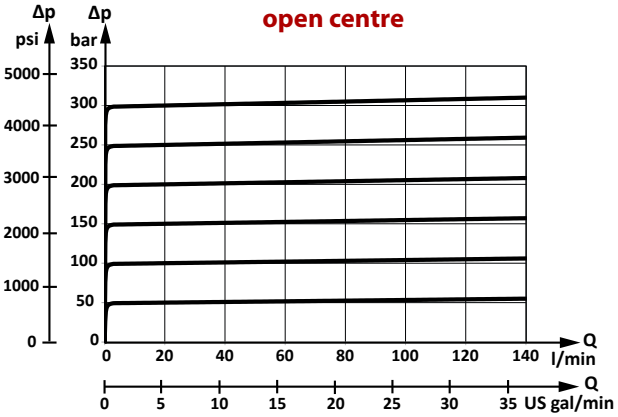
Hydraulic diagram

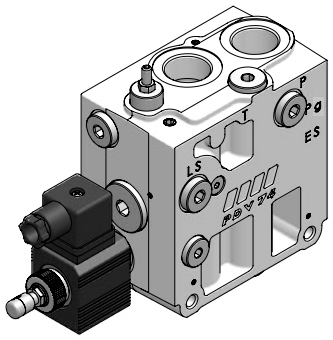


Neutral flow-pressure drop in PDI, open centre

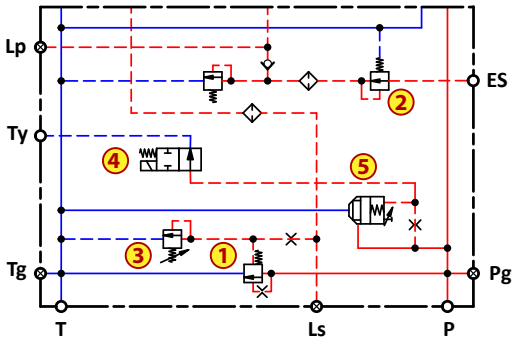


Pressure relief valve characteristic in PDI, open centre

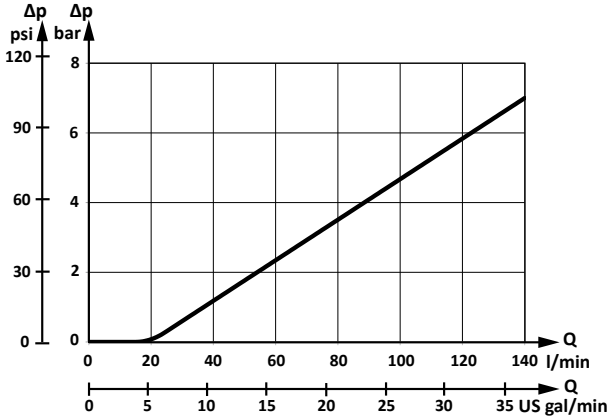




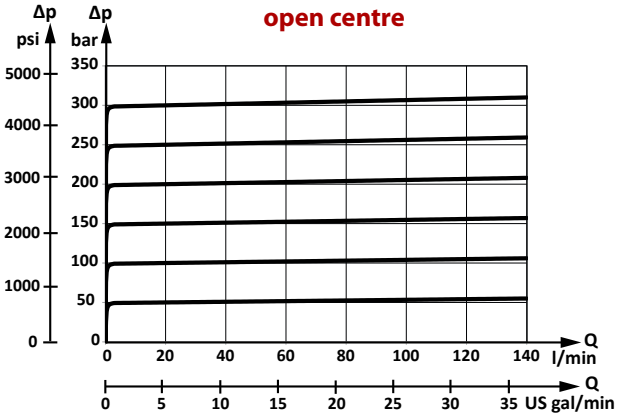
Hydraulic diagram



Neutral flow-pressure drop in PDI, open centre



Pressure relief valve characteristic in PDI, open centre



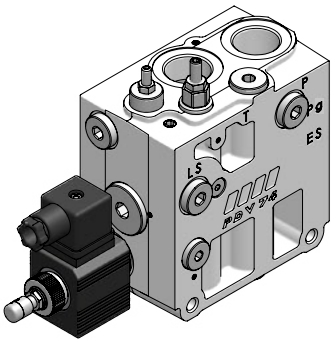
Designed for use with fixed displacement pumps.

Inlet comes standard with pressure compensated 3-way flow regulator ①, that when pump is started and working sections spools are in neutral position, it's unloaded to tank, and the oil flow being supplied from the pump, passes through the 3-way flow regulator to tank with minimal off-load pressure drop (see diagram below).

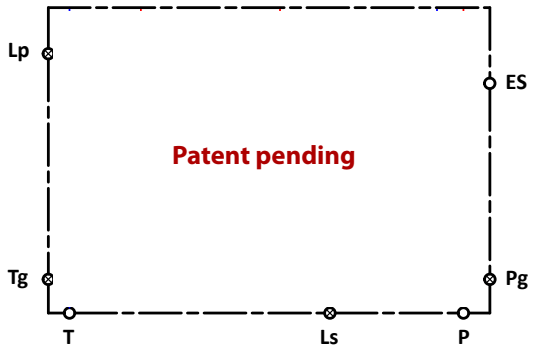
When one or more of the spools are actuated, the highest working pressure signal is fed to the 3-way flow regulator, that maintains the Δp at a constant level, so that the flow rate is independent of the load, and proportional to the opened spool area.
The built in pressure reducing valve ②, act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.
When the main PDS spools are actuated, the exceeding pump flow is being sent to tank at the highest load pressure value.
If the working pressure reaches the setting of the upstream max pressure pilot relief valve ③, the 3-way flow regulator will be opened to tank, thus limiting the working pressure inside the complete PDV.

By means of an electrical signal coming from the remote controls or I/O controller, the PDU solenoid valve ④, operates the poppet type pilot operated valve ⑤, which in turn, allows the full flow coming from the pump to be relieved to tank, bypassing the 3-way flow regulator ①.
The effect of this condition is a complete and safely pressureless system, where all actuators will be automatically catted-off, and the pressure into the system will be reduced to the sum of the tank port pressure, plus the pressure drop through the poppet unloading valve (see characteristic curve below)

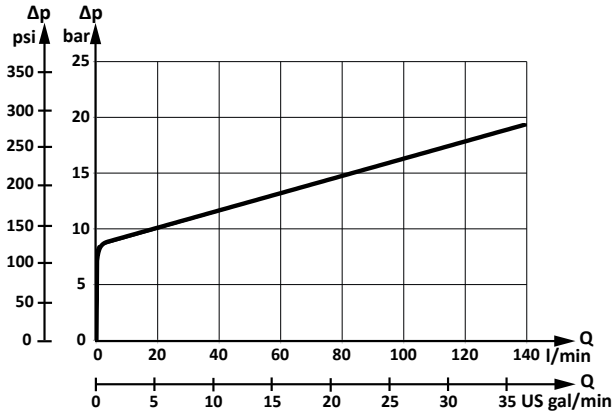
When the inlet section comes with this configuration and the pump unloading system is connected with the active fault monitoring spool actuators, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.



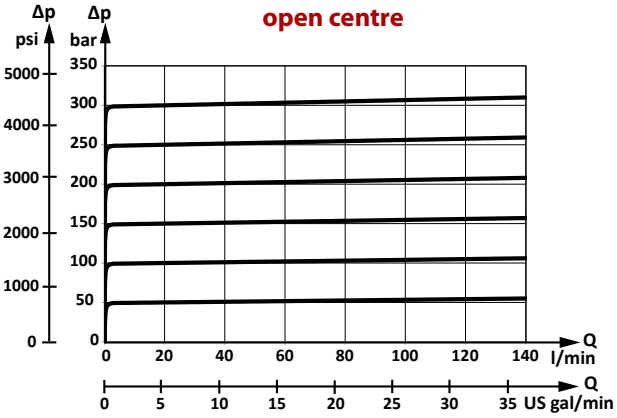
Hydraulic diagram



Neutral flow-pressure drop in PDI, open centre



Pressure relief valve characteristic in PDI, open centre

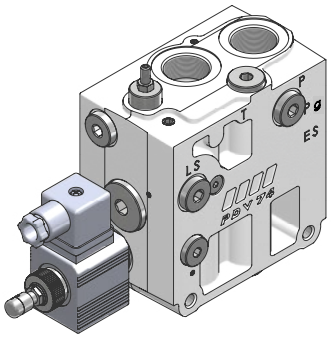


Designed to be configured either as open centre (fixed displacement pumps) or closed centre version (variable displacement pumps)

Inlet comes standard with pressure compensated 3-way flow regulator (1), that when pump is started and working sections spools are in neutral position, it's unloaded to tank, and the oil flow being supplied from the pump, passes through the 3-way flow regulator to tank with minimal off-load pressure drop (see diagram below).

When one or more of the spools are actuated, the highest working pressure signal is fed to the 3-way flow regulator, that maintains the Δp at a constant level, so that the flow rate is independent of the load, and proportional to the opened spool area.
The built in pressure reducing valve (2), act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.
When the main PDS spools are actuated, the exceeding pump flow is being sent to tank at the highest load pressure value.
If the working pressure reaches the setting of the upstream max pressure pilot relief valve (3), the 3-way flow regulator will be opened to tank, thus limiting the working pressure inside the complete PDV.

By acting clockwise on the pilot shifting spool (4), without changing any components, the inlet section circuit will be transformed into closed centre configuration.
In this configuration the load sensing pilot pressure is led to pump control via the LS connection. When a main spool is actuated, the pump regulator will adjust the displacement so that the set differential pressure (stand-by pressure) between P and LS signal is maintened.
The pressure relief valve 3 is to be set at 35 bar above maximum cut-off pressure set on the pump.
The LS control performs as a constant pressure control also, decreasing pump displacement when system pressure reaches the PC setting.
The pressure compensating function has the priority over the load sensing function.



Designed for use with LS variable displacement pumps.

Inlet comes standard without pressure compensated 3-way flow regulator.

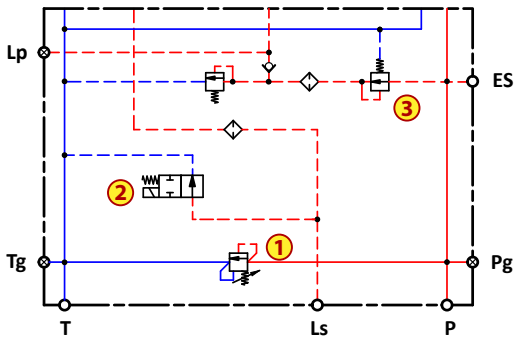
When pump is started and PDV spools are in neutral position, the LS pump signal is unloaded to tank.
When one or more of the spools are actuated, the highest signal is sent to the pump regulator that control the pump swashplate angle.
The PDS main spool compares the pressure drop before and after the spool notches (differential pressure Δp), and therefore, the pump flow remain constant.
The position of the PDS spool determines the flow demand. If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

The inlet section can comes with an optional pressure relief valve ① that should be set at pressure about 35 bar above maximum system pressure set on the pump regulator.

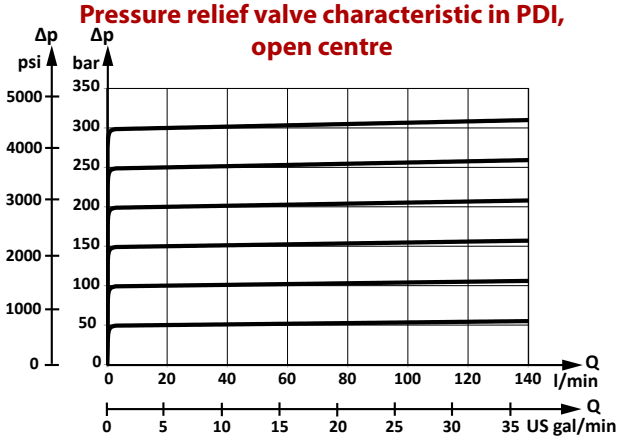
According to an electrical signal coming from the remote controls or I/O controller, the PIU solenoid unloading valve ② enable the LS signal to be relieved to tank.
The effect of this configuration is an almost pressureless system, where the activated actuators will be automatically catted off, and the pressure in the system will be reduced to the sum of the tank port pressure, plus the differential pressure of the pump, therefore, care must be given, because all the actuators whose working pressure is lower than the remaining pressure might be still operated.
The built in pressure reducing valve ③, act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.

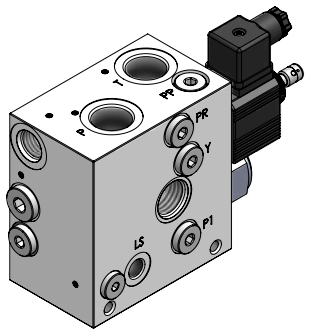
Also with the use of PIU emergency solenoid unloading valve, the level of safety degrees for the complete PDV valve is quite low, therefore, operator's great supervision is required.

Hydraulic diagram



Pressure relief valve characteristic in PDI, open centre





Designed for use with LS variable displacement pumps.

This version of inlet comes standard with a double stage cut-off pump system ①, that when activated according to an electrical signal ②, all down-stream working section will be perfectly and safely sealed from pressure and flow, protecting the complete hydraulic machines control against the negative effect of the remaining stand by pressure.

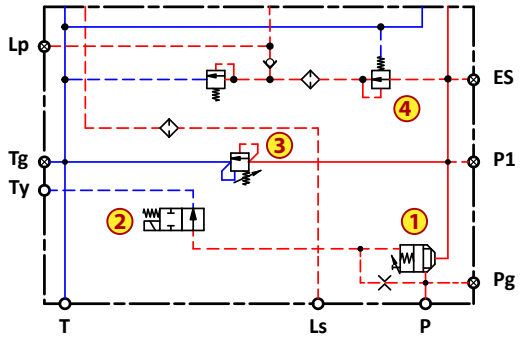
Inlet comes standard without pressure compensated 3-way flow regulator.

When pump is started and PDV spools are in neutral position, the LS pump signal is unloaded to tank.
When one or more of the spools are actuated, the highest signal is sent to the pump regulator that control the pump swashplate angle.
The PDS main spool compares the pressure drop before and after the spool notches (differential pressure Δp), and therefore, the pump flow remain constant.
The position of the PDS spool determines the flow demand. If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

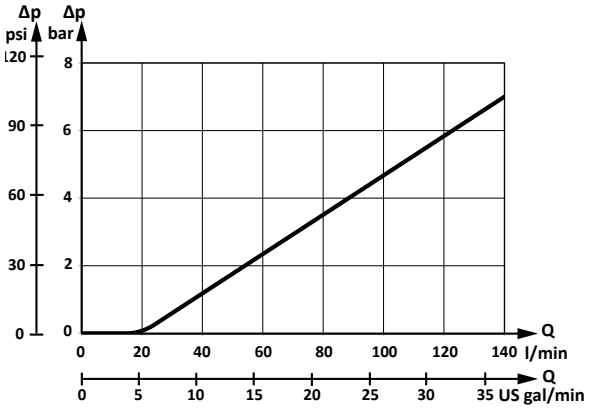
The inlet section can comes with an optional pressure relief valve ③ that should be set at pressure about 35 bar above maximum system pressure set on the pump regulator.
The built in pressure reducing valve ④, act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.

When the inlet section comes with this configuration and the cut-off pump system is connected with the active fault monitoring spool actuators, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

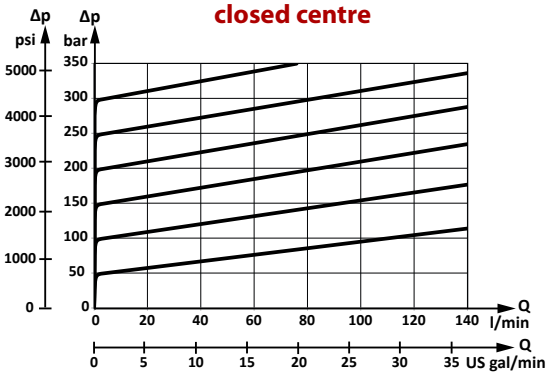
Hydraulic diagram

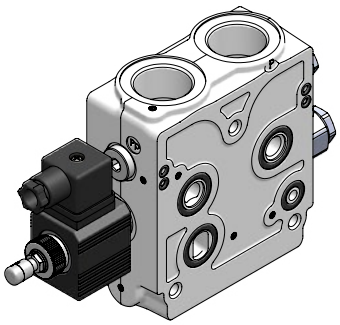


Pressure drop cut-off system in PDI, closed centre



Pressure relief valve characteristic in PDI, closed centre





Designed for use with LS variable displacement pumps.

PDIM is a MID inlet section that allows the PDV74 to be supplied with a larger variable pump flow capacity with a lower pressure drop.
PDIM enable to PDW to be mounted on both sides of the pump side module, therefore, the PDW fitted on PMID left side, the A-B work port position are reversed.

Inlet comes standard without pressure compensated 3-way flow regulator.

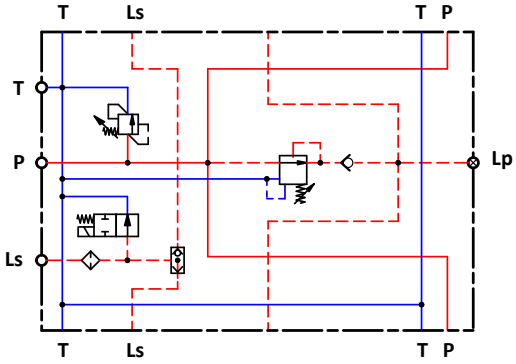
When pump is started and PDV spools are in neutral position, the LS pump signal is unloaded to tank.
When one or more of the spools are actuated, the highest signal is sent to the pump regulator that control the pump swashplate angle.
The PDS main spool compares the pressure drop before and after the spool notches (differential pressure Δp), and therefore, the pump flow remain constant.
The position of the PDS spool determines the flow demand. If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

The inlet section may comes with an optional pressure relief valve that should be set at pressure about 35 bar above maximum system pressure set on the pump regulator.

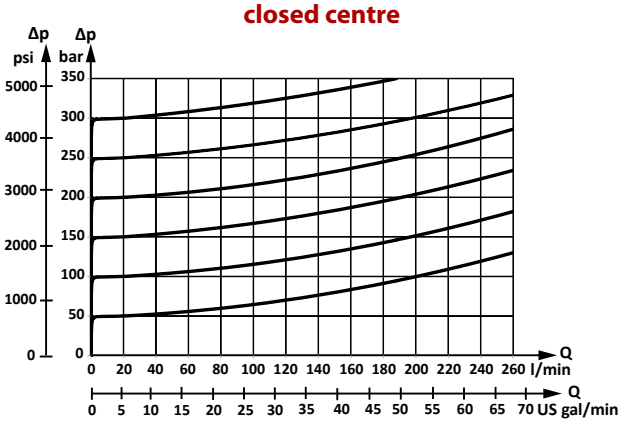
According to an electrical signal coming from the remote controls or I/O controller, the PIU solenoid unloading valve enable the LS signal to be relieved to tank.
The effect of this configuration is an almost pressureless system, where the activated actuators will be automatically catted off, and the pressure in the system will be reduced to the sum of the tank port pressure, plus the differential pressure of the pump, therefore, care must be given, because all the actuators whose working pressure is lower than the remaining pressure might be still operated.

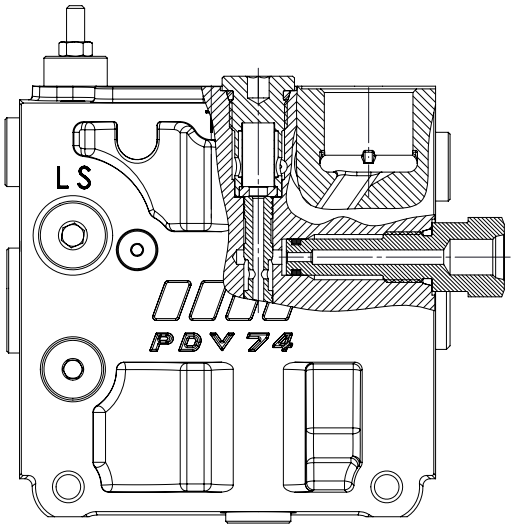
Also with the use of PIU emergency solenoid unloading valve, the level of safety degrees for the complete PDV valve is quite low, therefore, operator's great supervision is required.

Hydraulic diagram

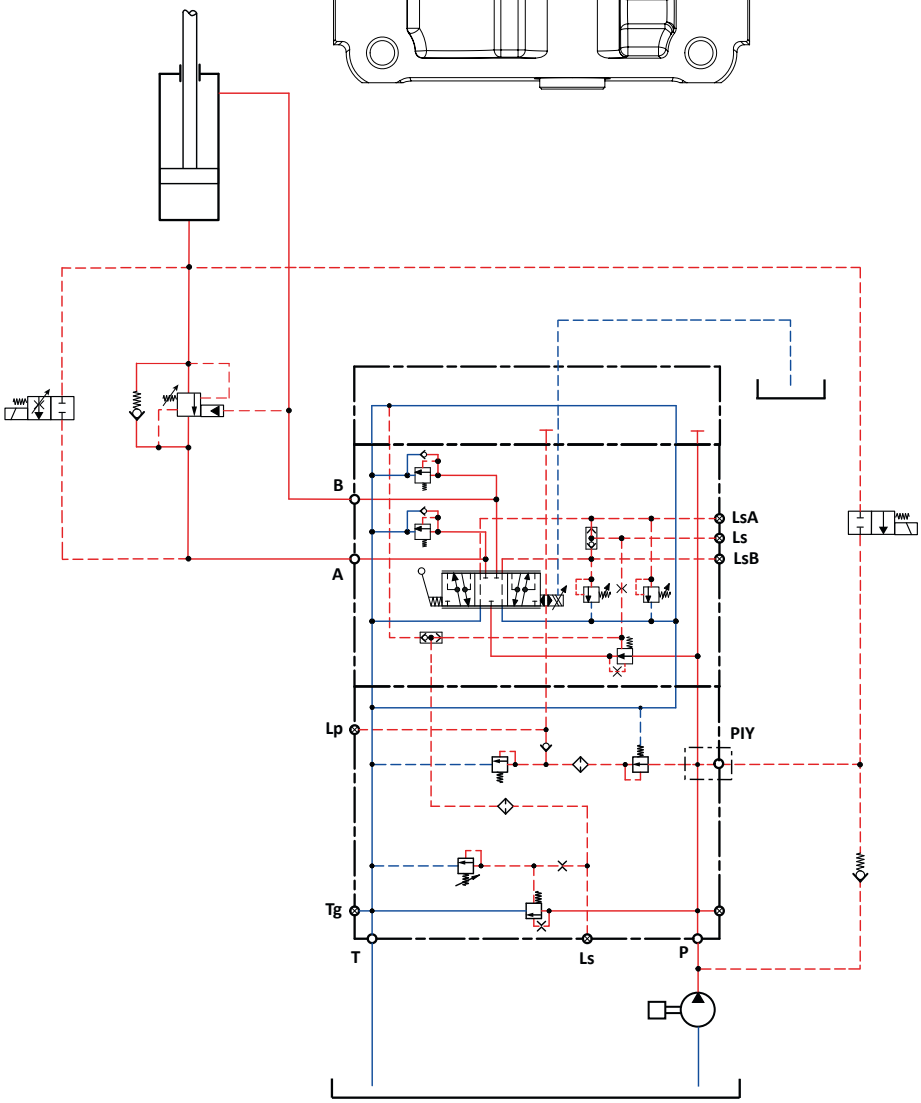


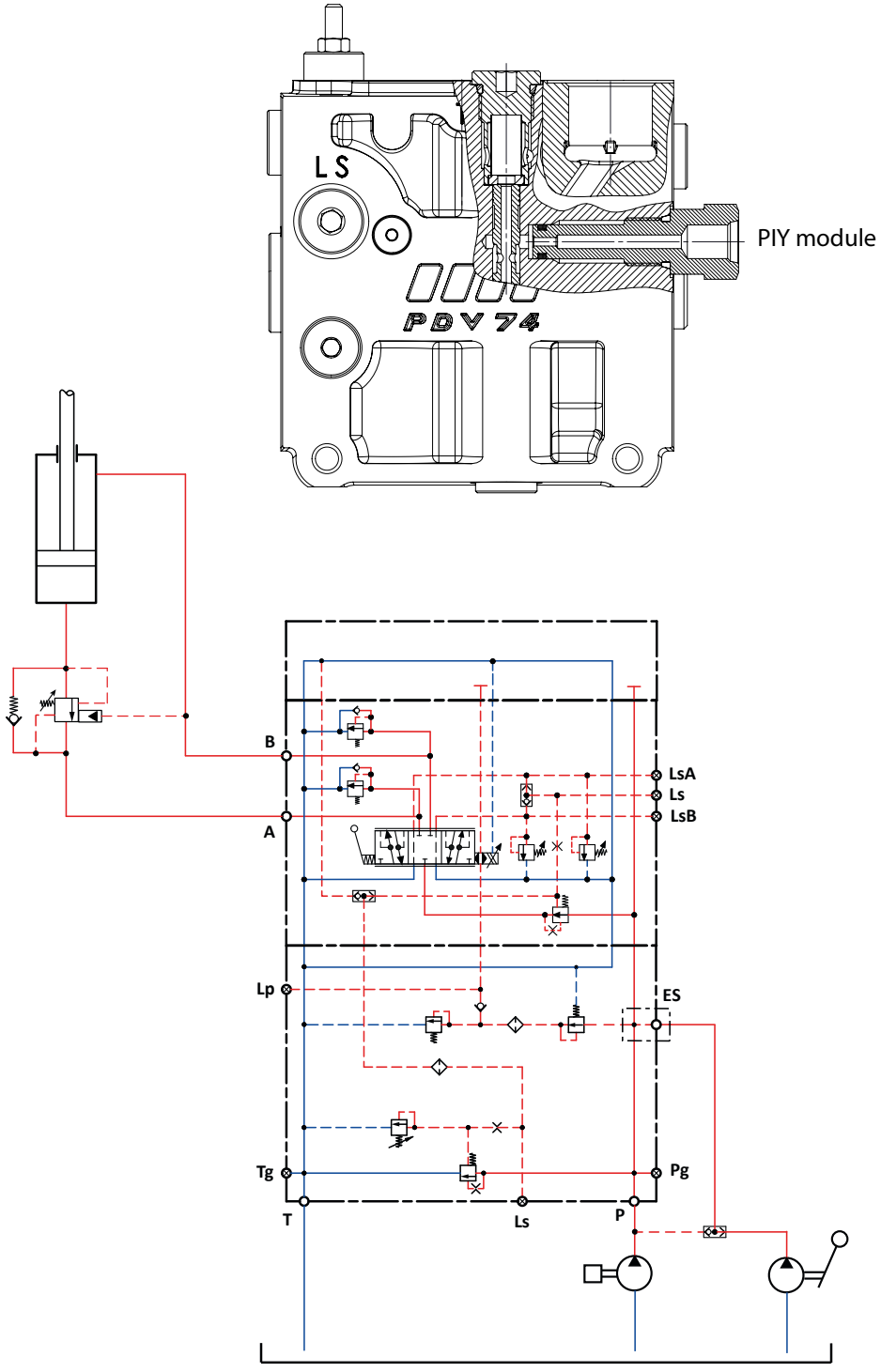
Pressure relief valve characteristic in PDI, closed centre





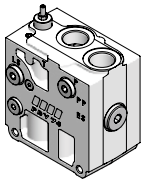
PIY module

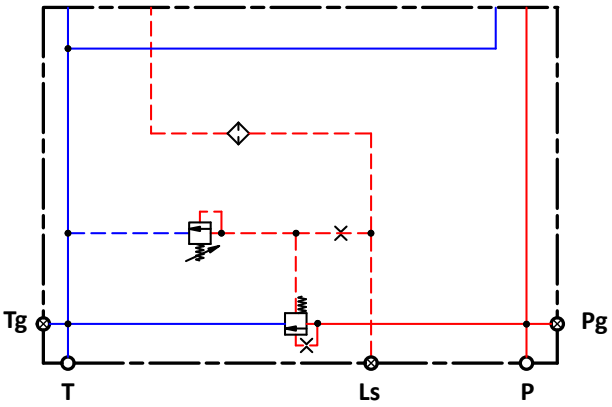




This inlet configuration (for open or closed centre) is suited to supply the PDV74 with a flow from an auxiliary manual operated emergency pump.
Normally the main pump supply the built in pressure reducing valve through the PIY, screw-in cartridge.
In case of main pump failure, the external shuttle valve ensure that the main pressure reducing valve is being supplied from the emergency hand pump, and the pilot oil supply available for electric actuators.

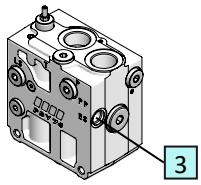
Product	Hydraulic diagram	Description

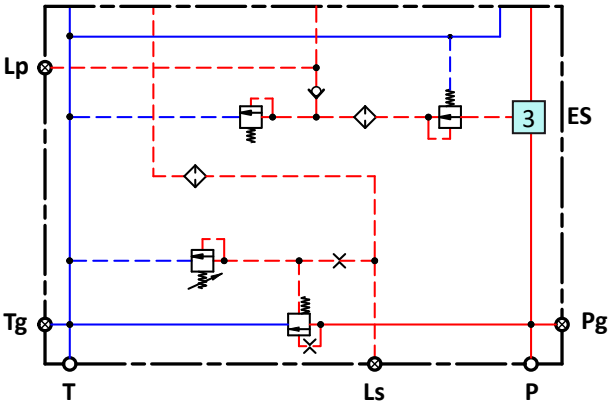




For mechanically actuated valves, only

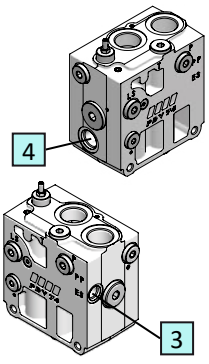
Code numbers	
PDI07A30000	**PDI07A30010**
BSPP	UN-UNF
P, T ports 3/4" Ls, Pg, Tg ports 1/4"	P, T ports 1 1/16"-12UN-2B Ls, Pg, Tg ports 7/16"-20UNF-2B

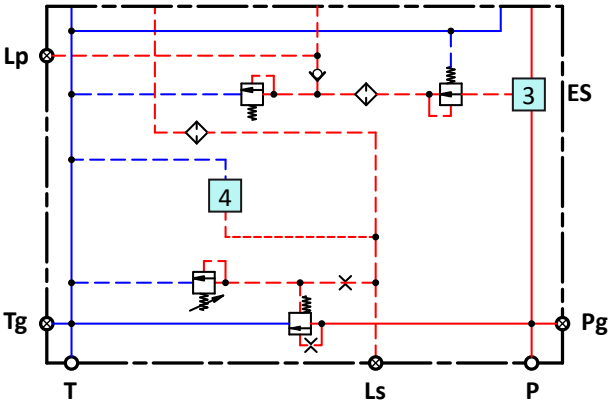




With pilot oil supply for electrically and hydraulic actuated valves 3

Code numbers	
PDI07A40000	**PDI07A40010**
BSPP	UN-UNF
Connections threads see page 113	

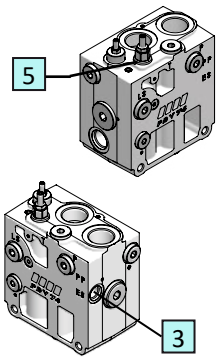


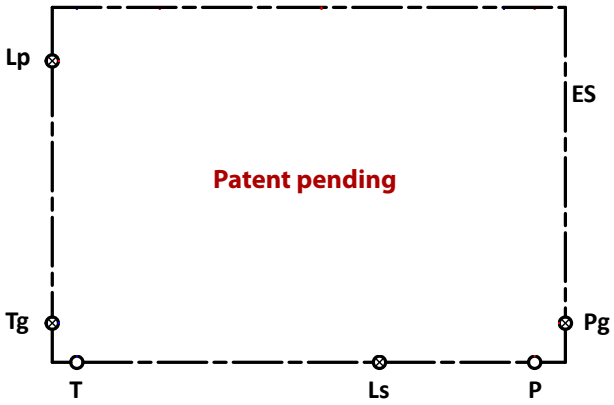


With pilot oil supply for electrically and hydraulic actuated valves 3 and facility for LS unloading 4

Code numbers	
PDI07A41000	**PDI07A41010**
BSPP	UN-UNF
Connections threads see page 113	

Product	Hydraulic diagram	Description

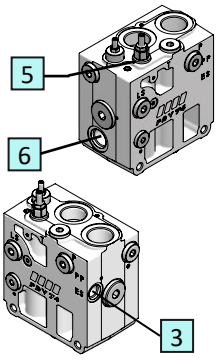


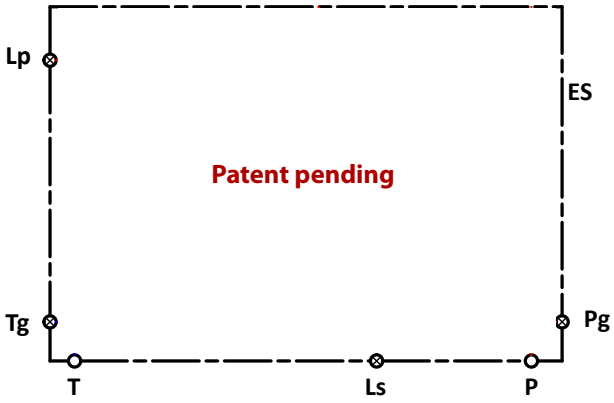


With pilot oil supply, for electrically and hydraulic actuated valves 3 and shifting pump system 5

Code numbers	
PDI07B40000	**PDI07B40010**
BSPP	UN-UNF

Connections threads see page 113

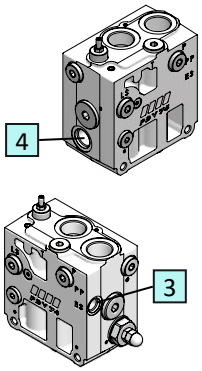


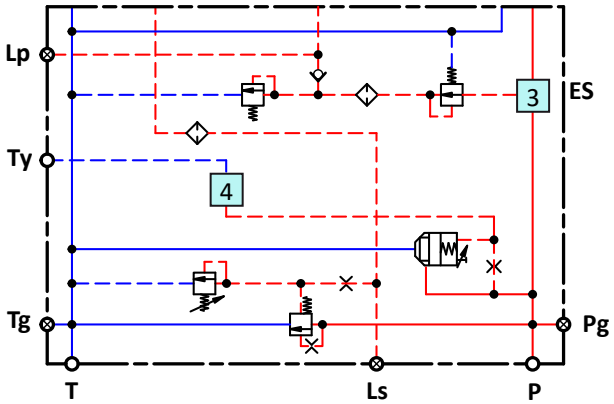


With pilot oil supply for electrically and hydraulic actuated valves 5, shifting pump system 6 and facility for LS unloading 3

Code numbers	
PDI07B41000	**PDI07B41010**
BSPP	UN-UNF

Connections threads see page 113

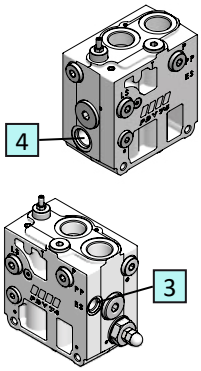


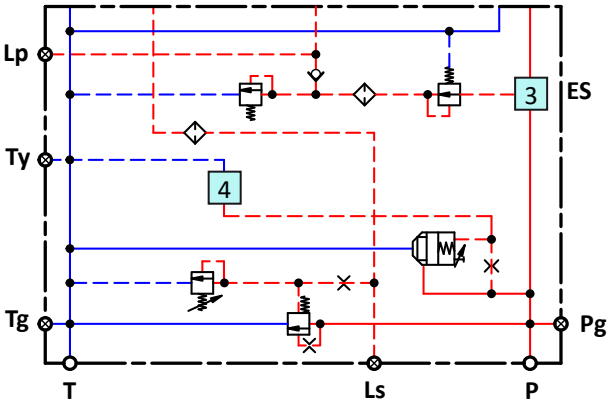


With pilot oil supply for electrically and hydraulic actuated valves 3 and pump unloading system 4 with external drain line

Code numbers	
PDI07A42000	**PDI07A42010**
BSPP	UN-UNF

Connections threads see page 113



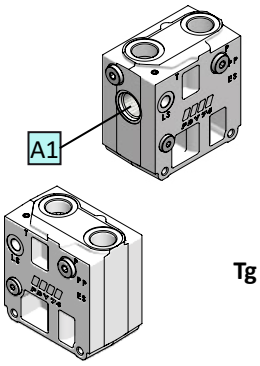


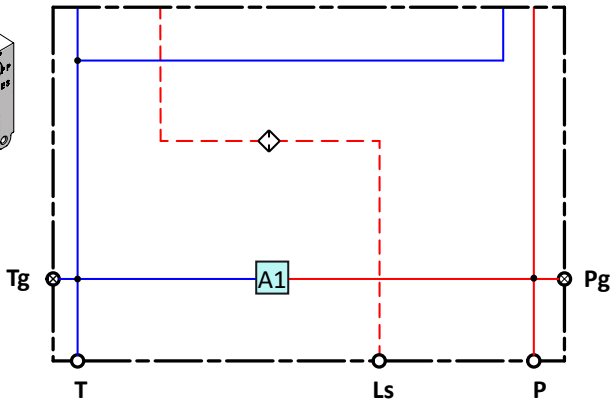
With pilot oil supply for electrically and hydraulic actuated valves 3 and pump unloading system 4 with internal drain line

Code numbers	
PDI07A45000	**PDI07A45010**
BSPP	UN-UNF

Connections threads see page 113

Product	Hydraulic diagram	Description

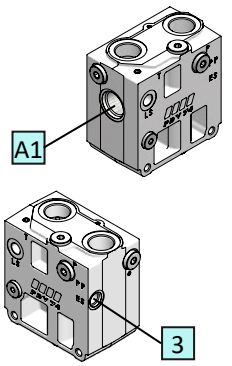


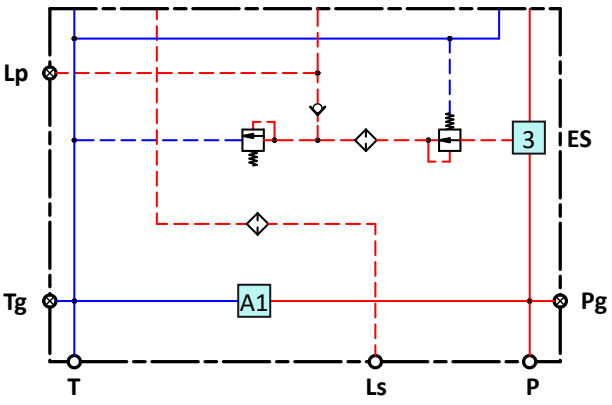


For mechanically actuated valves, prearranged for pressure relief valve A

Code numbers	
PDI07C30000	**PDI07C30010**
BSPP	UN-UNF

Connections threads see page 113

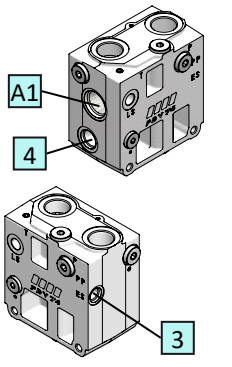


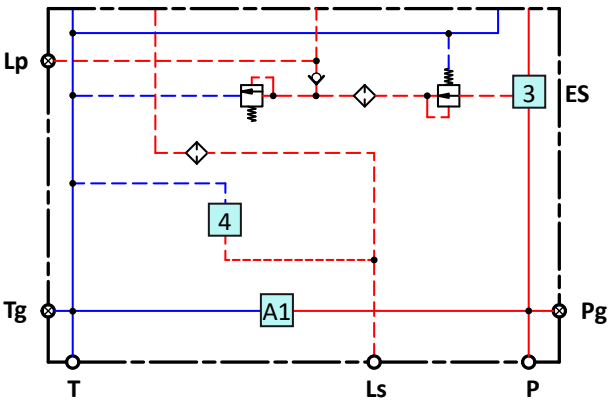


With pilot oil supply for electrically and hydraulic actuated valves 3 prearranged for pressure relief valve A

Code numbers	
PDI07C40000	**PDI07C40010**
BSPP	UN-UNF

Connections threads see page 113



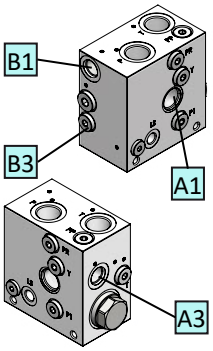


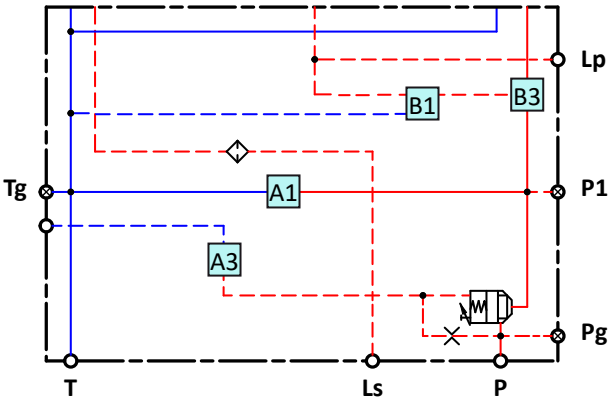
With pilot oil supply for electrically and hydraulic actuated valves 3 preagganged for LS unloading 4 and pressure relief A

Code numbers	
PDI07C41000	**PDI07C41010**
BSPP	UN-UNF

Connections threads see page 113

Product	Hydraulic diagram	Description

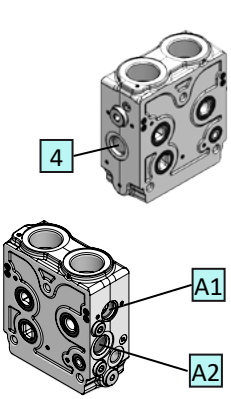


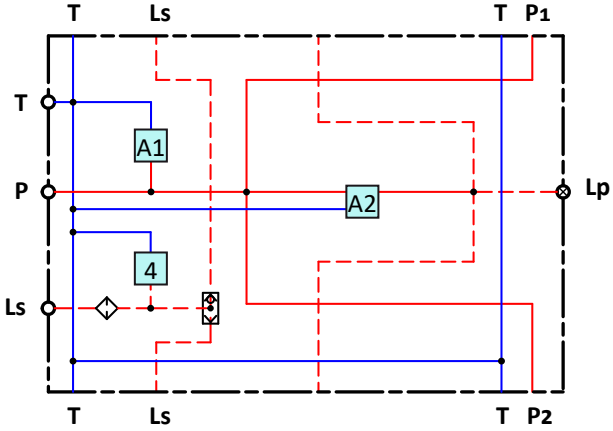


With pilot pressure oil supply for electrically and hydraulic actuated valves B3, and cut-off pump system A3 prearranged for pressure relief valve A1

Code numbers	
PDI07C44000	**PDI07C44010**
BSPP	UN-UNF

Connections threads see page 113

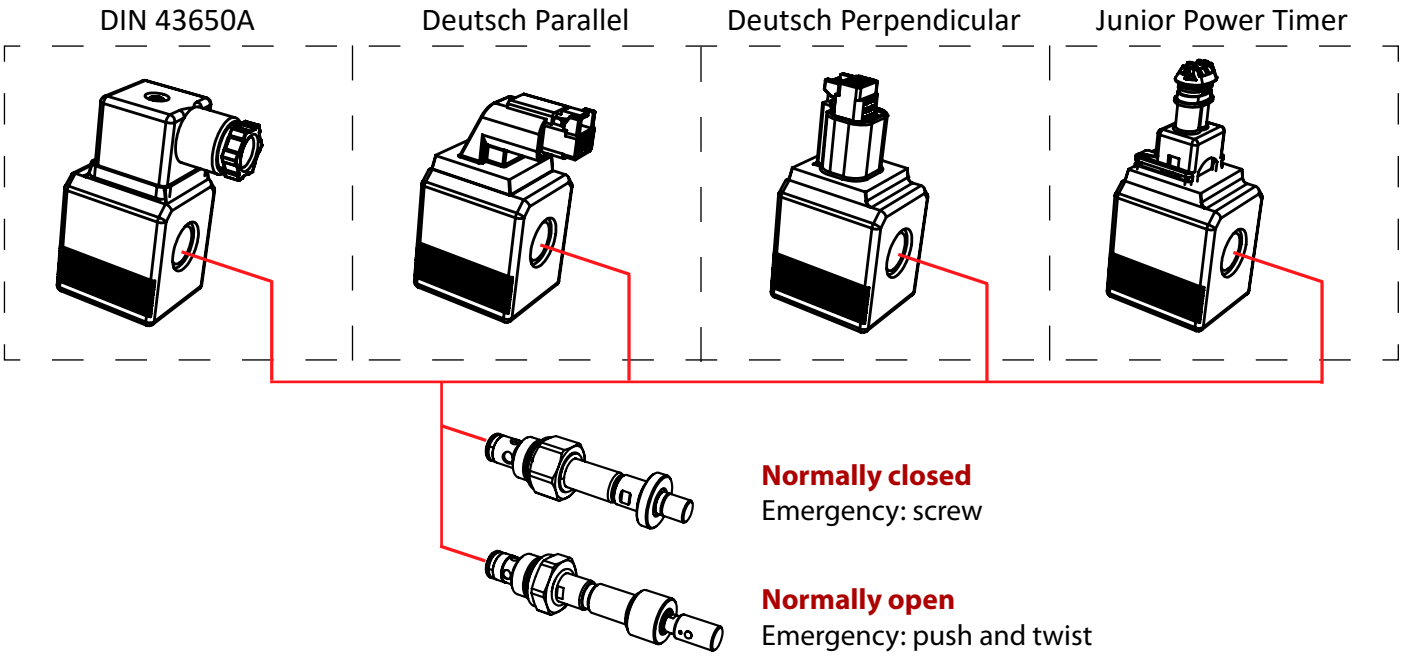


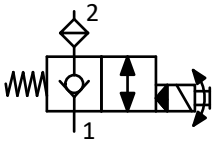
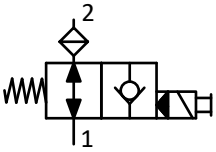


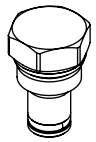
PDV74 MID inlet with pilot oil supply for electrically and hydraulic actuated valves, facility for LS unloading 4 and prearranged for pressure relief valve A1

Code numbers	
PDIM7C41000	**PDIM7C41010**
BSPP	UN-UNF

Connections threads see page 127

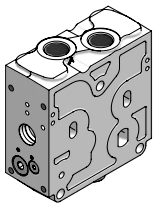


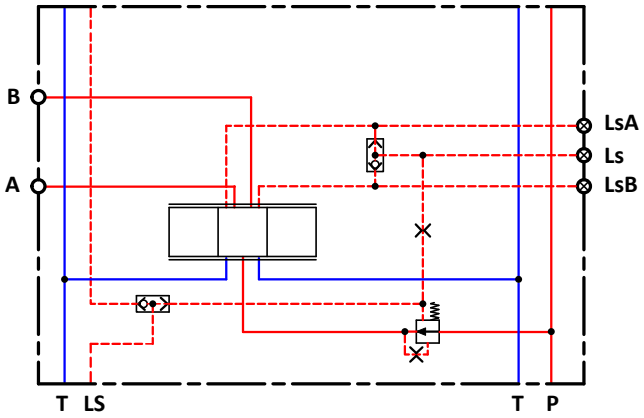
Code numbers PIU solenoid LS unloading valve codes			
Cartridge valve type	Connector type	12 Vdc	24 Vdc
Normally closed Emergency: screw 	DIN 43650A	**PIU0C023200**	**PIU0C013200**
	Deutsch Parallel	**PIU0C021200**	**PIU0C011200**
	Deutsch Perpendicular	**PIU0C022200**	**PIU0C012200**
	Junior Power Timer	**PIU0C024200**	**PIU0C014200**
Normally open Emergency: push and twist 	DIN 43650A	**PIU0A023100**	**PIU0A013100**
	Deutsch Parallel	**PIU0A021100**	**PIU0A011100**
	Deutsch Perpendicular	**PIU0A022100**	**PIU0A012100**
	Junior Power Timer	**PIU0A024100**	**PIU0A014100**

Plug for LS unloading cavity		
Plug cavity	Hydraulic scheme	Code numbers
		**PIP10000000**

Max. operating pressure		**350 bar**	
Max. internal leakage		**350 bar, 46 mm²/sec 1 cm³/min**	
max pressure drop		**< 1,5 bar**	
Expected life - 350 bar, 0,5 Hz (1s on / 1s off)		**10.000.000 cycles**	
Response time for LS pressure relief		**< 280ms**	
Oil temperature	**Recommended**	**30 ÷ 60 °C**	
	Min.	**-30 °C**	
	Max.	**90 °C**	
Ambient temperature		**-30 ÷ 60 °C**	
Max. coil surface temperature		**160 °C**	
Oil viscosity	**Operating range**	**10 ÷ 90 cSt**	
	Min.	**4 mm²/sec**	
	Max.	**460 mm²/sec**	
Degree of enclosure	**Connector DIN 43650**	**IP65**	
	Connector Deutsch DT04-2p	**IP67**	
		IP69K integrated to coil	
Rated voltage		**12 Vdc**	**24 Vdc**
Supply voltage		**10,6 ÷ 14,6 Vdc**	**20,4 ÷ 28,6 Vdc**
Working temperature		**-30 ÷ 80 °C**	
Maximum coil surface temperature		**175 °C**	
Heat insulation		**Class H (180 °C)**	
Resistance		**7,5 Ω**	**29,9 Ω**
Current consumption		**1,6 A**	**0,8 A**
Power consumption		**19 W**	

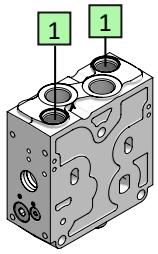
Product	Hydraulic diagram	Description

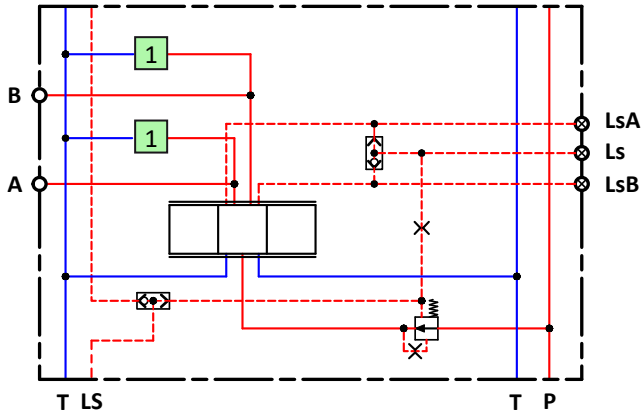




No facilities for shock-suction valves
No facilities for LS A/B pilot relief valves

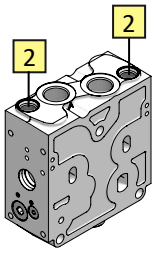
Code numbers	
PDW71000000	**PDW71000010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 7/8"-14UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

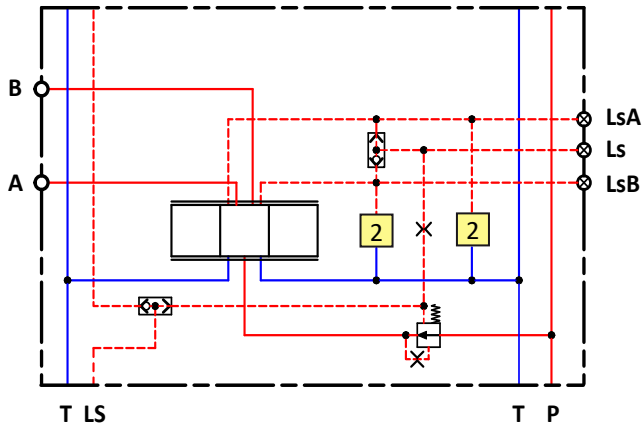




Facilities for shock-suction valves 1
No facilities for LS A/B pilot relief valves

Code numbers	
PDW71010000	**PDW71010010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 7/8"-14UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

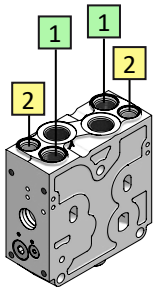


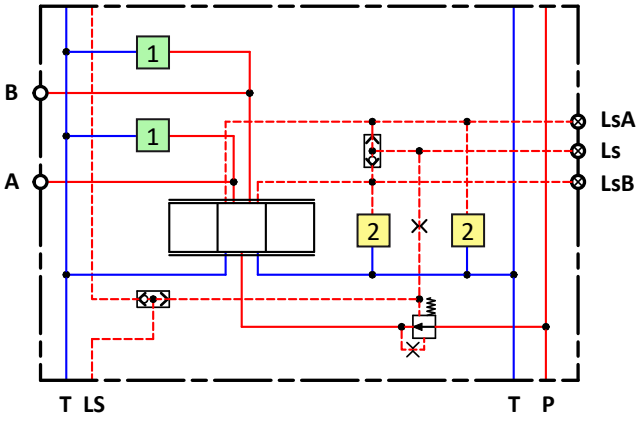


No facilities for shock-suction valves
Facilities for LS A/B pilot relief valves 2

Code numbers	
PDW71100000	**PDW71100010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 7/8"-14UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

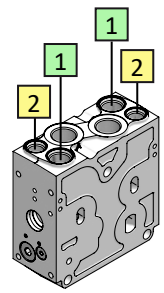
Product	Hydraulic diagram	Description

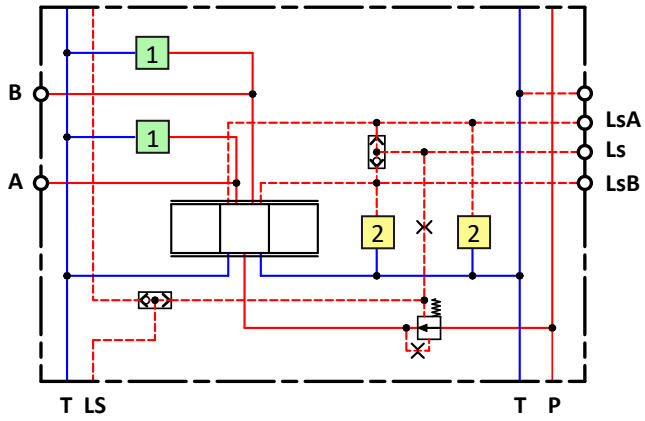




Facilities for shock-suction valves 1
Facilities for LS A/B pilot relief valves 2

Code numbers	
PDW71110000	**PDW71110010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 7/8"-14UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

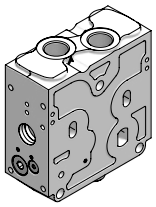


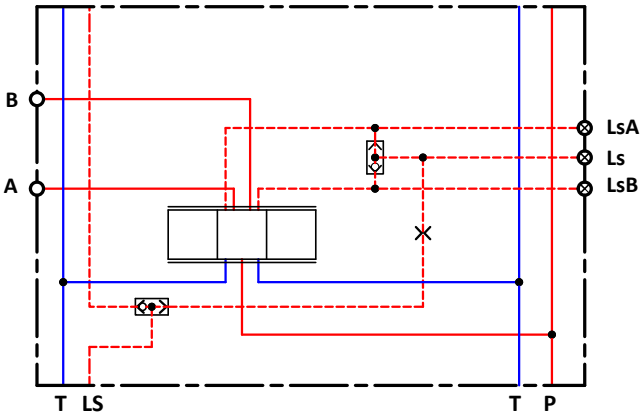


Facilities for shock-suction valves 1
Facilities for LS A/B pilot relief valves and electric unloading LS A/B piloting 2

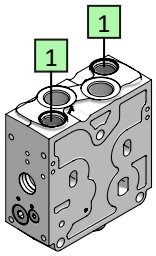
Code numbers	
PDW71111000	**PDW71111010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 7/8"-14UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

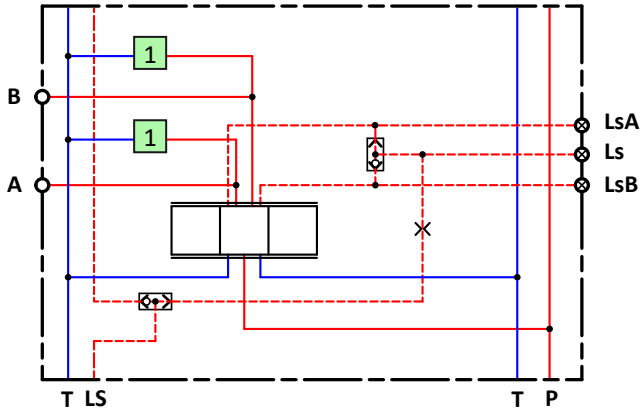
Product	Hydraulic diagram	Description



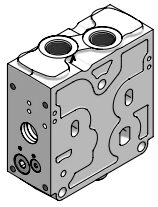


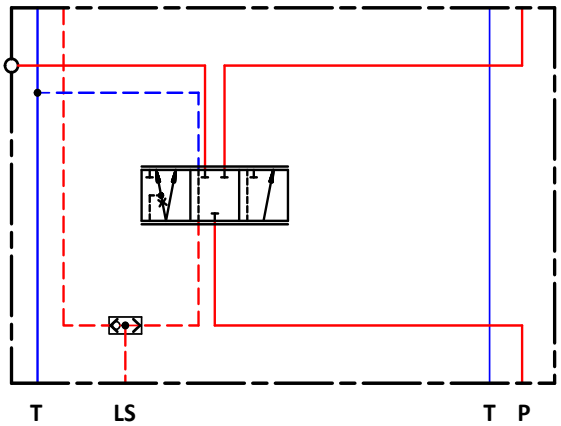
No facilities for shock-suction valves	
Code numbers	
PDW70000000	**PDW70000010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB piloting connections 1/4"	A/B ports 7/8" - 14UNF - 2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B





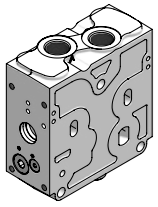
Facilities for shock-suction valves 1	
Code numbers	
PDW70010000	**PDW70010010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB piloting connections 1/4"	A/B ports 7/8" - 14UNF - 2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

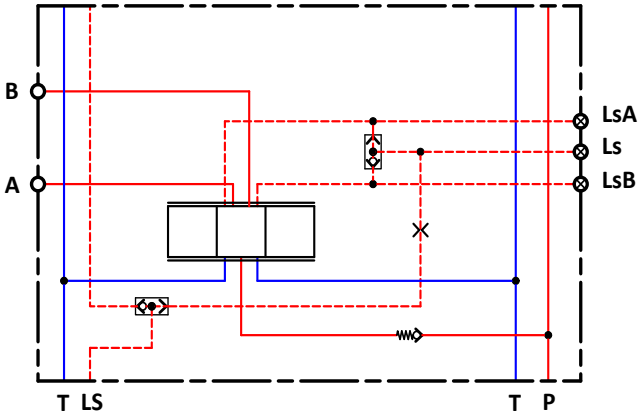




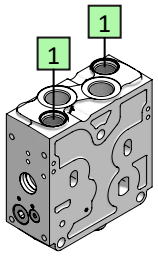
Functional safety cut-off system and diverter flow	
Code numbers	
PDW75000000	**PDW7500010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB piloting connections 1/4"	A/B ports 7/8" - 14UNF - 2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

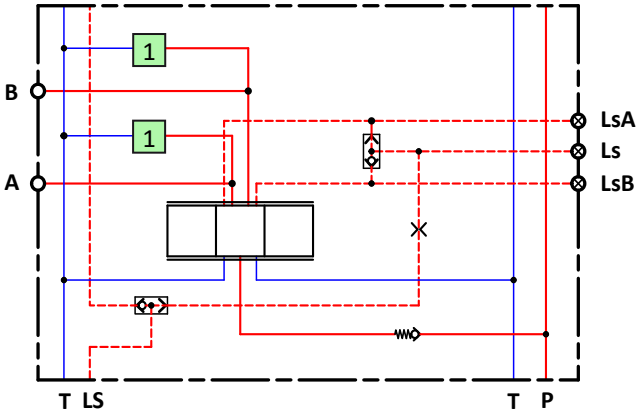
Product	Hydraulic diagram	Description





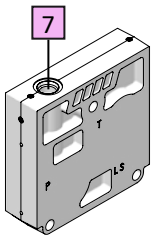
No facilities for shock-suction valves With load drop check valve on P channel	
Code numbers	
PDW73000000	**PDW73000010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB piloting connections 1/4"	A/B ports 7/8" - 14UNF - 2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

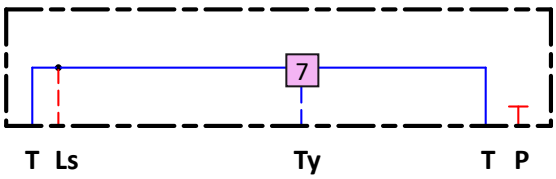




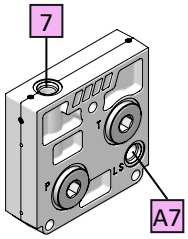
Facilities for shock-suction valve 1 With load drop check valve on P channel	
Code numbers	
PDW73010000	**PDW73010010**
BSPP	UN-UNF
A/B ports 1/2" Ls-LsA-LsB piloting connections 1/4"	A/B ports 7/8" - 14UNF - 2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

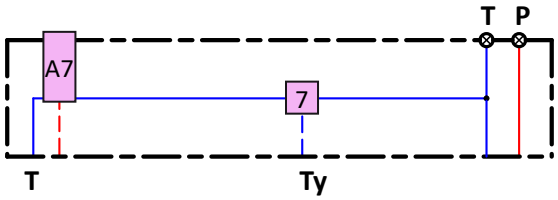
Product	Hydraulic diagram	Description



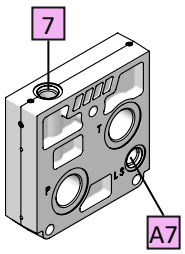


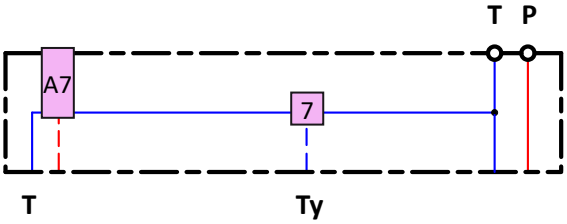
No ported, prearranged for external/internal drain 7	
Code numbers	
PDE07010000	**PDE07010010**
BSPP	UN-UNF
Ty ports 1/4"	Ty ports 7/16"-20UNF-2B





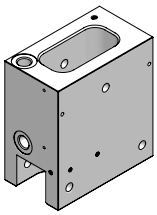
Ls port A7 prearranged for external/internal drain 7	
Code numbers	
PDE07210000	**PDE07210010**
BSPP	UN-UNF
P, T ports 3/4" Ls, Ty ports 1/4"	P, T ports 1 1/16"-12UN-2B Ls, Ty ports 7/16"-20UNF-2B



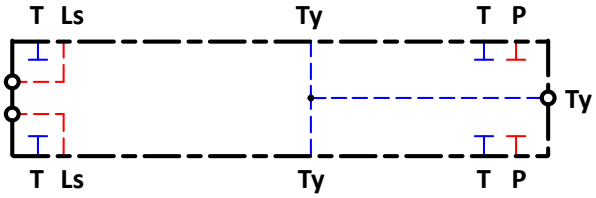


P-T-Ls ports A7 prearranged for external/internal drain 7	
Code numbers	
PDE07110000	**PDE07110010**
BSPP	UN-UNF
Connections thread see page____	Connections thread see page____

Product

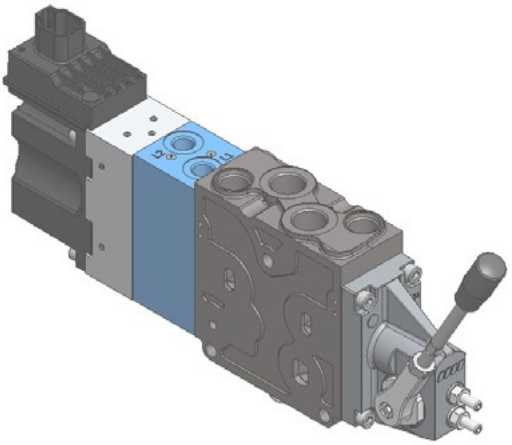


Hydraulic diagram

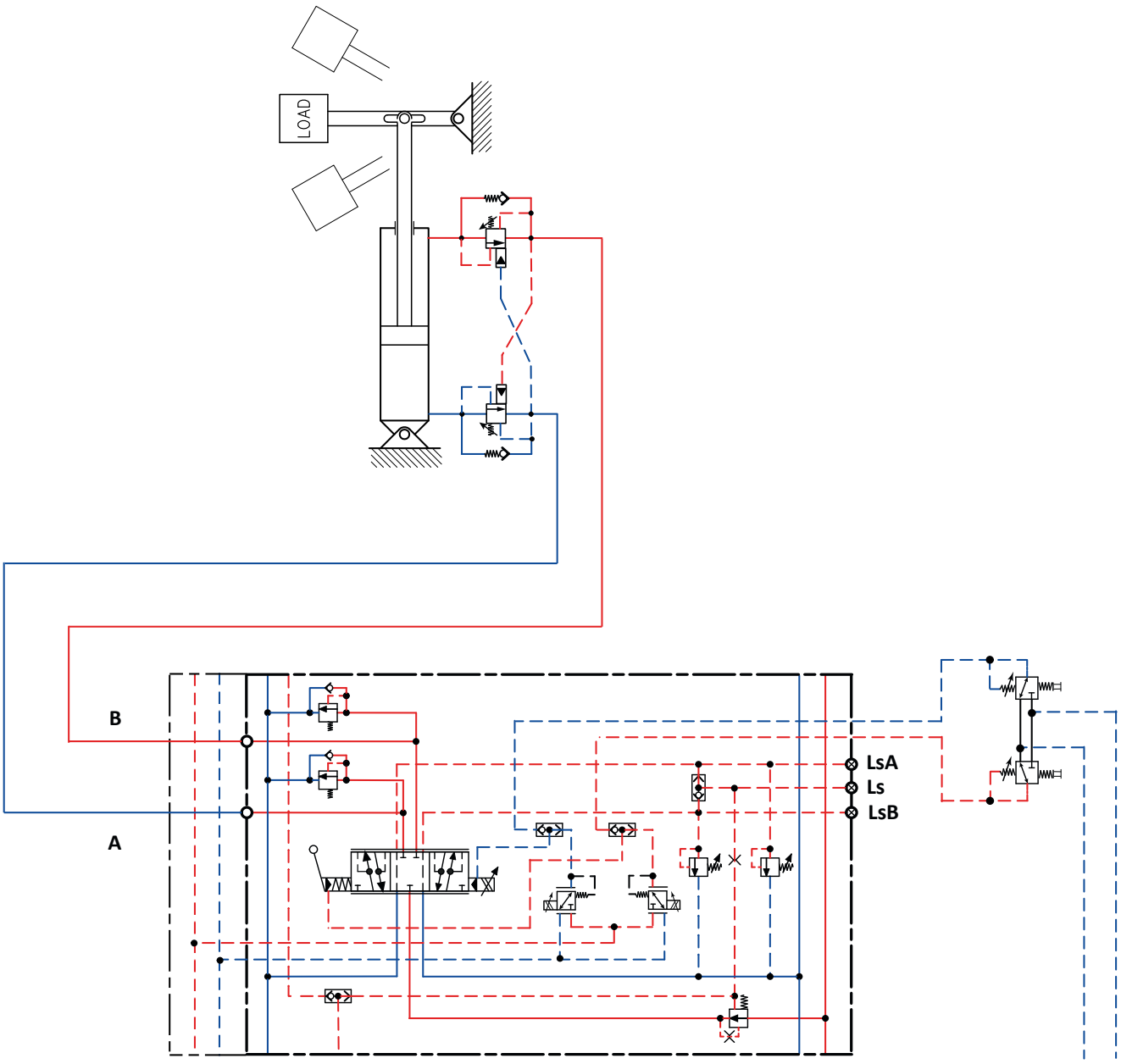


Description

MID end section	
Code numbers	
PDEM7010000	**PDEM7010010**
BSPP	UN-UNF
Ls, Ty ports 1/4"	Ls, Ty ports 7/16"-20UNF-2B



PDZ is a small HIC body that can be matched with any kind of PDV74 working section PDW, to get hydraulic and electro-hydraulic spool control

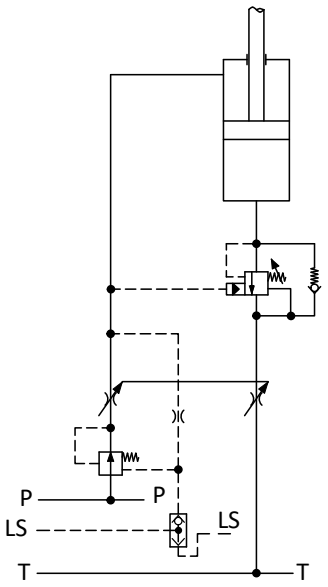


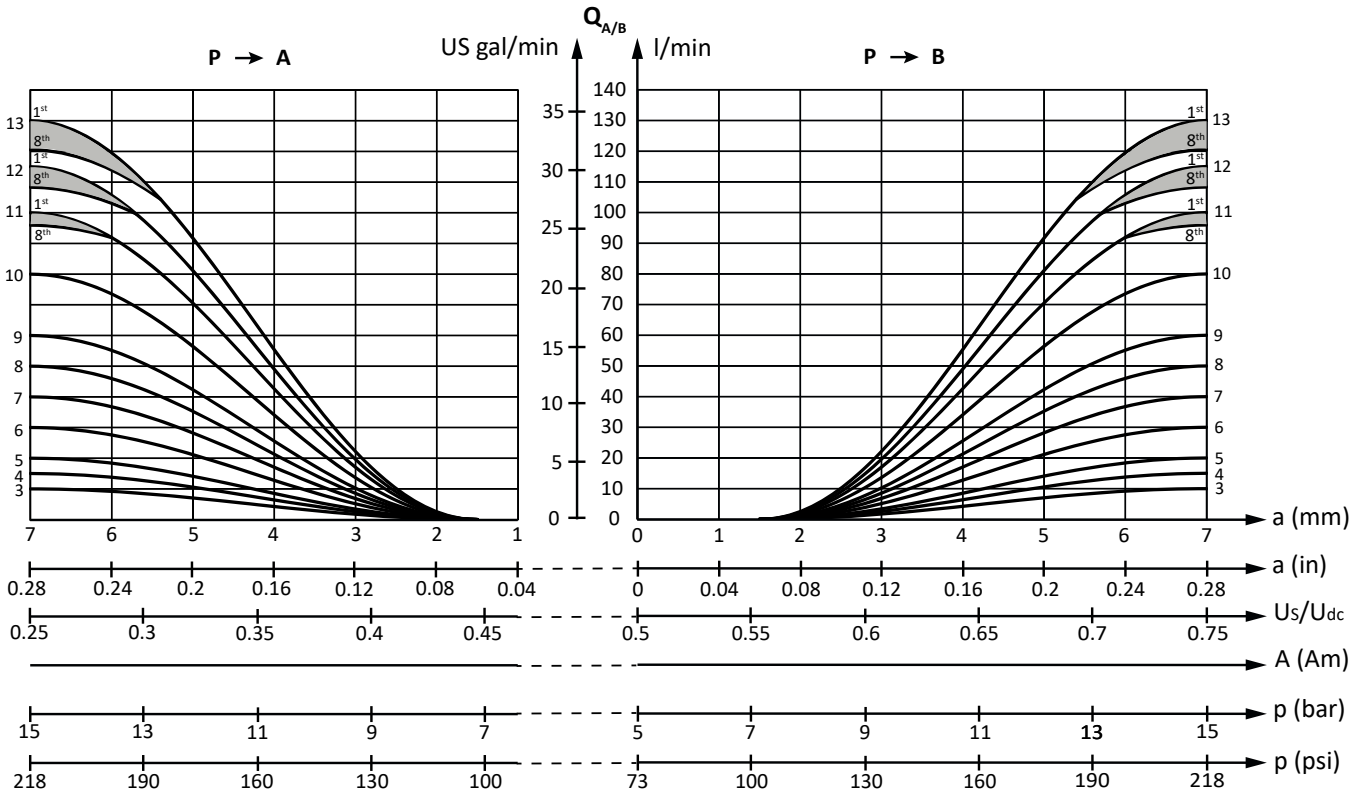
PDZ overrall dimensions	For open loop spool control (Aluminium)	For closed loop spool control (Cast Iron)
	PDZ70000000 1/4" BSPP - 12 mm deep	**PDZ71000000** 1/4" BSPP - 12 mm deep
	PDZ70100000 [7/16 in-20 UNF-2B - 0,47 in deep]	**PDZ71100000** [7/16 in-20 UNF-2B - 0,47 in deep]

Oil flow characteristics

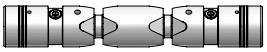
With flow control spool, the oil flow depends on type of PDW module (with or without pressure compensator) and type of pump (fixed or variable displacement).

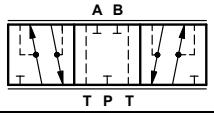
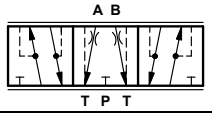
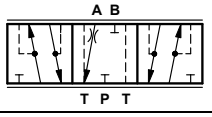
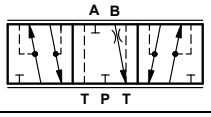
In the below chart, the ordinate numbers refer to spool size, and the ordinal numbers refer to the same spool size but fitted in a different position with related lost flow.



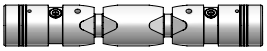


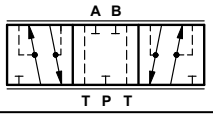
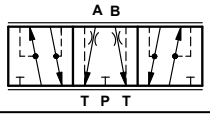
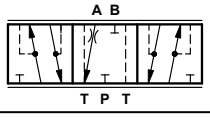
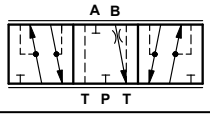
Double acting flow control spool



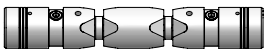
Size	Max oil flow pressure compensated **l/min**	Code numbers and symbol			
					
		4-way, 3-position - A, B closed	4-way, 3-position, A, B → T	4-way, 3-position, B → T; A closed	4-way, 3-position, A → T; B closed
1	5	PDS00210101	PDS00220102	PDS00280101	PDS00280102
2	7,5	PDS00210102	PDS00220103	PDS00280103	PDS00280104
3	10	PDS00210103	PDS00220104	PDS00280105	PDS00280106
4	15	PDS00210105	PDS00220106	PDS00280107	PDS00280108
5	20	PDS00210106	PDS00220107	PDS00280109	PDS00280110
5,5	25	PDS00210121	PDS00220122	PDS00280111	PDS00280112
6	30	PDS00210107	PDS00220108	PDS00280113	PDS00280114
7	40	PDS00210109	PDS00220110	PDS00280115	PDS00280116
8	50	PDS00210110	PDS00220111	PDS00280117	PDS00280118
9	60	PDS00210111	PDS00220112	PDS00280119	PDS00280120
10	80	PDS00210113	PDS00220114	PDS00280121	PDS00280122
11	100	PDS00210115	PDS00220116	PDS00280123	PDS00280124
12	115	PDS00210117	PDS00220118	PDS00280125	PDS00280126
13	130	PDS00210119	PDS00220120	PDS00280127	PDS00280128

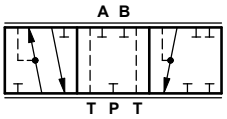
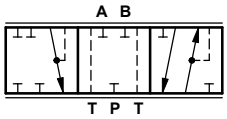
Double acting asymmetric flow control spool



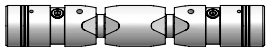
Max oil flow pressure compensated **l/min**		Code numbers and symbol			
					
A	**B**	4-way, 3-position - A, B closed	4-way, 3-position, A, B → T	4-way, 3-position, B → T, A closed	4-way, 3-position, A → T, B closed
15	7,5	PDS00230101	PDS00230102	PDS00270103	PDS00270102
20	40	PDS00230117	PDS00230118	PDS00270119	PDS00270120
25	15	PDS00230123	PDS00230124	PDS00270125	PDS00270126
30	40	-	PDS00230116	PDS00270115	PDS00270116
30	50	PDS00230127	-	-	-
30	60	PDS00230131	-	-	-
40	20	PDS00230105	PDS00230104	PDS00270101	PDS00270104
40	30	PDS00230115	-	PDS00270117	PDS00270118
40	60	PDS00230113	PDS00230114	PDS00270113	PDS00270114
40	110	PDS00230129	-	-	-
50	30	PDS00230121	PDS00230122	PDS00270123	PDS00270124
60	40	PDS00230125	PDS00230126	-	-
65	30	PDS00230107	PDS00230106	PDS00270105	PDS00270106
75	30	PDS00230103	PDS00230112	PDS00270111	PDS00270112
80	40	PDS00230119	PDS00230120	PDS00270121	PDS00270122
110	40	PDS00230109	PDS00230108	PDS00270107	PDS00270108
130	60	PDS00230111	PDS00230110	PDS00270109	PDS00270110

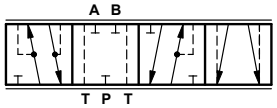
Single acting flow control spool



Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		3-way, 3-position P → A	3-way, 3-position P → B
1	**7,5**	**PDS00750101**	**PDS00750102**
2	**15**	**PDS00750103**	**PDS00750104**
3	**20**	**PDS00750105**	**PDS00750106**
4	**30**	**PDS00750107**	**PDS00750108**
5	**40**	**PDS00750109**	**PDS00750110**
6	**50**	**PDS00750111**	**PDS00750112**
7	**60**	**PDS00750113**	**PDS00750114**
8	**80**	**PDS00750115**	**PDS00750116**
9	**100**	**PDS00750117**	**PDS00750118**

Double acting flow control spool, floating position

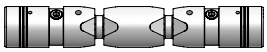


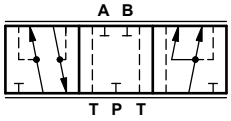
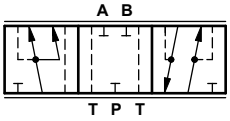
Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		3-way, 4-position floating position on A port	3-way, 4-position floating position on B port
1	**10**	**PDS00730101**	**PDS00740101**
2	**15**	**PDS00730102**	**PDS00740102**
3	**25**	**PDS00730103**	**PDS00740103**
4	**40**	**PDS00730104**	**PDS00740104**
5	**50**	**PDS00730105**	**PDS00740105**

Spool centered set, code numbers (needed for any kind of flow control spool)

Tightening torque		Tightening torque
6^{+1}_{0} Nm		6^{+1}_{0} Nm
$53,1^{+8,85}_{0}$ lb*in		$53,1^{+8,85}_{0}$ lb*in
Manual control	**PDR00300101**	
Hydraulic - Electrohydraulic	**PDR00300102**	

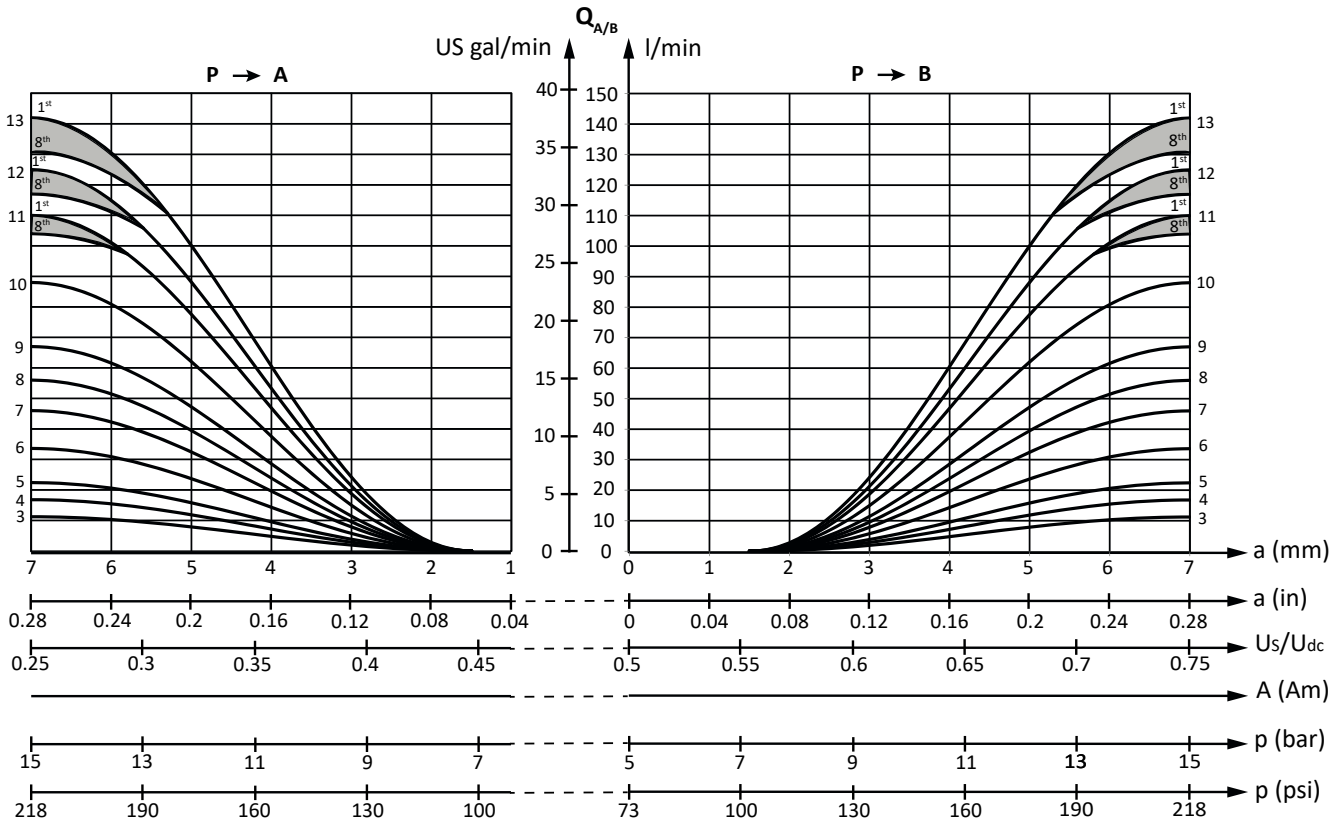
Double acting flow control, regenerative function



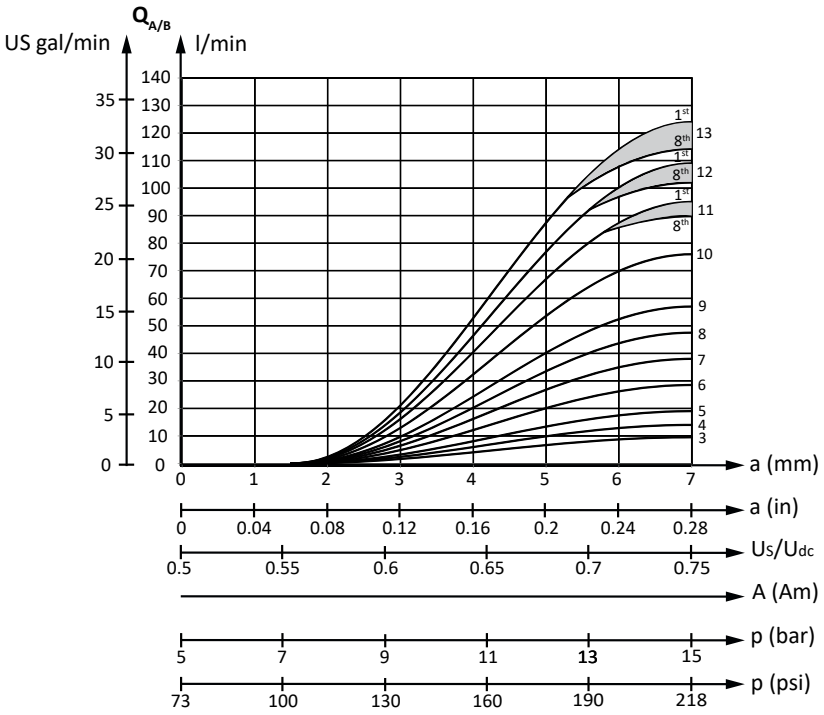
Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		Regenerative circuit on A port	Regenerative circuit on B port
1	**7,5**		
2	**15**	**PDS00610103**	**PDS00610104**
3	**20**	**PDS00610105**	**PDS00610106**
4	**30**	**PDS00610107**	**PDS00610108**
5	**40**	**PDS00610109**	**PDS00610110**
6	**50**	**PDS00610111**	**PDS00610112**
7	**60**		
8	**80**	**PDS00610115**	**PDS00610116**
9	**100**		
10	**130**		

Spool centered set, code numbers (needed for any kind of flow control spool)

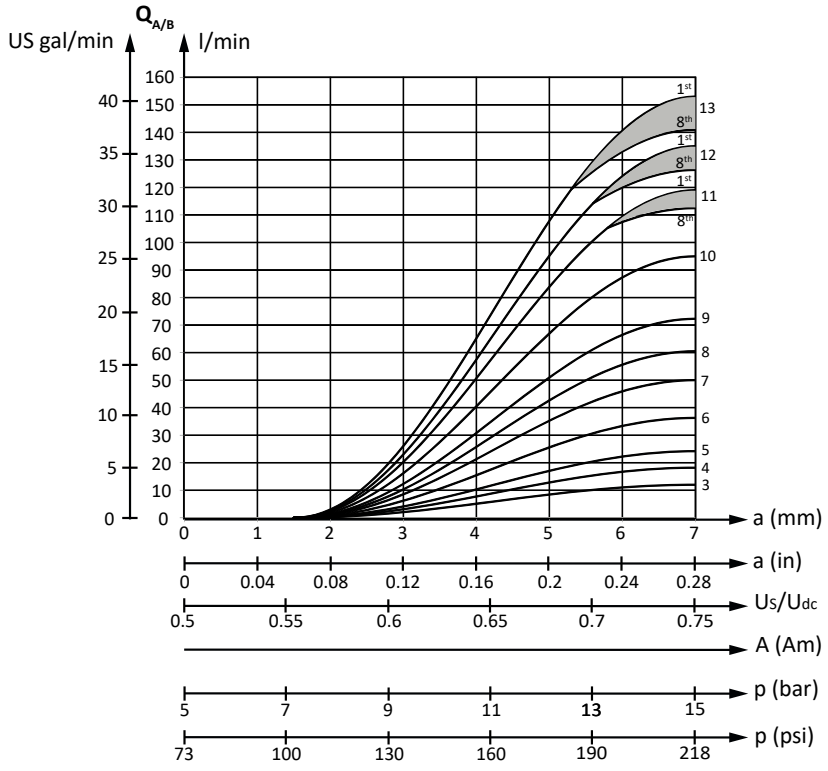
Tightening torque		Tightening torque
6^{+1}_{0} Nm		6^{+1}_{0} Nm
$53,1^{+8,85}_{0}$ lb*in		$53,1^{+8,85}_{0}$ lb*in
Manual control	**PDR00300101**	
Hydraulic - Electrohydraulic	**PDR00300102**	


$Q_{A/B}$
US gal/min
l/min
P → A
P → B
1st
8th
a (mm)
a (in)
Us/Udc
A (Am)
p (bar)
p (psi)

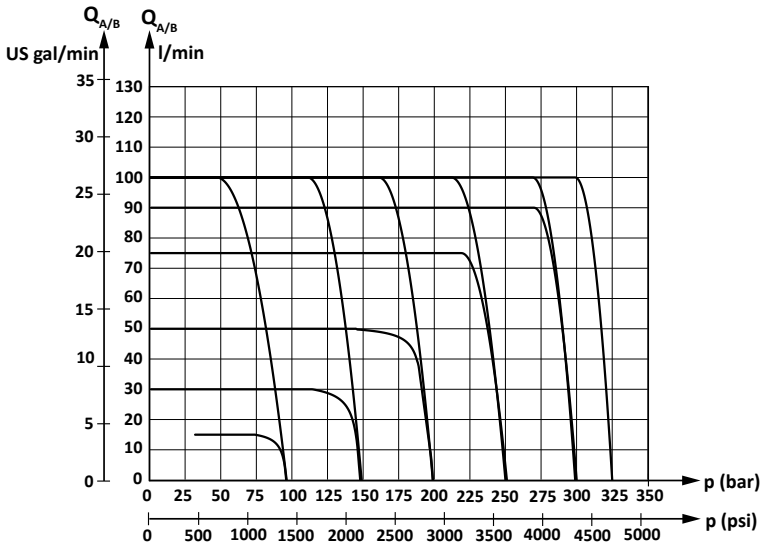
Oil flow characteristics PDW without pressure compensator, and pump differential pressure setting = 16 bar



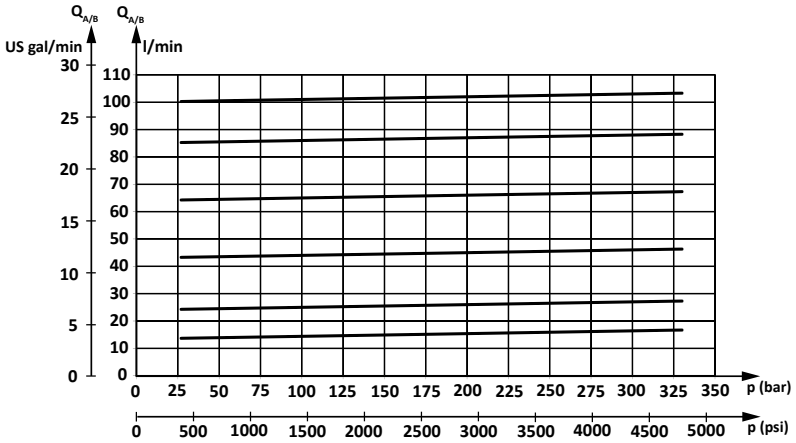
Oil flow characteristics PDW without pressure compensator, and pump differential pressure setting = 25 bar



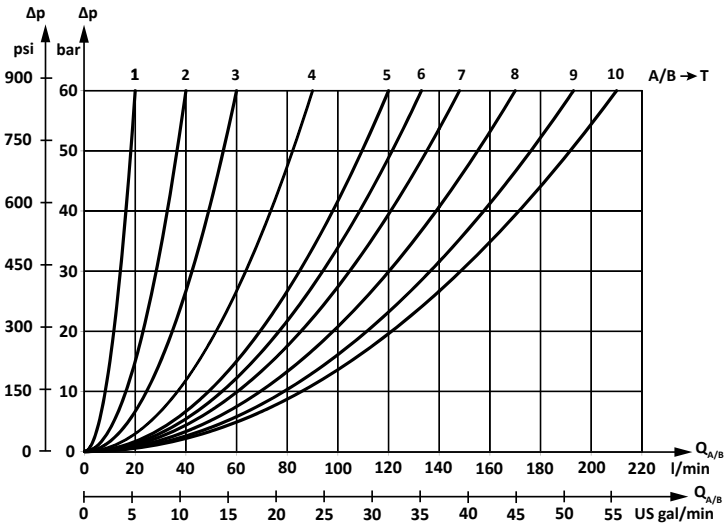
Oil flow PDW pressure compensated with LS $_{A/B}$ pilot relief valves



Load independent oil flow pressure compensated PDW



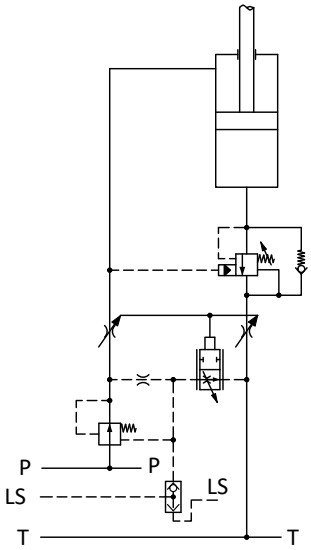
PDW pressure drop at max main spool travel

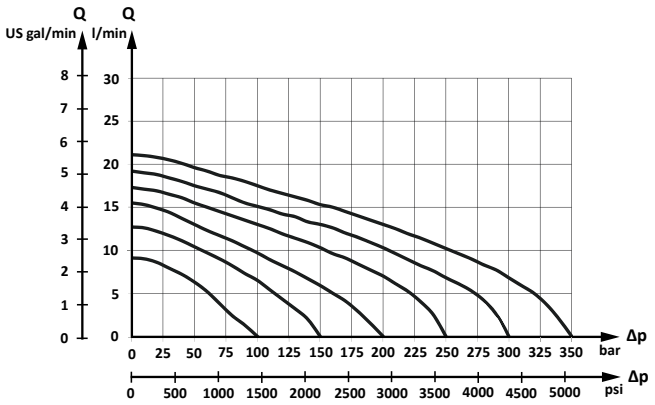


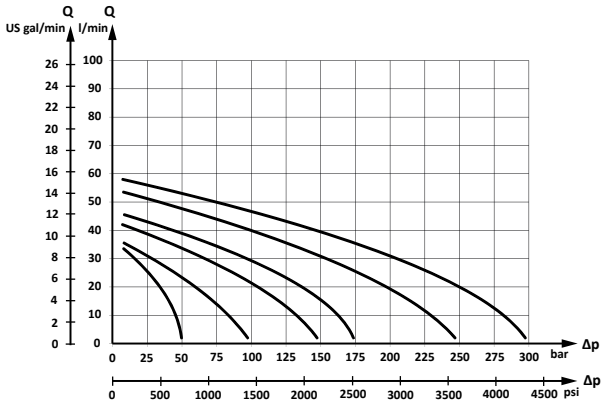
By using proportional directional valves along with overcenter valves, instability problems may occurs in the form of pressure surging.
To suite this problems, spools with different circuit named " Pressure Control " have been developed.
The main purpose of these spools, is to hold in position the 2-way pressure compensator, preventing it from going into unstable condition, and in turn, to keep the overcenter's pilot pressure value as stable as possible.
Pressure control spools, must always be used with pressure compensated working sections equipped with pilot LS A/B relief valves.

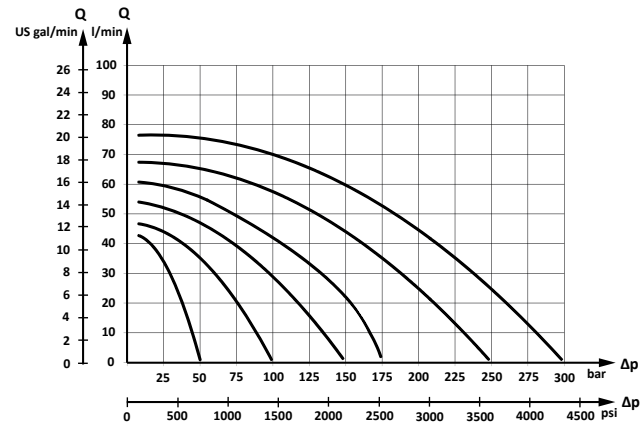
Pressure control spool, normally give a higher degree of stability to whole hydraulic system, however, we advise to look after their use, because:

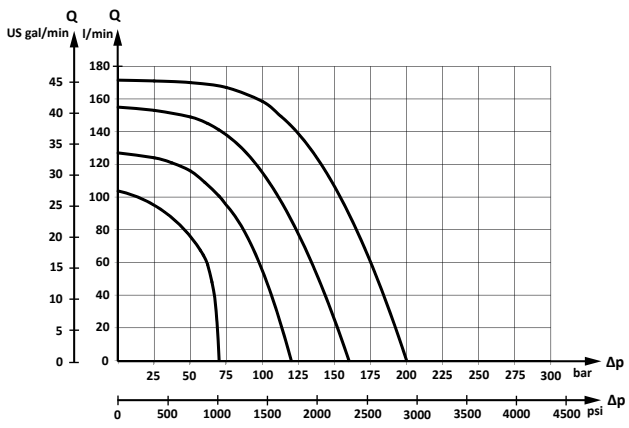
- The valve may loose a bit of pressure compensation, becoming load dependent.
- The pump pressure may be considerably higher than that necessary to move the load.



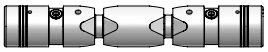


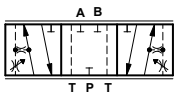
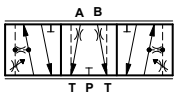
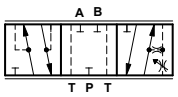
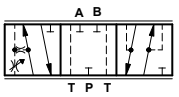
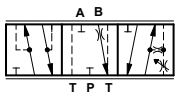
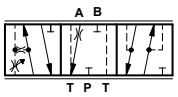






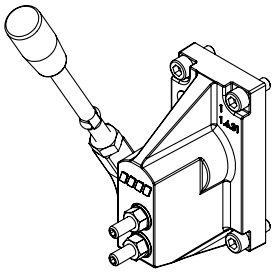
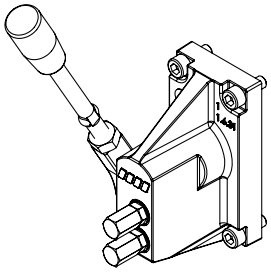
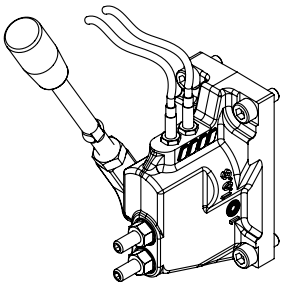
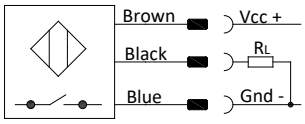
Pressure control spool

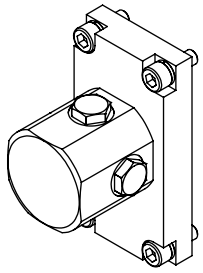
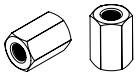


Size	Symbol and code numbers (PC = Pressure control - FC = Flow control)					
						
	4-way, 3-position, A, B closed	4-way, 3-position, A, B throttled open to T	4-way, 3-position, A, B closed	4-way, 3-position, A, B closed	4-way, 3-position, A throttled open to T, B closed	4-way, 3-position, A closed, B throttled open to T
1	**PDS00710113** PC→A + B	**PDS00720114** PC→A + B	**PDS00760113** PC→A FC→B, Q=--l/min	**PDS00770114** PC→B FC→A, Q=--l/min	**PDS00780113** PC→A FC→B, Q=--l/min	**PDS00790114** PC→B FC→A, Q=--l/min
	-	-	**PDS00760121** PC→A FC→B, Q=--l/min	-	-	-
2	**PDS00710115** PC→A + B	**PDS00720116** PC→A + B	**PDS00760115** PC→A FC→B, Q=--l/min	**PDS00770116** PC→B FC→A, Q=--l/min	**PDS00780115** PC→A FC→B, Q=--l/min	**PDS00790116** PC→B FC→A, Q=--l/min
3	**PDS00710117** PC→A + B	**PDS00720118** PC→A + B	**PDS00760117** PC→A FC→B, Q=--l/min	**PDS00770118** PC→B FC→A, Q=--l/min	**PDS00780117** PC→A FC→B, Q=--l/min	**PDS00790118** PC→B FC→A, Q=--l/min
3,5	**PDS00710111** PC→A + B	**PDS00720112** PC→A + B	**PDS00760111** PC→A FC→B, Q=--l/min	**PDS00770112** PC→B FC→A, Q=--l/min	**PDS00780111** PC→A FC→B, Q=--l/min	**PDS00790112** PC→B FC→A, Q=--l/min
4	**PDS00710119** PC→A + B	**PDS00720120** PC→A + B	**PDS00760119** PC→A FC→B, Q=--l/min	**PDS00770120** PC→B FC→A, Q=--l/min	**PDS00780119** PC→A FC→B, Q=--l/min	**PDS00790120** PC→B FC→A, Q=--l/min

Spool centered set, code numbers (needed for any kind of flow control spool)

Tightening torque		Tightening torque
6^{+1}_{0} Nm		6^{+1}_{0} Nm
$53,1^{+8,85}_{0}$ lb*in		$53,1^{+8,85}_{0}$ lb*in
Manual control	**PDR00300101**	
Hydraulic - Electrohydraulic	**PDR00300102**	

<table>
<tr><th>Product</th><th>Description</th><th>Aluminium</th><th>Cast iron</th></tr>
<tr><td rowspan="4">PDM
  </td><td rowspan="4">Mechanical actuation</td><td colspan="2">With lever</td></tr>
<tr><td>PDM10101000</td><td>PDM11101000</td></tr>
<tr><td colspan="2">Without lever</td></tr>
<tr><td>PDM101000000</td><td>PDM11100000</td></tr>
<tr><td>PDM
  </td><td>Mechanical actuation, with flow adjustament nuts protection</td><td>PDM10200000</td><td>PDM11200000</td></tr>
<tr><td rowspan="3">PDM
  </td><td rowspan="3">Mechanical actuation with directional sensors for electrical monitoring of spool valve movement
 

Vcc 10 V ... 30 V
I L < 200 mA</td><td colspan="2">With lever</td></tr>
<tr><td colspan="2">Normally closed: PDM11111000</td></tr>
<tr><td colspan="2">Normally open: PDM11121000</td></tr>
<tr><td rowspan="2">PDF
  </td><td rowspan="2">Friction detent (for mechanical actuation only)</td><td colspan="2">Cast iron only</td></tr>
<tr><td colspan="2">PDF10000001</td></tr>
<tr><td>  </td><td>Flow adjustement protection nuts for PDM mechanical control</td><td colspan="2"></td></tr>
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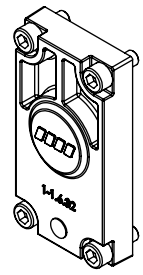
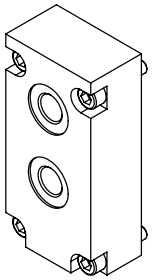
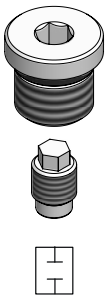
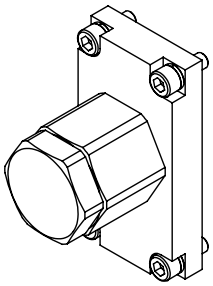
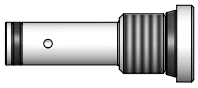
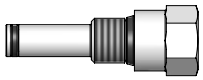
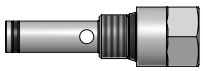
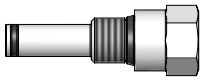
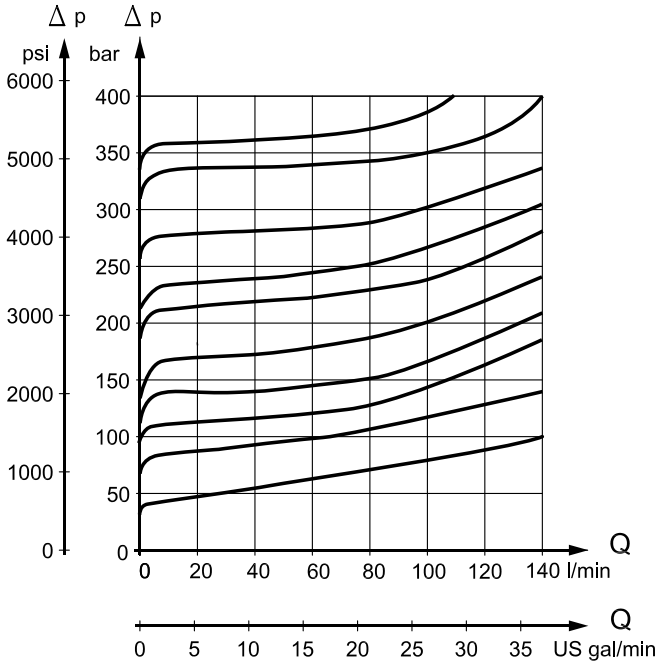
Product	Description	Aluminium	Cast iron
PDC 	Rear cover for mechanical actuation	**PDC00000000**	**PDC10000000**
PDH 	Hydraulic actuation	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PDH70000000**	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PDH71000000**
		A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PDH70000100**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PDH71000100**
	Pilot LS A/B relief valve	50 ÷ 80 bar	**PLS0A100000**
		81 ÷ 380 bar	**PLS0A400000**
	Plug for pilot LS A/B relief valve cavity	**PLS0P000000**	

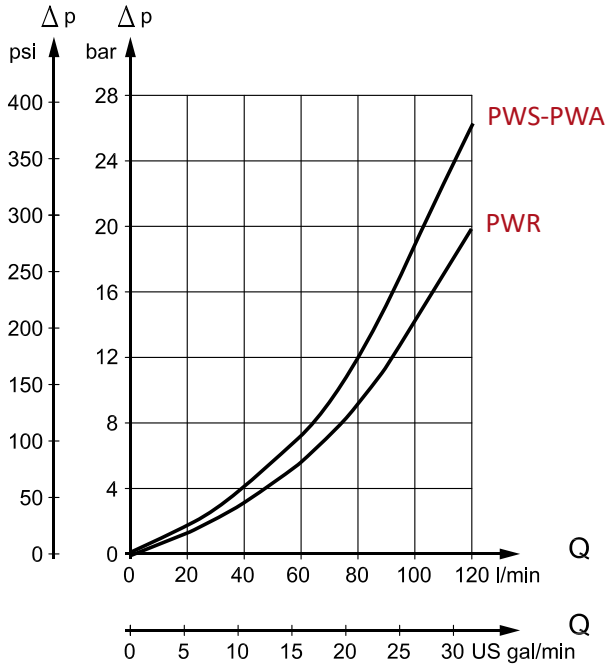
Product	Description	Aluminium	Cast iron
PDD 	Mechanical spool lock device, manual release	P→A - lock P→B - free **PDD70100000**	
		P→A - free P→B - lock **PDD70010000**	
		P→A - lock P→B - lock **PDD70110000**	
		P→A - float P→B - free **PDD70200000**	
		P→A - free P→B - float **PDD70020000**	

Product	Description	Code numbers	
PIZ 	For PDI with internal pilot oil supply	**PIZ10000000**	
PIY 	For PDI with external pilot oil supply	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PIY10000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PIY10000010**
	For PDE with external drain line electrical actuation	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PED10000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PED10000010**
	For PDE with internal drain line electrical actuation	**PEI10000000**	
	For PDE with LS carry-over	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PED20000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PED20000010**
	For PDE prearranged LS carry-over	**PEI10000000**	

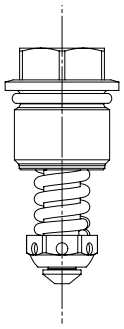
PWS, PWA and PWB are shock suction valves design to absorb shock effects only, and they should never be used as a pressure relief valves.
PWS, PWA and PWB are set at an oil flow of 10 l/min.
If the hydraulic actuator requires a pressure relief valve function, a PDW module with built-in LS A/B pilot pressure limit valves should be used

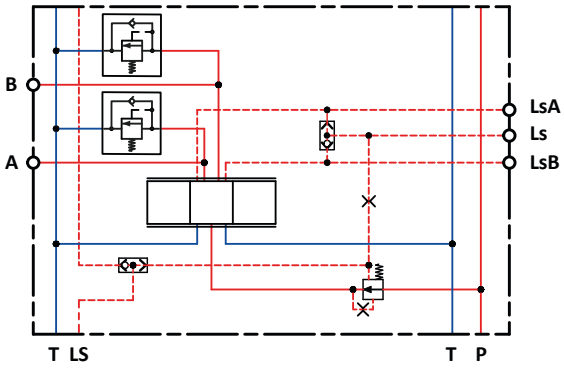


PWR suction valve



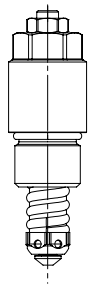
PWS shock and suction valve for A/B port. **Not adjustable**

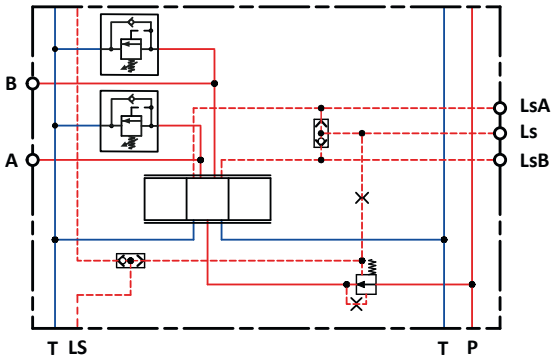




Setting Pressure*(bar)*	Code numbers
50	**PWS7M180050**
70	**PWS7M180070**
90	**PWS7M180090**
110	**PWS7M180110**
130	**PWS7M180130**
150	**PWS7M180150**
180	**PWS7M180180**
200	**PWS7M180200**
230	**PWS7M180230**
260	**PWS7M180260**
290	**PWS7M180290**
320	**PWS7M180320**
350	**PWS7M180350**
380	**PWS7M180380**

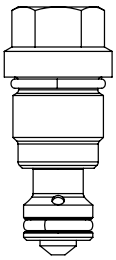
PWA shock and suction valve for A/B port. **Adjustable**

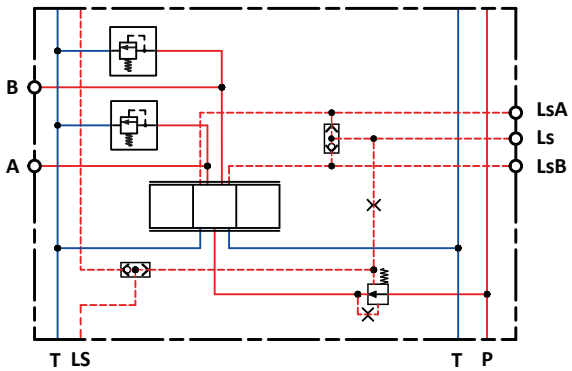




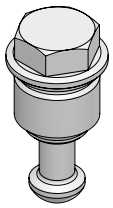
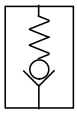
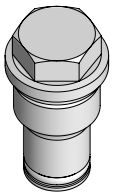
Range setting *(bar)*	Code numbers
20 ÷ 70	**PWA7M180N00**
71 ÷ 130	**PWA7M180B00**
131 ÷ 210	**PWA7M180G00**
211 ÷ 280	**PWA7M180V00**
281 ÷ 350	**PWA7M180W00**
351 ÷ 420	**PWA7M180R00**

PWB shock valve for A/B port. **Not adjustable**



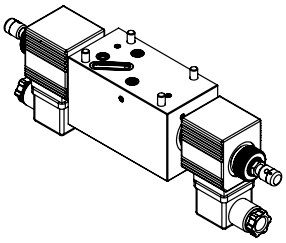


Setting pressure*(bar)*	Code numbers
50	**PWB7M180050**
70	**PWB7M180070**
90	**PWB7M180090**
110	**PWB7M180110**
130	**PWB7M180130**
150	**PWB7M180150**
180	**PWB7M180180**
200	**PWB7M180200**
230	**PWB7M180230**
260	**PWB7M180260**
290	**PWB7M180290**
320	**PWB7M180320**
350	**PWB7M180350**
380	**PWB7M180380**

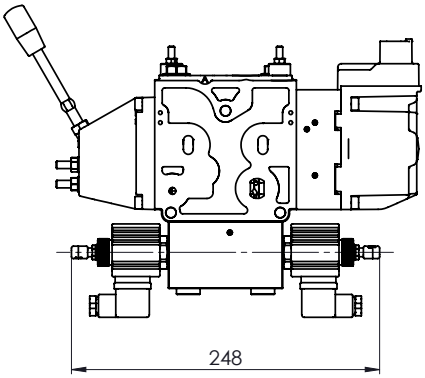
PWR suction valve for A/B port		
Product	Hydraulic diagram	Code numbers
		**PWR7M180000**
Plug for **PWS - PWA - PWB** and **PWR** cavity		
Product	Hydraulic diagram	Code numbers
		**PWP7M180000**

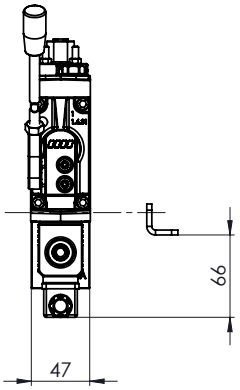
OMFB
HYDRAULIC POWER CONTROL

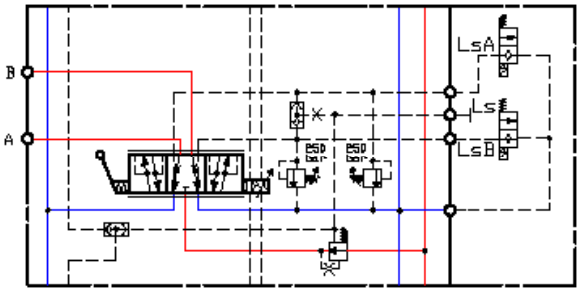
PDV74 Proportional Valve
PDL module - **Electrical LS$_{A/B}$ unloading**
ON-OFF actuation normally closed

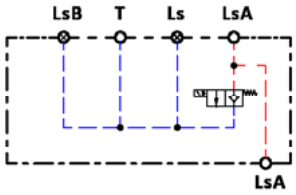
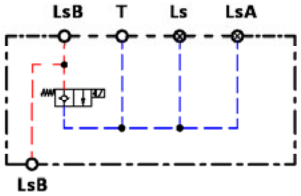
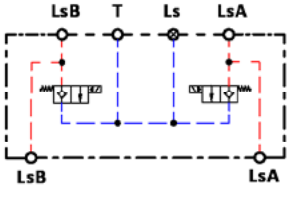
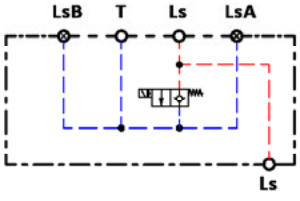


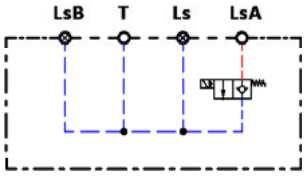
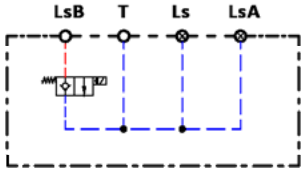
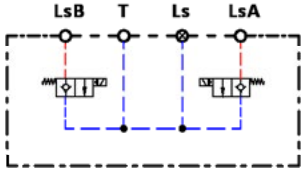
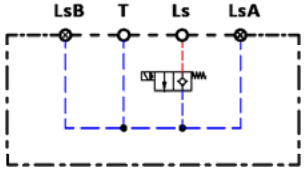
When PDL is energized, the piloting signal is lead to tank and in turn the work port oil flow will be cutted off.
PDL modules is always to be matched with PDW pressure compesated.



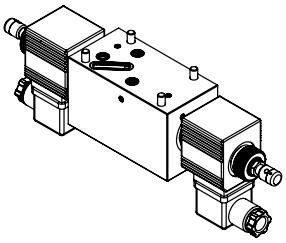




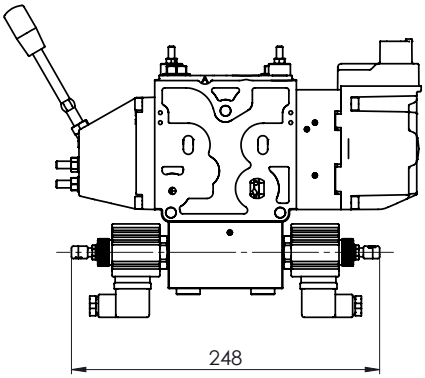
PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL12C11200**	**PDL12C31200**
	Deutsch Perpendicular	**PDL12C12200**	**PDL12C32200**
	DIN	**PDL12C13200**	**PDL12C33200**
	JPT	**PDL12C14200**	**PDL12C34200**
Active on LsB 	Deutsch Parallel	**PDL13C11200**	**PDL13C31200**
	Deutsch Perpendicular	**PDL13C12200**	**PDL13C32200**
	DIN	**PDL13C13200**	**PDL13C33200**
	JPT	**PDL13C14200**	**PDL13C34200**
Active on LsA and LsB 	Deutsch Parallel	**PDL11C11200**	**PDL11C31200**
	Deutsch Perpendicular	**PDL11C12200**	**PDL11C32200**
	DIN	**PDL11C13200**	**PDL11C33200**
	JPT	**PDL11C14200**	**PDL11C34200**
Active on Ls 	Deutsch Parallel	**PDL14C11200**	**PDL14C31200**
	Deutsch Perpendicular	**PDL14C12200**	**PDL14C32200**
	DIN	**PDL14C13200**	**PDL14C33200**
	JPT	**PDL14C14200**	**PDL14C34200**

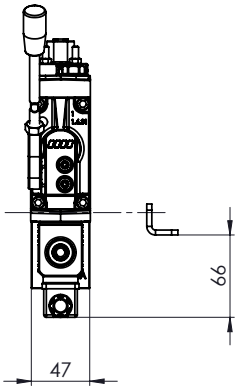
PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL32C11200**	**PDL32C31200**
	Deutsch Perpendicular	**PDL32C12200**	**PDL32C32200**
	DIN	**PDL32C13200**	**PDL32C33200**
	JPT	**PDL32C14200**	**PDL32C34200**
Active on LsB 	Deutsch Parallel	**PDL33C11200**	**PDL33C31200**
	Deutsch Perpendicular	**PDL33C12200**	**PDL33C32200**
	DIN	**PDL33C13200**	**PDL33C33200**
	JPT	**PDL33C14200**	**PDL33C34200**
Active on LsA and LsB 	Deutsch Parallel	**PDL35C11200**	**PDL35C31200**
	Deutsch Perpendicular	**PDL35C12200**	**PDL35C32200**
	DIN	**PDL35C13200**	**PDL35C33200**
	JPT	**PDL35C14200**	**PDL35C34200**
Active on Ls 	Deutsch Parallel	**PDL34C11200**	**PDL34C31200**
	Deutsch Perpendicular	**PDL34C12200**	**PDL34C32200**
	DIN	**PDL34C13200**	**PDL34C33200**
	JPT	**PDL34C14200**	**PDL34C34200**

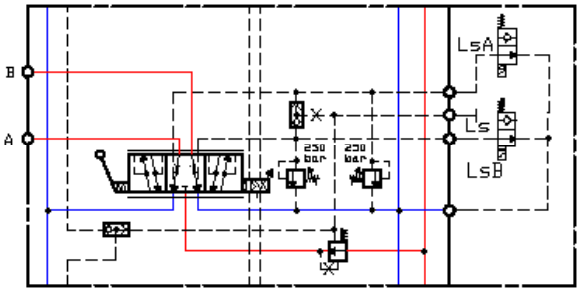
PDV74 Proportional Valve
PDL module - **Electrical LS$_{A/B}$ unloading**
ON-OFF actuation normally open

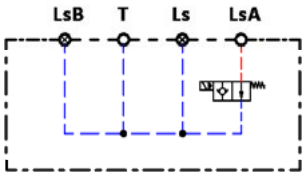
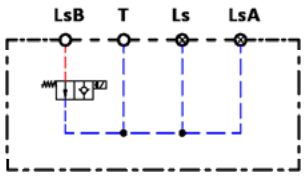
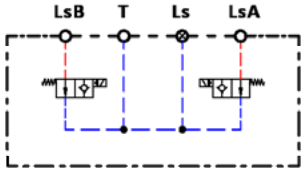
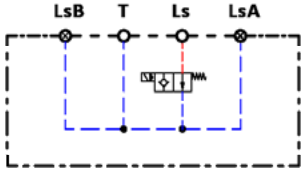


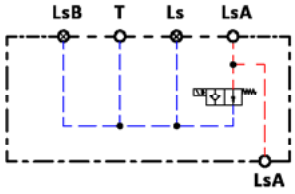
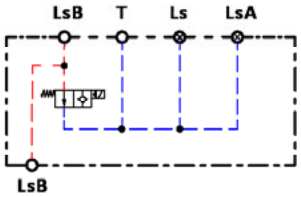
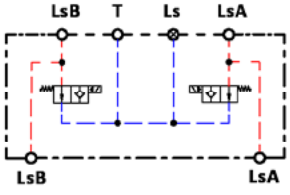
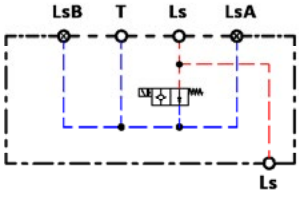
When PDL is deenergized, the piloting signal is lead to tank and in turn the work port oil flow will be cutted off.
PDL modules is always to be matched with PDW pressure compesated.





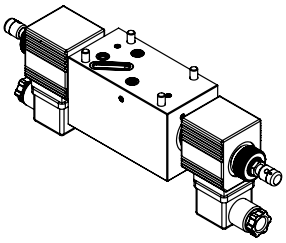


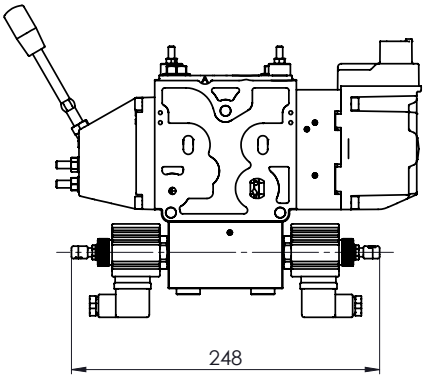
PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL32A11100**	**PDL32A31100**
	Deutsch Perpendicular	**PDL32A12100**	**PDL32A32100**
	DIN	**PDL32A13100**	**PDL32A33100**
	JPT	**PDL32A14100**	**PDL32A34100**
Active on LsB 	Deutsch Parallel	**PDL33A11100**	**PDL33A31100**
	Deutsch Perpendicular	**PDL33A12100**	**PDL33A32100**
	DIN	**PDL33A13100**	**PDL33A33100**
	JPT	**PDL33A14100**	**PDL33A34100**
Active on LsA and LsB 	Deutsch Parallel	**PDL35A11100**	**PDL35A31100**
	Deutsch Perpendicular	**PDL35A12100**	**PDL35A32100**
	DIN	**PDL35A13100**	**PDL35A33100**
	JPT	**PDL35A14100**	**PDL35A34100**
Active on Ls 	Deutsch Parallel	**PDL34A11100**	**PDL34A31100**
	Deutsch Perpendicular	**PDL34A12100**	**PDL34A32100**
	DIN	**PDL34A13100**	**PDL34A33100**
	JPT	**PDL34A14100**	**PDL34A34100**

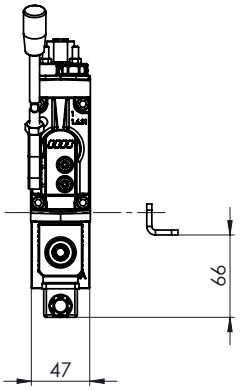
PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL12A11100**	**PDL12A31100**
	Deutsch Perpendicular	**PDL12A12100**	**PDL12A32100**
	DIN	**PDL12A13100**	**PDL12A33100**
	JPT	**PDL12A14100**	**PDL12A34100**
Active on LsB 	Deutsch Parallel	**PDL13A11100**	**PDL13A31100**
	Deutsch Perpendicular	**PDL13A12100**	**PDL13A32100**
	DIN	**PDL13A13100**	**PDL13A33100**
	JPT	**PDL13A14100**	**PDL13A34100**
Active on LsA and LsB 	Deutsch Parallel	**PDL11A11100**	**PDL11A31100**
	Deutsch Perpendicular	**PDL11A12100**	**PDL11A32100**
	DIN	**PDL11A13100**	**PDL11A33100**
	JPT	**PDL11A14100**	**PDL11A34100**
Active on Ls 	Deutsch Parallel	**PDL14A11100**	**PDL14A31100**
	Deutsch Perpendicular	**PDL14A12100**	**PDL14A32100**
	DIN	**PDL14A13100**	**PDL14A33100**
	JPT	**PDL14A14100**	**PDL14A34100**

OMFB
HYDRAULIC POWER CONTROL

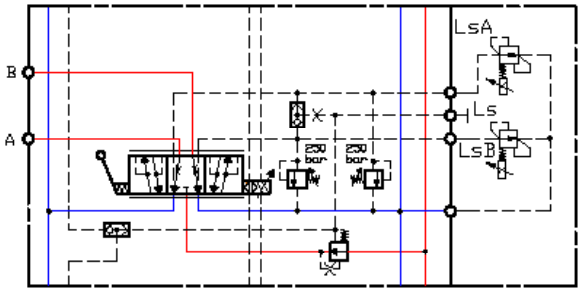
PDV74 Proportional Valve
PDLD module - **Electrical LS$_{A/B}$ unloading**
Proportional actuation normally open (current signal mA)

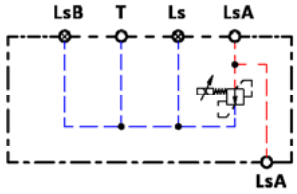
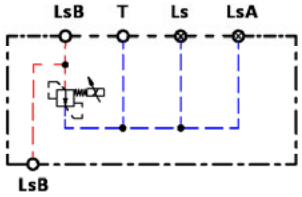
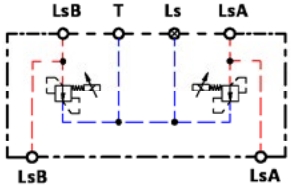
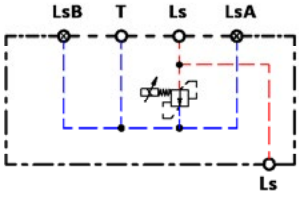




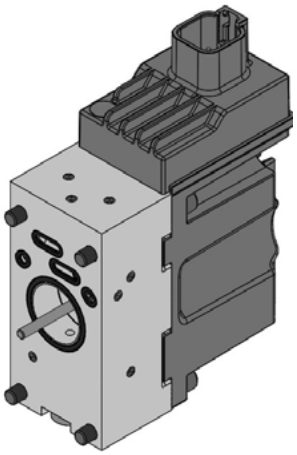


PDLD is an electro-hydraulic device that allows the A/B port working pressure to be remotely an proportionally operated according to a current signal (mA). When the working pressure exceed the setting pressure value, the A/B port oil flow will be cutted off.
When PDLD is not energized, PDW is almost pressureless, as well as the A-B oil flow is cutted off.



PDLD code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL12D11000**	**PDL12D31000**
Active on LsB 	Deutsch Parallel	**PDL13D11000**	**PDL13D31000**
Active on LsA and LsB 	Deutsch Parallel	**PDL11D11000**	**PDL11D31000**
Active on Ls 	Deutsch Parallel	**PDL14D11000**	**PDL14D31000**

PDV74 - PEAC111 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc



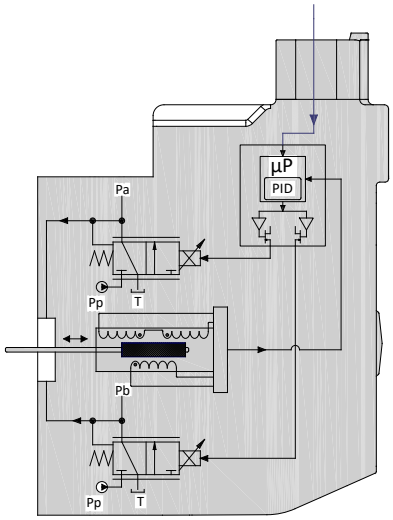
PEAC111 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC111 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version

Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.



Passive fault monitoring

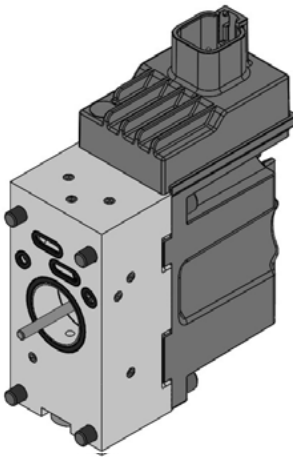
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC111 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC111 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAC111 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc

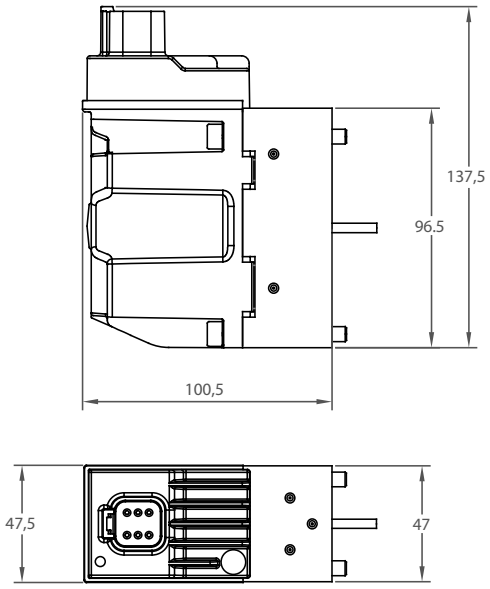


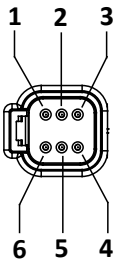
PEAC111 is defined by:

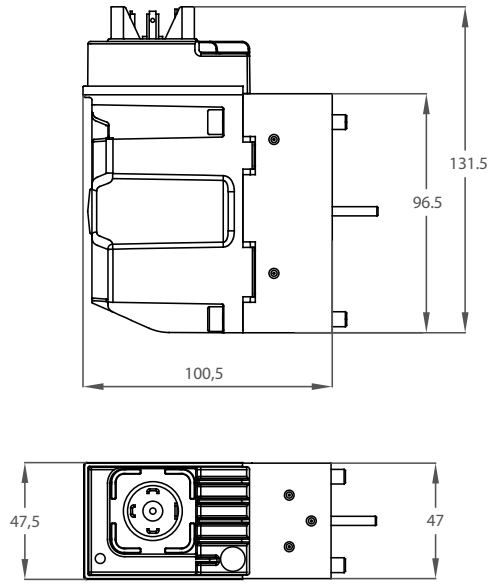
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power

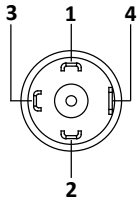
PEAC111 Technical data		
Rated supply voltage		**10 ÷ 30 Vdc**
Max ripple		**5%**
Signal control		**0,5 Udc**
Range control signal		**0,25 Udc to 0,75 Udc**
Neutral spool position		**0,5 Udc**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV74 - PEAC111 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 0,5 Udc - Electrical connectors



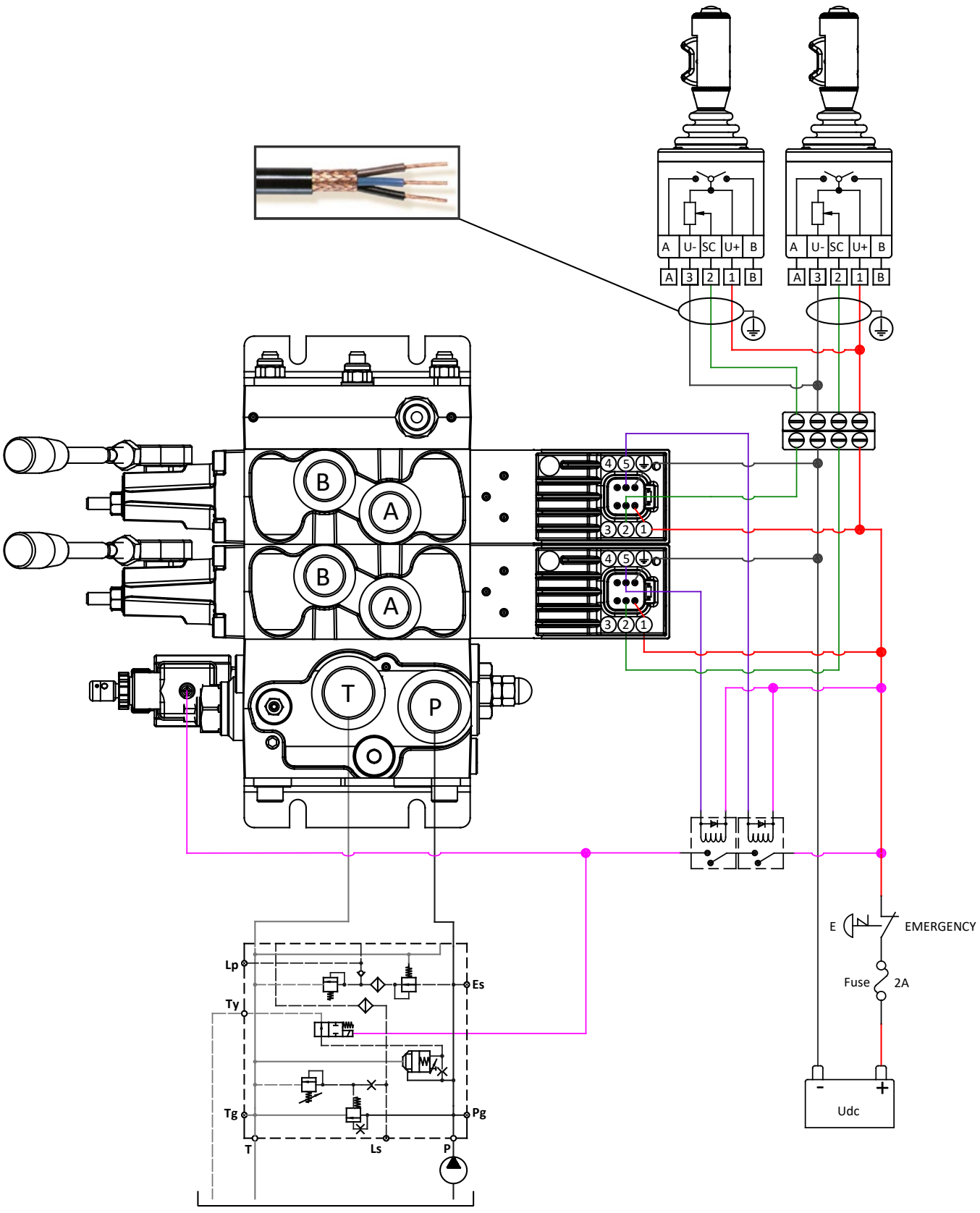
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment			
	**1**	Power supply	
	2	Input signal control	
	3	CAN-high	**A** port-spool movement signal
	4	CAN-low	**B** port-spool movement signal
	5	Fault monitoring signal	
	6	Ground	



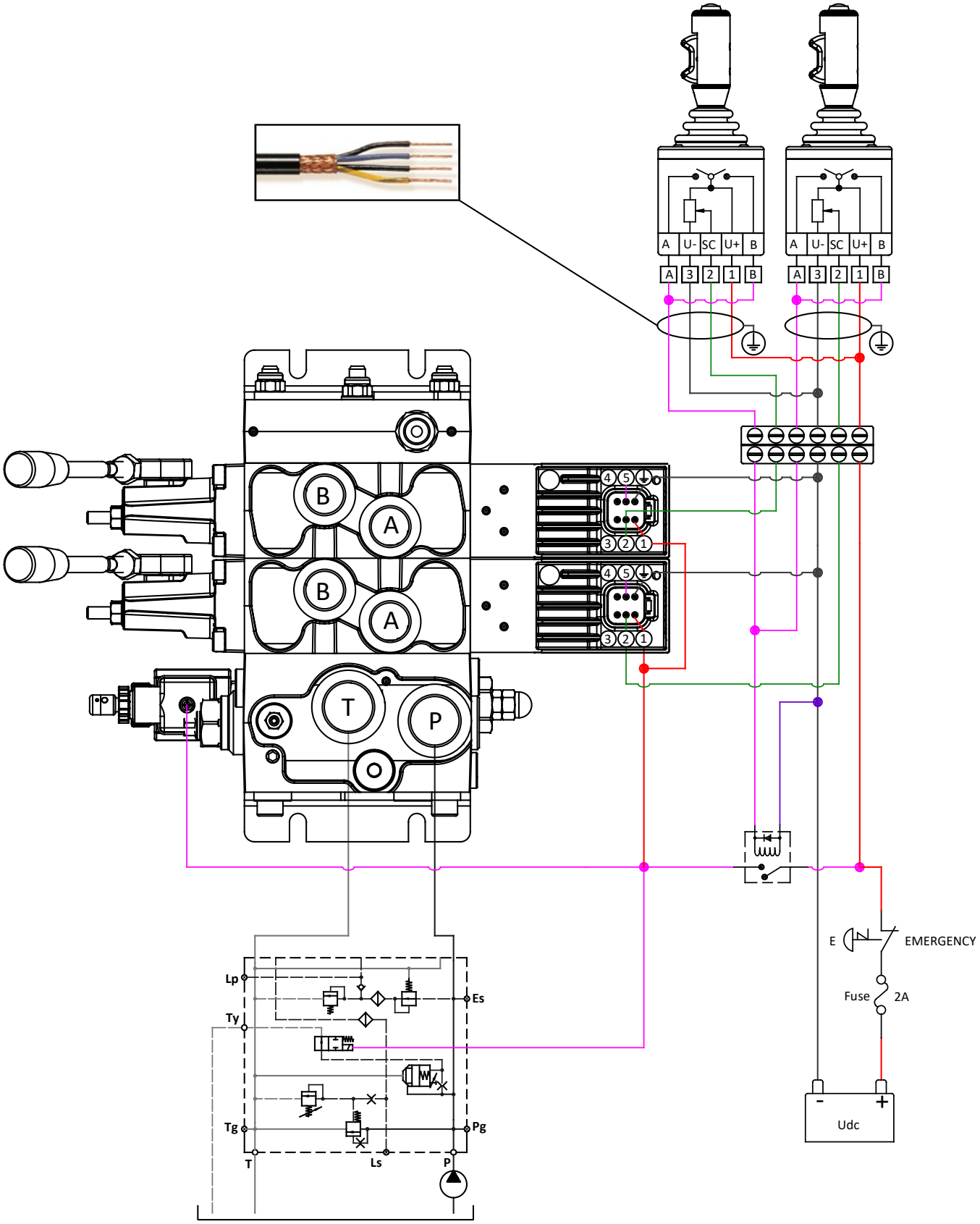
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Fault monitoring signal
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0121000**	**PEAC1121000**	**PEAC0111000**	**PEAC1111000**
DIN 43650	**PEAC0121200**	**PEAC1121200**	**PEAC0111200**	**PEAC1111200**

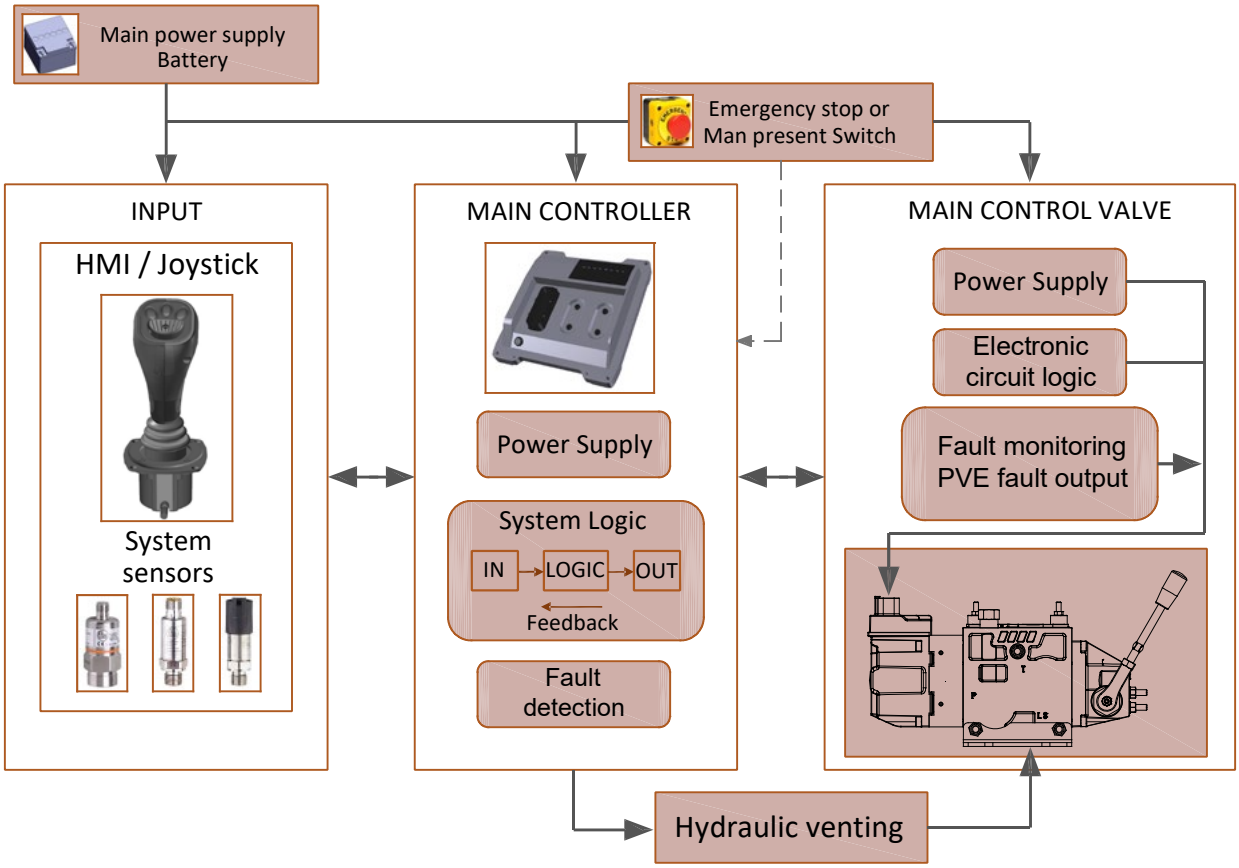
PDV74 - PEAC111 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc



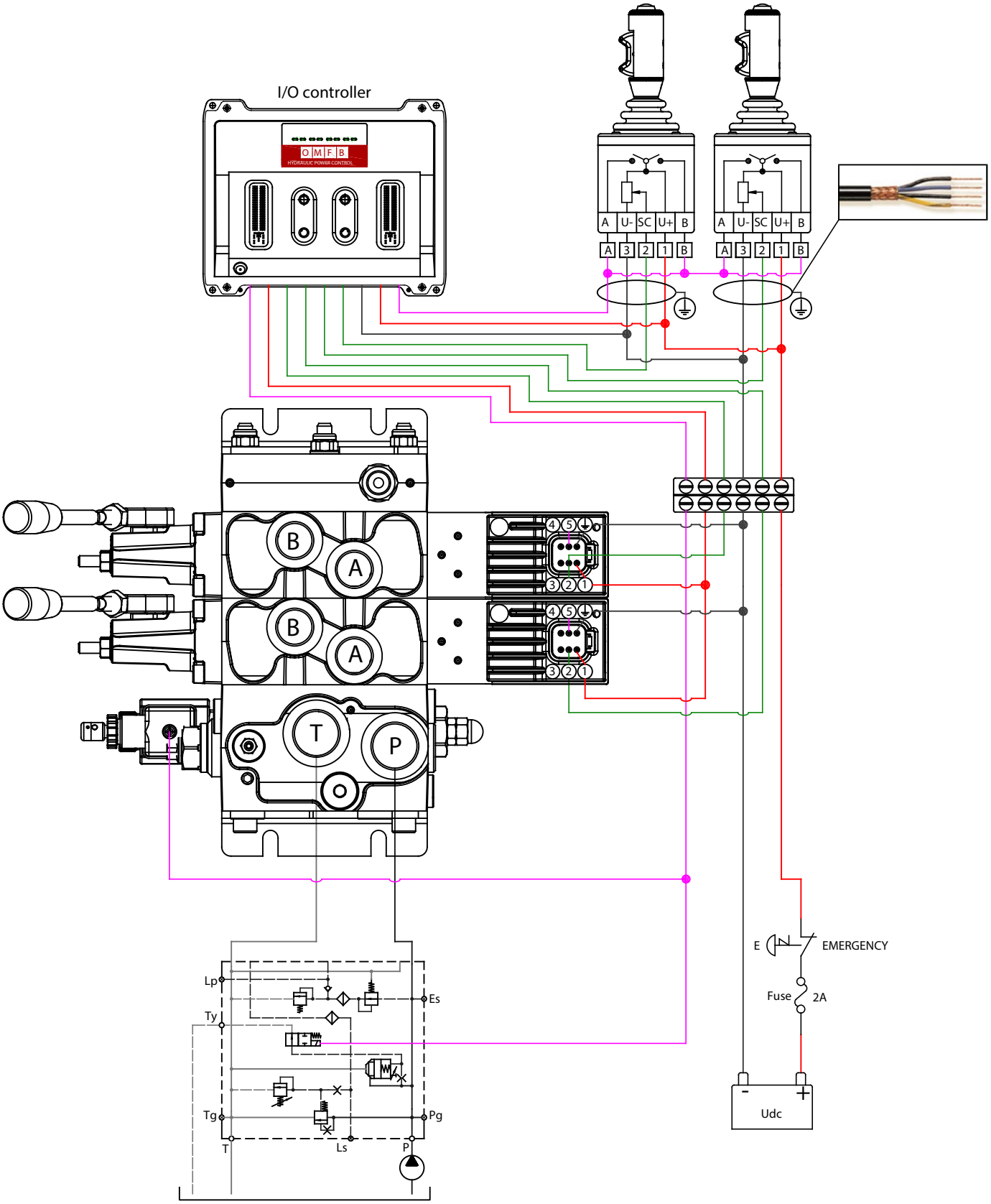
PDV74 - PEAC111 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc



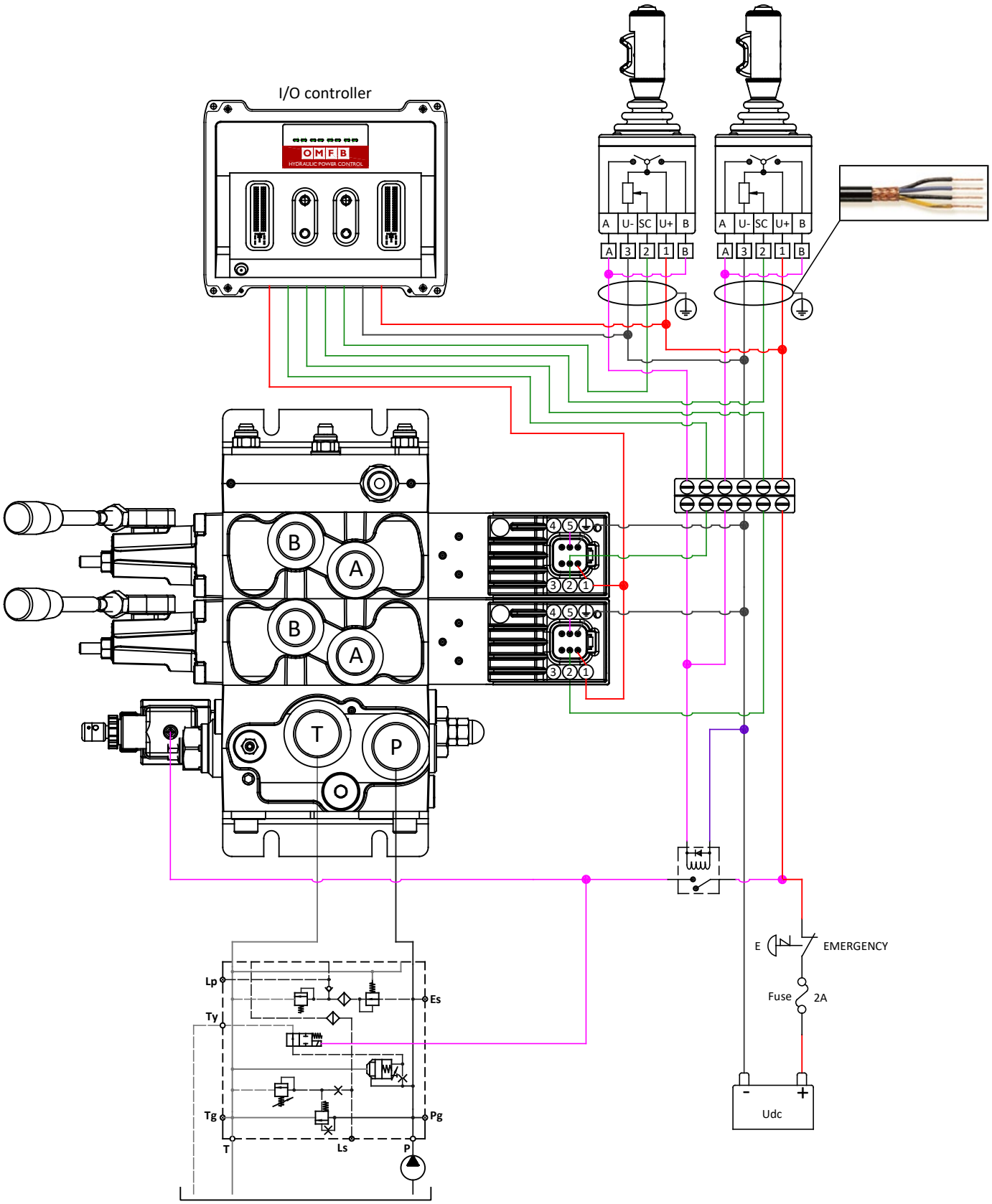
PDV74 - PEAC111 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



PDV74 - PEAC111 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc

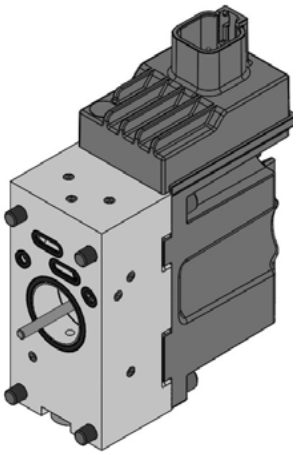


PDV74 - PEAC111 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAC112 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



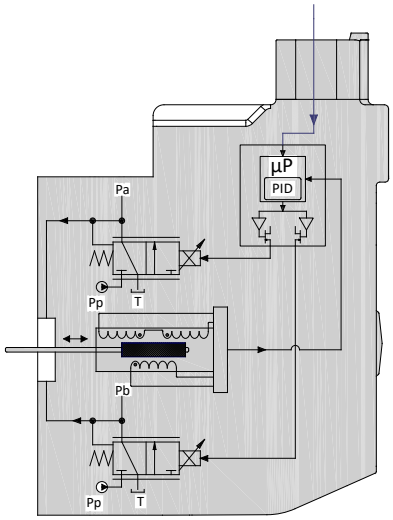
PEAC112 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC112 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version

Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.



Passive fault monitoring

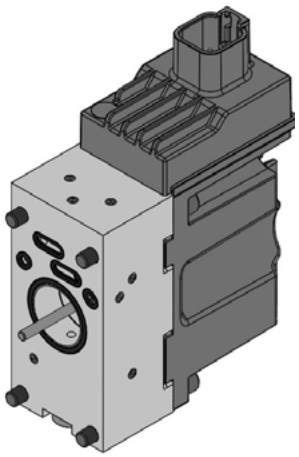
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC112 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC112 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAC112 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

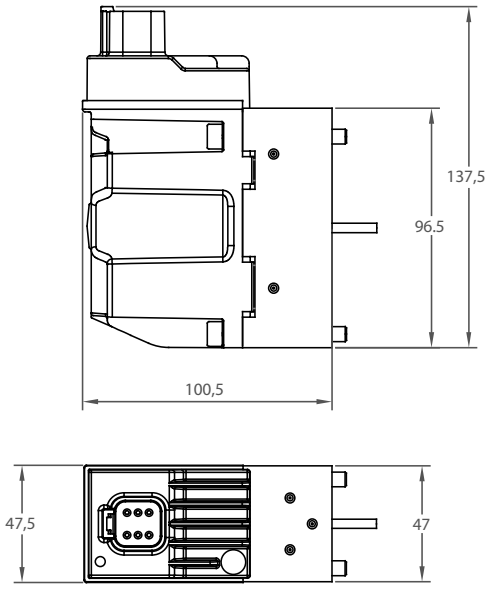


PEAC112 is defined by:

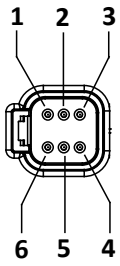
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace to
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power

PEAC112 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0-10 V**
Range control signal		**2,5 V to 7,5 V**
Neutral spool position		**5 V**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

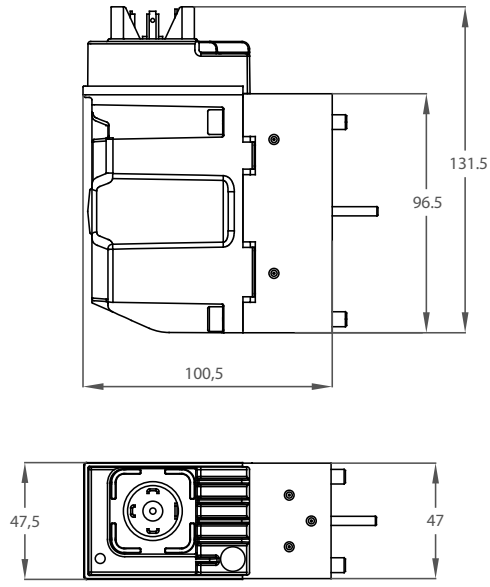
PDV74 - PEAC112 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 0 ÷ 10 V - Electrical connectors



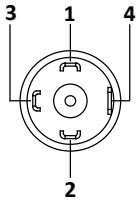
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply	
2	Input signal control	
3	CAN-high	**A** port-spool movement signal
4	CAN-low	**B** port-spool movement signal
5	Fault monitoring signal	
6	Ground	



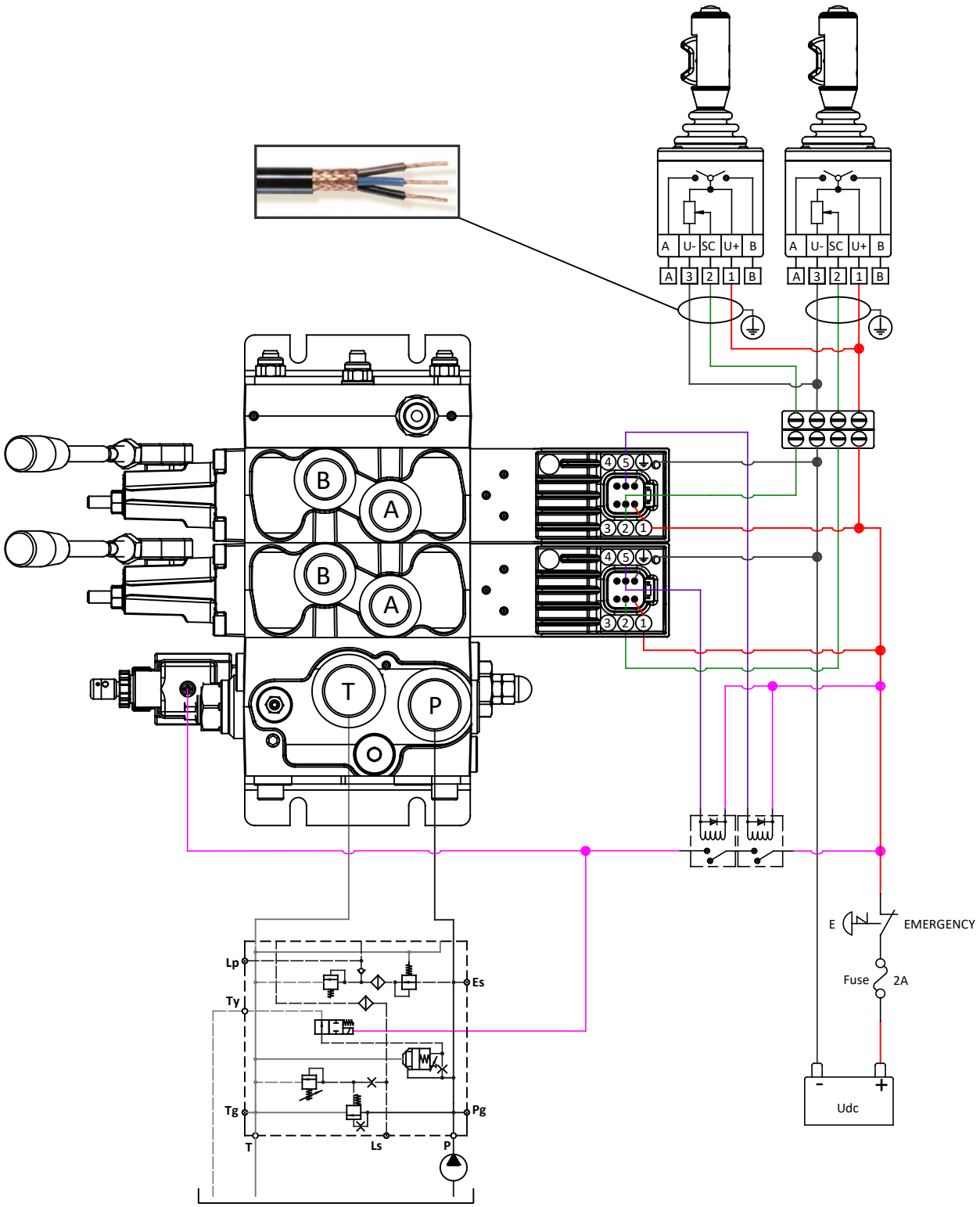
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



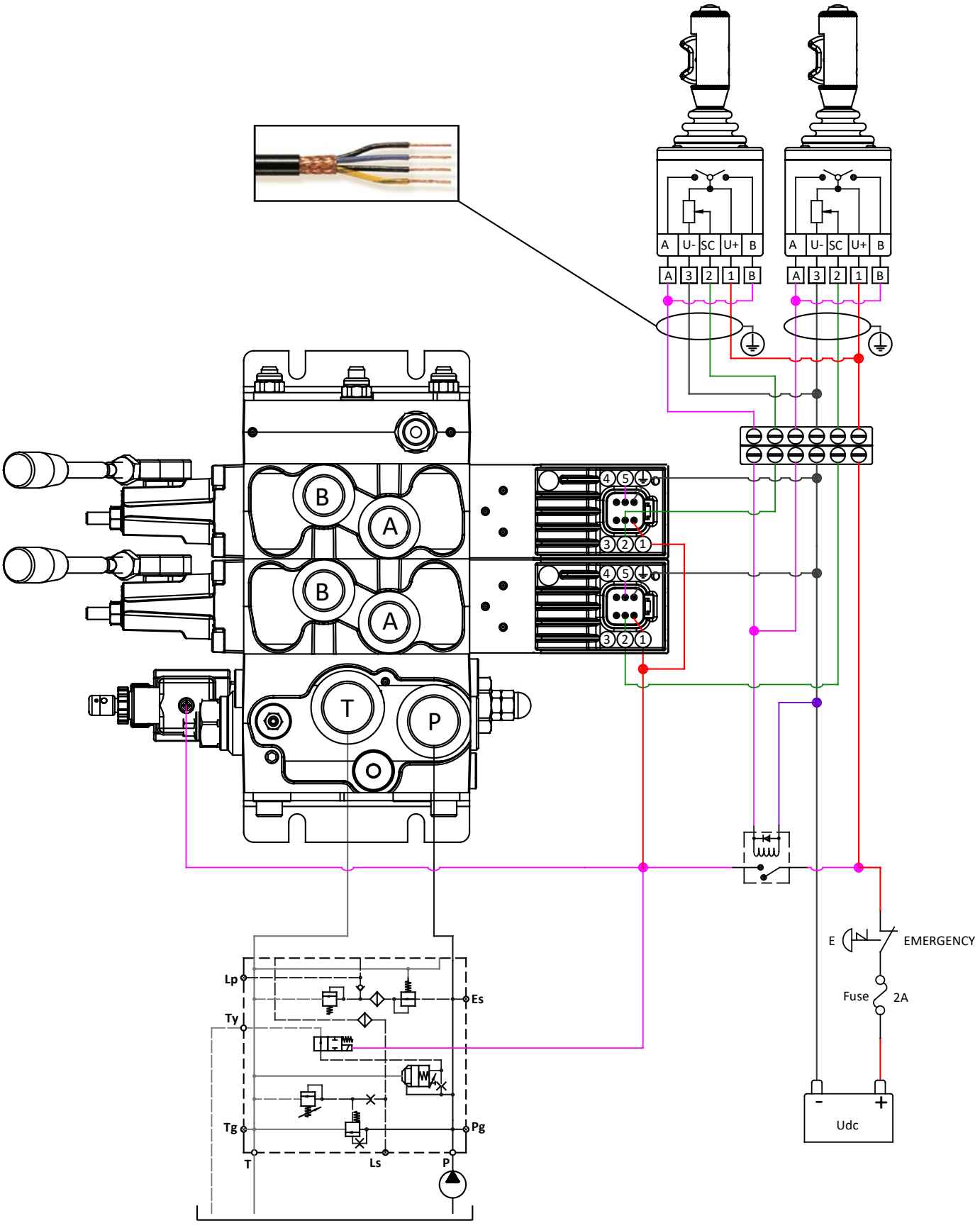
1	Power supply
2	Input signal control
3	Fault monitoring signal
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0122000**	**PEAC1122000**	**PEAC0112000**	**PEAC1112000**
DIN 43650	**PEAC0122200**	**PEAC1122200**	**PEAC0112200**	**PEAC1112200**

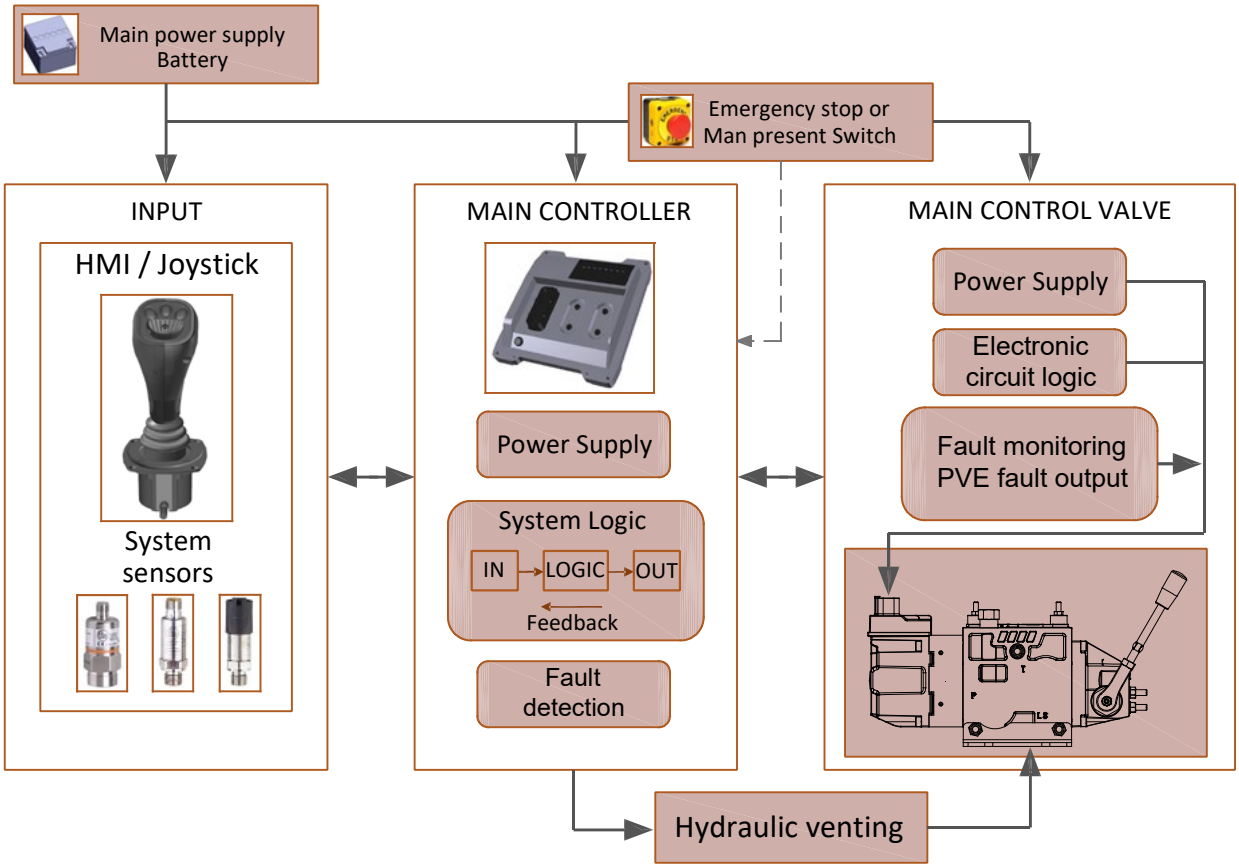
PDV74 - PEAC112 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



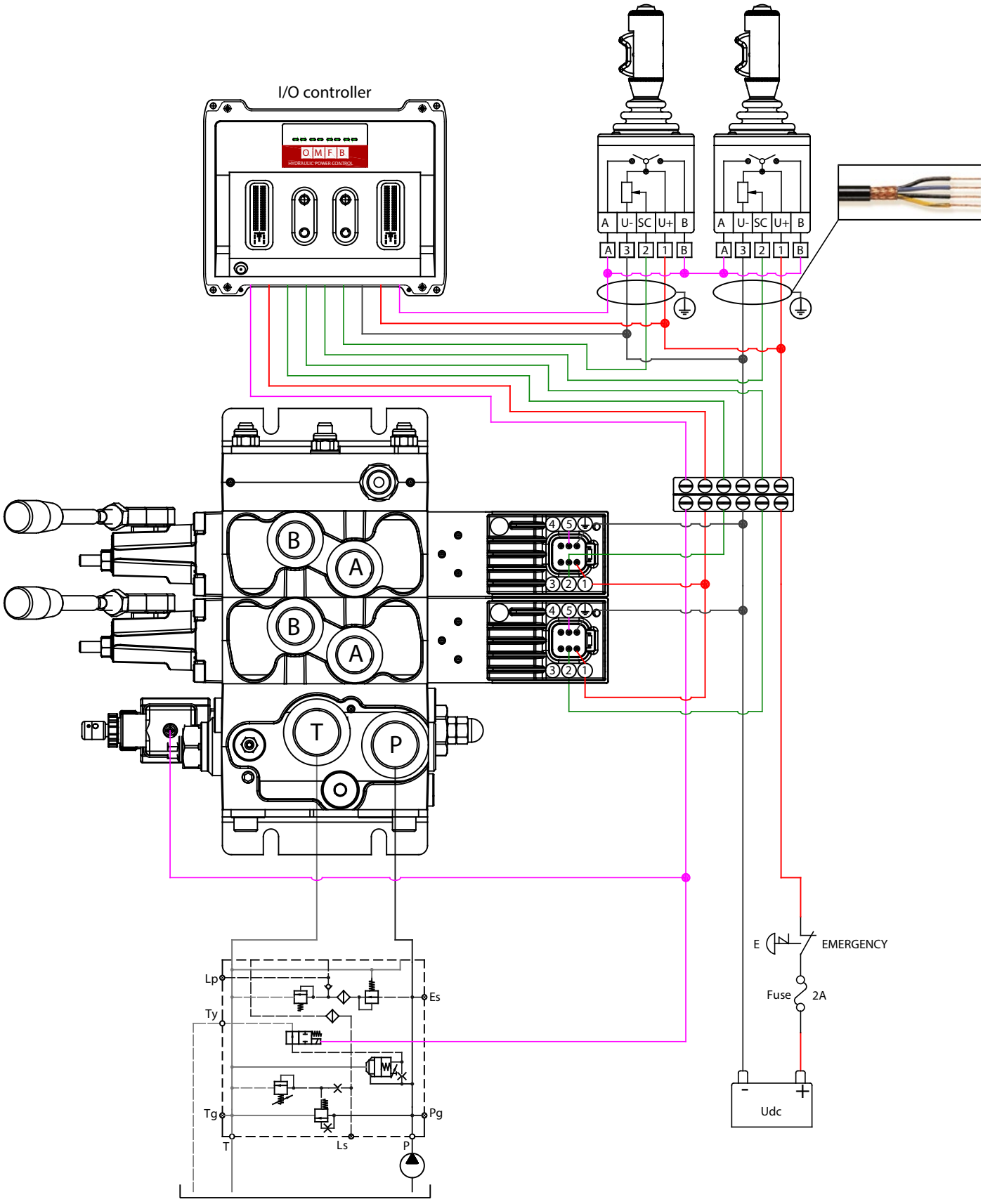
PDV74 - PEAC112 Electro-hydraulic proportional actuation.
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



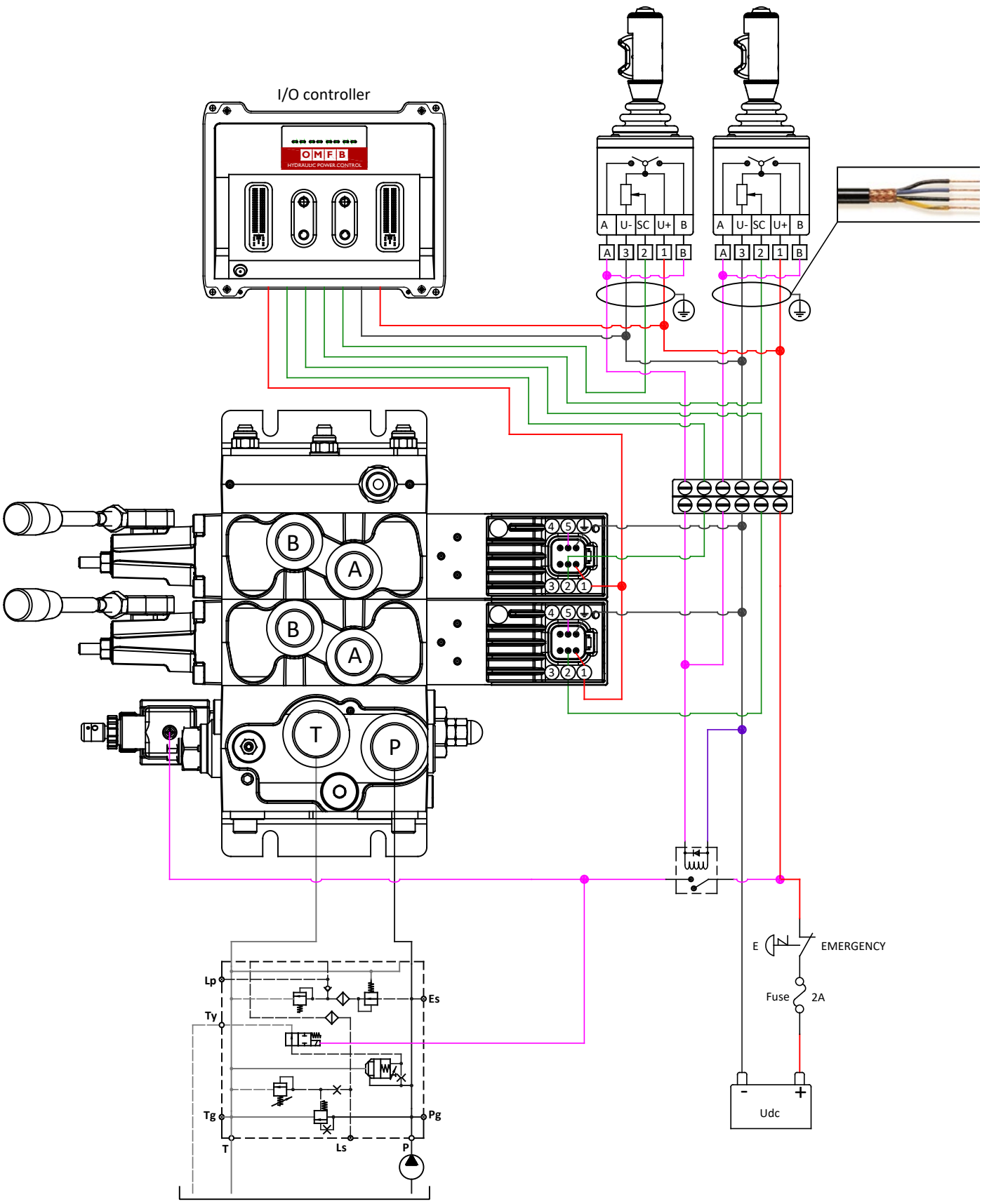
PDV74 - PEAC112 Electro-hydraulic proportional actuation.
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



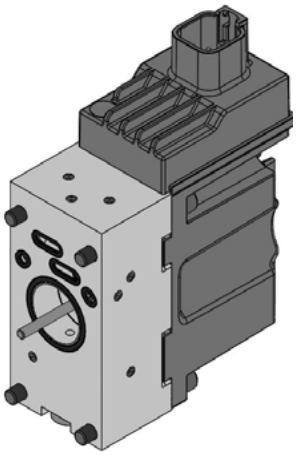
PDV74 - PEAC112 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



PDV74 - PEAC112 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



PDV74 - PEAC116 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 4 ÷ 20 mA



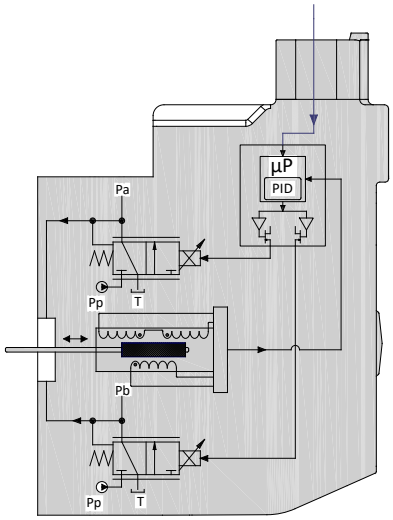
PEAC116 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC116 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version

Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.



Passive fault monitoring

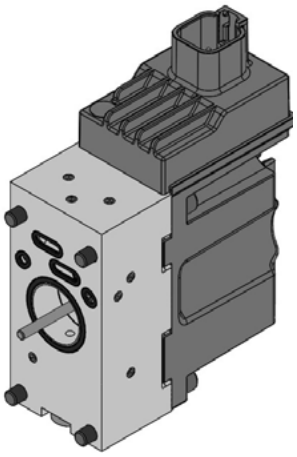
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC116 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC116 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAC116 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA

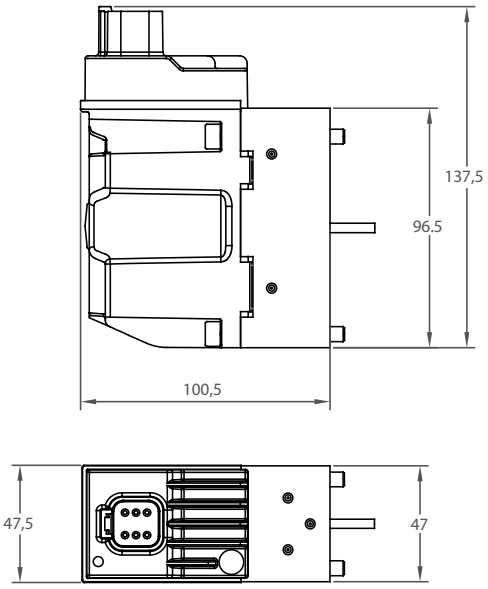


PEAC116 is defined by:

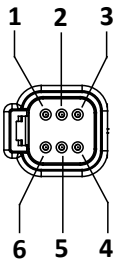
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAC116 Technical data		
Rated supply voltage		**10 ÷ 30 Vdc**
Max ripple		**5%**
Signal control		**4 ÷ 20 mA**
Range control signal		**4 mA to 20 mA**
Neutral spool position		**12 mA**
Max threshold signal, **A** port		**1,5 mA**
Max threshold signal, **B** port		**1,5 mA**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**220 Ω**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50 ÷ 200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP65 - IP66 - IP69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available with Deutsch connector DT06-6S, only		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 ÷ 140 ms**
	From max spool travel to neutral	**70 ÷ 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 ÷ 170 ms**
	From max spool travel to neutral	**70 ÷ 90 ms**

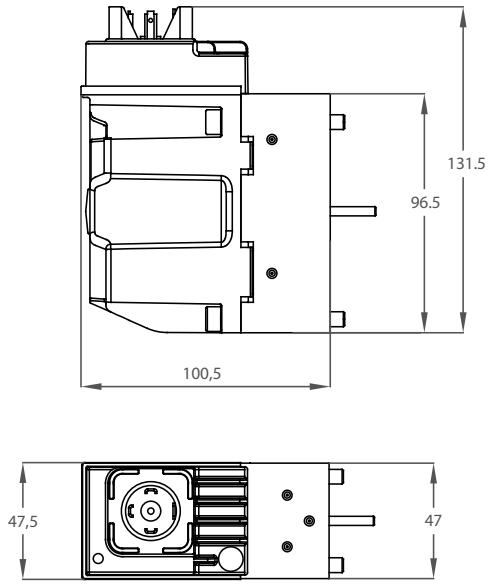
PDV74 - PEAC116 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA - Electrical connectors



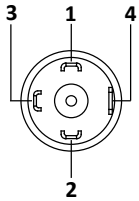
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply	
2	Input signal control	
3	CAN-high	**A** port-spool movement signal
4	CAN-low	**B** port-spool movement signal
5	Fault monitoring signal	
6	Ground	



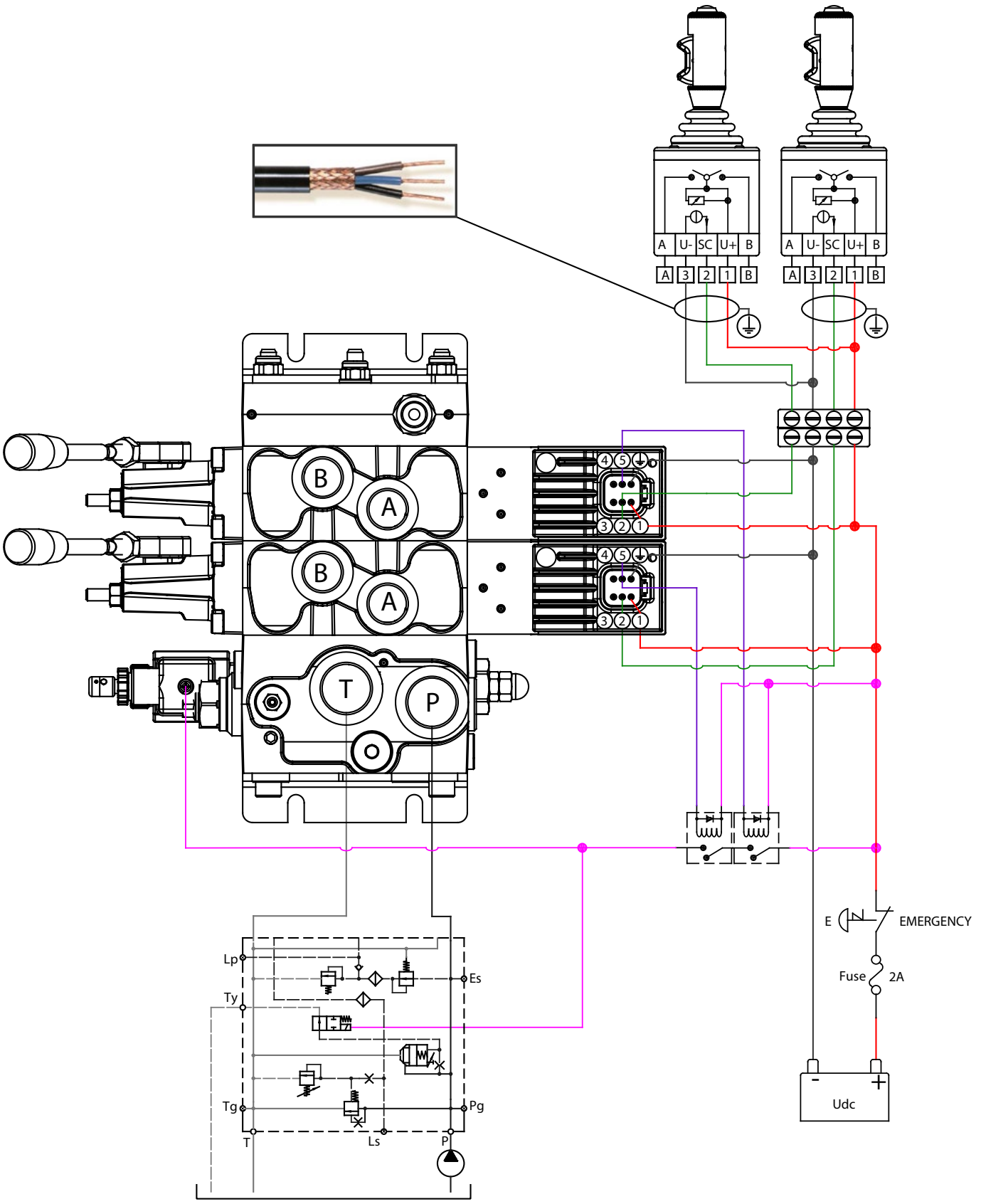
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



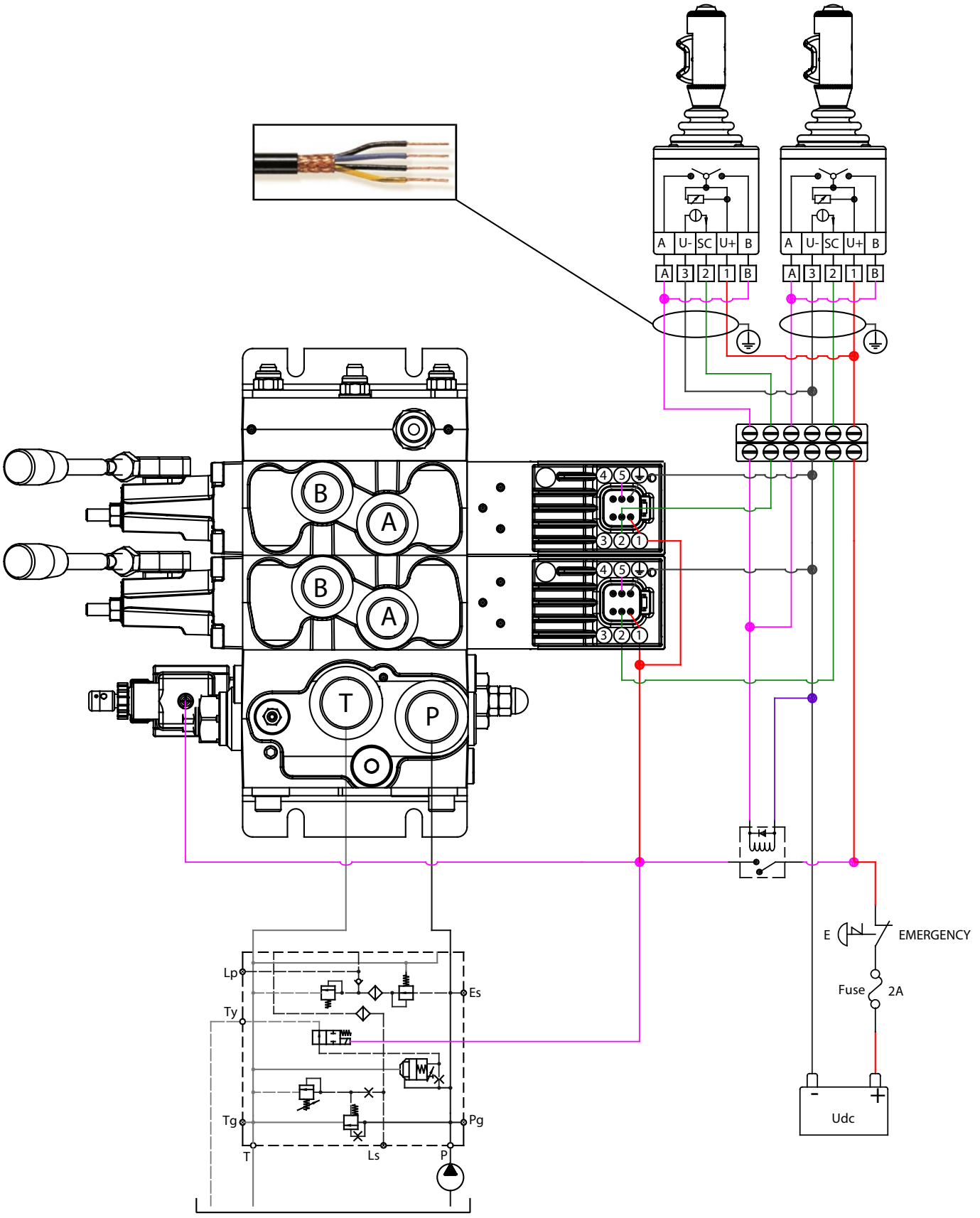
1	Power supply
2	Input signal control
3	Fault monitoring signal
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0126000**	**PEAC1126000**	**PEAC0116000**	**PEAC1116000**
DIN 43650	**PEAC0126200**	**PEAC1126200**	**PEAC0116200**	**PEAC1116200**

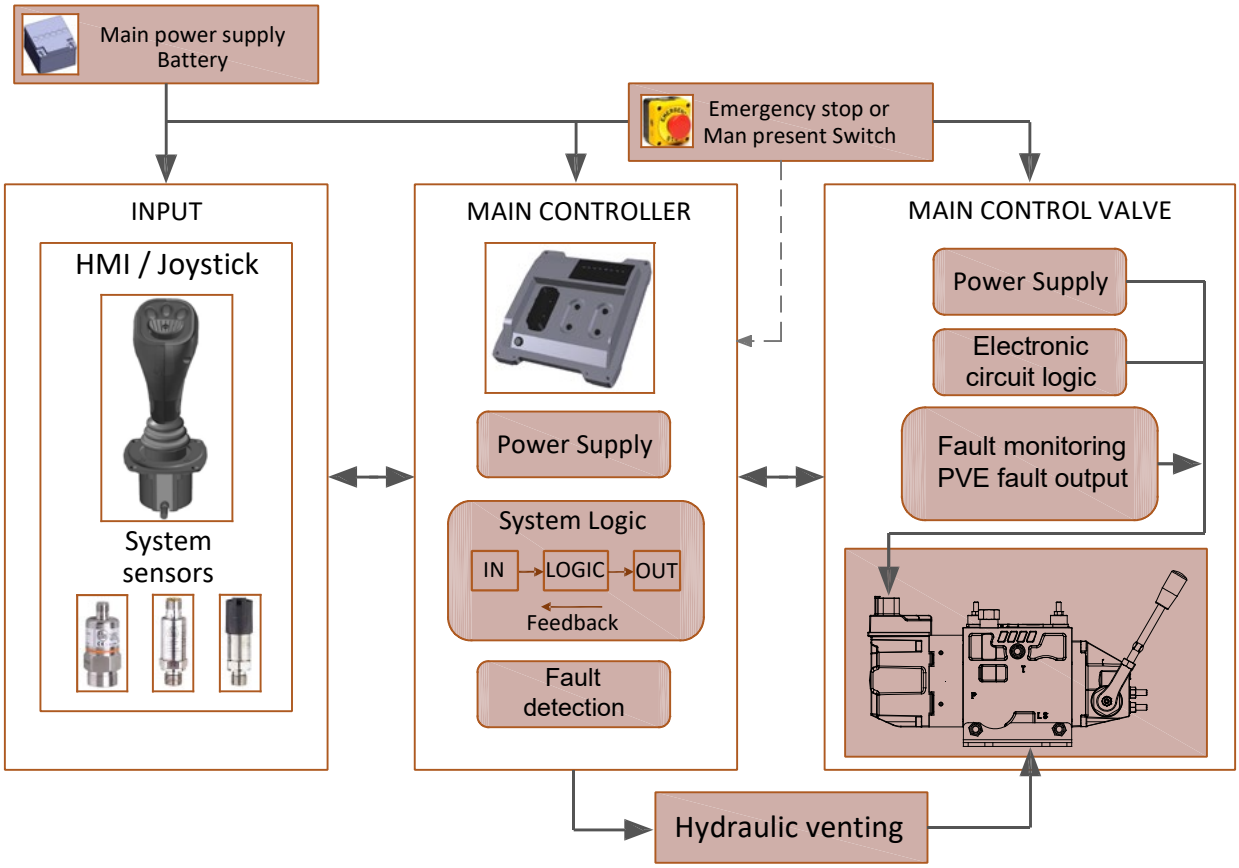
PDV74 - PEAC116 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 4 ÷ 20 mA



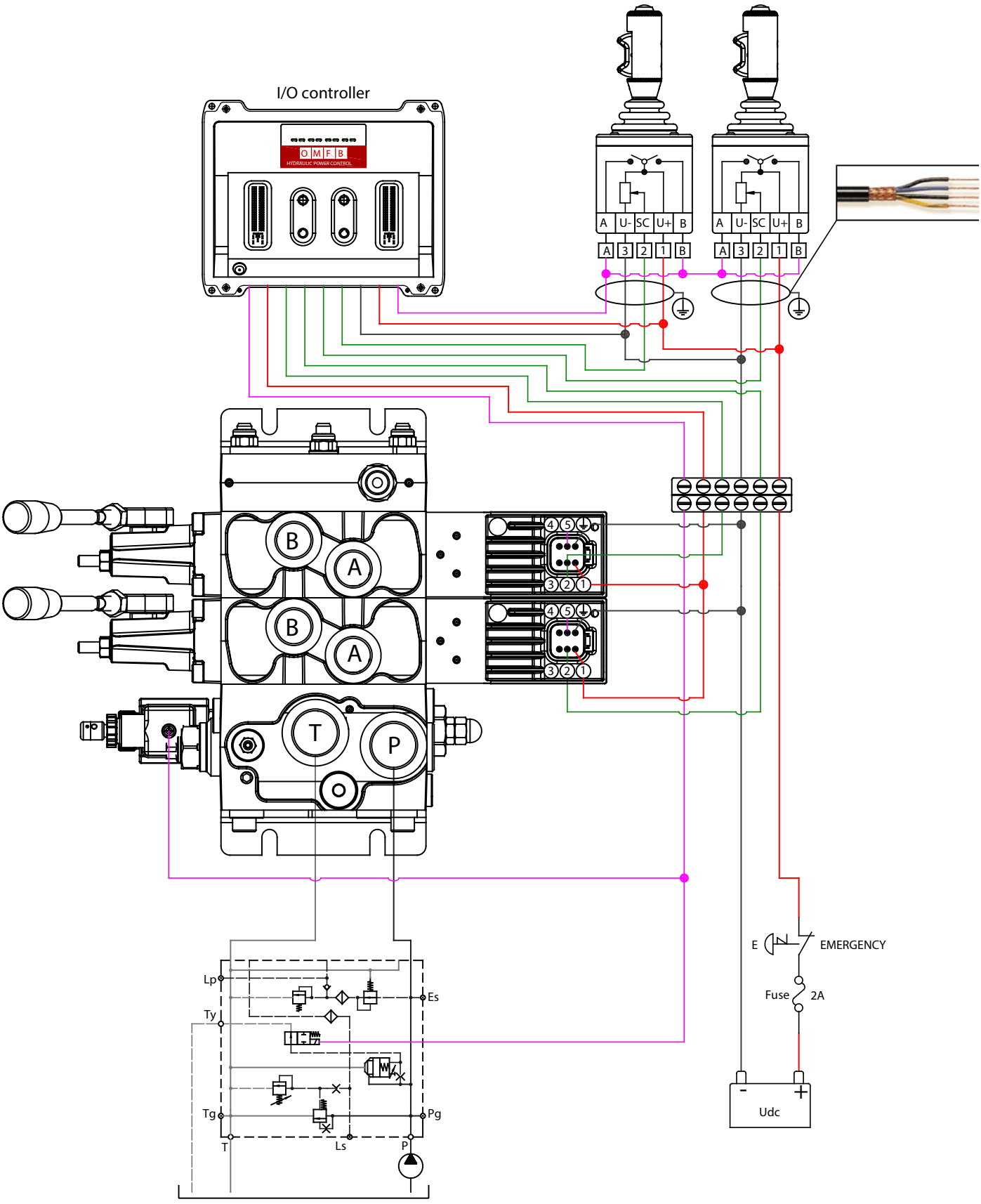
PDV74 - PEAC116 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA



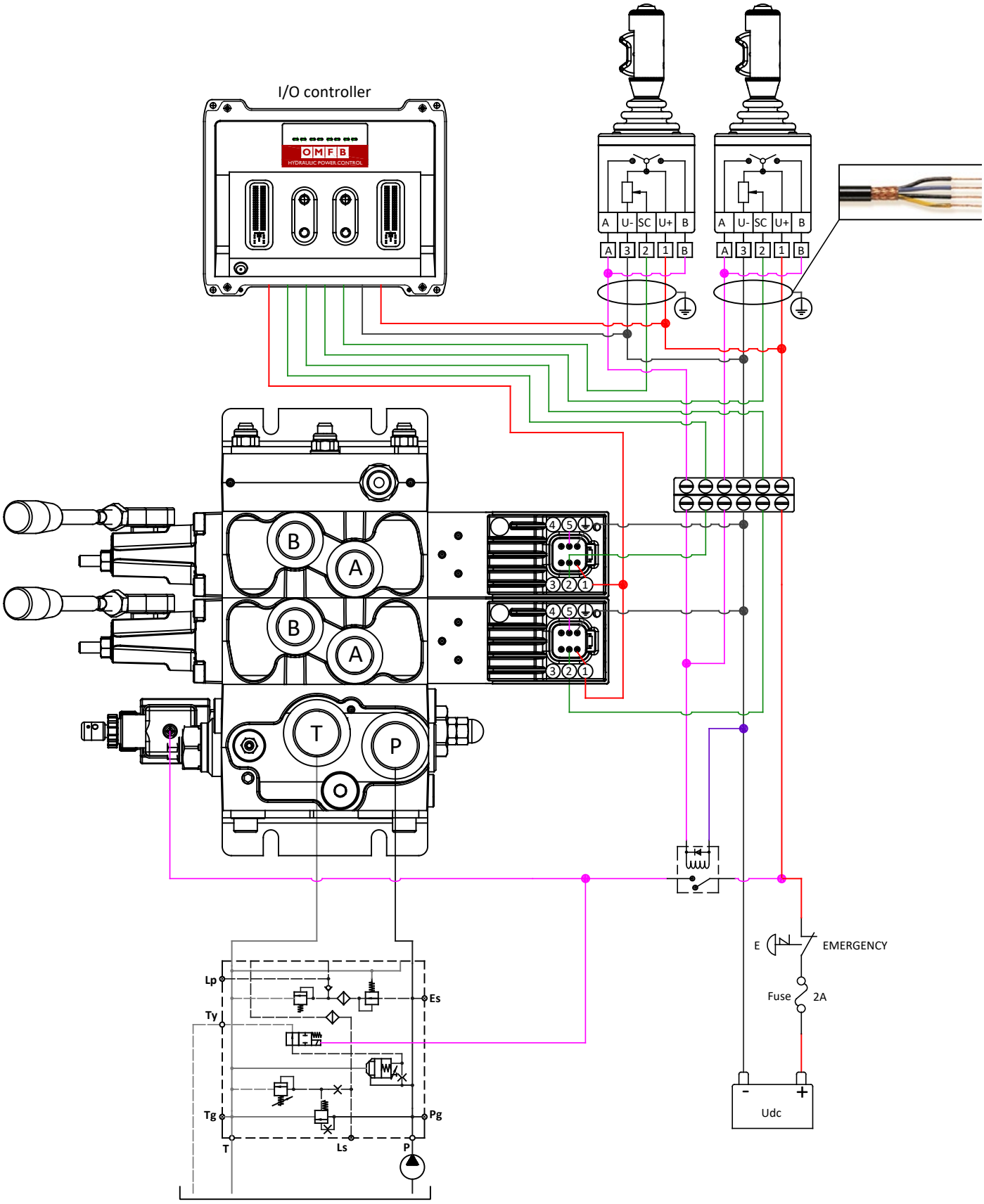
PDV74 - PEAC116 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



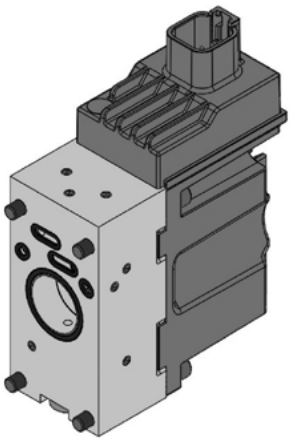
PDV74 - PEAC116 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Input signal 4 ÷ 20 mA



PDV74 - PEAC116 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 4 ÷ 20 mA



PDV74 - PEAC011 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc

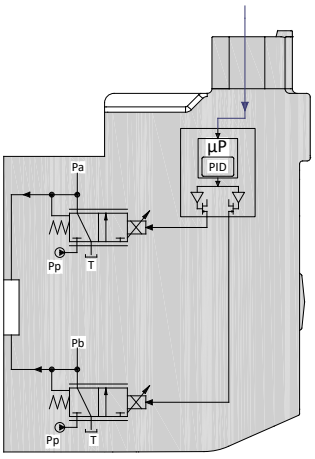


PEAC011 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

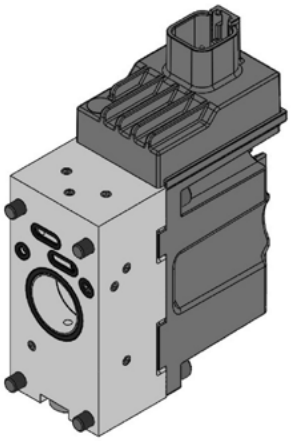
PEAC011 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC011 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAC011 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc

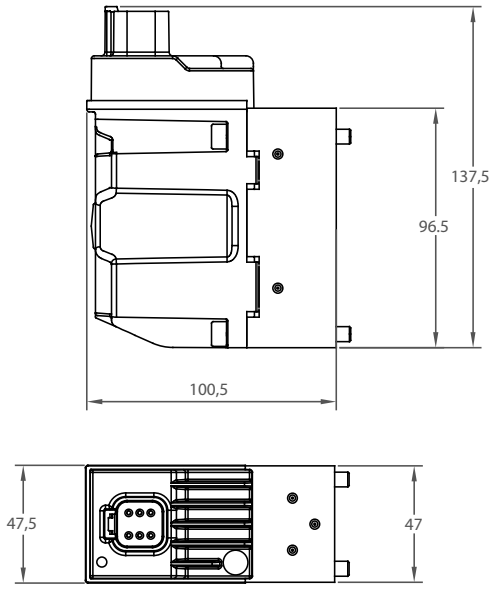


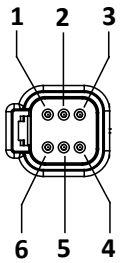
PEAC011 is defined by:

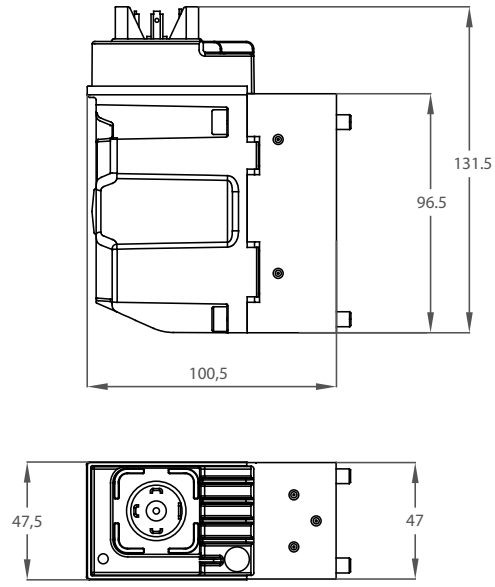
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

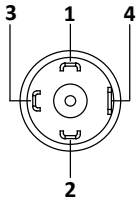
PEAC011 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0,5 Udc**
Range control signal		**0,25 Udc to 0,75 Udc**
Neutral spool position		**0,5 Udc**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV74 - PEAC011 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal 0,5 Udc - Electrical connectors



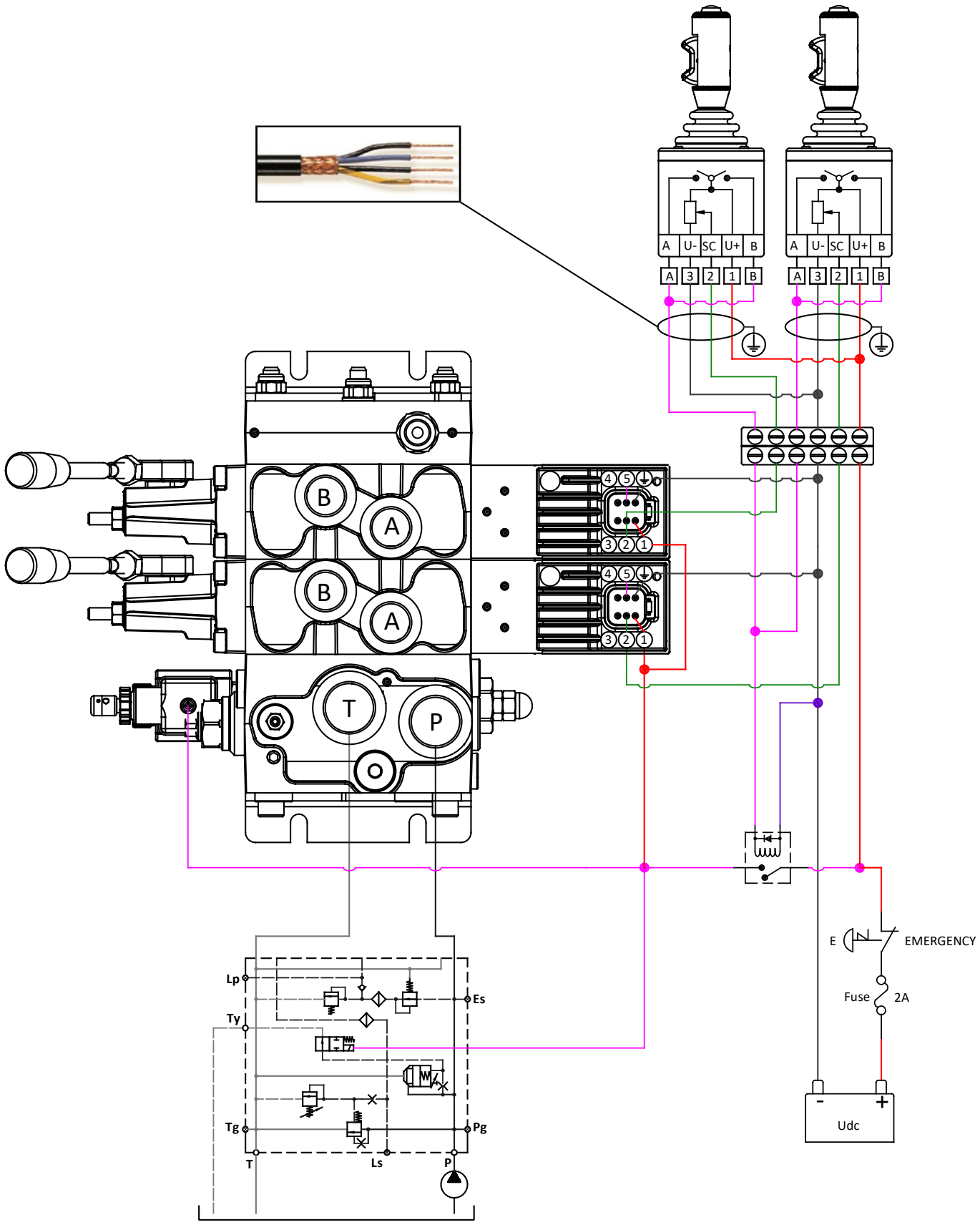
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	CAN-high
	4	CAN-low
	5	Free
	6	Ground



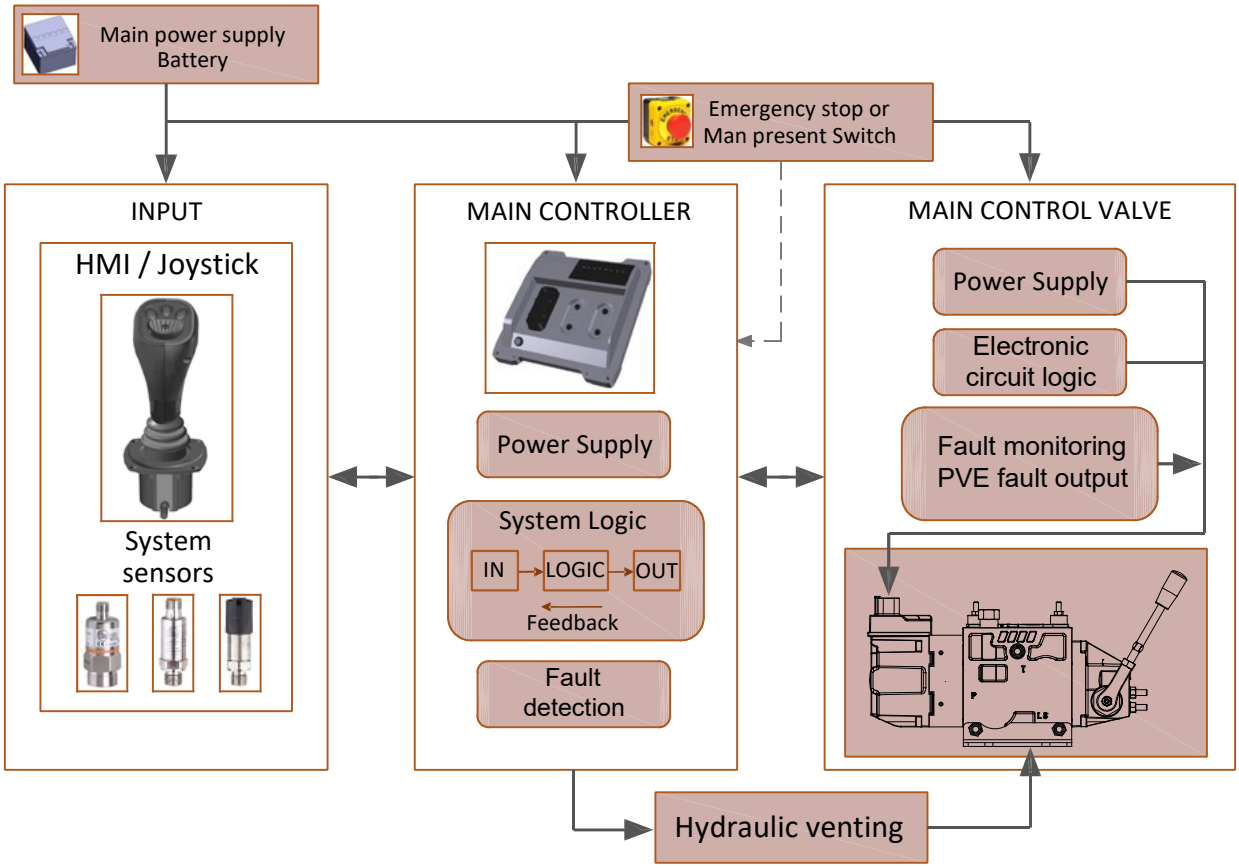
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Free
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0021000**	**PEAC1021000**	**PEAC0011000**	**PEAC1011000**
DIN 43650	**PEAC0021200**	**PEAC1021200**	**PEAC0011200**	**PEAC1011200**

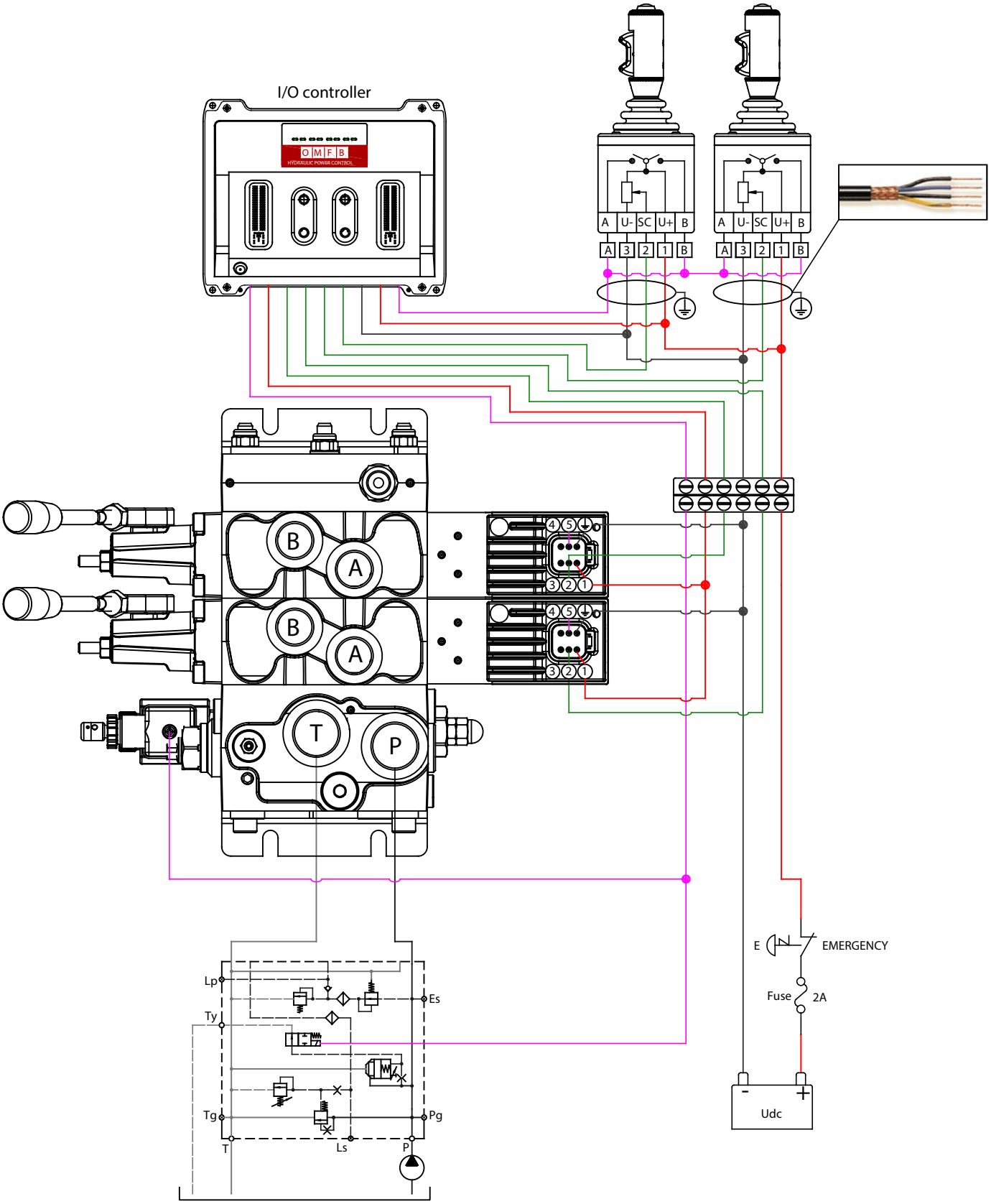
PDV74 - PEAC011 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc



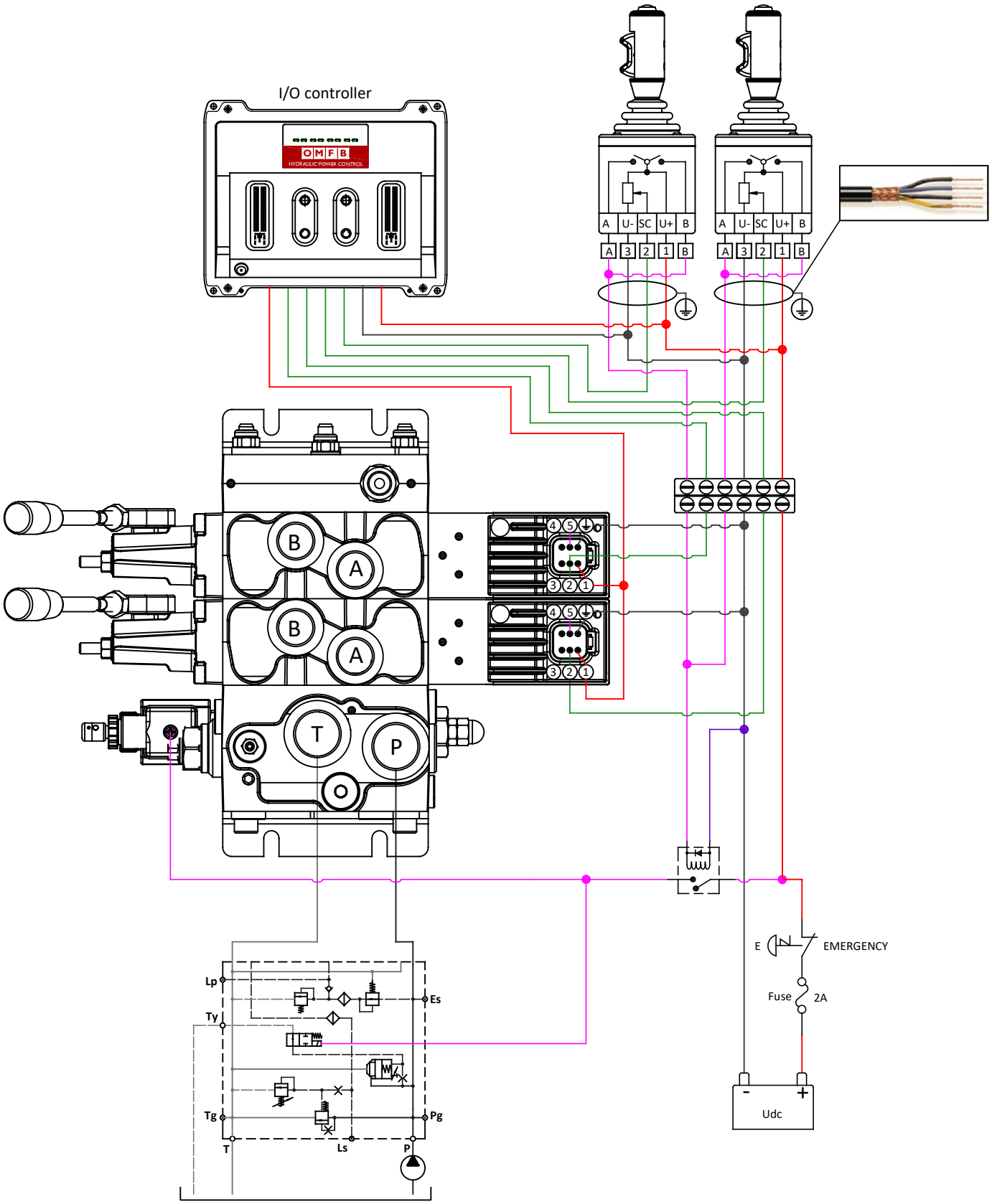
PDV74 - PEAC011 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



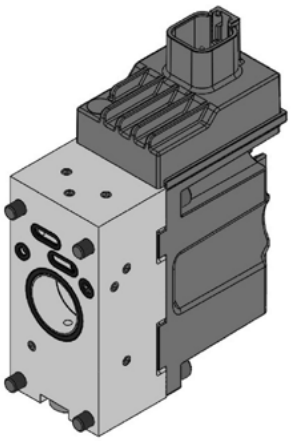
PDV74 - PEAC011 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV74 - PEAC011 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV74 - PEAC012 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

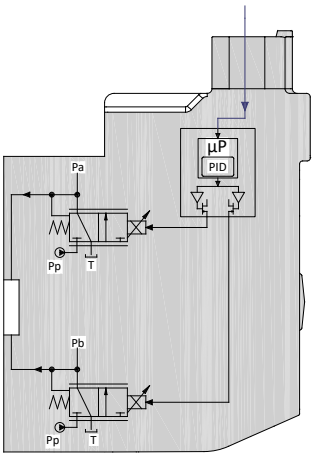


PEAC012 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

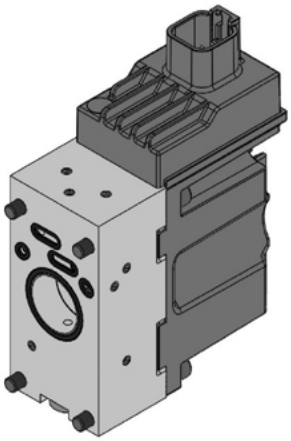
PEAC012 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC012 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAC012 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

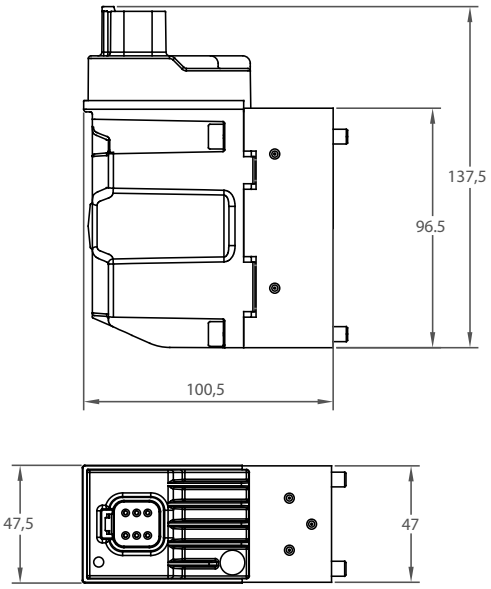


PEAC012 is defined by:

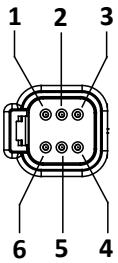
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAC012 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0-10 V**
Range control signal		**2,5 V to 7,5 V**
Neutral spool position		**5 V**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

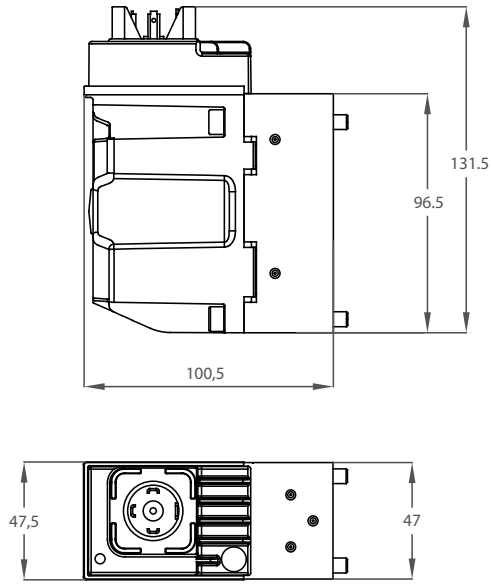
PDV74 - PEAC012 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal 0 ÷ 10 V - Electrical connectors



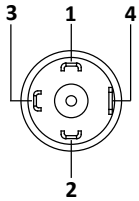
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply
2	Input signal control
3	CAN-high
4	CAN-low
5	Free
6	Ground



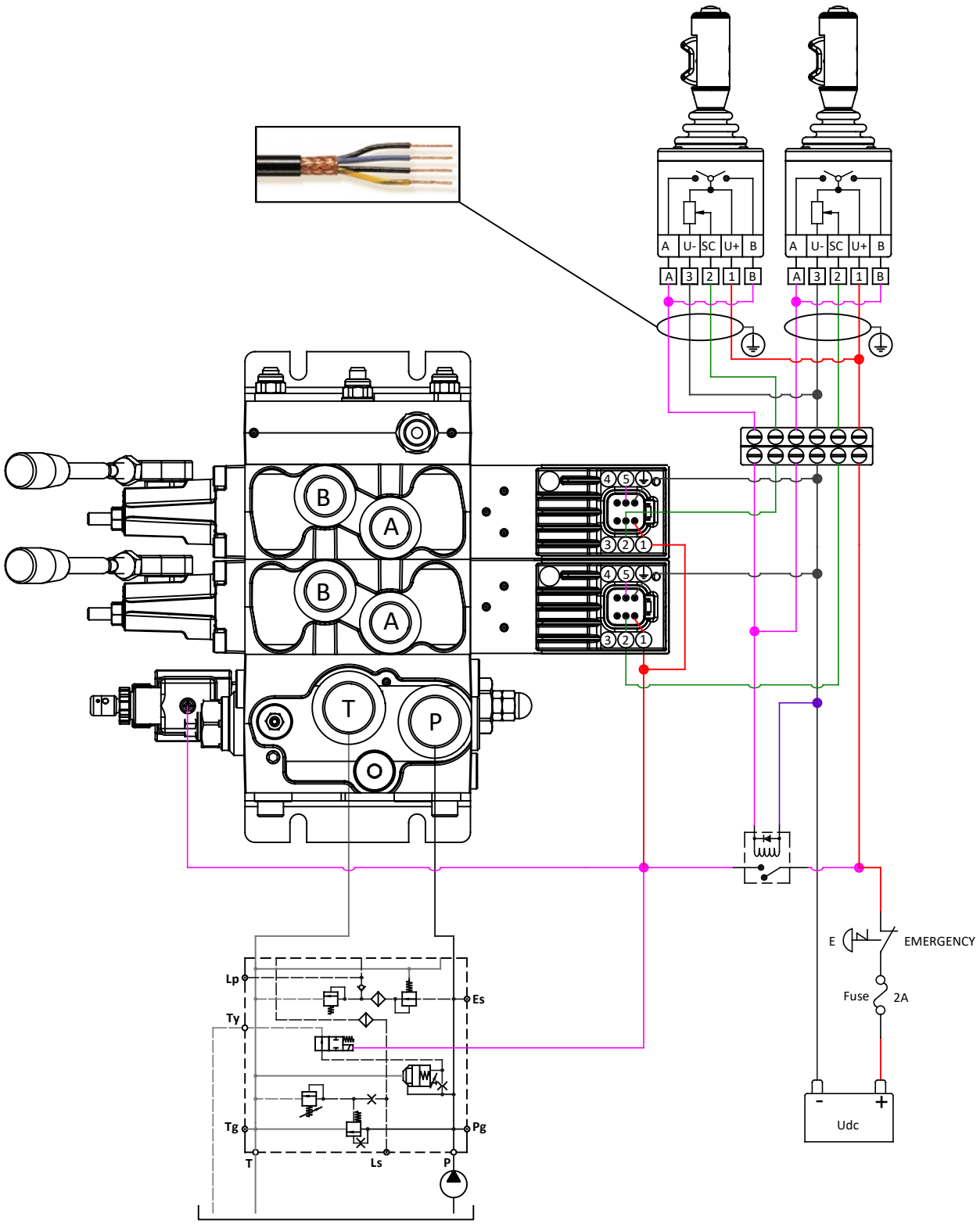
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



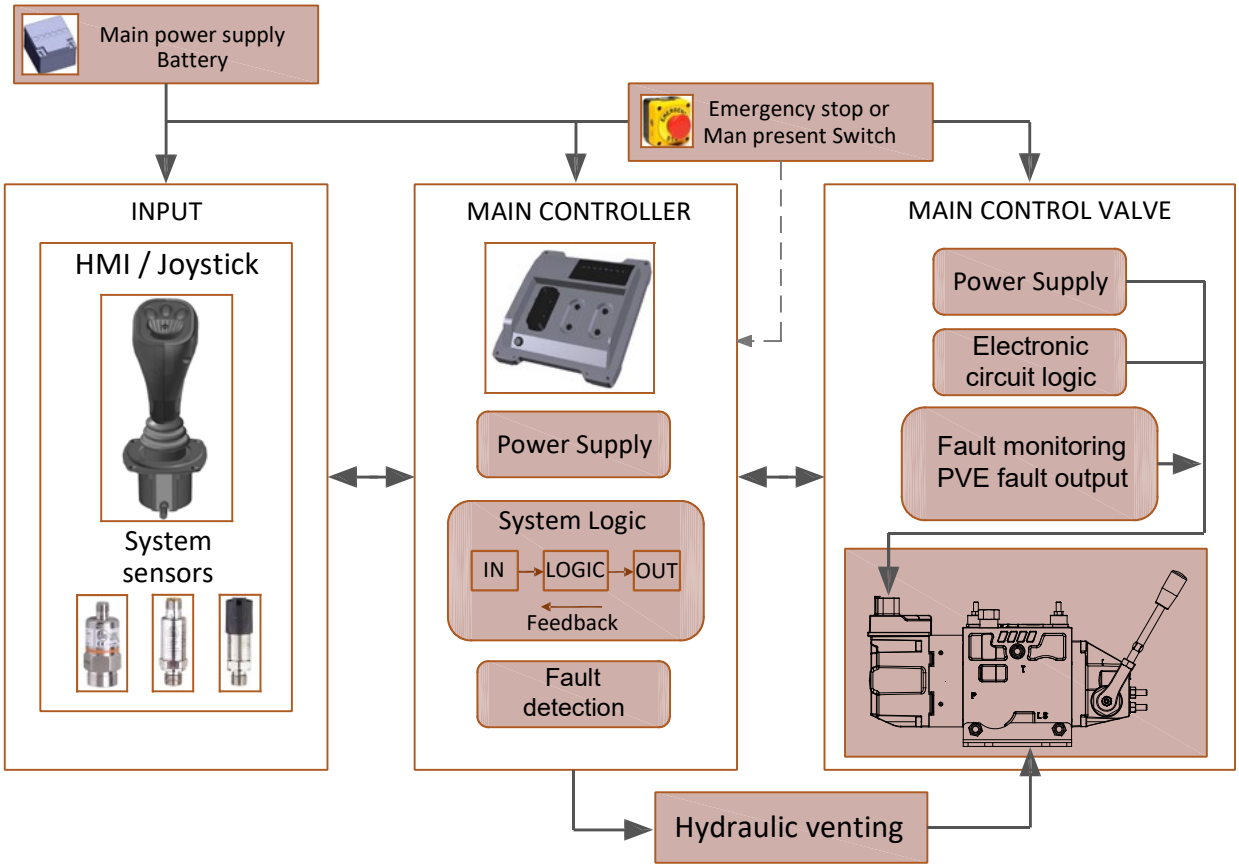
1	Power supply
2	Input signal control
3	Free
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0022000**	**PEAC1022000**	**PEAC0012000**	**PEAC1012000**
DIN 43650	**PEAC0022200**	**PEAC1022200**	**PEAC0012200**	**PEAC1012200**

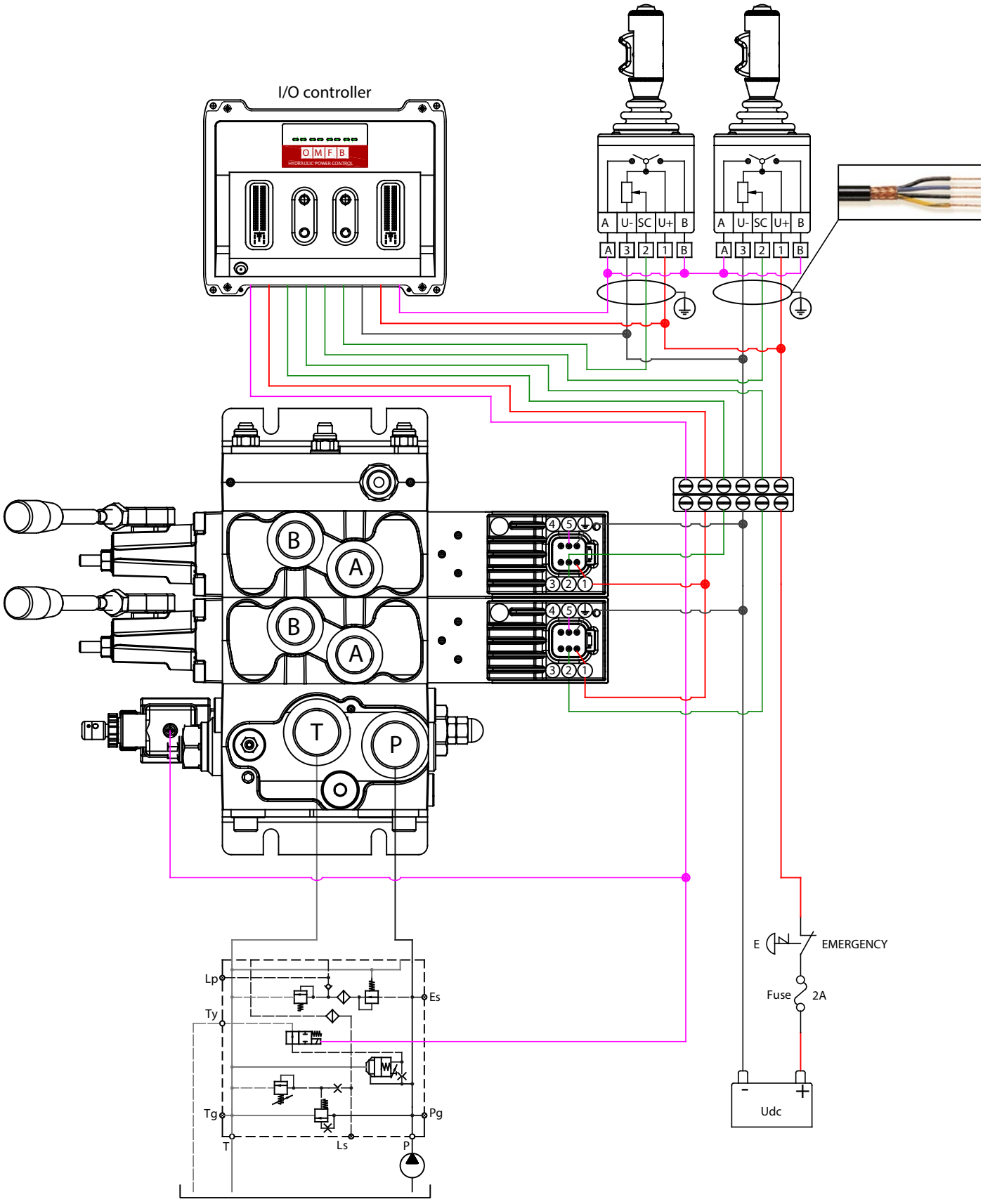
PDV74 - PEAC012 Electro-hydraulic proportional actuation.
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



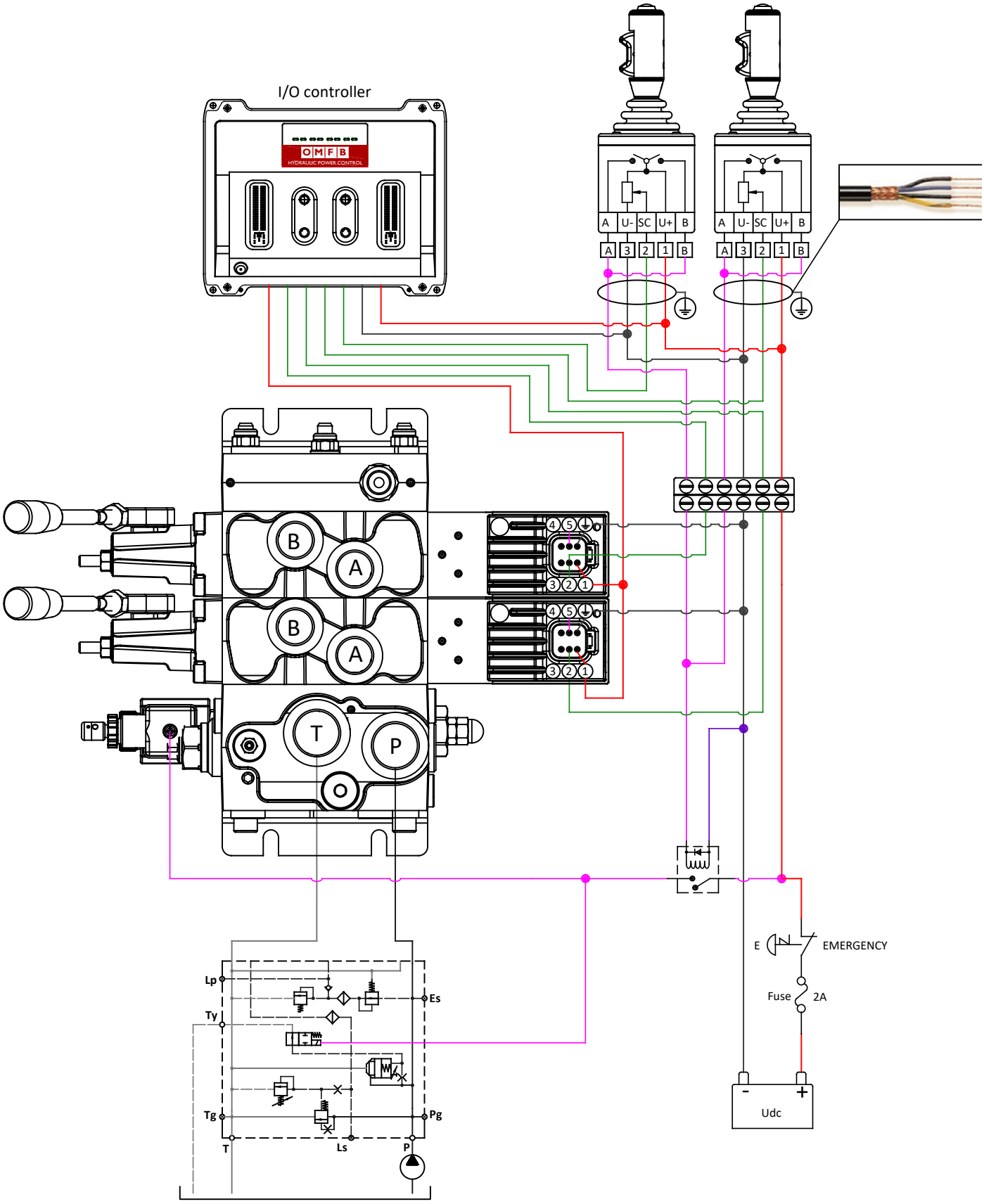
PDV74 - PEAC012 Electro-hydraulic proportional actuation.
Open loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



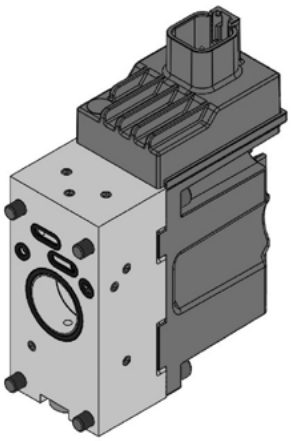
PDV74 - PEAC012 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



PDV74 - PEAC012 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



PDV74 - PEAC016 Electro-hydraulic proportional actuation
Open loop spool control
Input signal 4 ÷ 20 mA

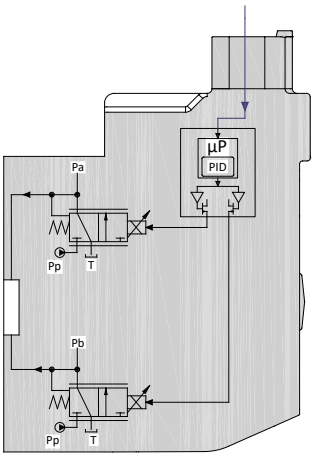


PEAC016 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

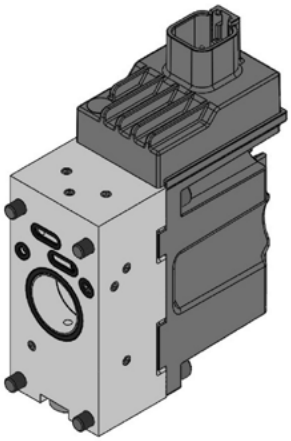
PEAC016 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC016 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAC016 Electro-hydraulic proportional actuation
Open loop spool control
Input signal 4 ÷ 20 mA

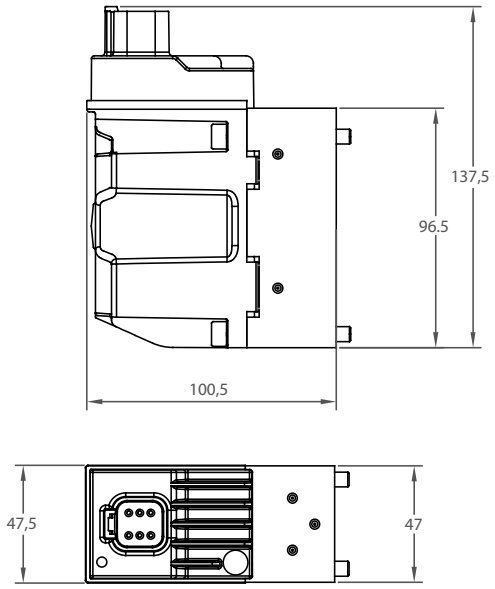


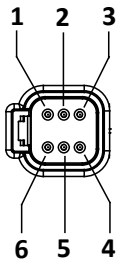
PEAC016 is defined by:

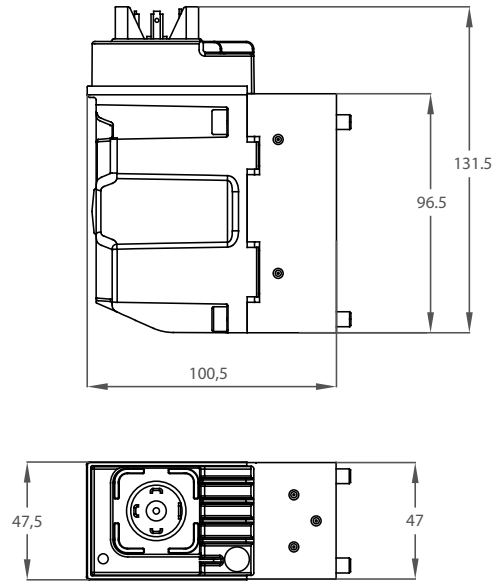
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

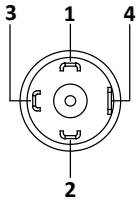
PEAC016 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**4-20 mA**
Range control signal		**4 mA to 20 mA**
Neutral spool position		**12 mA**
Max threshold signal, **A** port		**1,5 mA**
Max threshold signal, **B** port		**1,5 mA**
Input capacitor		**100 ηF**
Input impedance		**220 Ω**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Max current start spool travel		**140 mA**
Max current end spool travel		**450 mA**
Coil impedance @ 20°C		**8,9 Ω**
Signal control impedance		**50 KΩ**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP65 - IP66 - IP69K**
Bootloader function, debugging parameters and set-up function available with Deutsch connector DT06-6S, only		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV74 - PEAC016 Electro-hydraulic proportional actuation.
Input signal control 4 ÷ 20 mA
Electrical connectors



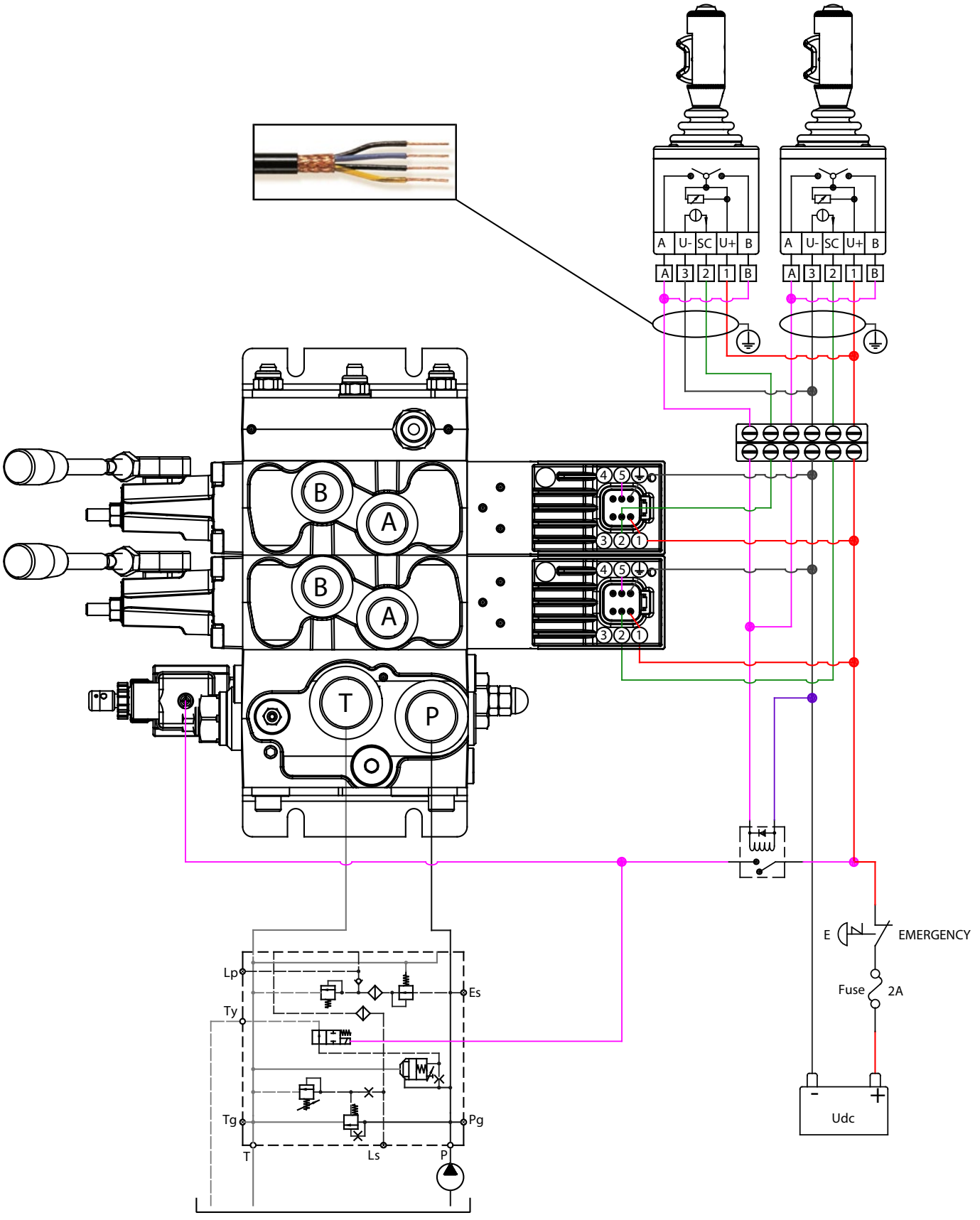
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	CAN-high
	4	CAN-low
	5	Free
	6	Ground



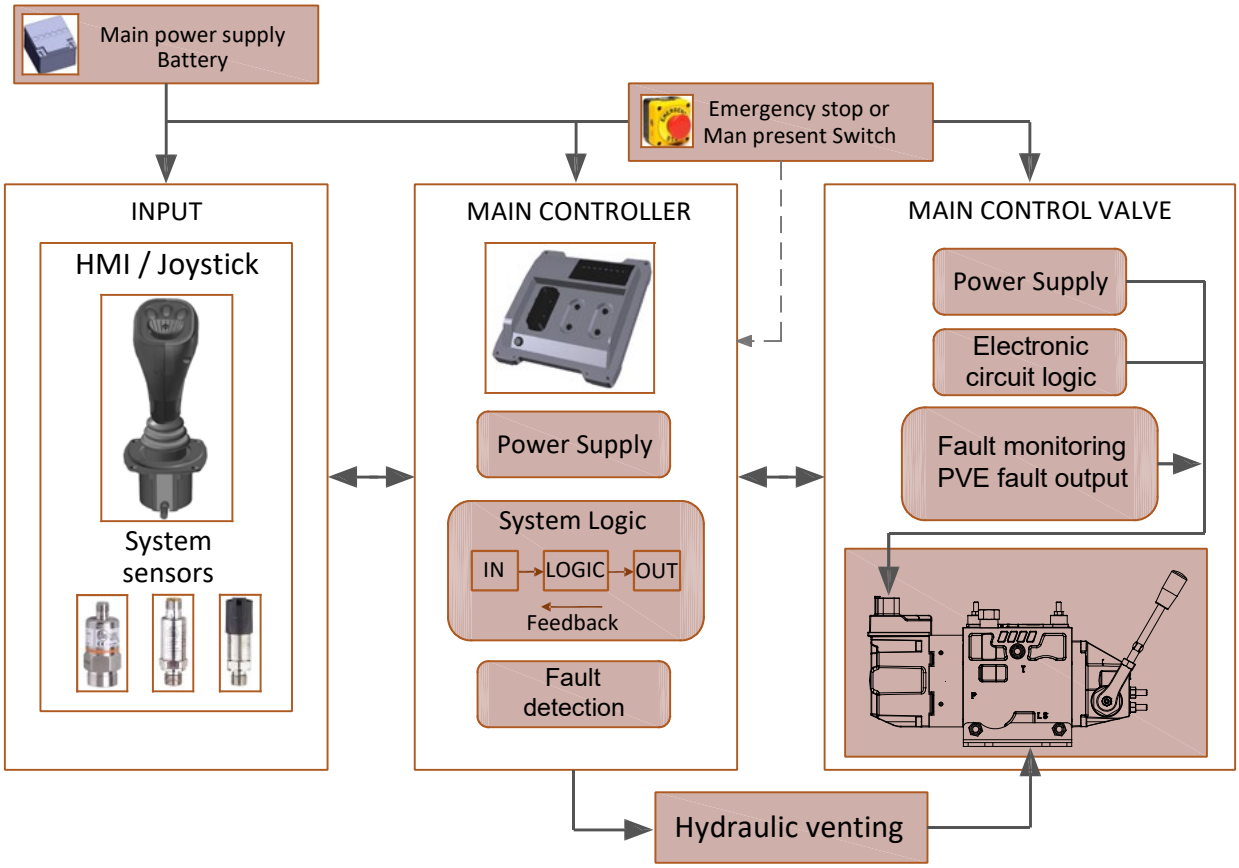
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Free
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0026000**	**PEAC1026000**	**PEAC0016000**	**PEAC1016000**
DIN 43650	**PEAC0026200**	**PEAC1026200**	**PEAC0016200**	**PEAC1016200**

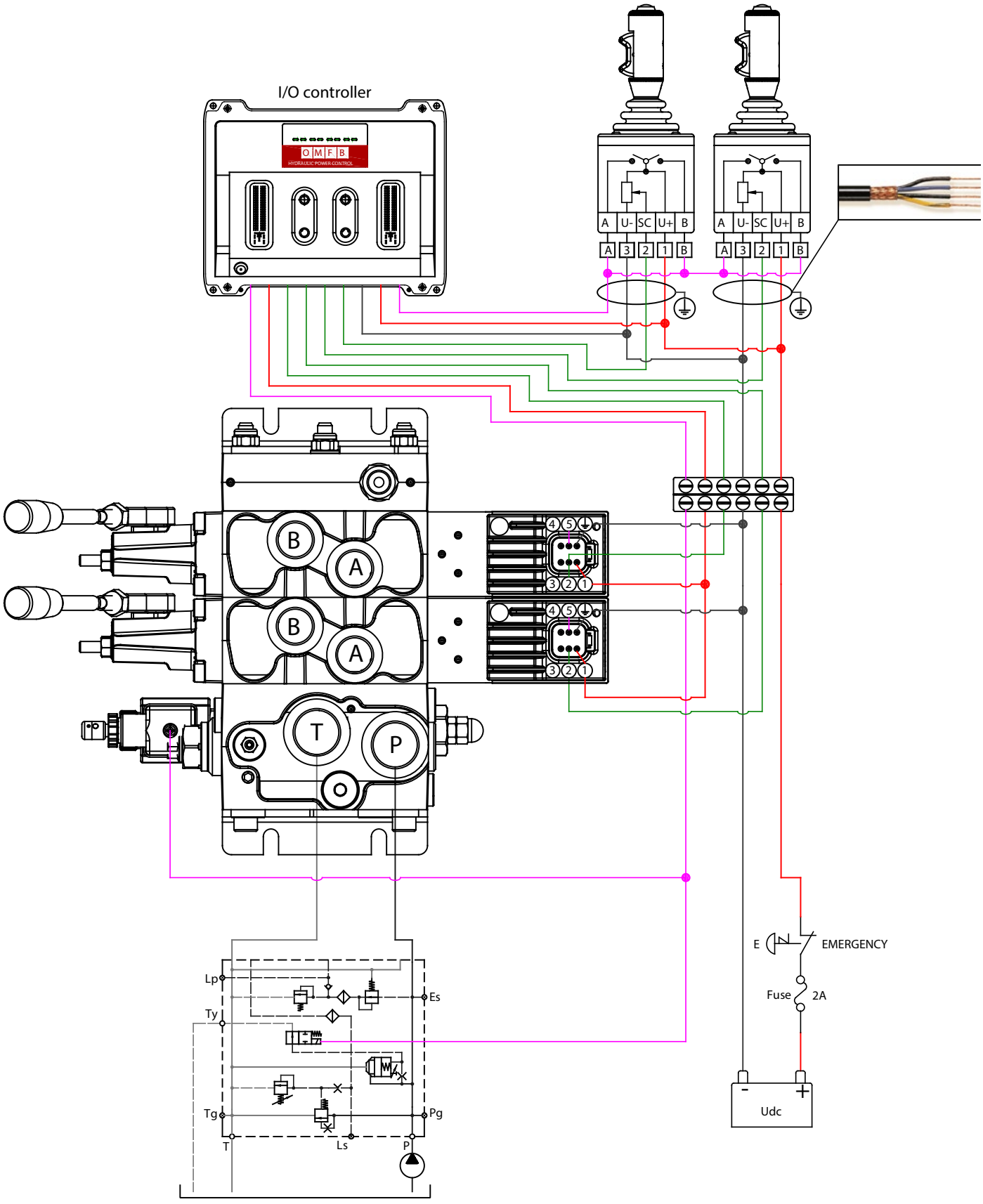
PDV74 - PEAC016 Electro-hydraulic proportional actuation.
Input signal control 4-20 mA
Electrical wiring



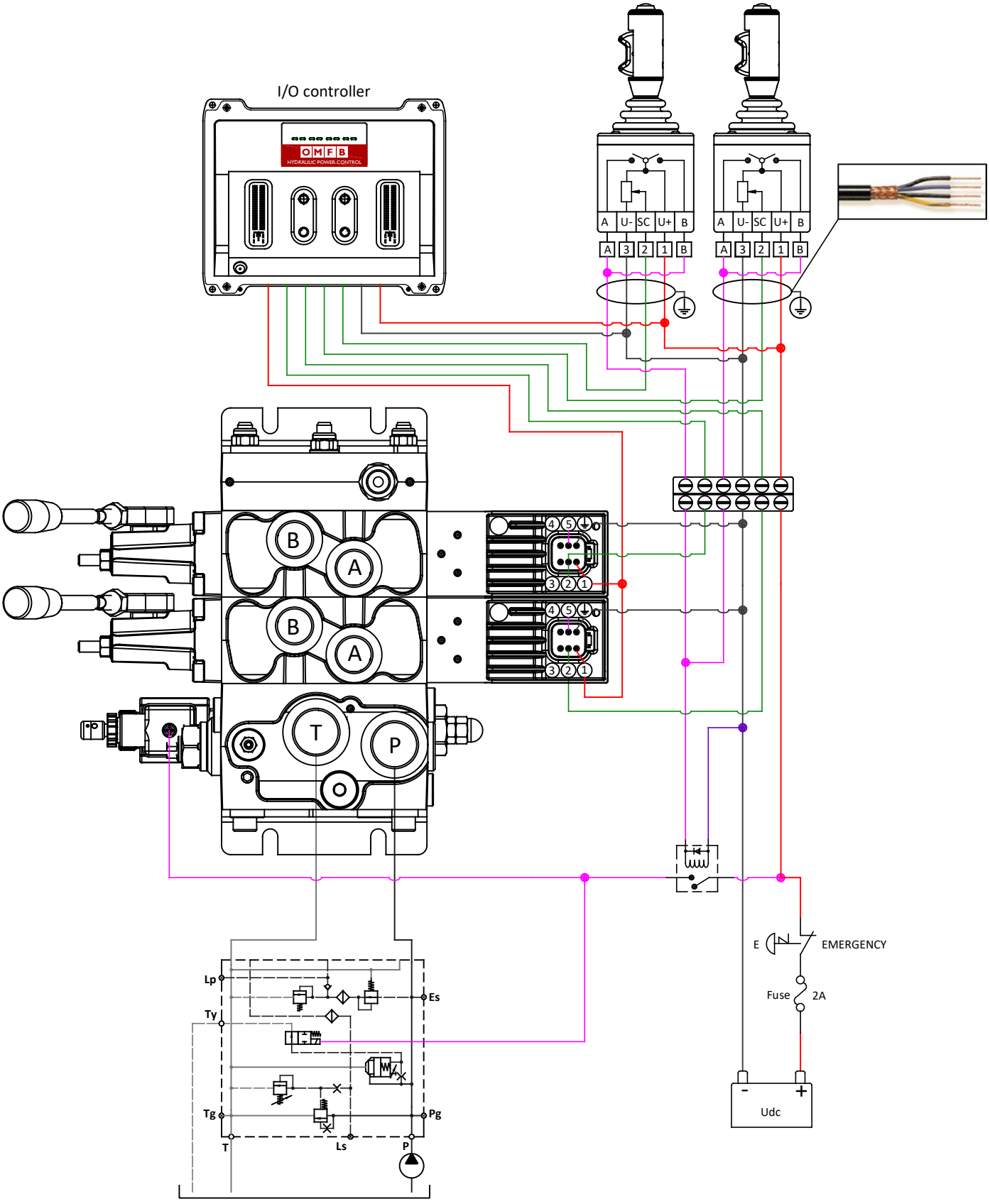
PDV74 - PEAC016 Electro-hydraulic proportional actuation
Open loop spool control
Current input signal 4-20 mA



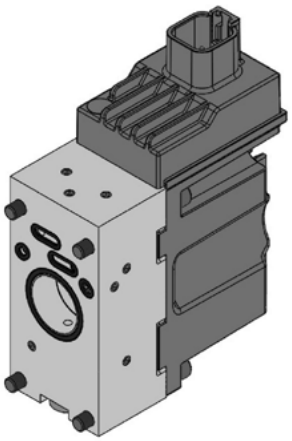
PDV74 - PEAC016 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Current input signal 4 ÷ 20 mA



PDV74 - PEAC016 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Current input signal 4 ÷ 20 mA



PDV74 - PEAD1 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

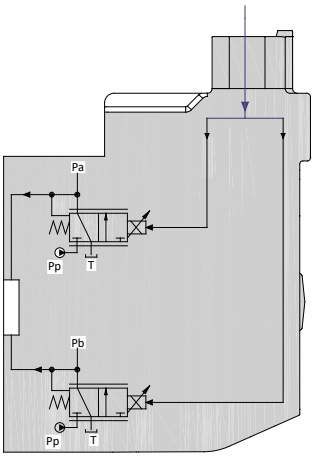


PEAD1 is a proportional open loop spool actuation without integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

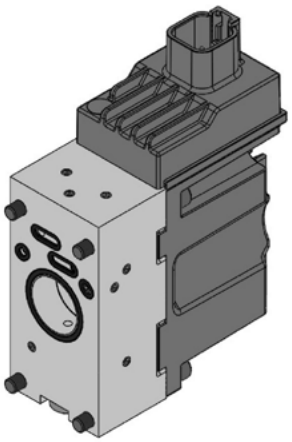
PEAD1 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAD1 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAD1 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

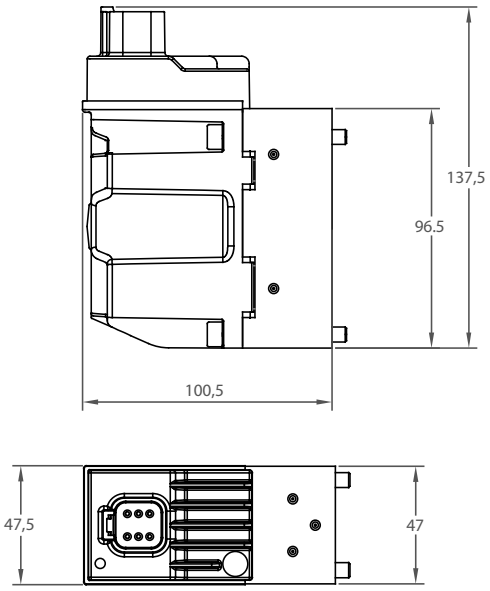


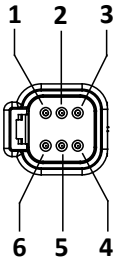
PEAD1 is defined by:

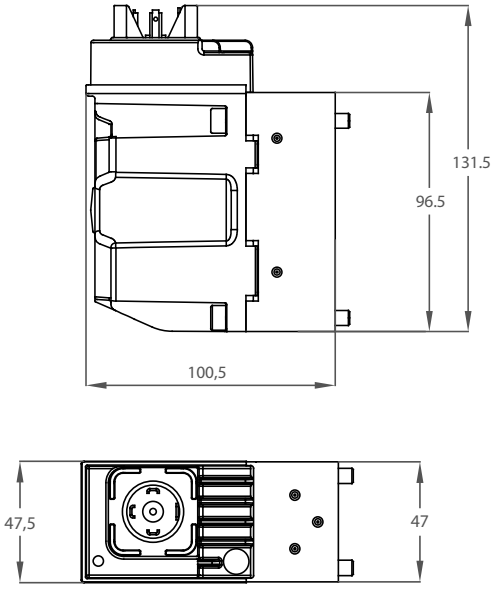
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

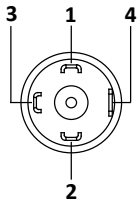
PEAD1 Technical data			
Supply voltage		12 Vdc	24 Vdc
Voltage range		10-16 V	20-30 V
Max ripple		5%	5%
Current consuption at rated voltage		750 mA @ 12 Vdc	400 mA @ 24 Vdc
Power consumption		9 W	9,6 W
R @ 20°C		8,9 Ω	35 Ω
Start spool travel		220 mA	140 mA
End spool travel flow control		650 mA	350 mA
Max spool flow in pre-floating position		650 mA	350 mA
Spool floating position		750 mA	400 mA
Heat insulation		Class H (180°C)	
Oil temperature	(Recommended)	20 ÷ 60 °C	
Oil temperature	(Min)	-30 °C	
Oil temperature	(Max)	80 °C	
Ambient temperature		-30 ÷ 60 °C	
PWM frequency		50 ÷ 200 Hz	
Best frequency		100 Hz	
Duty cycle		100% ED	
Plug connector		6 pins Deutsch or 4 pins DIN	
Enclouser degree	(Electrical wiring excepted)	IP69K	
Weight cast iron body		1, 8 kg	
Weight Aluminium body		1,3 kg	
Max current output signal for spool direction moviment		50 mA	
Reaction time (constant voltage)	From neutral position to max spool travel	110 - 140 ms	
	From max spool travel to neutral	70 - 90 ms	
Reaction time (neutral switch)	From neutral position to max spool travel	130 - 170 ms	
	From max spool travel to neutral	70 - 90 ms	

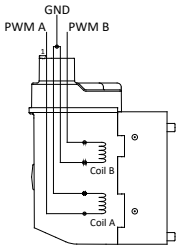
PDV74 - PEAD1 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control - Electrical connectors



Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	**A** port +
	2	Free
	3	**A** port -
	4	**B** port +
	5	Free
	6	**B** port -

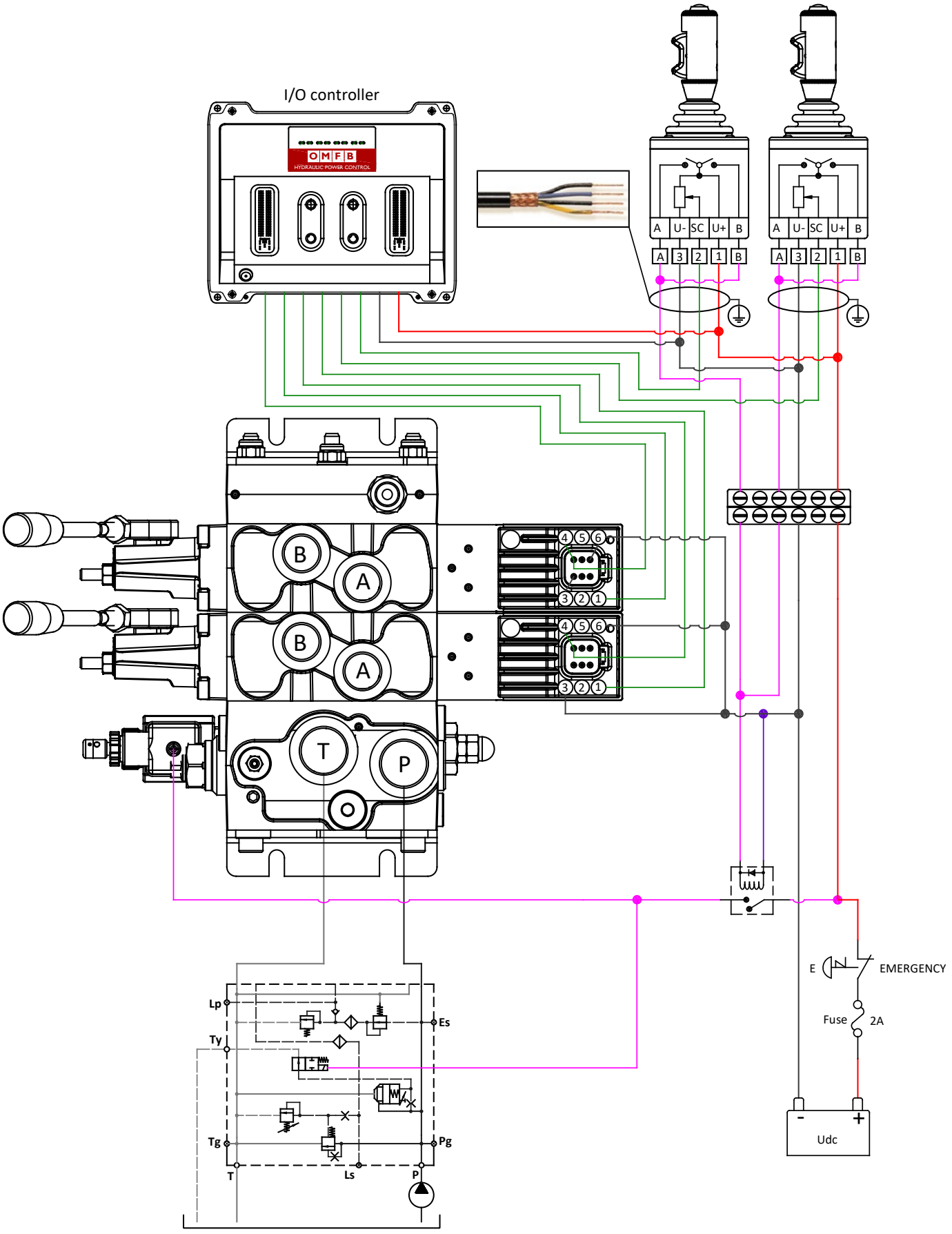


Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	**A** port +
	2	**B** port +
	3	Free
	4	Ground

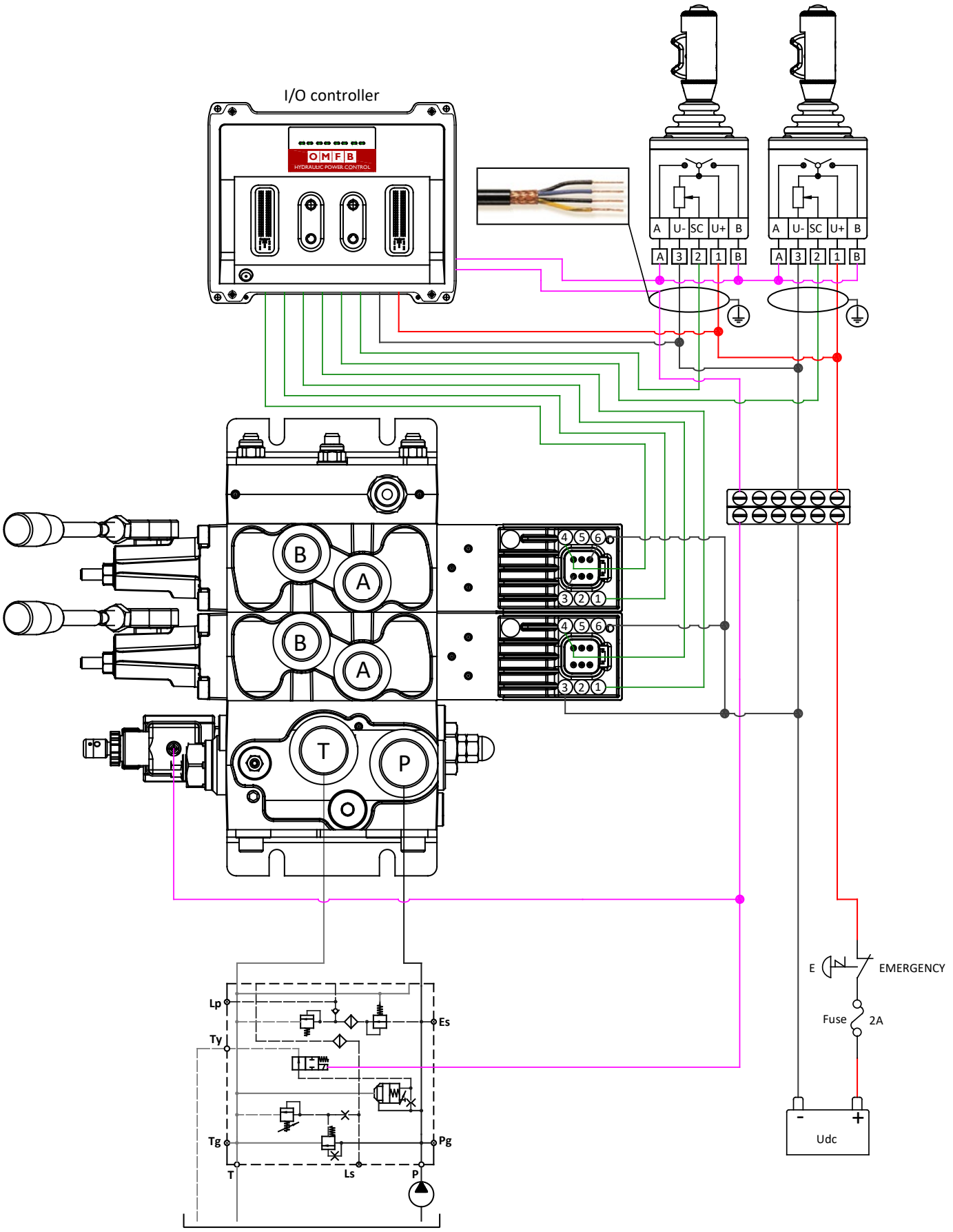


Connector version	Code numbers			
	12 V		24 V	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAD0100000**	**PEAD1100000**	**PEAD0200000**	**PEAD1200000**
DIN 43650	**PEAD0120000**	**PEAD1120000**	**PEAD0220000**	**PEAD1220000**

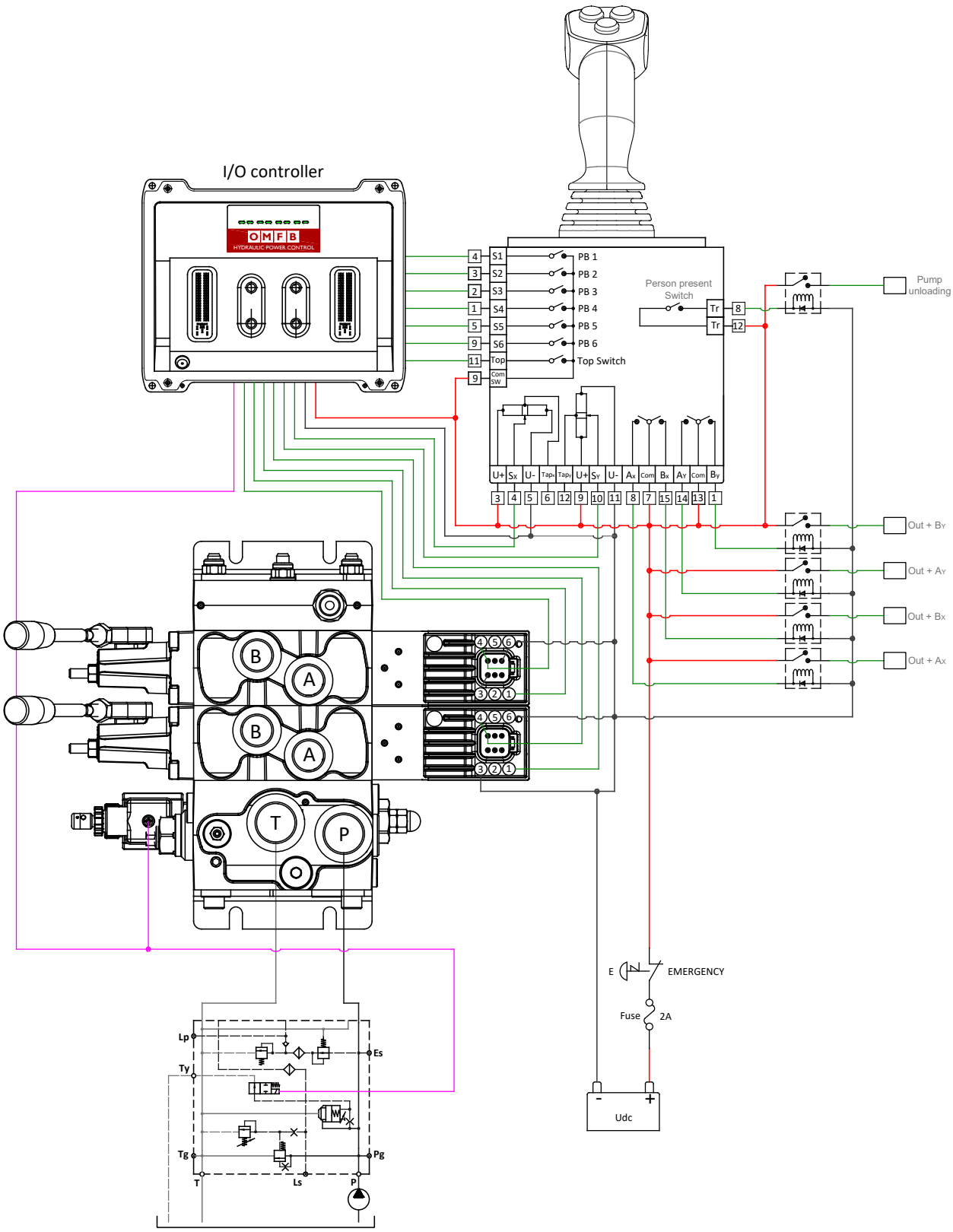
PDV74 - PEAD1 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



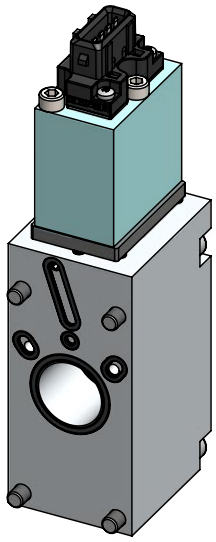
PDV74 - PEAD1 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV74 - PEAD1 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV74 - PEAP1 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

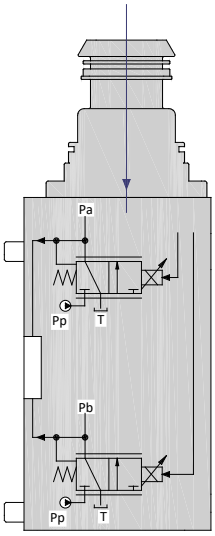


PEAP1 is a proportional open loop spool actuation without integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

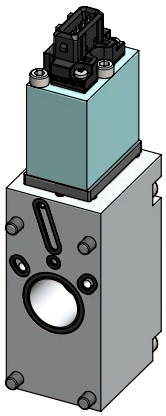
PEAP1 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAP1 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV74 - PEAP1 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

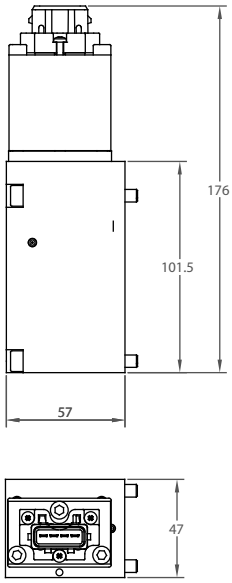


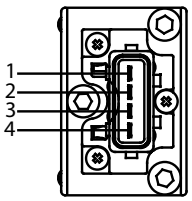
PEAP1 is defined by:

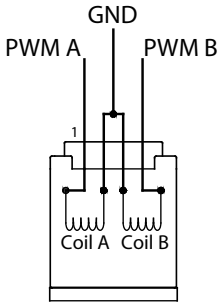
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAP1 Technical data			
Supply voltage		12 Vdc	24 Vdc
Voltage range		10-16 V	20-30 V
Max ripple		5%	5%
Current consuption at rated voltage		1330 mA @ 12 Vdc	630 mA @ 24 Vdc
Power consumption		23 W	21 W
R @ 20°C		6,3 Ω	27 Ω
Start spool travel		220 mA	140 mA
End spool travel flow control		1330 mA	630 mA
Max spool flow in pre-floating position		1330 mA	630 mA
Spool floating position		750 mA	400 mA
Heat insulation		Class H (180°C)	
Oil temperature	(Recommended)	-20 ÷ 60 °C	
Oil temperature	(Min)	-30 °C	
Oil temperature	(Max)	80 °C	
Ambient temperature		-30 ÷ 60 °C	
PWM frequency		50 ÷ 200 Hz	
Best frequency		100 Hz	
Duty cycle		100% ED	
Plug connector		Amp Junior Power Timer 4 pins	
Enclouser degree	(Electrical wiring excepted)	IP69K	
Max current output signal for spool direction moviment		50 mA	
Reaction time (constant voltage)	From neutral position to max spool travel	110 - 140 ms	
	From max spool travel to neutral	70 - 90 ms	
Reaction time (neutral switch)	From neutral position to max spool travel	130 - 170 ms	
	From max spool travel to neutral	70 - 90 ms	

PDV74 - PEAP1 Electro-hydraulic proportional actuation
Input signal control PWM - Current input signal for PWM or supply voltage for ON/OFF control - Electrical connector

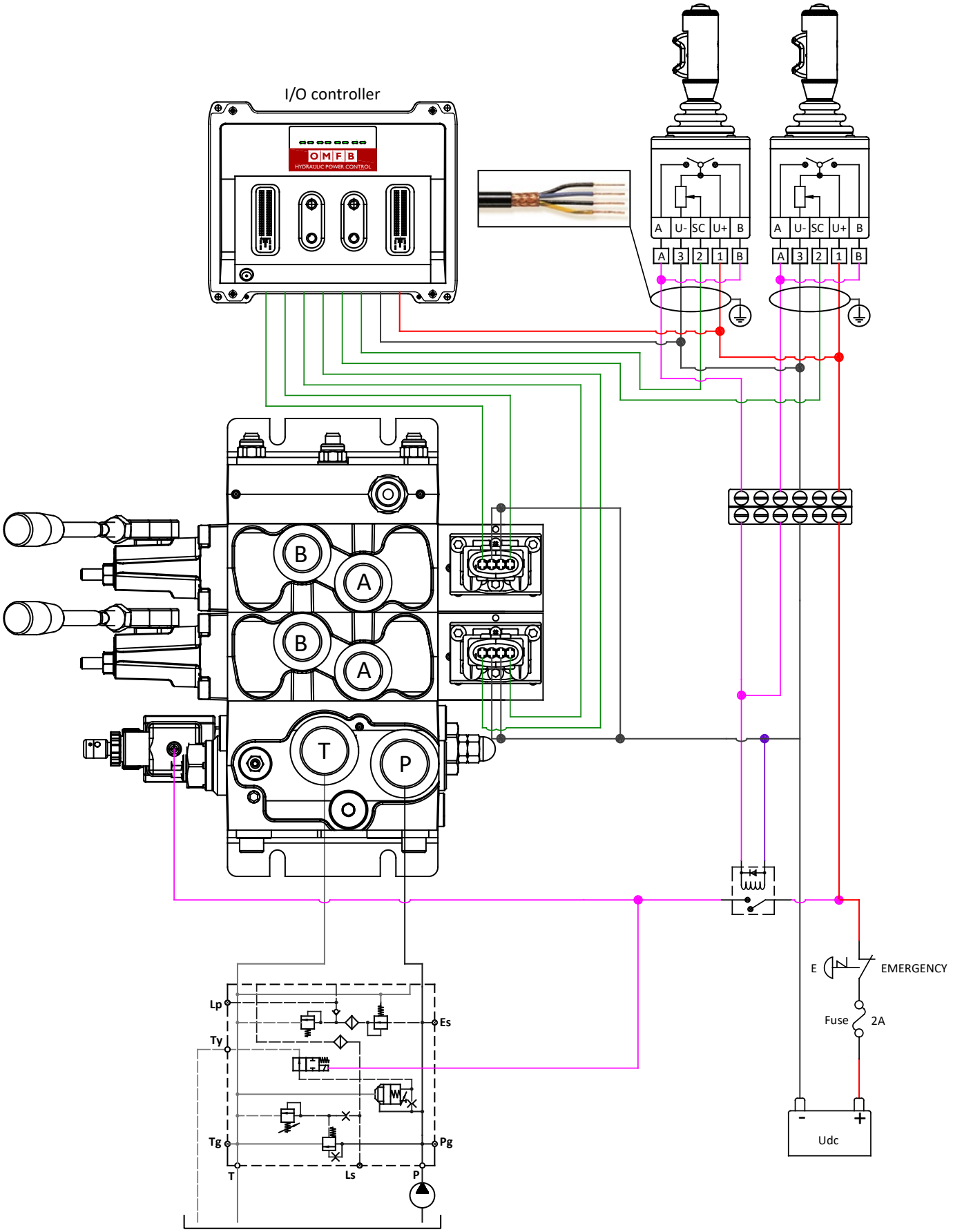


Amp Junior Power Timer 4 pin connector Enclousure degree IP 65 PIN-assignment		
	**1**	**A** port +
	2	**A** port -
	3	**B** port -
	4	**B** port +

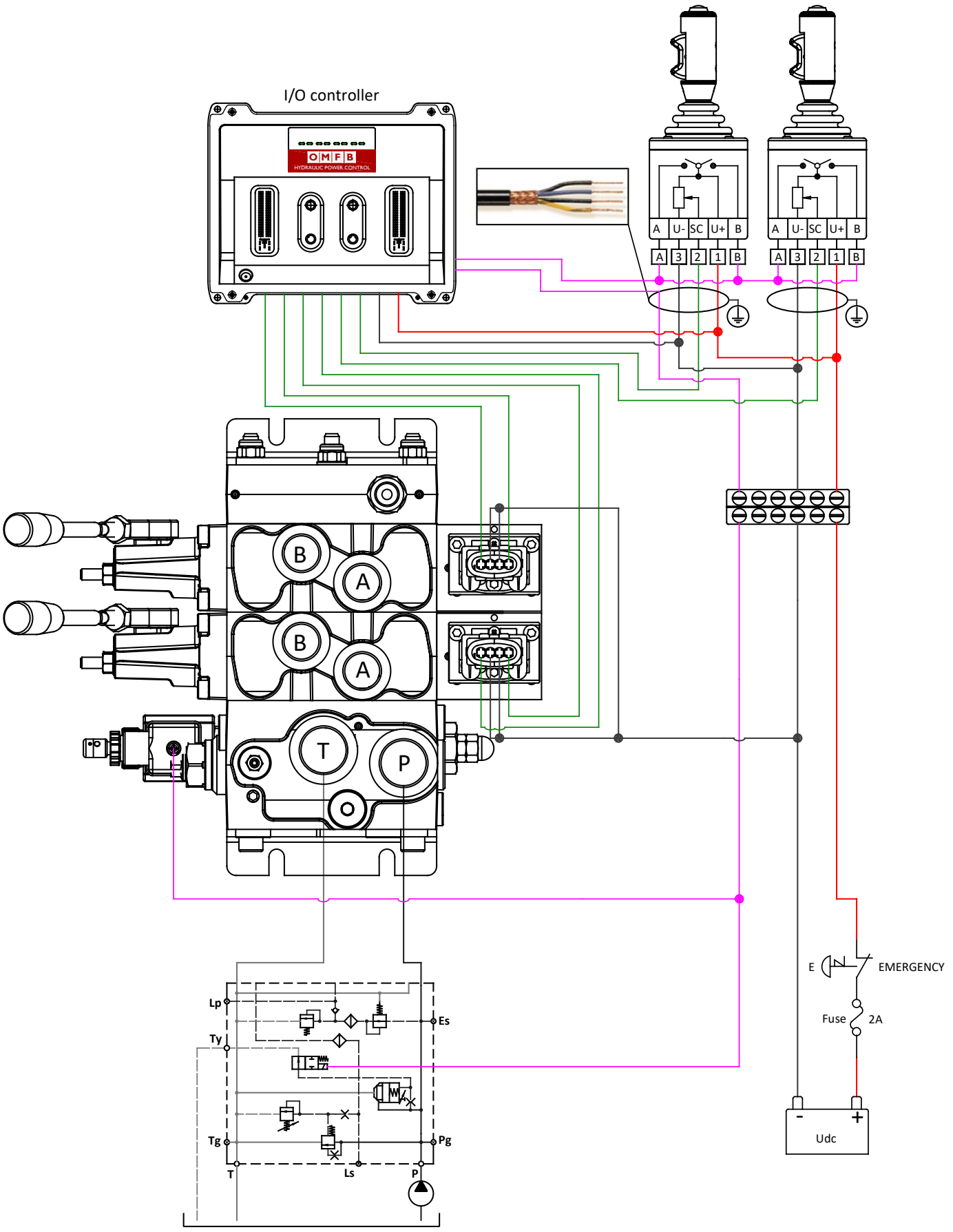


Connector version	Code numbers			
	12 V		24 V	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
AMP Junior timer 4 Pin	**PEAP0132000**	**PEAP1312000**	**PEAP0412000**	**PEAP1412000**

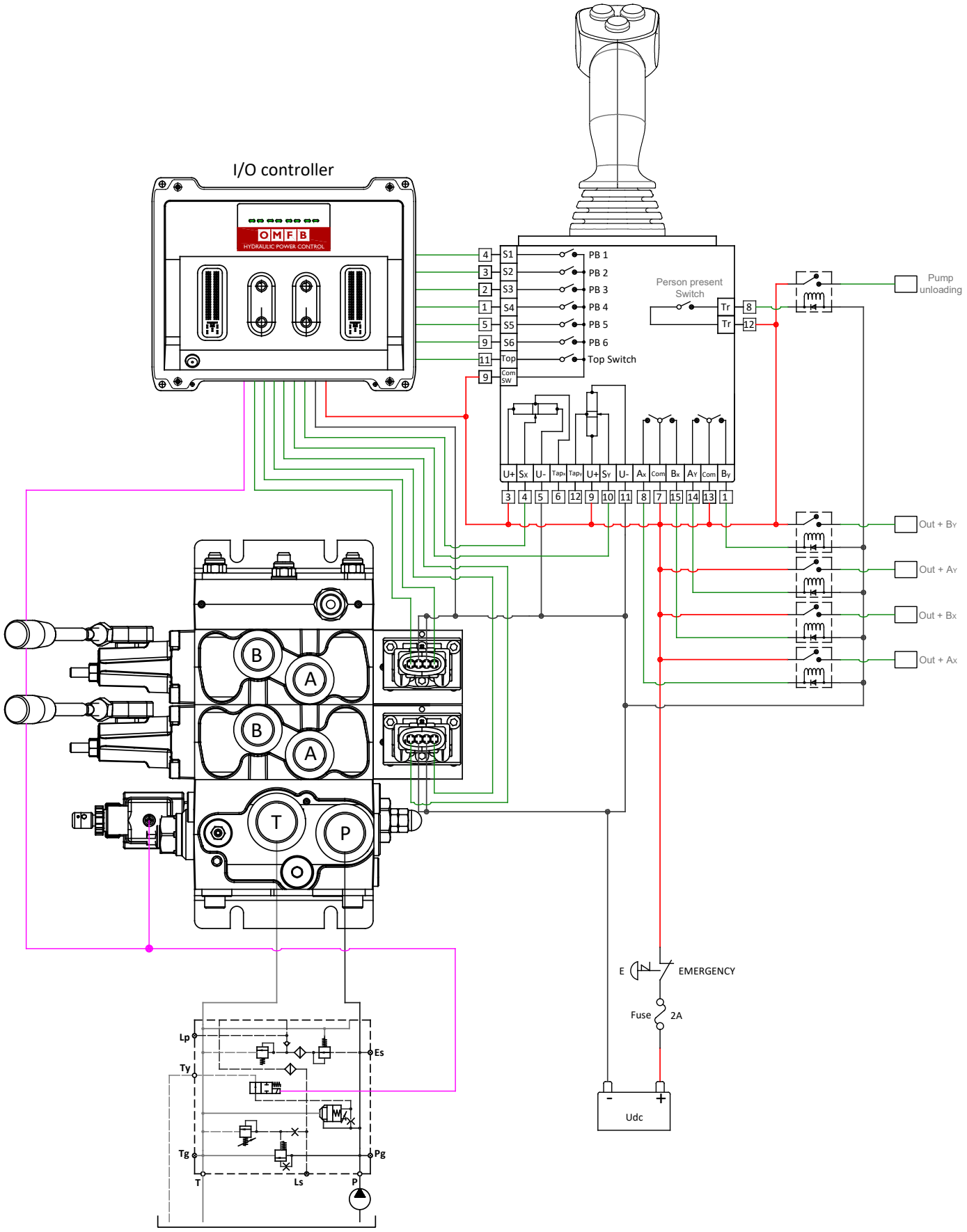
PDV74 - PEAP1 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV74 - PEAP1 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



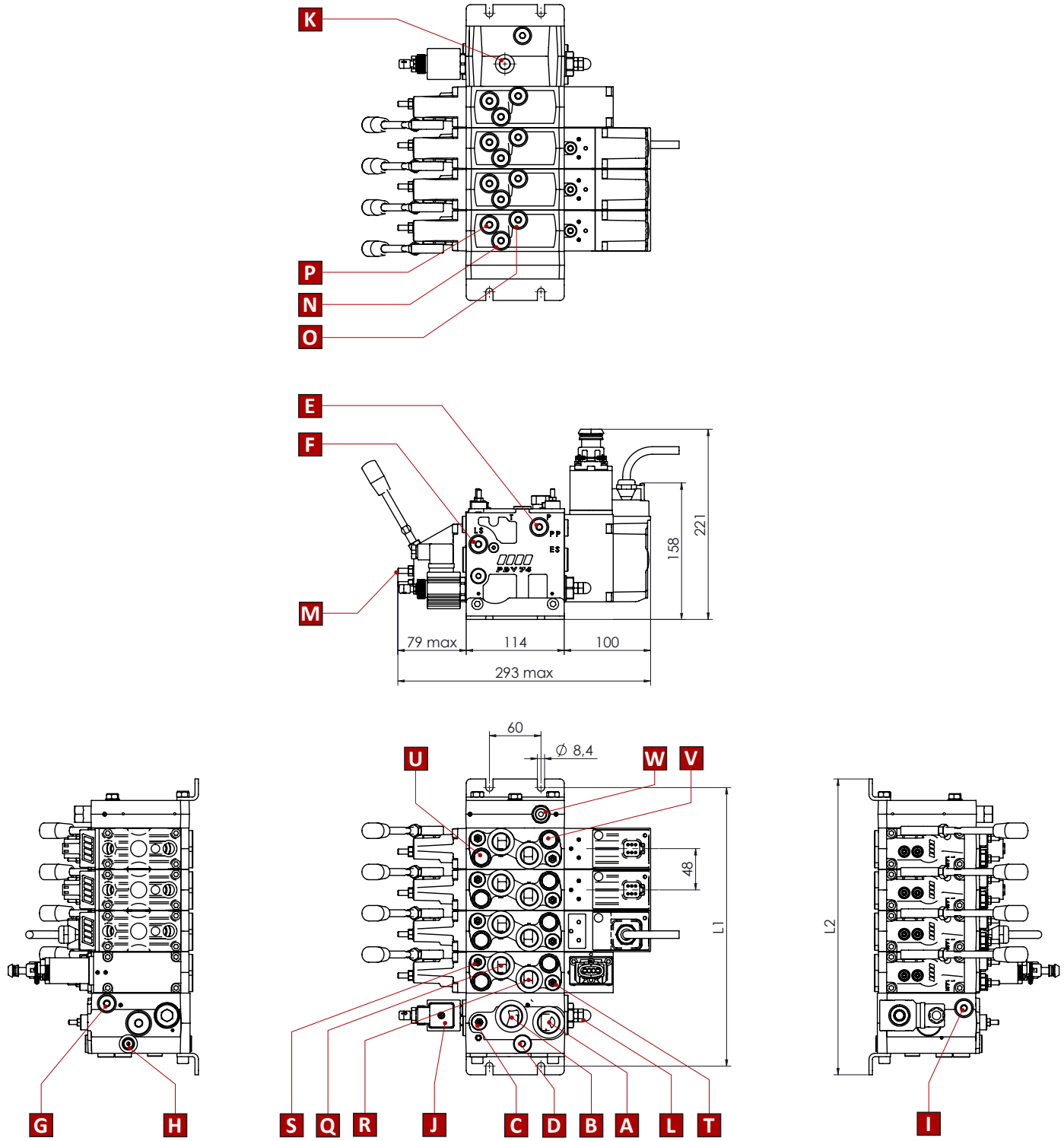
PDV74 - PEAP1 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



OMFB
HYDRAULIC POWER CONTROL

PDV74 Proportional valve

Overall dimensions drawing with standard inlet section
Right assembly version

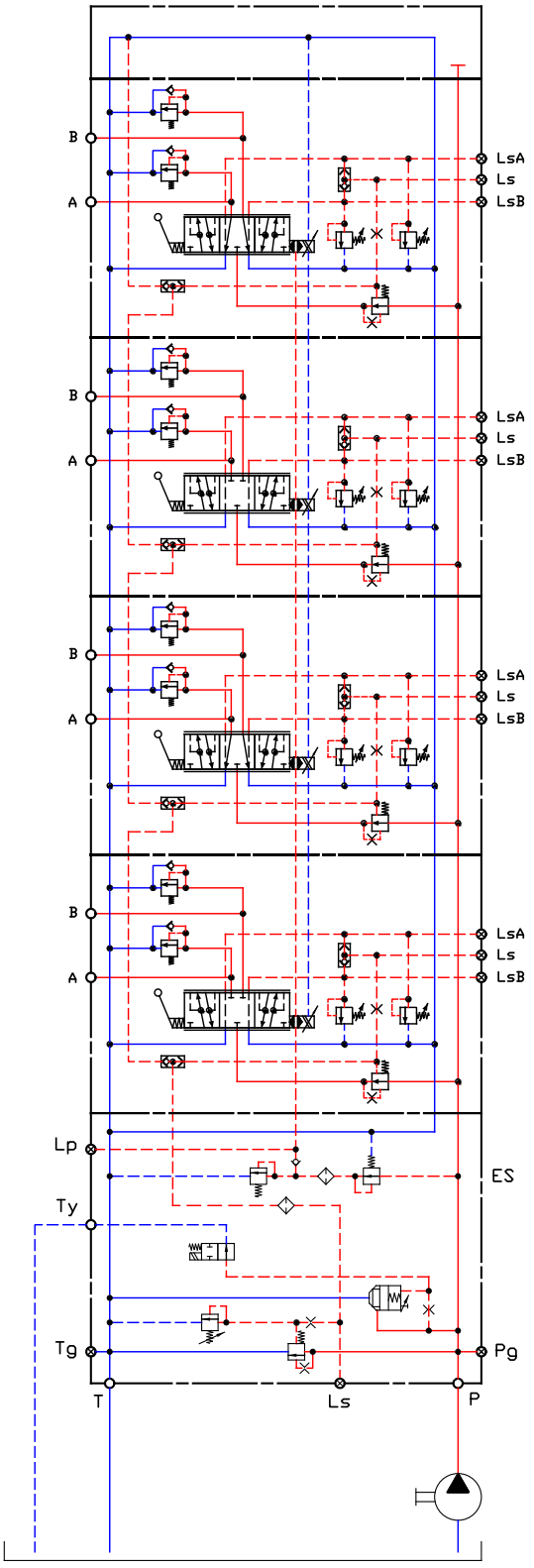


PDW		1	2	3	4	5	6	7	8	9	10	11	12
L1	mm	180	228	276	324	372	420	468	516	564	612	660	708
	in	7,09	8,98	10,87	12,76	14,65	16,54	18,43	20,31	22,20	24,09	25,98	27,87
L2	mm	200	248	296	344	392	440	488	536	584	632	680	728
	in	7,87	9,76	11,65	13,54	15,43	17,32	19,21	21,10	22,99	24,88	26,77	28,66

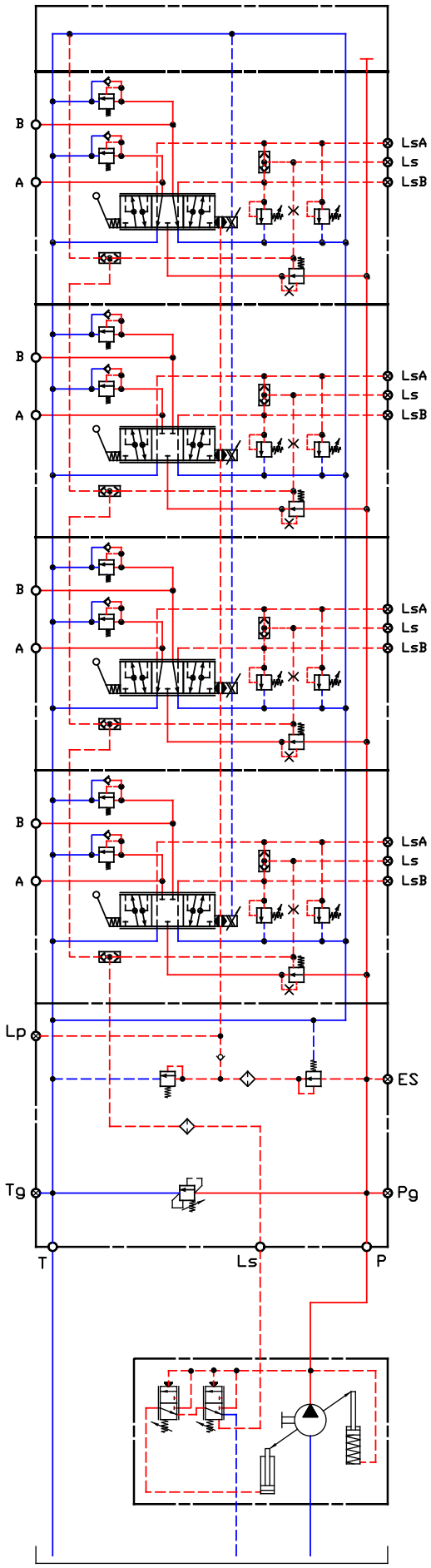
PDV74 Proportional valve
Overall dimensions drawing with standard inlet section
Right assembly version

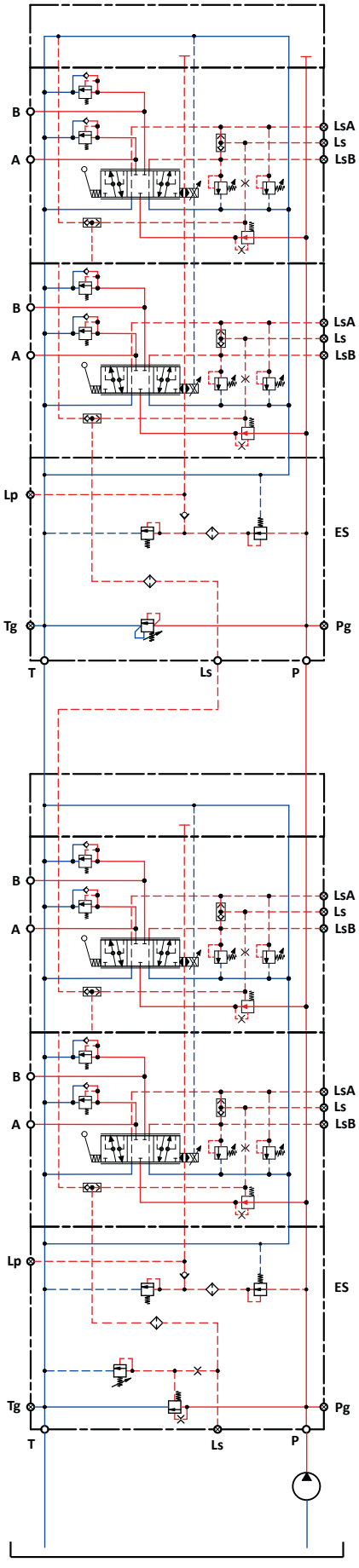
A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB
P = LS
} remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
Q = Port A
R = Port B
} 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A
} pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

PDV74 with open centre inlet section (fixed displacement pump), pump unloading system, pilot oil supply for electro-hydraulic spool actuations



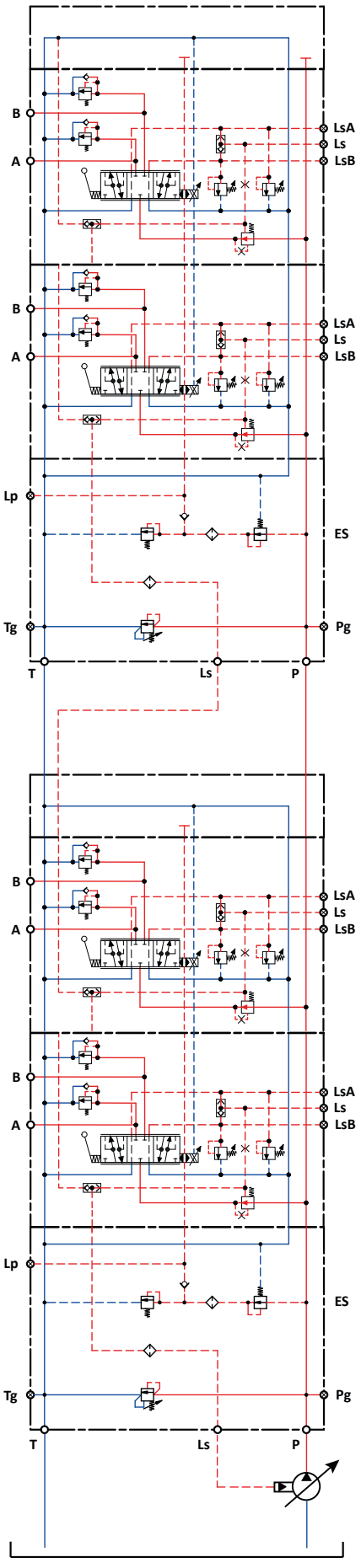
PDV74 with closed centre inlet section (variable displacement pump), pilot oil supply for electro-hydraulic spool actuations





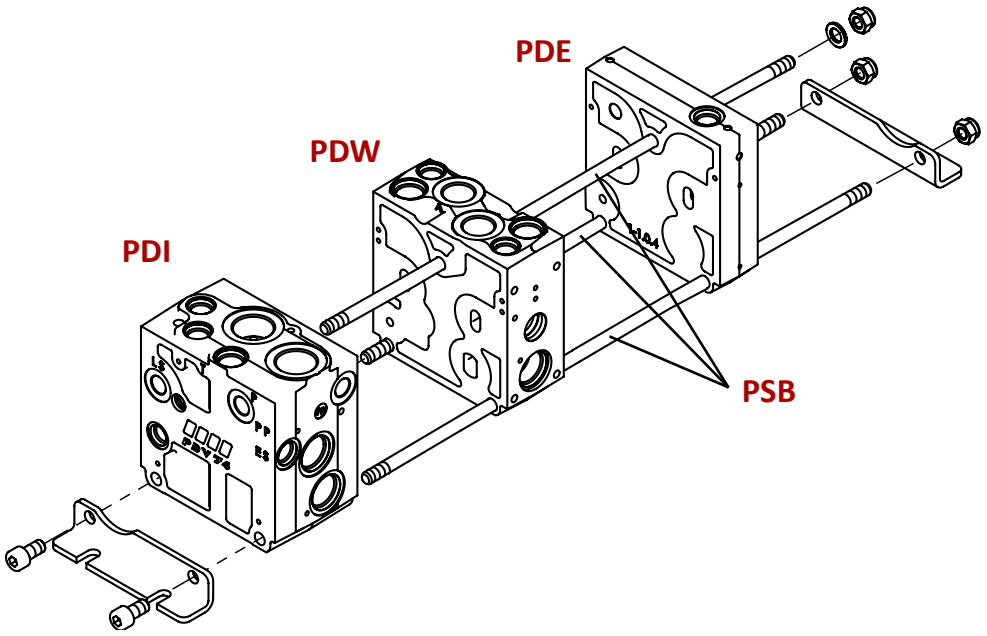
Closed center
Inlet section

Open center
Inlet section



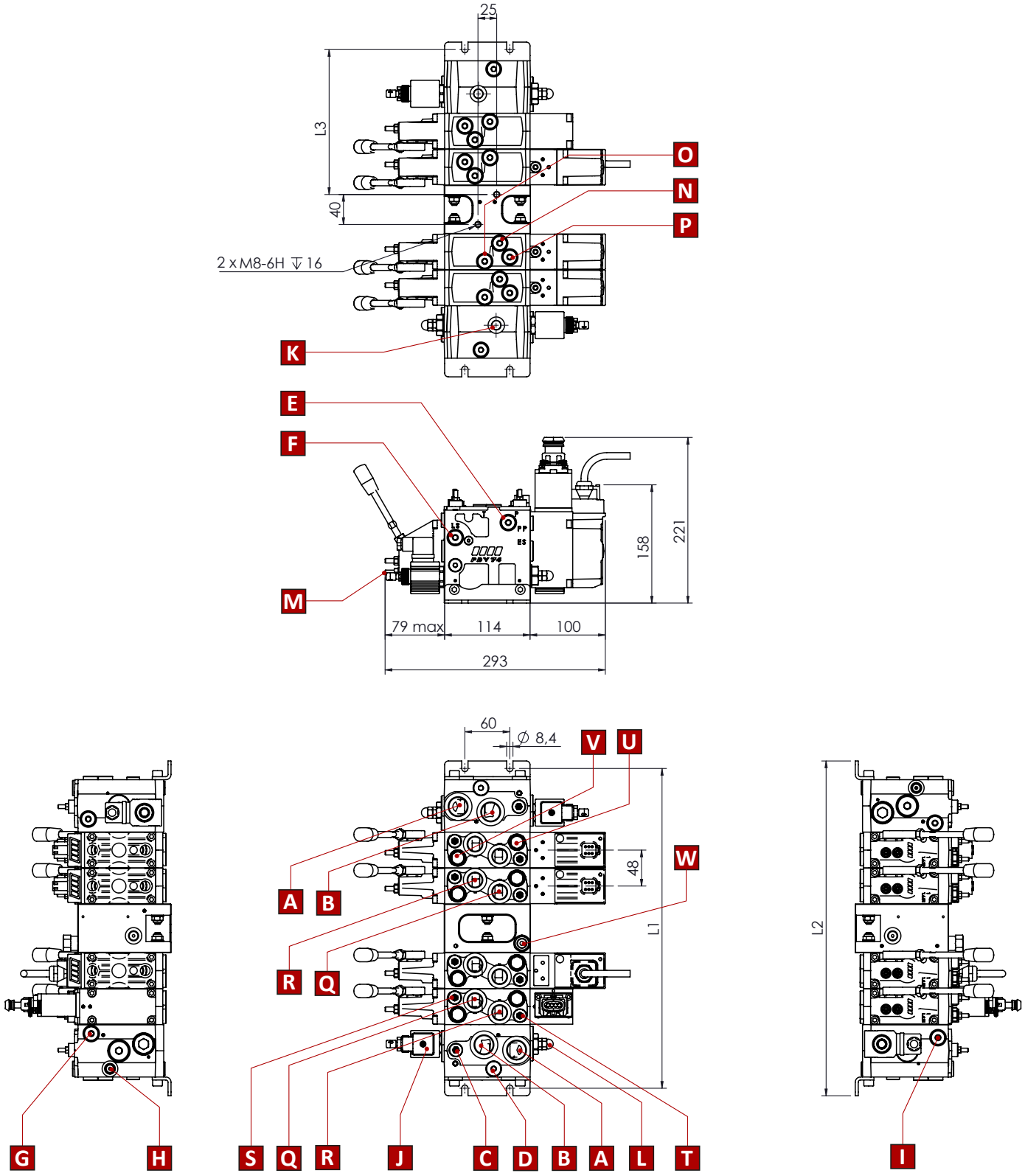
Closed center
Inlet section

Closed center
Inlet section



PDW	Code numbers	Tightening torque
1	**PSB70011000**	**25 ± 2 Nm** **220 ±18 lb*in**
2	**PSB70021000**	
3	**PSB70031000**	
4	**PSB70041000**	
5	**PSB70051000**	
6	**PSB70061000**	
7	**PSB70071000**	
8	**PSB70081000**	
9	**PSB70091000**	
10	**PSB70101000**	

PDV74 Proportional valve
Overall dimensions drawing with double inlet section and MID end

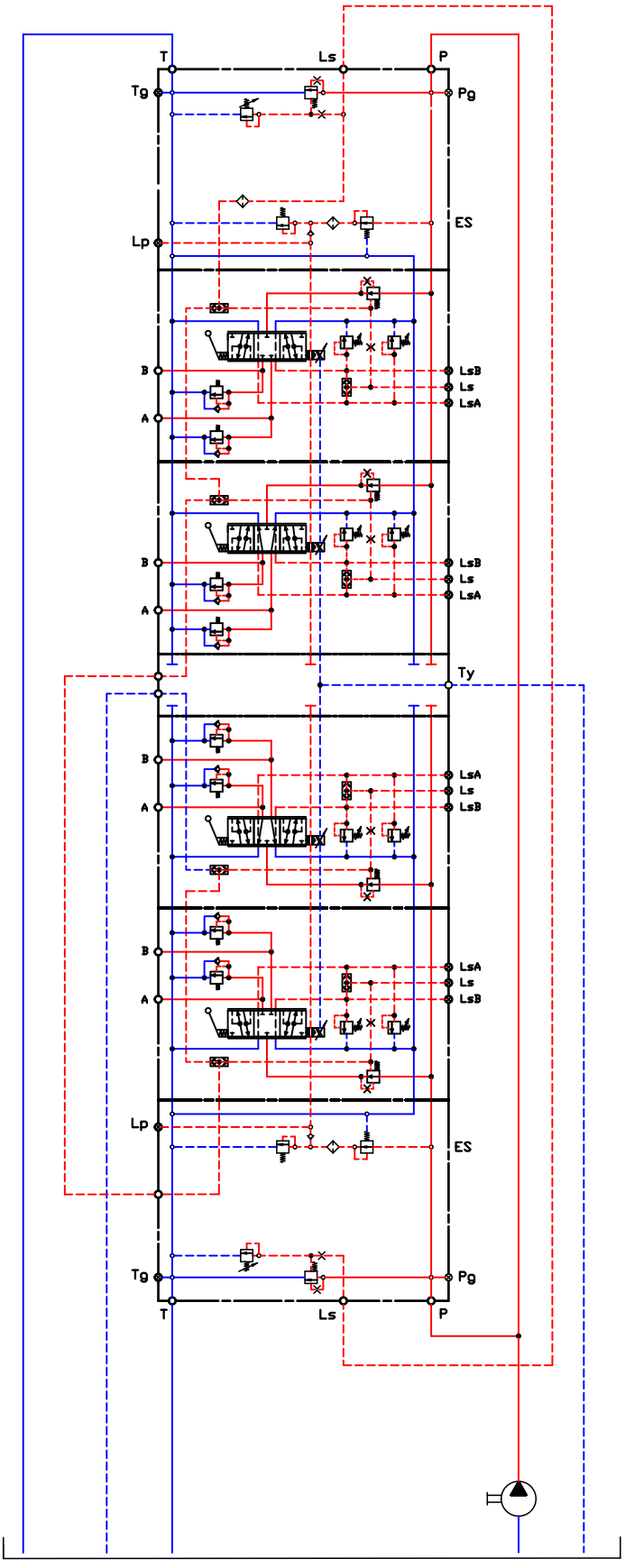


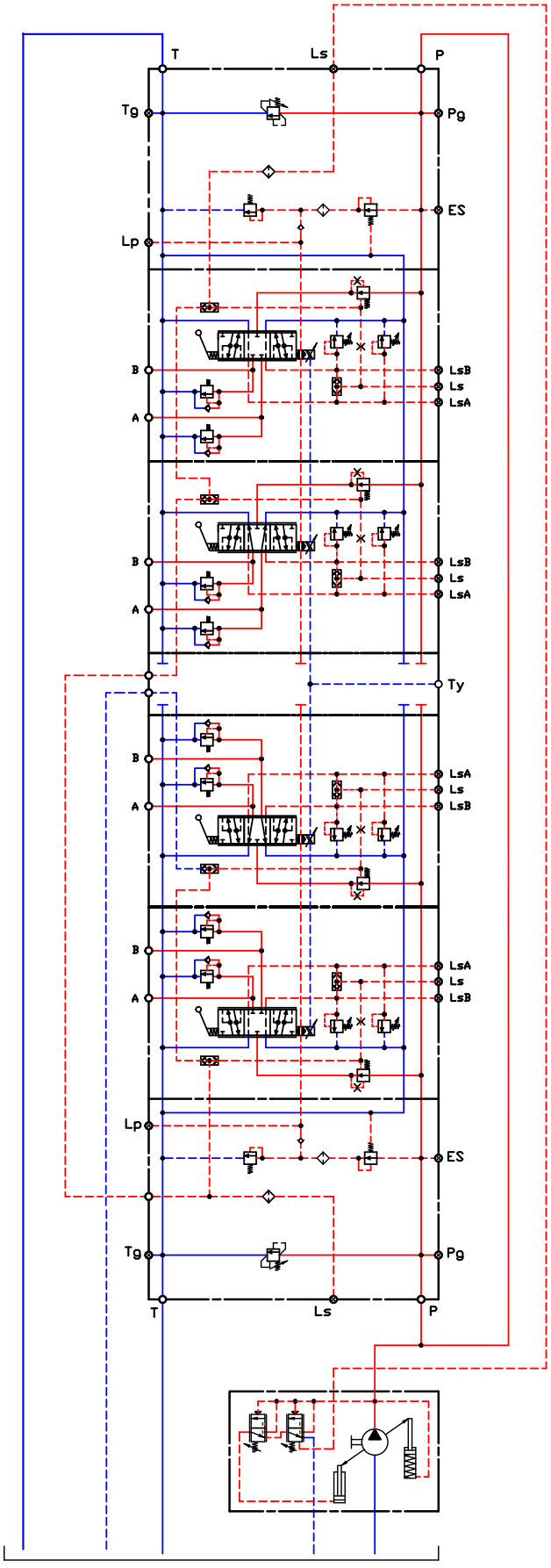
PDW		2	3	4	5	6	7	8	9	10	11	12
L1	mm	331	379	427	475	523	571	619	667	715	763	811
	in	13,03	14,92	16,81	18,70	20,59	22,48	24,37	26,26	28,15	30,04	31,93
L2	mm	351	399	447	495	543	591	639	687	735	783	831
	in	13,82	15,71	17,60	19,49	21,38	23,27	25,16	27,05	28,94	30,83	32,72

PDV74 Proportional valve
Overall dimensions drawing with double inlet section and MID end

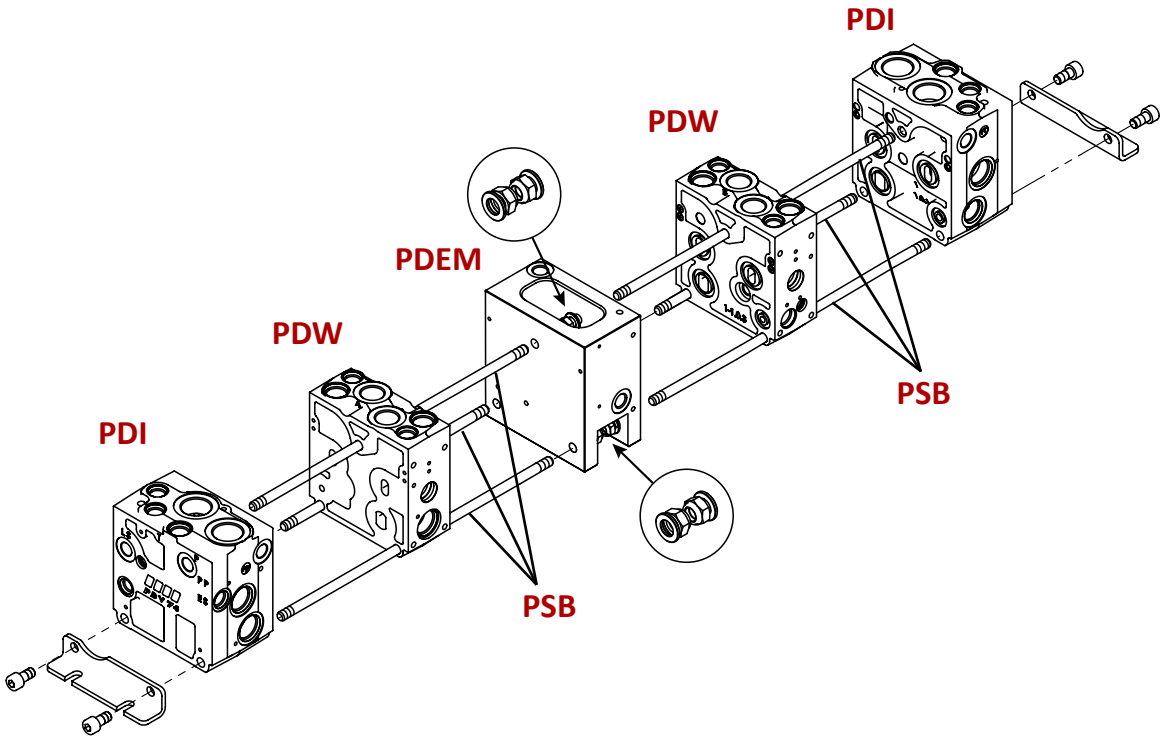
A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB
P = LS
} remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
Q = Port A
R = Port B
} 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A
} pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

PDV74 with double open centre inlet section (fixed displacement pump), pilot oil supply for electro-hydraulic spool actuations



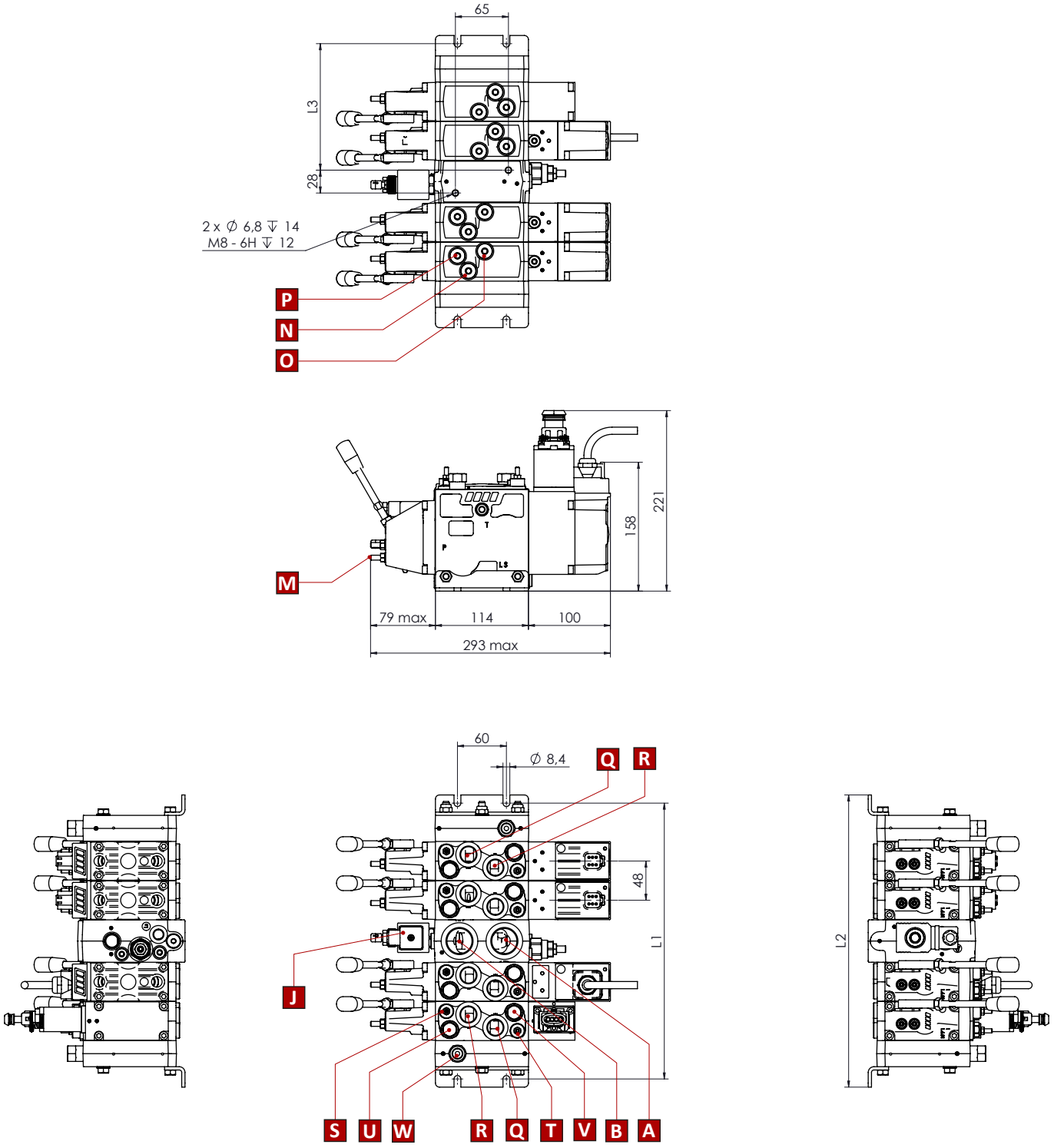

T
Ls
P
Tg
Pg
ES
Lp
B
A
LsB
Ls
LsA
Ty
Tg
Pg
T
Ls
P

PDV74 Proportional Valve
PSB Stay bolt kit - Double inlet sections and MID end section configuration



PDW	Code numbers	Tightening torque
1	**PSB72011000**	**25 ± 2 Nm** **220 ±18 lb*in**
2	**PSB72021000**	
3	**PSB72031000**	
4	**PSB72041000**	
5	**PSB72051000**	
6	**PSB72061000**	

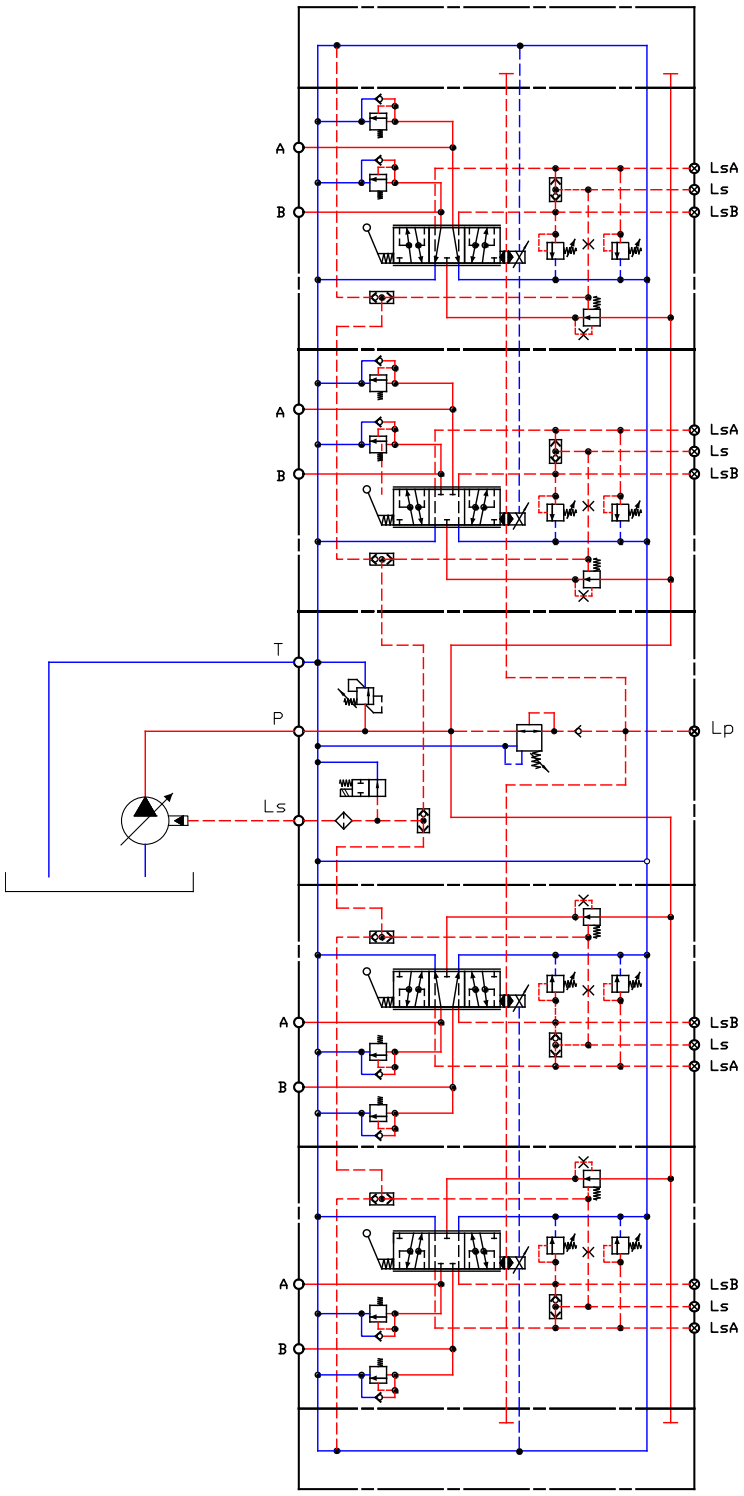
PDV74 Proportional valve
Overall dimensions drawing with closed centre MID inlet section

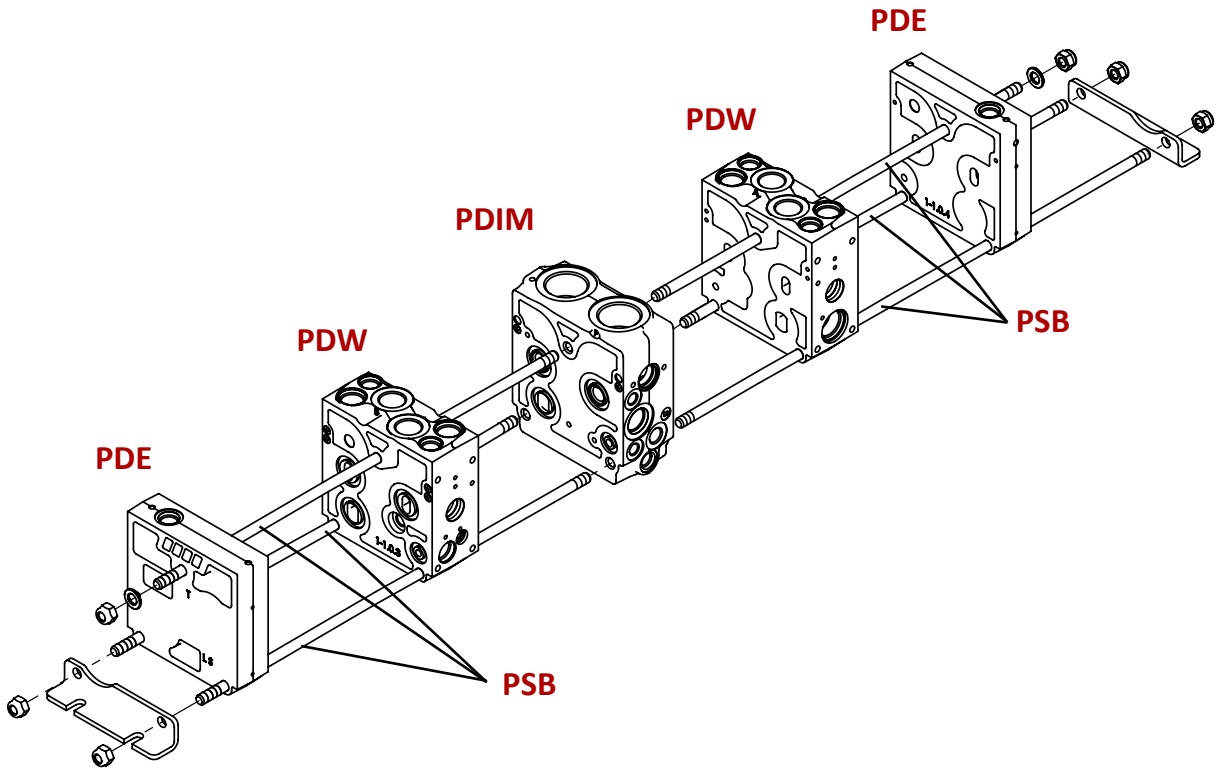


Overall dimensions drawing with closed centre MID inlet section

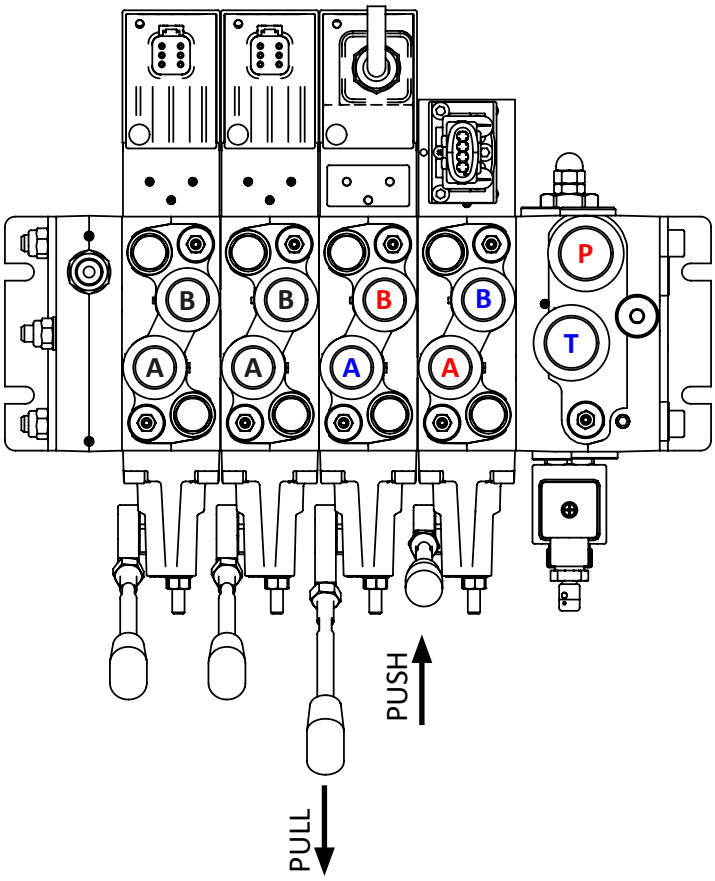
A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB
P = LS
} remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
Q = Port A
R = Port B
} 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A
} pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

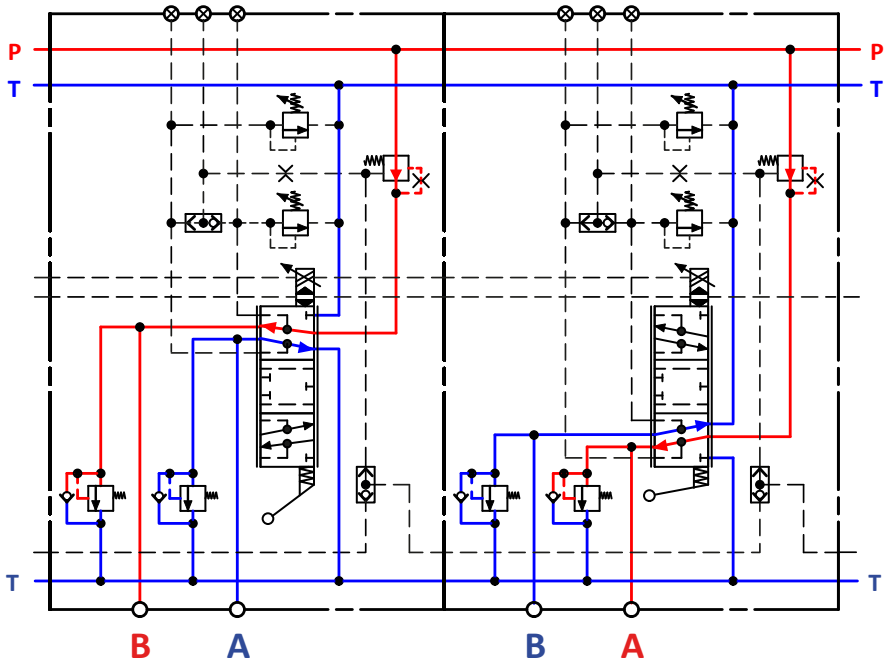
PDV74 with MID-inlet closed centre section (variable displacement pump), pilot oil supply for electro-hydraulic spool actuations



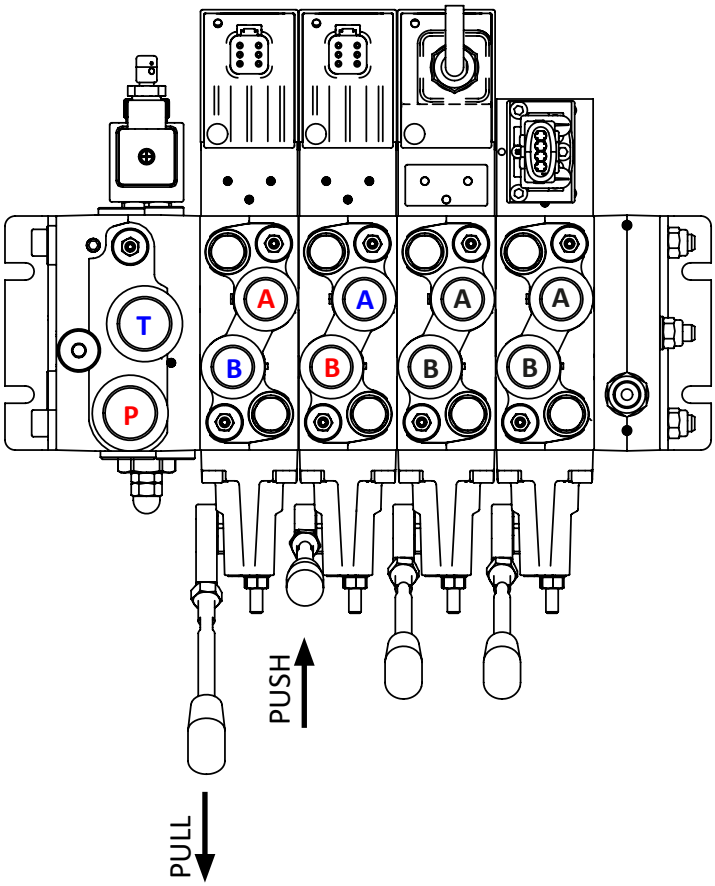


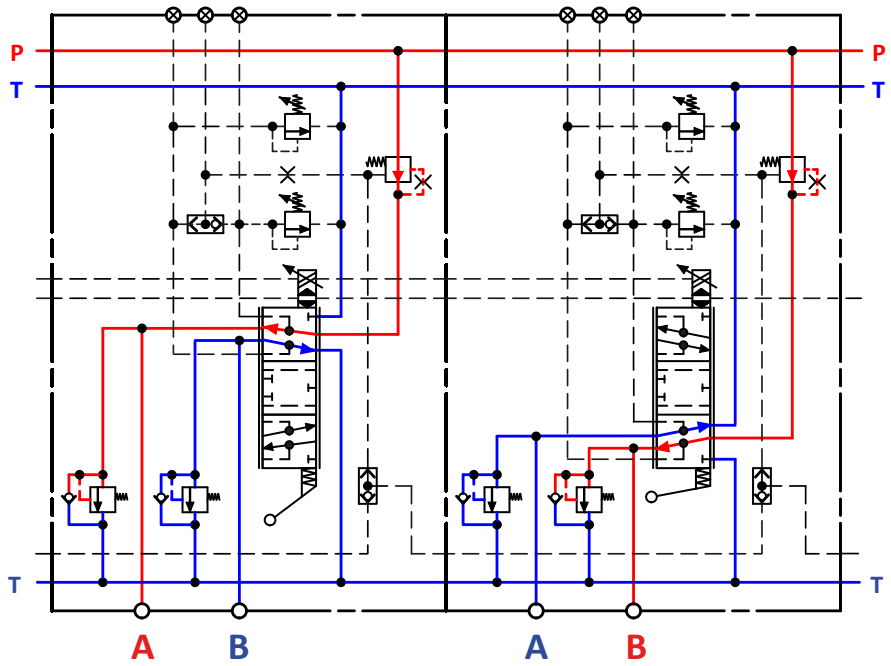
PDW	Code numbers	Tightening torque
1	**PSB71011000**	**25 ± 2 Nm** **220 ±18 lb*in**
2	**PSB71021000**	
3	**PSB71031000**	
4	**PSB71041000**	
5	**PSB71051000**	
6	**PSB71061000**	


P
T
B
B
B
B
A
A
A
A
PUSH
PULL


P
T
T
P
T
B
A
B
A

PDV74 Proportional valve
Left side version

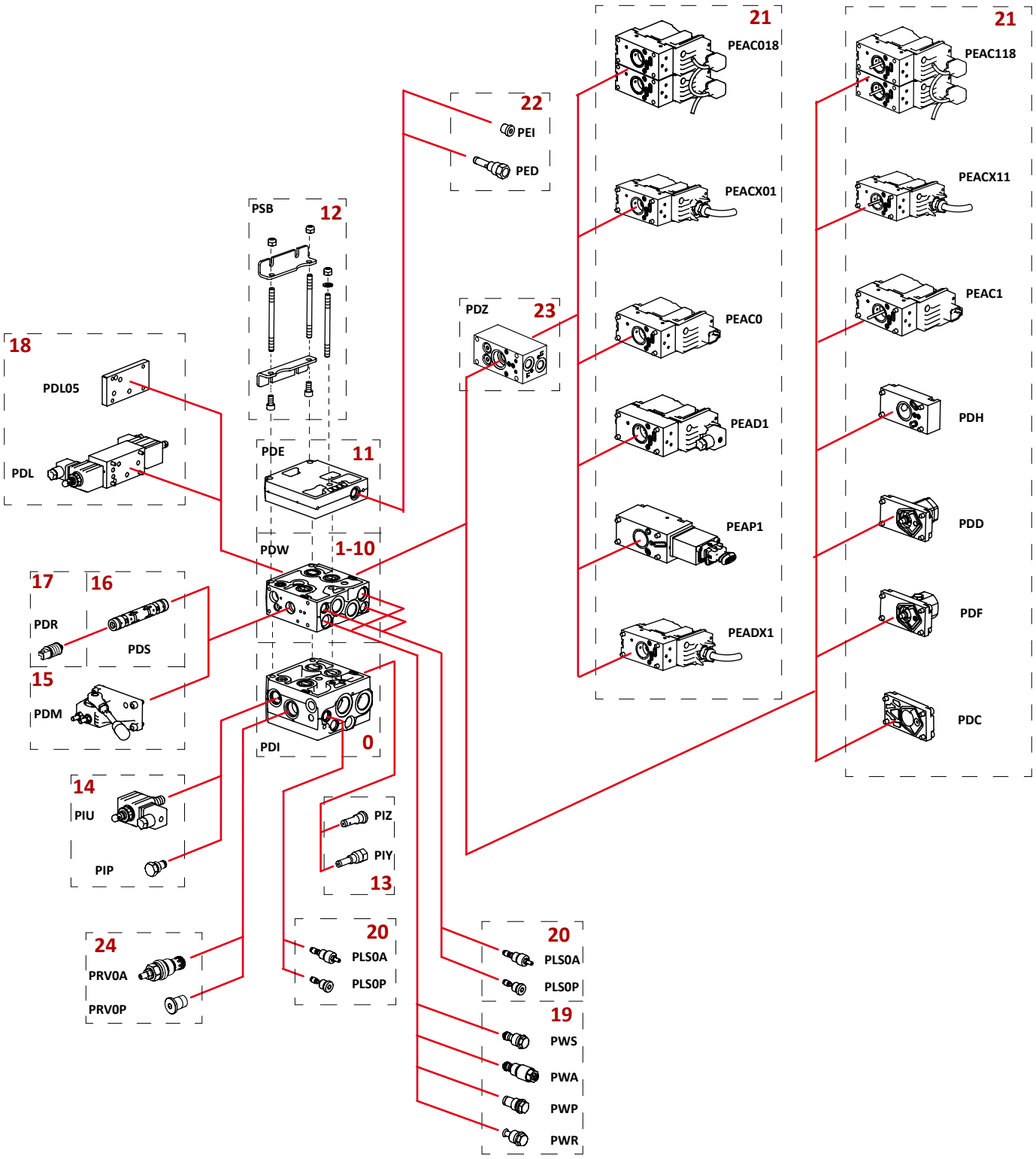




OMFB
HYDRAULIC POWER CONTROL

PDV74 Proportional valve
Configuration with standard inlet section - Right side assembly
Product selection chart

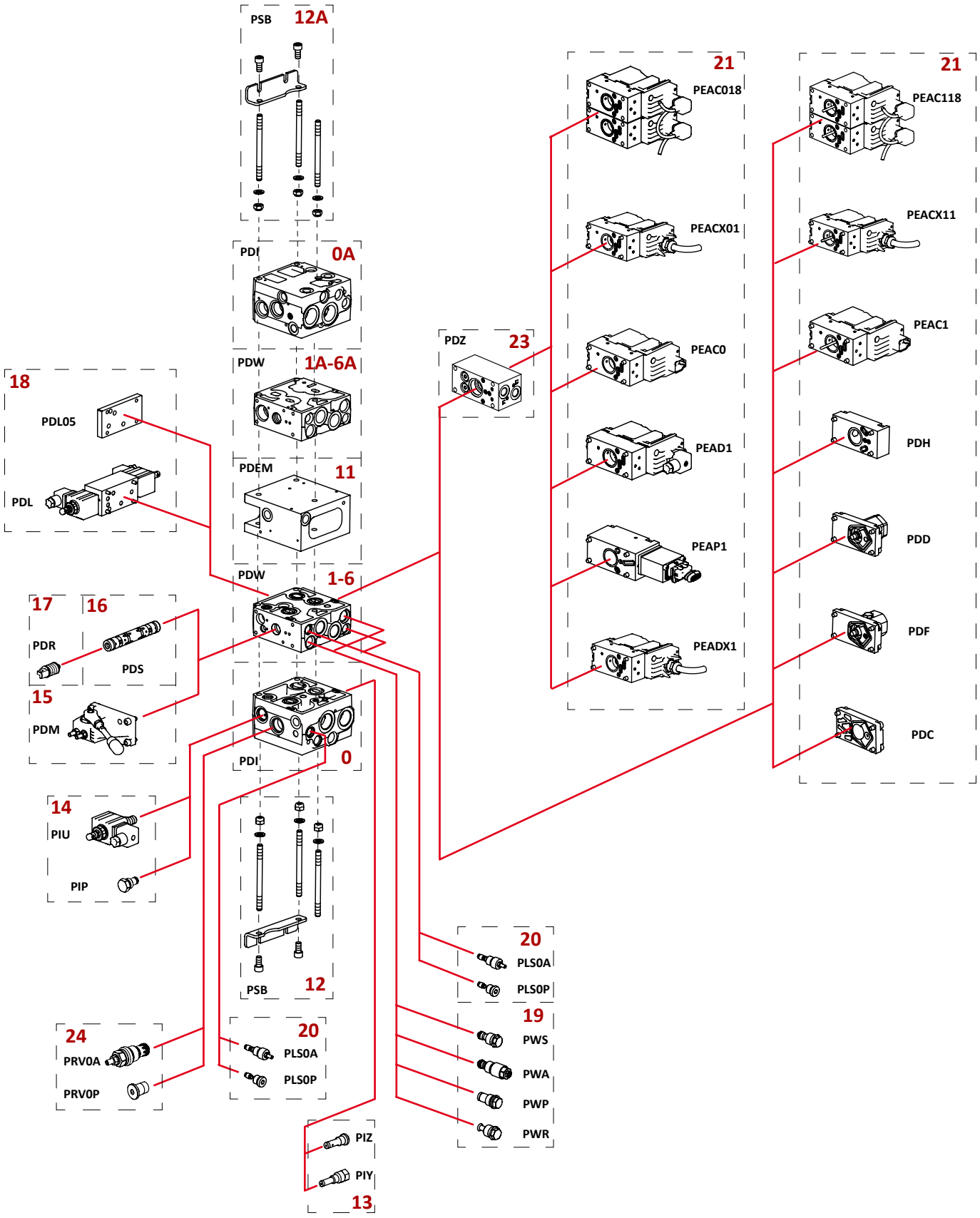
This specification sheet, gives an overview of any modules with which the PDV74 is being assembled. Each module has its own field. The purpose of this chart is to provide a quick access to the module's choice, whose characteristics must always be checked on the catalog related data.



PDV74 Proportional valve,
Product selection chart, with standard inlet section

Reference field	Description			Code numbers see pag
0	Inlet sections	Open centre	PDI	18 - 19
		Closed centre		21 - 22
1-10	Working sections	with pressure compensator	PDW	25 - 26
		without pressure compensator		27 - 28
11	End sections		PDE	29 - 30
12	Stay bolt set		PSB	118
13	Pilot oil supply cartridge	Internal	PIZ	45
		External	PIY	45
14	Solenoid Ls unloading		PIU	23 - 24
	Plug for LS unloading cavity		PIP	23
15	Mechanical actuation		PDM	42
16	Spool		PDS	From 33 to 41
17	Spool centered set		PDR	From 35 to 41
18	Unloading module		PDL	From 49 to 53
	Cover plate		PDL05	
19	Shock and suction valve	not adjustable	PWS	46 - 47
		adjustable	PWA	46 - 47
	Plug for shock and suction valve cavity		PWP	48
	Suction valve		PWR	48
20	Pilot pressure $LS_{A/B}$ relief valve		PLS0A	43
	Set plug $LS_{A/B}$ cavity		PLS0P	43
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	PEAD1	From 99 to 104
		Open loop spool control high resolution	PEAC0	From 78 to 98
		Closed loop spool control high performance resolution	PEAC1	From 54 to 77
		Open loop spool control high resolution CAN-Bus	PEAC018	
		Closed loop spool control high performance resolution CAN-Bus	PEAC118	
		Open loop spool control high resolution ATEX	PEACX01	
		Closed loop spool control high performance resolution ATEX version	PEACX11	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	PEADX1	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	PEAP1	From 105 to 110
	Rear cover for	Hydraulic control	PDH	43
		Detent	PDD	44
		Friction detent	PDF	42
		Mechanical actuation	PDC	43
22	End sections	External drain line cartridge	PED	45
		Internal plug	PEI	45
23	Dual function control body		PDZ	31 - 32
24	Pump pressure relief valve (for closed centre only)		PRV0A	
	Plug for relief valve cavity (for closed centre only)		PRV0P	

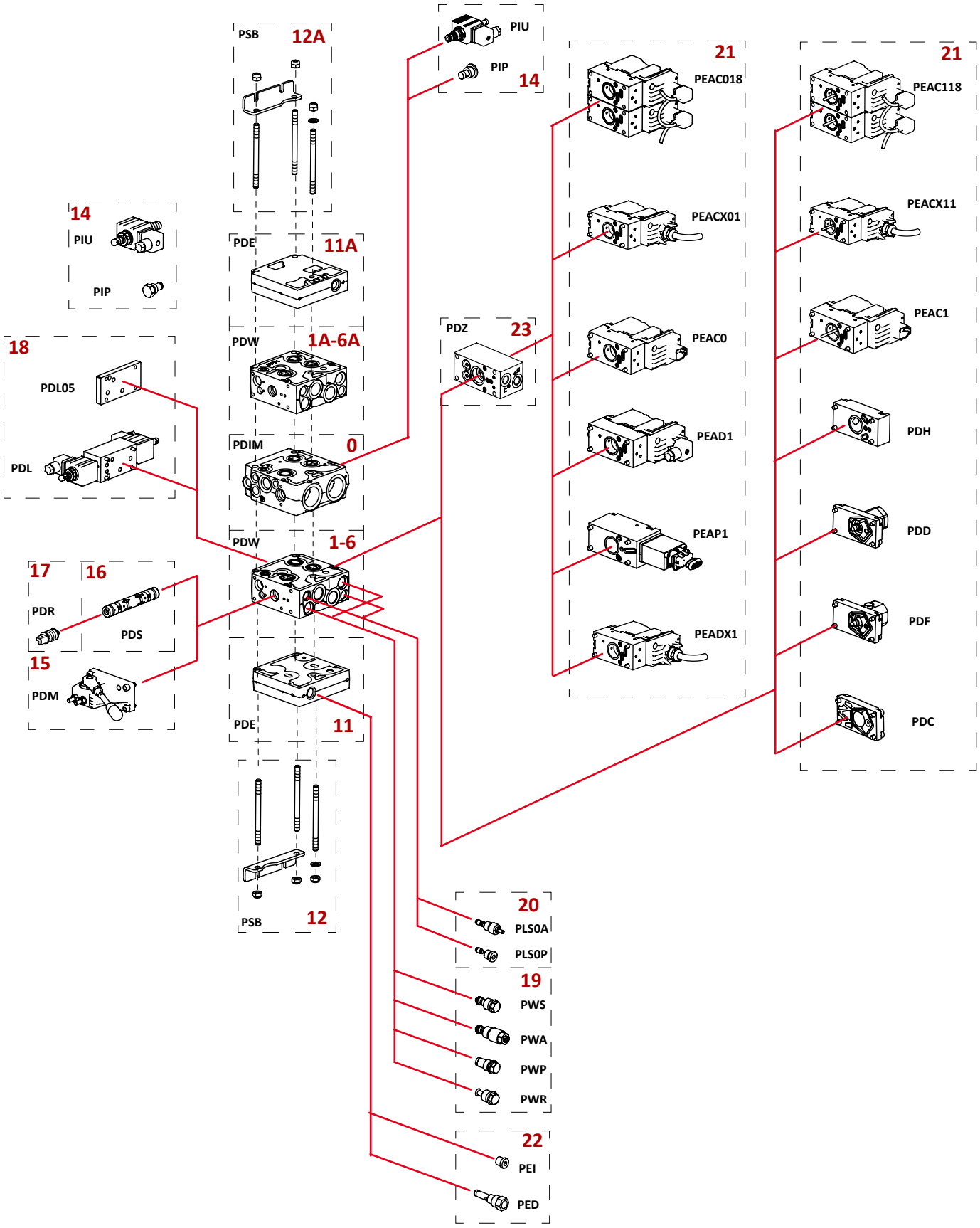
PDV74 Proportional valve, product selection chart
Configuration with double inlet sections and MID end section



PDV74 Proportional valve,
Product selection chart, with double inlet sections and MID end section

Reference field	Description			Code numbers see pag
0 0A	Inlet sections	Open centre	PDI	18 - 19
		Closed centre		21 - 22
1-6 1A-6A	Working sections	with pressure compensator	PDW	25 - 26
		without pressure compensator		27 - 28
11	End sections		PDEM	30
12 12A	Stay bolt set		PSB	124
13	Pilot oil supply cartridge	Internal	PIZ	45
		External	PIY	45
14	Solenoid Ls unloading		PIU	23 - 24
	Plug for LS unloading cavity		PIP	23
15	Mechanical actuation		PDM	42
16	Spool		PDS	From 33 to 41
17	Spool centered set		PDR	From 35 to 41
18	Unloading module		PDL	From 49 to 53
	Cover plate		PDL05	
19	Shock and suction valve	not adjustable	PWS	46 - 47
		adjustable	PWA	46 - 47
	Plug for shock and suction valve cavity		PWP	48
	Suction valve		PWR	48
20	Pilot pressure $LS_{A/B}$ relief valve		PLS0A	43
	Set plug $LS_{A/B}$ cavity		PLS0P	43
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	PEAD1	From 99 to 104
		Open loop spool control high resolution	PEAC0	From 78 to 98
		Closed loop spool control high performance resolution	PEAC1	From 54 to 77
		Open loop spool control high resolution CAN-Bus	PEAC018	
		Closed loop spool control high performance resolution CAN-Bus	PEAC118	
		Open loop spool control high resolution ATEX	PEACX01	
		Closed loop spool control high performance resolution ATEX version	PEACX11	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	PEADX1	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	PEAP1	From 105 to 110
	Rear cover for	Hydraulic control	PDH	43
		Detent	PDD	44
		Friction detent	PDF	42
		Mechanical actuation	PDC	43
22	End sections	External drain line cartridge	PED	45
		Internal plug	PEI	45
23	Dual function control body		PDZ	31 - 32
24	Pump Pressure relief valve (for closed centre only)		PRV0A	
	Plug for relief valve cavity (for closed centre only)		PRV0P	

PDV74 Proportional valve, product selection chart
Configuration with MID inlet section



Reference field	Description			Code numbers see pag
0	Inlet sections	Closed centre	PDIM	22
1-6 1A-6A	Working sections	with pressure compensator	PDW	25 - 26
		without pressure compensator		27 - 28
11 11A	End sections		PDE	29 - 30
12 12A	Stay bolt set		PSB	129
14	Solenoid Ls unloading		PIU	23 - 24
	Plug for LS unloading cavity		PIP	23
15	Mechanical actuation		PDM	42
16	Spool		PDS	From 33 to 41
17	Spool centered set		PDR	From 35 to 41
18	Unloading module		PDL	From 49 to 53
	Cover plate		PDL05	
19	Shock and suction valve	not adjustable	PWS	46 - 47
		adjustable	PWA	46 - 47
	Plug for shock and suction valve cavity		PWP	48
	Suction valve		PWR	48
20	Pilot pressure $LS_{A/B}$ relief valve		PLS0A	43
	Set plug $LS_{A/B}$ cavity		PLS0P	43
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	PEAD1	From 99 to 104
		Open loop spool control high resolution	PEAC0	From 78 to 98
		Closed loop spool control high performance resolution	PEAC1	From 54 to 77
		Open loop spool control high resolution CAN-Bus	PEAC018	
		Closed loop spool control high performance resolution CAN-Bus	PEAC118	
		Open loop spool control high resolution ATEX	PEACX01	
		Closed loop spool control high performance resolution ATEX version	PEACX11	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	PEADX1	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	PEAP1	From 105 to 110
	Rear cover for	Hydraulic control	PDH	43
		Detent	PDD	44
		Friction detent	PDF	42
		Mechanical actuation	PDC	43
22	End sections	External drain line cartridge	PED	45
		Internal plug	PEI	45
23	Dual function control body		PDZ	31 - 32
24	Pump Pressure relief valve		PRV0A	
	Plug for relief valve cavity		PRV0P	

OMFB HYDRAULIC POWER CONTROL

PDV74 Proportional valve
Composition form for standard inlet section

OMFB HYDRAULIC POWER CONTROL			Code:	**PDV74**		Customer:		
			Date:	__/__/____		Customer ref:		
			Review index:	-		Issued by:		
			Review date:	-		OMFB sales ref:		

I	Valve type:	PDV 74	V	Working sections Up:	10	IX	Rated voltage [V]:	12
II	Type of threads:	BSPP	VI	Working sections Down:		X	Certifications:	None
III	Type of inlet:	standard	VII	Inlet section side:	Right version	XI		
IV	Pump type:	Open Center	VIII	2nd pump type:		XII	Pump flow [l/min]:	

	Notes												Notes
0		**B** Port	0	bar			13	**A** Port					
			20				14						
		Actuation side	24					**Handle side**					
1			21		1	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
2			21		2	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
3			21		3	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
4			21		4	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
5			21		5	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
6			21		6	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
7			21		7	bar		bar	16		15		
			17		20				20				
					19				19				
					18								
8			21		8	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
9			21		9	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
10			21		10	bar		bar	16		15		
			17		20				20				
			23		19				19				
					18								
11													
			11				12						
			22										

OMFB HYDRAULIC POWER CONTROL				Code:	**PDV74**		Customer:		
				Date:	/ /		Customer ref:		
				Review index:	-		Issued by:		
				Review date:	-		OMFB sales ref:		
1	Valve type:	PDV 74	5	Working sections Up:	6	9	Rated voltage [V]:	12	
2	Type of threads:	BSPP	6	Working sections Down:	6	10	Certifications:	None	
3	Type of inlet:	mid_end	7	Inlet section side:	Right version	11			
4	Pump type:	Open Center	8	2nd pump type:		12	Pump flow [l/min]:		

Notes:

B Port Actuators side	0A	bar			13 14	A Port Handle side

Notes:

1A		21		1A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
2A		21		2A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
3A		21		3A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
4A		21		4A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
5A		21		5A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
6A		21		6A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									

11		12
12A		

6		21		6	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
5		21		5	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
4		21		4	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
3		21		3	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
2		21		2	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
1		21		1	bar			bar	16		15		
		17		20					20				
				19					19				
				18									

A Port Actuators side	0	bar			13 14	B Port Handle side

PDV74 Proportional valve
Composition form with MID inlet section

			Code:	**PDV74**		Customer:		
			Date:	__/__/____		Customer ref:		
			Review index:	-		Issued by:		
			Review date:	-		OMFB sales ref:		
1	Valve type:	PDV 74	5	Working sections Up:	6	9	Rated voltage [V]:	12
2	Type of threads:	BSPP	6	Working sections Down:	6	10	Certifications:	None
3	Type of inlet:	mid_inlet	7	Inlet section side:	Right version	11		
4	Pump type:	Open Center	8	2nd pump type:		12	Pump flow [l/min]:	

Notes:

	A Port					B Port	
11A					12A		
22							
	Actuators side					**Handle side**	

Notes:

6A		21		6A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
5A		21		5A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
4A		21		4A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
3A		21		3A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
2A		21		2A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
1A		21		1A	bar			bar	16		15		
		17		20					20				
				19					19				
				18									

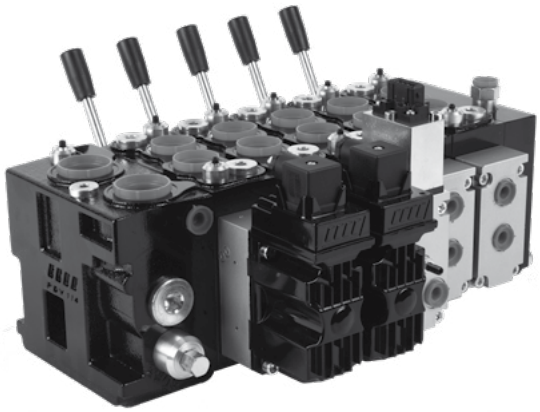
0	bar		14

1		21		1	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
2		21		2	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
3		21		3	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
4		21		4	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
5		21		5	bar			bar	16		15		
		17		20					20				
				19					19				
				18									
6		21		6	bar			bar	16		15		
		17		20					20				
				19					19				
				18									

11					12			
22								
Actuators side						**Handle side**		

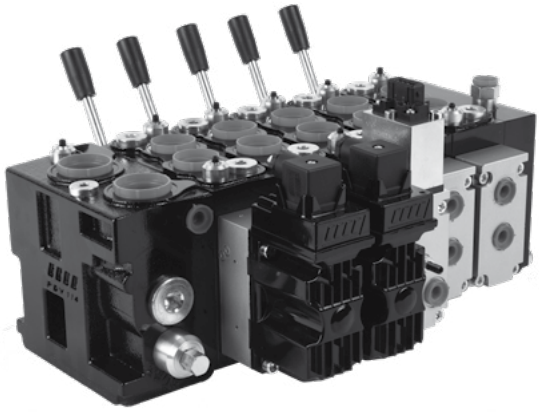
B Port			**A Port**

PDV114 Proportional Directional valve



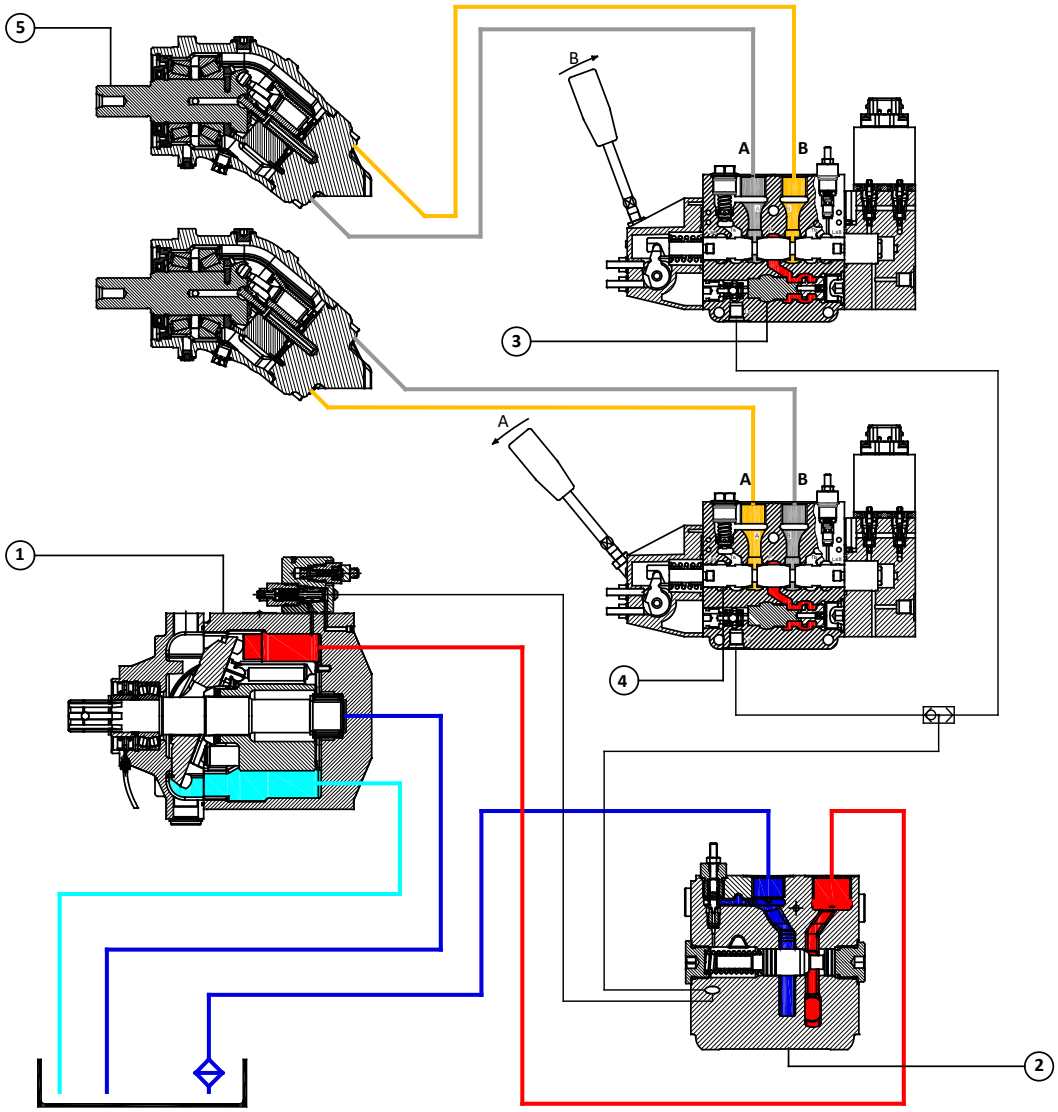
PDV114 Proportional valve
General description

PDV114 is a hydraulic proportional directional valve, designed to offers a wide range controls options and flexibility.
The **PDV114** modular system enables bankable groups to perform many individual tasks, to meeting and exceeding the changing control needs of the off-highway machines of today, and well into the future to maximize the efficiency, controllability and reliability of vehicles.



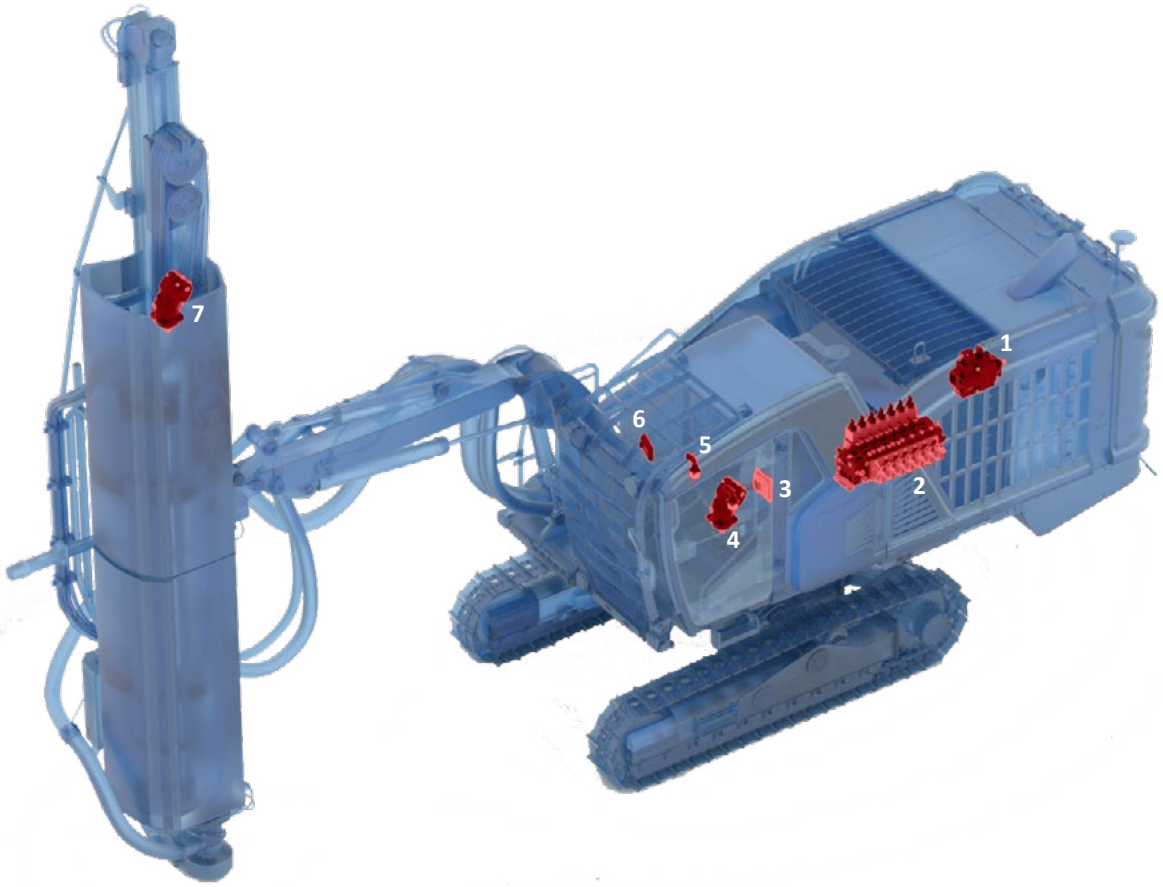
PDV114 main features:

- Load sensing up-stream pressure compensation
- High flow/low pressure drop capability in a compact size
- Integrated pump unloading system
- Integrated cut-off pump system
- Open/closed centre shifting system
- Precise metering capabilities
- LSA-LSB electrical unloading
- LSA-LSB electrical working pressure remote control
- Constant flow regardless of pressure
- Working sections symmetrical flow
- Optional priority inlet for steering or different priority functions
- Optional dual hydraulic pilot and electrohydraulic control
- ATEX and IECEx configuration
- CAN-Bus comunication
- EMC immunity ensures high safety with regard to electro-magnetic compatibility



High pressure port of **PPV** piston pump ① supply the closed centre inlet section of **PDV114** proportional valve ② which in turn feeds the down-stream working sections.
The **PDS** spool neutral position ④ unload the LS pump signal to tank, so that the swashplate angle is towards the minimum displacement and pressure in stand-by setting.
The spool position determines the flow demands (speed rotation) of the two **HPM** motors ⑤.
The PDS main spool compares the pressure drop before and after the spool notches (differential pressure Δp), and therefore, the pump flow remain constant.
If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

Actuators load determines the working pressure, and the built-in pressure compensator ③ enable simultaneously function regardless of different working pressure.



1. PPV110 load sensing piston pump

2. PDV114/7 closed centre inlet

3. I/O controller PHSI7101008

4. PPM80 bent axis piston motor

5. Electronic double axis joystick PEJD

6. Graphic display PDHI703000

7. PPM20 bent axis piston motor

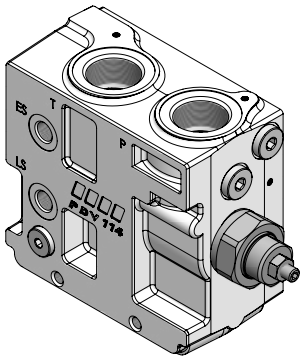
The hydraulic features listed in this chart, are typical measured data obtained by using mineral based hydraulic oil according to DIN 51524 with a viscosity of 21 mm²/sec [102 SUS] and a temperature of 50 °C [122 °F]

Oil flow rate	PDI inlet section, P port		**260 l/min (max)**	**69 US gal/min**
	PDIM - Mid inlet section, P port		**380 l/min**	**100 US gal/min**
	A, **B** port with pressure compensator		**190 l/min**	**50 US gal/min**
	A, **B** port without pressure compensator		**205 l/min**	**54 US gal/min**
Max. pressure	**P** port	Pressure relief valve setting	**400 bar**	**5800 psi**
		Working pressure	**370 bar**	**5370 psi**
	A, **B** port		**370 bar**	**5370 psi**
	Ty port, directly to tank			
	T port	Static	**25 bar**	**363 psi**
		Dynamic	**37 bar**	**537 psi**
Max. pilot pressure oil supply			**18 ÷ 22 bar**	**260 ÷ 320 psi**
Oil temperature	Recommended		**30 ÷ 65 °C**	**86 °F ÷ 149 °F**
	Min		**-30 °C**	**-22 °F**
	Max		**90 °C**	**194 °F**
Ambient temperature			**-30 ÷ 60 °C**	**-22 ÷ 140 °F**
Oil viscosity	Operating range		**12 ÷ 75 mm²/sec**	**65 ÷ 347 SUS**
	Min		**4 mm²/sec**	**39 SUS**
	Max		**460 mm²/sec**	**2128 SUS**
Spool stroke	Standard		**8 mm**	**0,31 in**
	Flow control proportional range		**6,5 mm**	**0,26 in**
	Pressure control propotional range		**7 mm**	**0,28 in**
Daed band spool	Flow control		**1,5 mm**	**0,06 in**
	Pressure control		**1 mm**	**0,04 in**
Max internal leakage A/B port at 100 bar [1450 psi] and 21 mm²/sec		**A/B T** without shock valves	**21 cm³/min**	**1,28 in³/min**
		A/B T with shock valves	**25 cm³/min**	**1,53 in³/min**
Filtration	Max. contamination: class 9 according to NAS 1638 (20/18/15 according to ISO 4406)			

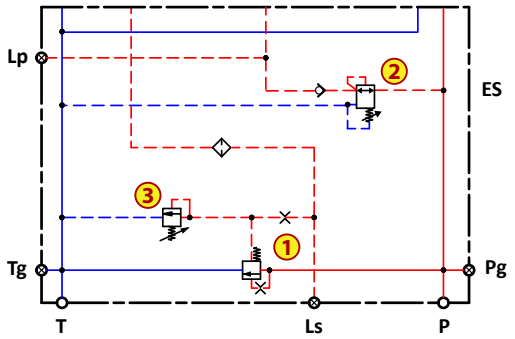
PDH module - hydraulic control		
Pilot pressure	Spool start movement	4 bar / 58 psi
	Spool end stroke	15 bar / 218 psi
Max. pilot pressure		30 bar / 436 psi

PDV74 internal filters, mesh 100 µm
Mineral oil hydraulic fluid: according to DIN 51524 and 51525 or ISO 6743/4 PDV74 can also be used with phosphate esters (HFDR), water-glycol (HFC) or water oil (HFB) mixes, subject to our Technical Dept. approval

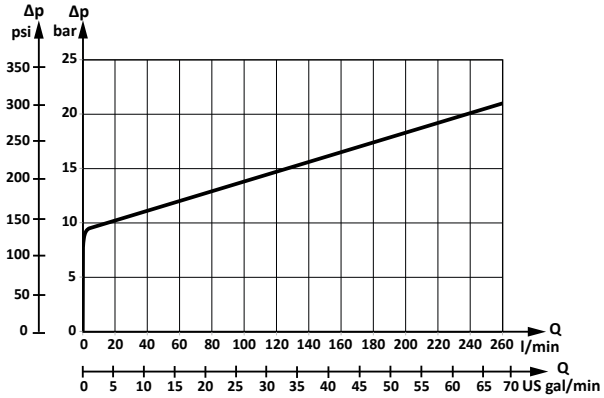
PDV114 Proportional Valve - Technical Information, Function.
PDI module - *Open centre inlet section for fixed displacement pumps*



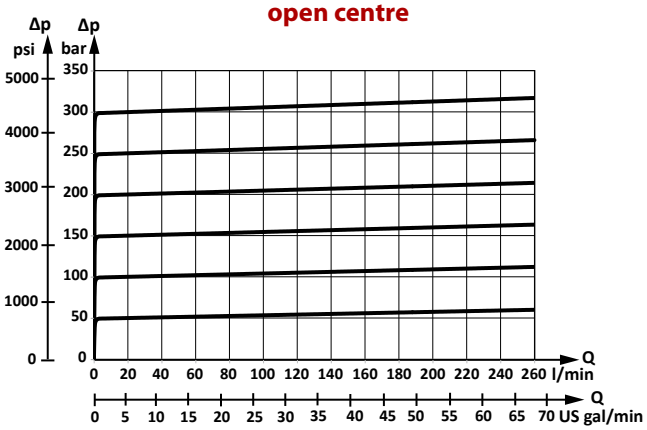
Hydraulic diagram



Neutral flow-pressure drop in PDI, open centre



Pressure relief valve characteristic in PDI, open centre

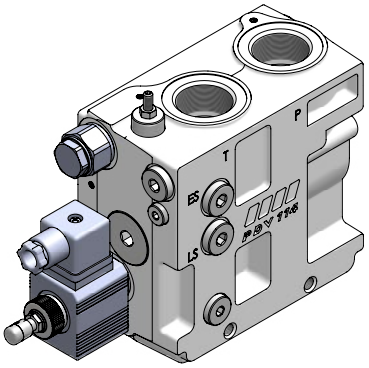


Designed for use with fixed displacement pumps.

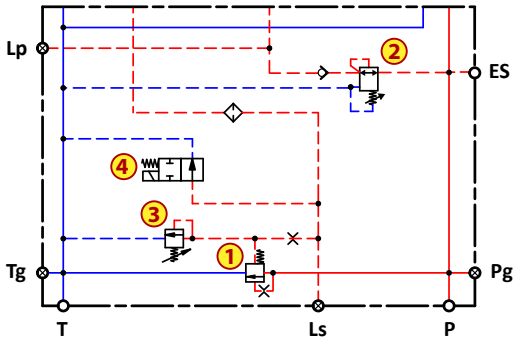
Inlet comes standard with pressure compensated 3-way flow regulator ①, that when pump is started and working sections spools are in neutral position, it's unloaded to tank, and the oil flow being supplied from the pump, passes through the 3-way flow regulator to tank with minimal off-load pressure drop (see diagram below).

When one or more of the spools are actuated, the highest working pressure signal is fed to the 3-way flow regulator, that maintains the Δp at a constant level, so that the flow rate is independent of the load, and proportional to the opened spool area.
The built in pressure reducing valve ②, act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.
When the main PDS spools are actuated, the exceeding pump flow is being sent to tank at the highest load pressure value.
If the working pressure reaches the setting of the upstream max pressure pilot relief valve ③, the 3-way flow regulator will be opened to tank, thus limiting the working pressure inside the complete PDV.

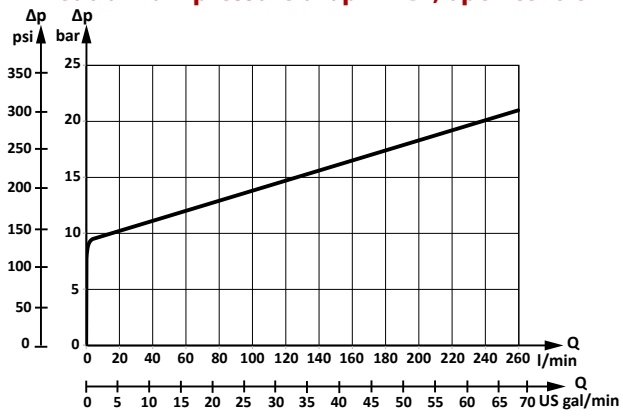
On this configuration, the level of safety degrees for the complete PDV valve is really low, therefore, operator's great supervision is strictly request.



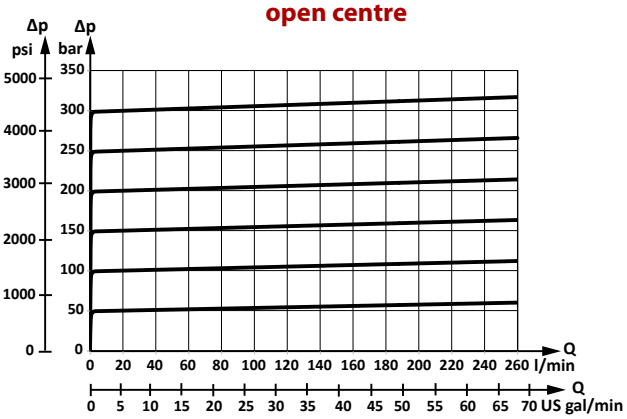
Hydraulic diagram



Neutral flow-pressure drop in PDI, open centre



Pressure relief valve characteristic in PDI, open centre



Designed for use with fixed displacement pumps.

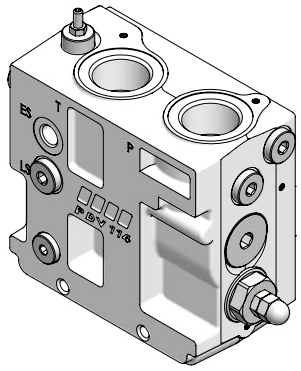
Inlet comes standard with pressure compensated 3-way flow regulator (1), that when pump is started and working sections spools are in neutral position, it's unloaded to tank, and the oil flow being supplied from the pump, passes through the 3-way flow regulator to tank with minimal off-load pressure drop (see diagram below).

When one or more of the spools are actuated, the highest working pressure signal is fed to the 3-way flow regulator, that maintains the Δp at a constant level, so that the flow rate is independent of the load, and proportional to the opened spool area.
The built in pressure reducing valve (2), act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.
When the main PDS spools are actuated, the exceeding pump flow is being sent to tank at the highest load pressure value.
If the working pressure reaches the setting of the upstream max pressure pilot relief valve (3), the 3-way flow regulator will be opened to tank, thus limiting the working pressure inside the complete PDV.

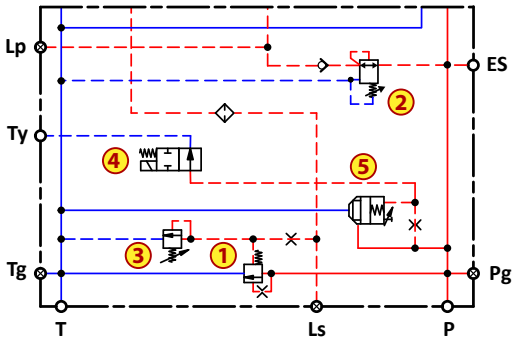
According to an electrical signal coming from the remote controls or I/O controller, the PDU solenoid unloading valve (4), enable the LS signal to be relieved to tank, and the effect of this configuration is an almost pressureless system, where the activated actuators will be automatically catted off.
The pressure in the system will be reduced to the sum of the tank port pressure, plus the neutral flow pressure drop through the 3-way flow regulator.

Care must be given, because all the actuators whose working pressure is lower than the pressure drop through the 3-way regulator, might be still operated.

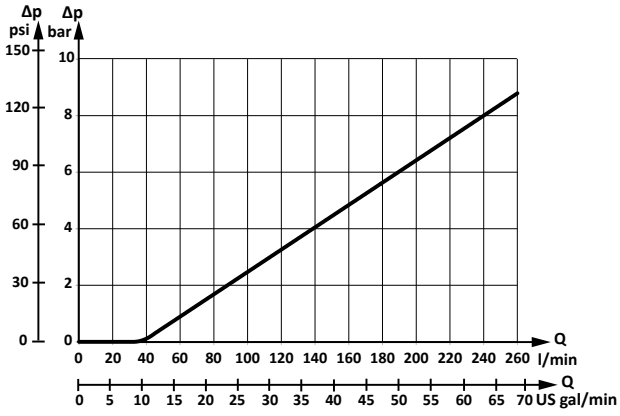
Also with the use of PDU emergency solenoid unloading valve, the level of safety degrees for the complete PDV valve is quite low, therefore, operator's supervision is required.



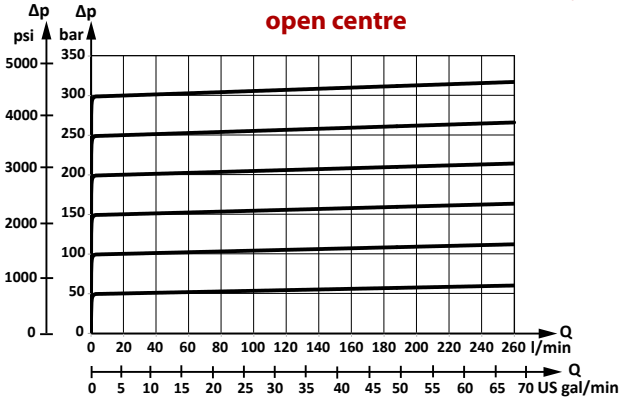
Hydraulic diagram



Neutral flow-pressure drop in PDI, open centre



Pressure relief valve characteristic in PDI, open centre



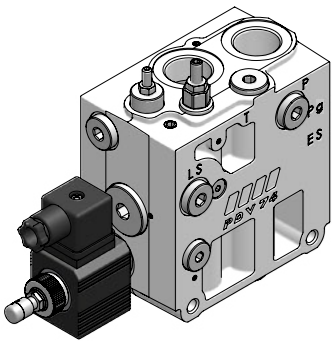
Designed for use with fixed displacement pumps.

Inlet comes standard with pressure compensated 3-way flow regulator (1), that when pump is started and working sections spools are in neutral position, it's unloaded to tank, and the oil flow being supplied from the pump, passes through the 3-way flow regulator to tank with minimal off-load pressure drop (see diagram below).

When one or more of the spools are actuated, the highest working pressure signal is fed to the 3-way flow regulator, that maintains the Δp at a constant level, so that the flow rate is independent of the load, and proportional to the opened spool area.
The built in pressure reducing valve (2), act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.
When the main PDS spools are actuated, the exceeding pump flow is being sent to tank at the highest load pressure value.
If the working pressure reaches the setting of the upstream max pressure pilot relief valve (3), the 3-way flow regulator will be opened to tank, thus limiting the working pressure inside the complete PDV.

By means of an electrical signal coming from the remote controls or I/O controller, the PDU solenoid valve (4), operates the poppet type pilot operated valve (5), which in turn, allows the full flow coming from the pump to be relieved to tank, bypassing the 3-way flow regulator (1).
The effect of this condition is a complete and safely pressureless system, where all actuators will be automatically catted-off, and the pressure into the system will be reduced to the sum of the tank port pressure, plus the pressure drop through the poppet unloading valve (see characteristic curve below)

When the inlet section comes with this configuration and the pump unloading system is connected with the active fault monitoring spool actuators, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.



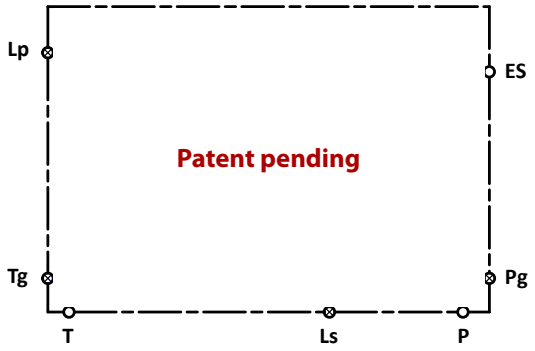
Designed to be configured either as open centre (fixed displacement pumps) or closed centre version (variable displacement pumps.)

Inlet comes standard with pressure compensated 3-way flow regulator ①, that when pump is started and working sections spools are in neutral position, it's unloaded to tank, and the oil flow being supplied from the pump, passes through the 3-way flow regulator to tank with minimal off-load pressure drop (see diagram below).

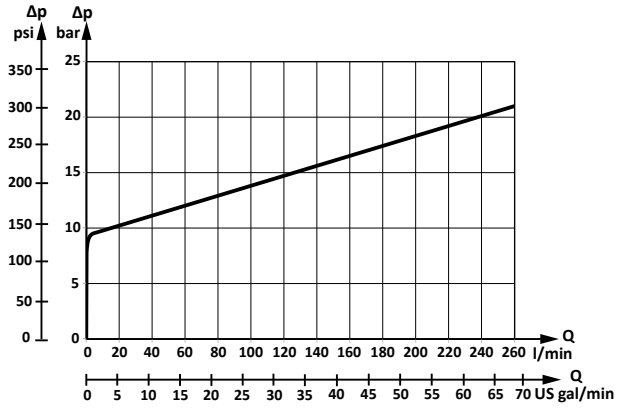
When one or more of the spools are actuated, the highest working pressure signal is fed to the 3-way flow regulator, that maintains the Δp at a constant level, so that the flow rate is independent of the load, and proportional to the opened spool area.
The built in pressure reducing valve ②, act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.
When the main PDS spools are actuated, the exceeding pump flow is being sent to tank at the highest load pressure value.
If the working pressure reaches the setting of the upstream max pressure pilot relief valve ③, the 3-way flow regulator will be opened to tank, thus limiting the working pressure inside the complete PDV.

By acting clockwise on the pilot shifting spool ④, without changing any components, the inlet section circuit will be transformed into closed centre configuration.
In this configuration the load sensing pilot pressure is led to pump control via the LS connection. When a main spool is actuated, the pump regulator will adjust the displacement so that the set differential pressure (stand-by pressure) between P and LS signal is maintened.
The pressure relief valve 3 is to be set at 35 bar above maximum cut-off pressure set on the pump.
The LS control performs as a constant pressure control also, decreasing pump displacement when system pressure reaches the PC setting.
The pressure compensating function has the priority over the load sensing function.

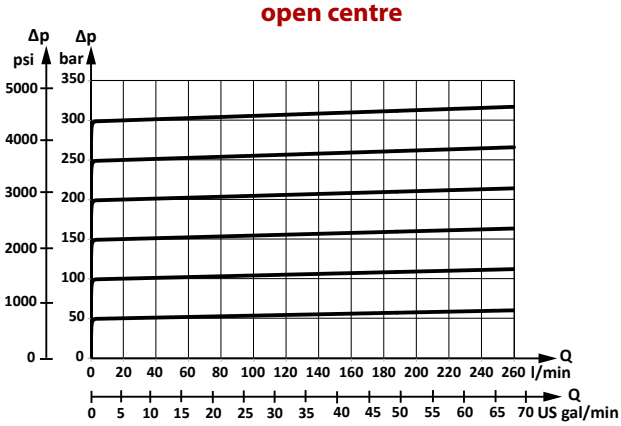
Hydraulic diagram

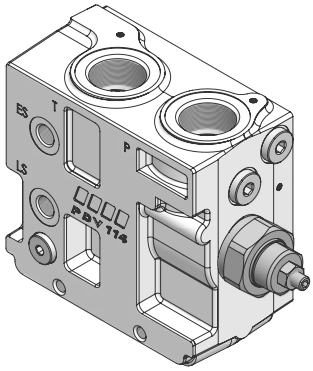


Neutral flow-pressure drop in PDI, open centre



Pressure relief valve characteristic in PDI, open centre





Designed for use with LS variable displacement pumps.

Inlet comes standard without pressure compensated 3-way flow regulator.

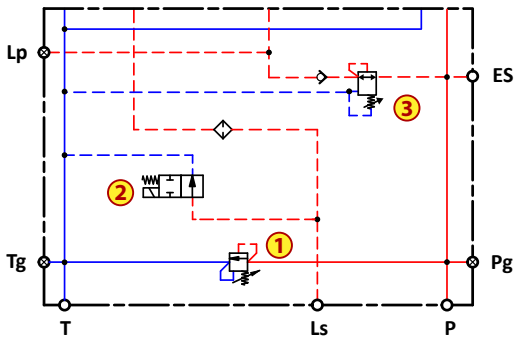
When pump is started and PDV spools are in neutral position, the LS pump signal is unloaded to tank.
When one or more of the spools are actuated, the highest signal is sent to the pump regulator that control the pump swashplate angle.
The PDS main spool compares the pressure drop before and after the spool notches
(differential pressure Δp), and therefore, the pump flow remain constant.
The position of the PDS spool determines the flow demand. If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

The inlet section can comes with an optional pressure relief valve ① that should be set at pressure about 35 bar above maximum system pressure set on the pump regulator.

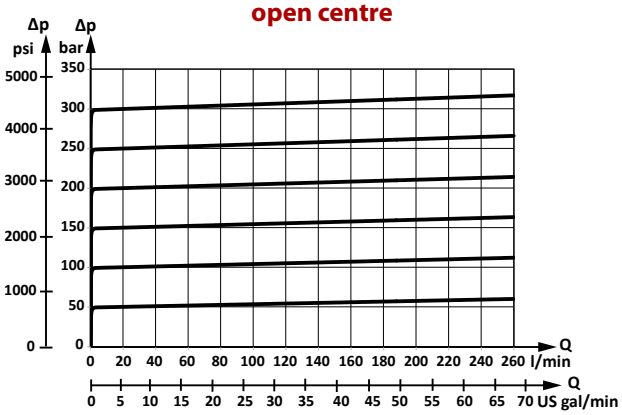
According to an electrical signal coming from the remote controls or I/O controller, the PIU solenoid unloading valve ② enable the LS signal to be relieved to tank.
The effect of this configuration is an almost pressureless system, where the activated actuators will be automatically catted off, and the pressure in the system will be reduced to the sum of the tank port pressure, plus the differential pressure of the pump, therefore, care must be given, because all the actuators whose working pressure is lower than the remaining pressure might be still operated.
The built in pressure reducing valve ③, act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.

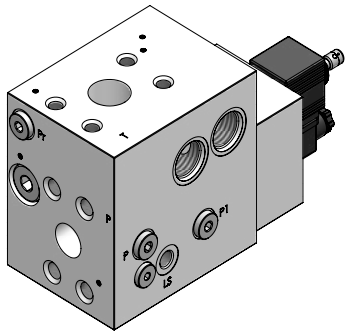
Also with the use of PIU emergency solenoid unloading valve, the level of safety degrees for the complete PDV valve is quite low, therefore, operator's great supervision is required.

Hydraulic diagram

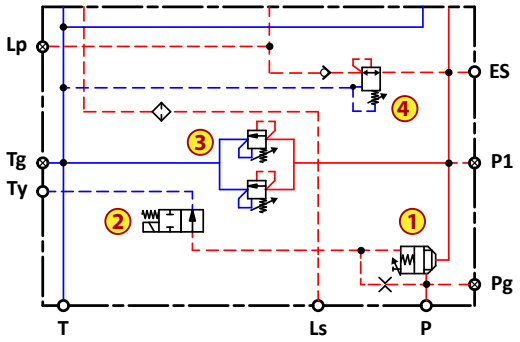


Pressure relief valve characteristic in PDI, open centre

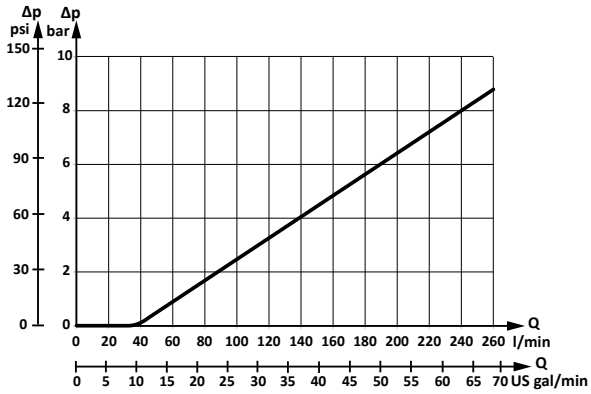




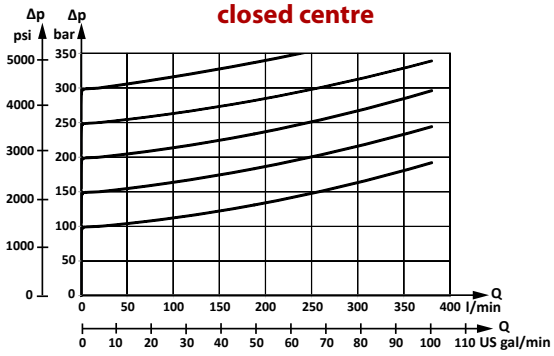
Hydraulic diagram



Pressure drop cut-off system in PDI, closed centre



Pressure relief valve characteristic in PDI, closed centre



Designed for use with LS variable displacement pumps.

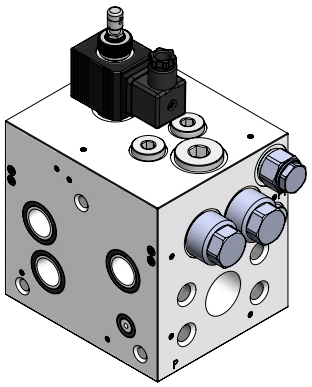
This version of inlet comes standard with a double stage cut-off pump system (1), that when activated according to an electrical signal (2), all down-stream working section will be perfectly and safely sealed from pressure and flow, protecting the complete hydraulic machines control against the negative effect of the remaining stand by pressure.

Inlet comes standard without pressure compensated 3-way flow regulator.

When pump is started and PDV spools are in neutral position, the LS pump signal is unloaded to tank.
When one or more of the spools are actuated, the highest signal is sent to the pump regulator that control the pump swashplate angle.
The PDS main spool compares the pressure drop before and after the spool notches
(differential pressure Δp), and therefore, the pump flow remain constant.
The position of the PDS spool determines the flow demand. If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

The inlet section can comes with an optional pressure relief valve (3) that should be set at pressure about 35 bar above maximum system pressure set on the pump regulator.
The built in pressure reducing valve (4), act as the pilot pressure supply for the electrical actuators, as well as, the hydraulic remote controls.

When the inlet section comes with this configuration and the cut-off pump system is connected with the active fault monitoring spool actuators, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.



Designed for use with LS variable displacement pumps.

PDIM is a MID inlet section that allows the PDV74 to be supplied with a larger variable pump flow capacity with a lower pressure drop.
PDIM enable to PDW to be mounted on both sides of the pump side module, therefore, the PDW fitted on PMID left side, the A-B work port position are reversed.

Inlet comes standard without pressure compensated 3-way flow regulator.

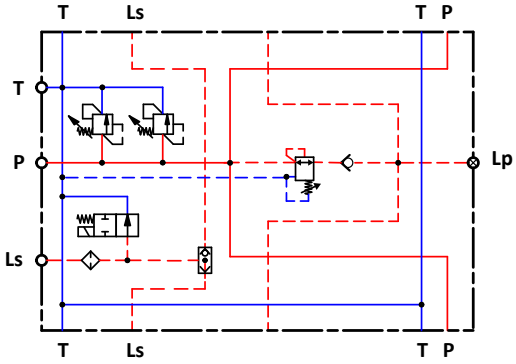
When pump is started and PDV spools are in neutral position, the LS pump signal is unloaded to tank.
When one or more of the spools are actuated, the highest signal is sent to the pump regulator that control the pump swashplate angle.
The PDS main spool compares the pressure drop before and after the spool notches
(differential pressure Δp), and therefore, the pump flow remain constant.
The position of the PDS spool determines the flow demand. If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

The inlet section may comes with an optional pressure relief valve that should be set at pressure about 35 bar above maximum system pressure set on the pump regulator.

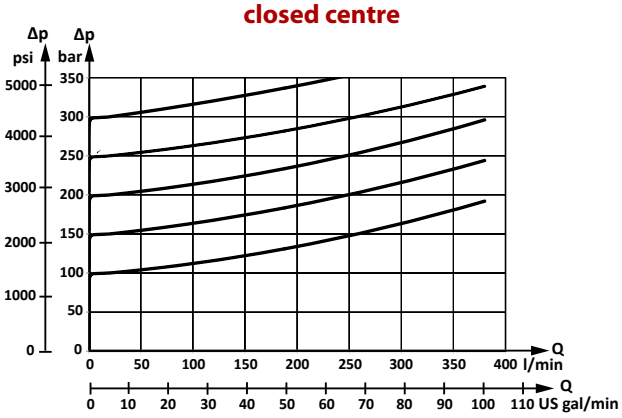
According to an electrical signal coming from the remote controls or I/O controller, the PIU solenoid unloading valve enable the LS signal to be relieved to tank.
The effect of this configuration is an almost pressureless system, where the activated actuators will be automatically catted off, and the pressure in the system will be reduced to the sum of the tank port pressure, plus the differential pressure of the pump, therefore, care must be given, because all the actuators whose working pressure is lower than the remaining pressure might be still operated.

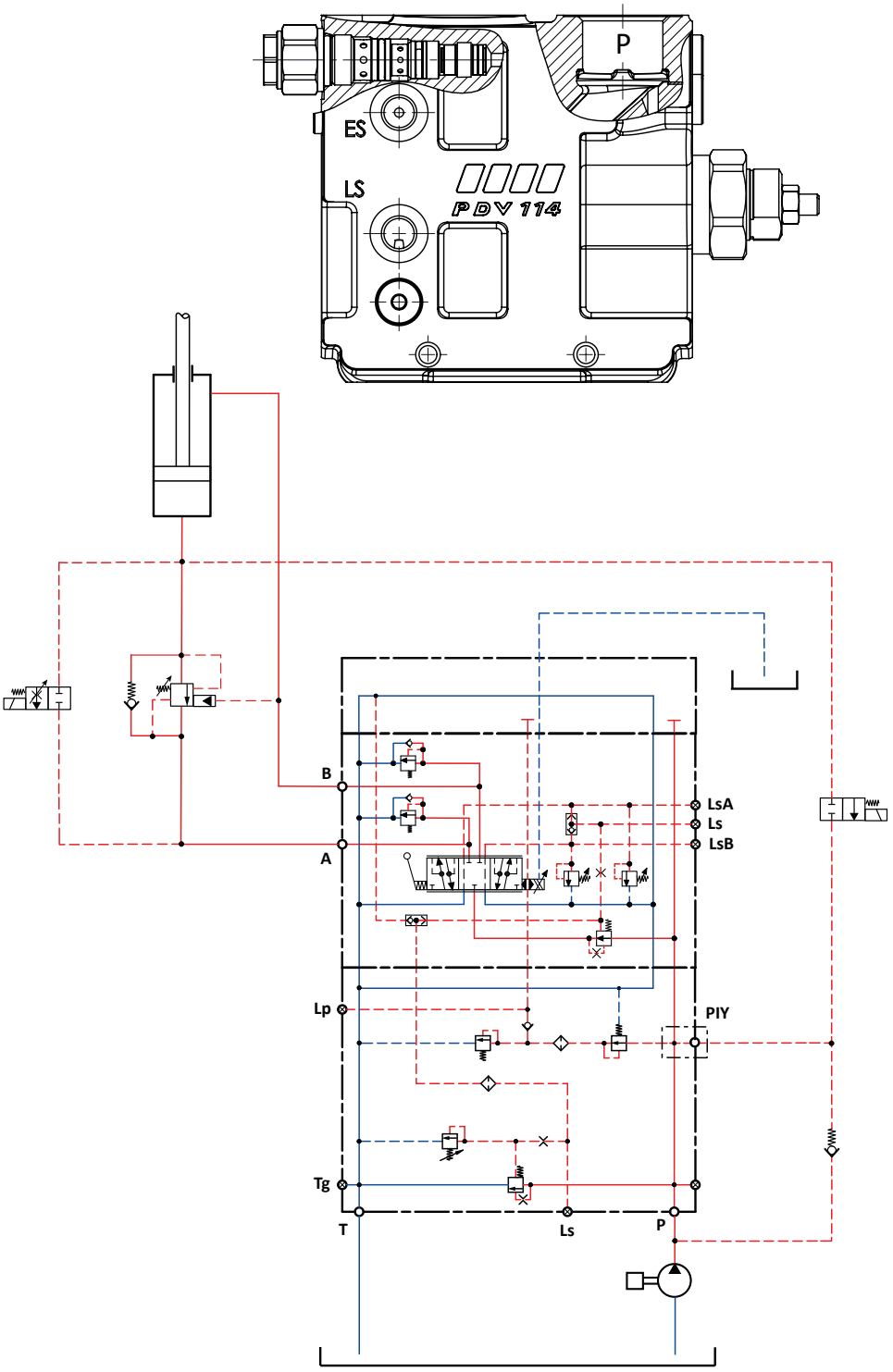
Also with the use of PIU emergency solenoid unloading valve, the level of safety degrees for the complete PDV valve is quite low, therefore, operator's great supervision is required.

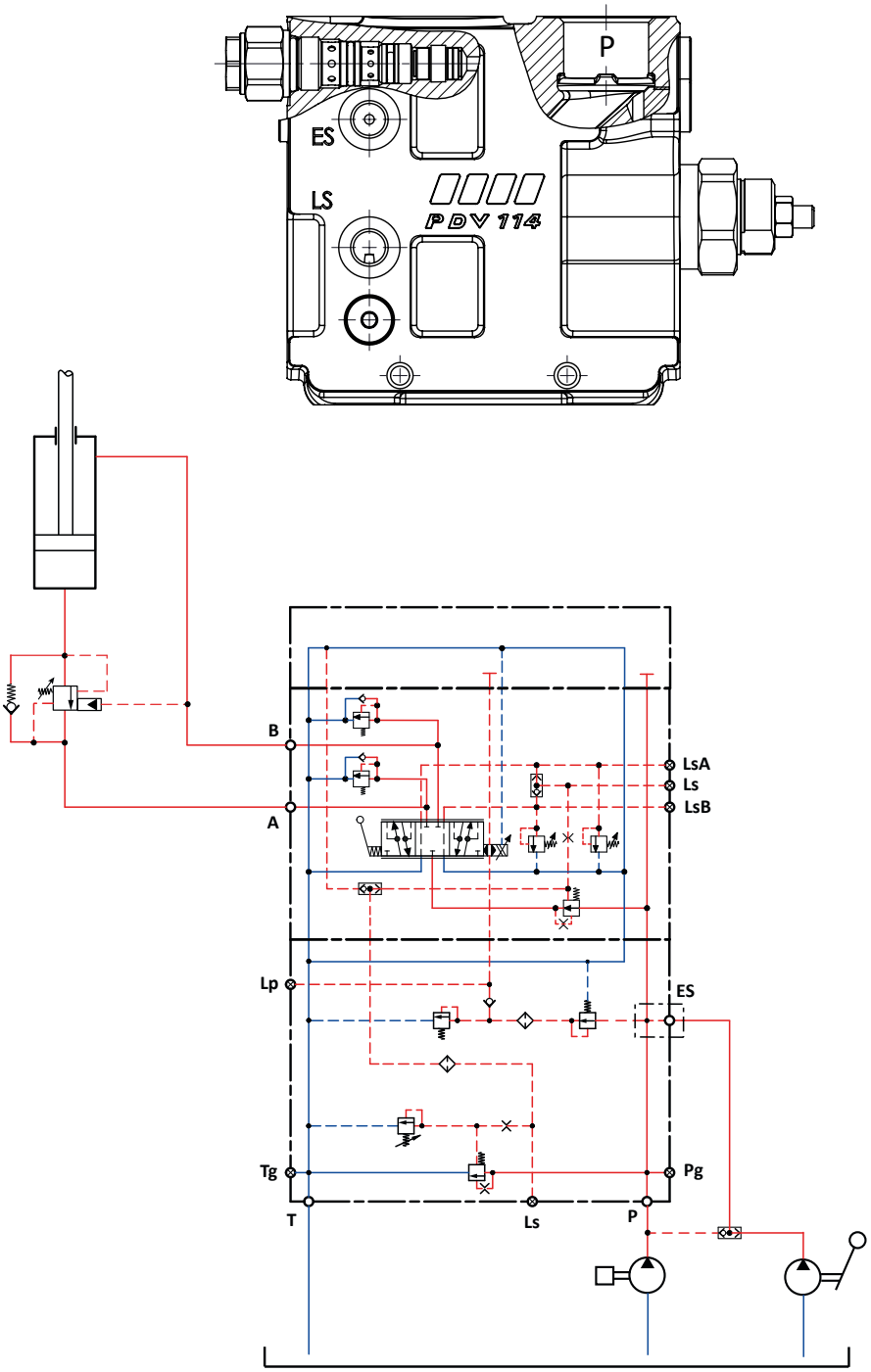
Hydraulic diagram



Pressure relief valve characteristic in PDI, closed centre

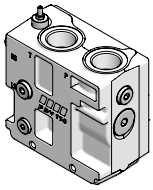


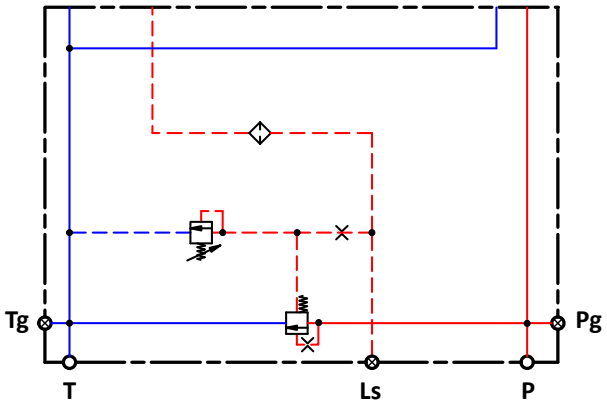

P
ES
LS
PDV 114
B
A
LsA
Ls
LsB
Lp
PIY
Tg
T
Ls
P



This inlet configuration (for open or closed centre) is suited to supply the PDV74 with a flow from an auxiliary manual operated emergency pump.
Normally the main pump supply the built in pressure reducing valve through the PIY, screw-in cartridge.
In case of main pump failure, the external shuttle valve ensure that the main pressure reducing valve is being supplied from the emergency hand pump, and the pilot oil supply available for electric actuators.

Product	Hydraulic diagram	Description

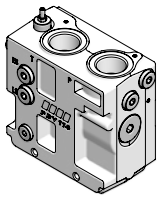


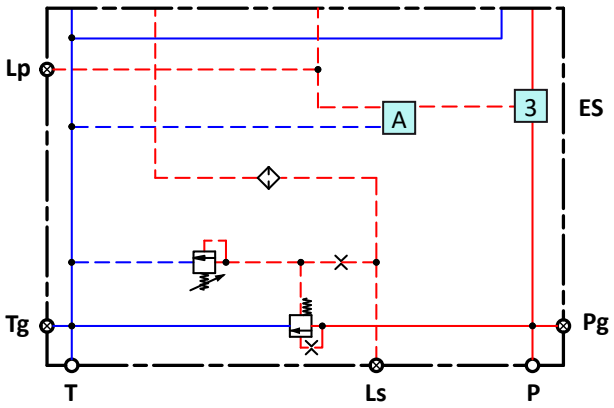


For mechanically actuated valves, only

Code numbers	
PDI01A30000	**PDI01A30010**
BSPP	UN-UNF

Connections thread see page 249

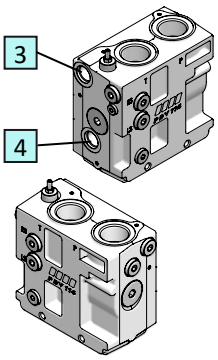


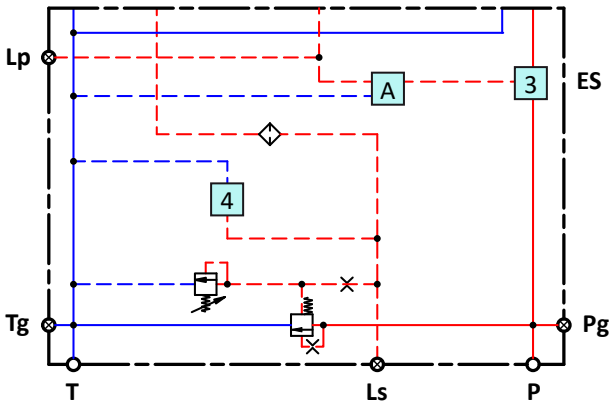


With pilot oil supply for electrically and hydraulic actuated valves 3

Code numbers	
PDI01A40000	**PDI01A40010**
BSPP	UN-UNF

Connections thread see page 249



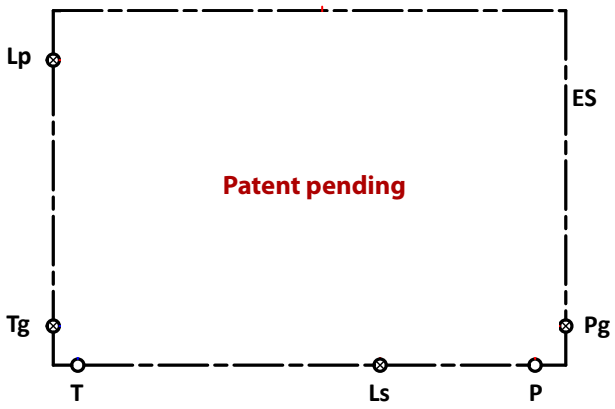


With pilot oil supply for electrically and hydraulic actuated valves 3 and facility for LS unloading 4

Code numbers	
PDI01A41000	**PDI01A41010**
BSPP	UN-UNF

Connections thread see page 249

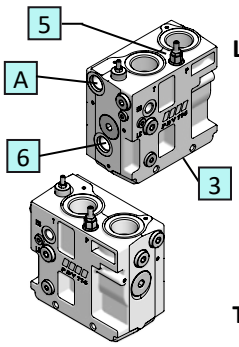
Product **Hydraulic diagram** **Description**

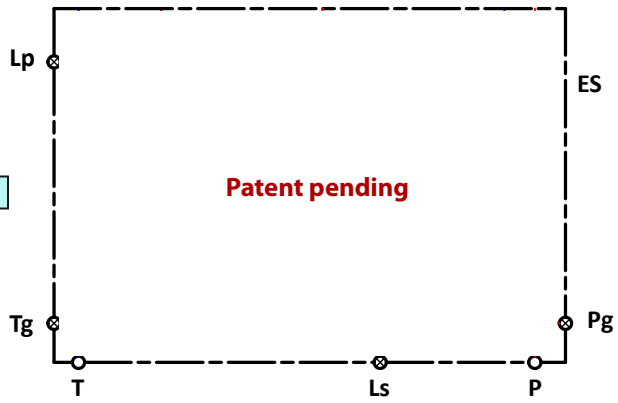


With pilot oil supply, for electrically and hydraulic actuated valves 3 and shifting pump system 5

Code numbers	
PDI01B40000	**PDI01B40010**
BSPP	UN-UNF

Connections thread see page 249



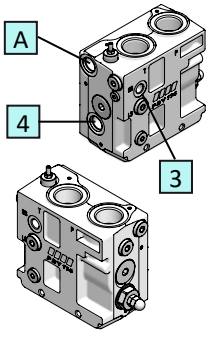


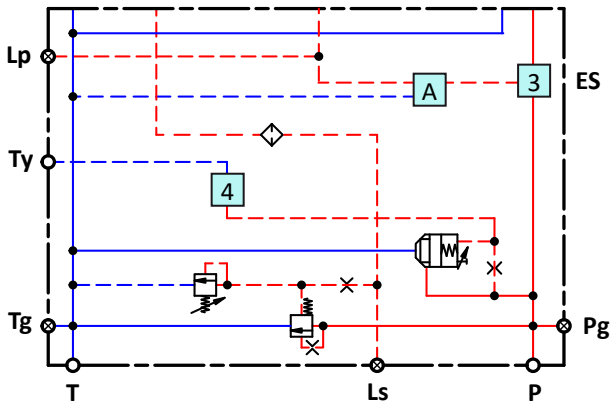
With pilot oil supply for electrically and hydraulic actuated valves 5, shifting pump system 6 and facility for LS unloading 3

Code numbers	
PDI01B41000	**PDI01B41010**
BSPP	UN-UNF

Connections thread see page 249

Product **Hydraulic diagram** **Description**

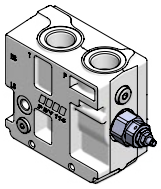
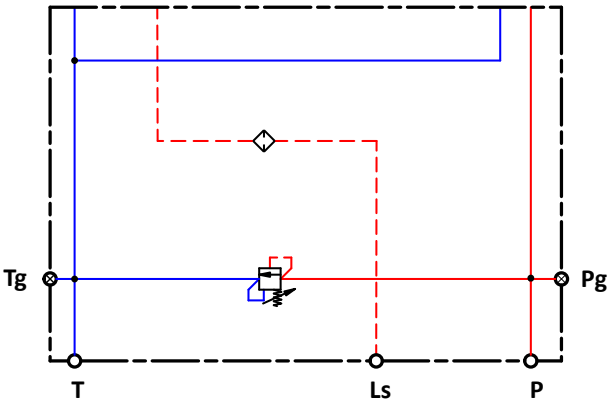
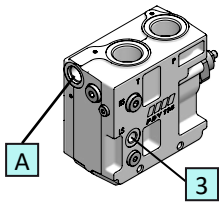
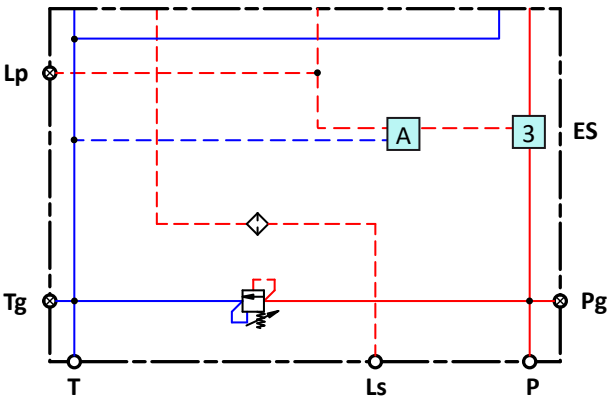
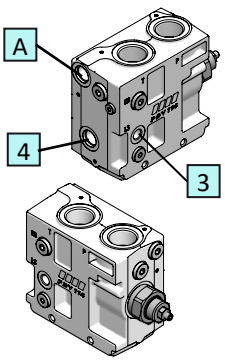
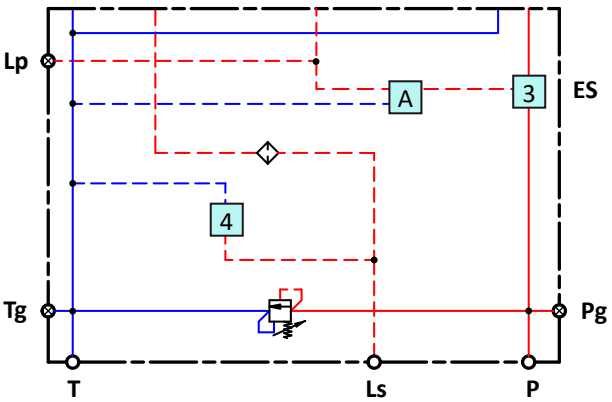




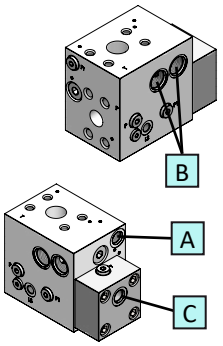
With pilot oil supply for electrically and hydraulic actuated valves 3 and pump unloading system 4

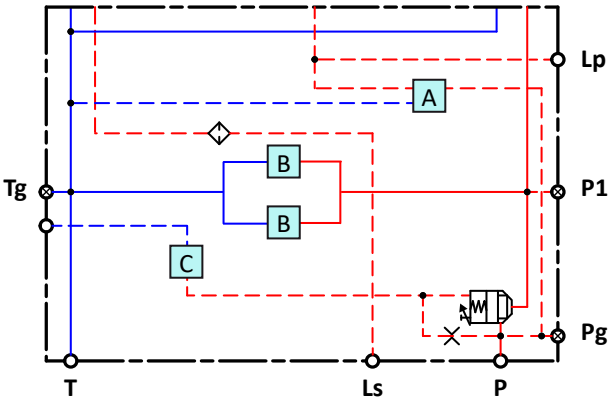
Code numbers	
PDI01A42000	**PDI01A42010**
BSPP	UN-UNF

Connections thread see page 249

Product	Hydraulic diagram	Description
		For mechanically actuated valves, only Code numbers **PDI01C30000** BSPP **PDI01C30010** UN-UNF Connections thread see page 249
		With pilot oil supply for electrically and hydraulic actuated valves 3 Code numbers **PDI01C40000** BSPP **PDI01C40010** UN-UNF Connections thread see page 249
		With pilot oil supply for electrically and hydraulic actuated valves 4 and facility for LS unloading 3 Code numbers **PDI01C41000** BSPP **PDI01C41010** UN-UNF Connections thread see page 249

Product	Hydraulic diagram	Description

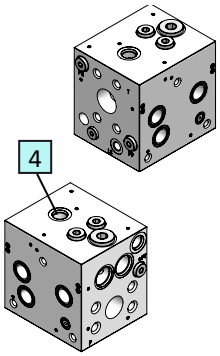


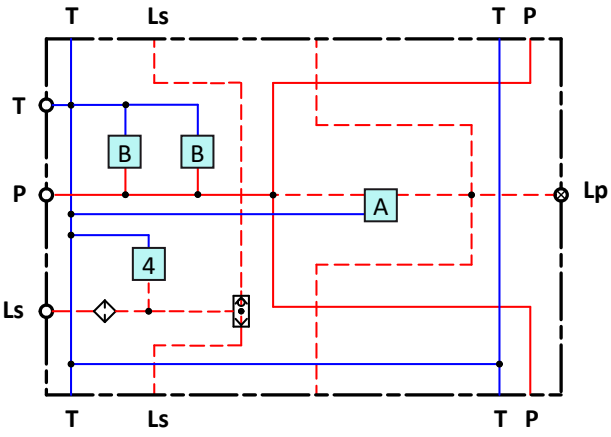


With pilot oil supply for electrically and hydraulic actuated valves 3 and cut-off system

Code numbers	
PDI01C44000	**PDI01C44010**
BSPP	UN-UNF

Connections thread see page 249

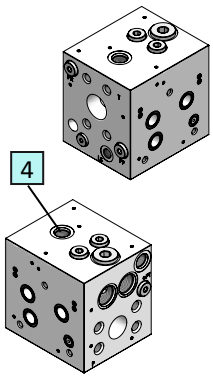


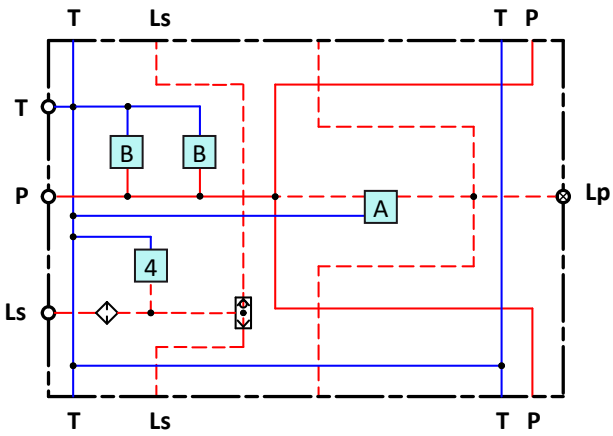


MID inlet PDV114 with pilot oil supply for electrically and hydraulic actuated valves and facility for LS unloading 4

Code numbers	
PDIM1C41000	**PDIM1C41010**
BSPP	UN-UNF

Connections thread see page 261

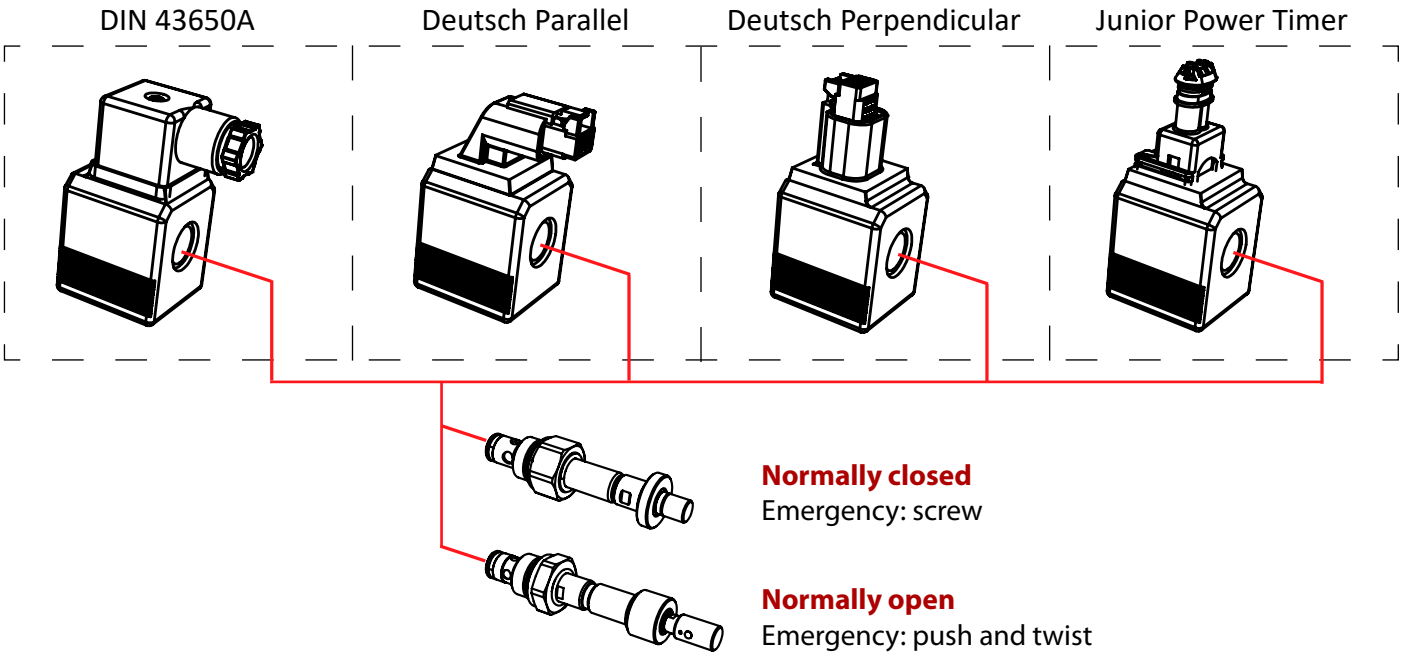


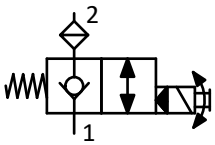
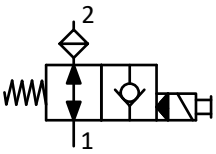


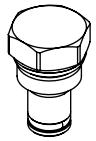
MID inlet PDV117 with pilot oil supply for electrically and hydraulic actuated valves and facility for LS unloading 4

Code numbers	
PDIM4C41000	**PDIM4C41010**
BSPP	UN-UNF

Connections thread see page 166

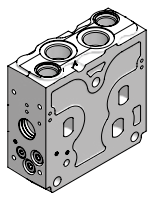


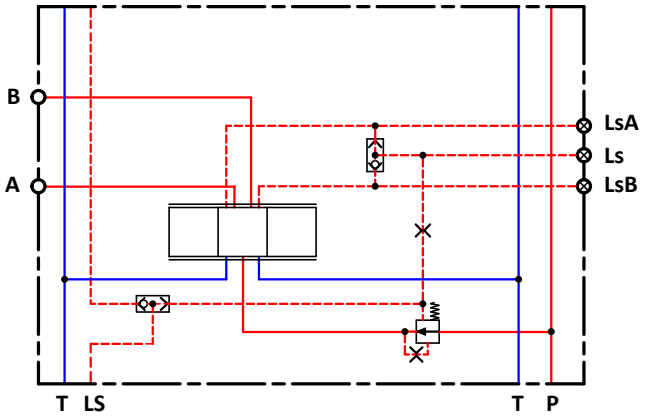
Code numbers PIU solenoid LS unloading valve codes			
Cartridge valve type	Connector type	12 Vdc	24 Vdc
Normally closed Emergency: screw 	DIN 43650A	**PIU0C023200**	**PIU0C013200**
	Deutsch Parallel	**PIU0C021200**	**PIU0C011200**
	Deutsch Perpendicular	**PIU0C022200**	**PIU0C012200**
	Junior Power Timer	**PIU0C024200**	**PIU0C014200**
Normally open Emergency: push and twist 	DIN 43650A	**PIU0A023100**	**PIU0A013100**
	Deutsch Parallel	**PIU0A021100**	**PIU0A011100**
	Deutsch Perpendicular	**PIU0A022100**	**PIU0A012100**
	Junior Power Timer	**PIU0A024100**	**PIU0A014100**

Plug for LS unloading cavity		
Plug cavity	Hydraulic scheme	Code numbers
		**PIP10000000**

Max. operating pressure		**350 bar**	
Max. internal leakage		**350 bar, 46 mm²/sec 1 cm³/min**	
max pressure drop		**< 1,5 bar**	
Expected life - 350 bar, 0,5 Hz (1s on / 1s off)		**10.000.000 cycles**	
Response time for LS pressure relief		**< 280ms**	
Oil temperature	**Recommended**	**30 ÷ 60 °C**	
	Min.	**-30 °C**	
	Max.	**90 °C**	
Ambient temperature		**-30 ÷ 60 °C**	
Max. coil surface temperature		**160 °C**	
Oil viscosity	**Operating range**	**10 ÷ 90 cSt**	
	Min.	**4 mm²/sec**	
	Max.	**460 mm²/sec**	
Degree of enclosure	**Connector DIN 43650**	**IP65**	
	Connector Deutsch DT04-2p	**IP67**	
		IP69K integrated to coil	
Rated voltage		**12 Vdc**	**24 Vdc**
Supply voltage		**10,6 ÷ 14,6 Vdc**	**20,4 ÷ 28,6 Vdc**
Working temperature		**-30 ÷ 80 °C**	
Maximum coil surface temperature		**175 °C**	
Heat insulation		**Class H (180 °C)**	
Resistance		**7,5 Ω**	**29,9 Ω**
Current consumption		**1,6 A**	**0,8 A**
Power consumption		**19 W**	

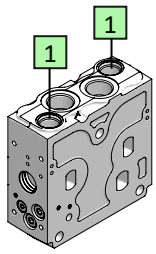
Product	Hydraulic diagram	Description

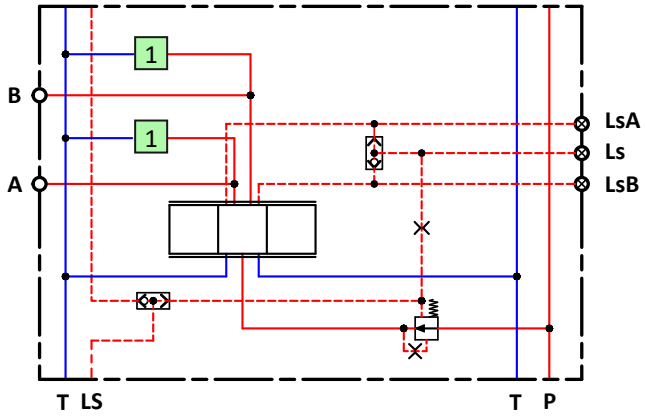




No facilities for shock-suction valves
No facilities for LS A/B pilot relief valves

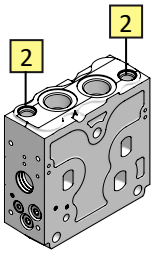
Code numbers	
PDW11000000	**PDW11000010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

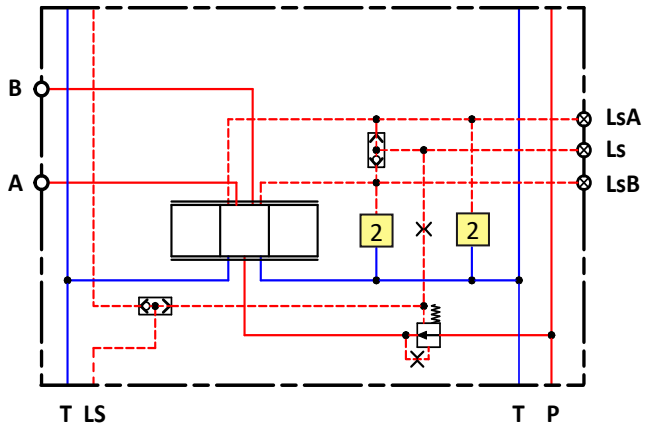




Facilities for shock-suction valves 1
No facilities for LS A/B pilot relief valves

Code numbers	
PDW11010000	**PDW11010010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

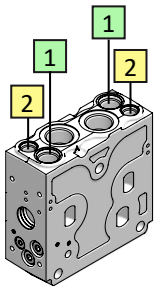


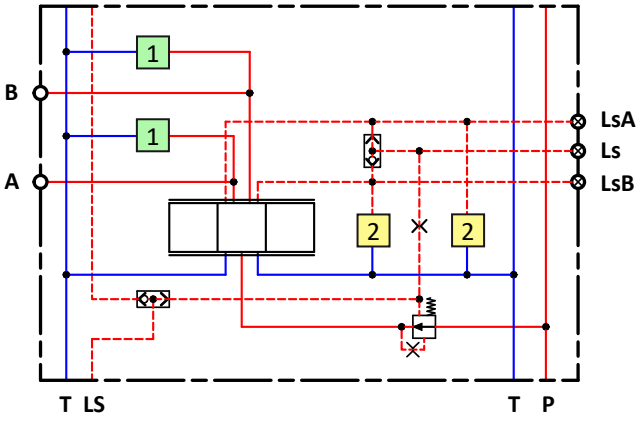


No facilities for shock-suction valves
Facilities for LS A/B pilot relief valves 2

Code numbers	
PDW11100000	**PDW11100010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

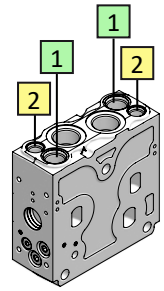
Product	Hydraulic diagram	Description

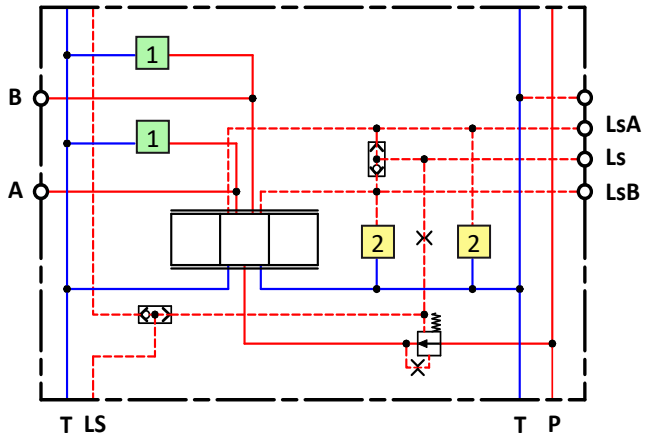




Facilities for shock-suction valves 1
Facilities for LS A/B pilot relief valves 2

Code numbers	
PDW11110000	**PDW11110010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

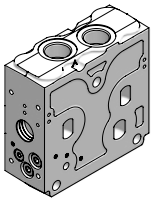


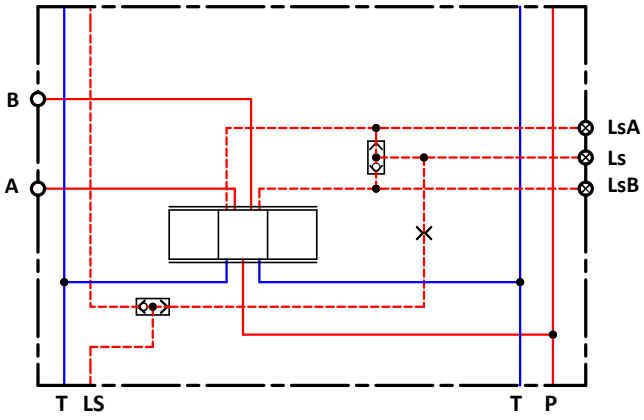


Facilities for shock-suction valves 1
Facilities for LS A/B pilot relief valves and electric unloading LS A/B piloting 2

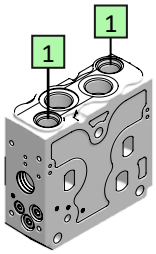
Code numbers	
PDW11111000	**PDW11111010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-14UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

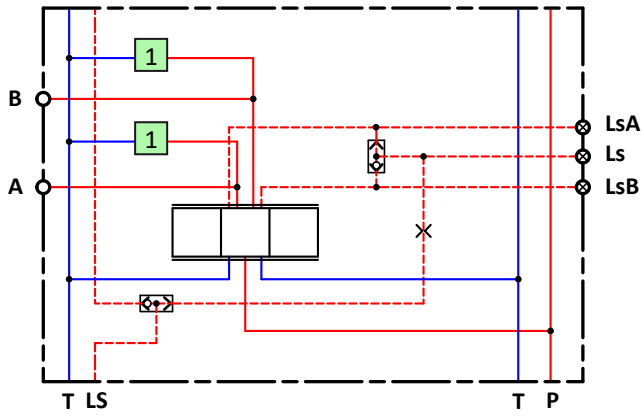
Product	Hydraulic diagram	Description



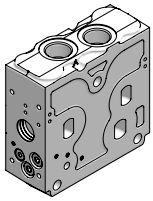


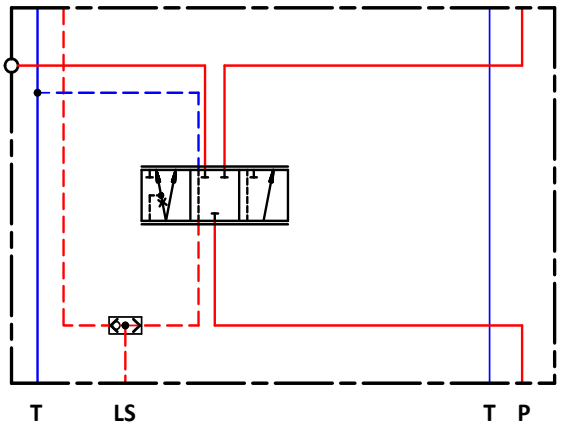
No facilities for shock-suction valves	
Code numbers	
PDW10000000	**PDW10000010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B





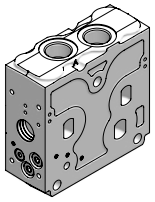
Facilities for shock-suction valves 1	
Code numbers	
PDW10010000	**PDW10010010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

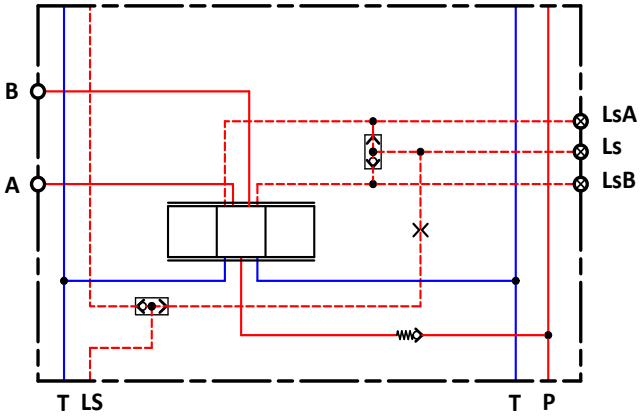




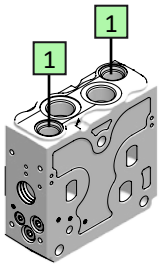
Functional safety cut off system and diverter flow	
Code numbers	
PDW15000000	**PDW15000010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

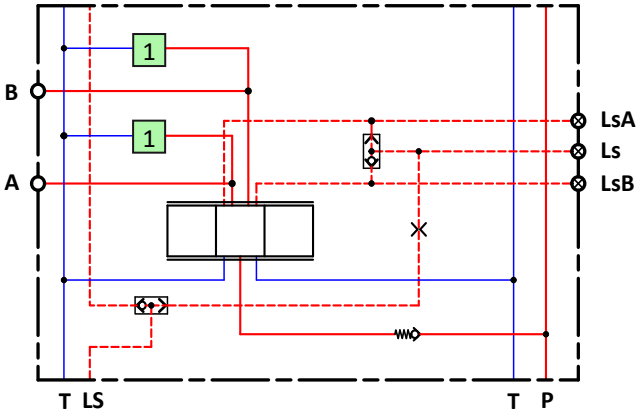
Product	Hydraulic diagram	Description





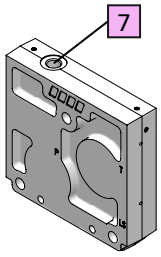
No facilities for shock-suction valves With load drop check valve on P channel	
Code numbers	
PDW13000000	**PDW13000010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

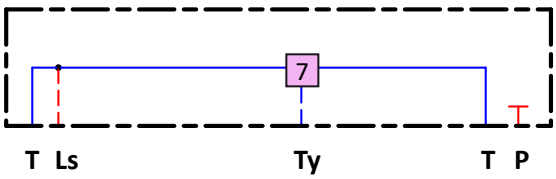




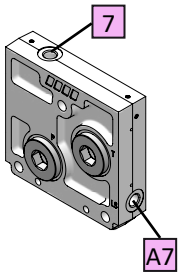
Facilities for shock-suction valve 1 With load drop check valve on P channel	
Code numbers	
PDW13010000	**PDW13010010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

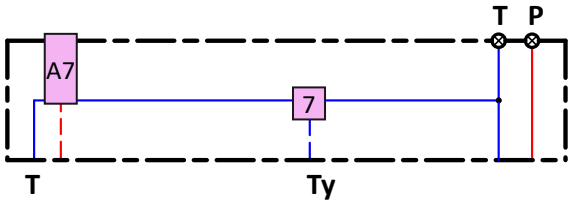
Product	Hydraulic diagram	Description



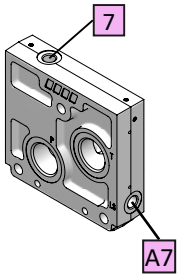


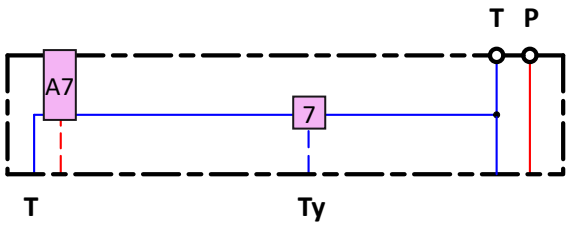
No ported, prearranged for external/internal drain 7	
Code numbers	
PDE01010000	**PDE01010010**
BSPP	UN-UNF
Connections thread see page 249	





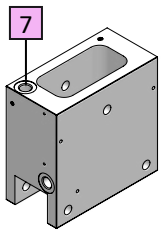
Ls port A7 prearranged for external/internal drain 7	
Code numbers	
PDE01210000	**PDE01210010**
BSPP	UN-UNF
Connections thread see page____	

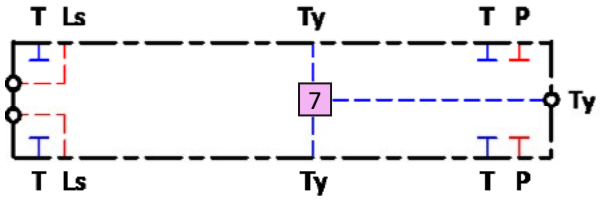




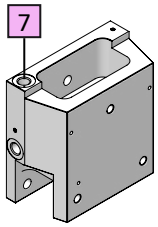
P-T-Ls ports A7 prearranged for external/internal drain 7	
Part number	
PDE01110000	**PDE01110010**
BSPP	UN-UNF
Connections thread see page___	

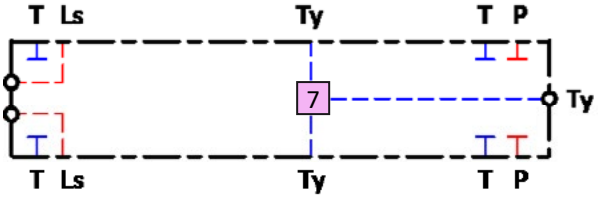
Product	Hydraulic diagram	Description



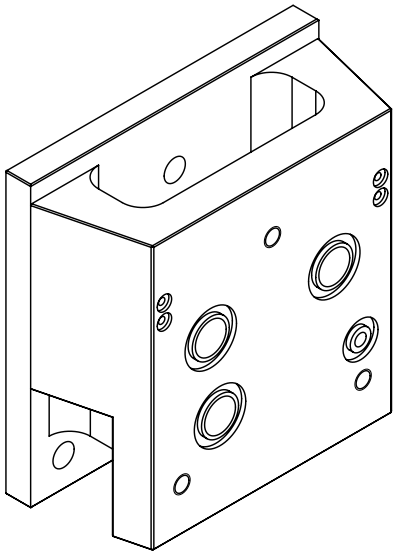


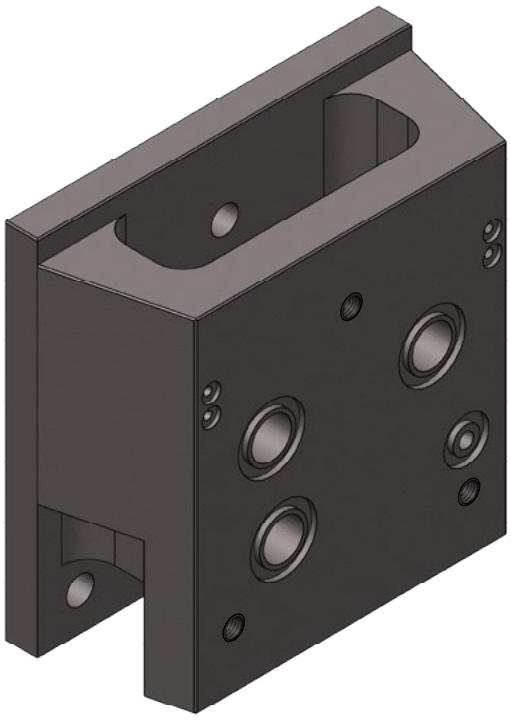
Mid End PDV114 7	
Code numbers	
PDEM1010000	**PDEM1010010**
BSPP	UN-UNF
Connections thread see page 255	



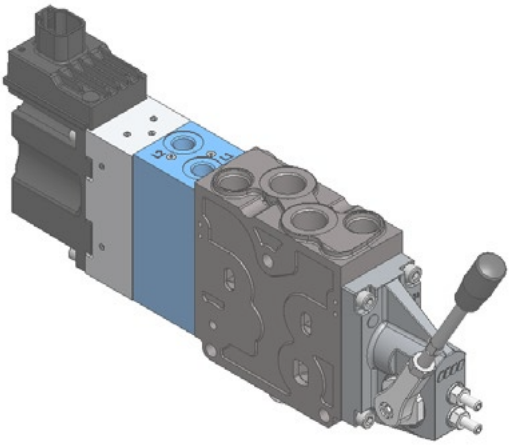


Mid End PDV117 7	
Code numbers	
PDEM4010000	**PDEM4010010**
BSPP	UN-UNF
Connections thread see page 265	

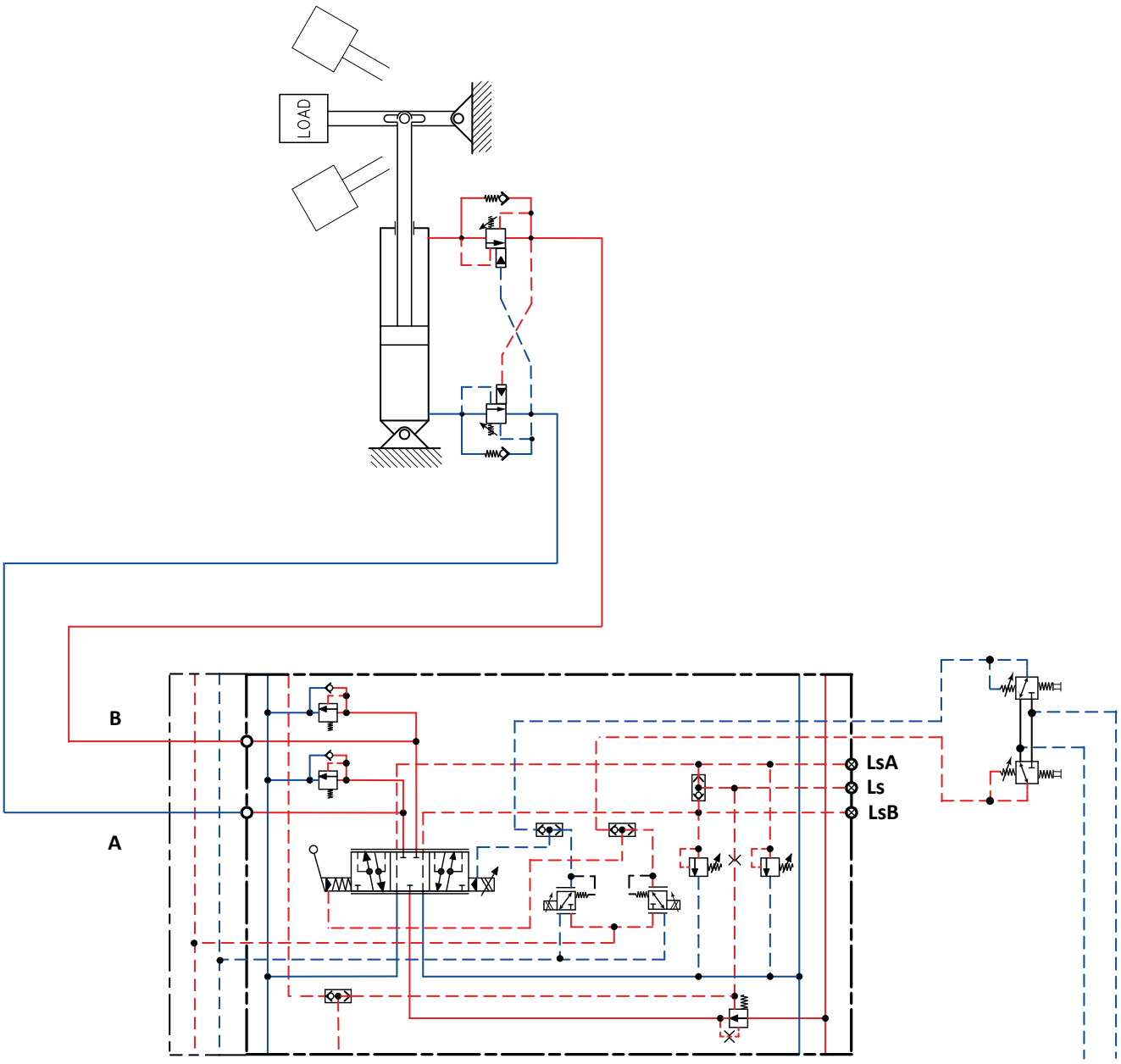
	Description	
		PDEI4000000



PDV114 Proportional Valve
PDZ module - Dual spool control



PDZ is a small HIC body that can be matched with any kind of PDV114 working section PDW, to get hydraulic and electro-hydraulic spool control

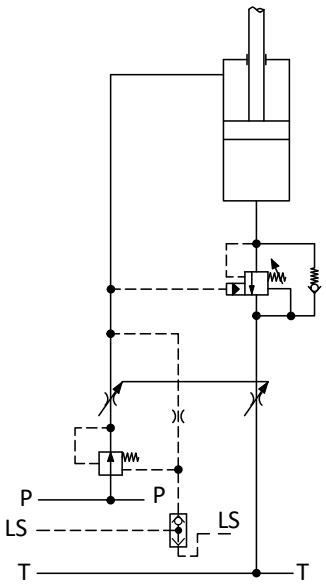


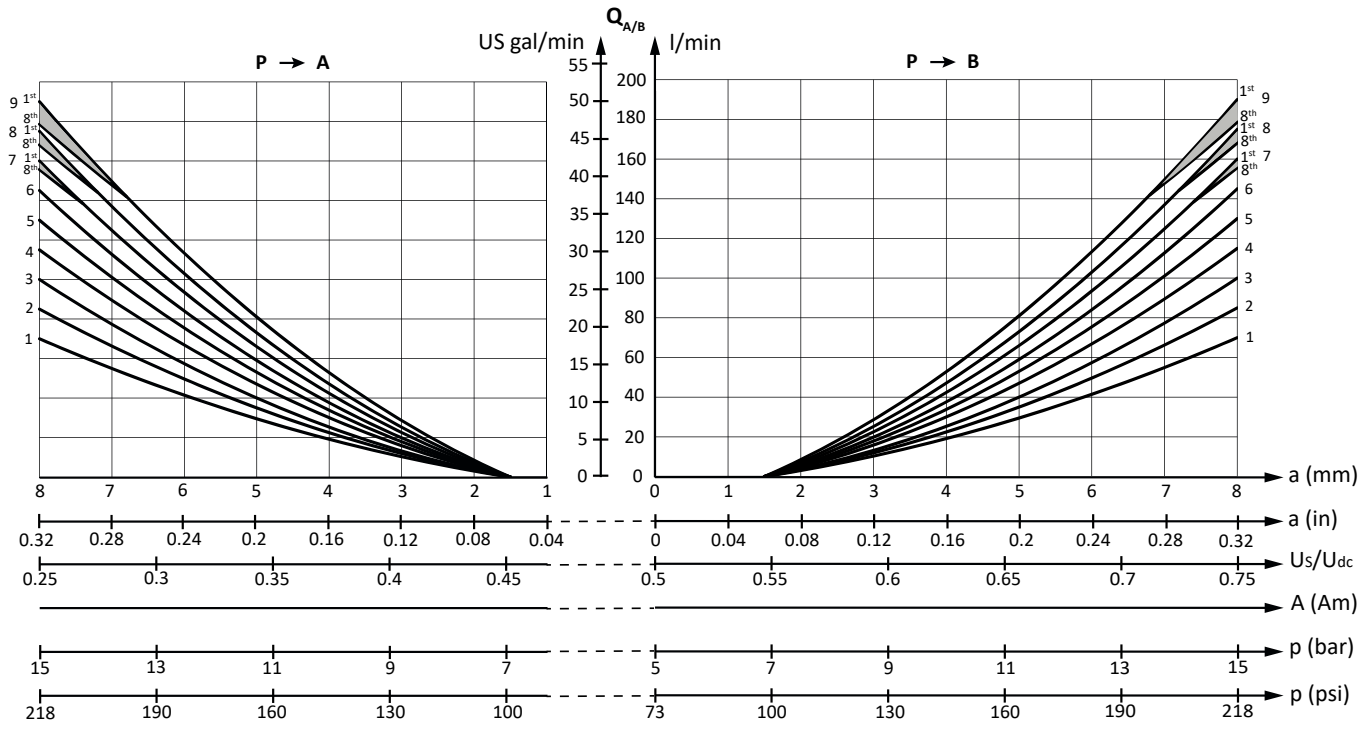
PDZ overrall dimensions	For open loop spool control (Aluminium)	For closed loop spool control (Cast Iron)
	PDZ10000000 1/4" BSPP - 12 mm deep	**PDZ** 1/4" BSPP - 12 mm deep
	PDZ [7/16 in-20 UNF-2B - 0,47 in deep]	**PDZ** [7/16 in-20 UNF-2B - 0,47 in deep]

Oil flow characteristics

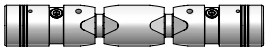
With flow control spool, the oil flow depends on type of PDW module (with or without pressure compensator) and type of pump (fixed or variable displacement).

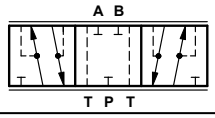
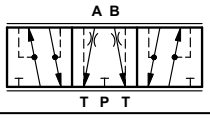
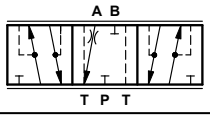
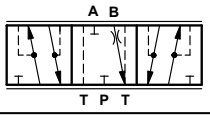
In the below chart, the ordinate numbers refer to spool size, and the ordinal numbers refer to the same spool size but fitted in a different position with related lost flow.



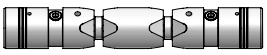


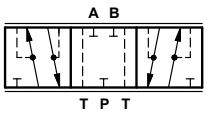
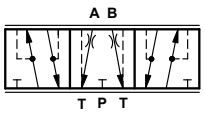
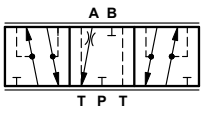
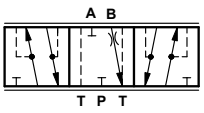
Double acting flow control spool



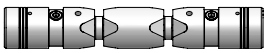
Size	Max oil flow pressure compensated **l/min**	Code numbers and symbol			
					
		4-way, 3-position - A, B closed	4-way, 3-position, A, B → T	4-way, 3-position, B → T; A closed	4-way, 3-position, A → T; B closed
1	**70**	**PDS01110101**	**PDS01120102**		
2	**85**	**PDS01110103**	**PDS01120104**		
3	**100**	**PDS01110105**	**PDS01120106**		
4	**115**	**PDS01110107**	**PDS01120108**		
5	**130**	**PDS01110109**	**PDS01120110**		
6	**145**	**PDS01110111**	**PDS01120112**		
7	**160**	**PDS01110117**	**PDS01120118**		
8	**175**	**PDS01110119**	**PDS01120120**		
9	**190**	**PDS01110121**	**PDS01120122**		

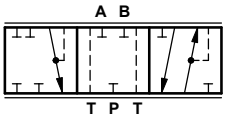
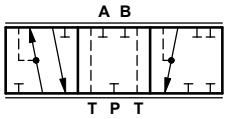
Double acting asymmetric flow control spool



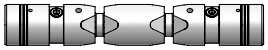
Max oil flow pressure compensated **l/min**		Code numbers and symbol			
					
A	**B**	4-way, 3-position - A, B closed	4-way, 3-position, A, B → T	4-way, 3-position, B → T, A closed	4-way, 3-position, A → T, B closed
190	**70**	**PDS01130101**	**PDS01130102**		
190	**115**	**PDS01130103**	**PDS01130104**		
70	**190**	**PDS01130105**	**PDS01130106**		
115	**190**	**PDS01130107**	**PDS01130108**		

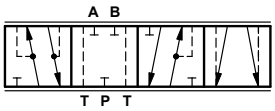
Single acting flow control spool



Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		3-way, 3-position P → A	3-way, 3-position P → B
1			
2			
3			
4			
5			
6			
7			
8			
9			

Double acting flow control spool, floating position

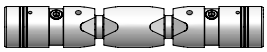


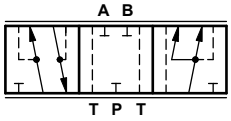
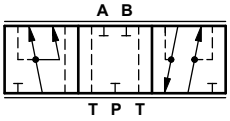
Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		3-way, 4-position floating position on A port	3-way, 4-position floating position on B port
1			
2			
3			
4			
5			

Spool centered set, code numbers (needed for any kind of flow control spool)

Tightening torque		Tightening torque
6^{+1}_{0} Nm		6^{+1}_{0} Nm
$53,1^{+8,85}_{0}$ lb*in		$53,1^{+8,85}_{0}$ lb*in
Manual control	**PDR10300101**	
Hydraulic - Electrohydraulic	**PDR10300102**	

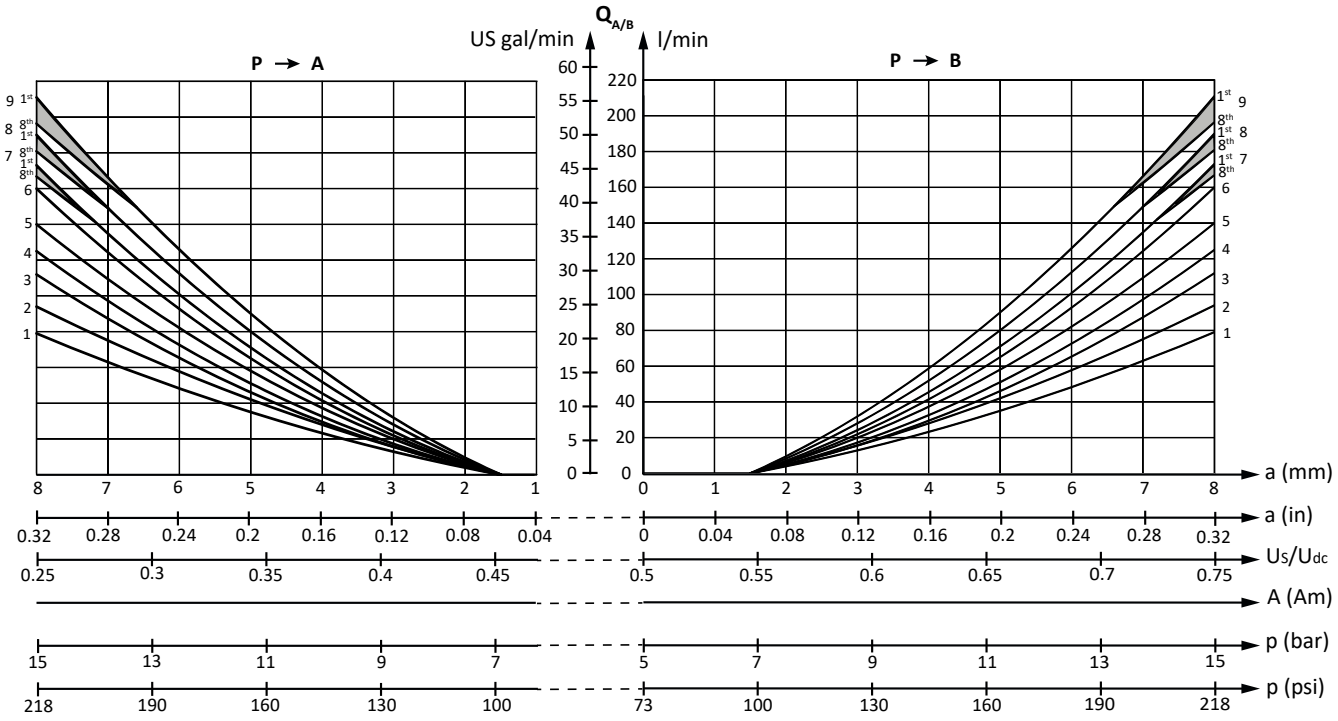
Double acting flow control, regenerative function



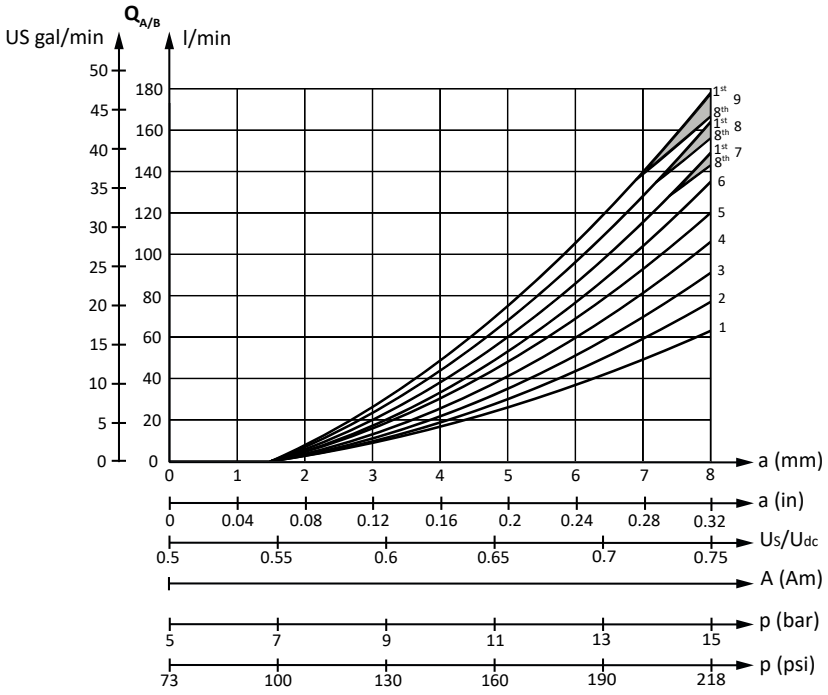
Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		Regenerative circuit on A port	Regenerative circuit on B port
1	**70**		
2	**85**		
3	**100**		
4	**115**		
5	**130**		
6	**145**		
7	**160**		
8	**175**		
9	**190**		
10			

Spool centered set, code numbers (needed for any kind of flow control spool)

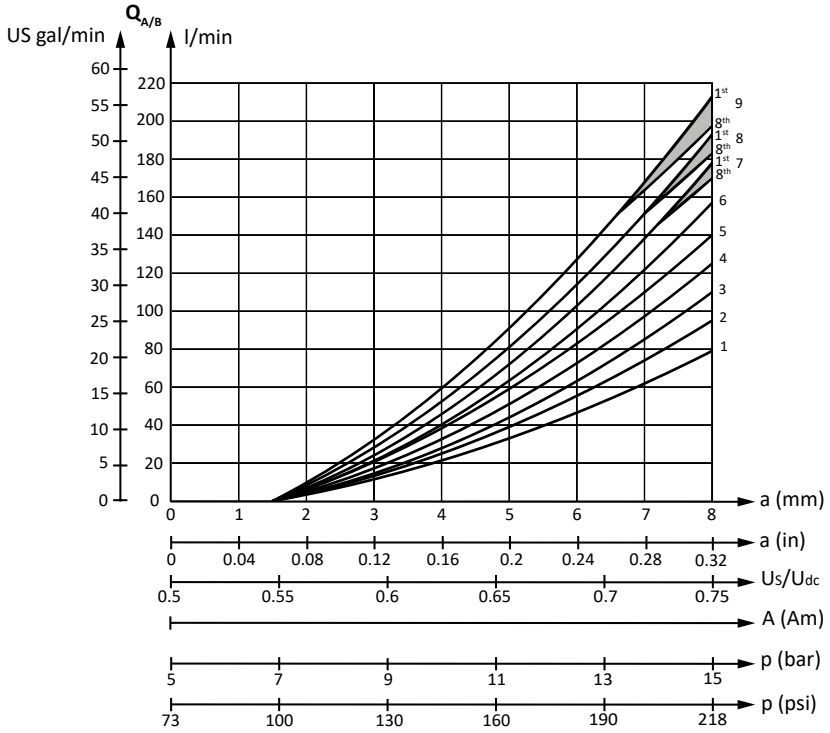
Tightening torque		Tightening torque
6^{+1}_{0} Nm		6^{+1}_{0} Nm
$53,1^{+8,85}_{0}$ lb*in		$53,1^{+8,85}_{0}$ lb*in
Manual control	**PDR10300101**	
Hydraulic - Electrohydraulic	**PDR10300102**	


$Q_{A/B}$
US gal/min
l/min
P → A
P → B
1st
8th
a (mm)
a (in)
Us/Udc
A (Am)
p (bar)
p (psi)

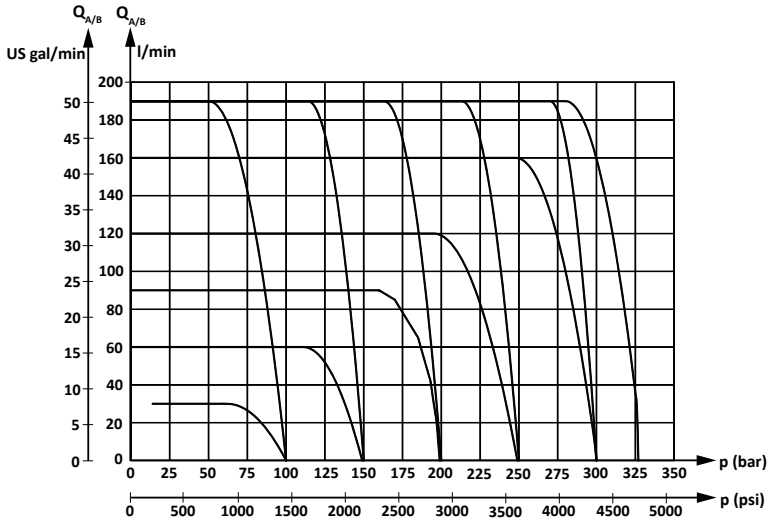
Oil flow characteristics PDW without pressure compensator, and pump differential pressure setting = 16 bar



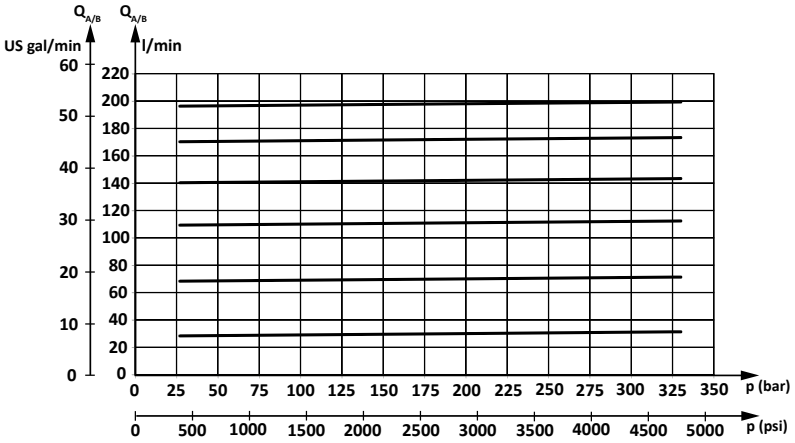
Oil flow characteristics PDW without pressure compensator, and pump differential pressure setting = 25 bar



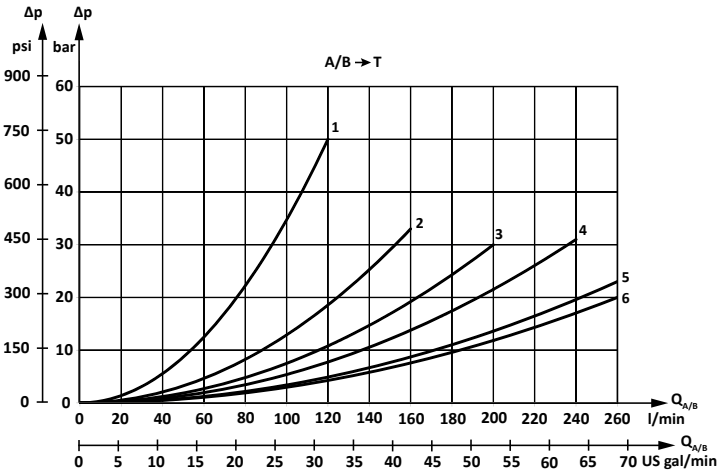
Oil flow PDW pressure compensated with LS A/B pilot relief valves



Load independent oil flow pressure compensated PDW



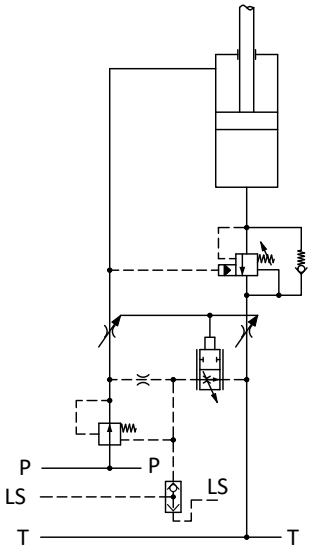
PDW pressure drop at max main spool travel

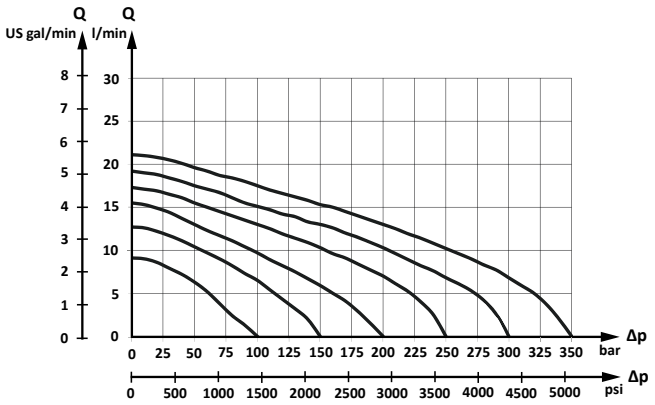


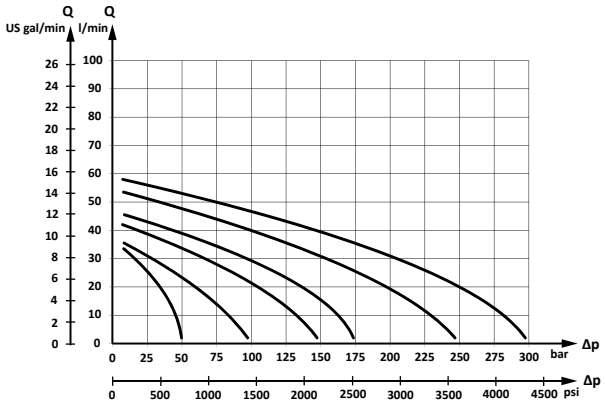
By using proportional directional valves along with overcenter valves, instability problems may occurs in the form of pressure surging.
To suite this problems, spools with different circuit named " Pressure Control " have been developed.
The main purpose of these spools, is to hold in position the 2-way pressure compensator, preventing it from going into unstable condition, and in turn, to keep the overcenter's pilot pressure value as stable as possible.
Pressure control spools, must always be used with pressure compensated working sections equipped with pilot LS A/B relief valves.

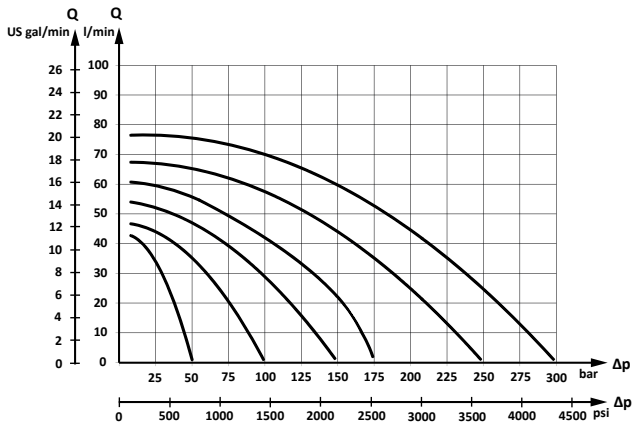
Pressure control spool, normally give a higher degree of stability to whole hydraulic system, however, we advise to look after their use, because:

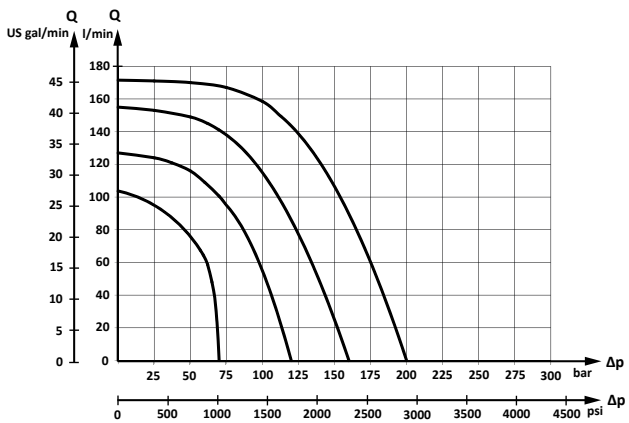
- The valve may loose a bit of pressure compensation, becoming load dependent.
- The pump pressure may be considerably higher than that necessary to move the load.



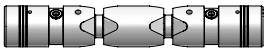


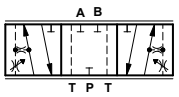
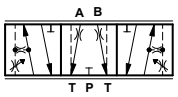
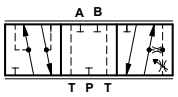
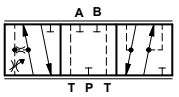
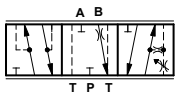
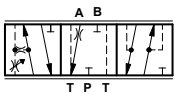






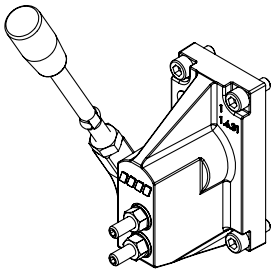
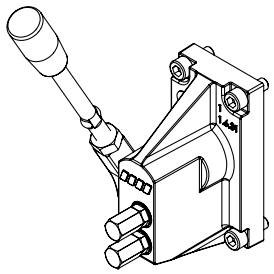
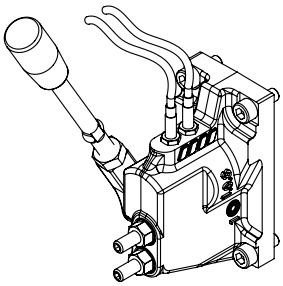
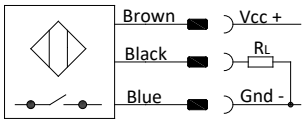
Pressure control spool

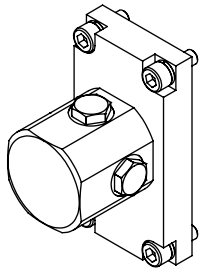
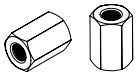


Size	Symbol and code numbers (PC = Pressure control - FC = Flow control)					
						
	4-way, 3-position, A, B closed	4-way, 3-position, A, B throttled open to T	4-way, 3-position, A, B closed	4-way, 3-position, A, B closed	4-way, 3-position, A throttled open to T, B closed	4-way, 3-position, A closed, B throttled open to T
1	**PDS** PC→A + B	**PDS** PC→A + B	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min
	-	-	**PDS** PC→A FC→B, Q=--l/min	-	-	-
2	**PDS** PC→A + B	**PDS** PC→A + B	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min
3	**PDS** PC→A + B	**PDS** PC→A + B	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min
3,5	**PDS** PC→A + B	**PDS** PC→A + B	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min
4	**PDS** PC→A + B	**PDS** PC→A + B	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min	**PDS** PC→A FC→B, Q=--l/min	**PDS** PC→B FC→A, Q=--l/min

Spool centered set, code numbers (needed for any kind of flow control spool)

Tightening torque		Tightening torque
6^{+1}_{0} Nm		6^{+1}_{0} Nm
$53,1^{+8,85}_{0}$ lb*in		$53,1^{+8,85}_{0}$ lb*in
Manual control	**PDR10300101**	
Hydraulic - Electrohydraulic	**PDR10300102**	

<table>
<tr><th>Product</th><th>Description</th><th>Aluminium</th><th>Cast iron</th></tr>
<tr><td rowspan="4">PDM
  </td><td rowspan="4">Mechanical actuation</td><td colspan="2">With lever</td></tr>
<tr><td>PDM20101000</td><td>PDM21101000</td></tr>
<tr><td colspan="2">Without lever</td></tr>
<tr><td>PDM20100000</td><td>PDM21100000</td></tr>
<tr><td>PDM
  </td><td>Mechanical actuation, with flow adjustement nuts protection</td><td>PDM20200000</td><td>PDM21200000</td></tr>
<tr><td rowspan="3">PDM
  </td><td rowspan="3">Mechanical actuations with directional sensors for electrical monitoring of spool valve movement
 

Vcc 10 V ... 30 V
I L < 200 mA</td><td colspan="2">With lever</td></tr>
<tr><td colspan="2">Normally closed: PDM21111000</td></tr>
<tr><td colspan="2">Normally open: PDM21121000</td></tr>
<tr><td rowspan="2">PDF
  </td><td rowspan="2">Friction detent (for mechanical actuation only)</td><td colspan="2">Cast iron only</td></tr>
<tr><td colspan="2">PDF11000000</td></tr>
<tr><td>  </td><td>Flow adjustement protection nuts for PDM mechanical control</td><td colspan="2"></td></tr>
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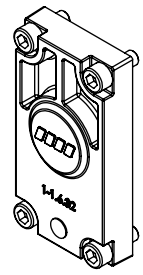
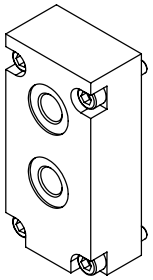
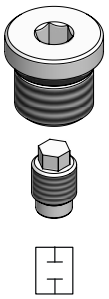
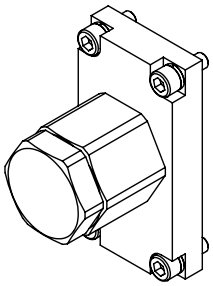
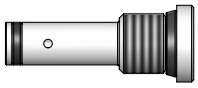
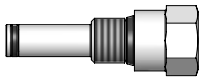
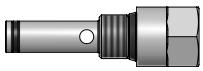
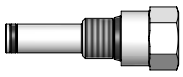
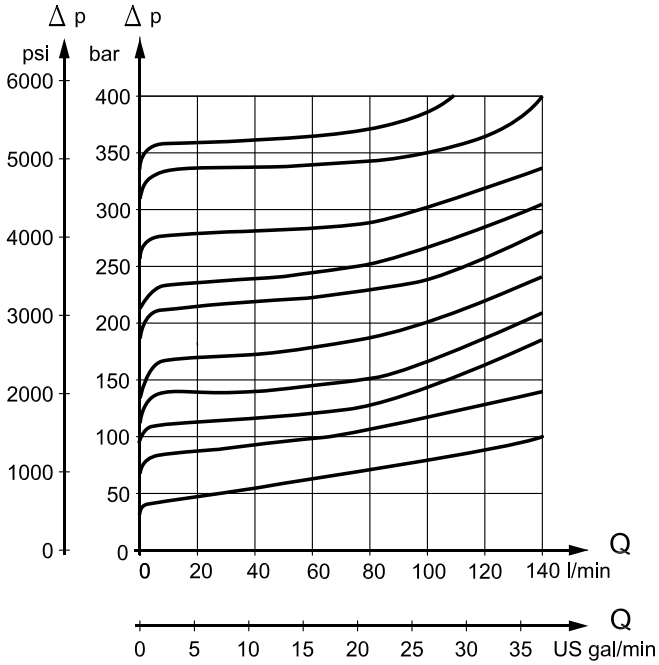
Product	Description	Aluminium	Cast iron
PDC 	Rear cover for mechanical actuation	**PDC00010000**	**PDC10010000**
PDH 	Hydraulic actuation	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PDH10000000**	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PDH11000000**
		A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PDH10000100**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PDH11000100**
	Pilot LS A/B relief valve	50 ÷ 80 bar	**PLS0A100000**
		81 ÷ 380 bar	**PLS0A400000**
	Plug for pilot LS A/B relief valve cavity	**PLS0P000000**	

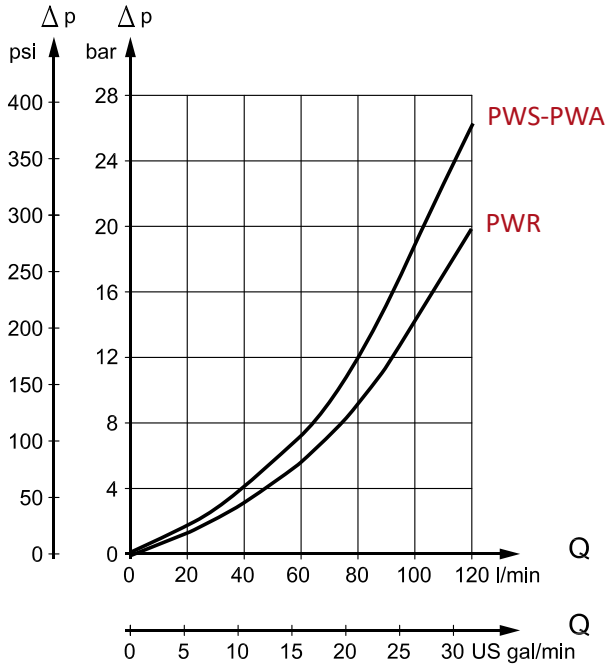
Product	Description	Aluminium	Cast iron
PDD 	Mechanical spool lock device, manual release	P→A - lock P→B - free **PDD10100000**	
		P→A - free P→B - lock **PDD10010000**	
		P→A - lock P→B - lock **PDD10110000**	
		P→A - float P→B - free **PDD10200000**	
		P→A - free P→B - float **PDD10020000**	

Product	Description	Code numbers	
PIZ 	For PDI with internal pilot oil supply	**PIZ10000000**	
PIY 	For PDI with external pilot oil supply	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PIY10000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PIY10000010**
	For PDE with external drain line electrical actuation	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PED10000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PED10000010**
	For PDE with internal drain line electrical actuation	**PEI10000000**	
	For PDE with LS carry-over	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PED20000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PED20000010**
	For PDE prearranged LS carry-over	**PEI10000000**	

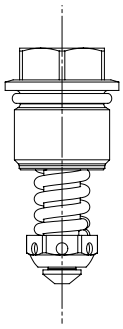
PWS, PWA and PWB are shock suction valves design to absorb shock effects only, and they should never be used as a pressure relief valves.
PWS, PWA and PWB are set at an oil flow of 10 l/min.
If the hydraulic actuator requires a pressure relief valve function, a PDW module with built-in LS A/B pilot pressure limit valves should be used

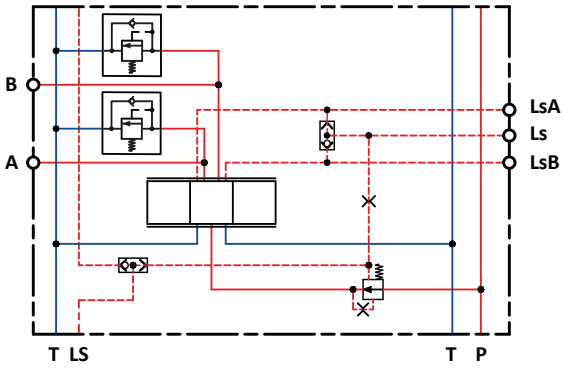


PWR suction valve



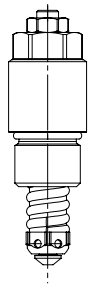
PWS shock and suction valve for A/B port. **Not adjustable**

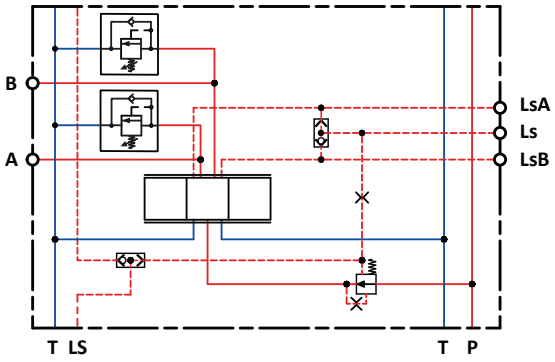




Setting Pressure*(bar)*	Code numbers
50	**PWS1M200050**
70	**PWS1M200070**
90	**PWS1M200090**
110	**PWS1M200110**
130	**PWS1M200130**
150	**PWS1M200150**
180	**PWS1M200180**
200	**PWS1M200200**
230	**PWS1M200230**
260	**PWS1M200260**
290	**PWS1M200290**
320	**PWS1M200320**
350	**PWS1M200350**
380	**PWS1M200380**

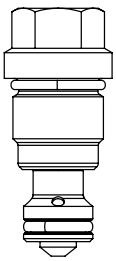
PWA shock and suction valve for A/B port. **Adjustable**

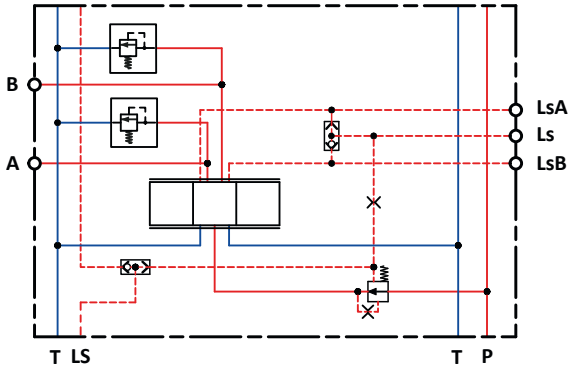




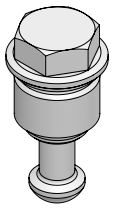
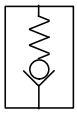
Range setting *(bar)*	Code numbers
20 ÷ 100	**PWA1M200S00**
101 ÷ 170	**PWA1M200T00**
171 ÷ 250	**PWA1M200F00**
251 ÷ 350	**PWA1M200C00**
351 ÷ 420	**PWA1M200R00**

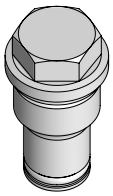
PWB shock valve for A/B port. **Not adjustable**





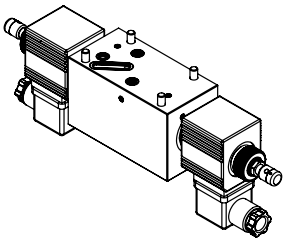
Setting pressure*(bar)*	Code numbers
50	**PWB1M200050**
70	**PWB1M200070**
90	**PWB1M200090**
110	**PWB1M200110**
130	**PWB1M200130**
150	**PWB1M200150**
180	**PWB1M200180**
200	**PWB1M200200**
230	**PWB1M200230**
260	**PWB1M200260**
290	**PWB1M200290**
320	**PWB1M200320**
350	**PWB1M200350**
380	**PWB1M200380**

PWR suction valve for A/B port		
Product	Hydraulic diagram	Code numbers
		**PWR1M200000**

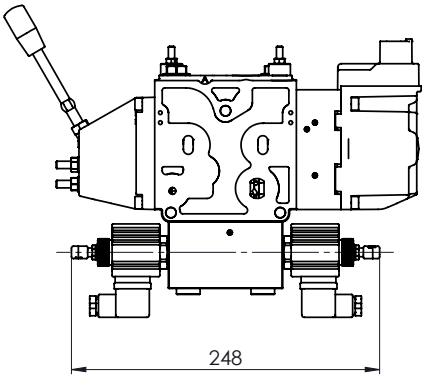
Plug for **PWS - PWA - PWB** and **PWR** cavity		
Product	Hydraulic diagram	Code numbers
		**PWP1M200000**

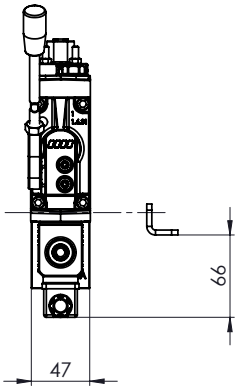
OMFB
HYDRAULIC POWER CONTROL

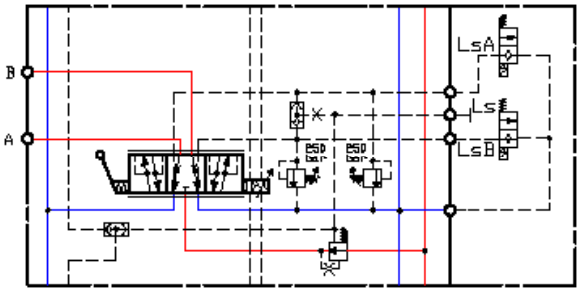
PDV74 Proportional Valve
PDL module - **Electrical LS$_{A/B}$ unloading**
ON-OFF actuation normally closed

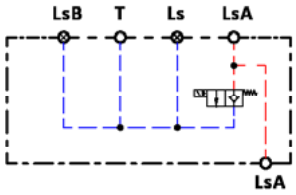
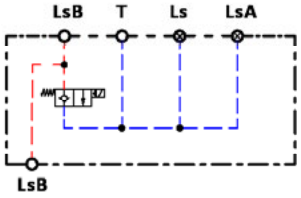
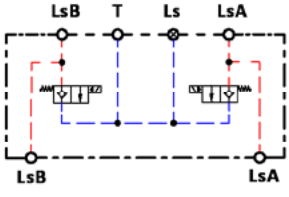
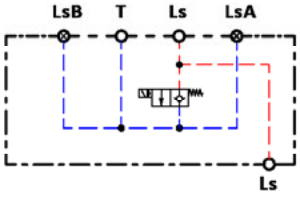


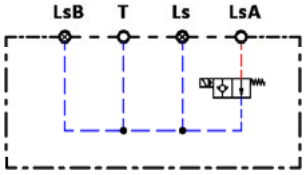
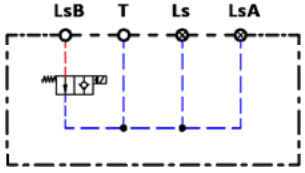
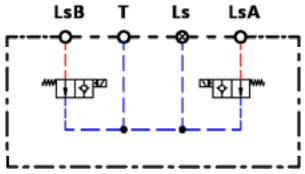
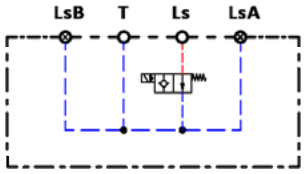
When PDL is energized, the piloting signal is lead to tank and in turn the work port oil flow will be cutted off.
PDL modules is always to be matched with PDW pressure compesated.





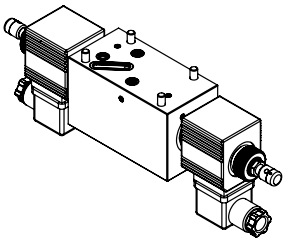


PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL12C11201**	**PDL12C31201**
	Deutsch Perpendicular	**PDL12C12201**	**PDL12C32201**
	DIN	**PDL12C13201**	**PDL12C33201**
	JPT	**PDL12C14201**	**PDL12C34201**
Active on LsB 	Deutsch Parallel	**PDL13C11201**	**PDL13C31201**
	Deutsch Perpendicular	**PDL13C12201**	**PDL13C32201**
	DIN	**PDL13C13201**	**PDL13C33201**
	JPT	**PDL13C14201**	**PDL13C34201**
Active on LsA and LsB 	Deutsch Parallel	**PDL11C11201**	**PDL11C31201**
	Deutsch Perpendicular	**PDL11C12201**	**PDL11C32201**
	DIN	**PDL11C13201**	**PDL11C33201**
	JPT	**PDL11C14201**	**PDL11C34201**
Active on Ls 	Deutsch Parallel	**PDL14C11201**	**PDL14C31201**
	Deutsch Perpendicular	**PDL14C12201**	**PDL14C32201**
	DIN	**PDL14C13201**	**PDL14C33201**
	JPT	**PDL14C14201**	**PDL14C34201**

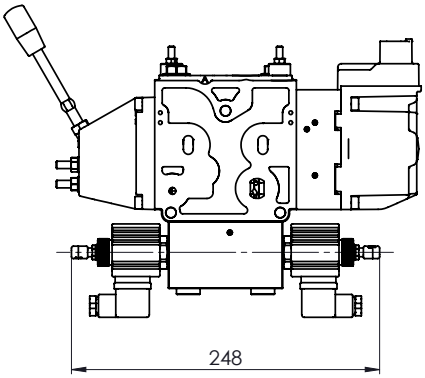
PDL code numbers			
Normally open module	**Connector type**	**12V**	**24V**
Active on LsA 	Deutsch Parallel	**PDL32A11101**	**PDL32A31101**
	Deutsch Perpendicular	**PDL32A12101**	**PDL32A32101**
	DIN	**PDL32A13101**	**PDL32A33101**
	JPT	**PDL32A14101**	**PDL32A34101**
Active on LsB 	Deutsch Parallel	**PDL33A11101**	**PDL33A31101**
	Deutsch Perpendicular	**PDL33A12101**	**PDL33A32101**
	DIN	**PDL33A13101**	**PDL33A33101**
	JPT	**PDL33A14101**	**PDL33A34101**
Active on LsA and LsB 	Deutsch Parallel	**PDL35A11101**	**PDL35A31101**
	Deutsch Perpendicular	**PDL35A12101**	**PDL35A32101**
	DIN	**PDL35A13101**	**PDL35A33101**
	JPT	**PDL35A14101**	**PDL35A34101**
Active on Ls 	Deutsch Parallel	**PDL34A11101**	**PDL34A31101**
	Deutsch Perpendicular	**PDL34A12101**	**PDL34A32101**
	DIN	**PDL34A13101**	**PDL34A33101**
	JPT	**PDL34A14101**	**PDL34A34101**

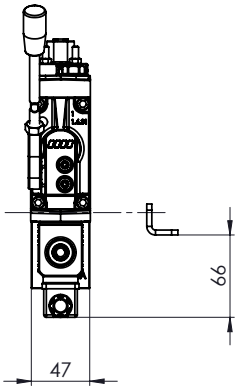
OMFB
HYDRAULIC POWER CONTROL

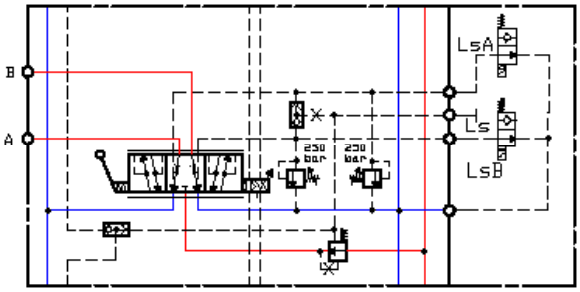
PDV74 Proportional Valve
PDL module - **Electrical LS$_{A/B}$ unloading**
ON-OFF actuation normally open

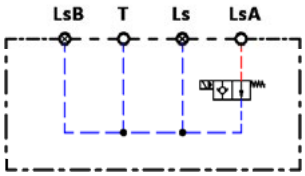
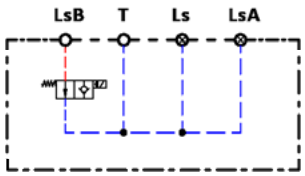
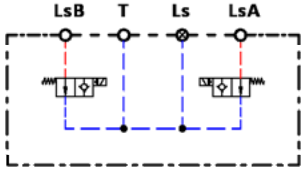
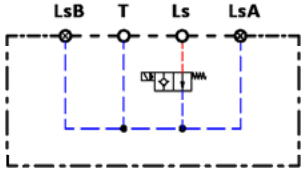


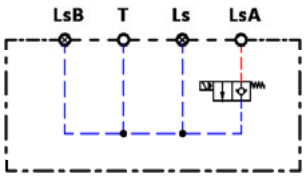
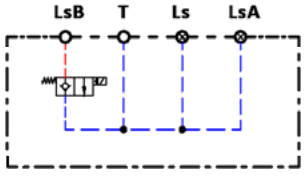
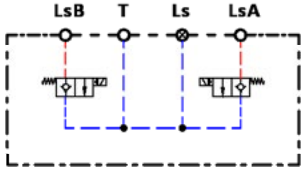
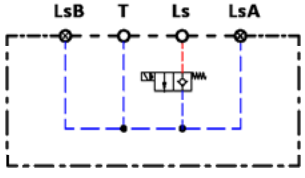
When PDL is deenergized, the piloting signal is lead to tank and in turn the work port oil flow will be cutted off.
PDL modules is always to be matched with PDW pressure compesated.





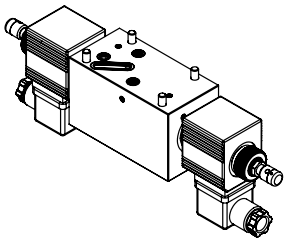


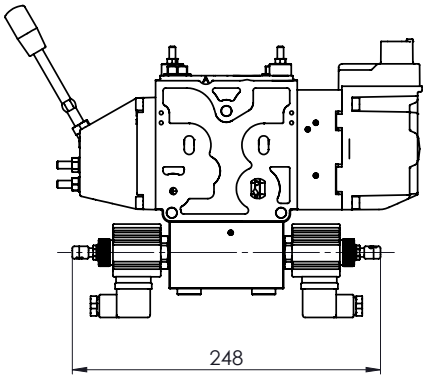
PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL32A11101**	**PDL32A31101**
	Deutsch Perpendicular	**PDL32A12101**	**PDL32A32101**
	DIN	**PDL32A13101**	**PDL32A33101**
	JPT	**PDL32A14101**	**PDL32A34101**
Active on LsB 	Deutsch Parallel	**PDL33A11101**	**PDL33A31101**
	Deutsch Perpendicular	**PDL33A12101**	**PDL33A32101**
	DIN	**PDL33A13101**	**PDL33A33101**
	JPT	**PDL33A14101**	**PDL33A34101**
Active on LsA and LsB 	Deutsch Parallel	**PDL35A11101**	**PDL35A31101**
	Deutsch Perpendicular	**PDL35A12101**	**PDL35A32101**
	DIN	**PDL35A13101**	**PDL35A33101**
	JPT	**PDL35A14101**	**PDL35A34101**
Active on Ls 	Deutsch Parallel	**PDL34A11101**	**PDL34A31101**
	Deutsch Perpendicular	**PDL34A12101**	**PDL34A32101**
	DIN	**PDL34A13101**	**PDL34A33101**
	JPT	**PDL34A14101**	**PDL34A34101**

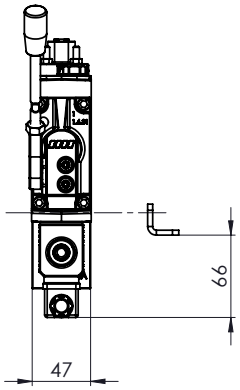
PDL code numbers			
Normally closed module	**Connector type**	**12V**	**24V**
Active on LsA 	Deutsch Parallel	**PDL32C11201**	**PDL32C31201**
	Deutsch Perpendicular	**PDL32C12201**	**PDL32C32201**
	DIN	**PDL32C13201**	**PDL32C33201**
	JPT	**PDL32C14201**	**PDL32C34201**
Active on LsB 	Deutsch Parallel	**PDL33C11201**	**PDL33C31201**
	Deutsch Perpendicular	**PDL33C12201**	**PDL33C32201**
	DIN	**PDL33C13201**	**PDL33C33201**
	JPT	**PDL33C14201**	**PDL33C34201**
Active on LsA and LsB 	Deutsch Parallel	**PDL35C11201**	**PDL35C31201**
	Deutsch Perpendicular	**PDL35C12201**	**PDL35C32201**
	DIN	**PDL35C13201**	**PDL35C33201**
	JPT	**PDL35C14201**	**PDL35C34201**
Active on Ls 	Deutsch Parallel	**PDL34C11201**	**PDL34C31201**
	Deutsch Perpendicular	**PDL34C12201**	**PDL34C32201**
	DIN	**PDL34C13201**	**PDL34C33201**
	JPT	**PDL34C14201**	**PDL34C34201**

OMFB
HYDRAULIC POWER CONTROL

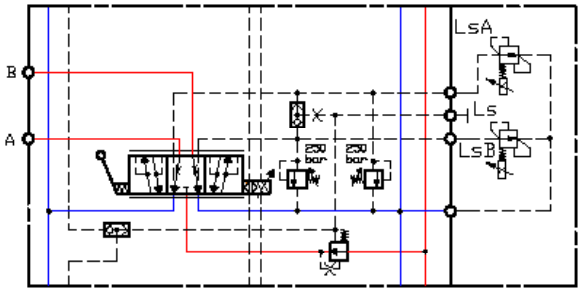
PDV114 Proportional Valve
PDLD module - **Electrical LS$_{A/B}$ unloading**
Proportional actuation normally open (current signal mA)

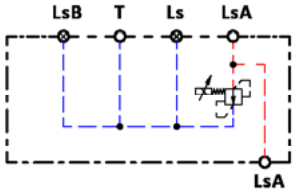
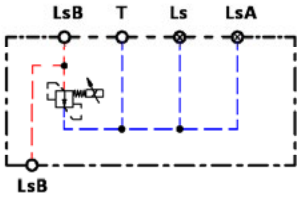
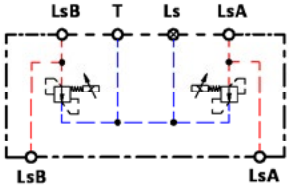
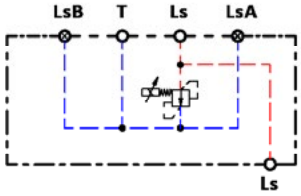




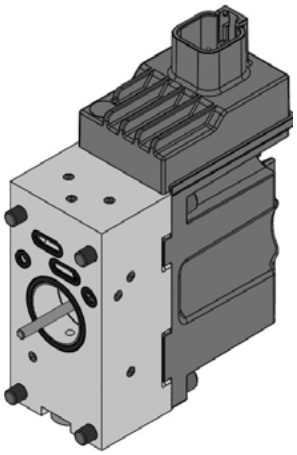


PDLD is an electro-hydraulic device that allows the A/B port working pressure to be remotely an proportionally operated according to a current signal (mA). When the working pressure exceed the setting pressure value, the A/B port oil flow will be cutted off.
When PDLD is not energized, PDW is almost pressureless, as well as the A-B oil flow is cutted off.



PDLD code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL12D11001**	**PDL12D31001**
Active on LsB 	Deutsch Parallel	**PDL13D11001**	**PDL13D31001**
Active on LsA and LsB 	Deutsch Parallel	**PDL11D11001**	**PDL11D31001**
Active on Ls 	Deutsch Parallel	**PDL14D11001**	**PDL14D31001**

PDV114 - PEAC121 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc



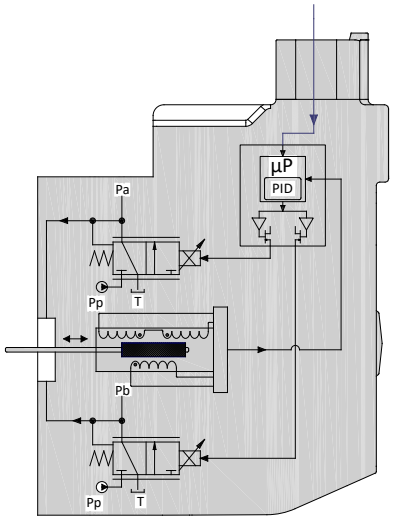
PEAC121 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC121 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version

Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.



Passive fault monitoring

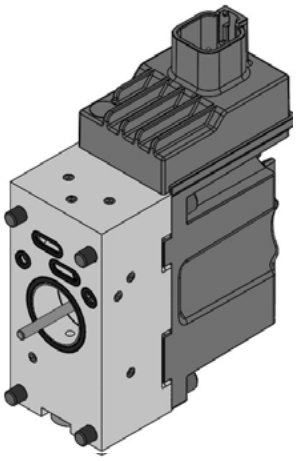
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC121 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC121 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV114 - PEAC121 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc

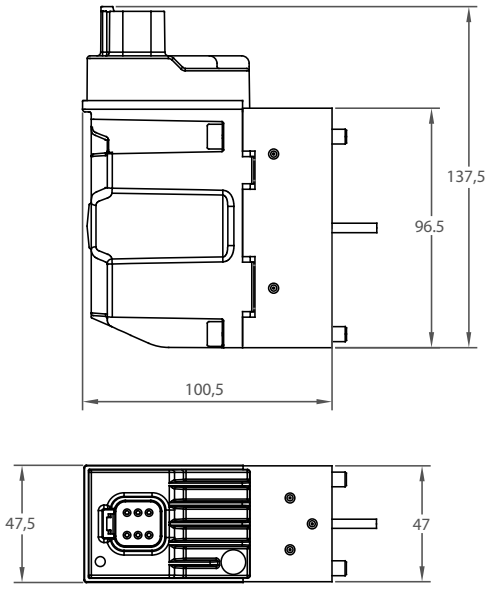


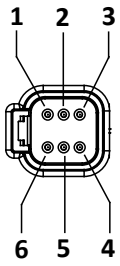
PEAC121 is defined by:

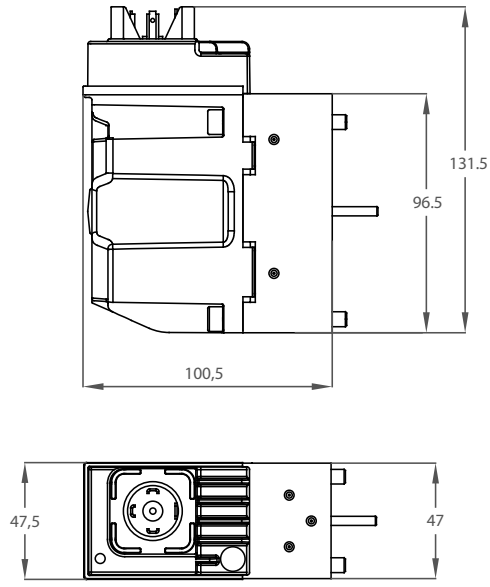
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power

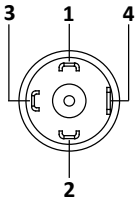
PEAC121 Technical data		
Rated supply voltage		**10 ÷ 30 Vdc**
Max ripple		**5%**
Signal control		**0,5 Udc**
Range control signal		**0,25 Udc to 0,75 Udc**
Neutral spool position		**0,5 Udc**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV114 - PEAC121 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 0,5 Udc - Electrical connectors



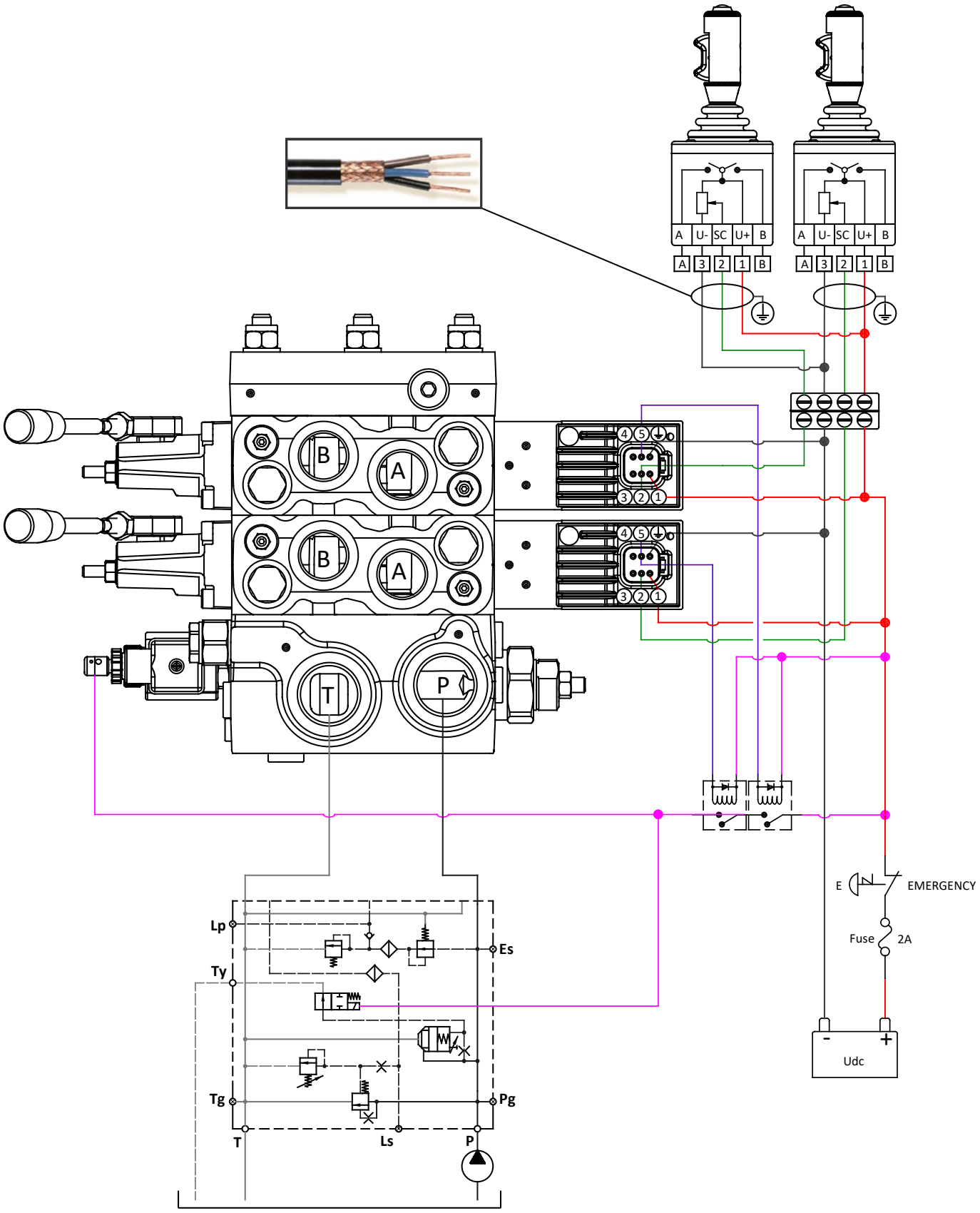
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment			
	**1**	Power supply	
	2	Input signal control	
	3	CAN-high	**A** port-spool movement signal
	4	CAN-low	**B** port-spool movement signal
	5	Fault monitoring signal	
	6	Ground	



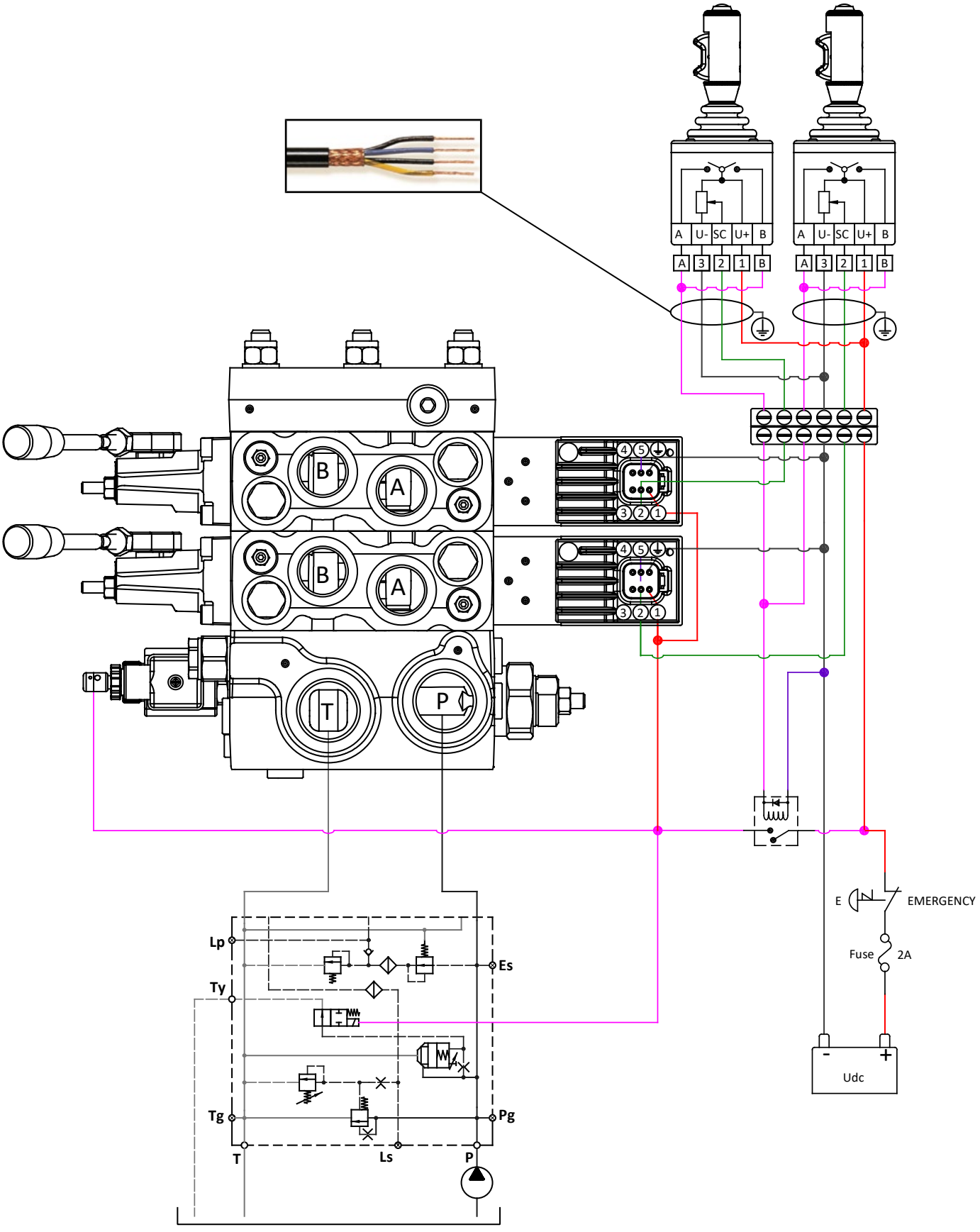
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Fault monitoring signal
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0141000**	**PEAC1141000**	**PEAC0131000**	**PEAC1131000**
DIN 43650	**PEAC0141200**	**PEAC1141200**	**PEAC0131200**	**PEAC1131200**

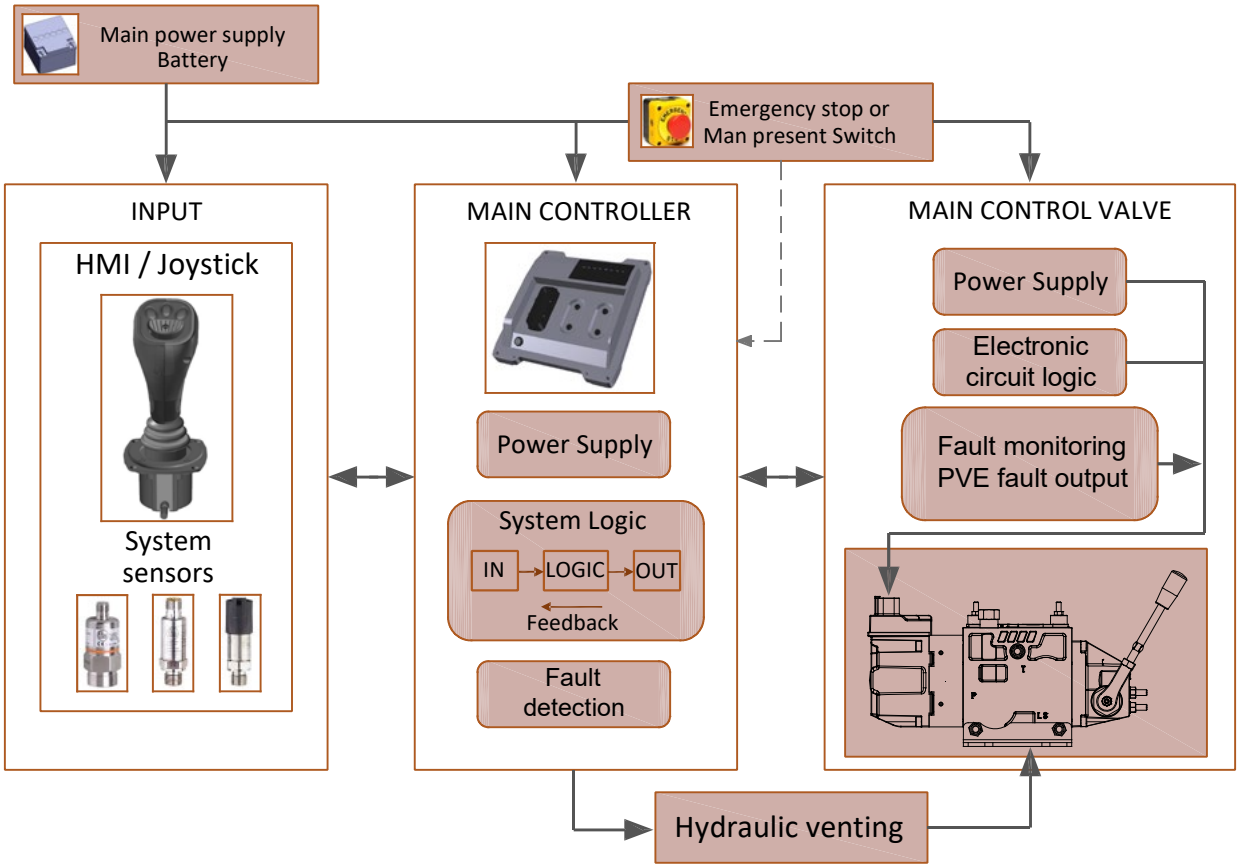
PDV114 - PEAC121 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc



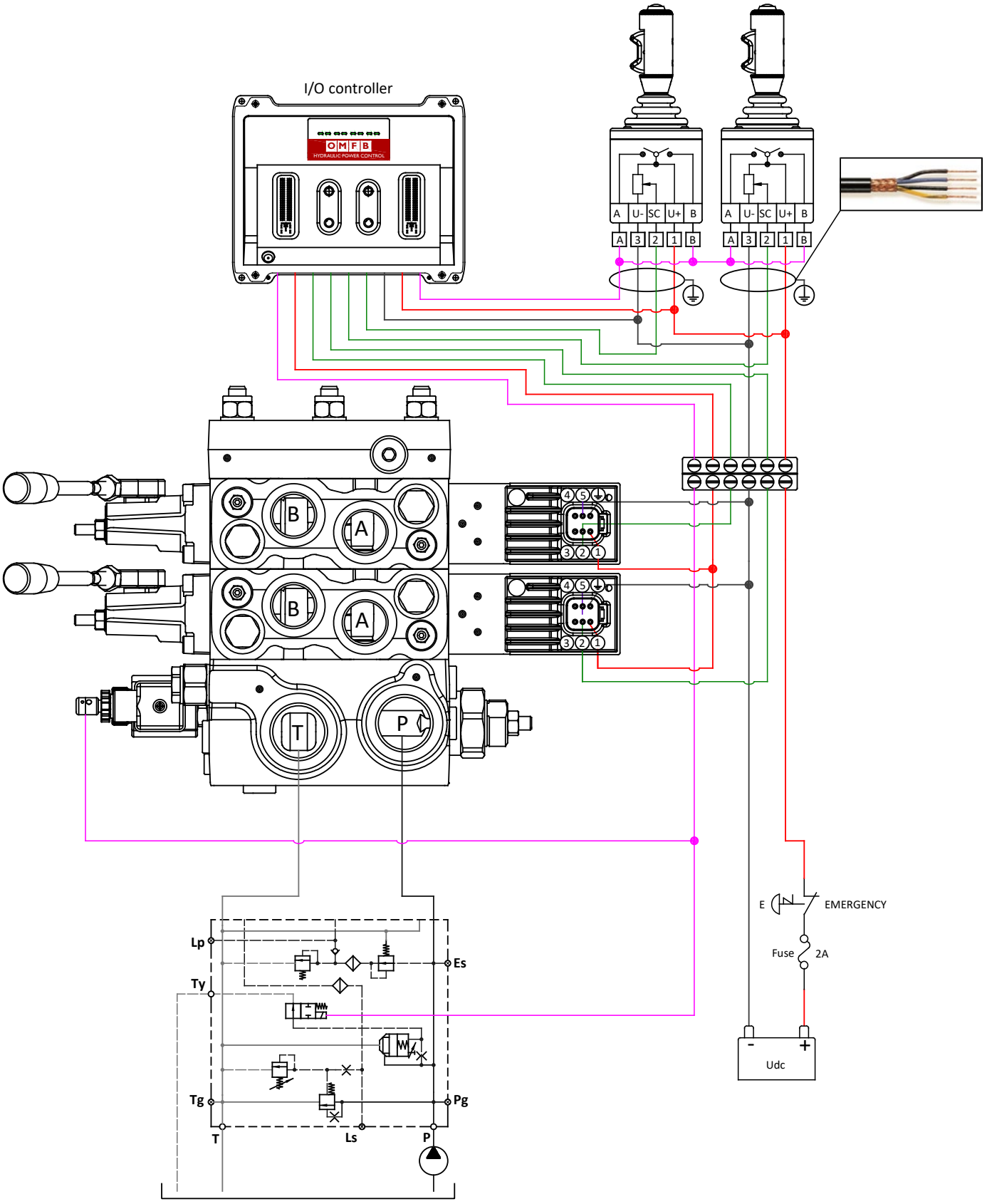
PDV114 - PEAC121 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc



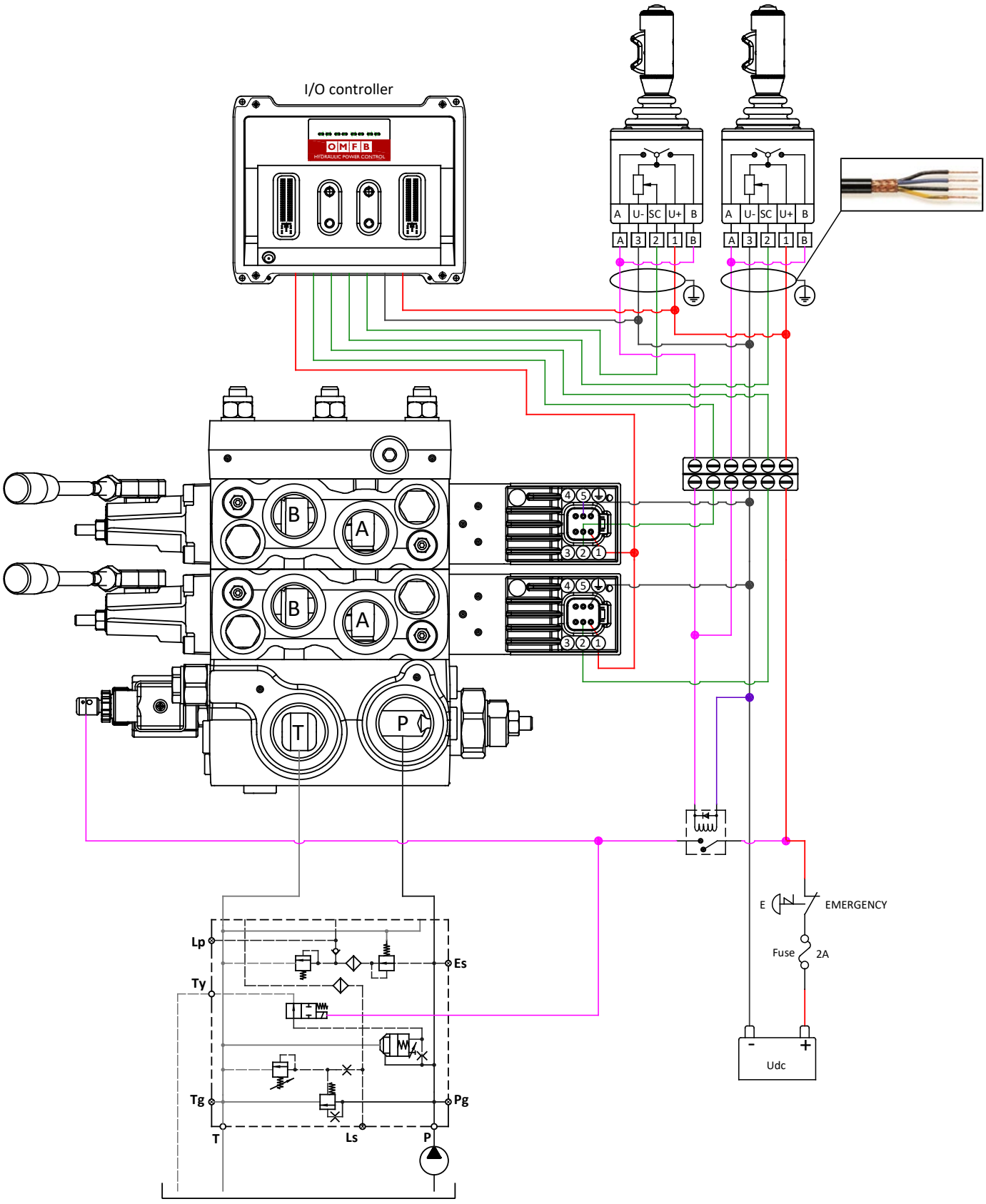
PDV114 - PEAC121 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



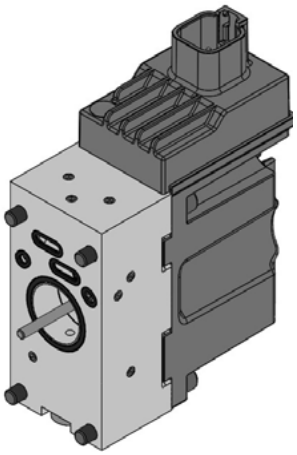
PDV114 - PEAC121 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV114 - PEAC121 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV114 - PEAC122 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



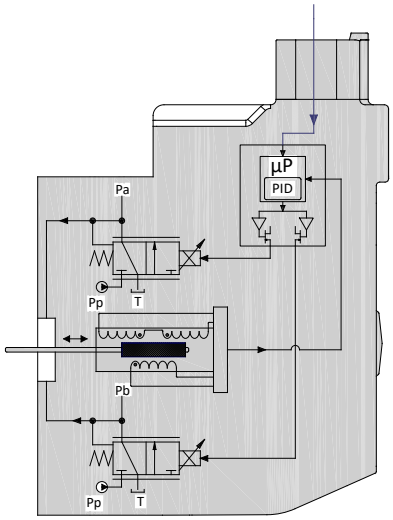
PEAC122 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC122 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version

Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.



Passive fault monitoring

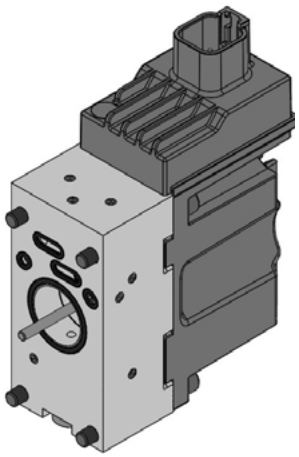
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC122 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC122 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV114 - PEAC122 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

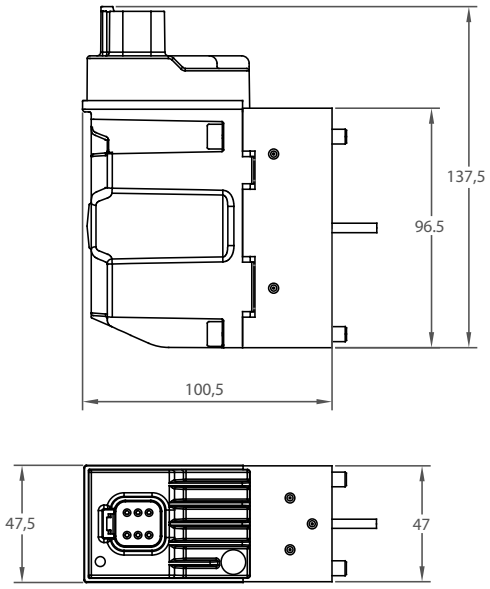


PEAC122 is defined by:

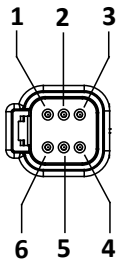
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace to
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power

PEAC122 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0-10 V**
Range control signal		**2,5 V to 7,5 V**
Neutral spool position		**5 V**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

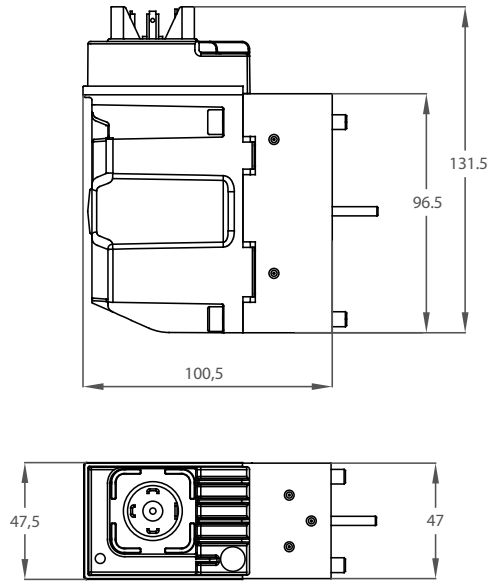
PDV114 - PEAC122 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 0 ÷ 10 V - Electrical connectors



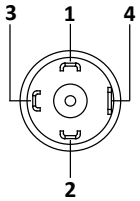
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply	
2	Input signal control	
3	CAN-high	**A** port-spool movement signal
4	CAN-low	**B** port-spool movement signal
5	Fault monitoring signal	
6	Ground	



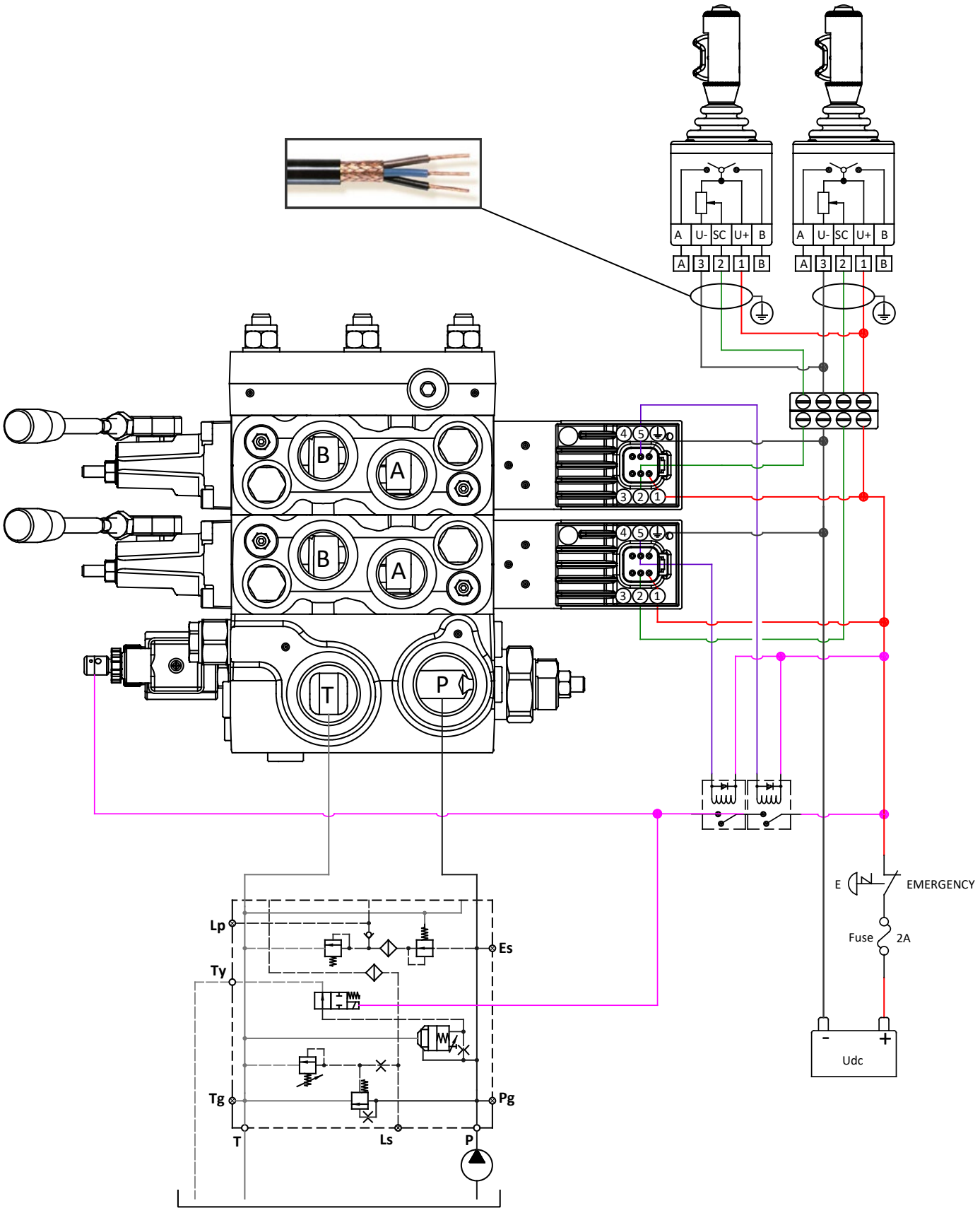
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



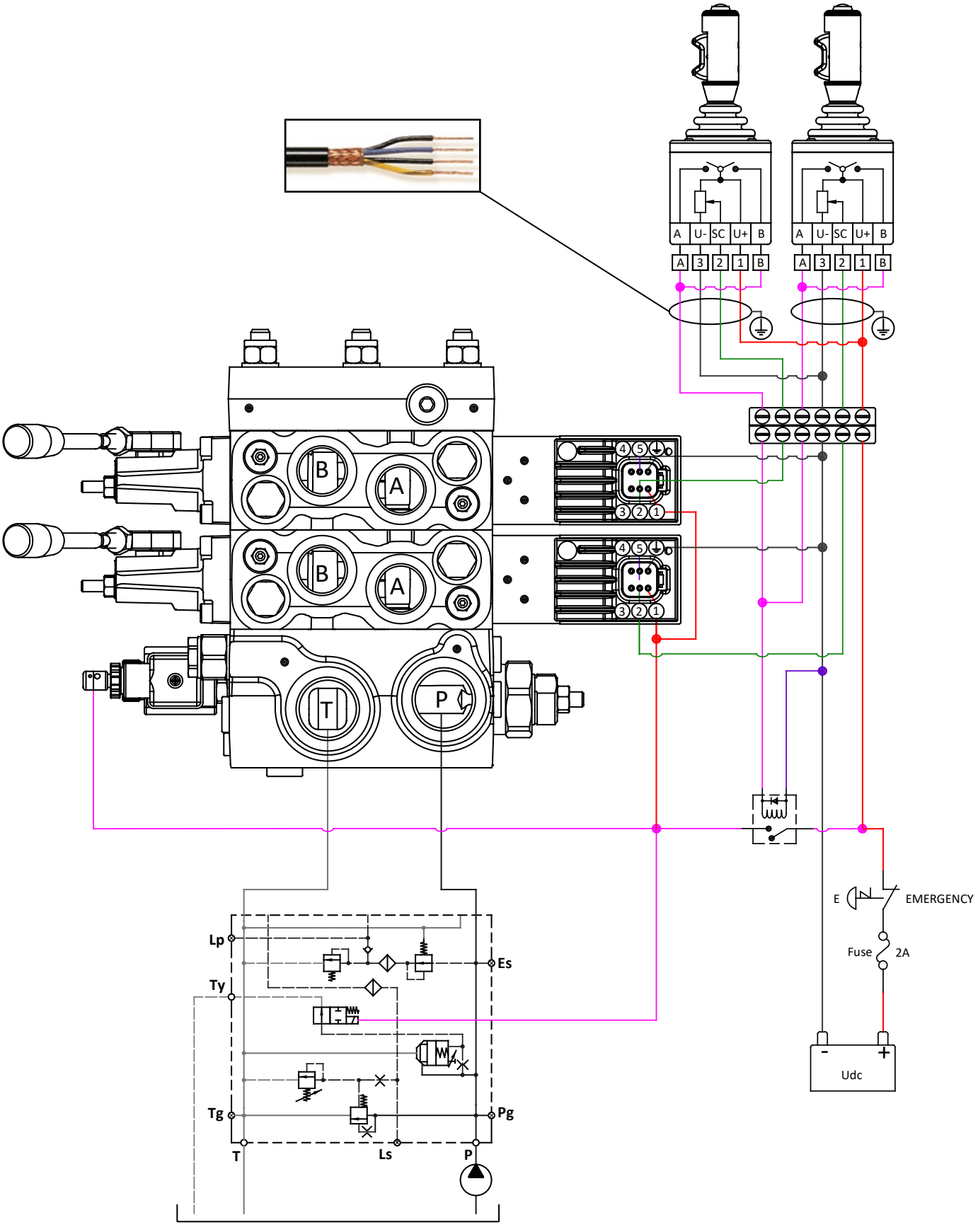
1	Power supply
2	Input signal control
3	Fault monitoring signal
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0142000**	**PEAC1142000**	**PEAC0132000**	**PEAC1132000**
DIN 43650	**PEAC0142200**	**PEAC1142200**	**PEAC0132200**	**PEAC1132200**

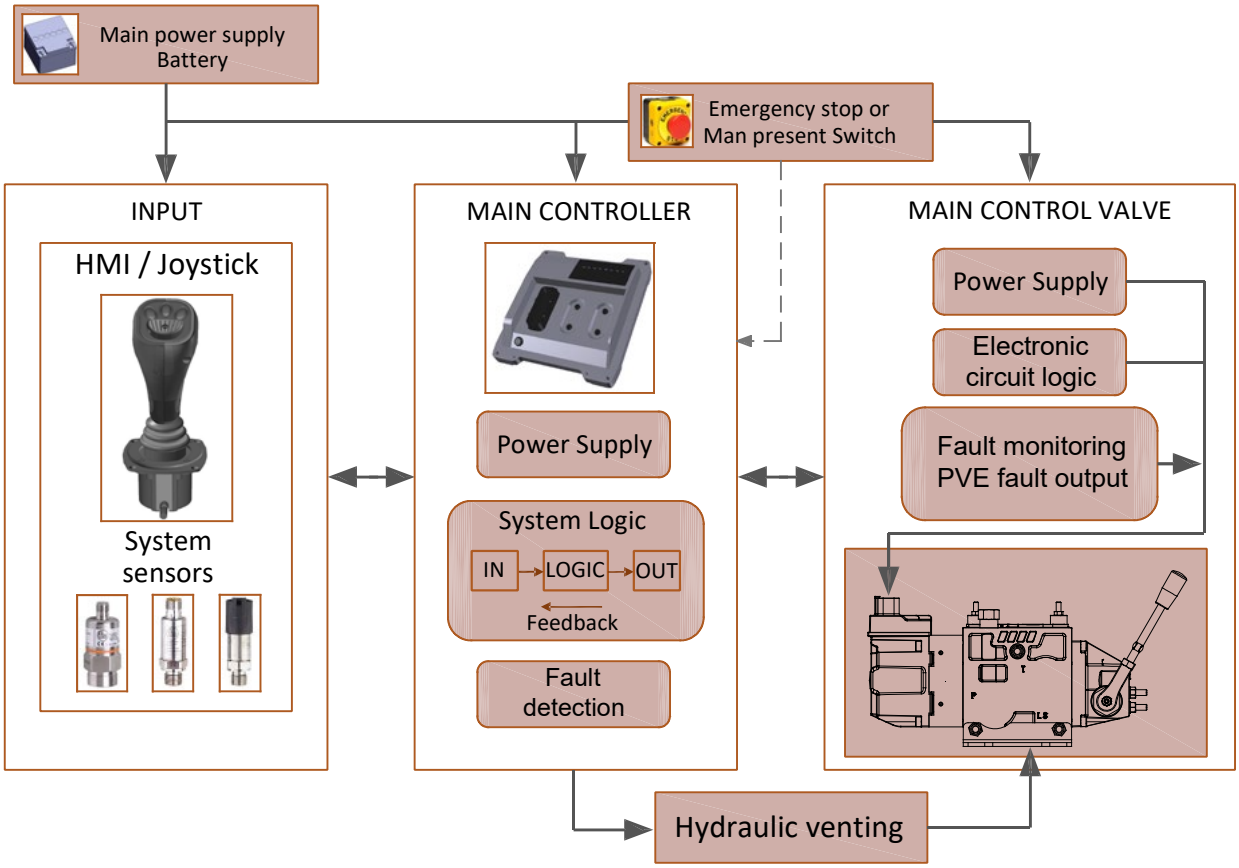
PDV114 - PEAC122 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



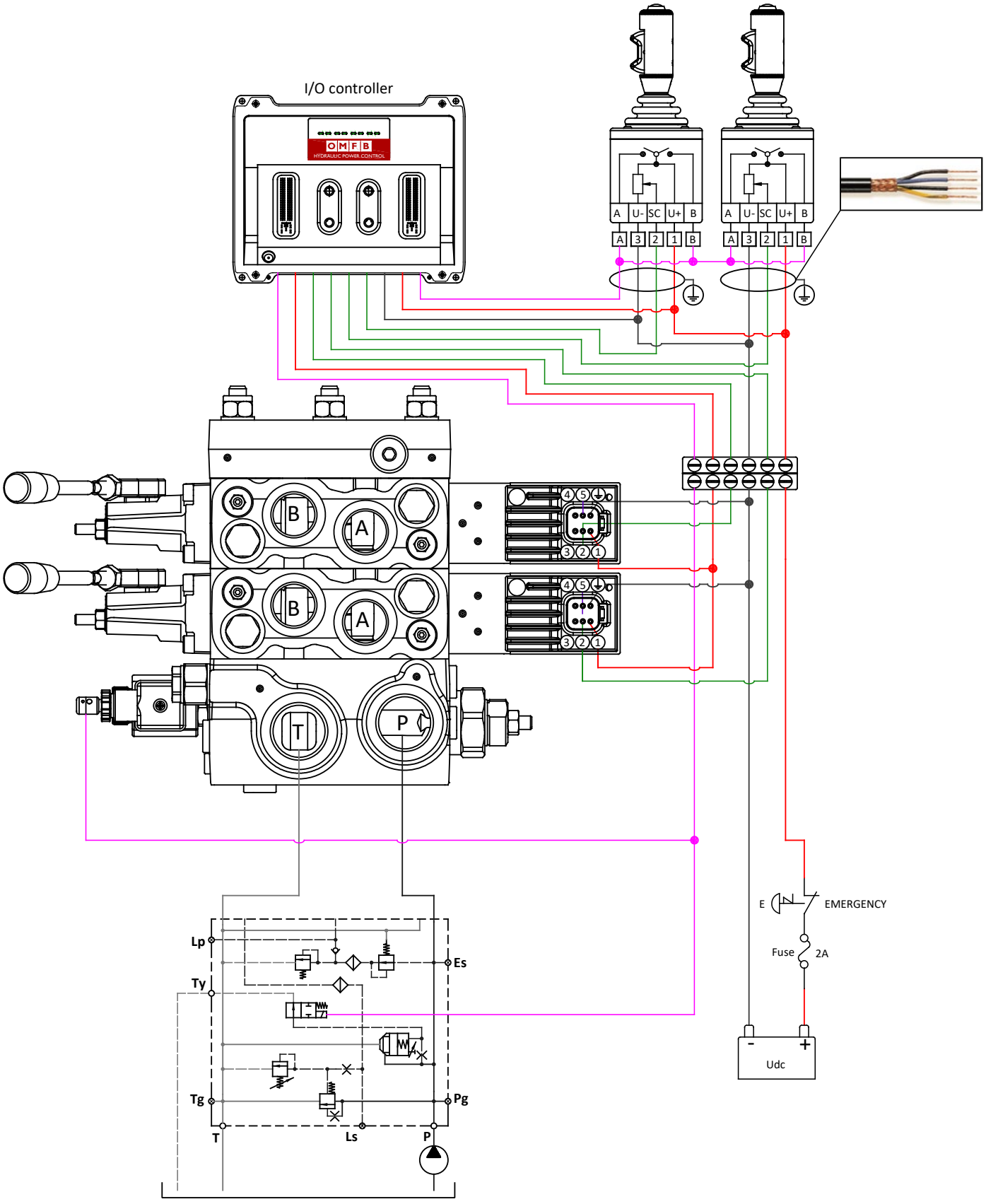
PDV114 - PEAC122 Electro-hydraulic proportional actuation.
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



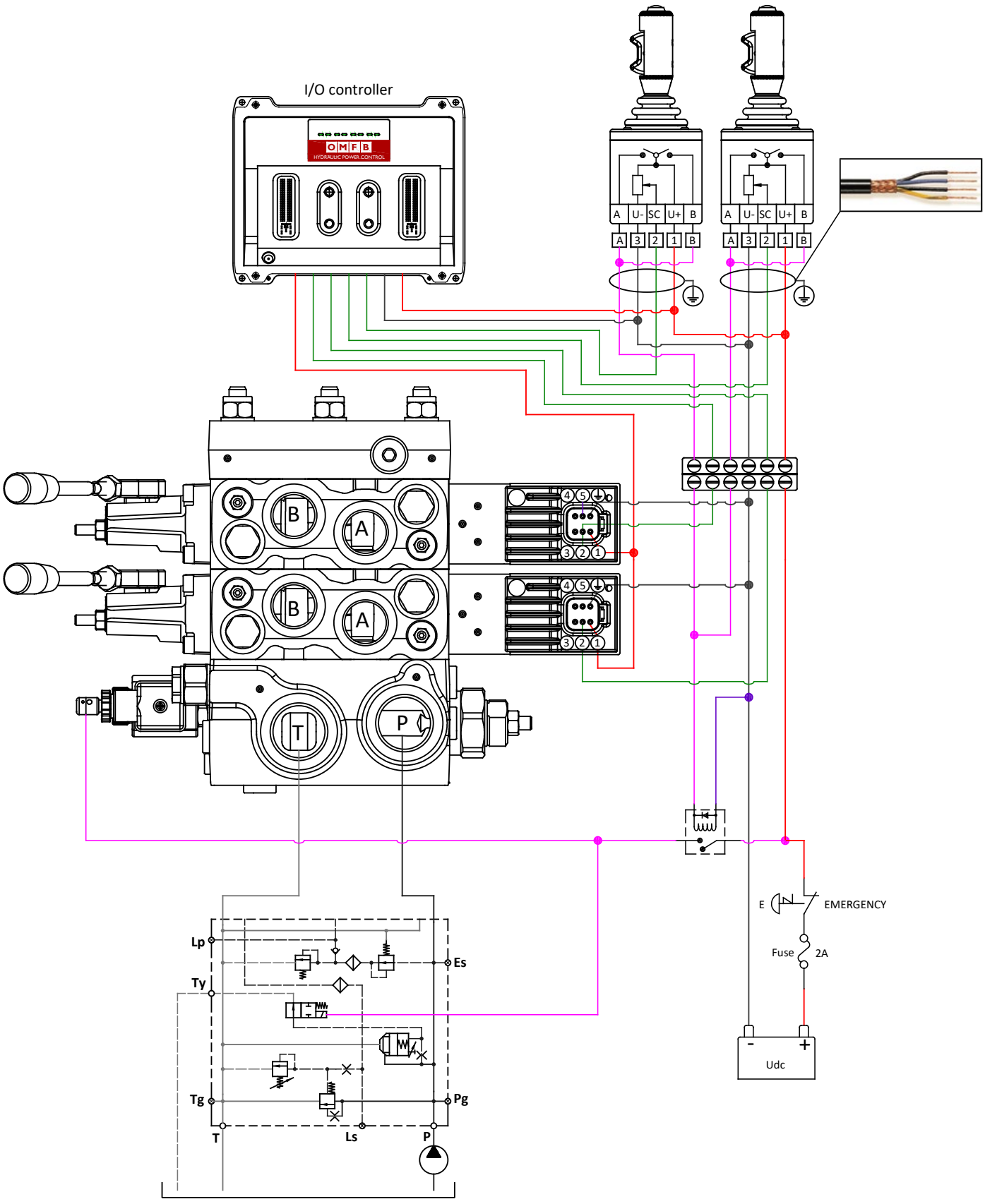
PDV114 - PEAC122 Electro-hydraulic proportional actuation.
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



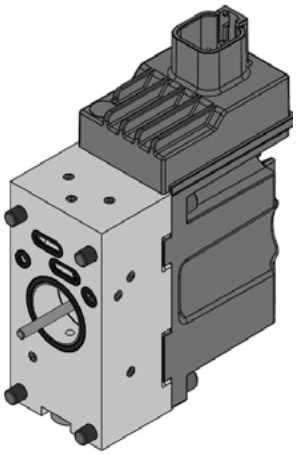
PDV114 - PEAC122 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



PDV114 - PEAC122 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



PDV114 - PEAC126 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 4 ÷ 20 mA



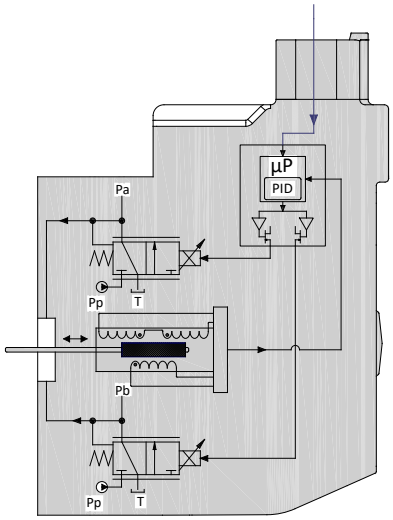
PEAC126 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC126 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version

Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.



Passive fault monitoring

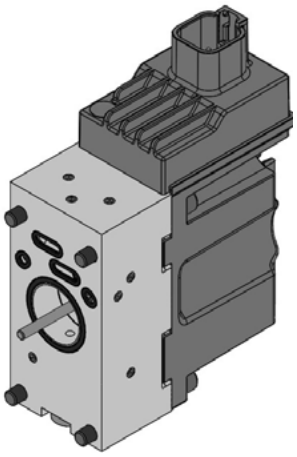
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC126 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC126 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV114 - PEAC126 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA

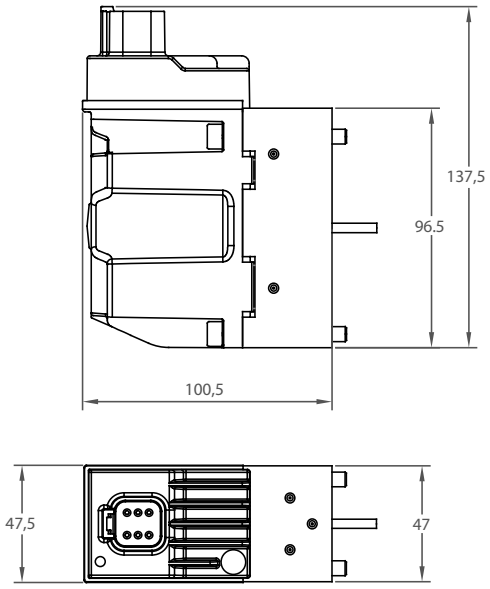


PEAC126 is defined by:

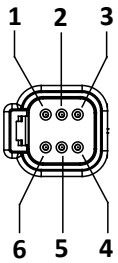
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAC126 Technical data		
Rated supply voltage		**10 ÷ 30 Vdc**
Max ripple		**5%**
Signal control		**4 ÷ 20 mA**
Range control signal		**4 mA to 20 mA**
Neutral spool position		**12 mA**
Max threshold signal, **A** port		**1,5 mA**
Max threshold signal, **B** port		**1,5 mA**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**220 Ω**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50 ÷ 200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP65 - IP66 - IP69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available with Deutsch connector DT06-6S, only		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 ÷ 140 ms**
	From max spool travel to neutral	**70 ÷ 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 ÷ 170 ms**
	From max spool travel to neutral	**70 ÷ 90 ms**

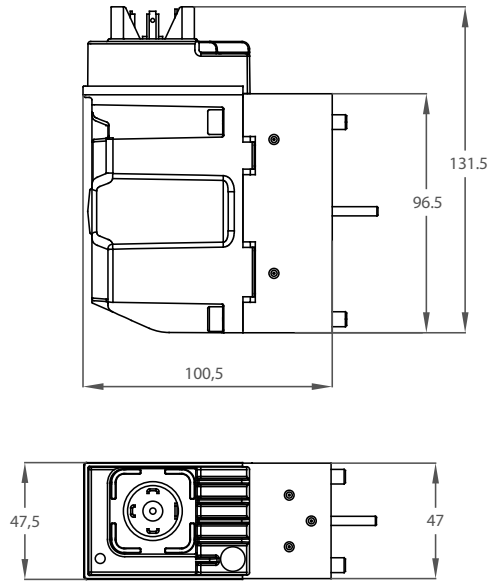
PDV114 - PEAC126 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA - Electrical connectors



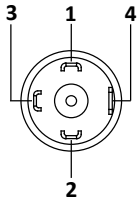
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply	
2	Input signal control	
3	CAN-high	**A** port-spool movement signal
4	CAN-low	**B** port-spool movement signal
5	Fault monitoring signal	
6	Ground	



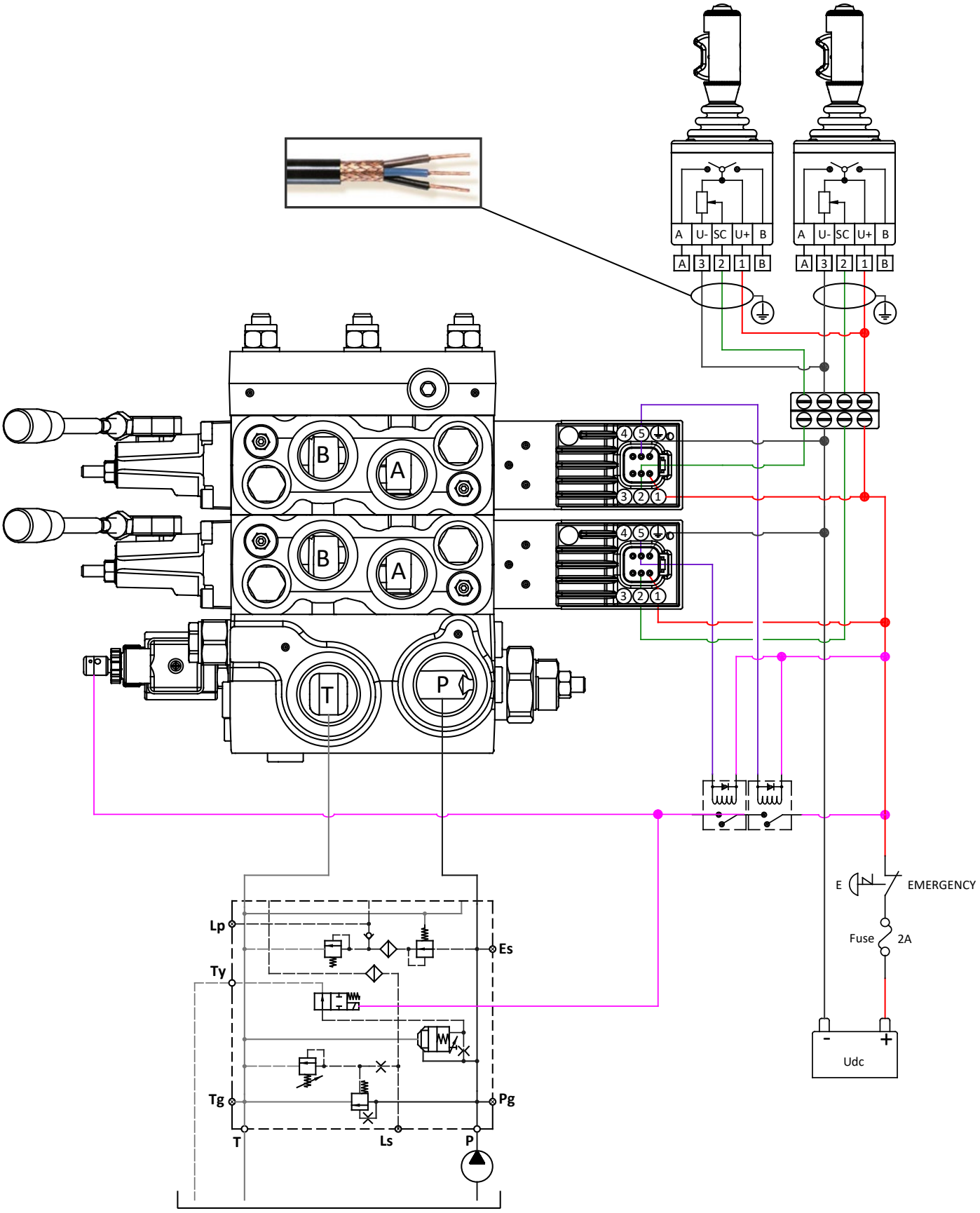
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



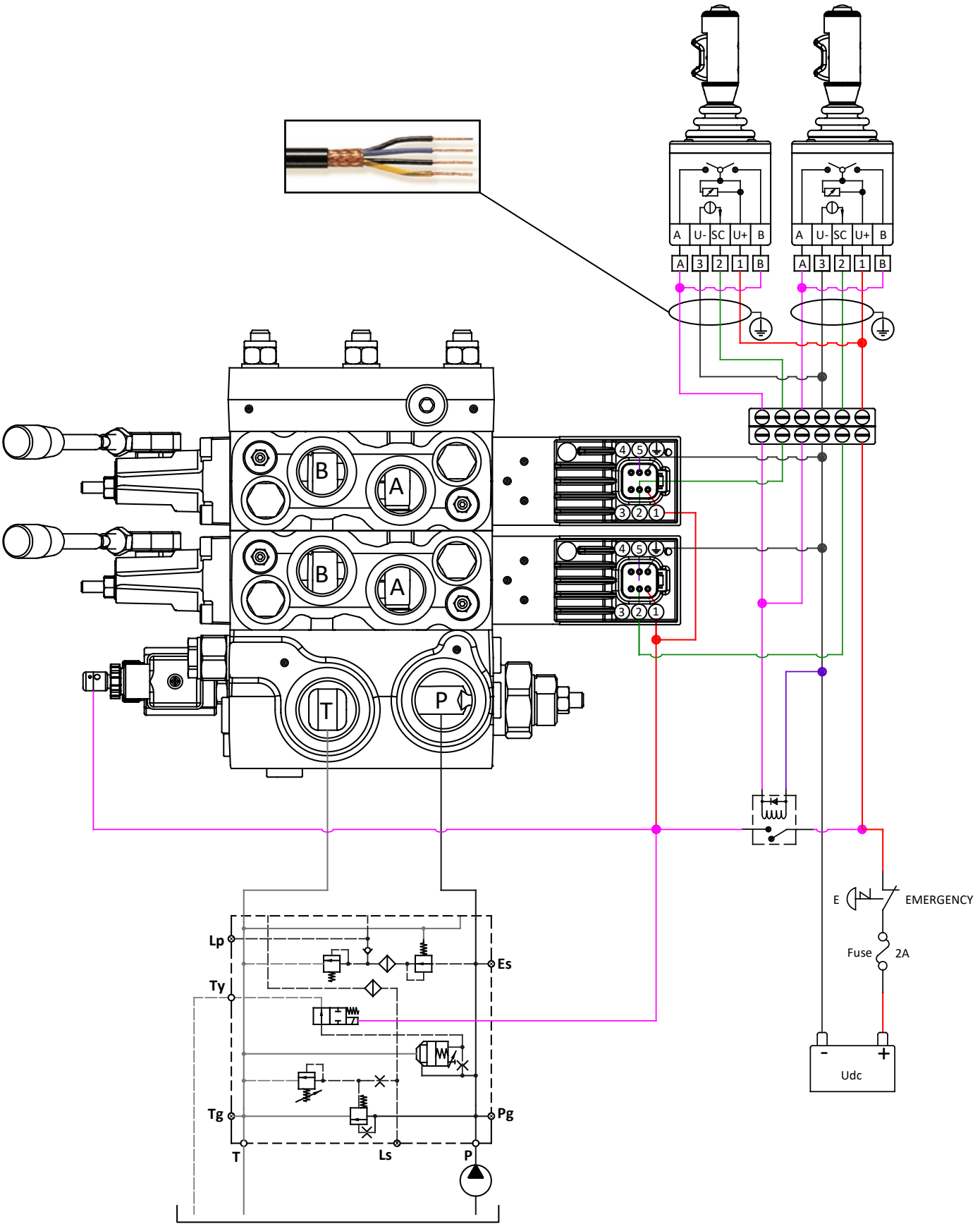
1	Power supply
2	Input signal control
3	Fault monitoring signal
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0146000**	**PEAC1146000**	**PEAC0136000**	**PEAC1136000**
DIN 43650	**PEAC0146200**	**PEAC1146200**	**PEAC0136200**	**PEAC1136200**

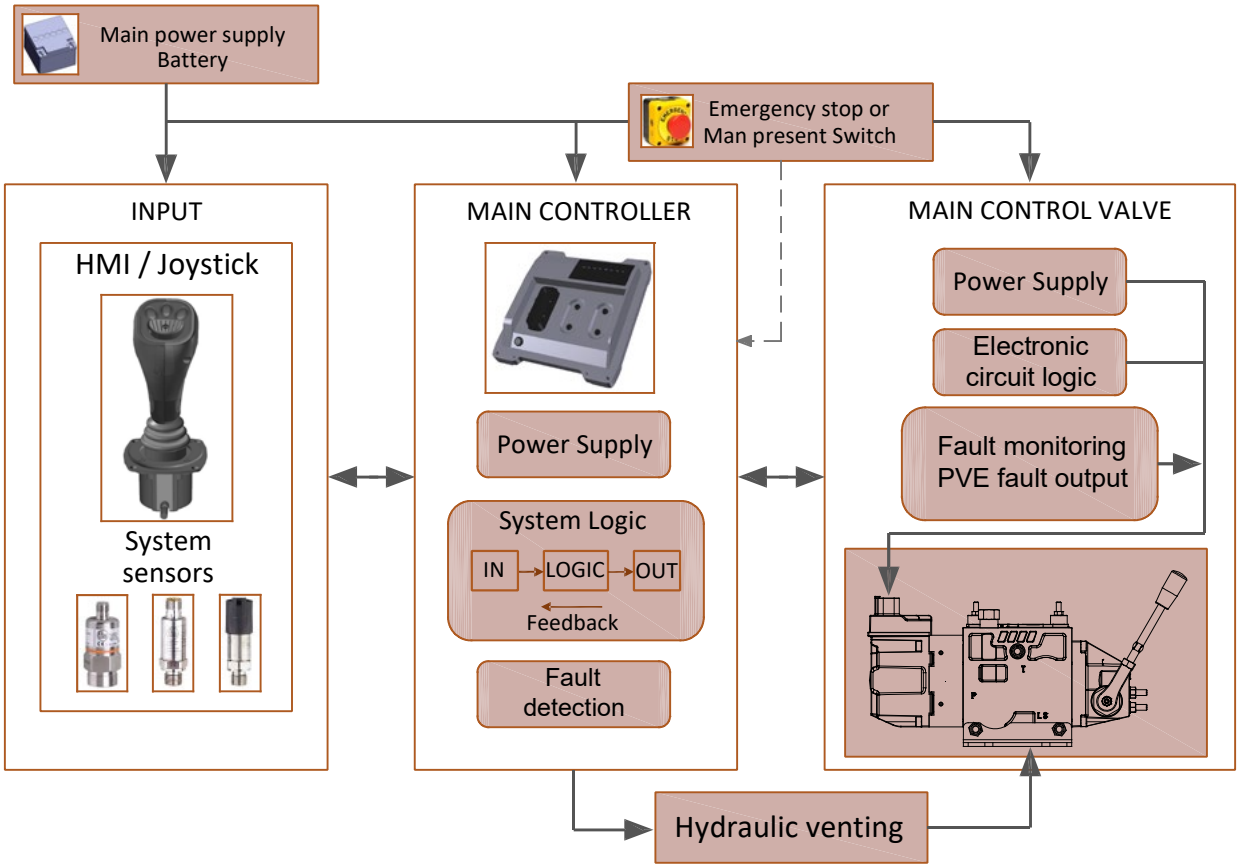
PDV114 - PEAC126 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 4 ÷ 20 mA



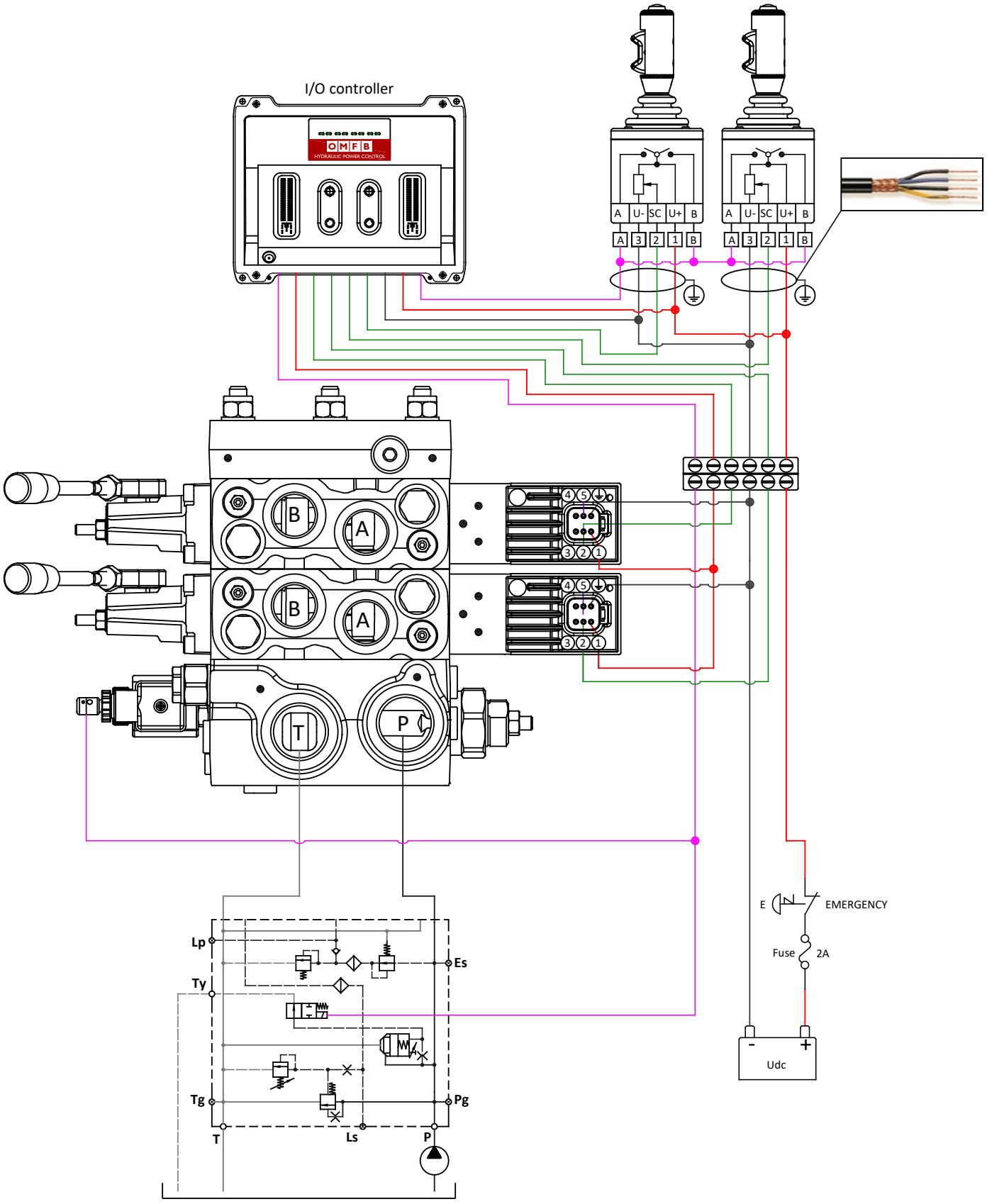
PDV114 - PEAC126 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA



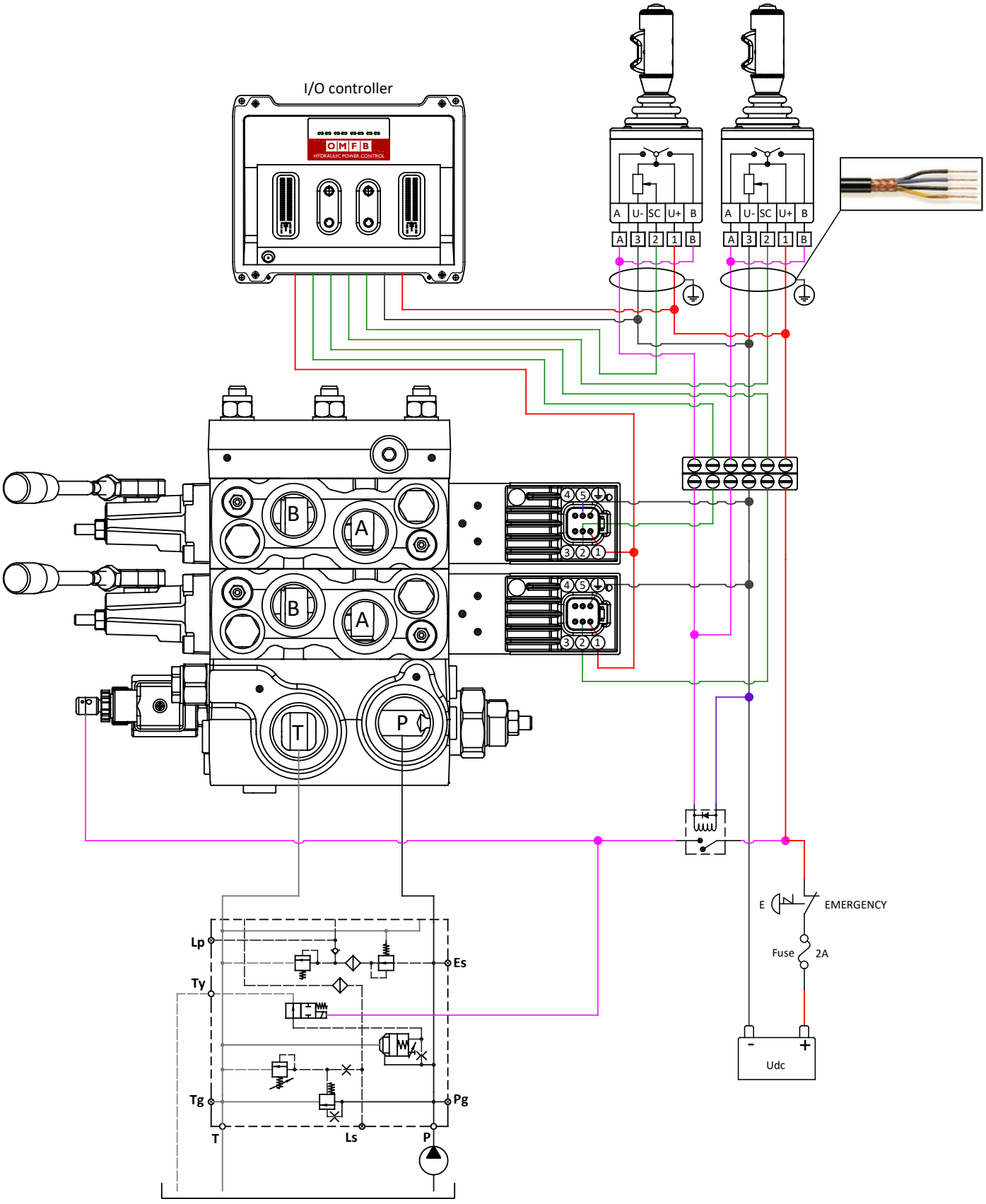
PDV114 - PEAC126 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



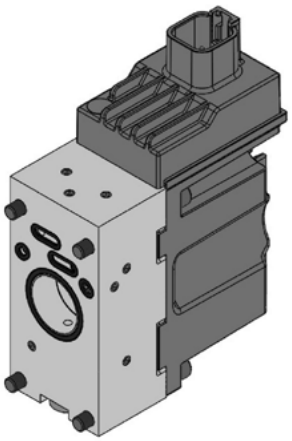
PDV114 - PEAC126 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Input signal 4 ÷ 20 mA



PDV114 - PEAC126 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 4 ÷ 20 mA



PDV114 - PEAC021 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc

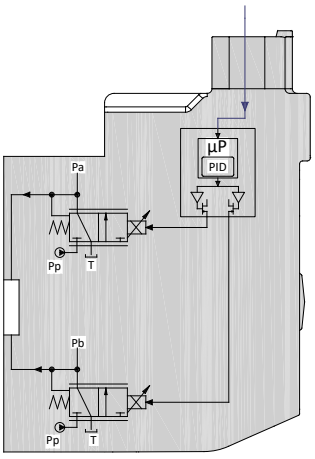


PEAC021 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

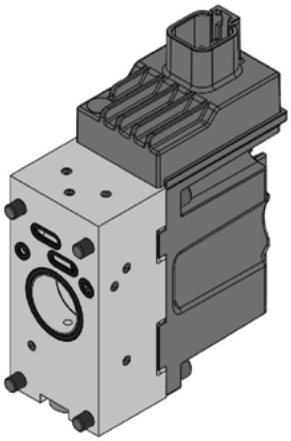
PEAC021 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC021 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV114 - PEAC021 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc

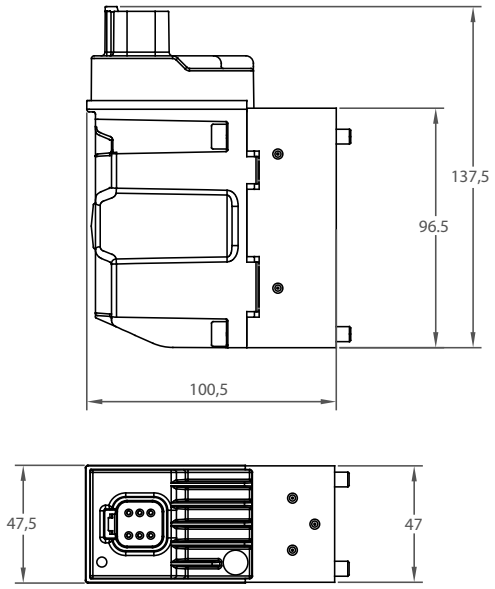


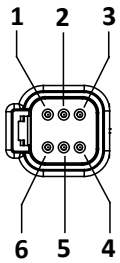
PEAC021 is defined by:

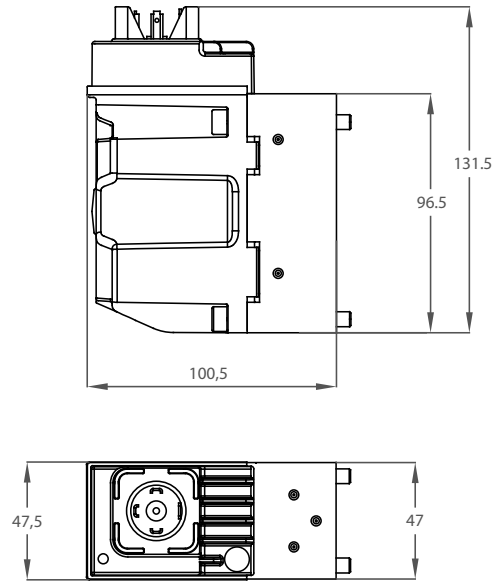
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

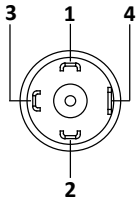
PEAC021 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0,5 Udc**
Range control signal		**0,25 Udc to 0,75 Udc**
Neutral spool position		**0,5 Udc**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV114 - PEAC021 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal 0,5 Udc - Electrical connectors



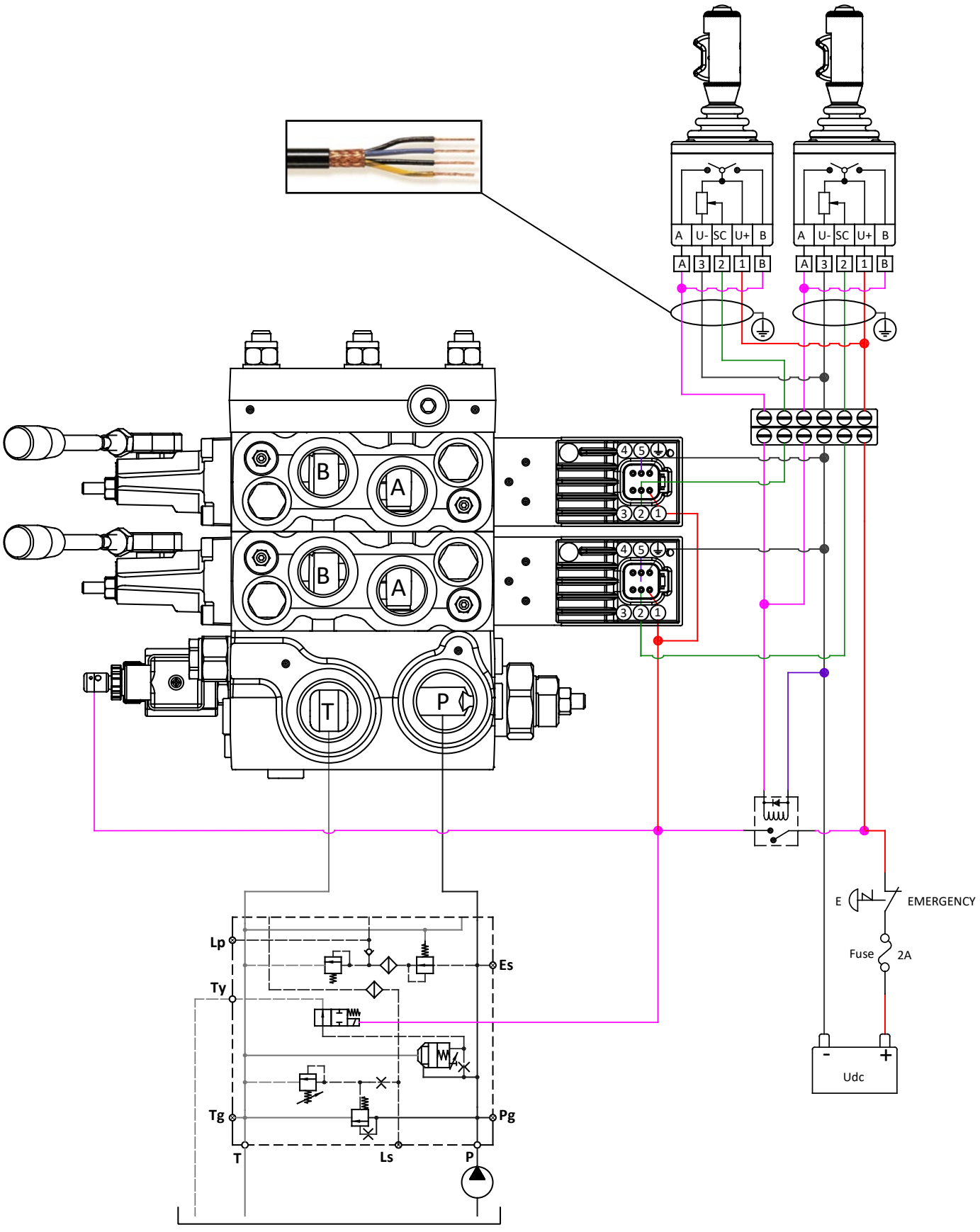
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	CAN-high
	4	CAN-low
	5	Free
	6	Ground



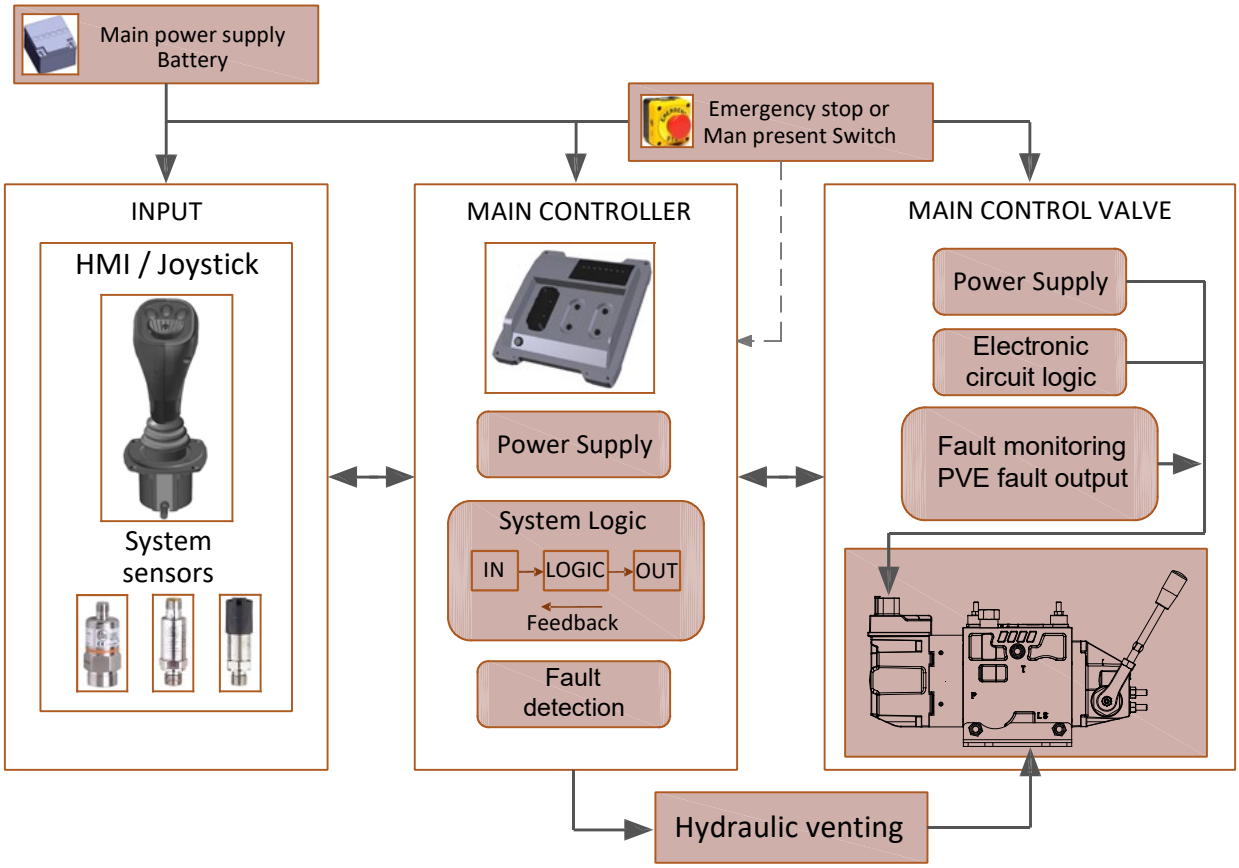
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Free
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0041000**	**PEAC1041000**	**PEAC0031000**	**PEAC1031000**
DIN 43650	**PEAC0041200**	**PEAC1041200**	**PEAC0031200**	**PEAC1031200**

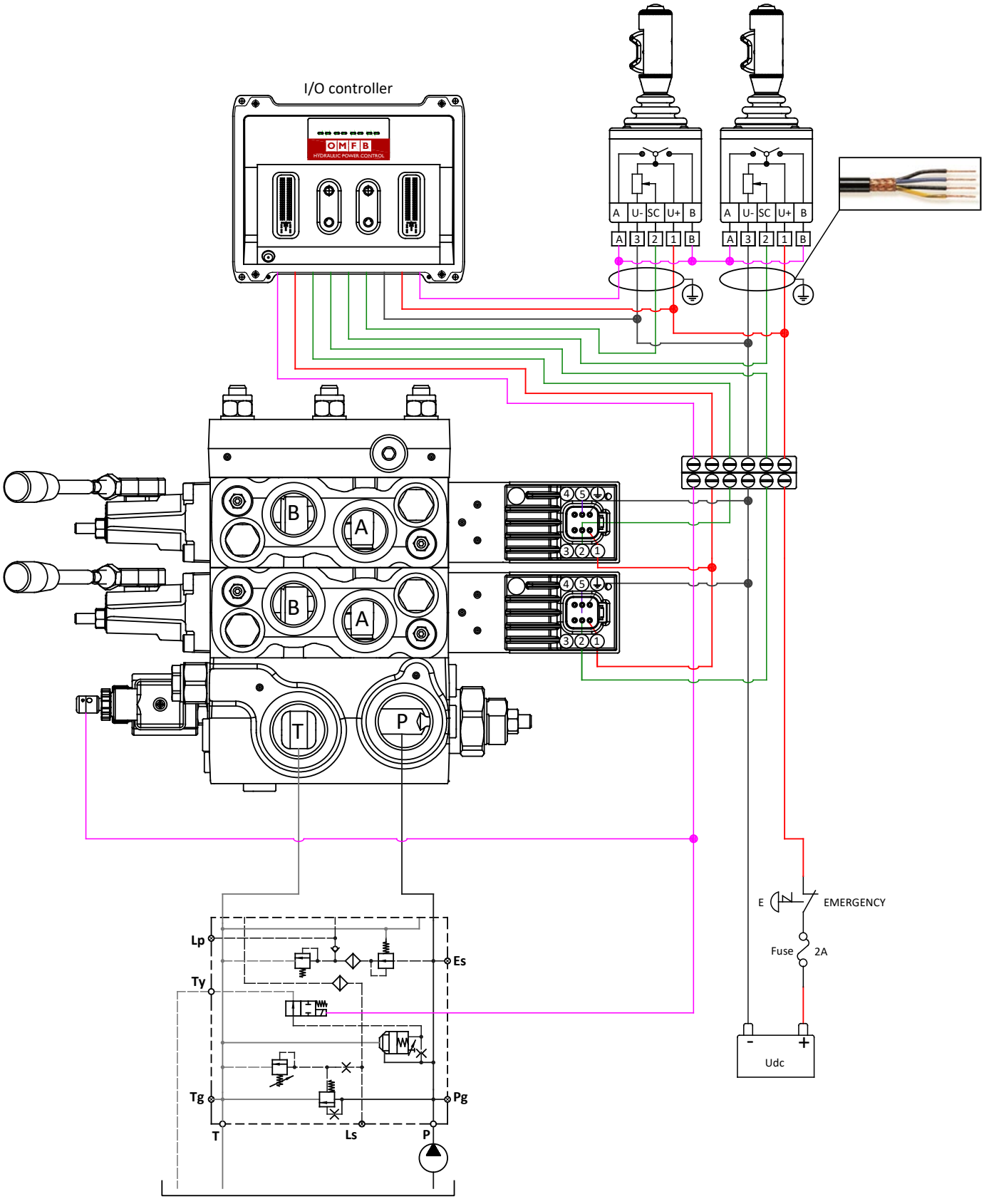
PDV114 - PEAC021 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc



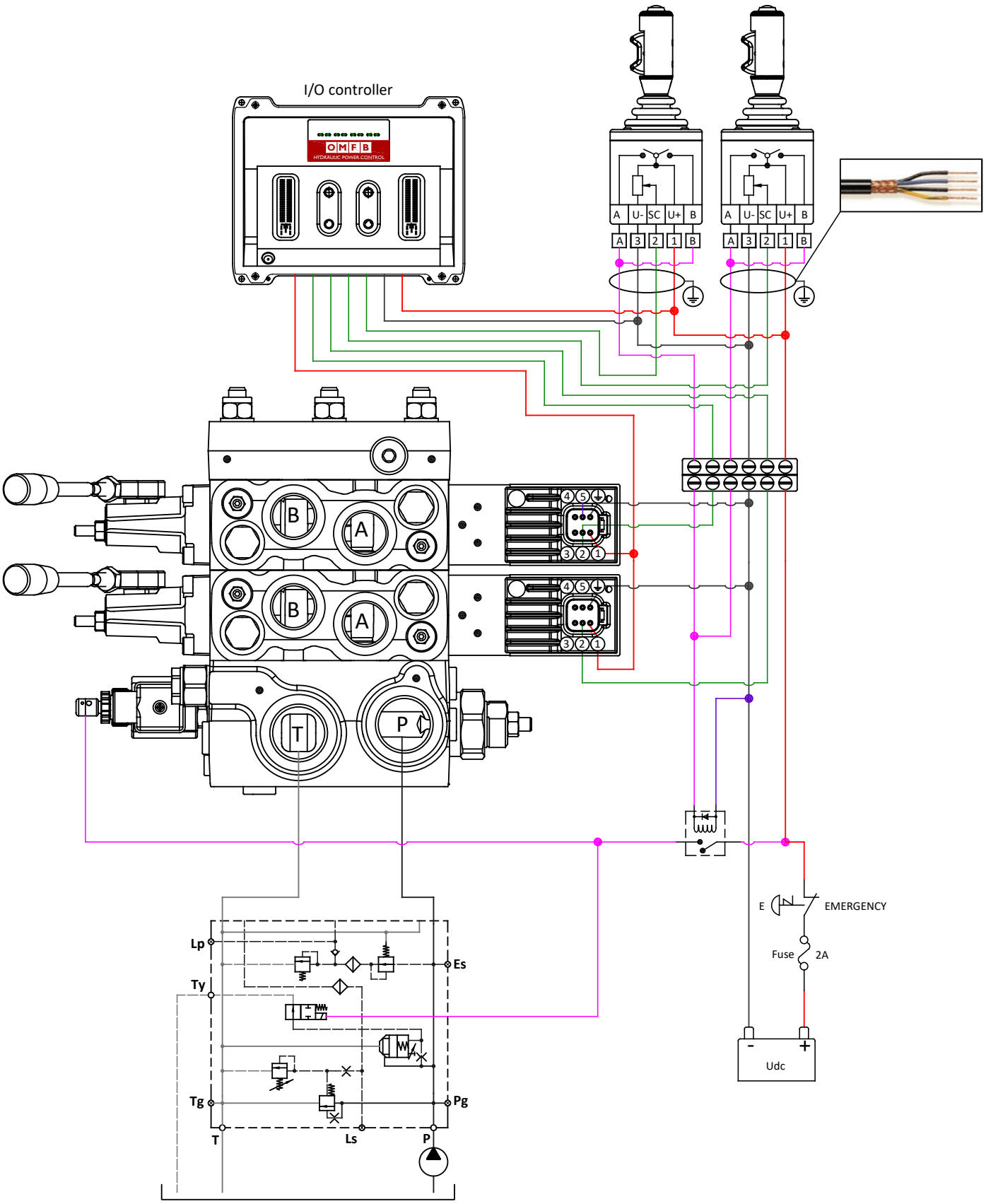
PDV114 - PEAC021 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



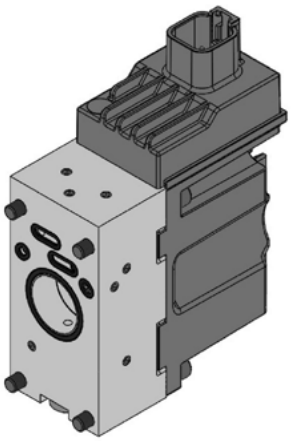
PDV114 - PEAC021 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV114 - PEAC021 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV114 - PEAC022 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

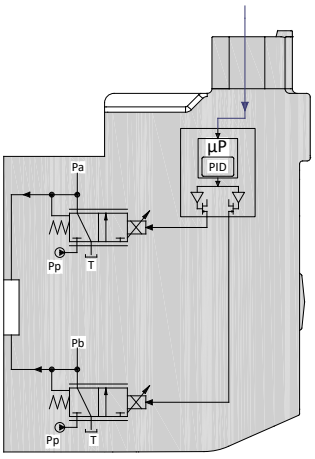


PEAC022 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

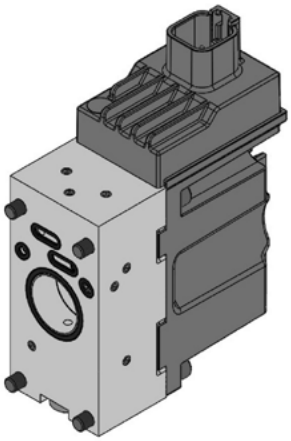
PEAC022 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC022 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV114 - PEAC022 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

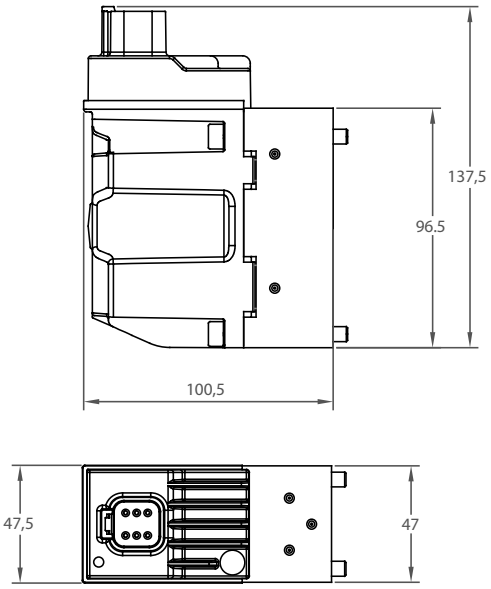


PEAC022 is defined by:

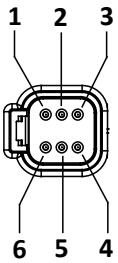
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAC022 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0-10 V**
Range control signal		**2,5 V to 7,5 V**
Neutral spool position		**5 V**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

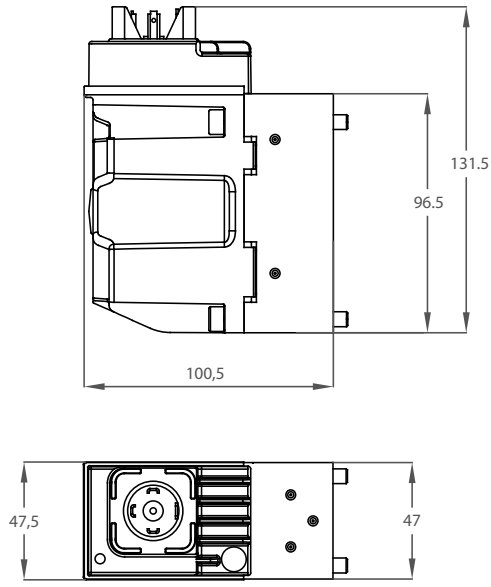
PDV114 - PEAC022 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal 0 ÷ 10 V - Electrical connectors



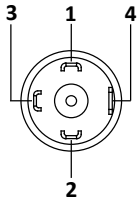
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply
2	Input signal control
3	CAN-high
4	CAN-low
5	Free
6	Ground



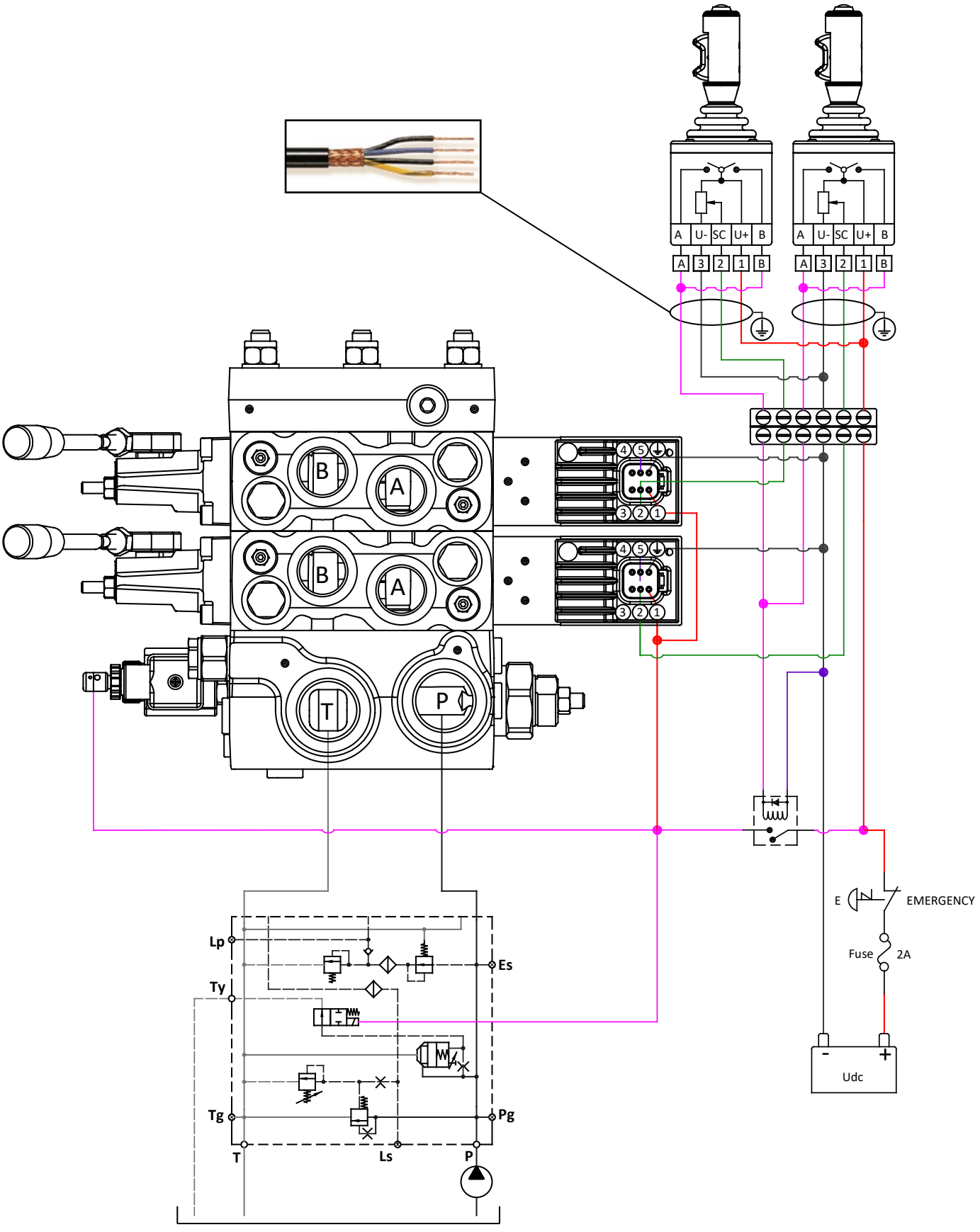
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



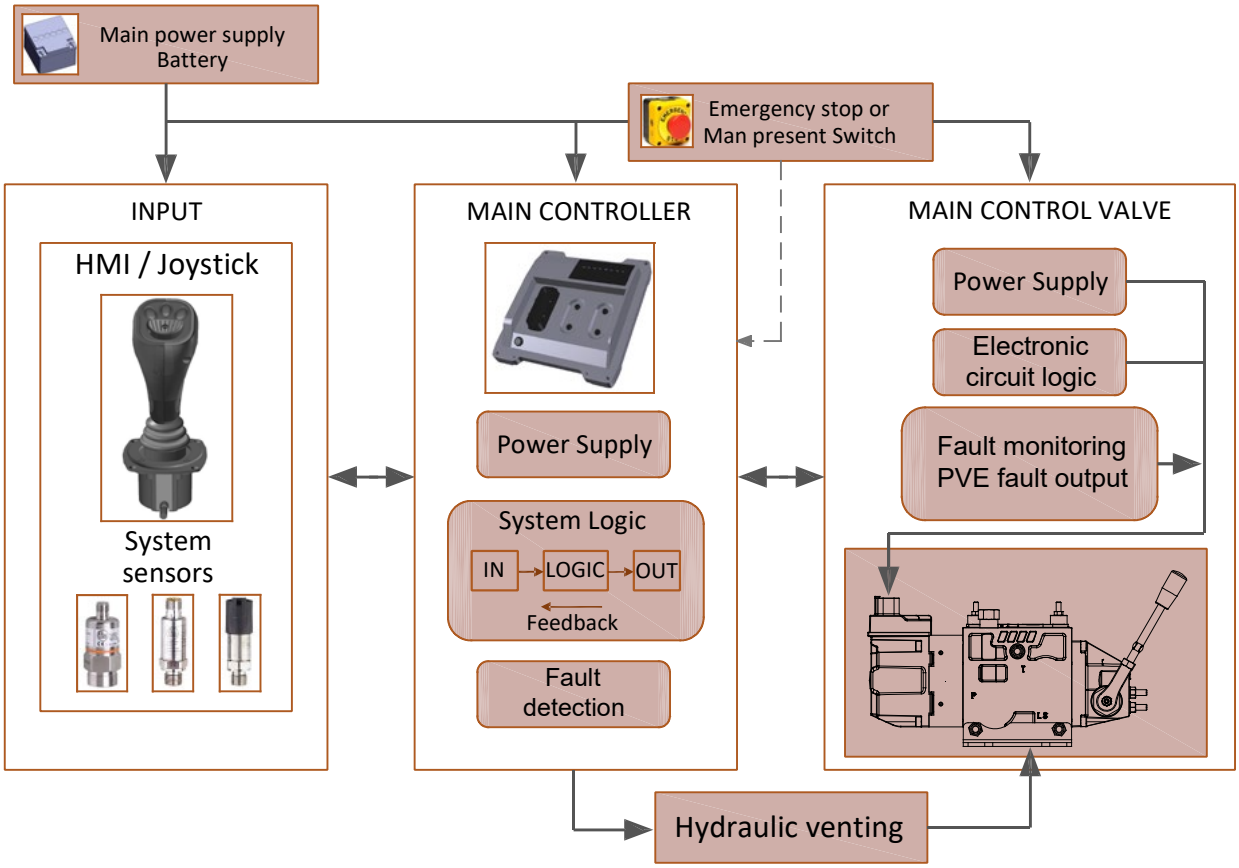
1	Power supply
2	Input signal control
3	Free
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0042000**	**PEAC1042000**	**PEAC0032000**	**PEAC1032000**
DIN 43650	**PEAC0042200**	**PEAC1042200**	**PEAC0032200**	**PEAC1032200**

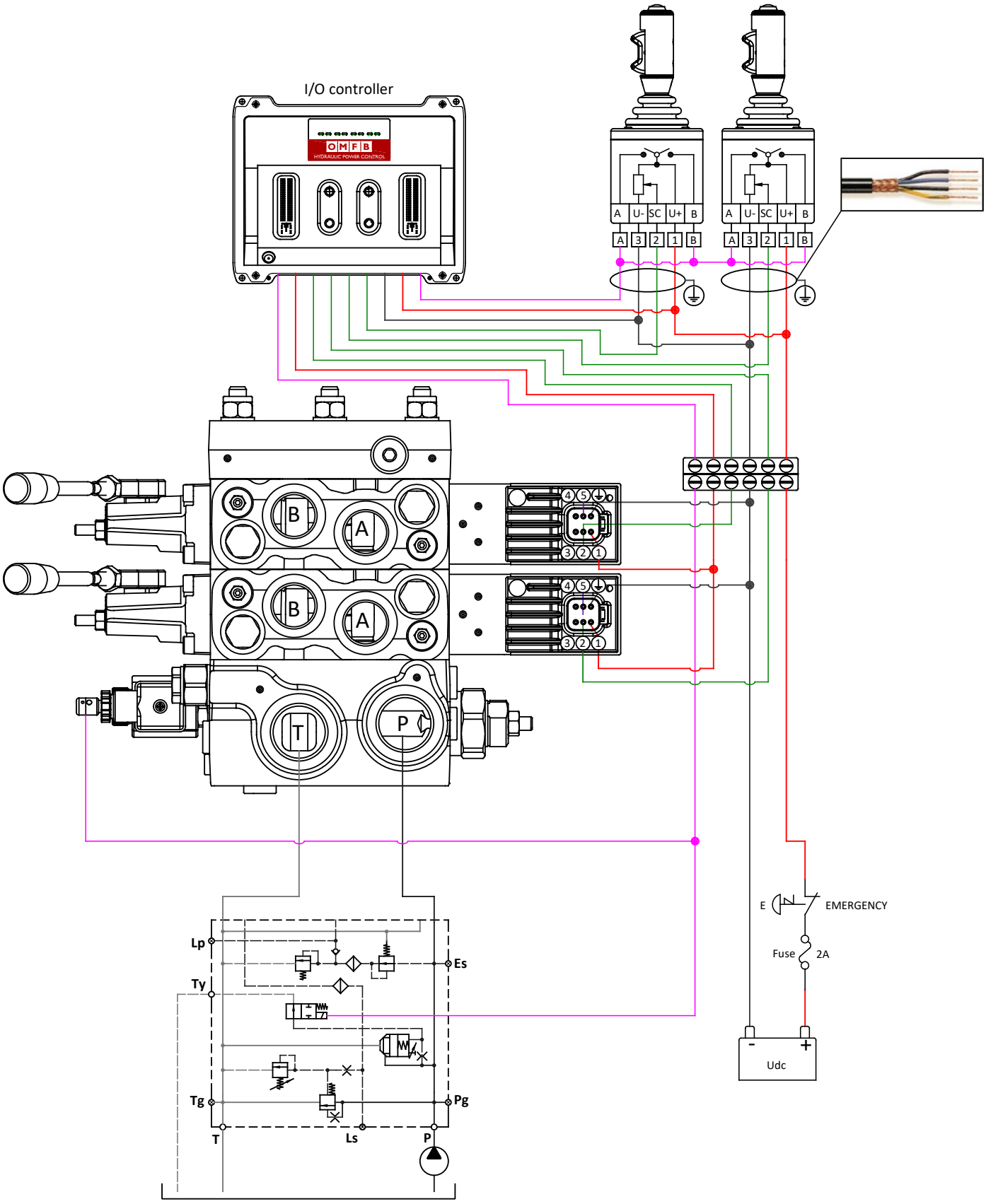
PDV114 - PEAC022 Electro-hydraulic proportional actuation.
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



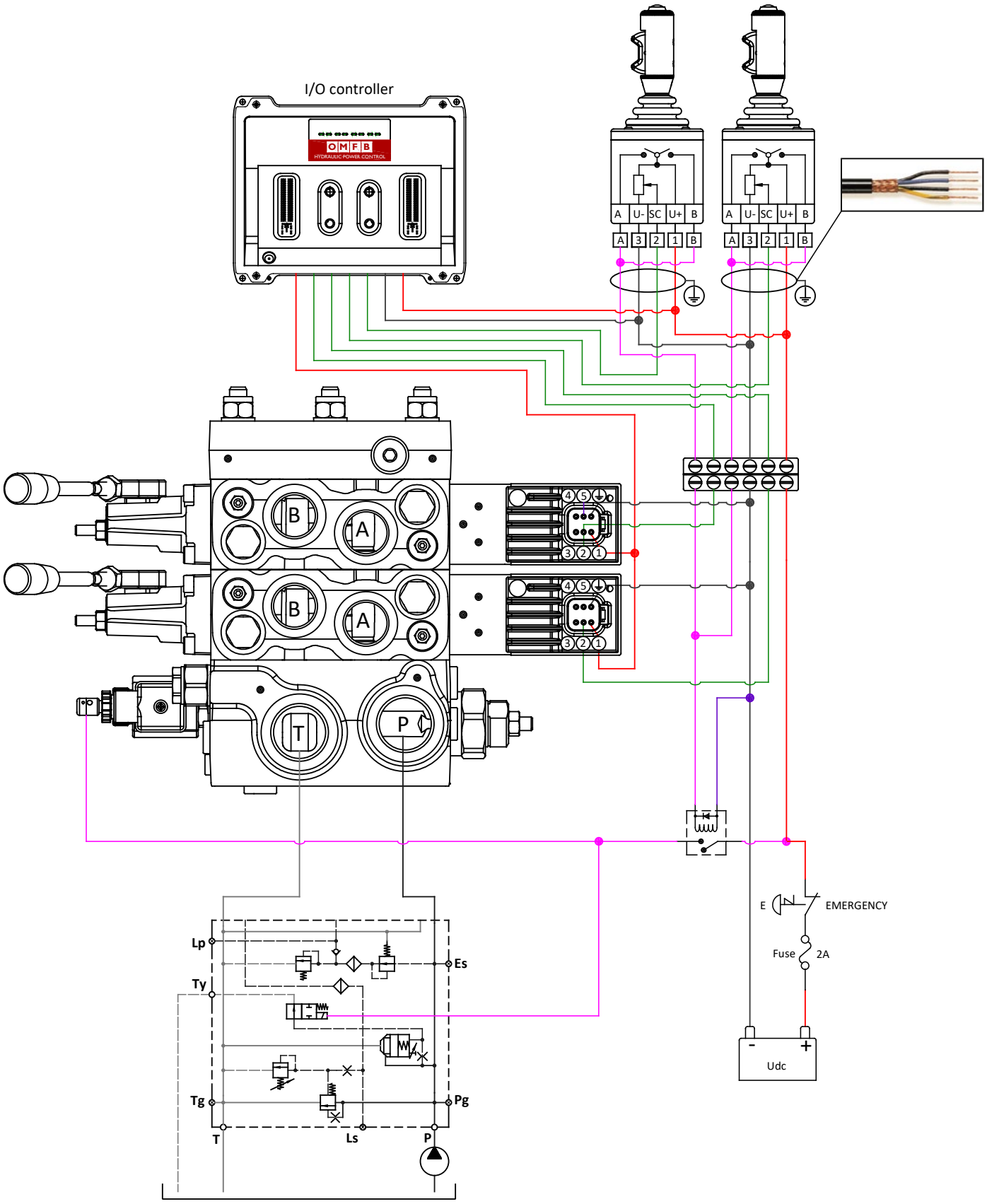
PDV114 - PEAC022 Electro-hydraulic proportional actuation.
Open loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



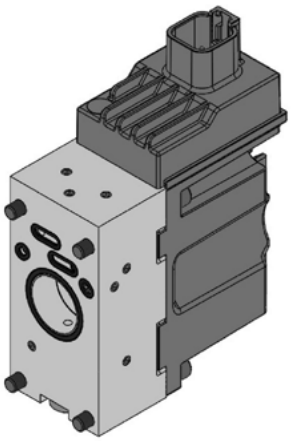
PDV114 - PEAC022 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



PDV114 - PEAC022 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



PDV114 - PEAC026 Electro-hydraulic proportional actuation
Open loop spool control
Input signal 4 ÷ 20 mA

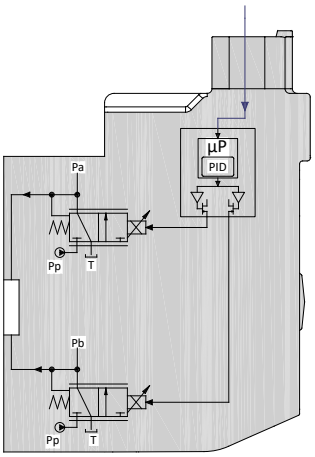


PEAC026 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

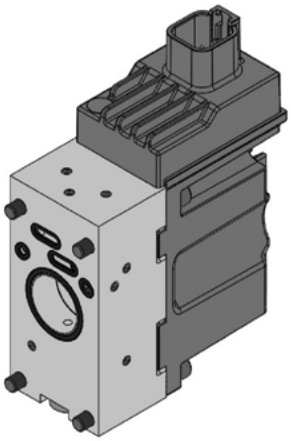
PEAC026 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC026 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV114 - PEAC026 Electro-hydraulic proportional actuation
Open loop spool control
Input signal 4 ÷ 20 mA

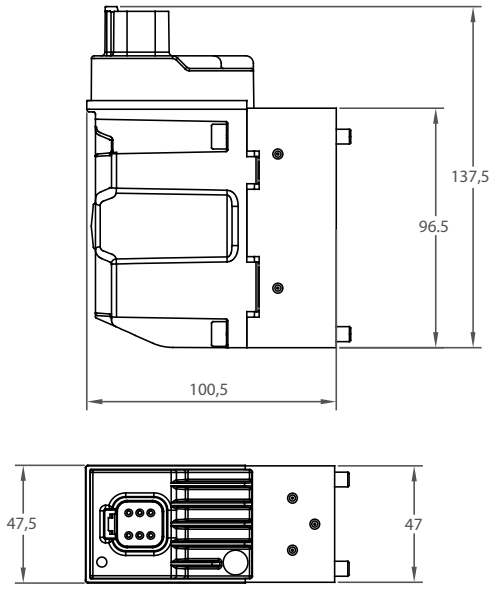


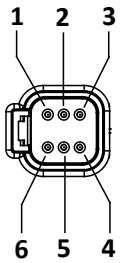
PEAC026 is defined by:

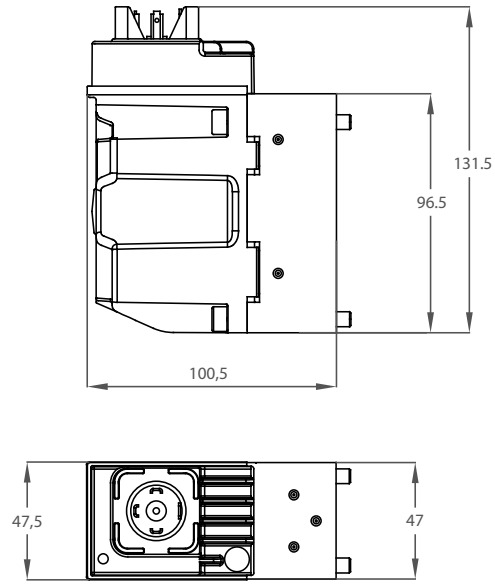
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

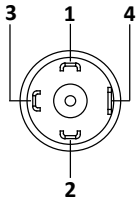
PEAC026 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**4-20 mA**
Range control signal		**4 mA to 20 mA**
Neutral spool position		**12 mA**
Max threshold signal, **A** port		**1,5 mA**
Max threshold signal, **B** port		**1,5 mA**
Input capacitor		**100 ηF**
Input impedance		**220 Ω**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Max current start spool travel		**140 mA**
Max current end spool travel		**450 mA**
Coil impedance @ 20°C		**8,9 Ω**
Signal control impedance		**50 KΩ**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP65 - IP66 - IP69K**
Bootloader function, debugging parameters and set-up function available with Deutsch connector DT06-6S, only		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV114 - PEAC026 Electro-hydraulic proportional actuation.
Input signal control 4 ÷ 20 mA
Electrical connectors



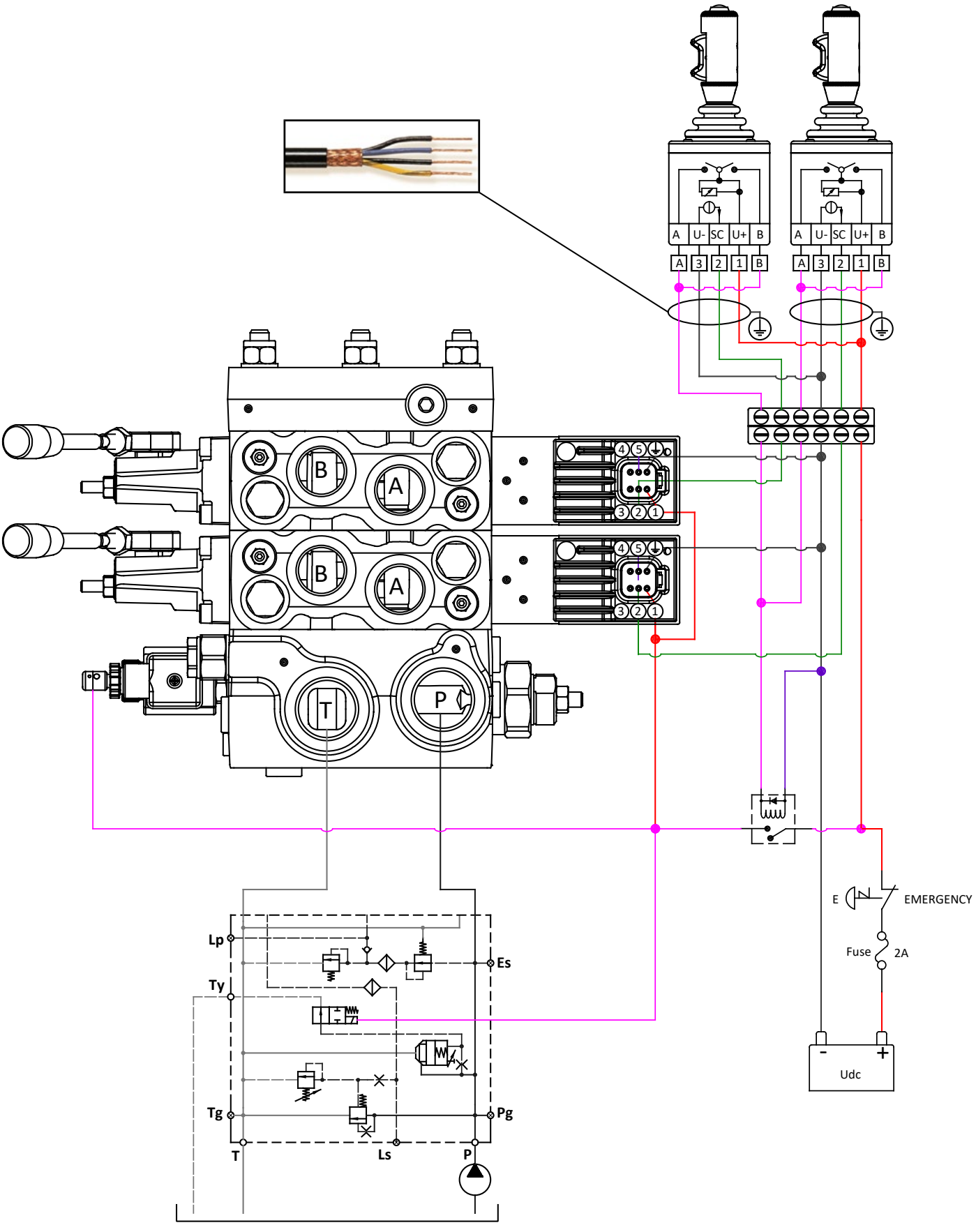
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	CAN-high
	4	CAN-low
	5	Free
	6	Ground



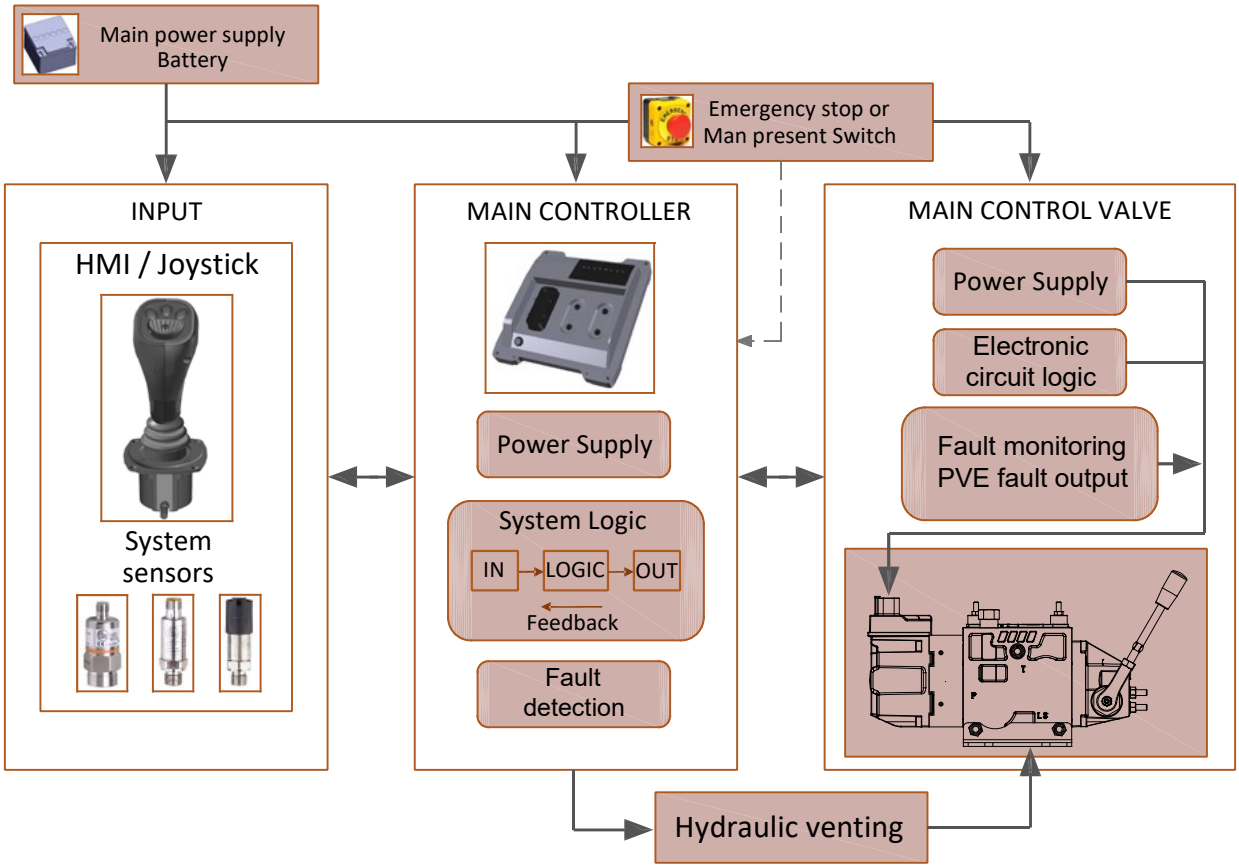
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Free
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0046000**	**PEAC1046000**	**PEAC0036000**	**PEAC1036000**
DIN 43650	**PEAC0046200**	**PEAC1046200**	**PEAC0036200**	**PEAC1036200**

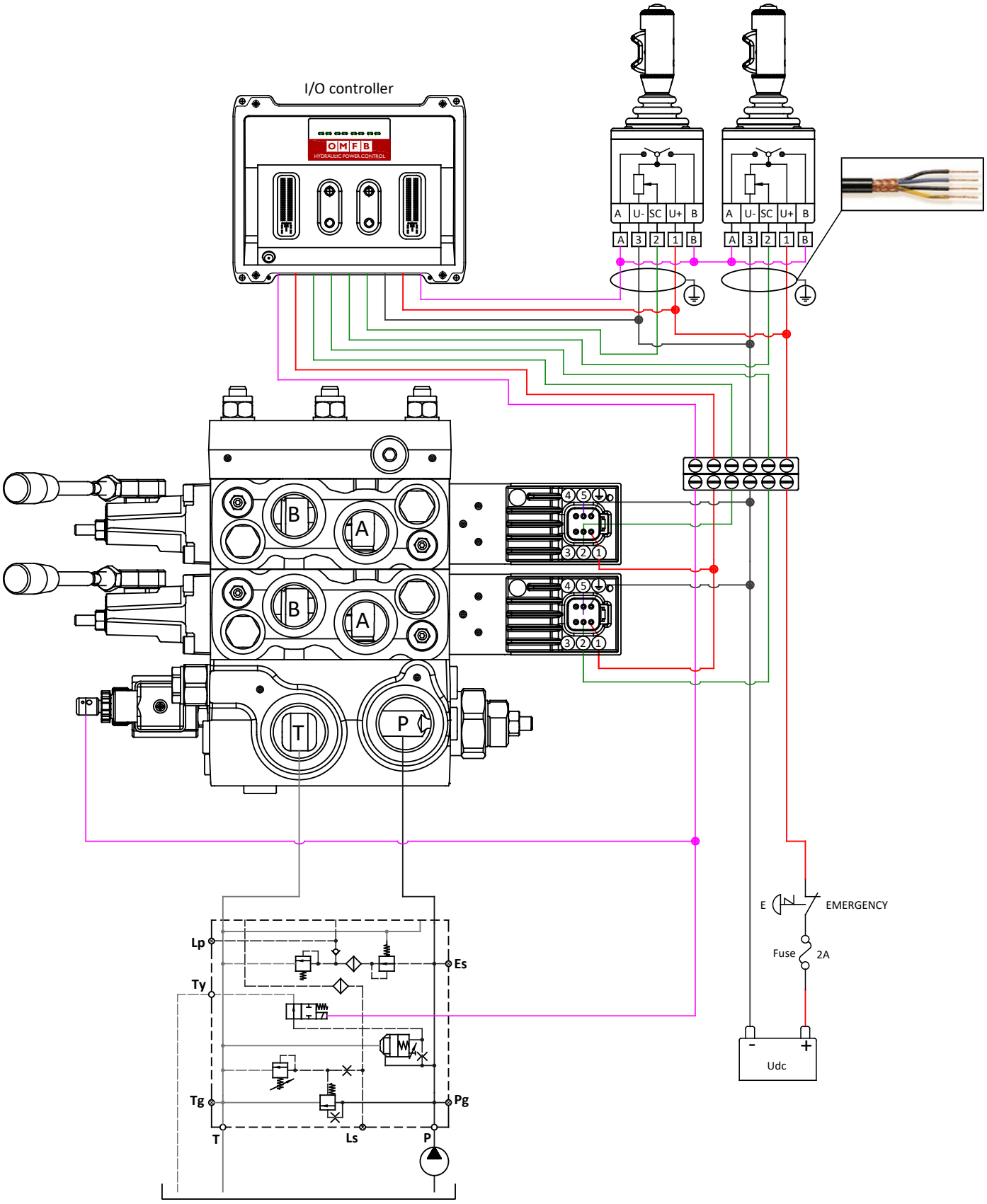
PDV114 - PEAC026 Electro-hydraulic proportional actuation.
Input signal control 4-20 mA
Electrical wiring



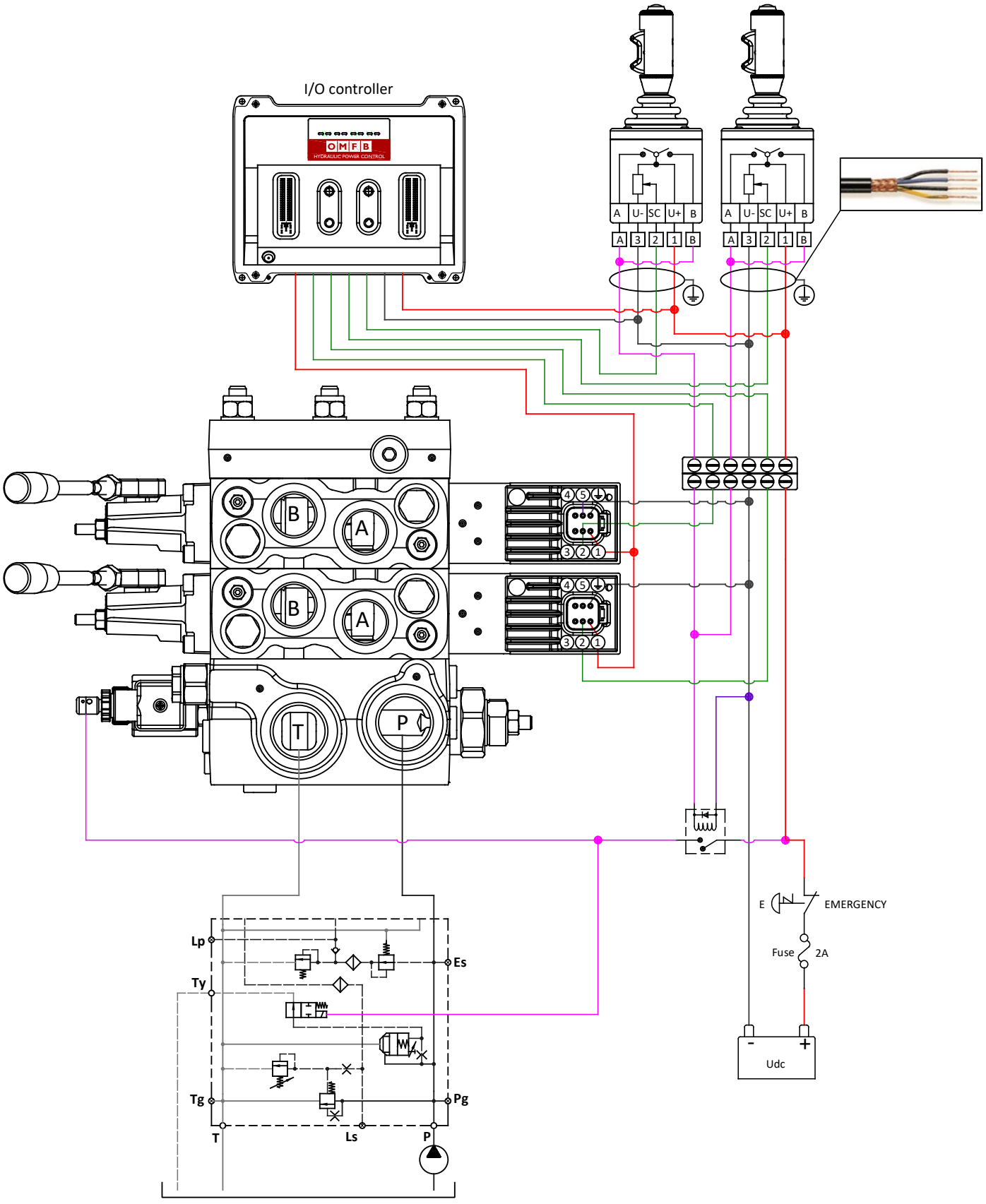
PDV114 - PEAC026 Electro-hydraulic proportional actuation
Open loop spool control
Current input signal 4-20 mA



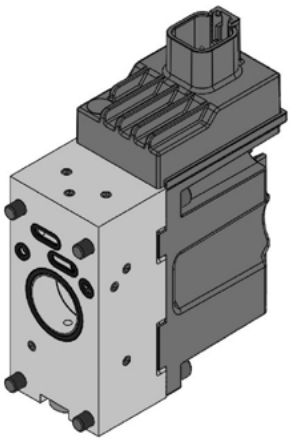
PDV114 - PEAC026 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Current input signal 4 ÷ 20 mA



PPDV114 - PEAC026 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Current input signal 4 ÷ 20 mA



PDV114 - PEAD2 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

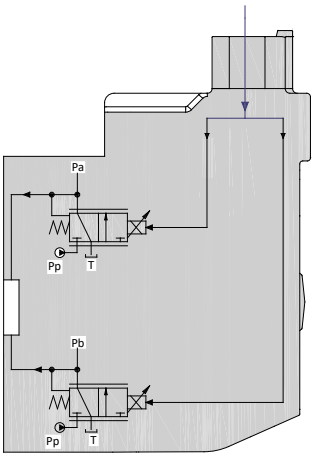


PEAD2 is a proportional open loop spool actuation without integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

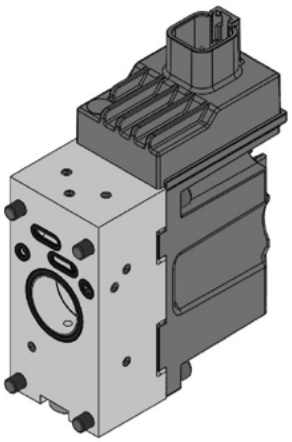
PEAD2 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAD2 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV114 - PEAD2 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

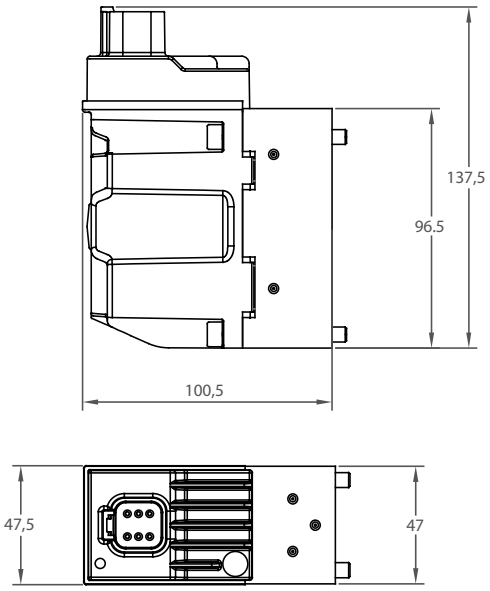


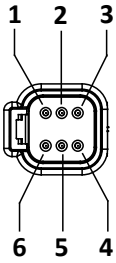
PEAD2 is defined by:

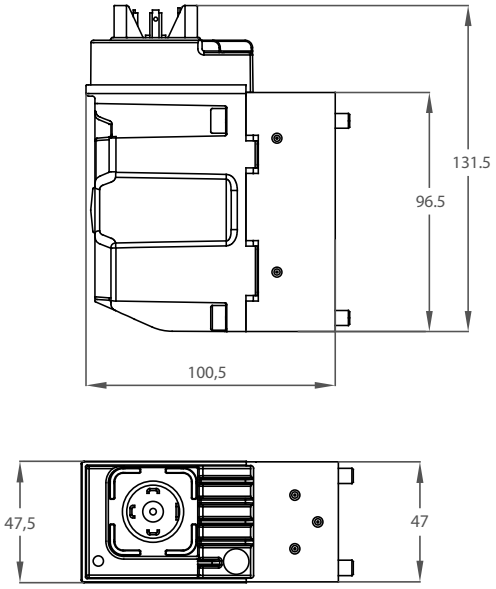
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

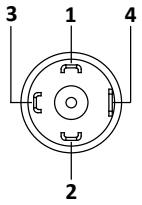
PEAD2 Technical data			
Supply voltage		12 Vdc	24 Vdc
Voltage range		10-16 V	20-30 V
Max ripple		5%	5%
Current consuption at rated voltage		750 mA @ 12 Vdc	400 mA @ 24 Vdc
Power consumption		9 W	9,6 W
R @ 20°C		8,9 Ω	35 Ω
Start spool travel		220 mA	140 mA
End spool travel flow control		650 mA	350 mA
Max spool flow in pre-floating position		650 mA	350 mA
Spool floating position		750 mA	400 mA
Heat insulation		Class H (180°C)	
Oil temperature	(Recommended)	20 ÷ 60 °C	
Oil temperature	(Min)	-30 °C	
Oil temperature	(Max)	80 °C	
Ambient temperature		-30 ÷ 60 °C	
PWM frequency		50 ÷ 200 Hz	
Best frequency		100 Hz	
Duty cycle		100% ED	
Plug connector		6 pins Deutsch or 4 pins DIN	
Enclouser degree	(Electrical wiring excepted)	IP69K	
Weight cast iron body		1, 8 kg	
Weight Aluminium body		1,3 kg	
Max current output signal for spool direction moviment		50 mA	
Reaction time (constant voltage)	From neutral position to max spool travel	110 - 140 ms	
	From max spool travel to neutral	70 - 90 ms	
Reaction time (neutral switch)	From neutral position to max spool travel	130 - 170 ms	
	From max spool travel to neutral	70 - 90 ms	

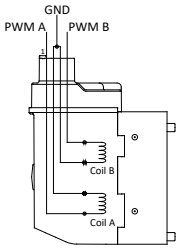
PDV114 - PEAD2 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control - Electrical connectors



Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	**A** port +
	2	Free
	3	**A** port -
	4	**B** port +
	5	Free
	6	**B** port -

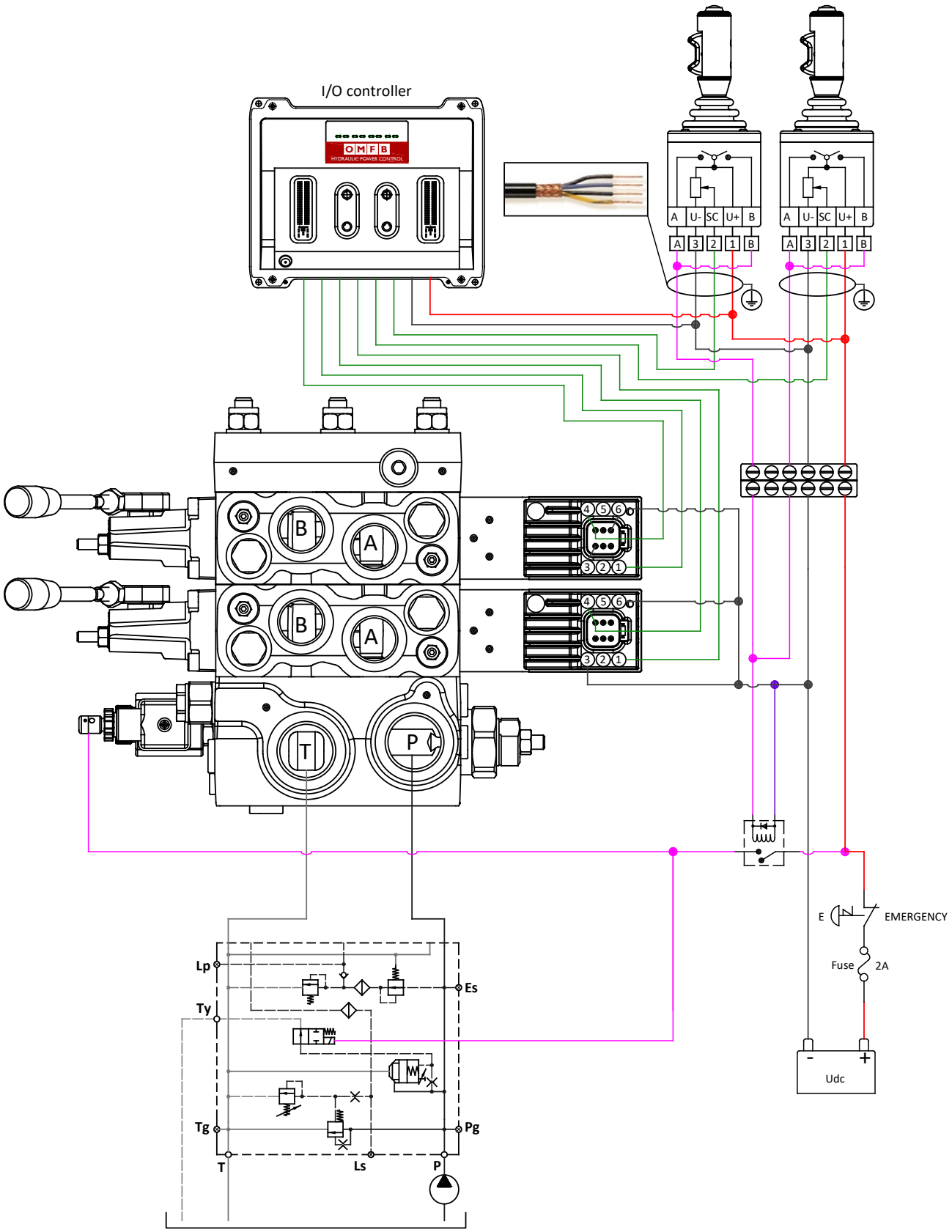


Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	**A** port +
	2	**B** port +
	3	Free
	4	Ground

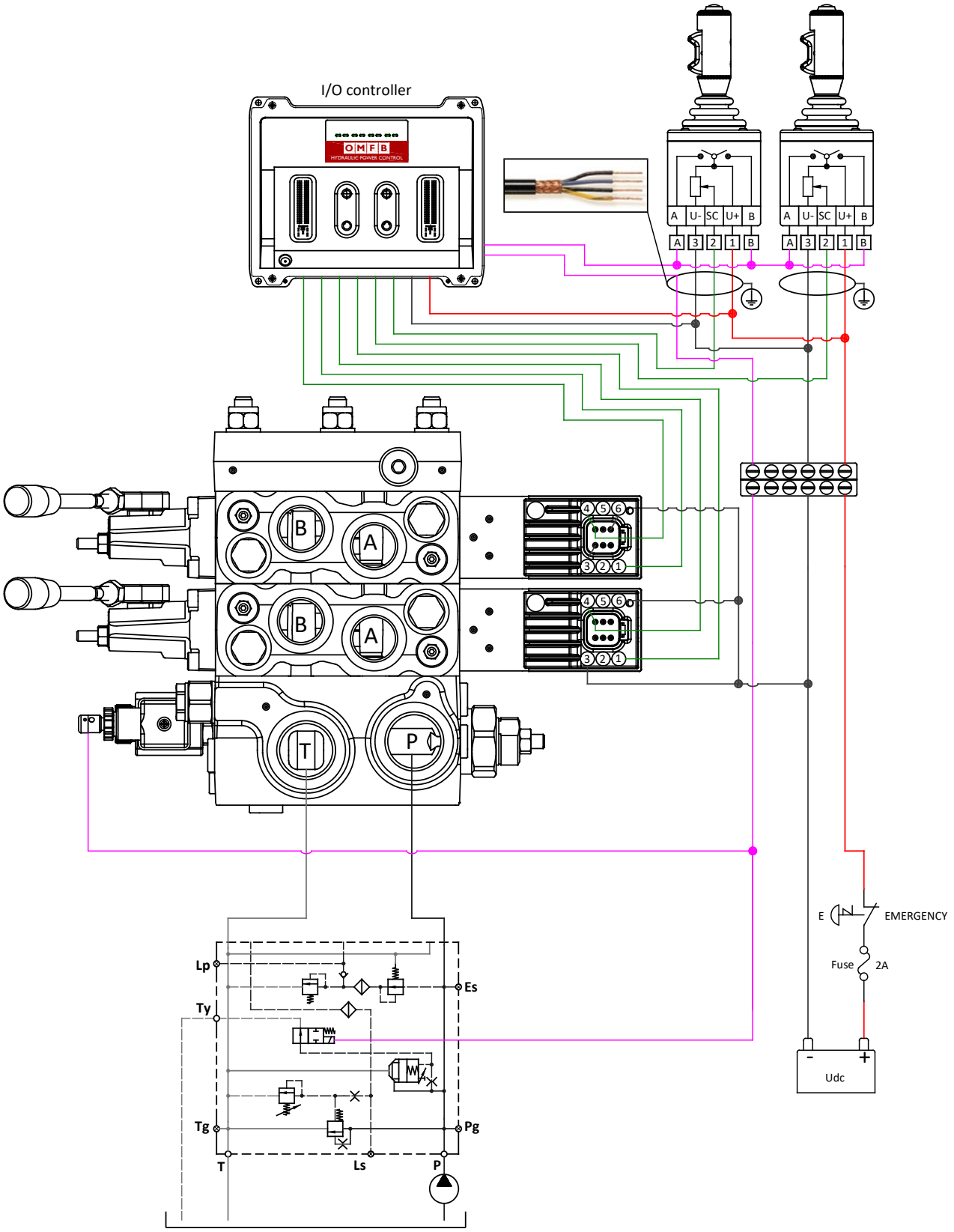


Connector version	Code numbers			
	12 V		24 V	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAD0100001**	**PEAD1100001**	**PEAD0200001**	**PEAD1200001**
DIN 43650	**PEAD0120001**	**PEAD1120001**	**PEAD0220001**	**PEAD1220001**

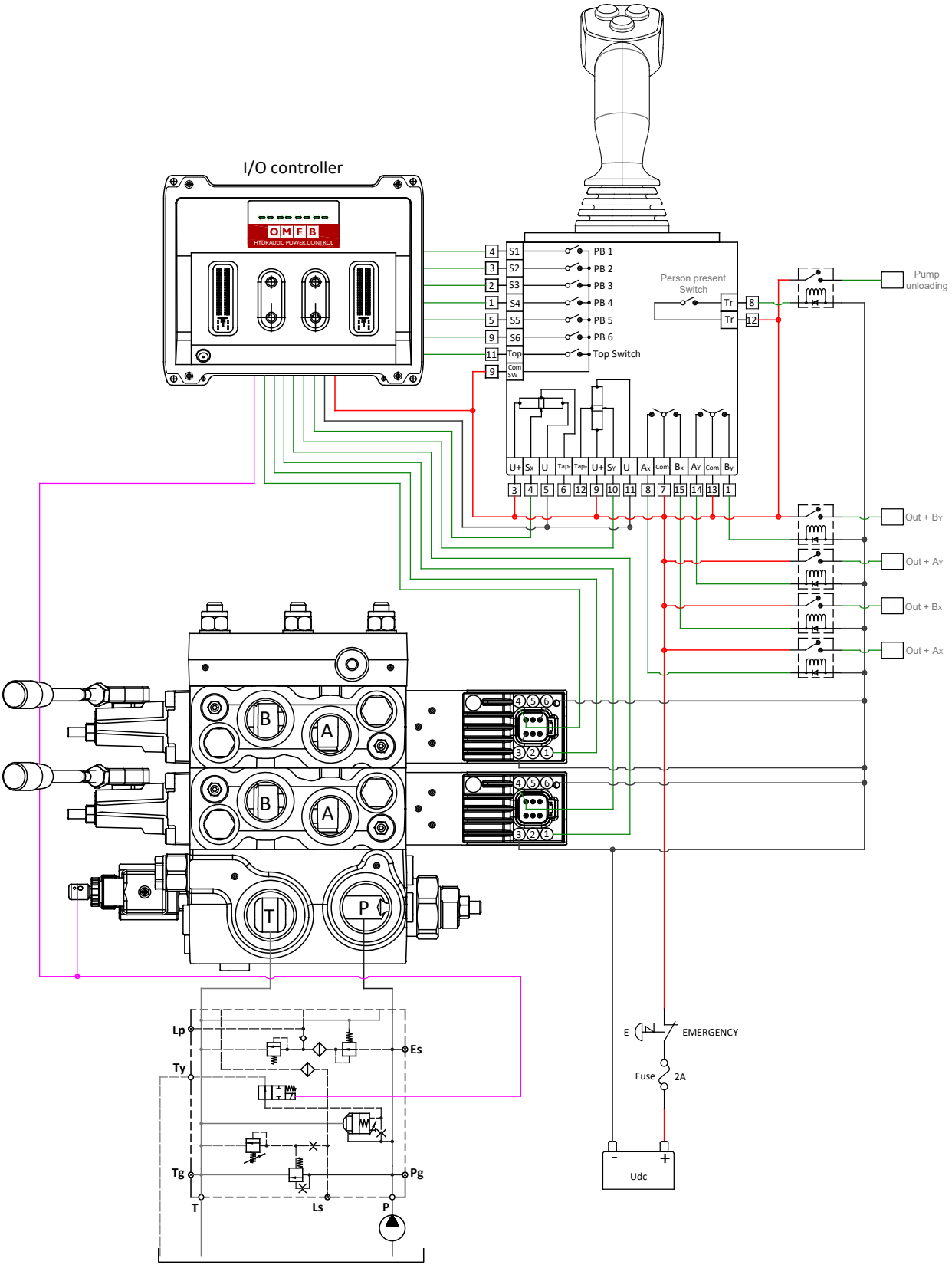
PDV114 - PEAD2 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



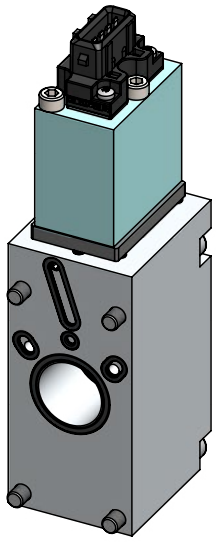
PDV114 - PEAD2 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV114 - PEAD2 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV114 - PEAP2 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

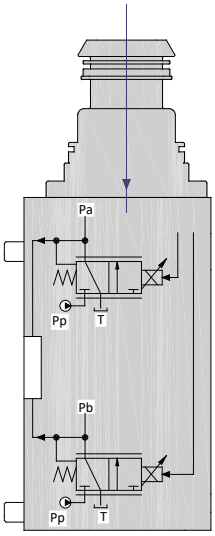


PEAP2 is a proportional open loop spool actuation without integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

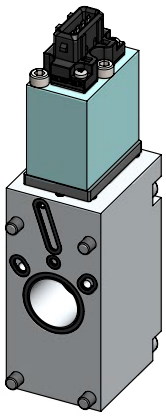
PEAP2 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAP2 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV114 - PEAP2 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

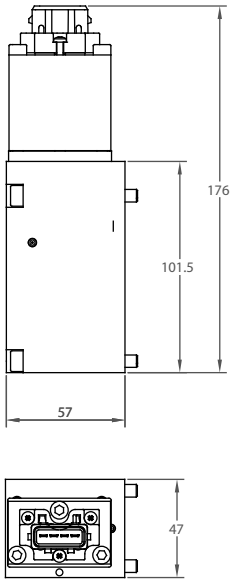


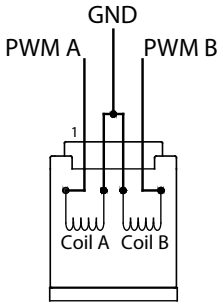
PEAP2 is defined by:

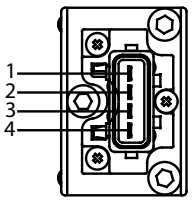
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAP2 Technical data			
Supply voltage		12 Vdc	24 Vdc
Voltage range		10-16 V	20-30 V
Max ripple		5%	5%
Current consuption at rated voltage		1330 mA @ 12 Vdc	630 mA @ 24 Vdc
Power consumption		23 W	21 W
R @ 20°C		6,3 Ω	27 Ω
Start spool travel		220 mA	140 mA
End spool travel flow control		650 mA	350 mA
Max spool flow in pre-floating position		650 mA	350 mA
Spool floating position		750 mA	400 mA
Heat insulation		Class H (180°C)	
Oil temperature	(Recommended)	-20 ÷ 60 °C	
Oil temperature	(Min)	-30 °C	
Oil temperature	(Max)	80 °C	
Ambient temperature		-30 ÷ 60 °C	
PWM frequency		50 ÷ 200 Hz	
Best frequency		100 Hz	
Duty cycle		100% ED	
Plug connector		Amp Junior Power Timer 4 pins	
Enclouser degree	(Electrical wiring excepted)	IP69K	
Max current output signal for spool direction moviment		50 mA	
Reaction time (constant voltage)	From neutral position to max spool travel	110 - 140 ms	
	From max spool travel to neutral	70 - 90 ms	
Reaction time (neutral switch)	From neutral position to max spool travel	130 - 170 ms	
	From max spool travel to neutral	70 - 90 ms	

PDV114 - PEAP2 Electro-hydraulic proportional actuation
Input signal control PWM - Current input signal for PWM or supply voltage for ON/OFF control - Electrical connector

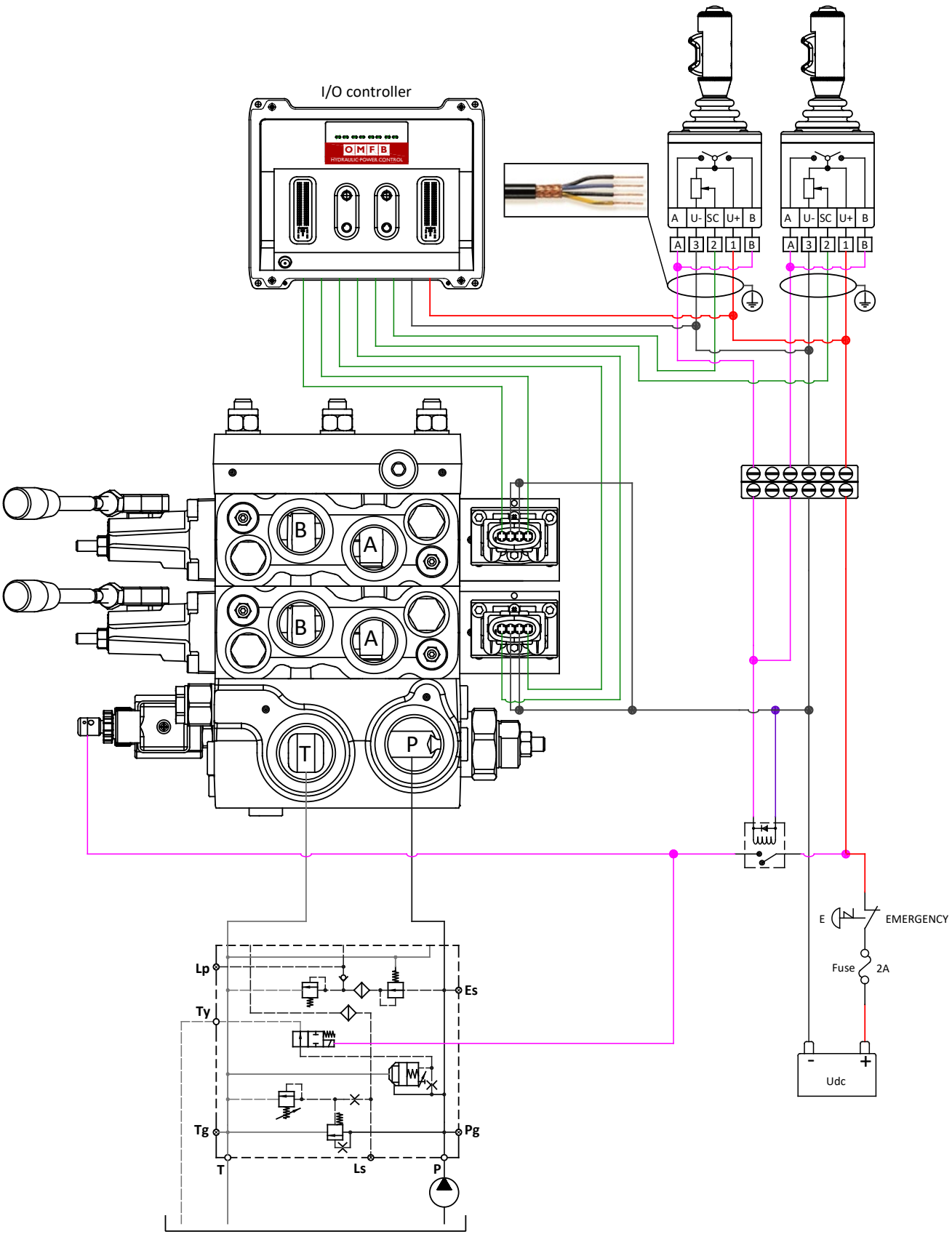




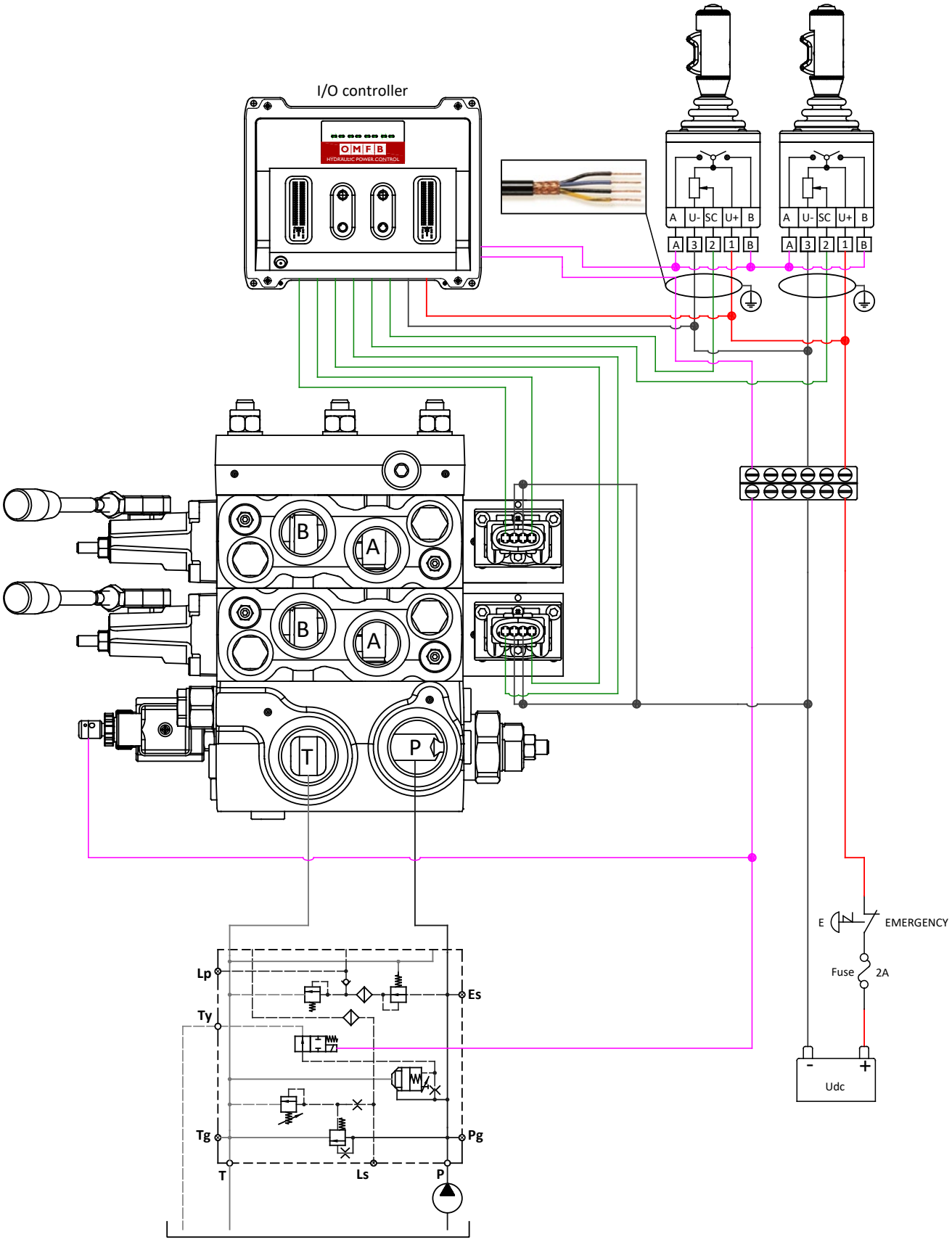
Amp Junior Power Timer 4 pin connector Enclousure degree IP 65 PIN-assignment		
	**1**	**A** port +
	2	**A** port -
	3	**B** port -
	4	**B** port +

Connector version	Code numbers			
	12 V		24 V	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
AMP Junior timer 4 Pin	**PEAP0312001**	**PEAP1312001**	**PEAP0412001**	**PEAP1412001**

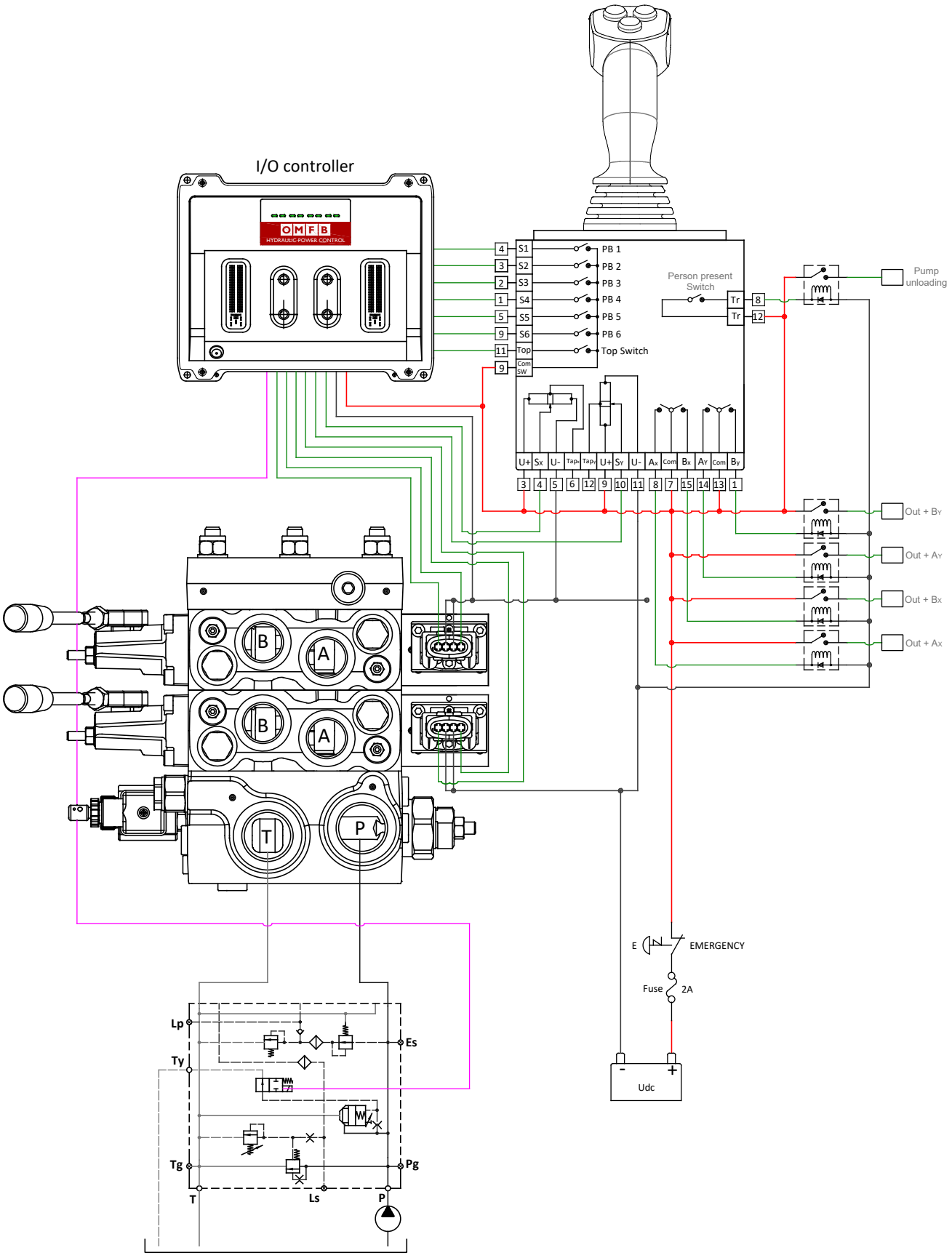
PDV114 - PEAP2 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV114 - PEAP2 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control

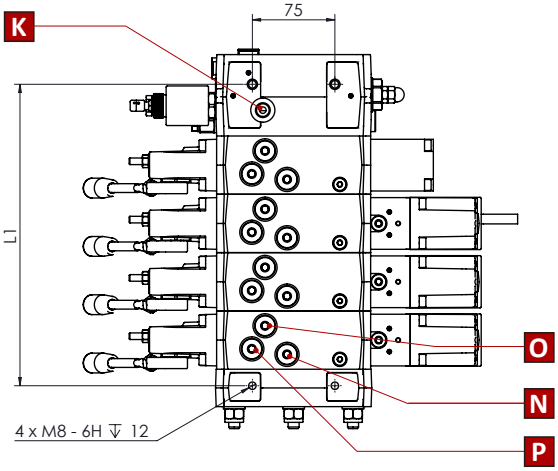


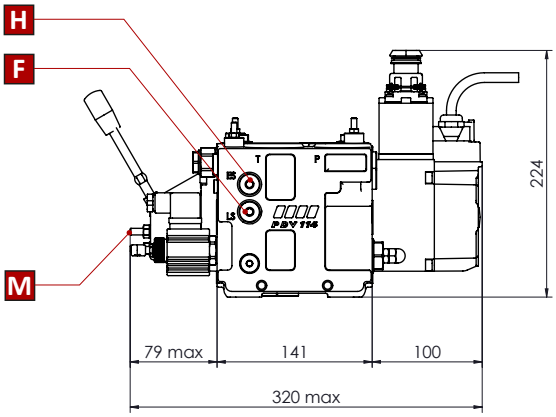
PDV114 - PEAP2 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control

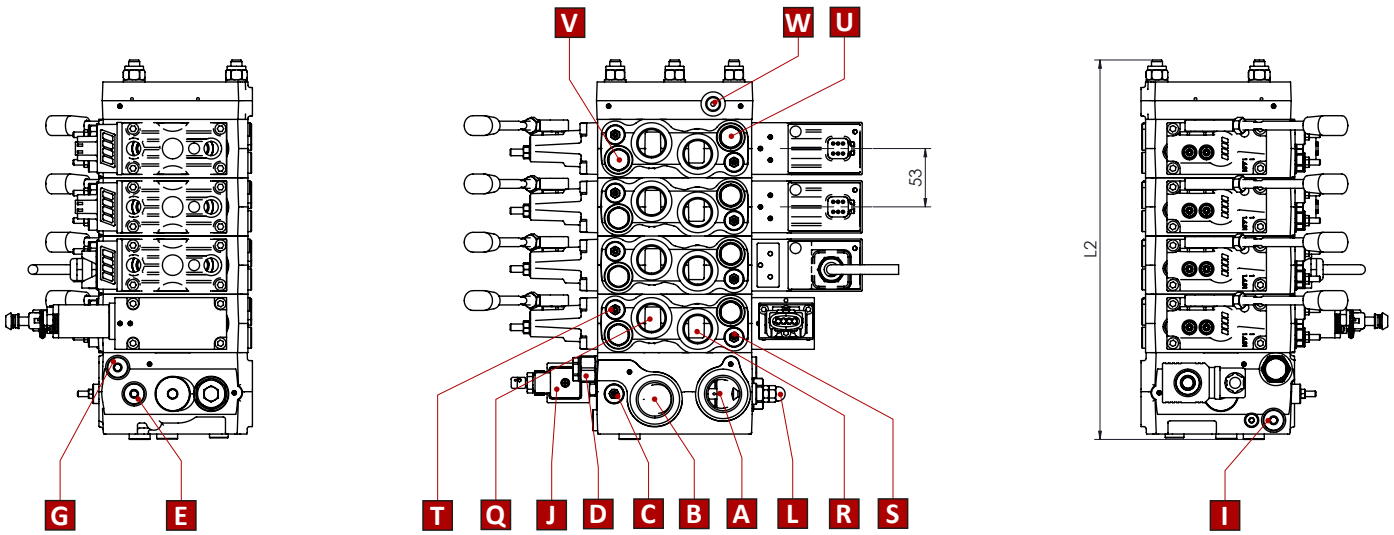


OMFB
HYDRAULIC POWER CONTROL

PDV114 Proportional valve
Overall dimensions drawing with standard inlet section
Right assembly version





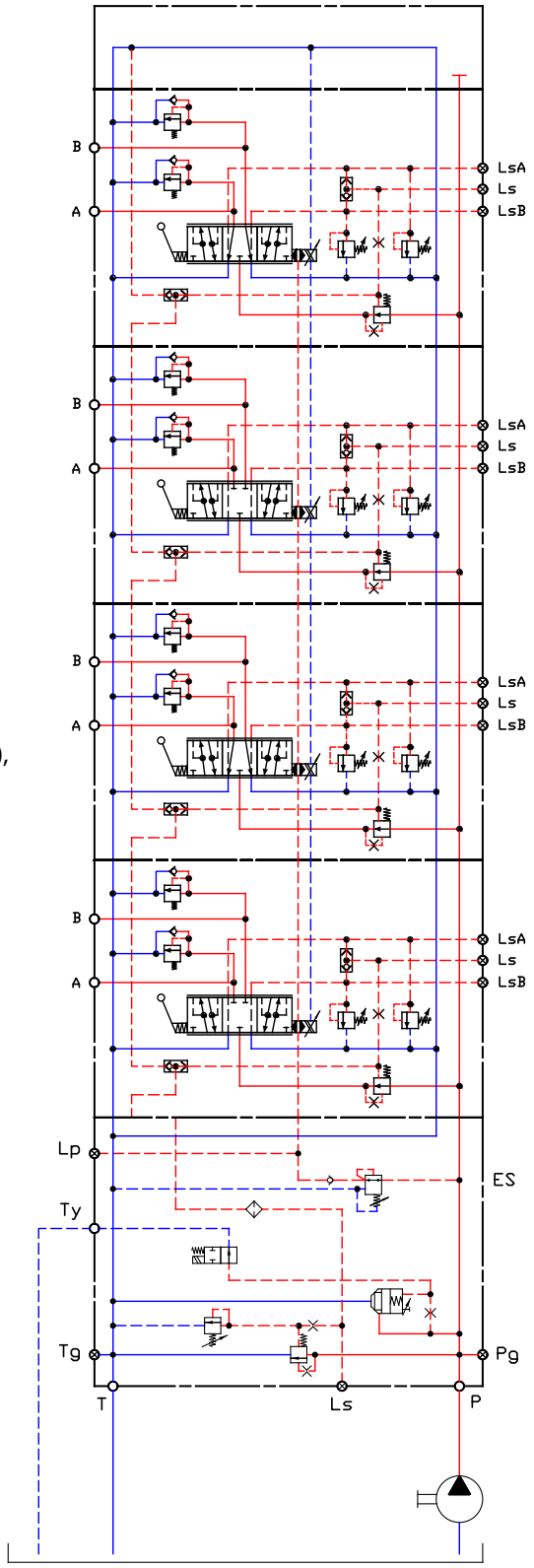


PDW		1	2	3	4	5	6	7	8	9	10	11	12
L1	mm	180	228	276	324	372	420	468	516	564	612	660	708
	in	7,09	8,98	10,87	12,76	14,65	16,54	18,43	20,31	22,20	24,09	25,98	27,87
L2	mm	200	248	296	344	392	440	488	536	584	632	680	728
	in	7,87	9,76	11,65	13,54	15,43	17,32	19,21	21,10	22,99	24,88	26,77	28,66

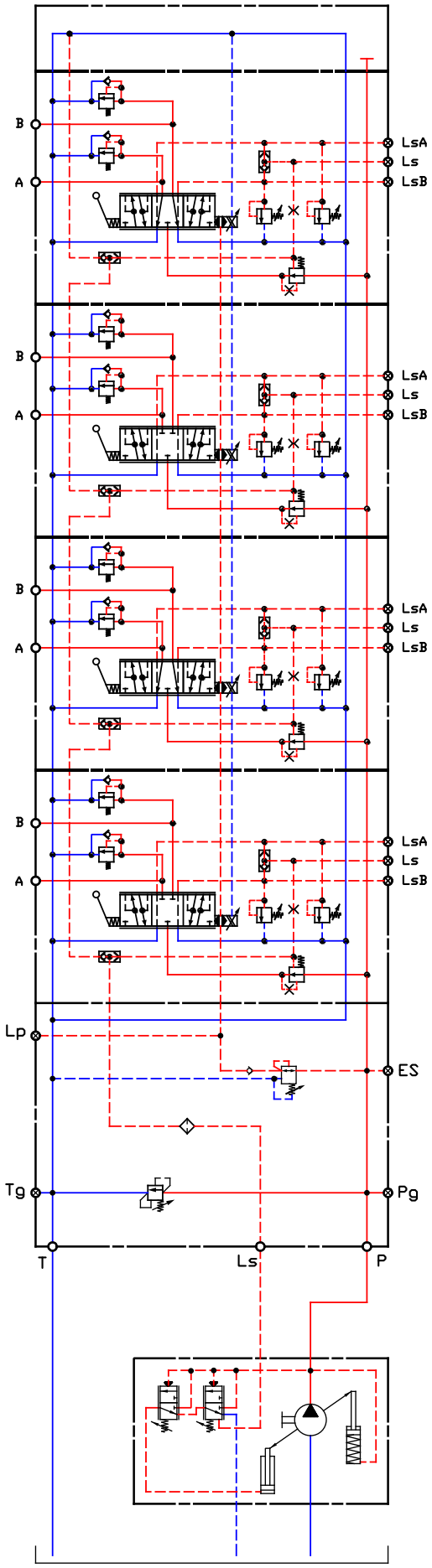
PDV114 Proportional valve
Overall dimensions drawing with standard inlet section
Right assembly version

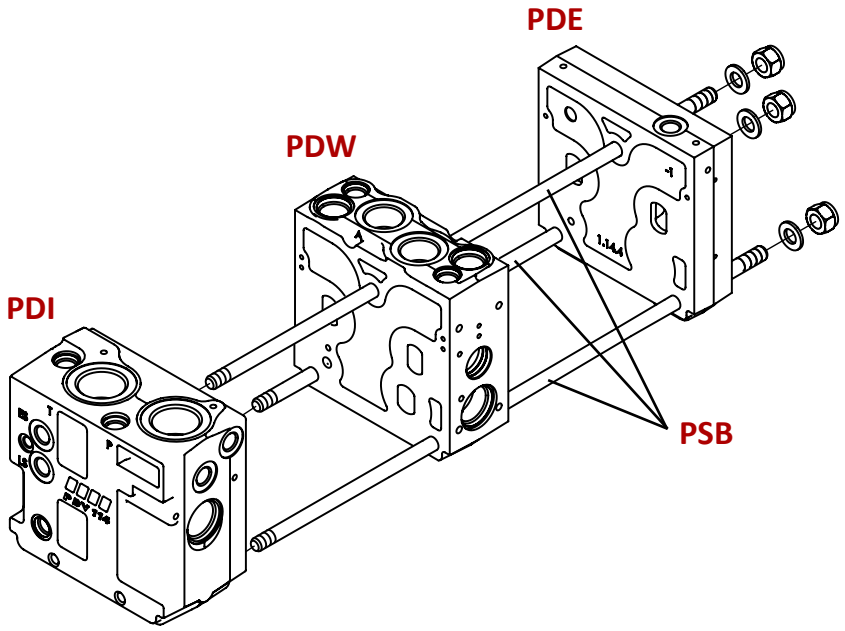
A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB } remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
P = LS
Q = Port A
R = Port B } 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A } pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

PDV114 with open centre inlet section (fixed displacement pump), pump unloading system, pilot oil supply for electro-hydraulic spool actuations



PDV114 with closed centre inlet section (variable displacement pump), pilot oil supply for electro-hydraulic spool actuations

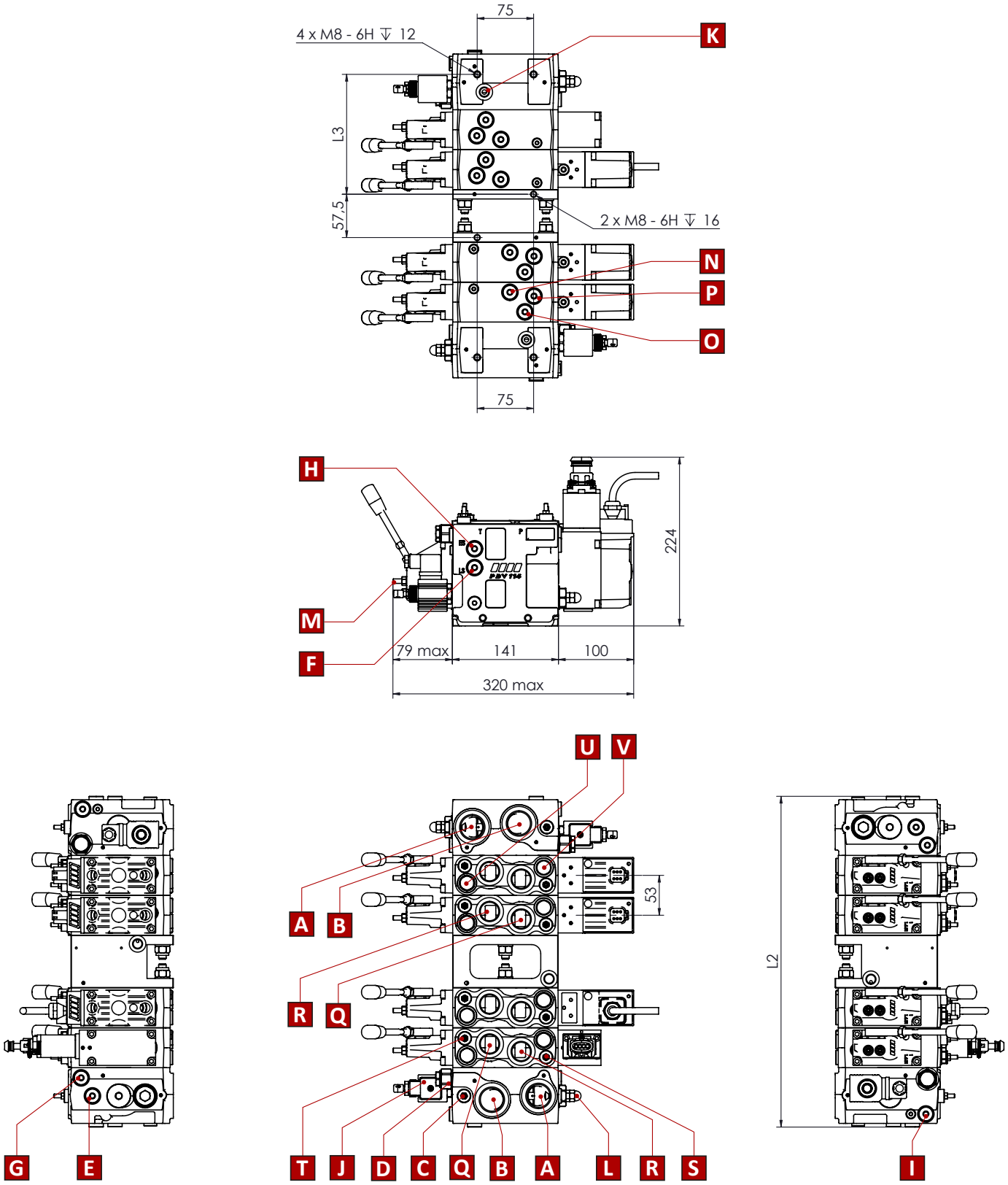




PDW	Code numbers	Tightening torque
1	**PSB10010000**	**25 ± 2 Nm** **220 ± 18 lb*in**
2	**PSB10020000**	
3	**PSB10030000**	
4	**PSB10040000**	
5	**PSB10050000**	
6	**PSB10060000**	
7	**PSB10070000**	
8	**PSB10080000**	
9	**PSB10090000**	
10	**PSB10100000**	

OMFB
HYDRAULIC POWER CONTROL

PDV114 Proportional valve
Overall dimensions drawing with double inlet and MID end section

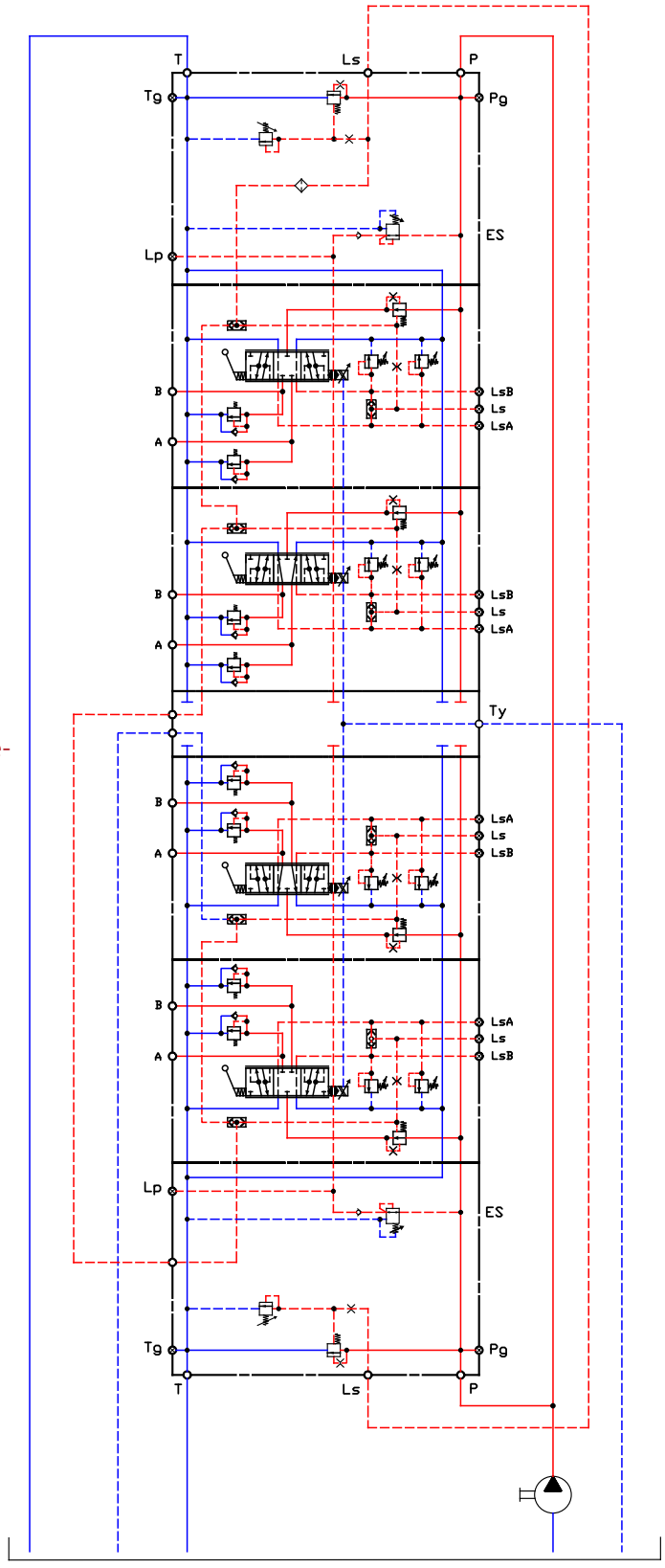


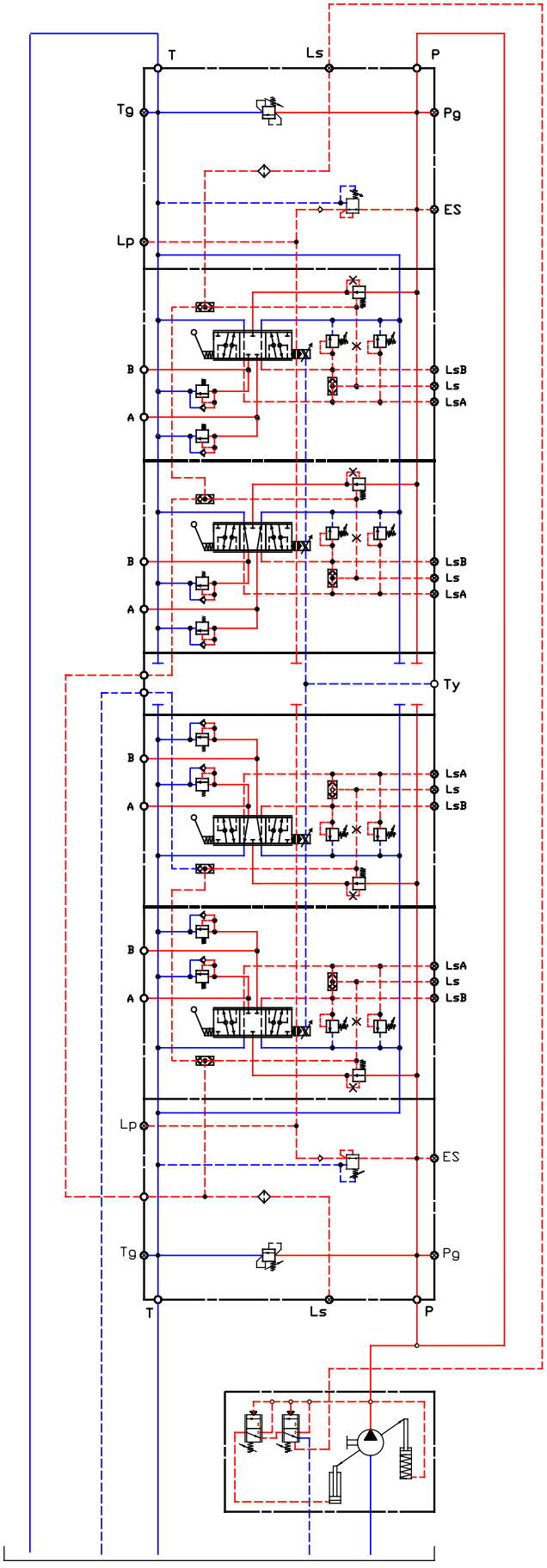
PDW		2	3	4	5	6	7	8	9	10	11	12
L1	mm	331	379	427	475	523	571	619	667	715	763	811
	in	13,03	14,92	16,81	18,70	20,59	22,48	24,37	26,26	28,15	30,04	31,93
L2	mm	351	399	447	495	543	591	639	687	735	783	831
	in	13,82	15,71	17,60	19,49	21,38	23,27	25,16	27,05	28,94	30,83	32,72

PDV114 Proportional valve
Overall dimensions drawing with double inlet and MID end section

A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB } remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
P = LS
Q = Port A
R = Port B } 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A } pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

PDV114 with double open centre inlet section (fixed displacement pump), pilot oil supply for electro-hydraulic spool actuations




T
Ls
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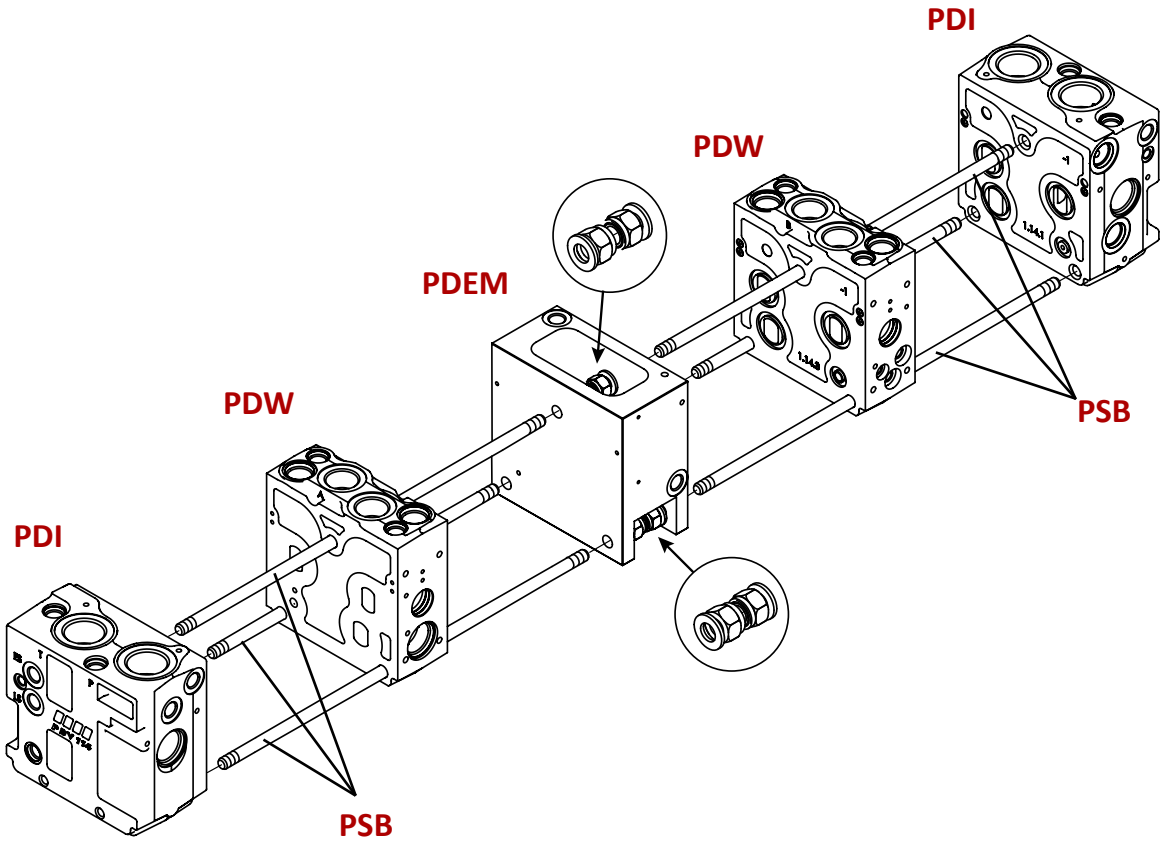
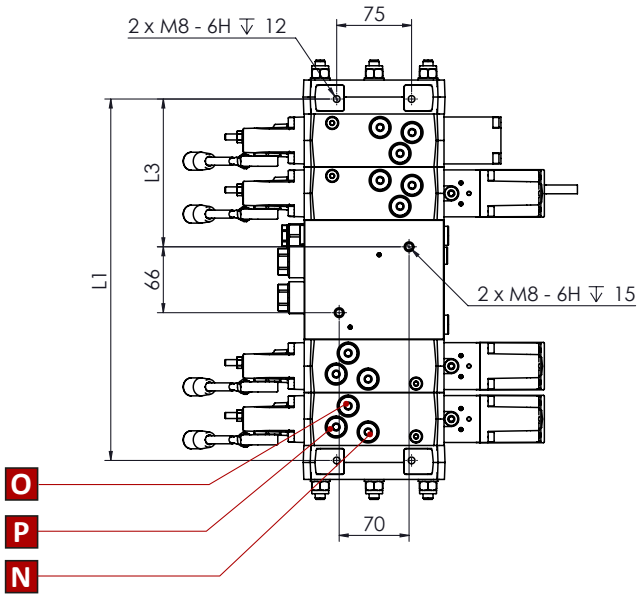
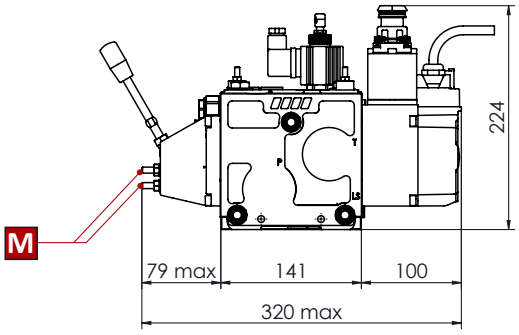
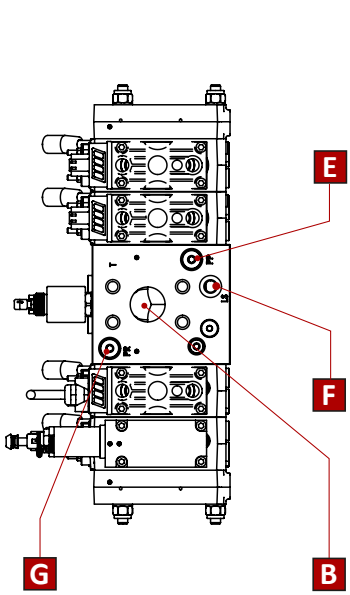


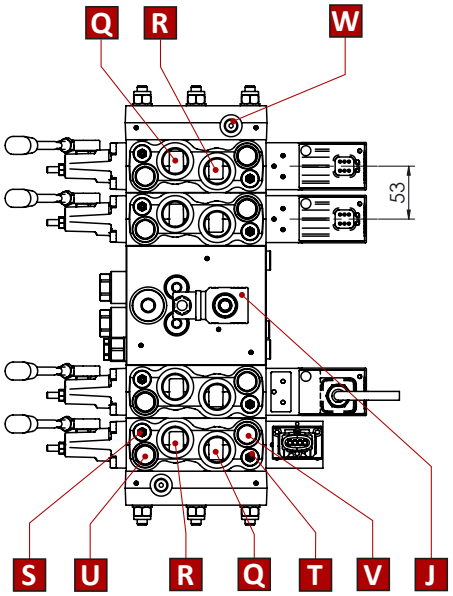
PDW	Code numbers	Tightening torque
1	**PSB12010000**	**25 ± 2 Nm** **220 ± 18 lb*in**
2	**PSB12020000**	
3	**PSB12030000**	
4	**PSB12040000**	
5	**PSB12050000**	
6	**PSB12060000**	

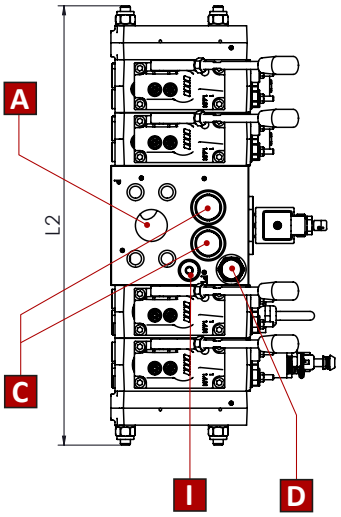
PDV114 Proportional valve
Overall dimensions drawing with closed centre MID inlet section







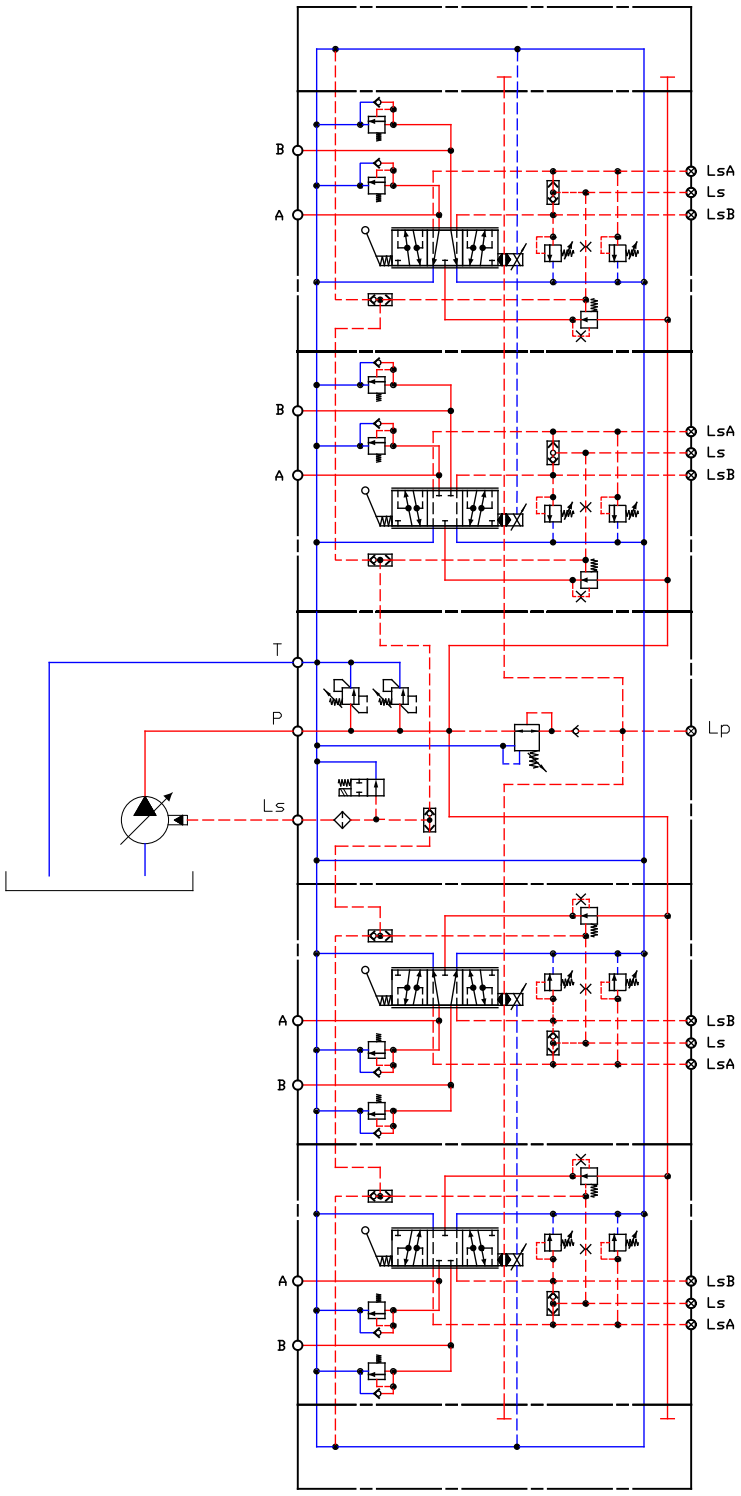


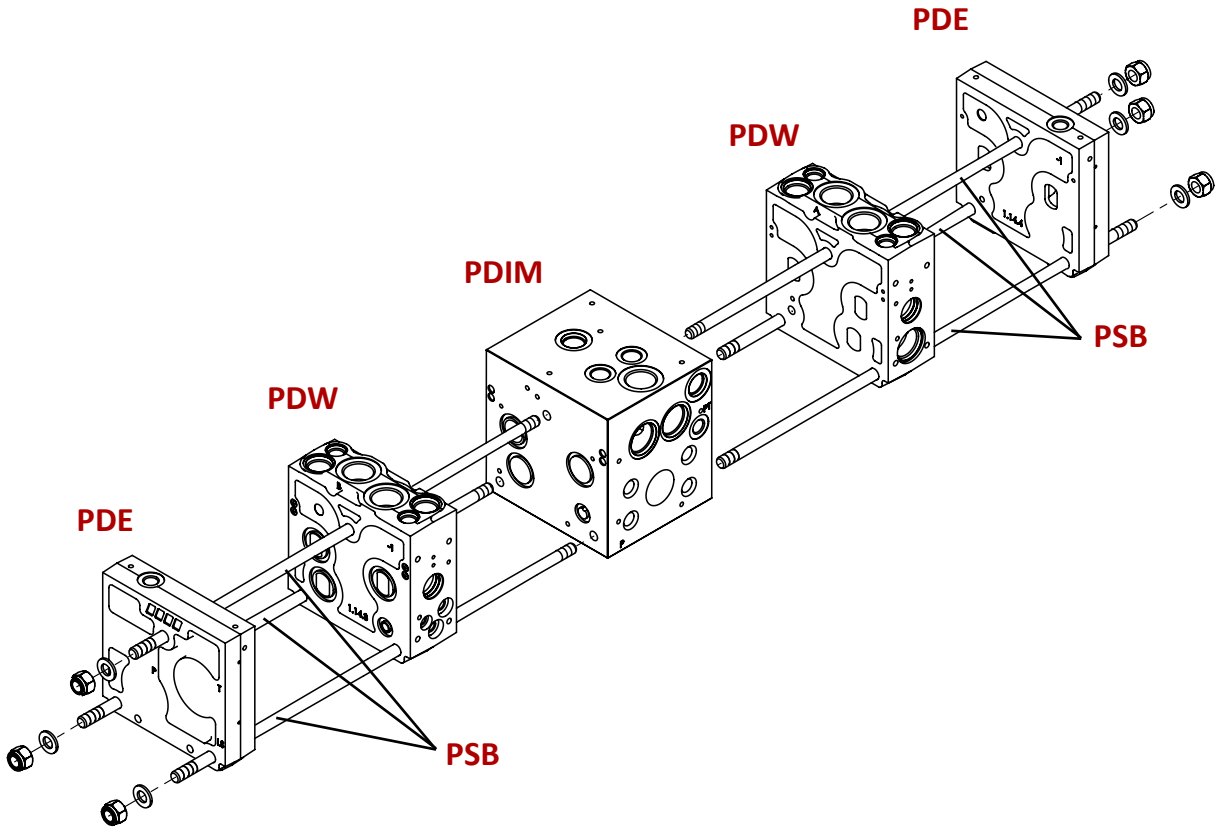


Overall dimensions drawing with closed centre MID inlet section

A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
M = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
N = LSA
O = LSB } remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
P = LS
Q = Port A
R = Port B } 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A } pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

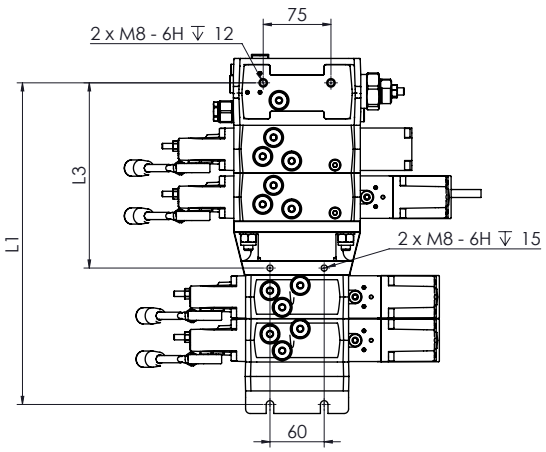
PDV74 with MID-inlet closed centre section (variable displacement pump), pilot oil supply for electro-hydraulic spool actuations

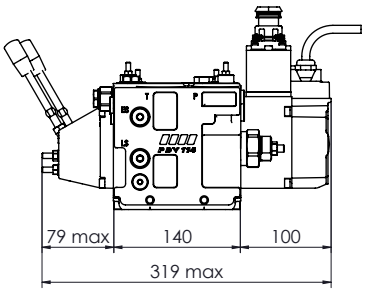


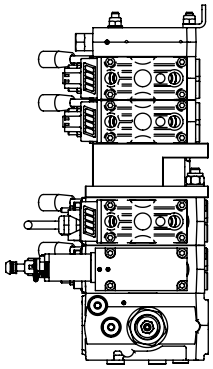


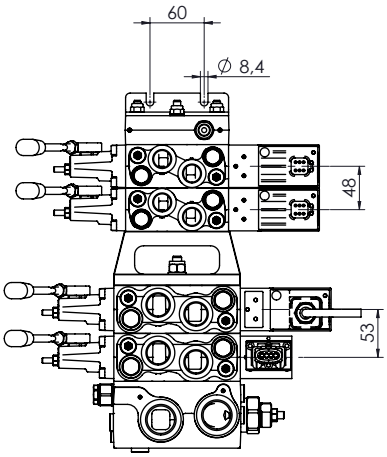
PDW	Code numbers	Tightening torque
1	**PSB10010000**	**25 ± 2 Nm** **220 ± 18 lb*in**
2	**PSB10020000**	
3	**PSB10030000**	
4	**PSB10040000**	
5	**PSB10050000**	
6	**PSB10060000**	

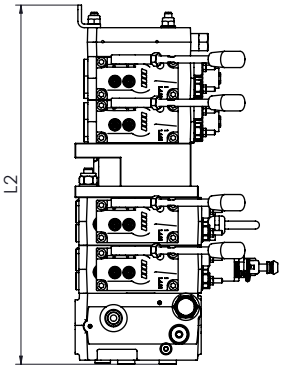
PDV114 + PDV74 Proportional valve
Overall dimensions drawing with standard inlet section
Right assembly version









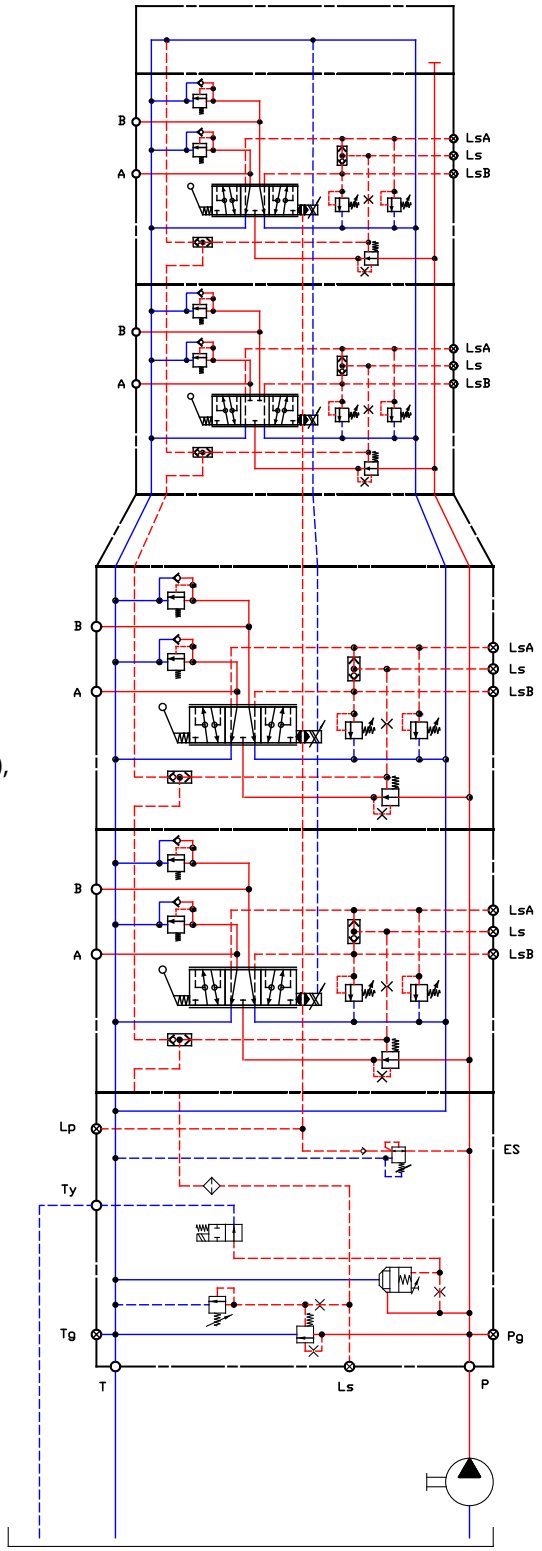


PDW		1	2	3	4	5	6	7	8	9	10	11	12
L1	mm	180	228	276	324	372	420	468	516	564	612	660	708
	in	7,09	8,98	10,87	12,76	14,65	16,54	18,43	20,31	22,20	24,09	25,98	27,87
L2	mm	200	248	296	344	392	440	488	536	584	632	680	728
	in	7,87	9,76	11,65	13,54	15,43	17,32	19,21	21,10	22,99	24,88	26,77	28,66

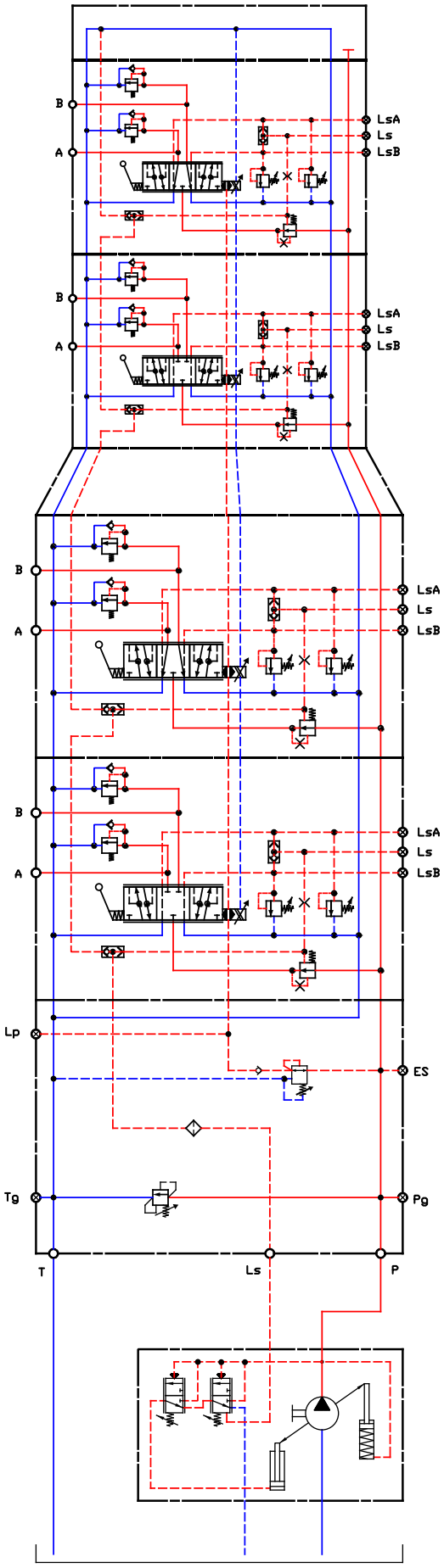
PDV114 + PDV74 Proportional valve
Overall dimensions drawing with standard inlet section
Right assembly version

A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB } remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
P = LS
Q = Port A
R = Port B } 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A } pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

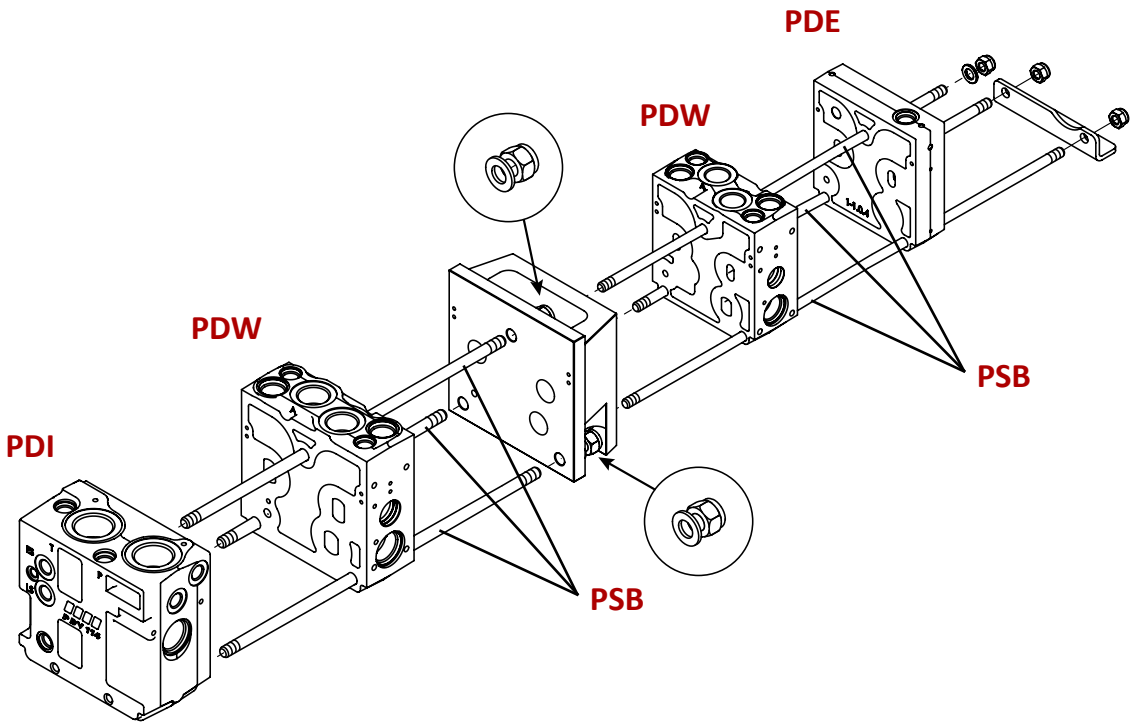
PDV117 with open centre inlet section (fixed displacement pump), pump unloading system, pilot oil supply for electro-hydraulic spool actuations



PDV117 with closed centre inlet section (variable displacement pump), pilot oil supply for electro-hydraulic spool actuations

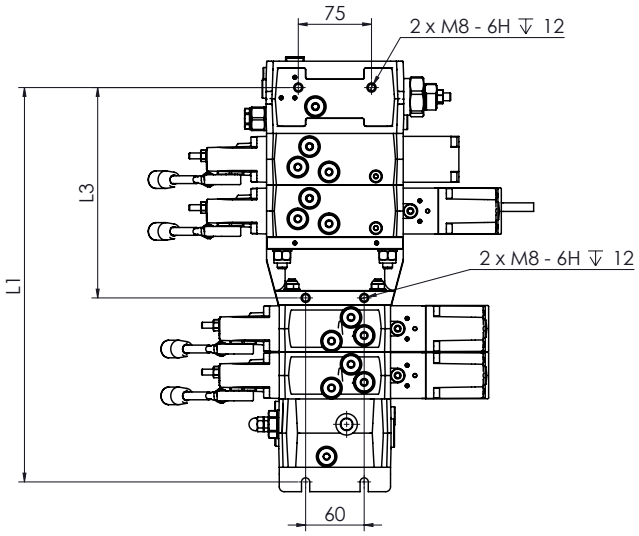


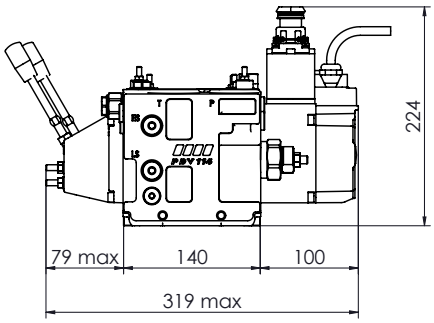
PDV114 + PDV74 Proportional Valve
PSB Stay bolt kit - Standard configuration

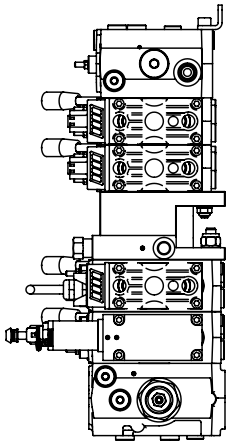


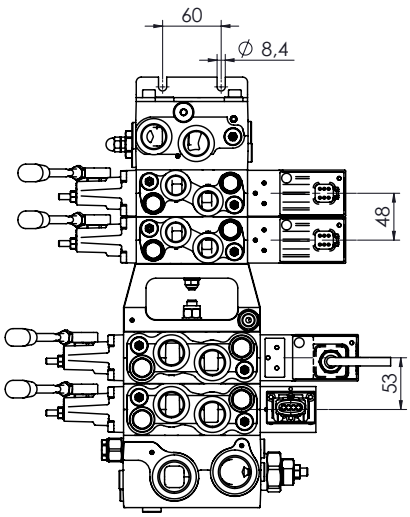
PDW	Code numbers PDV114	Code numbers PDV74	Tightening torque
1	**PSB12010000**	**PSB70011000**	**25 ± 2 Nm** **220 ±18 lb*in**
2	**PSB12020000**	**PSB70021000**	
3	**PSB12030000**	**PSB70031000**	
4	**PSB12040000**	**PSB70041000**	
5	**PSB12050000**	**PSB70051000**	
6	**PSB12060000**	**PSB70061000**	
7	**PSB12070000**	**PSB70071000**	
8	**PSB12080000**	**PSB70081000**	

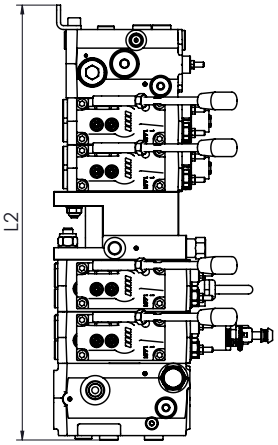
PDV114 + PDV74 Proportional valve
Overall dimensions drawing with double inlet and MID end section











PDV114 + PDV74 Proportional valve
Overall dimensions drawing with double inlet and MID end section

A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
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E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
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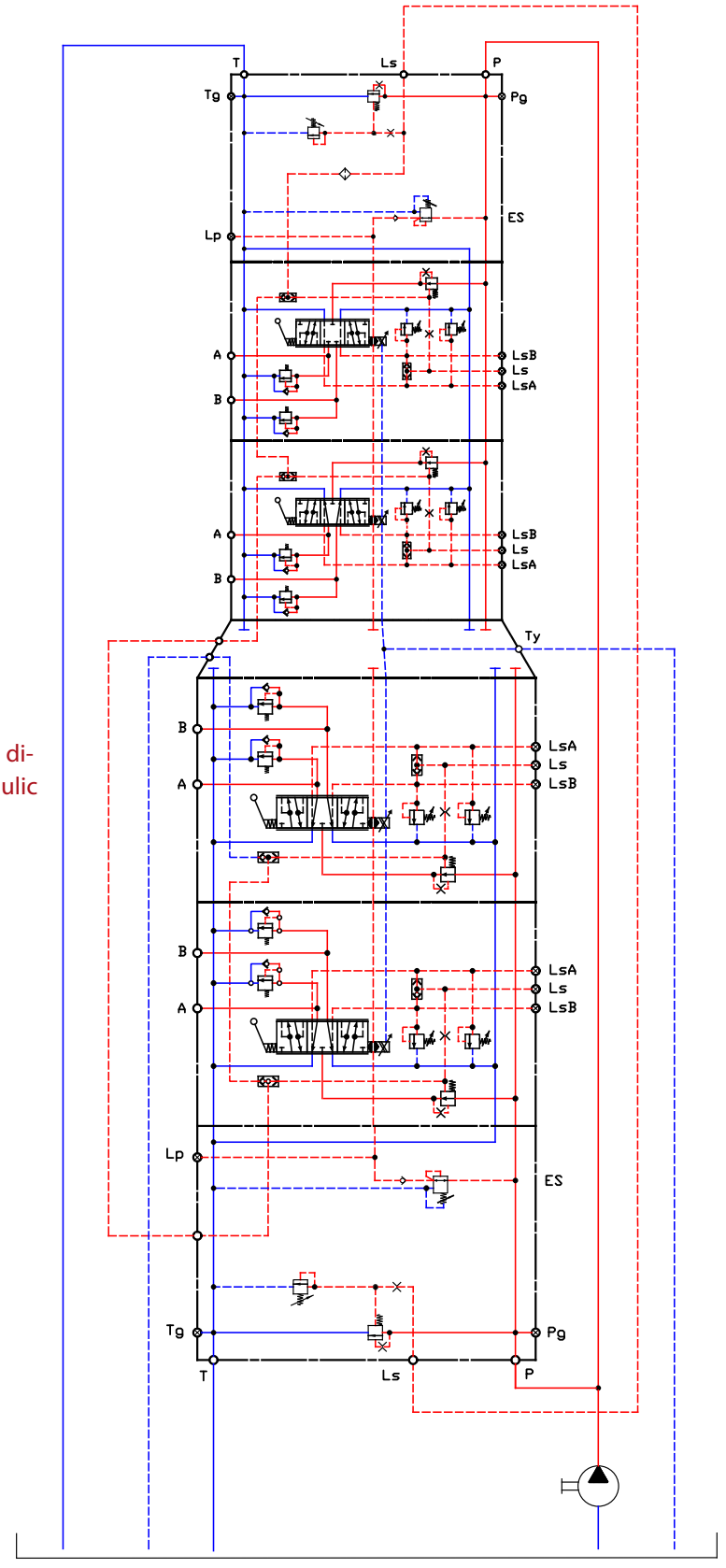
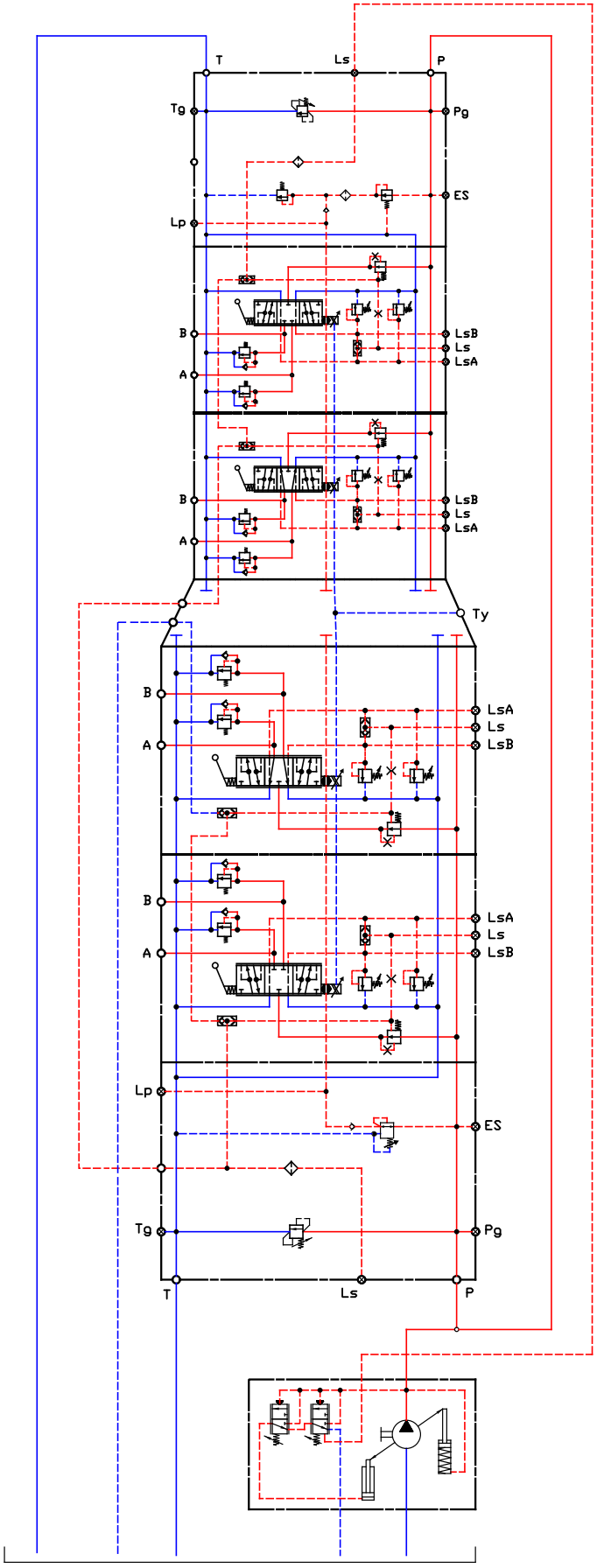
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB } remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
P = LS
Q = Port A
R = Port B } 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A } pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

PDV117 with double open centre inlet section (fixed displacement pump), pilot oil supply for electro-hydraulic spool actuations




T
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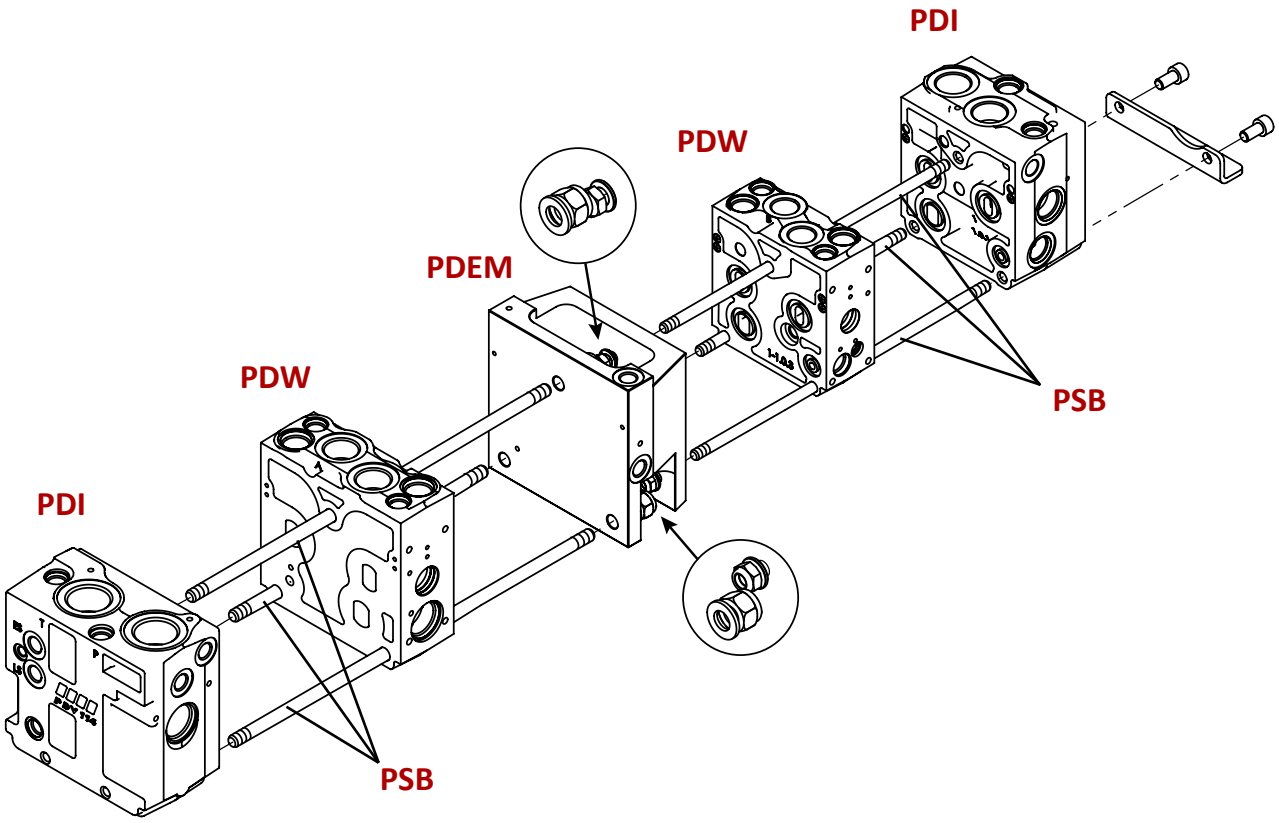
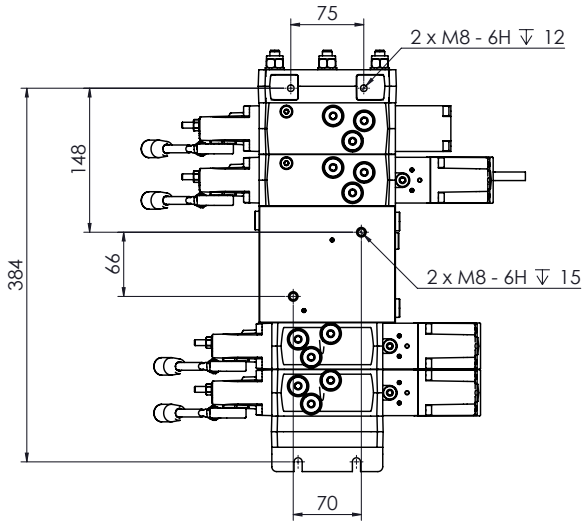
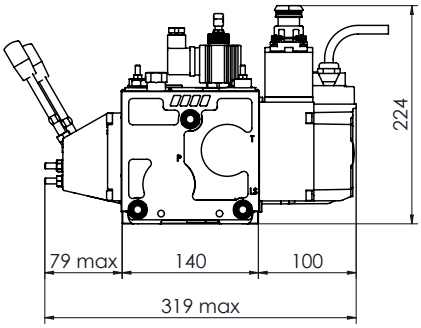
P
Tg
Pg
ES
Lp
B
A
LsB
Ls
LsA
Ty
LsA
Ls
LsB

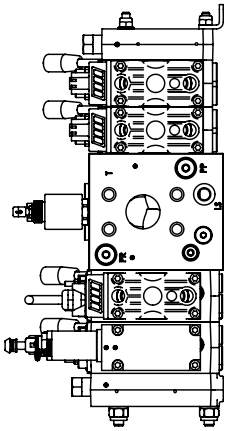


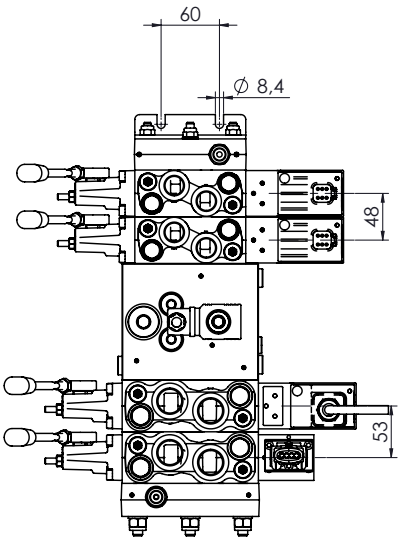
PDW	Code numbers PDV114	Code numbers PDV74	Tightening torque
1	**PSB12010000**	**PSB72011000**	**25 ± 2 Nm** **220 ±18 lb*in**
2	**PSB12020000**	**PSB72021000**	
3	**PSB12030000**	**PSB72031000**	
4	**PSB12040000**	**PSB72041000**	
5	**PSB12050000**	**PSB72051000**	
6	**PSB12060000**	**PSB72061000**	

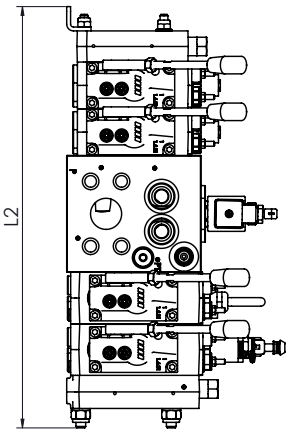
PDV114 + PDV74 Proportional valve
Overall dimensions drawing with closed centre MID inlet section











A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
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G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
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K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
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N = LSA
O = LSB } remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
P = LS
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T = Ls_A } pilot pressure relief valve
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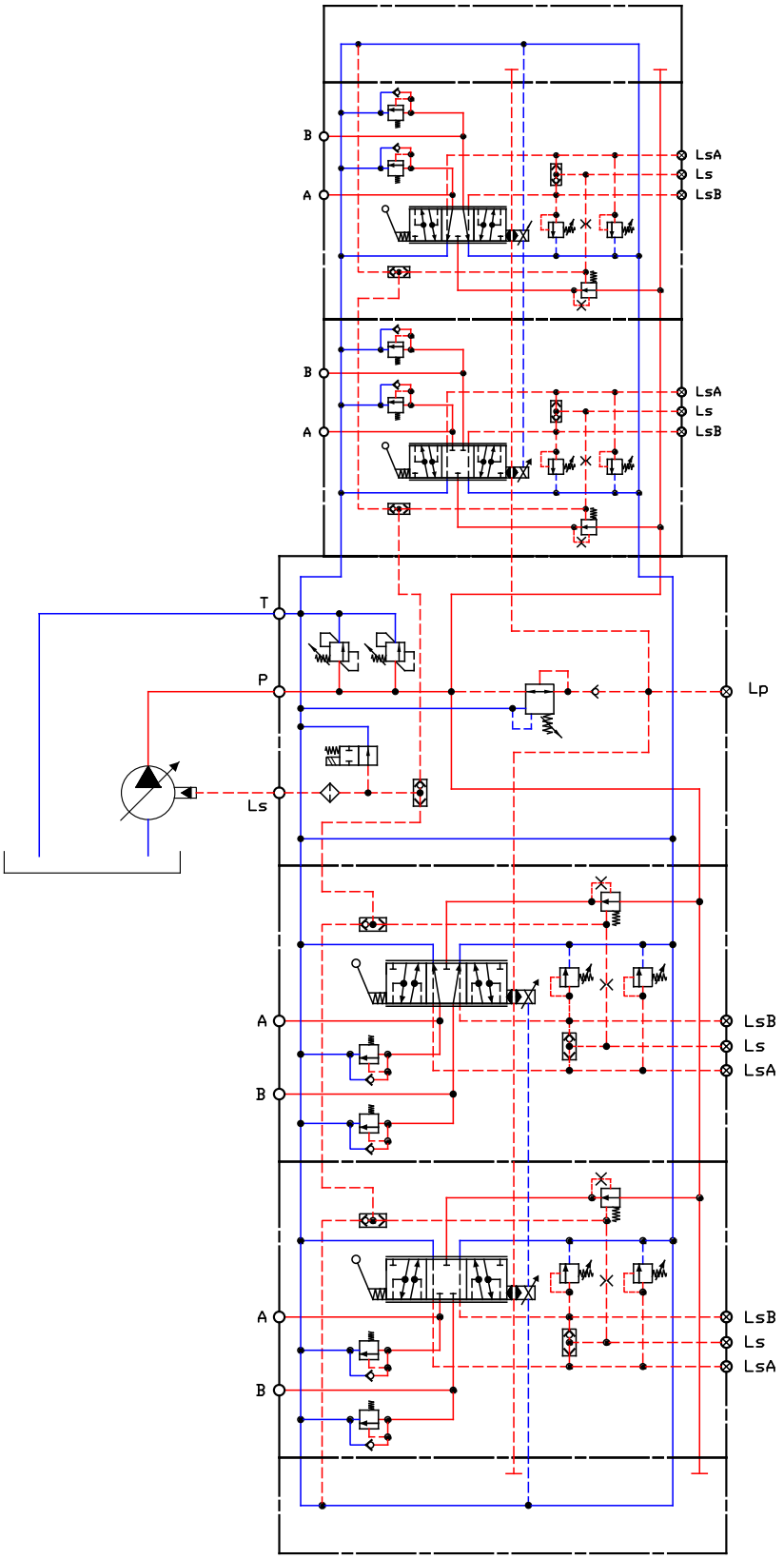
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]


B
A
LsA
Ls
LsB
B
A
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Ls
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T
P
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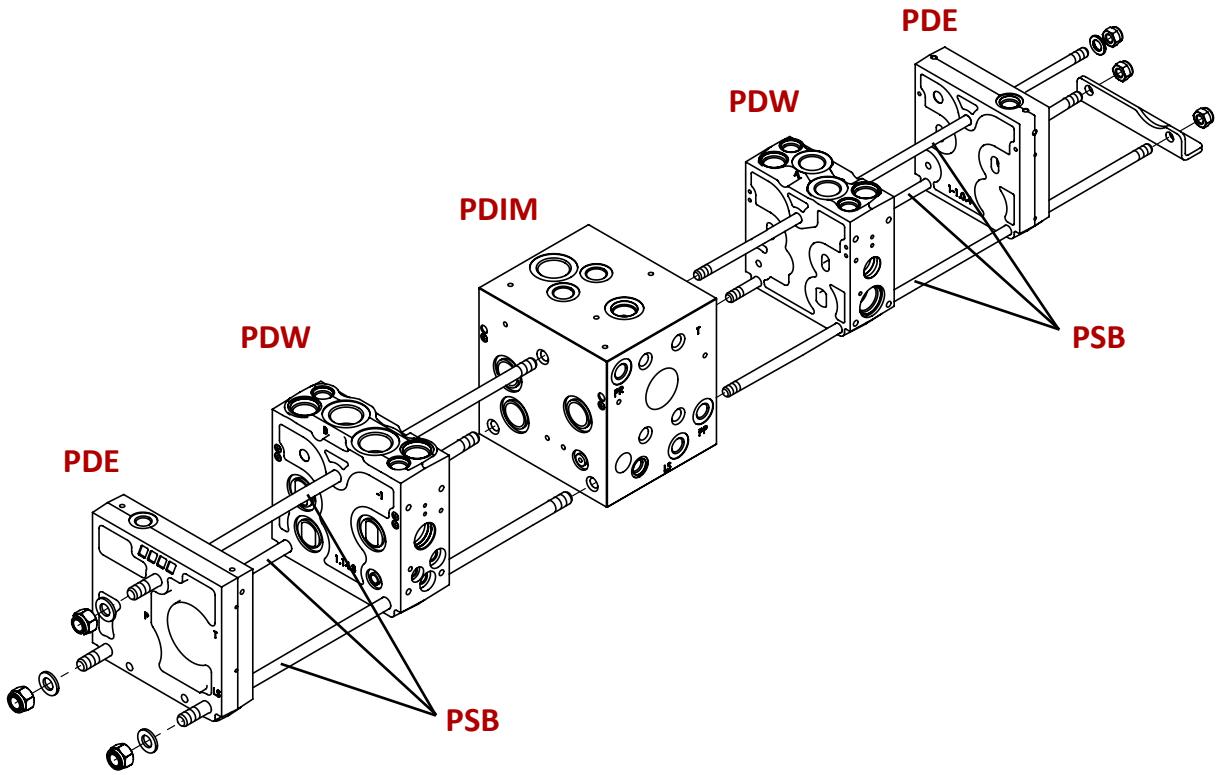
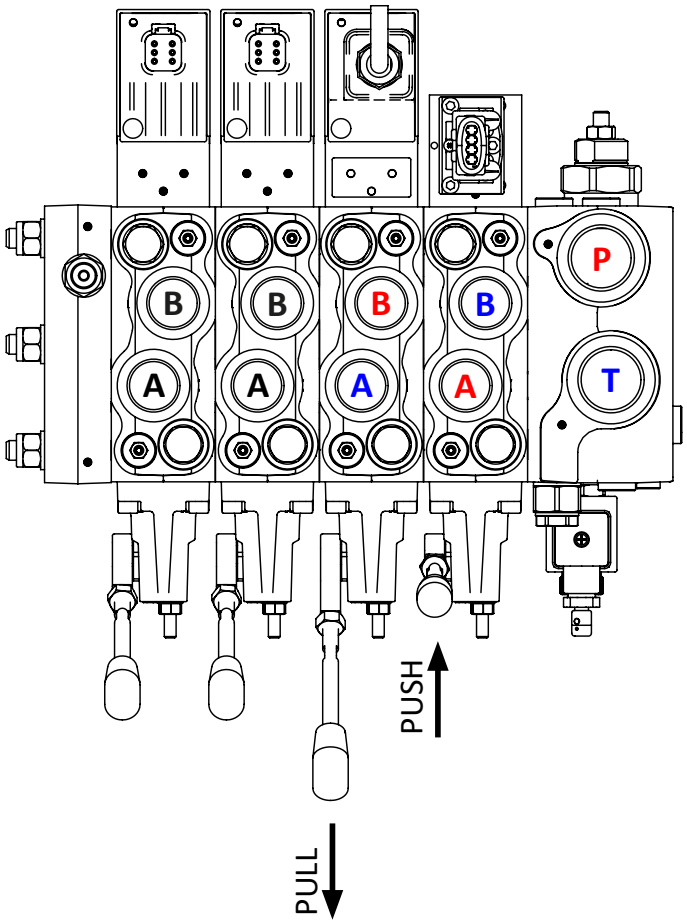
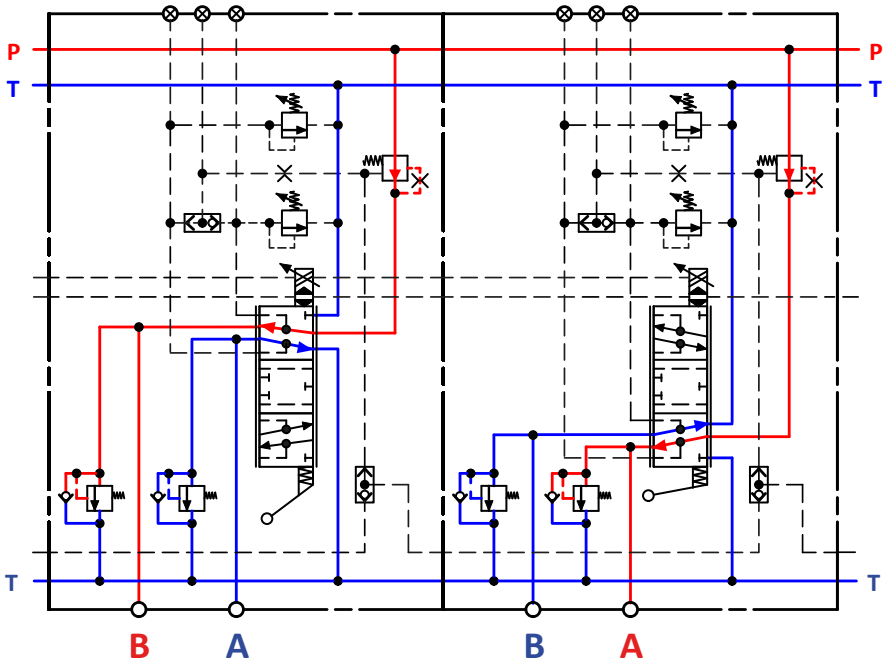
B
LsB
Ls
LsA



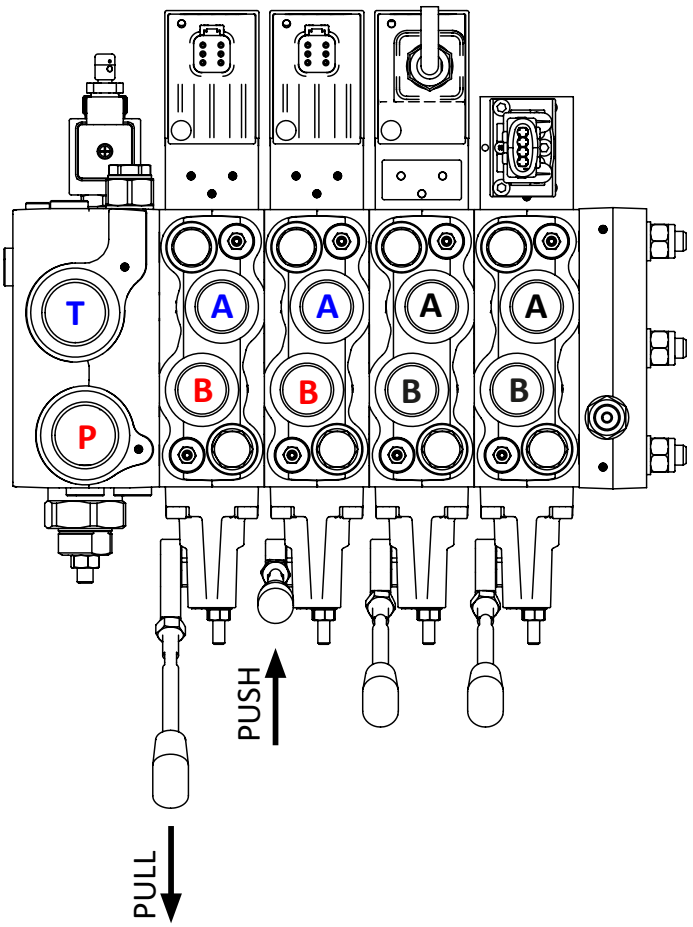
PDW	Code numbers PDV114	Code numbers PDV74	Tightening torque
1	**PSB10010000**	**PSB71011000**	**25 ± 2 Nm** **220 ±18 lb*in**
2	**PSB10020000**	**PSB71021000**	
3	**PSB10030000**	**PSB71031000**	
4	**PSB10040000**	**PSB71041000**	
5	**PSB10050000**	**PSB71051000**	
6	**PSB10060000**	**PSB71061000**	

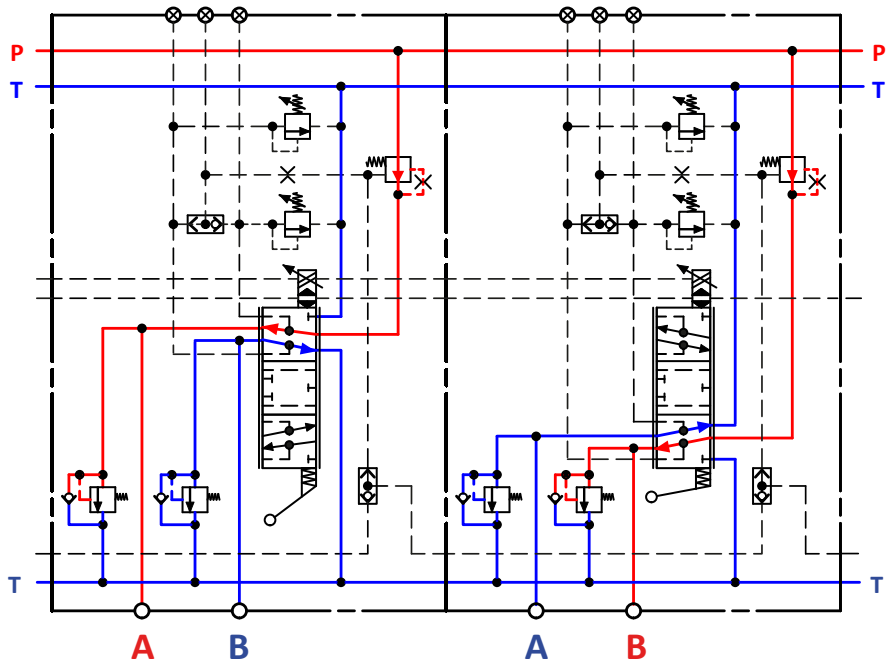
PDV114 Proportional valve
Right side version





PDV114 Proportional valve
Left side version

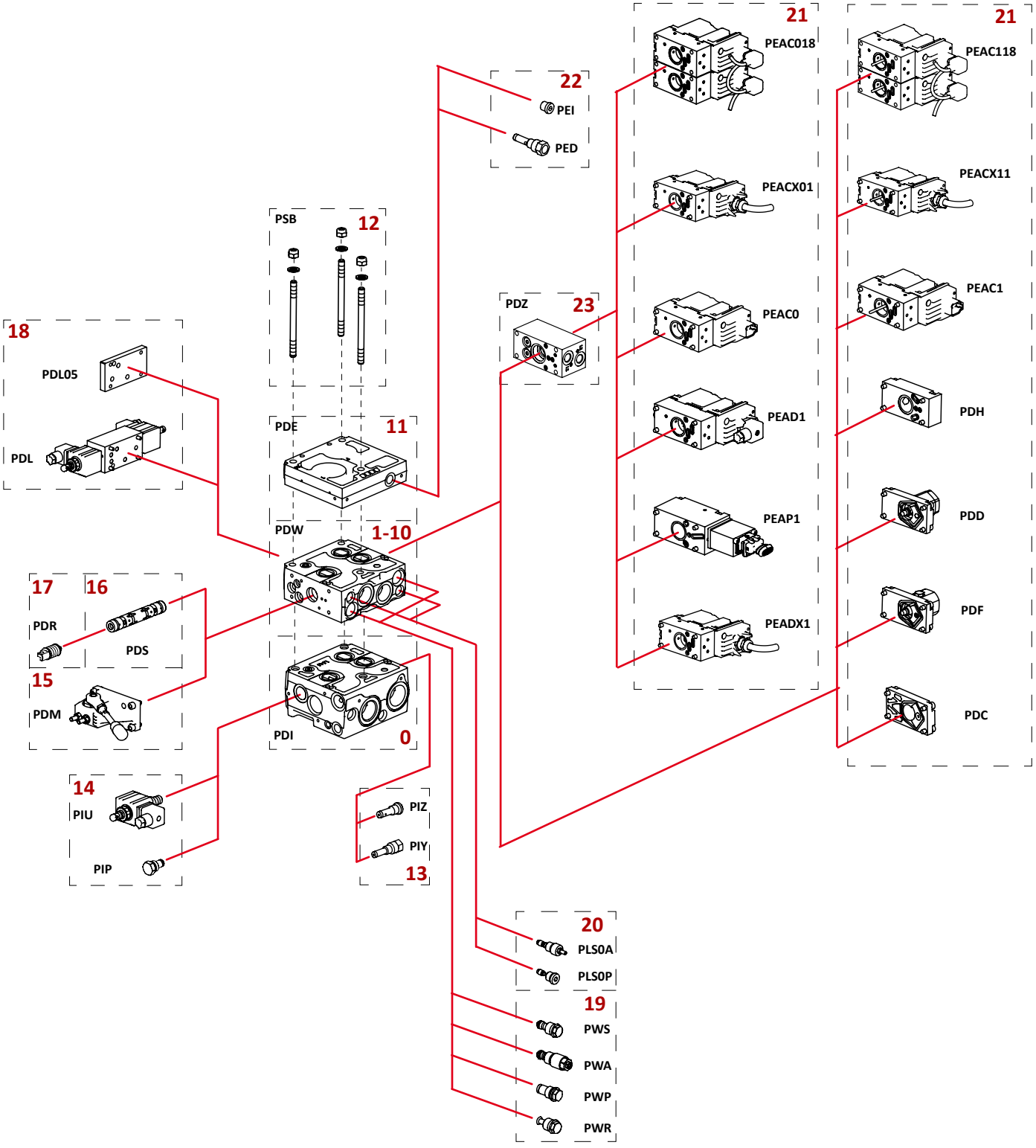




OMFB
HYDRAULIC POWER CONTROL

PDV114 Proportional valve
Configuration with standard inlet section - Right side assembly
Product selection chart

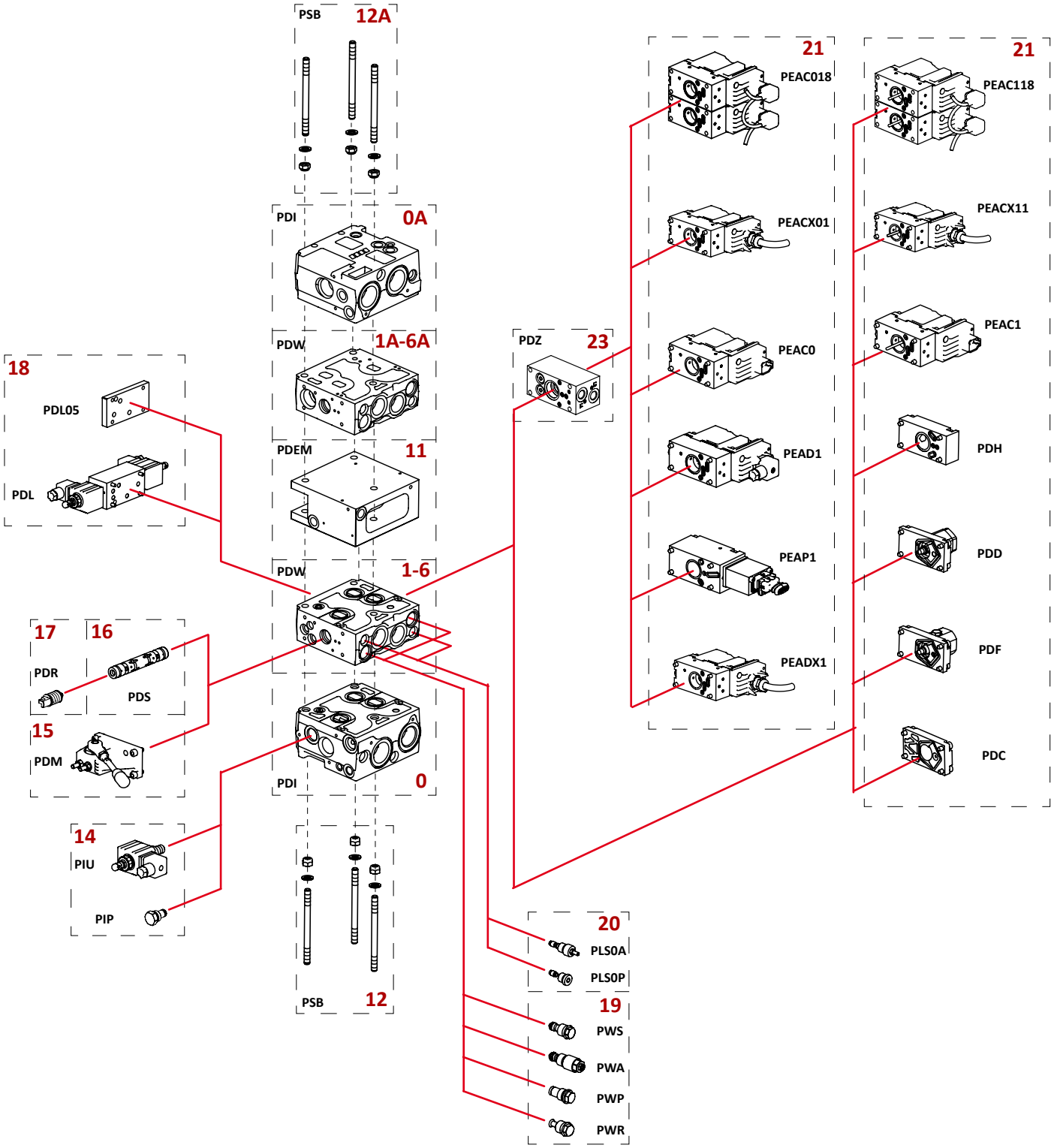
This specification sheet, gives an overview of any modules with which the PDV74 is being assembled. Each module has its own field. The purpose of this chart is to provide a quick access to the module's choice, whose characteristics must always be checked on the catalog related data.



PDV114 Proportional valve,
Product selection chart, with standard inlet section

Reference field	Description			Code numbers see pag
0	Inlet sections	Open centre	PDI	155 - 156
		Closed centre		157 - 158
1-10	Working sections	with pressure compensator	PDW	161 - 162
		without pressure compensator		163 - 164
11	End sections		PDE	165 - 166
12	Stay bolt set		PSB	252
13	Pilot oil supply cartridge	Internal	PIZ	182
		External	PIY	182
14	Solenoid Ls unloading		PIU	159 - 160
	Plug for LS unloading cavity		PIP	159
15	Mechanical actuation		PDM	179
16	Spool		PDS	From 170 to 178
17	Spool centered set		PDR	From 172 to 178
18	Unloading module		PDL	From 186 to 190
	Cover plate		PDL05	
19	Shock and suction valve	not adjustable	PWS	183-184
		adjustable	PWA	183-184
	Plug for shock and suction valve cavity		PWP	185
	Suction valve		PWR	185
20	Pilot pressure $LS_{A/B}$ relief valve		PLS0A	180
	Set plug $LS_{A/B}$ cavity		PLS0P	180
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	PEAD1	From 236 to 241
		Open loop spool control high resolution	PEAC0	From 215 to 235
		Closed loop spool control high performance resolution	PEAC1	From 191 to 214
		Open loop spool control high resolution CAN-Bus	PEAC018	
		Closed loop spool control high performance resolution CAN-Bus	PEAC118	
		Open loop spool control high resolution ATEX	PEACX01	
		Closed loop spool control high performance resolution ATEX version	PEACX11	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	PEADX1	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	PEAP1	From 242 to 247
	Rear cover for	Hydraulic control	PDH	180
		Detent	PDD	181
		Friction detent	PDF	179
		Mechanical actuation	PDC	180
22	End sections	External drain line cartridge	PED	182
		Internal plug	PEI	182
23	Dual function control body		PDZ	168 - 169
24	Pump pressure relief valve (for closed centre only)		PRV0A	
	Plug for relief valve cavity (for closed centre only)		PRV0P	

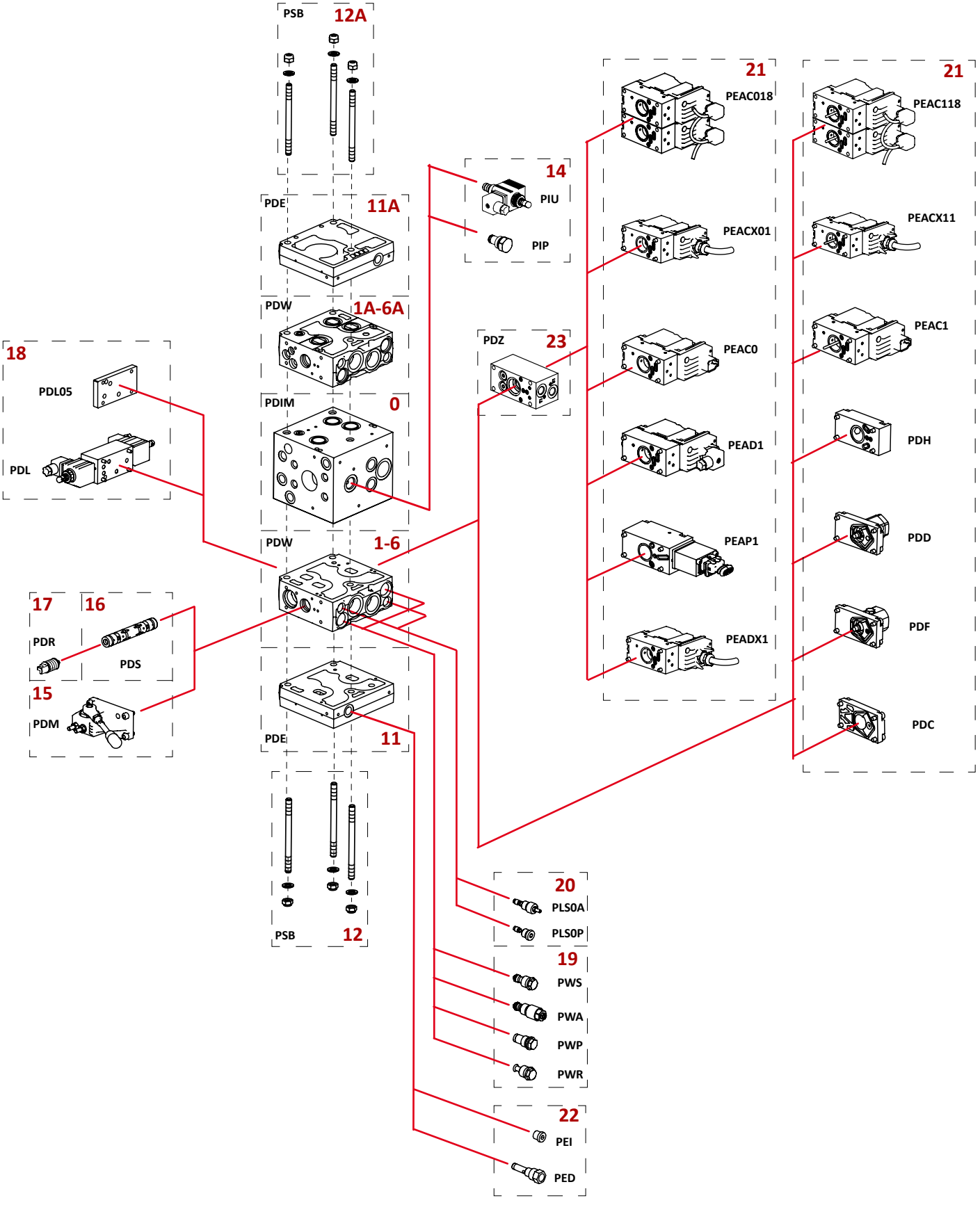
PDV114 Proportional valve, product selection chart
Configuration with double inlet sections and MID end section



PDV114 Proportional valve,
Product selection chart, with double inlet sections and MID end section

Reference field	Description			Code numbers see pag
0 0A	Inlet sections	Open centre	PDI	155 - 156
		Closed centre		157 - 158
1-6 1A-6A	Working sections	with pressure compensator	PDW	161 - 162
		without pressure compensator		163 - 164
11	End sections		PDE	165 - 166
12 12A	Stay bolt set		PSB	258
13	Pilot oil supply cartridge	Internal	PIZ	182
		External	PIY	182
14	Solenoid Ls unloading		PIU	159 - 160
	Plug for LS unloading cavity		PIP	159
15	Mechanical actuation		PDM	179
16	Spool		PDS	From 170 to 178
17	Spool centered set		PDR	From 172 to 178
18	Unloading module		PDL	From 186 to 190
	Cover plate		PDL05	
19	Shock and suction valve	not adjustable	PWS	183-184
		adjustable	PWA	183-184
	Plug for shock and suction valve cavity		PWP	185
	Suction valve		PWR	185
20	Pilot pressure $LS_{A/B}$ relief valve		PLS0A	180
	Set plug $LS_{A/B}$ cavity		PLS0P	180
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	PEAD1	From 236 to 241
		Open loop spool control high resolution	PEAC0	From 215 to 235
		Closed loop spool control high performance resolution	PEAC1	From 191 to 214
		Open loop spool control high resolution CAN-Bus	PEAC018	
		Closed loop spool control high performance resolution CAN-Bus	PEAC118	
		Open loop spool control high resolution ATEX	PEACX01	
		Closed loop spool control high performance resolution ATEX version	PEACX11	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	PEADX1	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	PEAP1	From 242 to 247
	Rear cover for	Hydraulic control	PDH	180
		Detent	PDD	181
		Friction detent	PDF	179
		Mechanical actuation	PDC	180
22	End sections	External drain line cartridge	PED	182
		Internal plug	PEI	182
23	Dual function control body		PDZ	168 - 169
24	Pump pressure relief valve (for closed centre only)		PRV0A	
	Plug for relief valve cavity (for closed centre only)		PRV0P	

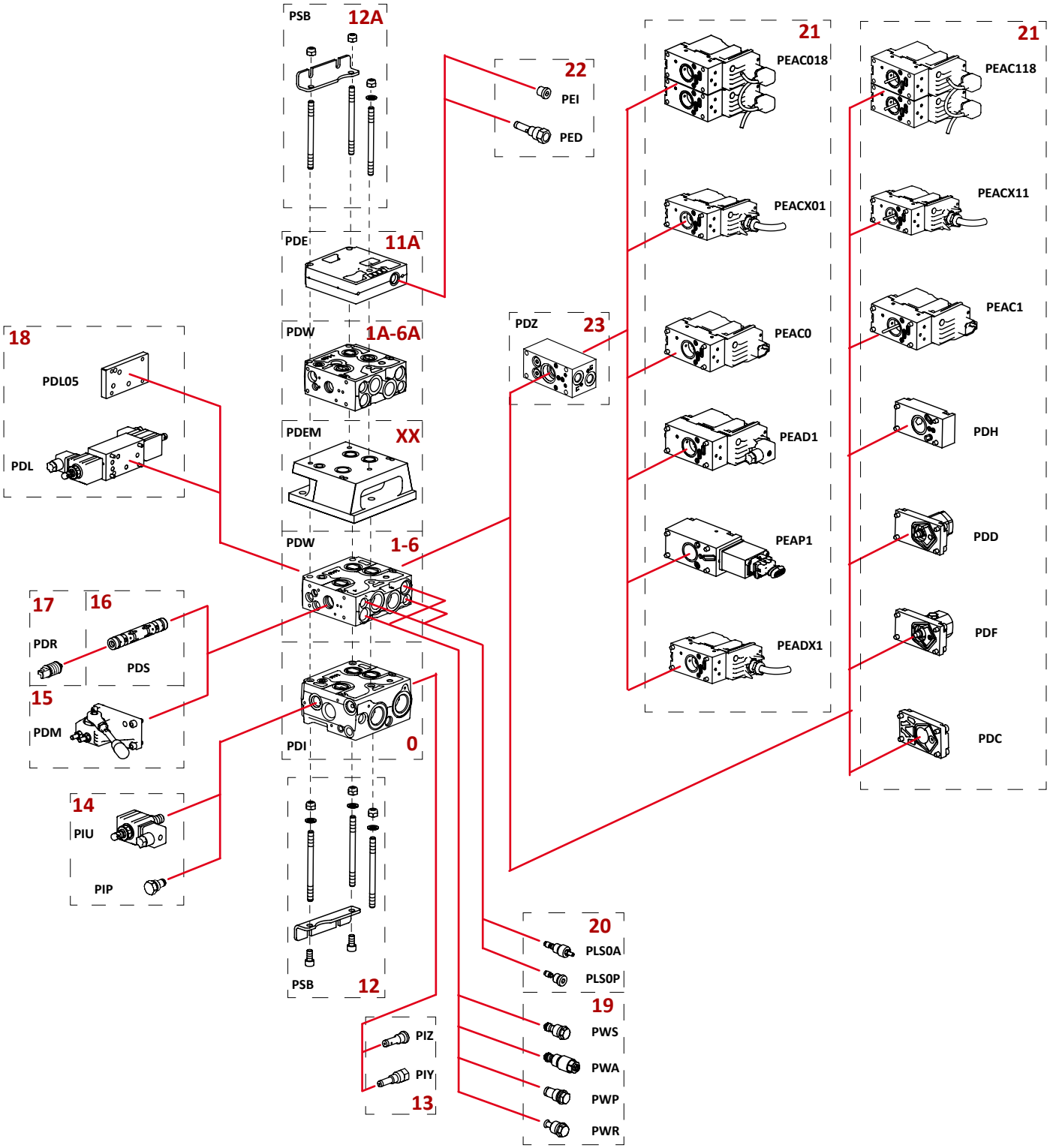
PDV114 Proportional valve, product selection chart
Configuration with MID inlet section



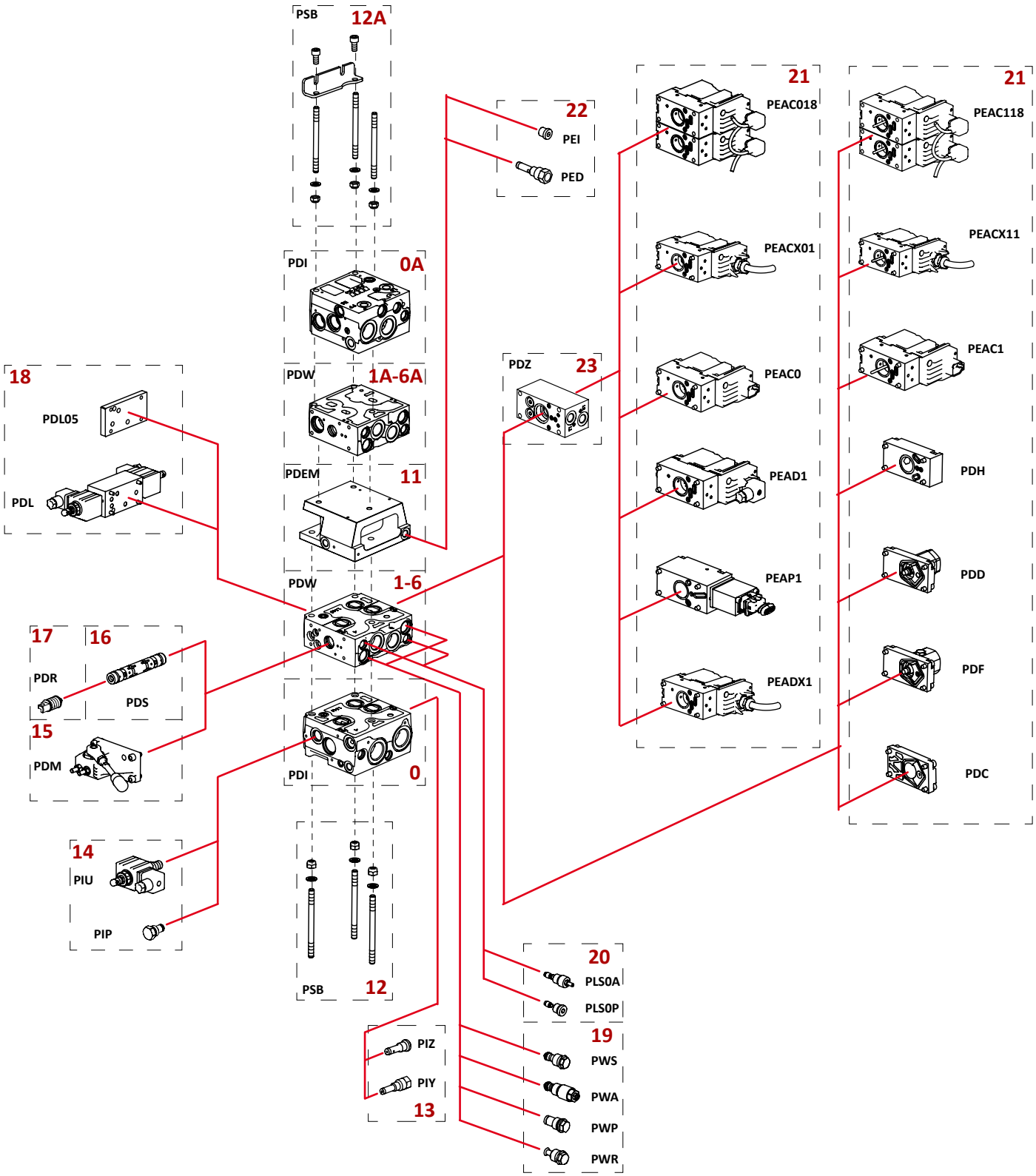
PDV114 Proportional valve,
Product selection chart, with MID inlet section

Reference field	Description			Code numbers see pag
		Closed centre	**PDI**	158
1-6 **1A-6A**	Working sections	with pressure compensator	**PDW**	161 - 162
		without pressure compensator		163 - 164
11 **11A**	End sections		**PDE**	165 - 166
12 **12A**	Stay bolt set		**PSB**	263
14	Solenoid Ls unloading		**PIU**	159 - 160
	Plug for LS unloading cavity		**PIP**	159
15	Mechanical actuation		**PDM**	179
16	Spool		**PDS**	From 170 to 178
17	Spool centered set		**PDR**	From 172 to 178
18	Unloading module		**PDL**	From 186 to 190
	Cover plate		**PDL05**	
19	Shock and suction valve	not adjustable	**PWS**	183-184
		adjustable	**PWA**	183-184
	Plug for shock and suction valve cavity		**PWP**	185
	Suction valve		**PWR**	185
20	Pilot pressure $LS_{A/B}$ relief valve		**PLS0A**	180
	Set plug $LS_{A/B}$ cavity		**PLS0P**	180
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	**PEAD1**	From 236 to 241
		Open loop spool control high resolution	**PEAC0**	From 215 to 235
		Closed loop spool control high performance resolution	**PEAC1**	From 191 to 214
		Open loop spool control high resolution CAN-Bus	**PEAC018**	
		Closed loop spool control high performance resolution CAN-Bus	**PEAC118**	
		Open loop spool control high resolution ATEX	**PEACX01**	
		Closed loop spool control high performance resolution ATEX version	**PEACX11**	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	**PEADX1**	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	**PEAP1**	From 242 to 247
	Rear cover for	Hydraulic control	**PDH**	180
		Detent	**PDD**	181
		Friction detent	**PDF**	179
		Mechanical actuation	**PDC**	180
22	End sections	External drain line cartridge	**PED**	182
		Internal plug	**PEI**	182
23	Dual function control body		**PDZ**	168 - 169
24	Pump pressure relief valve		**PRV0A**	
	Plug for relief valve cavity		**PRV0P**	

PDV114 + PDV74 Proportional valve, product selection chart
Standard configuration



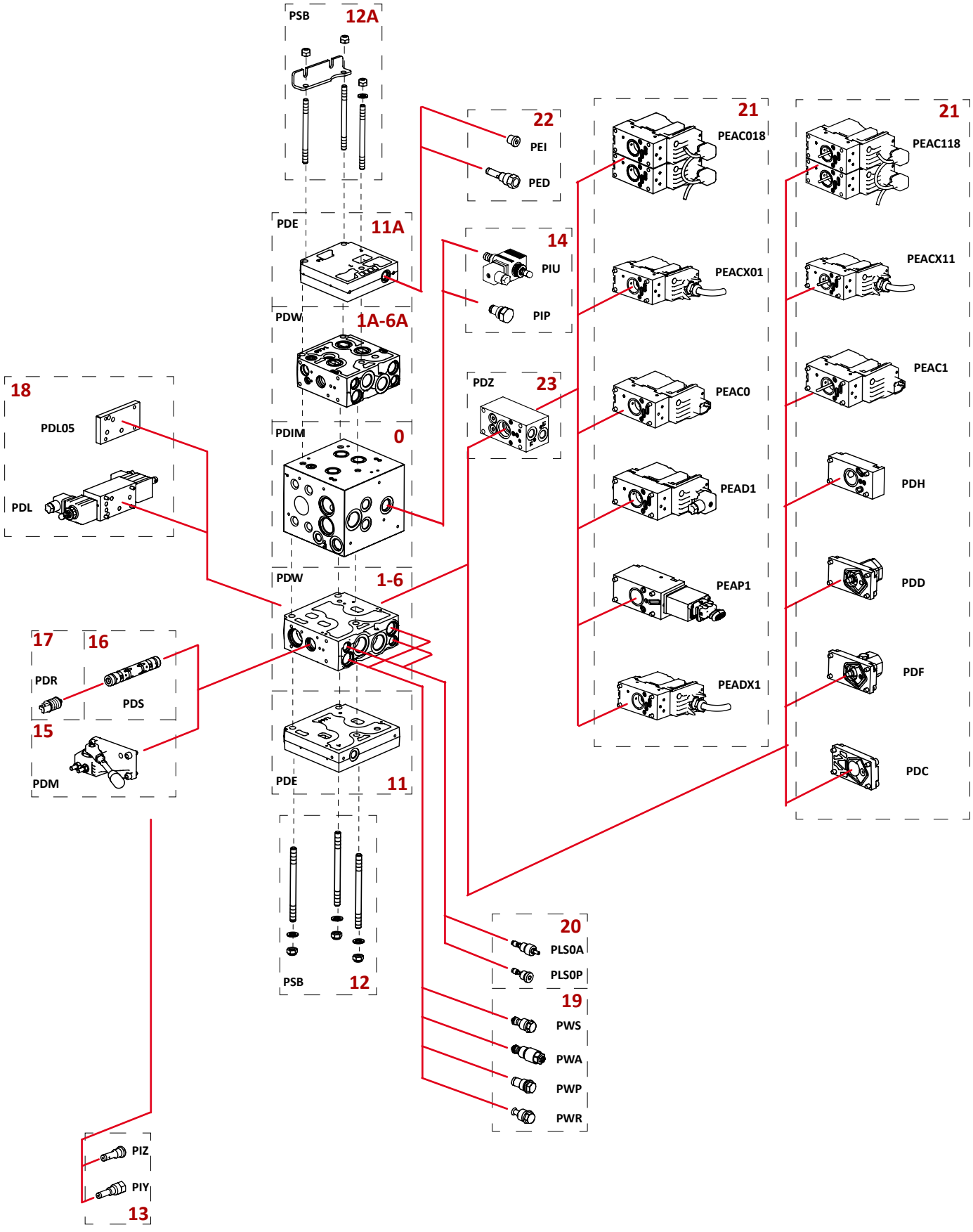
Reference field	Description			Code numbers see pag
0	Inlet sections	Open centre	PDI	155 - 156
		Closed centre		157 - 158
1-10	Working sections	with pressure compensator	PDW	161 - 162
		without pressure compensator		163 - 164
11	End sections		PDE	165 - 166
12	Stay bolt set		PSB	252
13	Pilot oil supply cartridge	Internal	PIZ	182
		External	PIY	182
14	Solenoid Ls unloading		PIU	159 - 160
	Plug for LS unloading cavity		PIP	159
15	Mechanical actuation		PDM	179
16	Spool		PDS	From 170 to 178
17	Spool centered set		PDR	From 172 to 178
18	Unloading module		PDL	From 186 to 190
	Cover plate		PDL05	
19	Shock and suction valve	not adjustable	PWS	183-184
		adjustable	PWA	183-184
	Plug for shock and suction valve cavity		PWP	185
	Suction valve		PWR	185
20	Pilot pressure $LS_{A/B}$ relief valve		PLS0A	180
	Set plug $LS_{A/B}$ cavity		PLS0P	180
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	PEAD1	From 236 to 241
		Open loop spool control high resolution	PEAC0	From 215 to 235
		Closed loop spool control high performance resolution	PEAC1	From 191 to 214
		Open loop spool control high resolution CAN-Bus	PEAC018	
		Closed loop spool control high performance resolution CAN-Bus	PEAC118	
		Open loop spool control high resolution ATEX	PEACX01	
		Closed loop spool control high performance resolution ATEX version	PEACX11	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	PEADX1	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	PEAP1	From 242 to 247
	Rear cover for	Hydraulic control	PDH	180
		Detent	PDD	181
		Friction detent	PDF	179
		Mechanical actuation	PDC	180
22	End sections	External drain line cartridge	PED	182
		Internal plug	PEI	182
23	Dual function control body		PDZ	168 - 169


PSB
12A
22
PEI
PED
21
PEAC018
PEACX01
PEAC0
PEAD1
PEAP1
PEADX1
21
PEAC118
PEACX11
PEAC1
PDH
PDD
PDF
PDC
PDI
0A
PDW
1A-6A
PDZ
23
18
PDL05
PDL
PDEM
11
PDW
1-6
17
16
PDR
PDS
15
PDM
PDI
0
14
PIU
PIP
PSB
12
20
PLS0A
PLS0P
19
PWS
PWA
PWP
PWR
PIZ
PIY
13

PDV114 + PDV74 Proportional valve, Product selection chart

Reference field	Description			Code numbers see pag
0 0A	Inlet sections	Open centre	PDI	
		Closed centre		
1-6 1A-6A	Working sections	with pressure compensator	PDW	
		without pressure compensator		
11	End sections		PDE	
12 12A	Stay bolt set		PSB	258
13	Pilot oil supply cartridge	Internal	PIZ	
		External	PIY	
14	Solenoid Ls unloading		PIU	
	Plug for LS unloading cavity		PIP	
15	Mechanical actuation		PDM	
16	Spool		PDS	
17	Spool centered set		PDR	
18	Unloading module		PDL	
	Cover plate		PDL05	
19	Shock and suction valve	not adjustable	PWS	
		adjustable	PWA	
	Plug for shock and suction valve cavity		PWP	
	Suction valve		PWR	
20	Pilot pressure $LS_{A/B}$ relief valve		PLS0A	
	Set plug $LS_{A/B}$ cavity		PLS0P	
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	PEAD1	
		Open loop spool control high resolution	PEAC0	
		Closed loop spool control high performance resolution	PEAC1	
		Open loop spool control high resolution CAN-Bus	PEAC018	
		Closed loop spool control high performance resolution CAN-Bus	PEAC118	
		Open loop spool control high resolution ATEX	PEACX01	
		Closed loop spool control high performance resolution ATEX version	PEACX11	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	PEADX1	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	PEAP1	
	Rear cover for	Hydraulic control	PDH	
		Detent	PDD	
		Friction detent	PDF	
		Mechanical actuation	PDC	
22	End sections	External drain line cartridge	PED	
		Internal plug	PEI	
23	Dual function control body		PDZ	32 - 33

PDV114 + PDV74 Proportional Valve
Configuration with MID inlet section



PDV114 + PDV74 Proportional valve, Product selection chart

Reference field	Description			Code numbers see pag
0	Inlet sections	Open centre	PDI	20 - 21
		Closed centre		22 - 23
1-6 1A-6A	Working sections	with pressure compensator	PDW	26 - 27
		without pressure compensator		28 - 29
11 11A	End sections		PDE	30 - 31
12 12A	Stay bolt set		PSB	263
14	Solenoid Ls unloading		PIU	24 - 25
	Plug for LS unloading cavity		PIP	24
15	Mechanical actuation		PDM	43
16	Spool		PDS	From 34 to 42
17	Spool centered set		PDR	From 36 to 42
18	Unloading module		PDL	From 49 to 53
	Cover plate		PDL05	
19	Shock and suction valve	not adjustable	PWS	46 - 47
		adjustable	PWA	46 - 47
	Plug for shock and suction valve cavity		PWP	48
	Suction valve		PWR	48
20	Pilot pressure $LS_{A/B}$ relief valve		PLS0A	44
	Set plug $LS_{A/B}$ cavity		PLS0P	44
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	PEAD1	From 99 to 104
		Open loop spool control high resolution	PEAC0	From 78 to 98
		Closed loop spool control high performance resolution	PEAC1	From 54 to 77
		Open loop spool control high resolution CAN-Bus	PEAC018	
		Closed loop spool control high performance resolution CAN-Bus	PEAC118	
		Open loop spool control high resolution ATEX	PEACX01	
		Closed loop spool control high performance resolution ATEX version	PEACX11	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	PEADX1	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	PEAP1	
	Rear cover for	Hydraulic control	PDH	44
		Detent	PDD	
		Friction detent	PDF	43
		Mechanical actuation	PDC	44
22	End sections	External drain line cartridge	PED	45
		Internal plug	PEI	45
23	Dual function control body		PDZ	32 - 33

PDV114 Proportional valve
Composition form for standard inlet section

OMFB HYDRAULIC POWER CONTROL	Code:	PDV114	Customer:
	Date:	__/__/____	Customer ref:
	Review index:	-	Issued by:
	Review date:	-	OMFB sales ref:

1	Valve type:	PDV 114	5	Working sections Up:	10	9	Rated voltage [V]:	12
2	Type of threads:	BSPP	6	Working sections Down:		10	Certifications:	None
3	Type of inlet:	standard	7	Inlet section side:	Right version	11		
4	Pump type:	Open Center	8	2nd pump type:		12	Pump flow [l/min]:	

Notes:

B Port	0	bar			13	**A Port**
					14	
Actuators side						**Handle side**

Notes:

1		21		1	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
2		21		2	bar			bar	16		15	
		17		20					20			
				19					19			
3		21		3	bar			bar	16		15	
		17		20					20			
				19					19			
4		21		4	bar			bar	16		15	
		17		20					20			
				19					19			
5		21		5	bar			bar	16		15	
		17		20					20			
				19					19			
6		21		6	bar			bar	16		15	
		17		20					20			
				19					19			
7		21		7	bar			bar	16		15	
		17		20					20			
				19					19			
8		21		8	bar			bar	16		15	
		17		20					20			
				19					19			
9		21		9	bar			bar	16		15	
		17		20					20			
				19					19			
10		21		10	bar			bar	16		15	
		17		20					20			
				19					19			

11			12
22			

PDV114 Proportional valve
Composition form with double inlet section and MID End section

OMFB HYDRAULIC POWER CONTROL	Code: **PDV114**	Customer:
	Date: / /	Customer ref:
	Review index: -	Issued by:
	Review date: -	OMFB sales ref:

1	Valve type:	PDV 114	5	Working sections Up:	6	9	Rated voltage [V]:	12
2	Type of threads:	BSPP	6	Working sections Down:	6	10	Certifications:	None
3	Type of inlet:	mid_end	7	Inlet section side:	Right version	11		
4	Pump type:	Open Center	8	2nd pump type:		12	Pump flow [l/min]:	

Notes:

B Port Actuators side	0A	bar			13	A Port Handle side
					14	

Notes:

1A		21		1A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
2A		21		2A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
3A		21		3A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
4A		21		4A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
5A		21		5A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
6A		21		6A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								

11		12
12A		

6		21		6	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
5		21		5	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
4		21		4	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
3		21		3	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
2		21		2	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
1		21		1	bar			bar	16		15	
		17		20					20			
				19					19			
				18								

A Port Actuators side	0	bar			13	B Port Handle side
					14	

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PDV114 Proportional valve
Composition form with MID inlet section

OMFB HYDRAULIC POWER CONTROL			Code:	**PDV114**		Customer:			
			Date:	/ /		Customer ref:			
			Review index:	-		Issued by:			
			Review date:	-		OMFB sales ref:			
1	Valve type:	PDV 114	5	Working sections Up:	6	9	Rated voltage [V]:	12	
2	Type of threads:	BSPP	6	Working sections Down:	6	10	Certifications:	None	
3	Type of inlet:	mid_inlet	7	Inlet section side:	Right version	11			
4	Pump type:	Open Center	8	2nd pump type:		12	Pump flow [l/min]:		

Notes:

A Port	11A			12A	**B Port**
	22				
Actuators side					**Handle side**

Notes:

6A		21		6A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
5A		21		5A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
4A		21		4A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
3A		21		3A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
2A		21		2A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
1A		21		1A	bar			bar	16		15	
		17		20					20			
				19					19			
				18								

0	bar		14

1		21		1	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
2		21		2	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
3		21		3	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
4		21		4	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
5		21		5	bar			bar	16		15	
		17		20					20			
				19					19			
				18								
6		21		6	bar			bar	16		15	
		17		20					20			
				19					19			
				18								

B Port	11			12	**A Port**
	22				
Actuators side					**Handle side**

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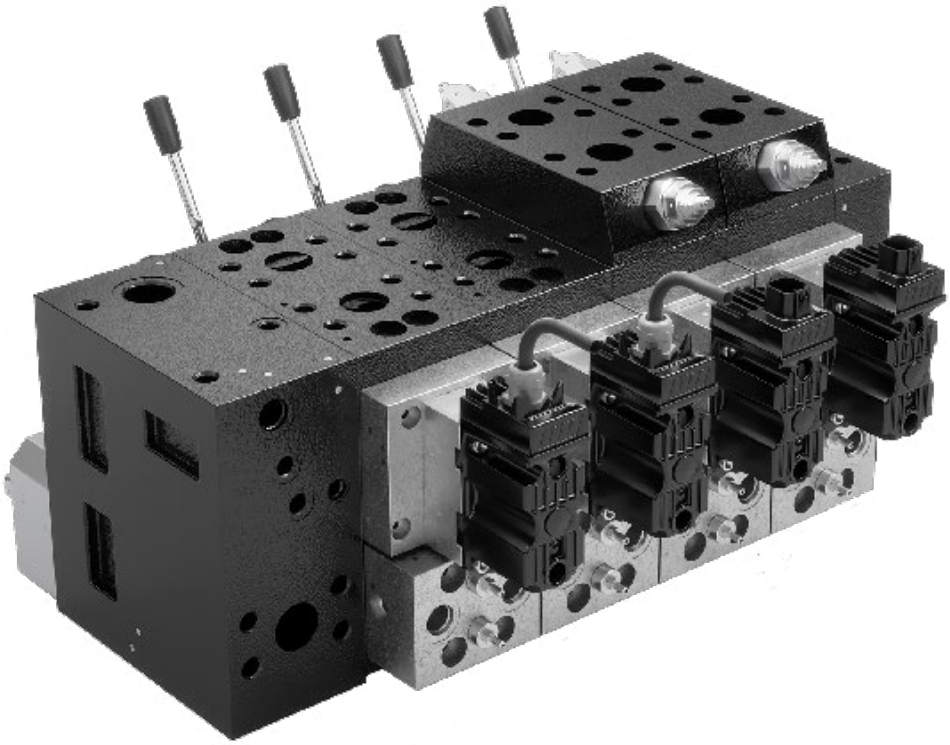
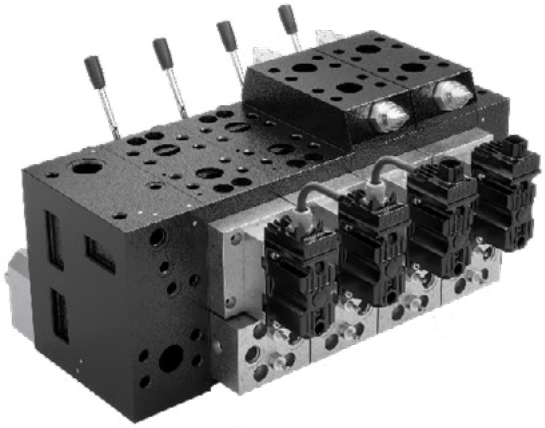
PDV315 Proportional Directional valve



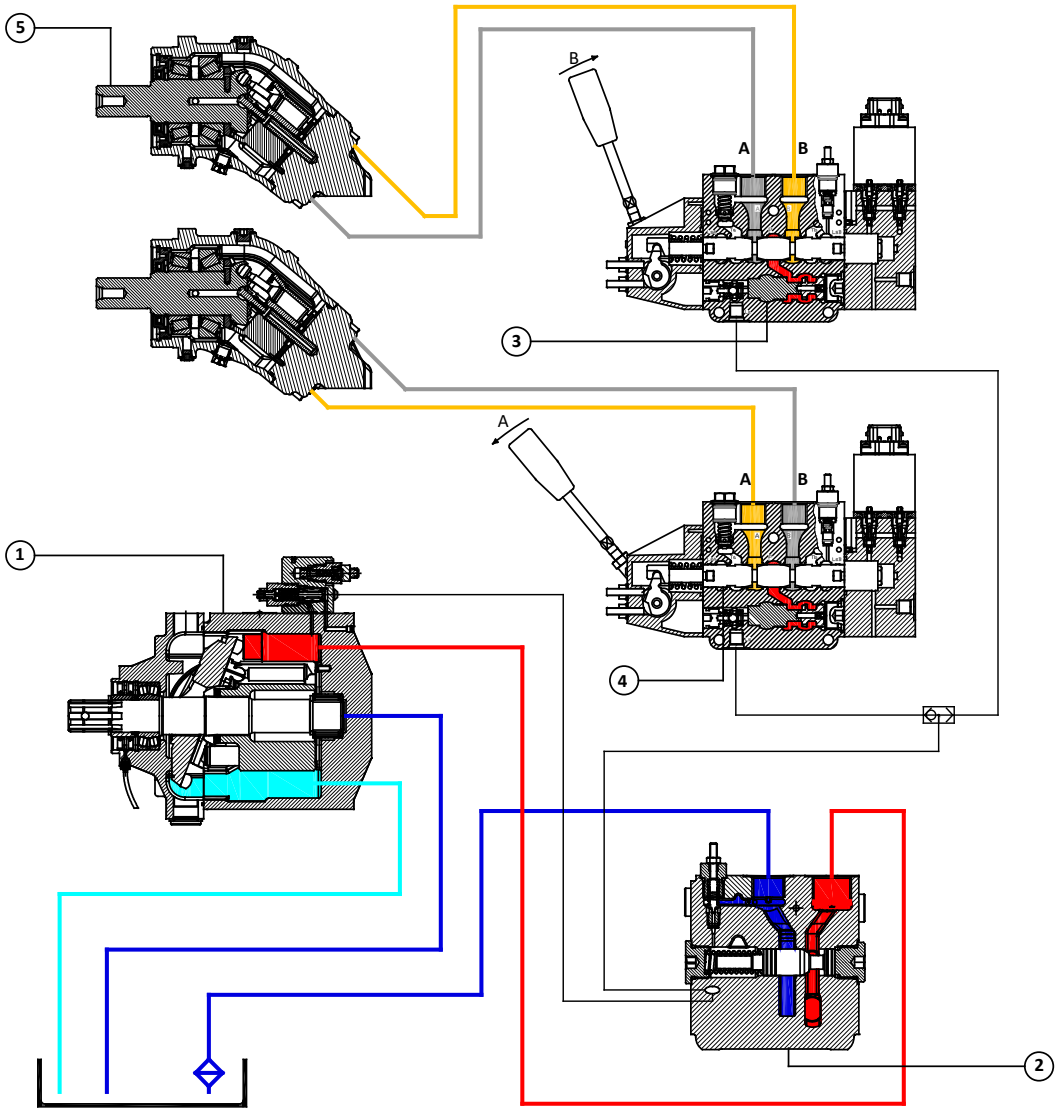
PDV315 Proportional valve
General description

PDV315 is a hydraulic proportional directional valve, designed to offers a wide range controls options and flexibility.
The **PDV315** modular system enables bankable groups to perform many individual tasks, to meeting and exceeding the changing control needs of the off-highway machines of today, and well into the future to maximize the efficiency, controllability and reliability of vehicles.



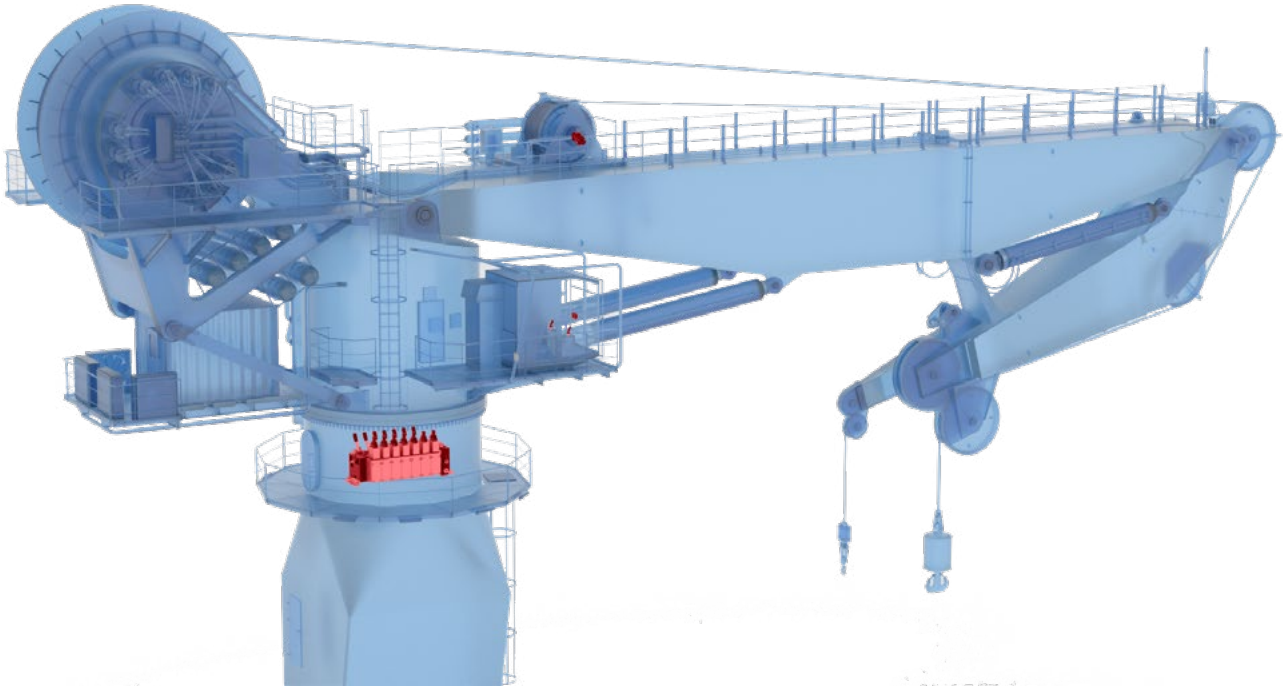
PDV315 main features:

- Load sensing up-stream pressure compensation
- High flow/low pressure drop capability
- Integrated pump unloading system
- Integrated cut-off pump system
- Open/closed centre shifting system
- Precise metering capabilities
- LSA-LSB electrical unloading
- LSA-LSB electrical working pressure remote control
- Constant flow regardless of pressure
- Working sections symmetrical flow
- Optional priority inlet for steering or different priority functions
- Optional dual hydraulic pilot and electrohydraulic control
- ATEX and IECEx configuration
- CAN-Bus comunication
- EMC immunity ensures high safety with regard to electro-magnetic compatibility



High pressure port of **PPV** piston pump ① supply the closed centre inlet section of **PDV315** proportional valve ② which in turn feeds the down-stream working sections.
The **PDS** spool neutral position ④ unload the LS pump signal to tank, so that the swashplate angle is towards the minimum displacement and pressure in stand-by setting.
The spool position determines the flow demands (speed rotation) of the two **HPM** motors ⑤.
The PDS main spool compares the pressure drop before and after the spool notches (differential pressure Δp), and therefore, the pump flow remain constant.
If the differential pressure increase, the pump swashplate is swivelled back towards the minimum displacement, and if the differential pressure decrease, the swashplate angle increase towards the max flow displacement until balance is restored within the valve.

Actuators load determines the working pressure, and the built-in pressure compensator ③ enable simultaneously function regardless of different working pressure.



1. PPV90 load sensing piston pump

2. Pump slitter gear box

3. I/O controller PHSI7101008

4. PDV74/6 closed centre inlet

5. Electronic double axis joystick PEJD

6. Graphic display PDHI703000

7. PPM40 piston motors

PDV315 Proportional Valve
Technical data

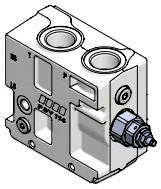
The hydraulic features listed in this chart, are typical measured data obtained by using mineral based hydraulic oil according to DIN 51524 with a viscosity of 21 mm²/sec [102 SUS] and a temperature of 50 °C [122 °F]

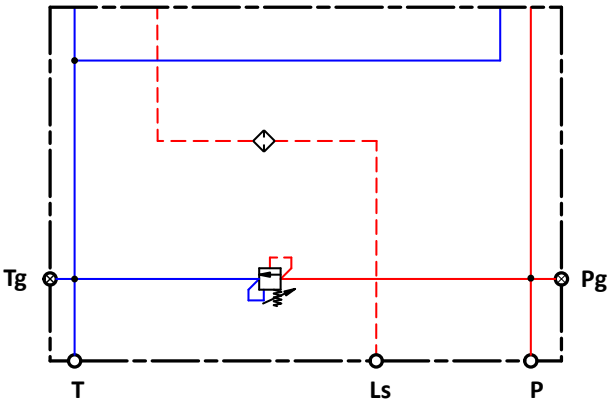
Oil flow rate	PDI inlet section, P port		**600 l/min (max)**	**158 US gal/min**
	PDIM - Mid inlet section, P port		**600 l/min**	**158 US gal/min**
	A, **B** port with pressure compensator		**500 l/min**	**132 US gal/min**
Max. pressure	**P** port	Pressure relief valve setting	**400 bar**	**5800 psi**
		Working pressure	**370 bar**	**5370 psi**
	A, **B** port		**370 bar**	**5370 psi**
	Ty port, directly to tank			
	T port	Static	**25 bar**	**363 psi**
		Dynamic	**35 bar**	**508 psi**
Max. pilot pressure oil supply			**30 bar**	**435 psi**
Oil temperature	Recommended		**30 ÷ 65 °C**	**86 °F ÷ 149 °F**
	Min		**-30 °C**	**-22 °F**
	Max		**90 °C**	**194 °F**
Ambient temperature			**-30 ÷ 60 °C**	**-22 ÷ 140 °F**
Oil viscosity	Operating range		**12 ÷ 75 mm²/sec**	**65 ÷ 347 SUS**
	Min		**4 mm²/sec**	**39 SUS**
	Max		**460 mm²/sec**	**2128 SUS**
Spool stroke	Standard		**9 mm**	**0,35 in**
	Flow control proportional range		**7,5 mm**	**0,3 in**
	Pressure control propotional range		**7,5 mm**	**0,3 in**
Daed band spool	Flow control		**1,5 mm**	**0,06 in**
	Pressure control		**1,5 mm**	**0,06 in**
Max internal leakage A/B port at 100 bar [1450 psi] and 21 mm²/sec		**A/B T** without shock valves	**100 cm³/min**	**6,1 in³/min**
		A/B T with shock valves	**115 cm³/min**	**7 in³/min**
Filtration	Max. contamination: class 9 according to NAS 1638 (20/18/15 according to ISO 4406)			

PDH module - hydraulic control		
Pilot pressure	Spool start movement	4 bar / 58 psi
	Spool end stroke	15 bar / 218 psi
Max. pilot pressure		30 bar / 436 psi

PDV74 internal filters, mesh 100 µm
Mineral oil hydraulic fluid: according to DIN 51524 and 51525 or ISO 6743/4 PDV74 can also be used with phosphate esters (HFDR), water-glycol (HFC) or water oil (HFB) mixes, subject to our Technical Dept. approval

Product	Hydraulic diagram	Description

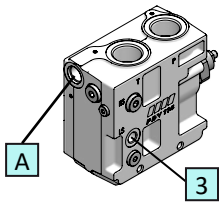


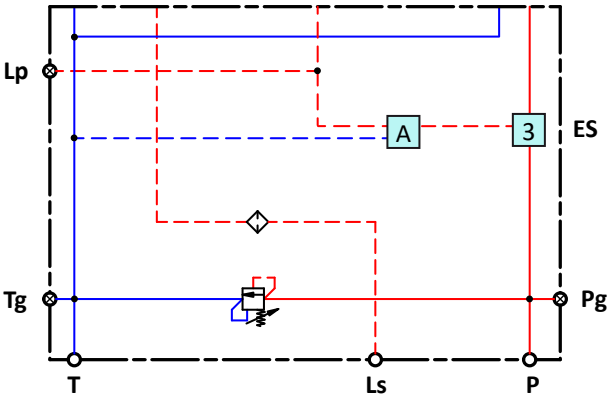


For mechanically actuated valves, only

Code numbers	
PDI01C30000	**PDI01C30010**
BSPP	UN-UNF

Connections thread see page 249

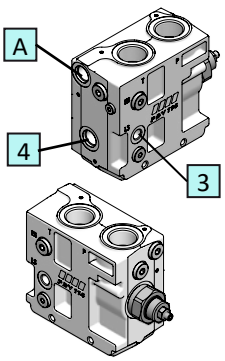


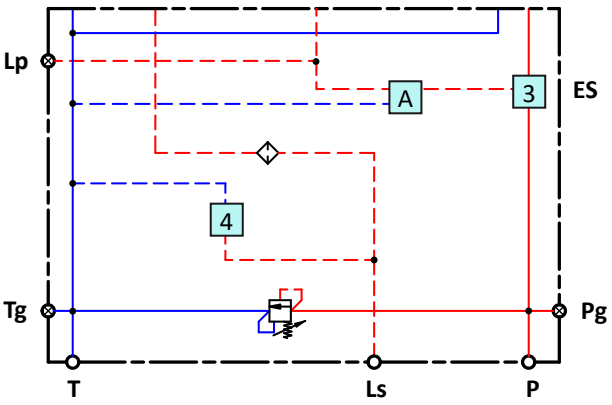


With pilot oil supply for electrically and hydraulic actuated valves 3

Code numbers	
PDI01C40000	**PDI01C40010**
BSPP	UN-UNF

Connections thread see page 249



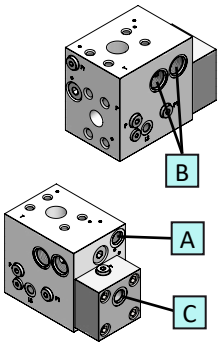


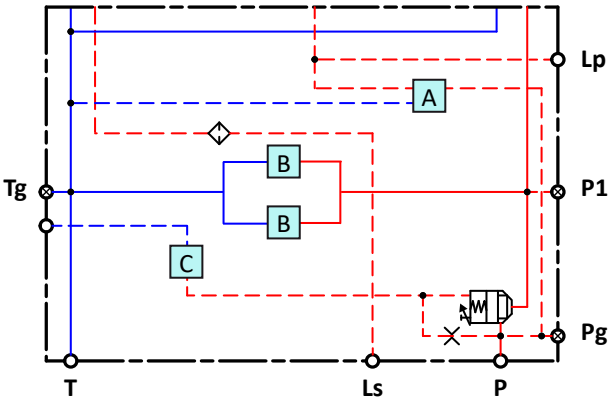
With pilot oil supply for electrically and hydraulic actuated valves 4 and facility for LS unloading 3

Code numbers	
PDI01C41000	**PDI01C41010**
BSPP	UN-UNF

Connections thread see page 249

Product	Hydraulic diagram	Description

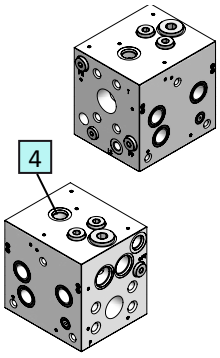


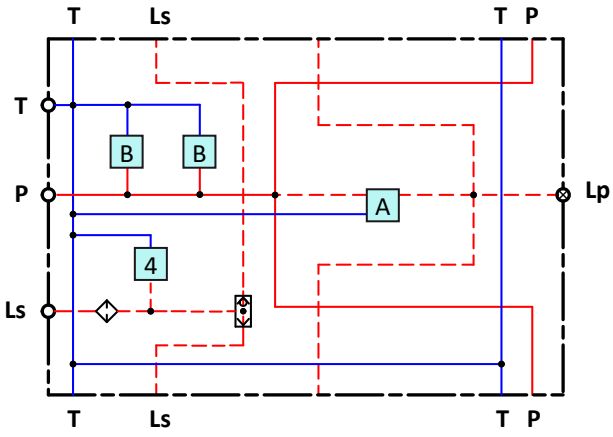


With pilot oil supply for electrically and hydraulic actuated valves 3 and cut-off system

Code numbers	
PDI01C44000	**PDI01C44010**
BSPP	UN-UNF

Connections thread see page 249

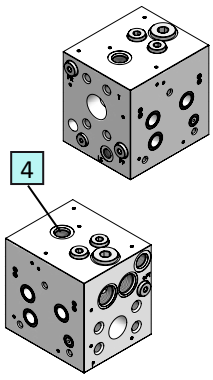


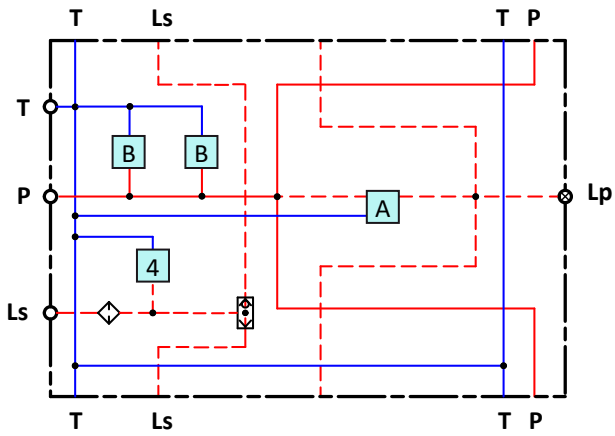


MID inlet PDV114 with pilot oil supply for electrically and hydraulic actuated valves and facility for LS unloading 4

Code numbers	
PDIM1C41000	**PDIM1C41010**
BSPP	UN-UNF

Connections thread see page 261

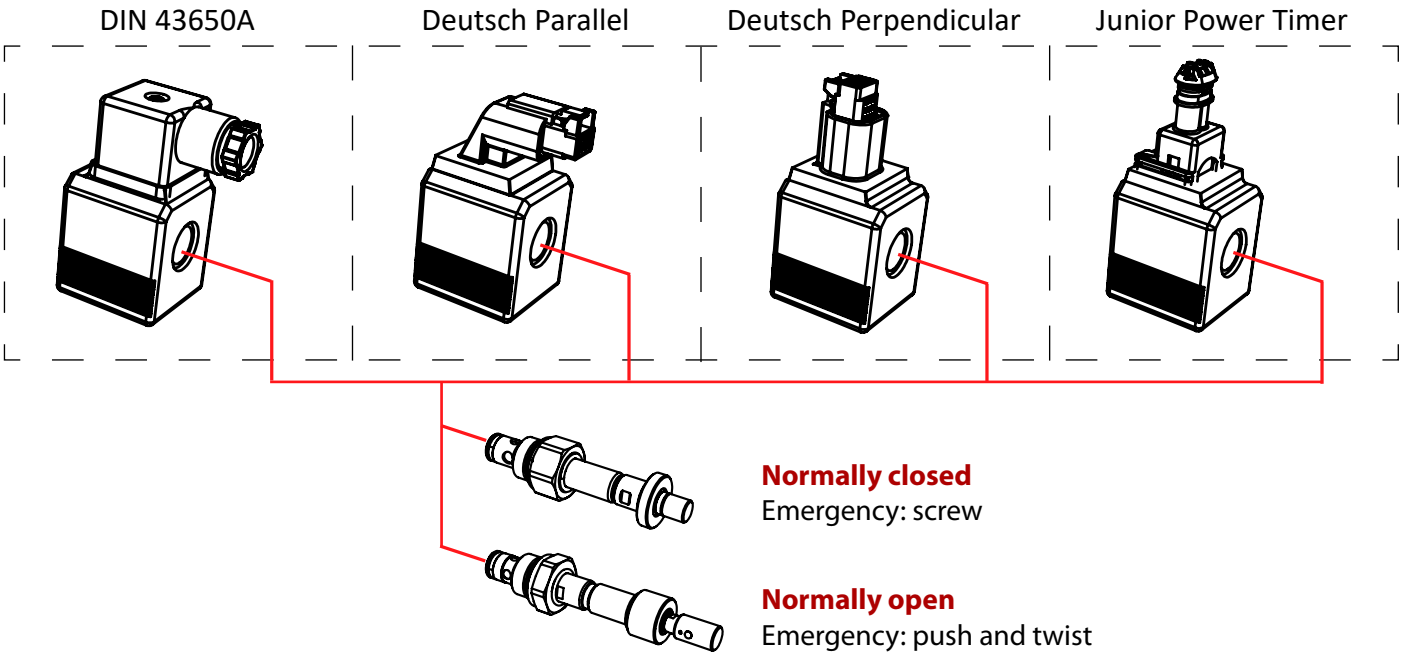


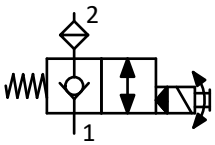
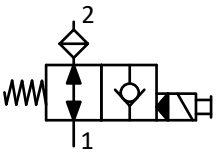


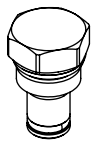
MID inlet PDV117 with pilot oil supply for electrically and hydraulic actuated valves and facility for LS unloading 4

Code numbers	
PDIM4C41000	**PDIM4C41010**
BSPP	UN-UNF

Connections thread see page 166

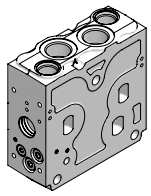


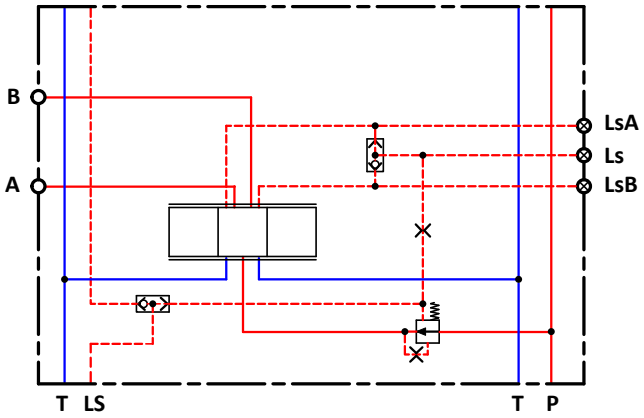
Code numbers PIU solenoid LS unloading valve codes			
Cartridge valve type	Connector type	12 Vdc	24 Vdc
Normally closed Emergency: screw 	DIN 43650A	**PIU0C023200**	**PIU0C013200**
	Deutsch Parallel	**PIU0C021200**	**PIU0C011200**
	Deutsch Perpendicular	**PIU0C022200**	**PIU0C012200**
	Junior Power Timer	**PIU0C024200**	**PIU0C014200**
Normally open Emergency: push and twist 	DIN 43650A	**PIU0A023100**	**PIU0A013100**
	Deutsch Parallel	**PIU0A021100**	**PIU0A011100**
	Deutsch Perpendicular	**PIU0A022100**	**PIU0A012100**
	Junior Power Timer	**PIU0A024100**	**PIU0A014100**

Plug for LS unloading cavity		
Plug cavity	Hydraulic scheme	Code numbers
		**PIP10000000**

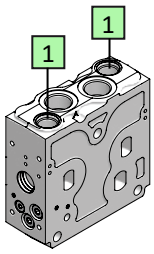
Max. operating pressure		**350 bar**	
Max. internal leakage		**350 bar, 46 mm²/sec 1 cm³/min**	
max pressure drop		**< 1,5 bar**	
Expected life - 350 bar, 0,5 Hz (1s on / 1s off)		**10.000.000 cycles**	
Response time for LS pressure relief		**< 280ms**	
Oil temperature	**Recommended**	**30 ÷ 60 °C**	
	Min.	**-30 °C**	
	Max.	**90 °C**	
Ambient temperature		**-30 ÷ 60 °C**	
Max. coil surface temperature		**160 °C**	
Oil viscosity	**Operating range**	**10 ÷ 90 cSt**	
	Min.	**4 mm²/sec**	
	Max.	**460 mm²/sec**	
Degree of enclosure	**Connector DIN 43650**	**IP65**	
	Connector Deutsch DT04-2p	**IP67**	
		IP69K integrated to coil	
Rated voltage		**12 Vdc**	**24 Vdc**
Supply voltage		**10,6 ÷ 14,6 Vdc**	**20,4 ÷ 28,6 Vdc**
Working temperature		**-30 ÷ 80 °C**	
Maximum coil surface temperature		**175 °C**	
Heat insulation		**Class H (180 °C)**	
Resistance		**7,5 Ω**	**29,9 Ω**
Current consumption		**1,6 A**	**0,8 A**
Power consumption		**19 W**	

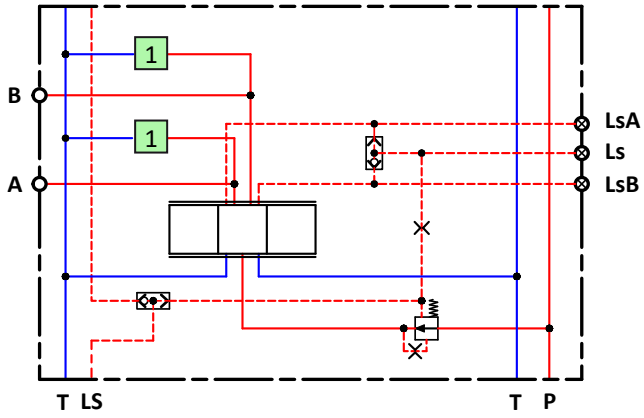
Product	Hydraulic diagram	Description



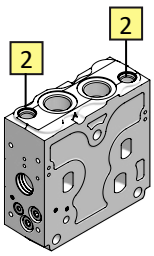


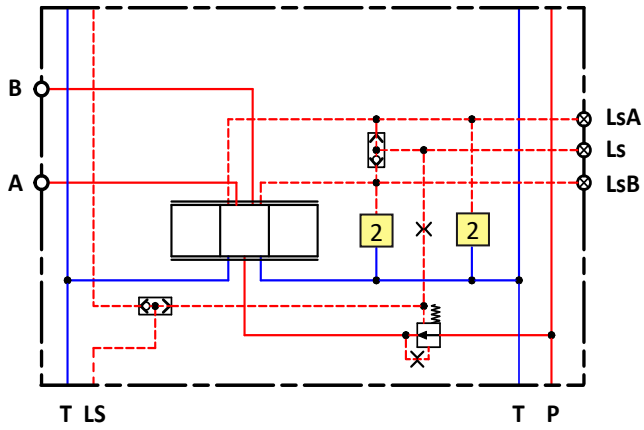
No facilities for shock-suction valves No facilities for LS A/B pilot relief valves	
Code numbers	
PDW11000000	**PDW11000010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B





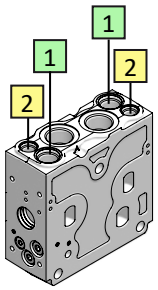
Facilities for shock-suction valves 1 No facilities for LS A/B pilot relief valves	
Code numbers	
PDW11010000	**PDW11010010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

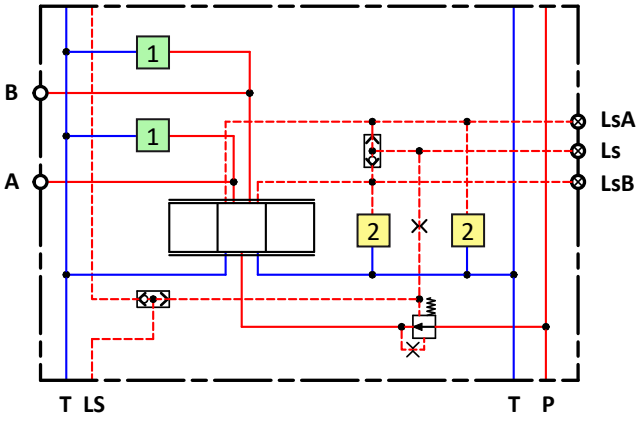




No facilities for shock-suction valves Facilities for LS A/B pilot relief valves 2	
Code numbers	
PDW11100000	**PDW11100010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

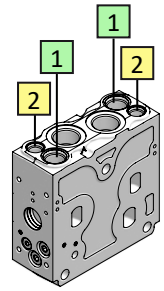
Product **Hydraulic diagram** **Description**

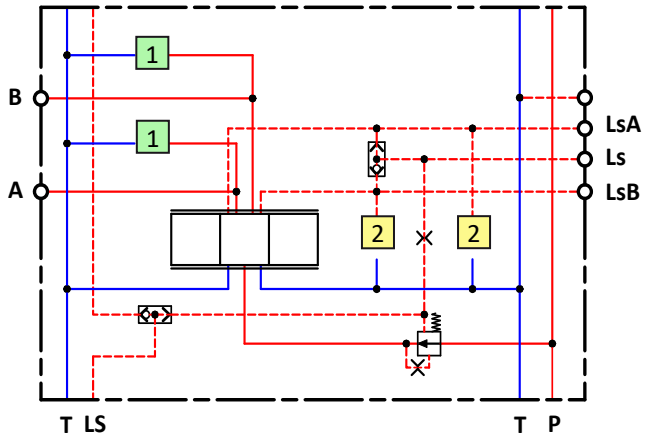




Facilities for shock-suction valves 1
Facilities for LS A/B pilot relief valves 2

Code numbers	
PDW11110000	**PDW11110010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

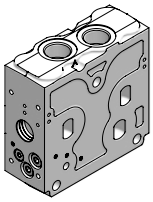


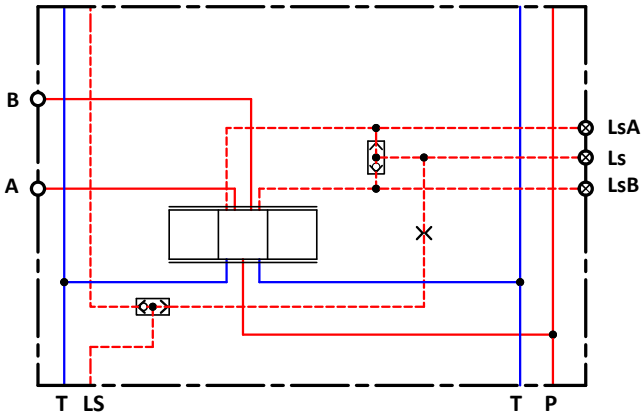


Facilities for shock-suction valves 1
Facilities for LS A/B pilot relief valves and electric unloading LS A/B piloting 2

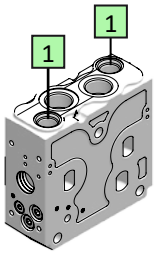
Code numbers	
PDW11111000	**PDW11111010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB remote pressure connections 1/4"	A/B ports 1-1/16"-14UNF-2B Ls-LsA-LsB remote pressure connections 7/16"-20UNF-2B

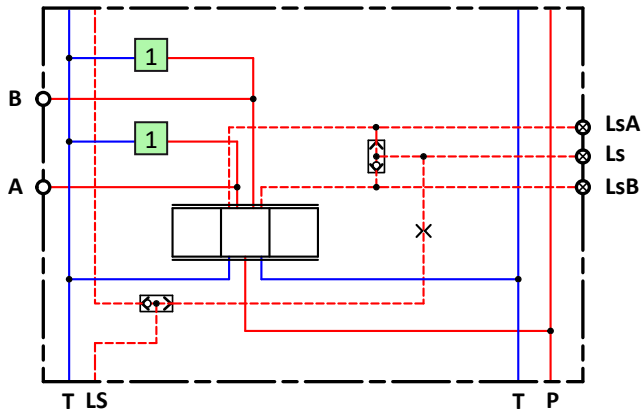
Product	Hydraulic diagram	Description



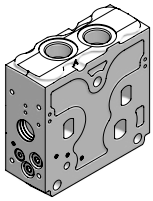


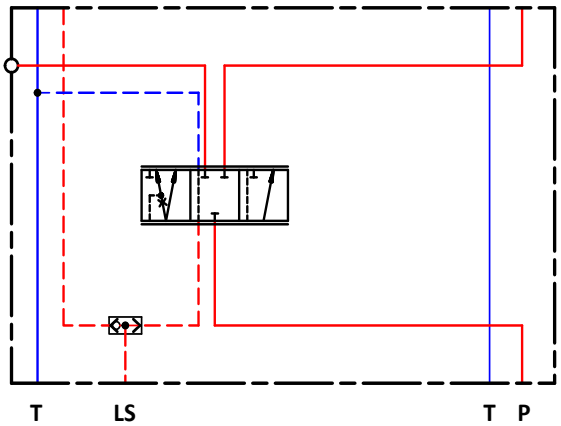
No facilities for shock-suction valves	
Code numbers	
PDW10000000	**PDW10000010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B





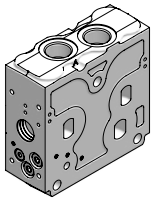
Facilities for shock-suction valves 1	
Code numbers	
PDW10010000	**PDW10010010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

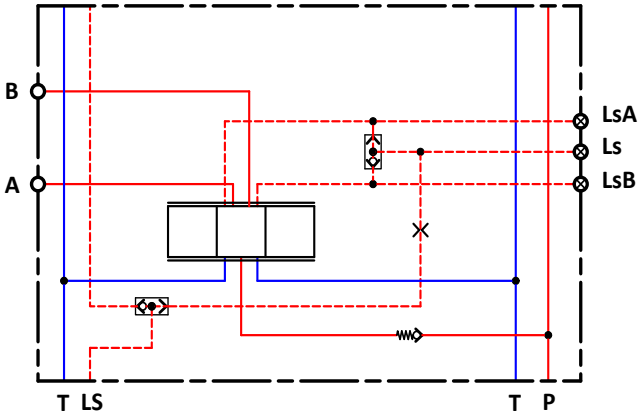




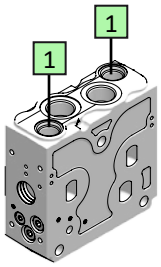
Functional safety cut off system and diverter flow	
Code numbers	
PDW15000000	**PDW15000010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

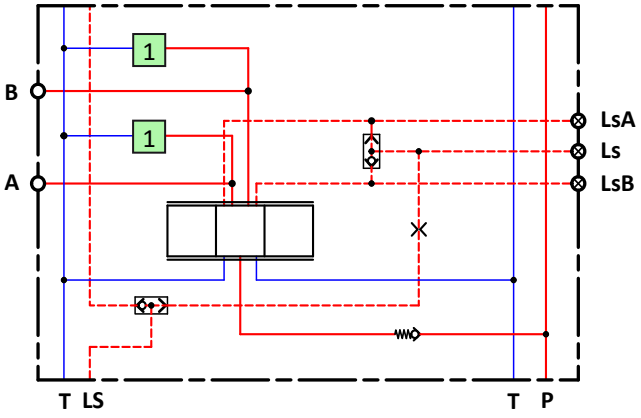
Product	Hydraulic diagram	Description





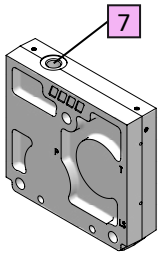
No facilities for shock-suction valves With load drop check valve on P channel	
Code numbers	
PDW13000000	**PDW13000010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

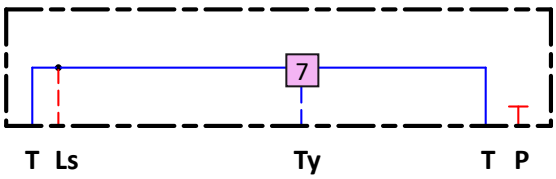




Facilities for shock-suction valve 1 With load drop check valve on P channel	
Code numbers	
PDW13010000	**PDW13010010**
BSPP	UN-UNF
A/B ports 3/4" Ls-LsA-LsB piloting connections 1/4"	A/B ports 1-1/16"-12UNF-2B Ls-LsA-LsB piloting connections 7/16" - 20UNF - 2B

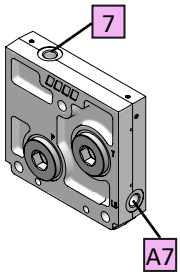
Product	Hydraulic diagram	Description

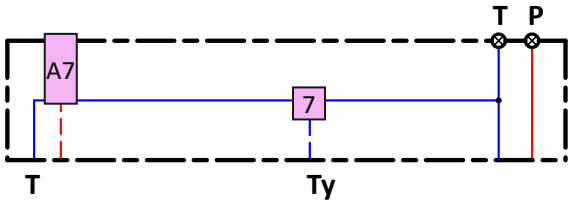




No ported, prearranged for external/internal drain 7

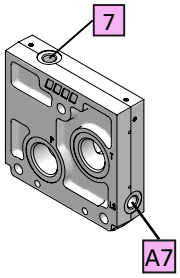
Code numbers	
PDE01010000	**PDE01010010**
BSPP	UN-UNF
Connections thread see page 249	

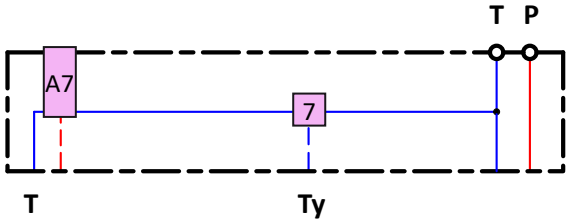




Ls port A7 prearranged for external/internal drain 7

Code numbers	
PDE01210000	**PDE01210010**
BSPP	UN-UNF
Connections thread see page____	

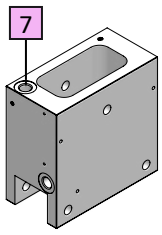


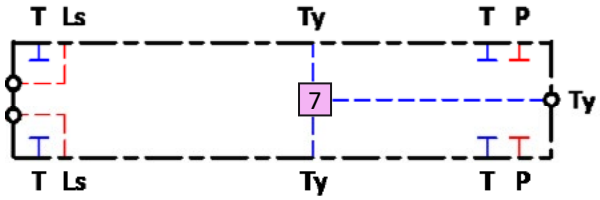


P-T-Ls ports A7 prearranged for external/internal drain 7

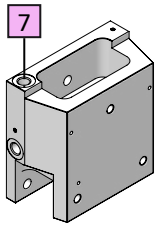
Part number	
PDE01110000	**PDE01110010**
BSPP	UN-UNF
Connections thread see page___	

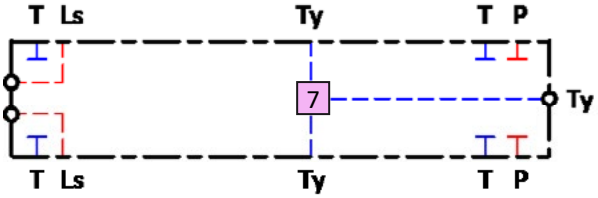
Product	Hydraulic diagram	Description



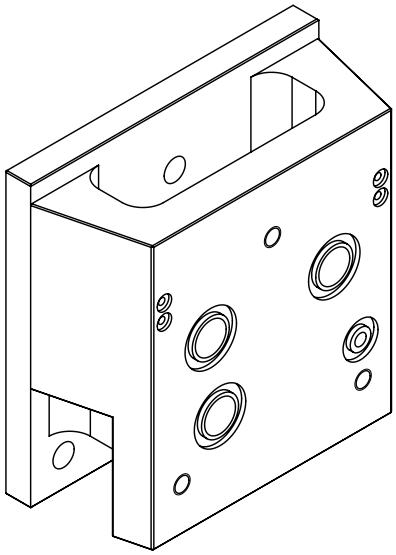


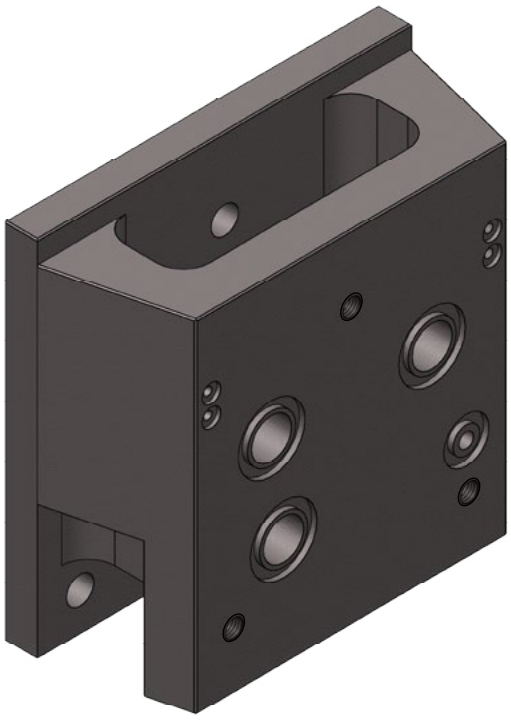
Mid End PDV114 7	
Code numbers	
PDEM1010000	**PDEM1010010**
BSPP	UN-UNF
Connections thread see page 255	

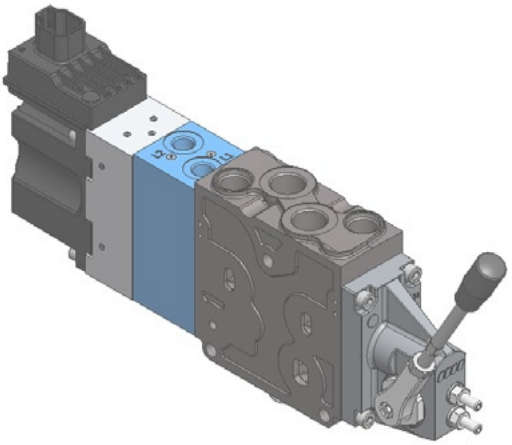




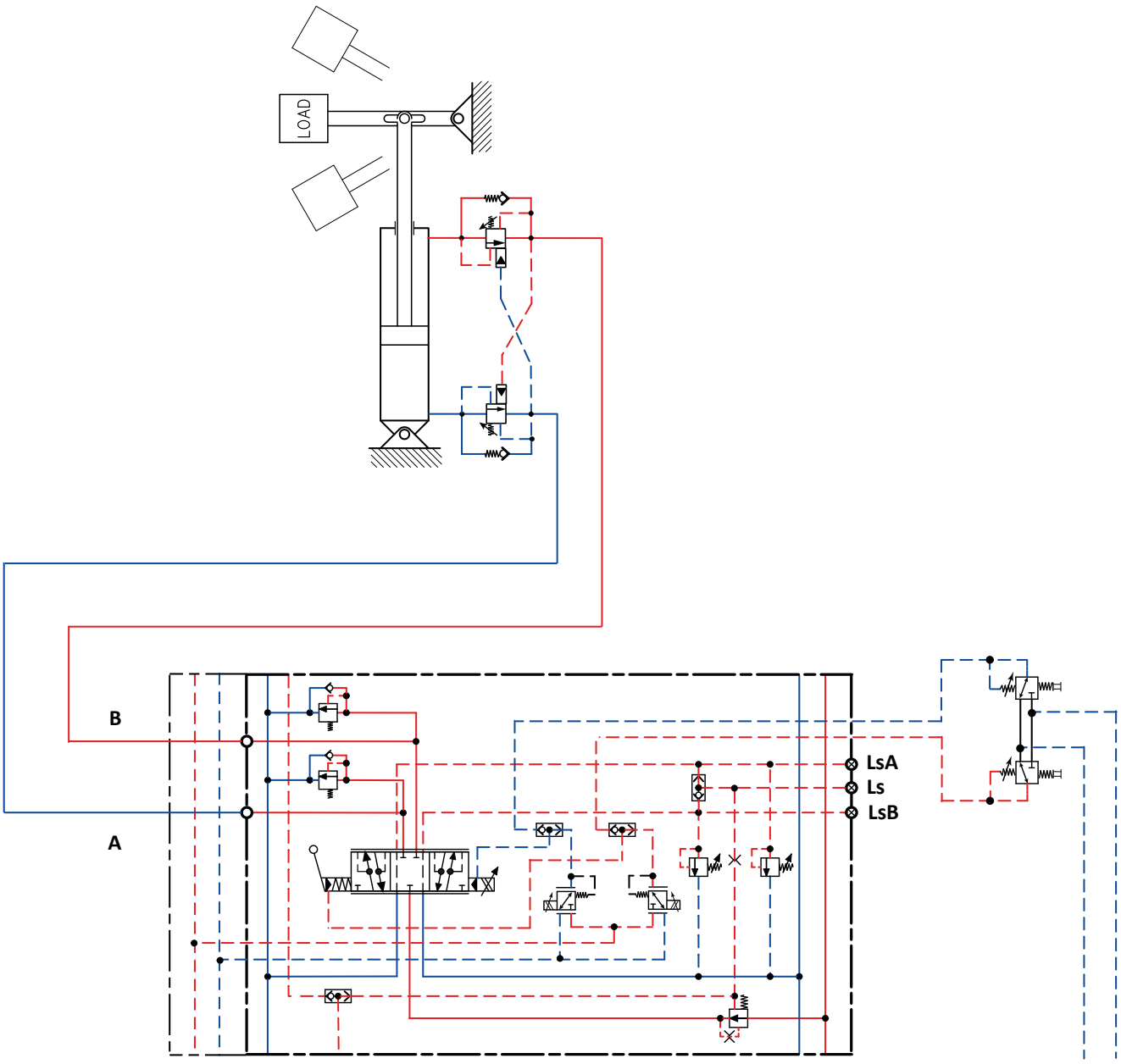
Mid End PDV117 7	
Code numbers	
PDEM4010000	**PDEM4010010**
BSPP	UN-UNF
Connections thread see page 265	

	Description	
		PDEI4000000





PDZ is a small HIC body that can be matched with any kind of PDV74 working section PDW, to get hydraulic and electro-hydraulic spool control

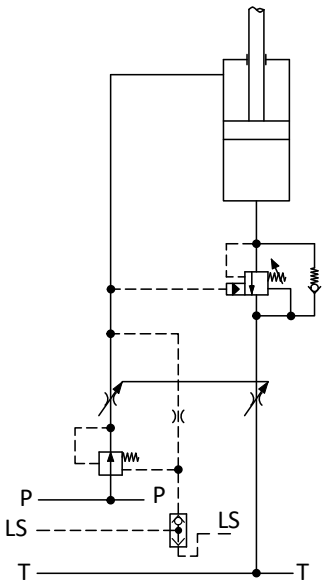


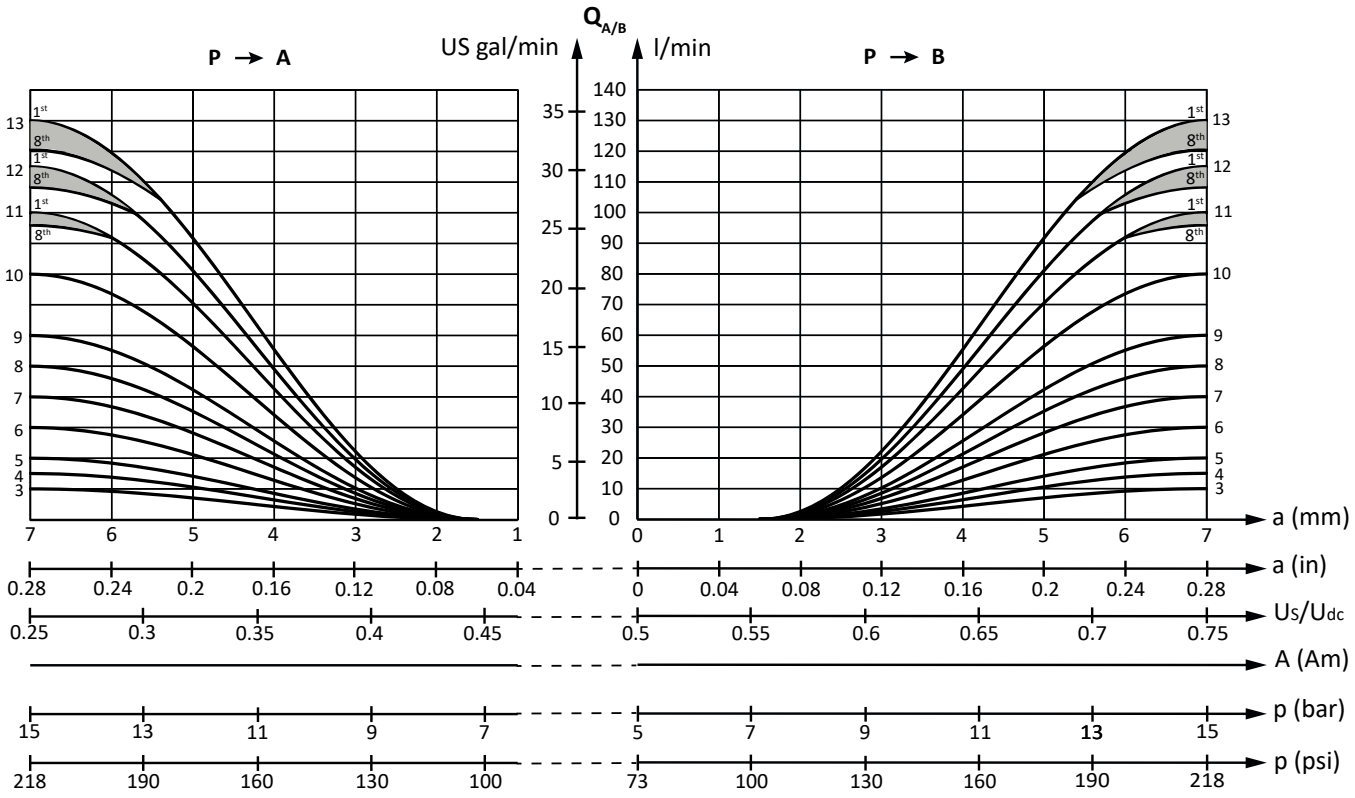
PDZ overrall dimensions	For open loop spool control	For closed loop spool control
	PDZ70000000 1/4" BSPP - 12 mm deep	**PDZ** 1/4" BSPP - 12 mm deep
	PDZ [7/16 in-20 UNF-2B - 0,47 in deep]	**PDZ** [7/16 in-20 UNF-2B - 0,47 in deep]

Oil flow characteristics

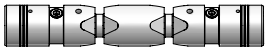
With flow control spool, the oil flow depends on type of PDW module (with or without pressure compensator) and type of pump (fixed or variable displacement).

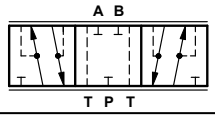
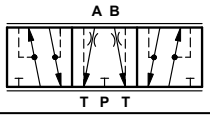
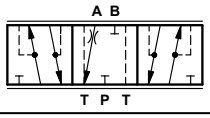
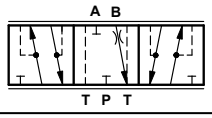
In the below chart, the ordinate numbers refer to spool size, and the ordinal numbers refer to the same spool size but fitted in a different position with related lost flow.



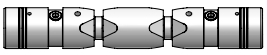


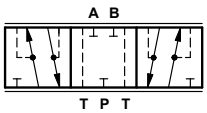
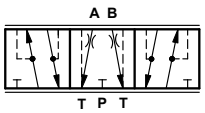
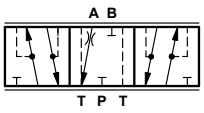
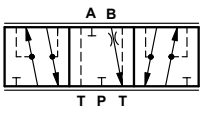
Double acting flow control spool



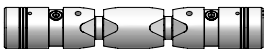
Size	Max oil flow pressure compensated **l/min**	Code numbers and symbol			
					
		4-way, 3-position - A, B closed	4-way, 3-position, A, B → T	4-way, 3-position, B → T; A closed	4-way, 3-position, A → T; B closed
1					
2					
3					
4					
5					
5,5					
6					
7					
8					
9					
10					
11					
12					
13					

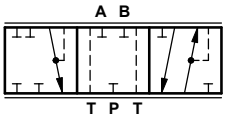
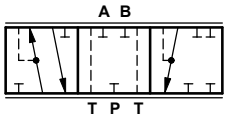
Double acting asymmetric flow control spool



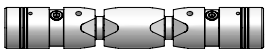
Max oil flow pressure compensated **l/min**		Code numbers and symbol			
					
A	**B**	4-way, 3-position - A, B closed	4-way, 3-position, A, B → T	4-way, 3-position, B → T, A closed	4-way, 3-position, A → T, B closed
15	**7,5**				
20	**40**				
25	**15**				
30	**40**				
40	**20**				
40	**30**				
40	**60**				
50	**30**				
60	**40**				
65	**30**				
75	**30**				
80	**40**				
110	**40**				
130	**60**				

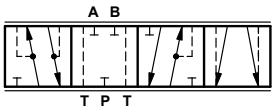
Single acting flow control spool



Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		3-way, 3-position P → A	3-way, 3-position P → B
1	**7,5**		
2	**15**		
3	**20**		
4	**30**		
5	**40**		
6	**50**		
7	**60**		
8	**80**		
9	**100**		

Double acting flow control spool, floating position

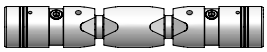


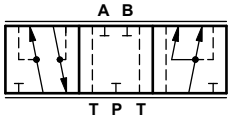
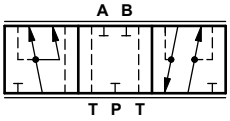
Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		3-way, 4-position floating position on A port	3-way, 4-position floating position on B port
1	**10**		
2	**15**		
3	**25**		
4	**40**		
5	**50**		

Spool centered set, code numbers (needed for any kind of flow control spool)

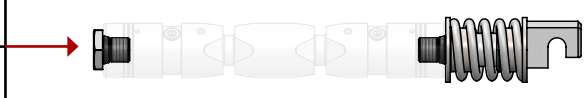
Tightening torque		Tightening torque
6^{+1}_{0} Nm		6^{+1}_{0} Nm
$53,1^{+8,85}_{0}$ lb*in		$53,1^{+8,85}_{0}$ lb*in
Manual control	**PDR00300101**	
Hydraulic - Electrohydraulic	**PDR00300102**	

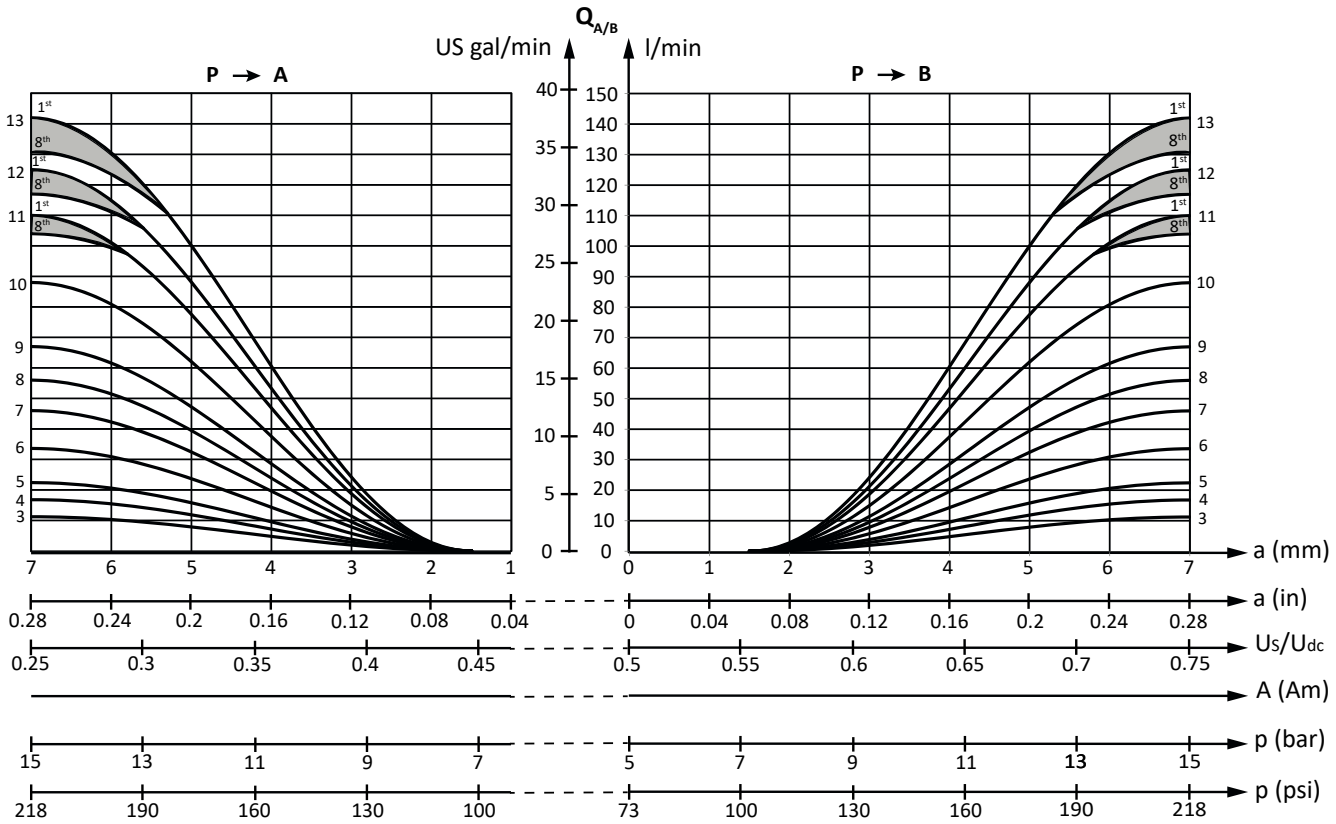
Double acting flow control, regenerative function



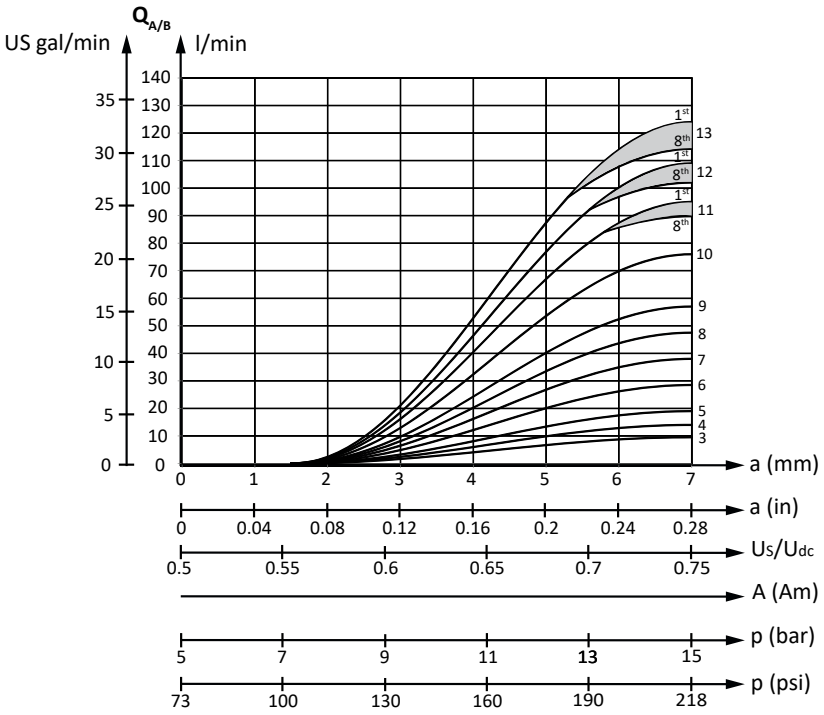
Size	Max oil flow pressure compensated **l/min**	Symbol and code numbers	
			
		Regenerative circuit on A port	Regenerative circuit on B port
1	**7,5**		
2	**15**		
3	**20**		
4	**30**		
5	**40**		
6	**50**		
7	**60**		
8	**80**		
9	**100**		
10	**130**		

Spool centered set, code numbers (needed for any kind of flow control spool)

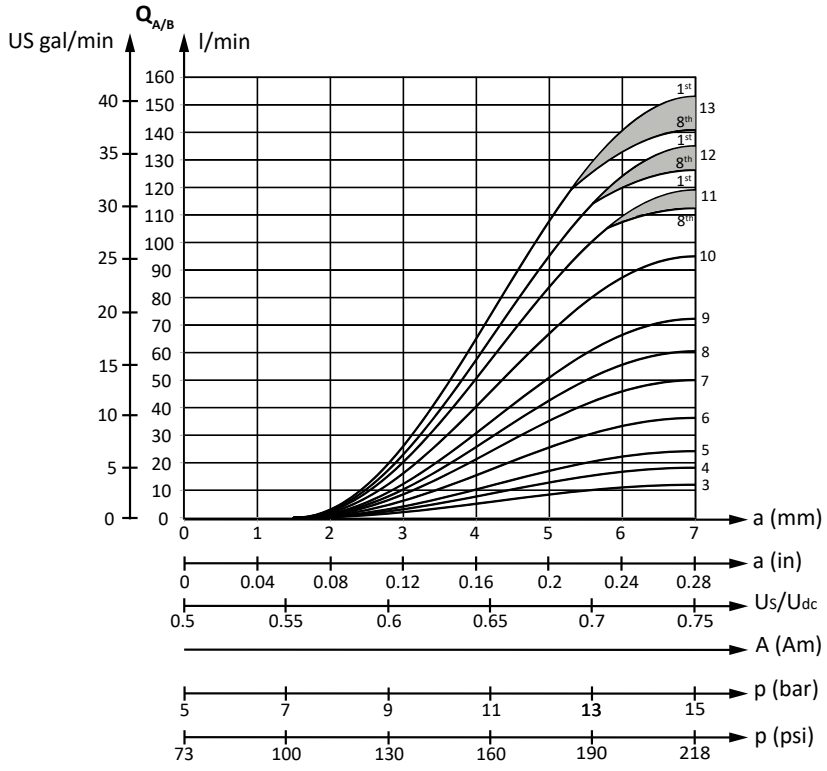
Tightening torque		Tightening torque
6^{+1}_{0} Nm		6^{+1}_{0} Nm
$53,1^{+8,85}_{0}$ lb*in		$53,1^{+8,85}_{0}$ lb*in
Manual control	**PDR00300101**	
Hydraulic - Electrohydraulic	**PDR00300102**	

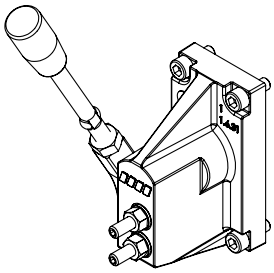
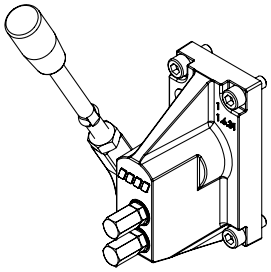
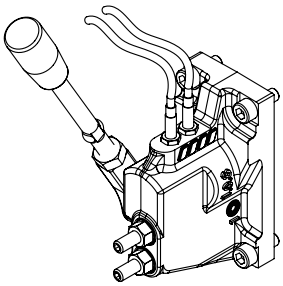
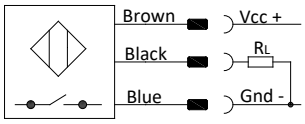

$Q_{A/B}$
US gal/min
l/min
P → A
P → B
1st
8th
a (mm)
a (in)
Us/Udc
A (Am)
p (bar)
p (psi)

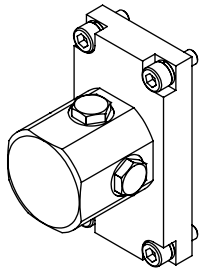
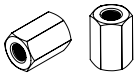
Oil flow characteristics PDW without pressure compensator, and pump differential pressure setting = 16 bar



Oil flow characteristics PDW without pressure compensator, and pump differential pressure setting = 25 bar



<table>
<tr><th>Product</th><th>Description</th><th>Aluminium</th><th>Cast iron</th></tr>
<tr><td rowspan="4">PDM
  </td><td rowspan="4">Mechanical actuation</td><td colspan="2">With lever</td></tr>
<tr><td>PDM10101000</td><td>PDM11101000</td></tr>
<tr><td colspan="2">Without lever</td></tr>
<tr><td>PDM101000000</td><td>PDM11100000</td></tr>
<tr><td>PDM
  </td><td>Mechanical actuation, with flow adjustement nuts protection</td><td>PDM10200000</td><td>PDM11200000</td></tr>
<tr><td rowspan="3">PDM
  </td><td rowspan="3">Mechanical actuation with directional sensors for electrical monitoring of spool valve movement
 

Vcc 10 V ... 30 V
I L < 200 mA</td><td colspan="2">With lever</td></tr>
<tr><td colspan="2">Normally closed: PDM1111100</td></tr>
<tr><td colspan="2">Normally open: PDM1112100</td></tr>
<tr><td rowspan="2">PDF
  </td><td rowspan="2">Friction detent (for mechanical actuation only)</td><td colspan="2">Cast iron only</td></tr>
<tr><td colspan="2">PDF10000000</td></tr>
<tr><td>  </td><td>Flow adjustement protection nuts for PDM mechanical control</td><td colspan="2"></td></tr>
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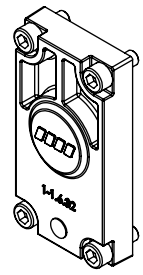
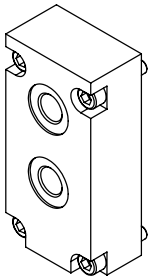
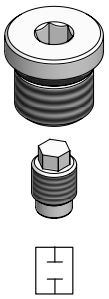
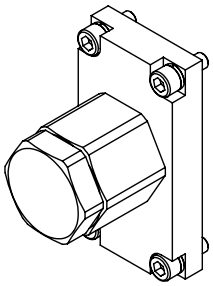
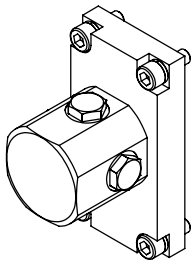
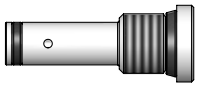
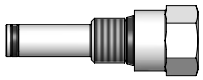
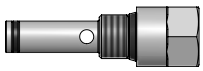
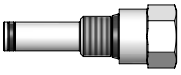
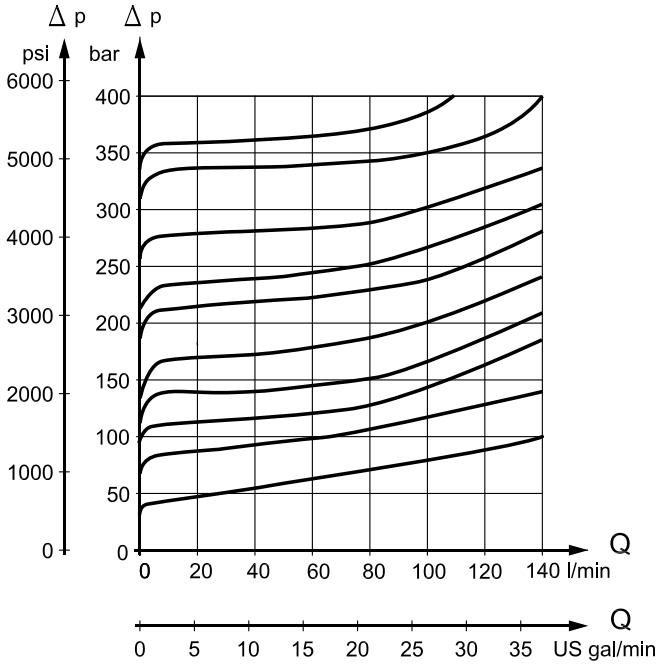
Product	Description	Aluminium	Cast iron
PDC 	Rear cover for mechanical actuation	**PDC00000000**	**PDC10000000**
PDH 	Hydraulic actuation	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PDH70000000**	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PDH71000000**
		A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PDH70000100**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PDH71000100**
	Pilot LS A/B relief valve	10 ÷40 bar	**PLS0A100000**
		41 ÷ 80 bar	**PLS0A200000**
		81 ÷ 380 bar	**PLS0A400000**
	Plug for pilot LS A/B relief valve cavity	**PLS0P000000**	

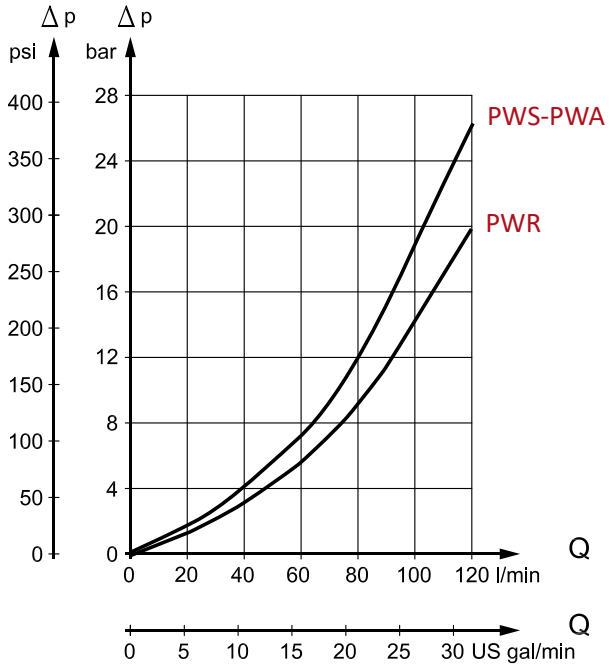
Product	Description	Aluminium	Cast iron
PDD 	Mechanical spool lock device, manual release	P→A - lock P→B - free **PDD30100000**	
		P→A - free P→B - lock **PDD30010000**	
		P→A - lock P→B - lock **PDD30110000**	
		P→A - float P→B - free **PDD30200000**	
		P→A - free P→B - float **PDD30020000**	
PDF 	Friction control		**PDF12000001**

Product	Description	Code numbers	
PIZ 	For PDI with internal pilot oil supply	**PIZ10000000**	
PIY 	For PDI with external pilot oil supply	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PIY10000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PIY10000010**
	For PDE with external drain line electrical actuation	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PED10000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PED10000010**
	For PDE with internal drain line electrical actuation	**PEI10000000**	
	For PDE with LS carry-over	A/B pilot port 1/4 BSPP deep: 12 mm (0,47 in) **PED20000000**	A/B pilot port 7/16-20UNF-2B deep: 12 mm (0,47 in) **PED20000010**
	For PDE prearranged LS carry-over	**PEI10000000**	

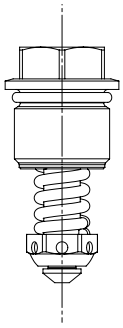
PWS, PWA and PWB are shock suction valves design to absorb shock effects only, and they should never be used as a pressure relief valves.
PWS, PWA and PWB are set at an oil flow of 10 l/min.
If the hydraulic actuator requires a pressure relief valve function, a PDW module with built-in LS A/B pilot pressure limit valves should be used

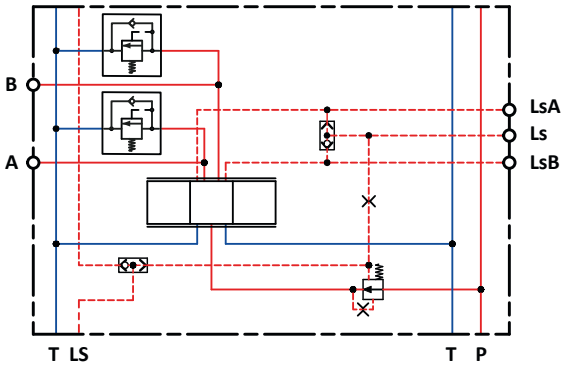


PWR suction valve



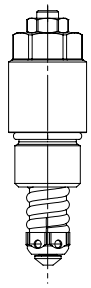
PWS shock and suction valve for A/B port. **Not adjustable**

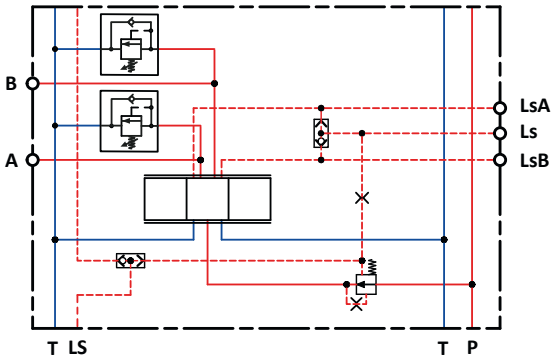




Setting Pressure*(bar)*	Code numbers
50	**PWS7M180050**
70	**PWS7M180070**
90	**PWS7M180090**
110	**PWS7M180110**
130	**PWS7M180130**
150	**PWS7M180150**
180	**PWS7M180180**
200	**PWS7M180200**
230	**PWS7M180230**
260	**PWS7M180260**
290	**PWS7M180290**
320	**PWS7M180320**
350	**PWS7M180350**
380	**PWS7M180380**

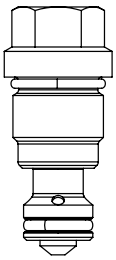
PWA shock and suction valve for A/B port. **Adjustable**

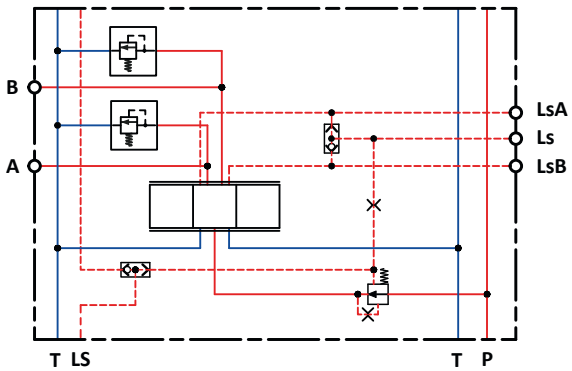




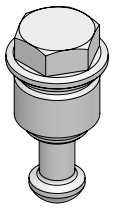
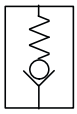
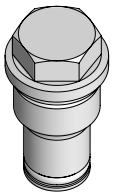
Range setting *(bar)*	Code numbers
20 ÷ 70	**PWA7M180N00**
71 ÷ 130	**PWA7M180B00**
131 ÷ 210	**PWA7M180G00**
211 ÷ 280	**PWA7M180V00**
281 ÷ 350	**PWA7M180W00**
351 ÷ 420	**PWA7M180R00**

PWB shock valve for A/B port. **Not adjustable**



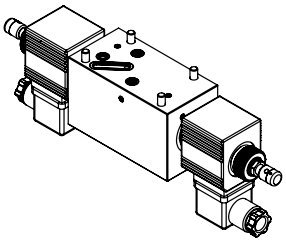


Setting pressure*(bar)*	Code numbers
50	**PWB7M180050**
70	**PWB7M180070**
90	**PWB7M180090**
110	**PWB7M180110**
130	**PWB7M180130**
150	**PWB7M180150**
180	**PWB7M180180**
200	**PWB7M180200**
230	**PWB7M180230**
260	**PWB7M180260**
290	**PWB7M180290**
320	**PWB7M180320**
350	**PWB7M180350**
380	**PWB7M180380**

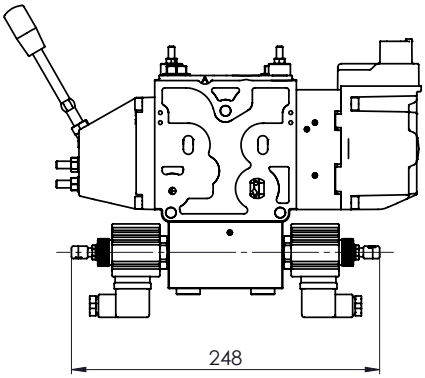
PWR suction valve for A/B port		
Product	Hydraulic diagram	Code numbers
		**PWR7M180000**
Plug for **PWS - PWA - PWB** and **PWR** cavity		
Product	Hydraulic diagram	Code numbers
		**PWP7M18000**

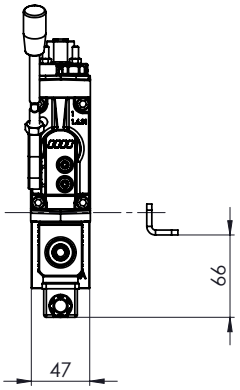
OMFB
HYDRAULIC POWER CONTROL

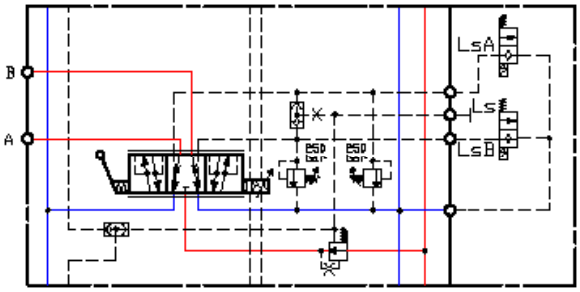
PDV315 Proportional Valve
PDL module - **Electrical LS$_{A/B}$ unloading**
ON-OFF actuation normally closed

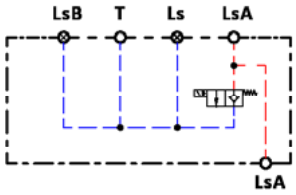
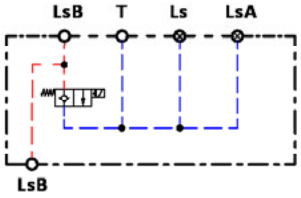
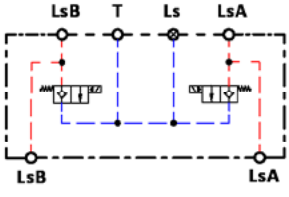
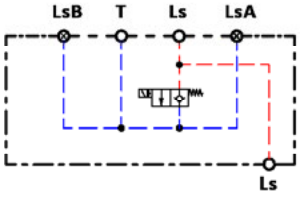


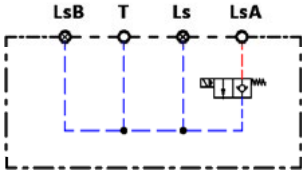
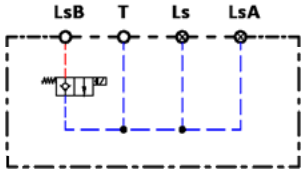
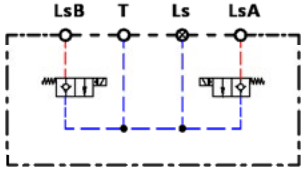
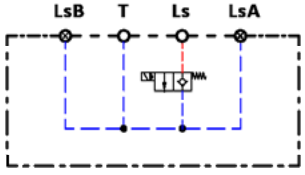
When PDL is energized, the piloting signal is lead to tank and in turn the work port oil flow will be cutted off.
PDL modules is always to be matched with PDW pressure compesated.





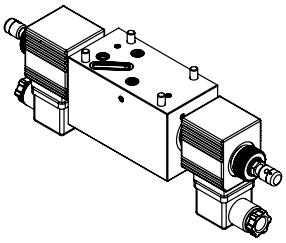


PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL12C11200**	**PDL12C31200**
	Deutsch Perpendicular	**PDL12C12200**	**PDL12C32200**
	DIN	**PDL12C13200**	**PDL12C33200**
	JPT	**PDL12C14200**	**PDL12C34200**
Active on LsB 	Deutsch Parallel	**PDL13C11200**	**PDL13C31200**
	Deutsch Perpendicular	**PDL13C12200**	**PDL13C32200**
	DIN	**PDL13C13200**	**PDL13C33200**
	JPT	**PDL13C14200**	**PDL13C34200**
Active on LsA and LsB 	Deutsch Parallel	**PDL11C11200**	**PDL11C31200**
	Deutsch Perpendicular	**PDL11C12200**	**PDL11C32200**
	DIN	**PDL11C13200**	**PDL11C33200**
	JPT	**PDL11C14200**	**PDL11C34200**
Active on Ls 	Deutsch Parallel	**PDL14C11200**	**PDL14C31200**
	Deutsch Perpendicular	**PDL14C12200**	**PDL14C32200**
	DIN	**PDL14C13200**	**PDL14C33200**
	JPT	**PDL14C14200**	**PDL14C34200**

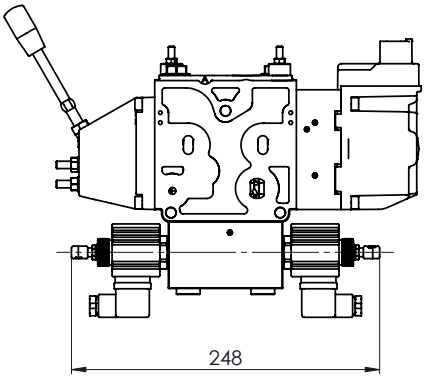
PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL32C11200**	**PDL32C31200**
	Deutsch Perpendicular	**PDL32C12200**	**PDL32C32200**
	DIN	**PDL32C13200**	**PDL32C33200**
	JPT	**PDL32C14200**	**PDL32C34200**
Active on LsB 	Deutsch Parallel	**PDL33C11200**	**PDL33C31200**
	Deutsch Perpendicular	**PDL33C12200**	**PDL33C32200**
	DIN	**PDL33C13200**	**PDL33C33200**
	JPT	**PDL33C14200**	**PDL33C34200**
Active on LsA and LsB 	Deutsch Parallel	**PDL35C11200**	**PDL35C31200**
	Deutsch Perpendicular	**PDL35C12200**	**PDL35C32200**
	DIN	**PDL35C13200**	**PDL35C33200**
	JPT	**PDL35C14200**	**PDL35C34200**
Active on Ls 	Deutsch Parallel	**PDL34C11200**	**PDL34C31200**
	Deutsch Perpendicular	**PDL34C12200**	**PDL34C32200**
	DIN	**PDL34C13200**	**PDL34C33200**
	JPT	**PDL34C14200**	**PDL34C34200**

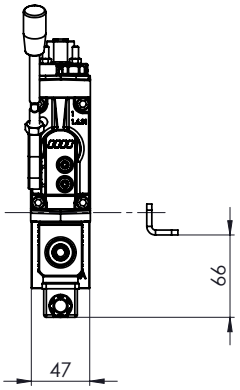
OMFB
HYDRAULIC POWER CONTROL

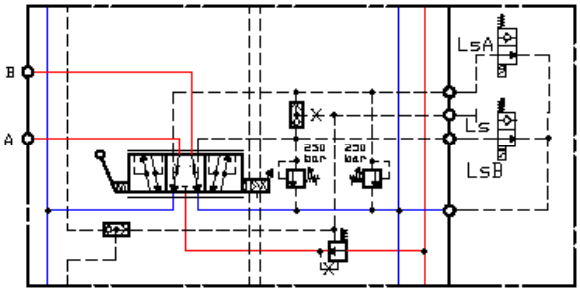
PDV315 Proportional Valve
PDL module - **Electrical LS$_{A/B}$ unloading**
ON-OFF actuation normally open

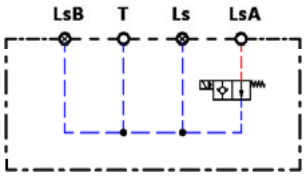
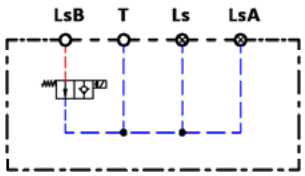
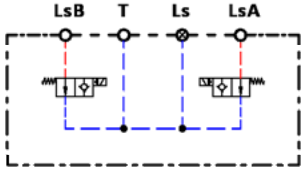
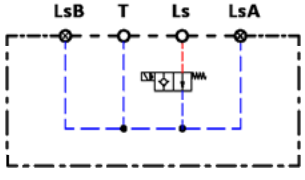


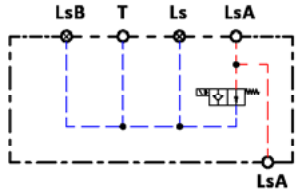
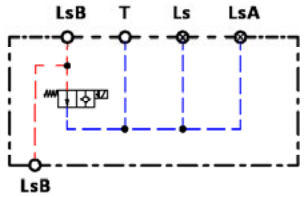
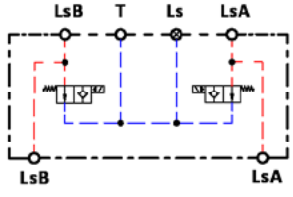
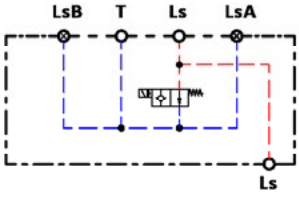
When PDL is deenergized, the piloting signal is lead to tank and in turn the work port oil flow will be cutted off.
PDL modules is always to be matched with PDW pressure compesated.





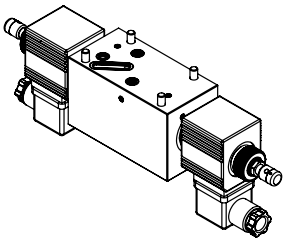


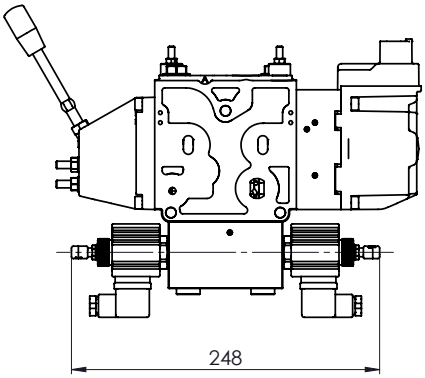
PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL32A11100**	**PDL32A31100**
	Deutsch Perpendicular	**PDL32A12100**	**PDL32A32100**
	DIN	**PDL32A13100**	**PDL32A33100**
	JPT	**PDL32A14100**	**PDL32A34100**
Active on LsB 	Deutsch Parallel	**PDL33A11100**	**PDL33A31100**
	Deutsch Perpendicular	**PDL33A12100**	**PDL33A32100**
	DIN	**PDL33A13100**	**PDL33A33100**
	JPT	**PDL33A14100**	**PDL33A34100**
Active on LsA and LsB 	Deutsch Parallel	**PDL35A11100**	**PDL35A31100**
	Deutsch Perpendicular	**PDL35A12100**	**PDL35A32100**
	DIN	**PDL35A13100**	**PDL35A33100**
	JPT	**PDL35A14100**	**PDL35A34100**
Active on Ls 	Deutsch Parallel	**PDL34A11100**	**PDL34A31100**
	Deutsch Perpendicular	**PDL34A12100**	**PDL34A32100**
	DIN	**PDL34A13100**	**PDL34A33100**
	JPT	**PDL34A14100**	**PDL34A34100**

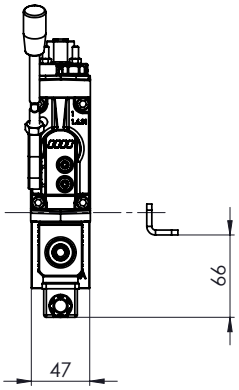
PDL code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL12A11100**	**PDL12A31100**
	Deutsch Perpendicular	**PDL12A12100**	**PDL12A32100**
	DIN	**PDL12A13100**	**PDL12A33100**
	JPT	**PDL12A14100**	**PDL12A34100**
Active on LsB 	Deutsch Parallel	**PDL13A11100**	**PDL13A31100**
	Deutsch Perpendicular	**PDL13A12100**	**PDL13A32100**
	DIN	**PDL13A13100**	**PDL13A33100**
	JPT	**PDL13A14100**	**PDL13A34100**
Active on LsA and LsB 	Deutsch Parallel	**PDL11A11100**	**PDL11A31100**
	Deutsch Perpendicular	**PDL11A12100**	**PDL11A32100**
	DIN	**PDL11A13100**	**PDL11A33100**
	JPT	**PDL11A14100**	**PDL11A34100**
Active on Ls 	Deutsch Parallel	**PDL14A11100**	**PDL14A31100**
	Deutsch Perpendicular	**PDL14A12100**	**PDL14A32100**
	DIN	**PDL14A13100**	**PDL14A33100**
	JPT	**PDL14A14100**	**PDL14A34100**

OMFB
HYDRAULIC POWER CONTROL

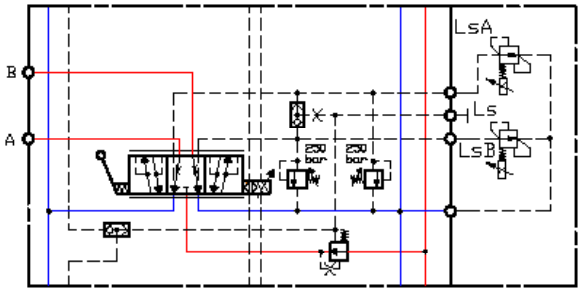
PDV315 Proportional Valve
PDLD module - **Electrical LS$_{A/B}$ unloading**
Proportional actuation normally open (current signal mA)

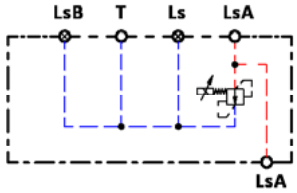
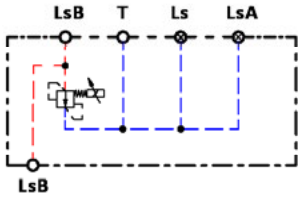
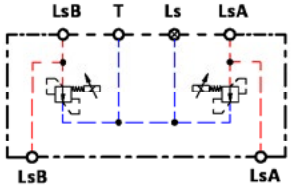
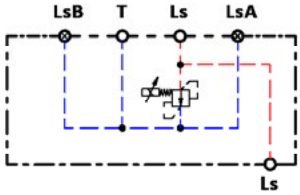




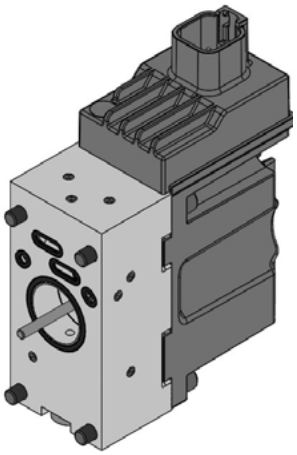


PDLD is an electro-hydraulic device that allows the A/B port working pressure to be remotely an proportionally operated according to a current signal (mA). When the working pressure exceed the setting pressure value, the A/B port oil flow will be cutted off.
When PDLD is not energized, PDW is almost pressureless, as well as the A-B oil flow is cutted off.



PDLD code numbers			
Hydraulic diagram	**Connector type**	**12V dc**	**24V dc**
Active on LsA 	Deutsch Parallel	**PDL12D11000**	**PDL12D31000**
Active on LsB 	Deutsch Parallel	**PDL13D11000**	**PDL13D31000**
Active on LsA and LsB 	Deutsch Parallel	**PDL11D11000**	**PDL11D31000**
Active on Ls 	Deutsch Parallel	**PDL14D11000**	**PDL14D31000**

PDV315 - PEAC131 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc



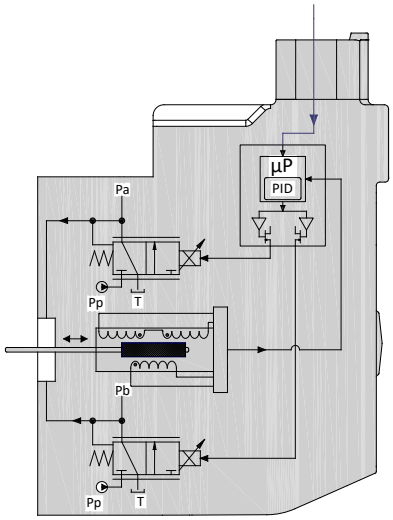
PEAC131 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC131 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version

Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.



Passive fault monitoring

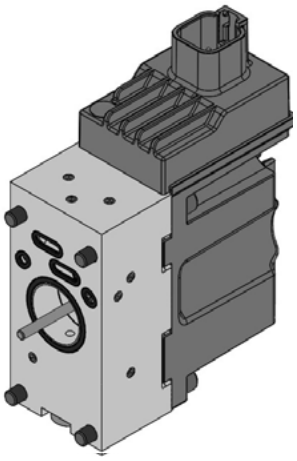
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC131 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC131 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAC131 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc

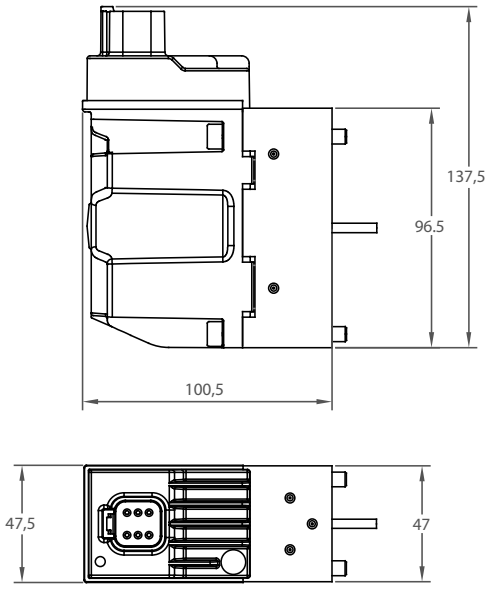


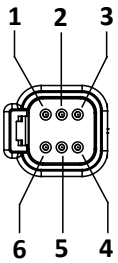
PEAC131 is defined by:

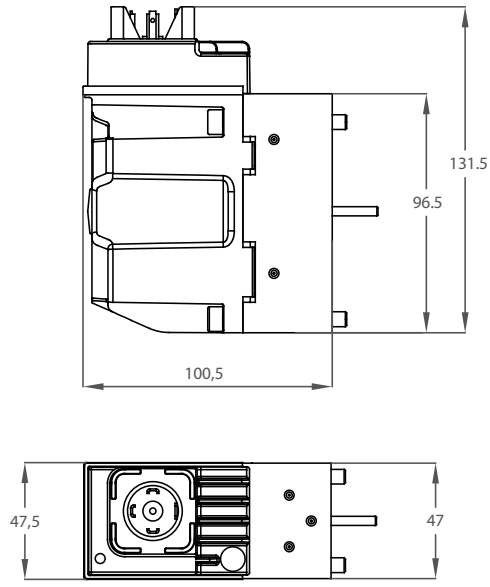
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power

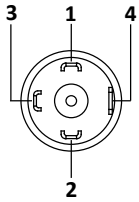
PEAC131 Technical data		
Rated supply voltage		**10 ÷ 30 Vdc**
Max ripple		**5%**
Signal control		**0,5 Udc**
Range control signal		**0,25 Udc to 0,75 Udc**
Neutral spool position		**0,5 Udc**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV315 - PEAC131 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 0,5 Udc - Electrical connectors



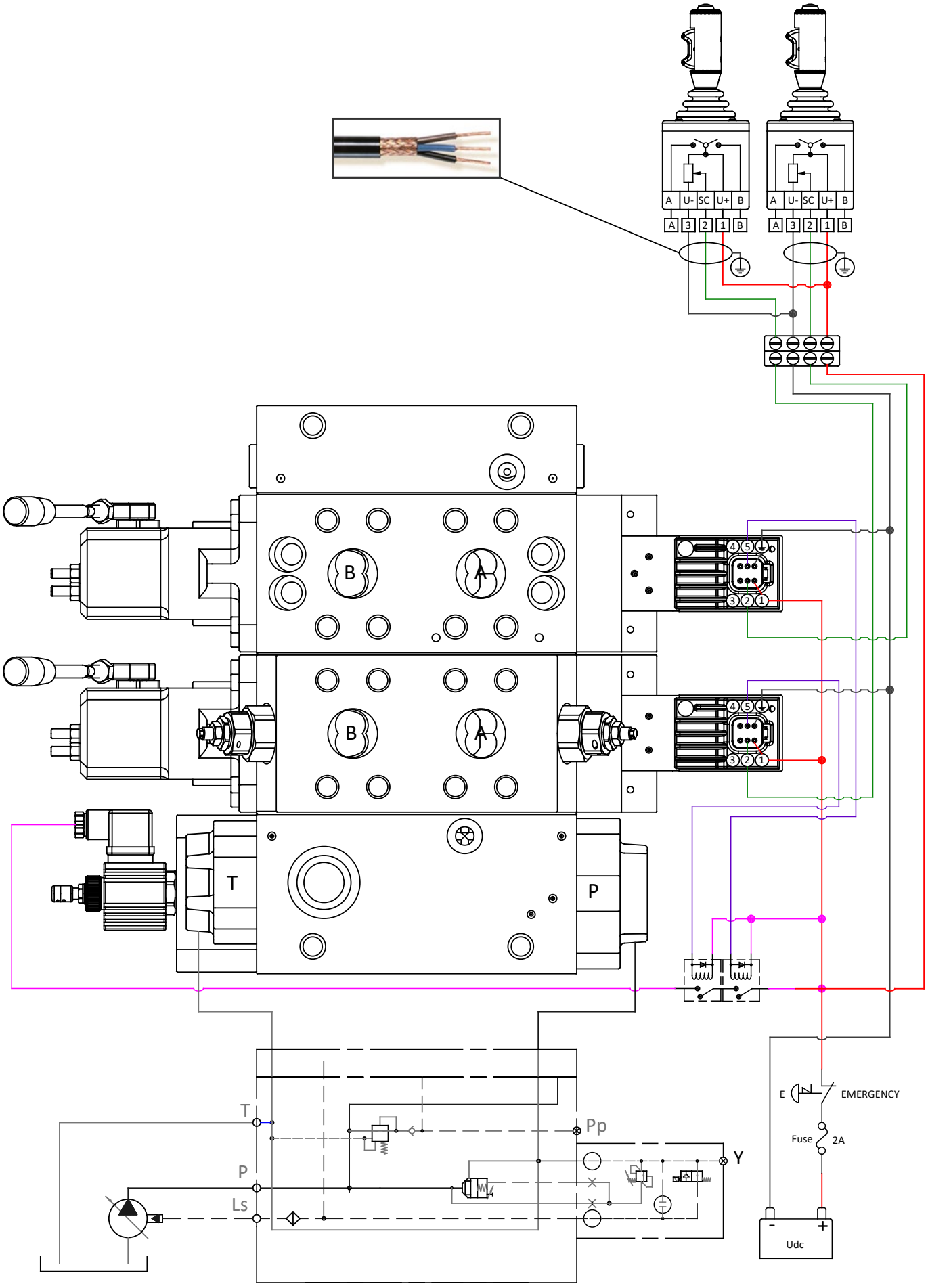
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment			
	**1**	Power supply	
	2	Input signal control	
	3	CAN-high	**A** port-spool movement signal
	4	CAN-low	**B** port-spool movement signal
	5	Fault monitoring signal	
	6	Ground	



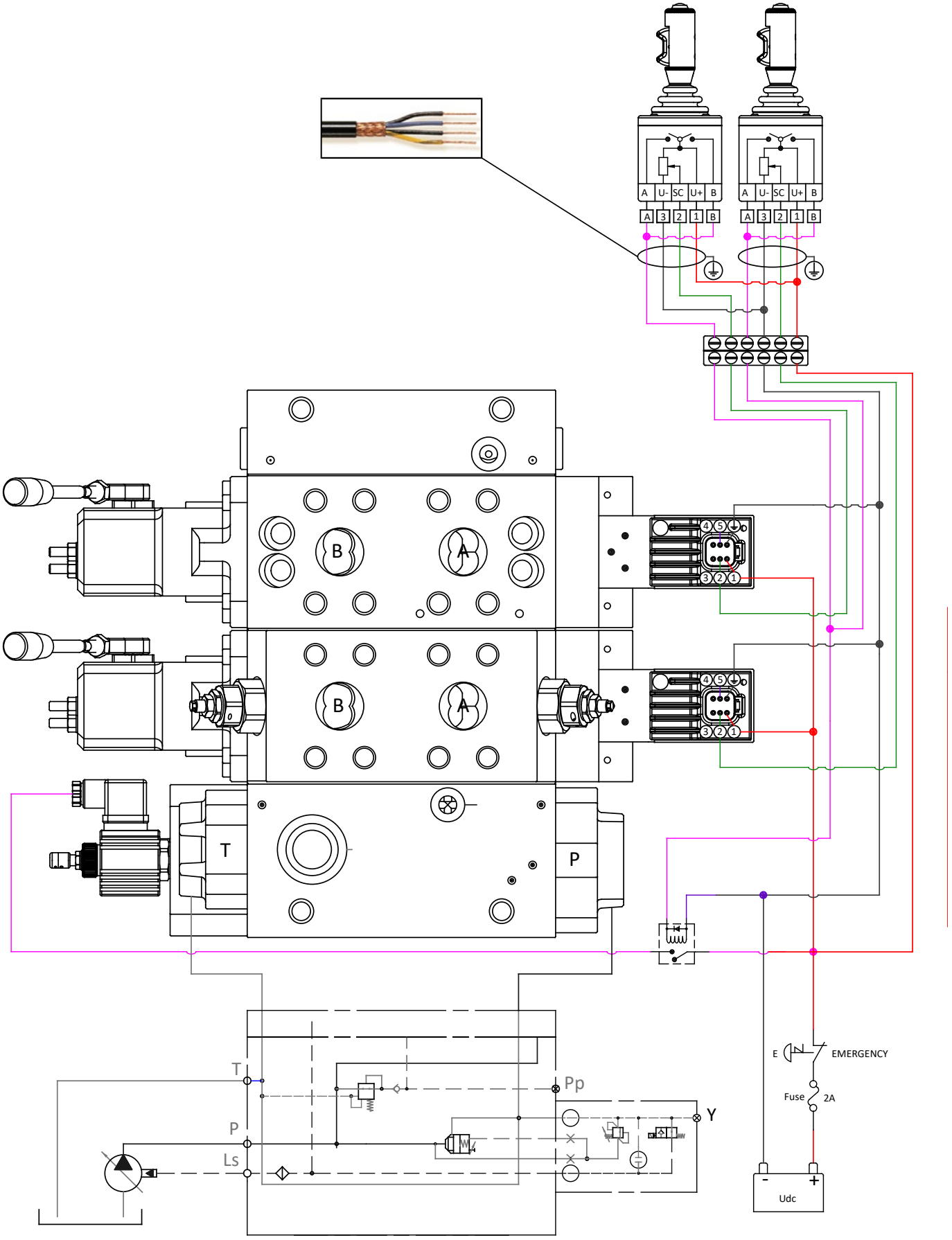
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Fault monitoring signal
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0181000**	**PEAC1181000**	**PEAC0171000**	**PEAC1171000**
DIN 43650	**PEAC0181200**	**PEAC1181200**	**PEAC0171200**	**PEAC1171200**

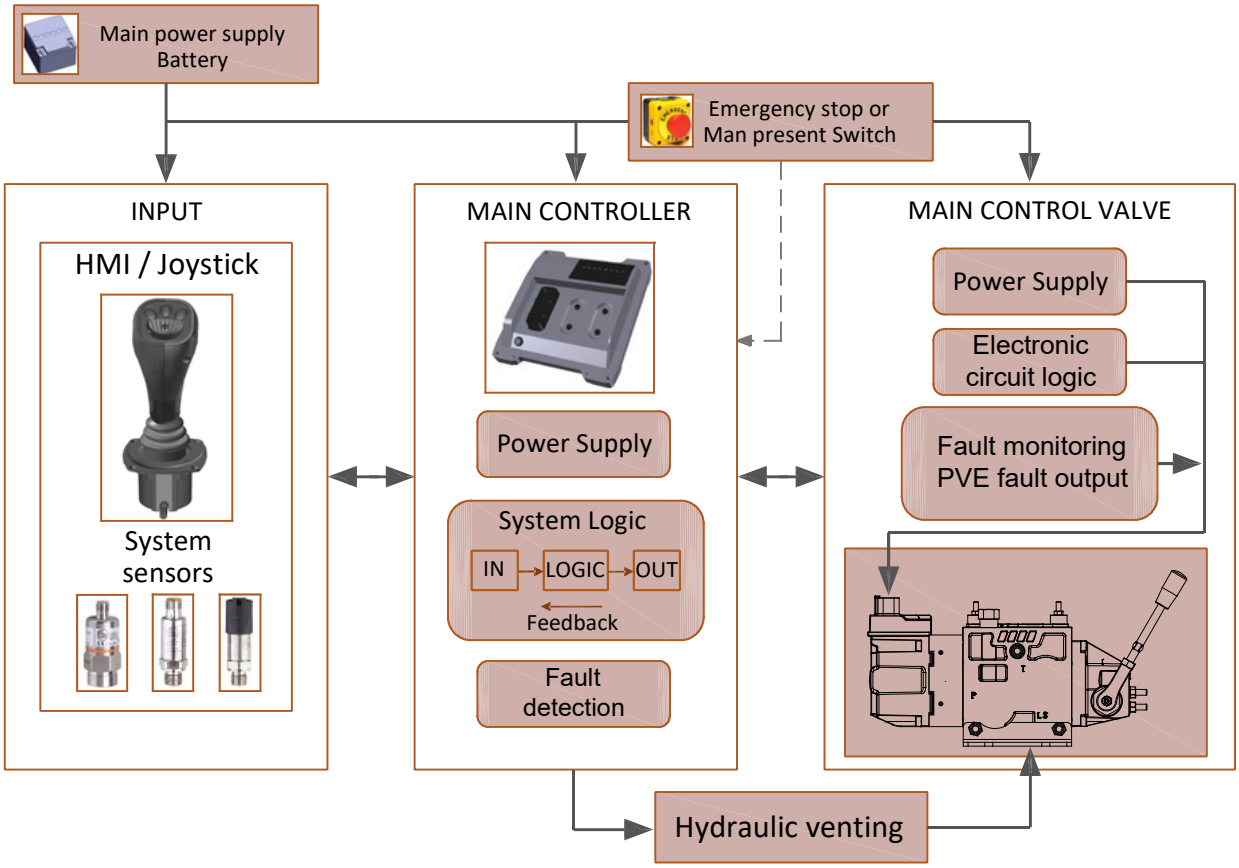
PDV315 - PEAC131 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc



PDV315 - PEAC131 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0,5 Udc

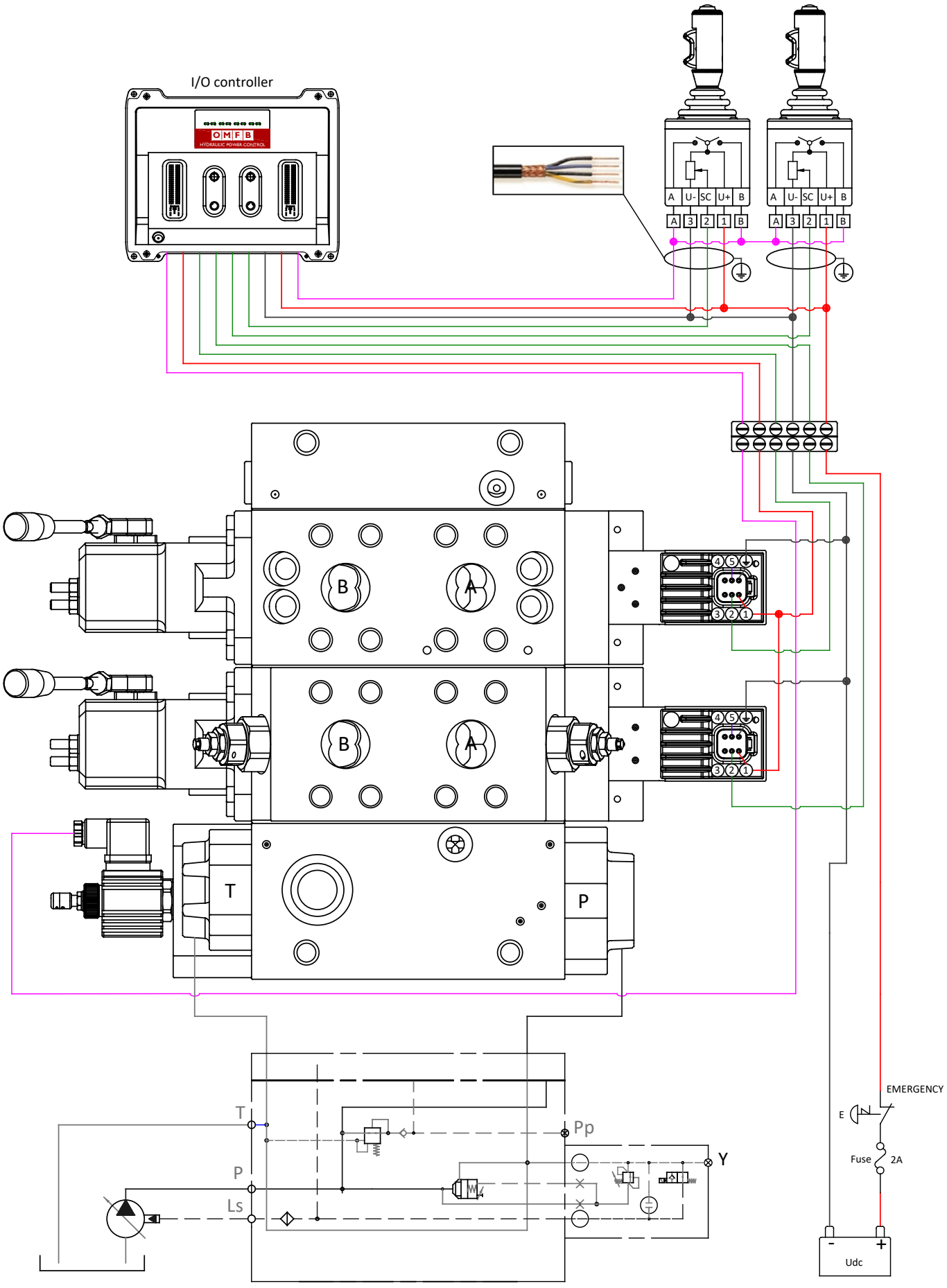


PDV315 - PEAC131 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control

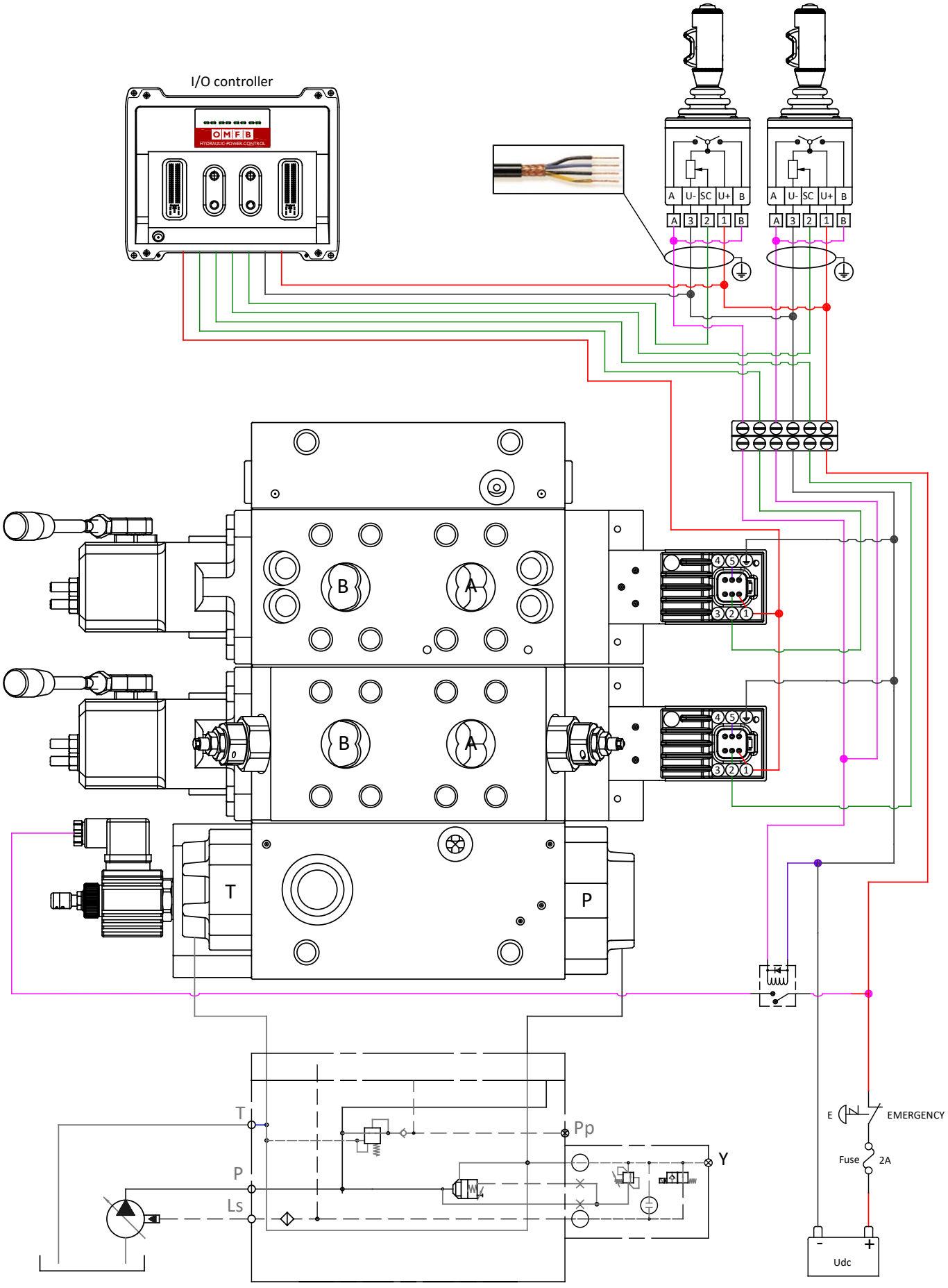


OMFB
HYDRAULIC POWER CONTROL

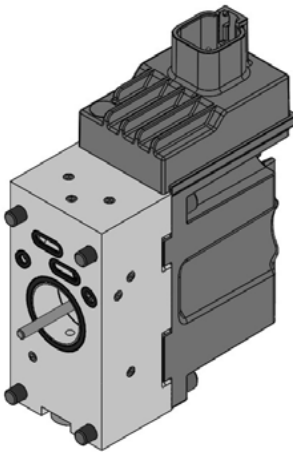
PDV315 - PEAC131 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV315 - PEAC131 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



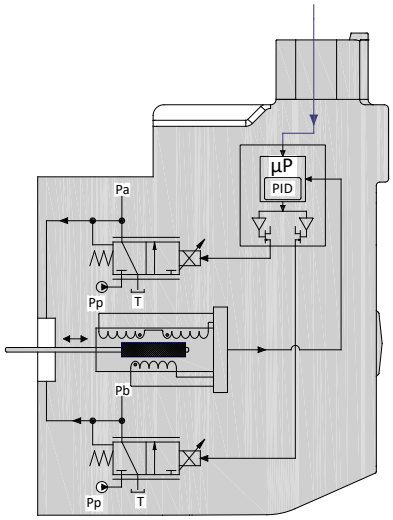
PDV315 - PEAC132 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



PEAC132 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC132 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version



Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.

Passive fault monitoring

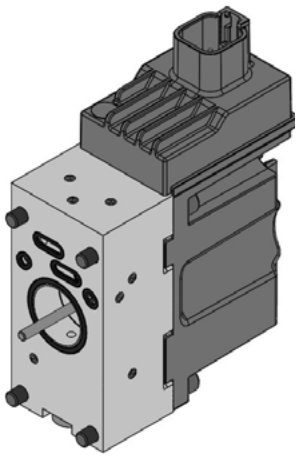
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC132 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC132 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAC132 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

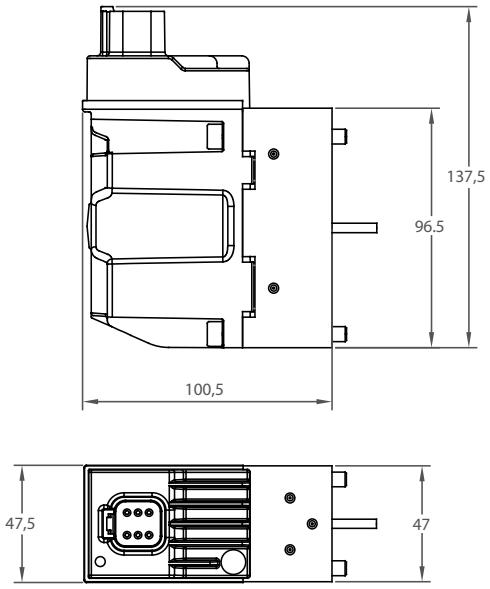


PEAC132 is defined by:

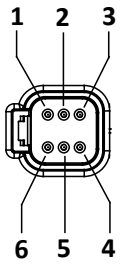
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace to
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power

PEAC132 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0-10 V**
Range control signal		**2,5 V to 7,5 V**
Neutral spool position		**5 V**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

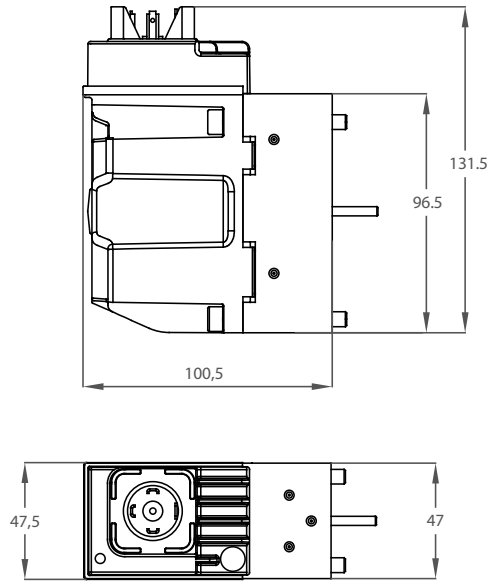
PDV315 - PEAC132 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 0 ÷ 10 V - Electrical connectors



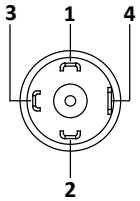
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply	
2	Input signal control	
3	CAN-high	**A** port-spool movement signal
4	CAN-low	**B** port-spool movement signal
5	Fault monitoring signal	
6	Ground	



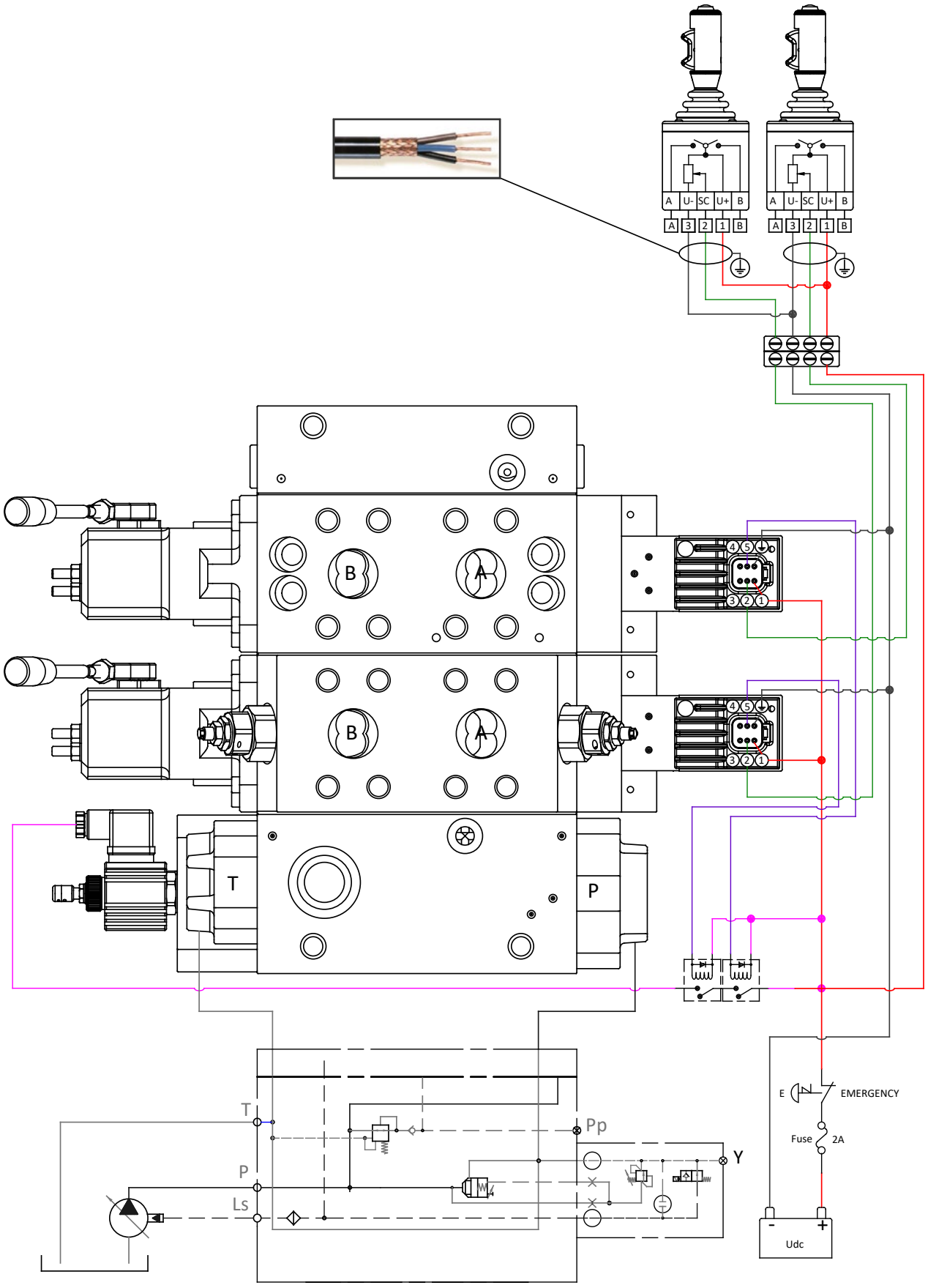
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



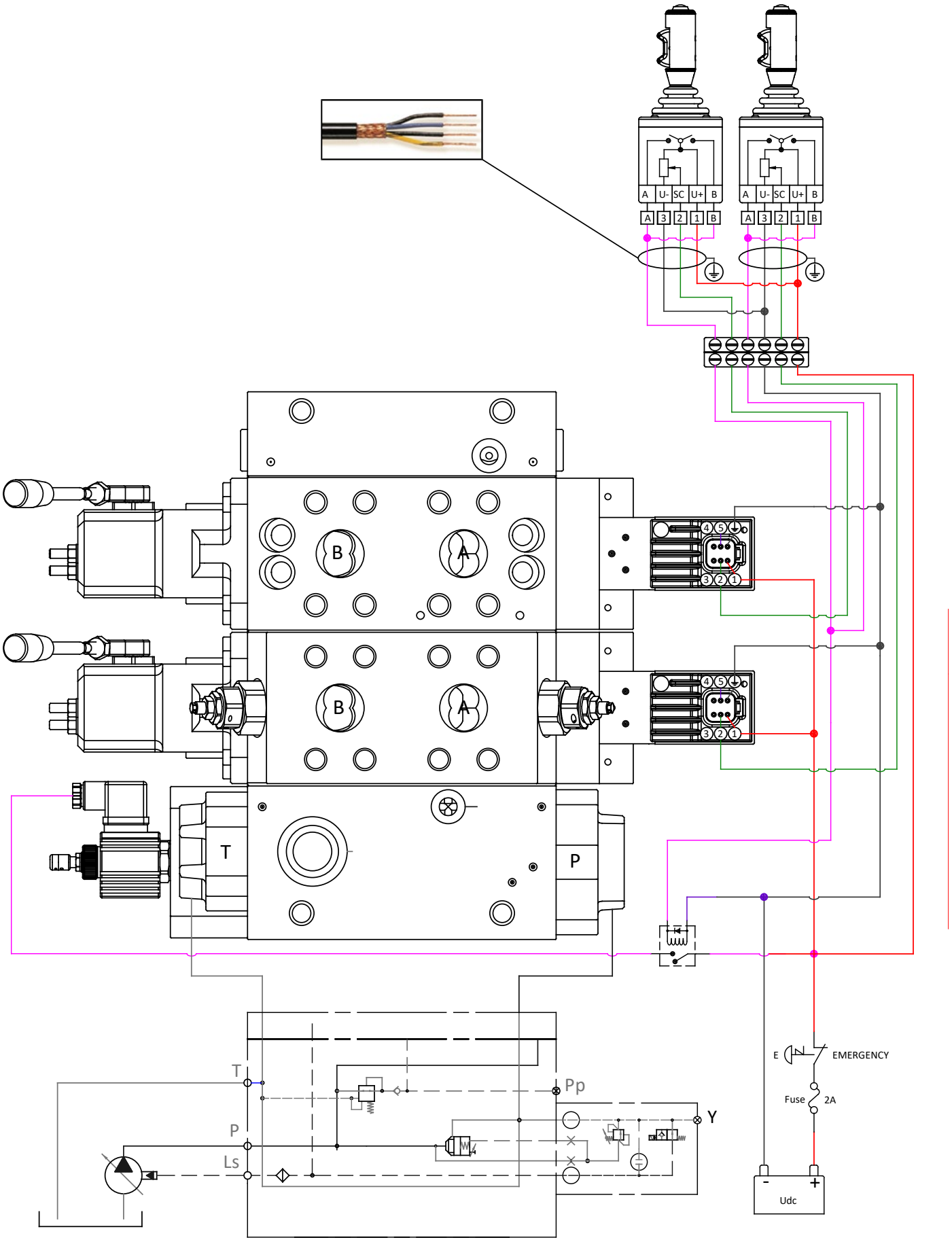
1	Power supply
2	Input signal control
3	Fault monitoring signal
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0182000**	**PEAC1182000**	**PEAC0172000**	**PEAC1172000**
DIN 43650	**PEAC0182200**	**PEAC1182200**	**PEAC0172200**	**PEAC1172200**

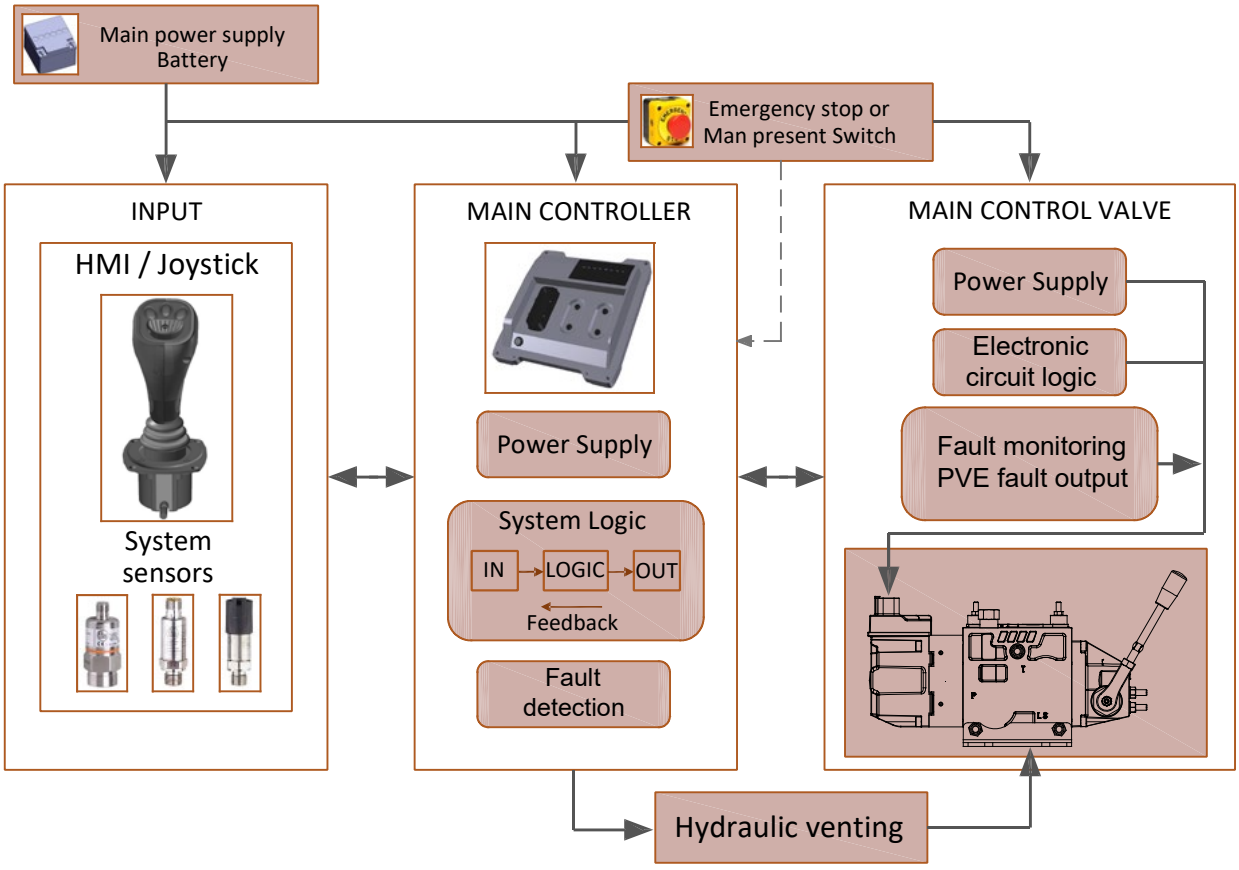
PDV315 - PEAC132 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



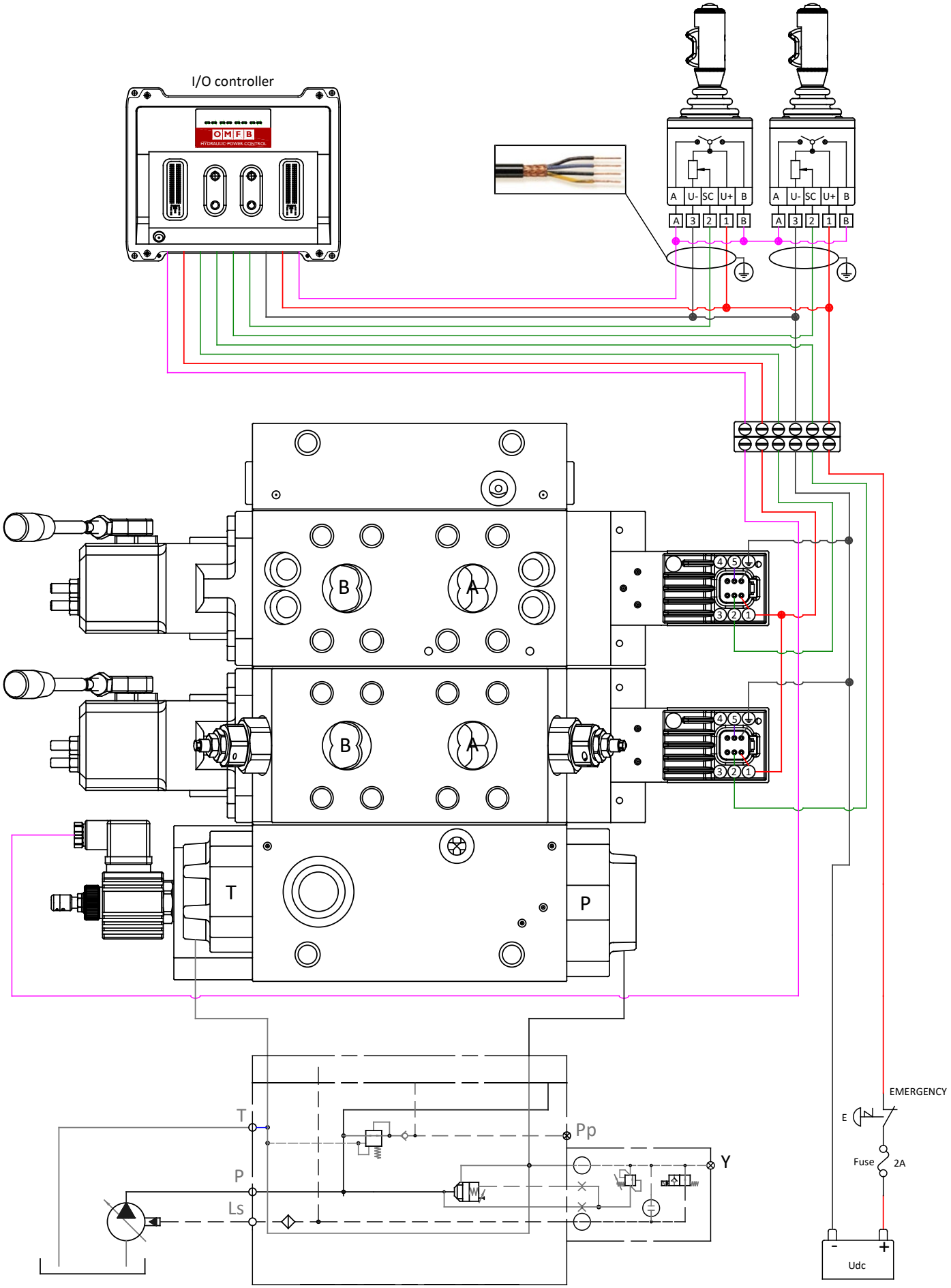
PDV315 - PEAC132 Electro-hydraulic proportional actuation.
Closed loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



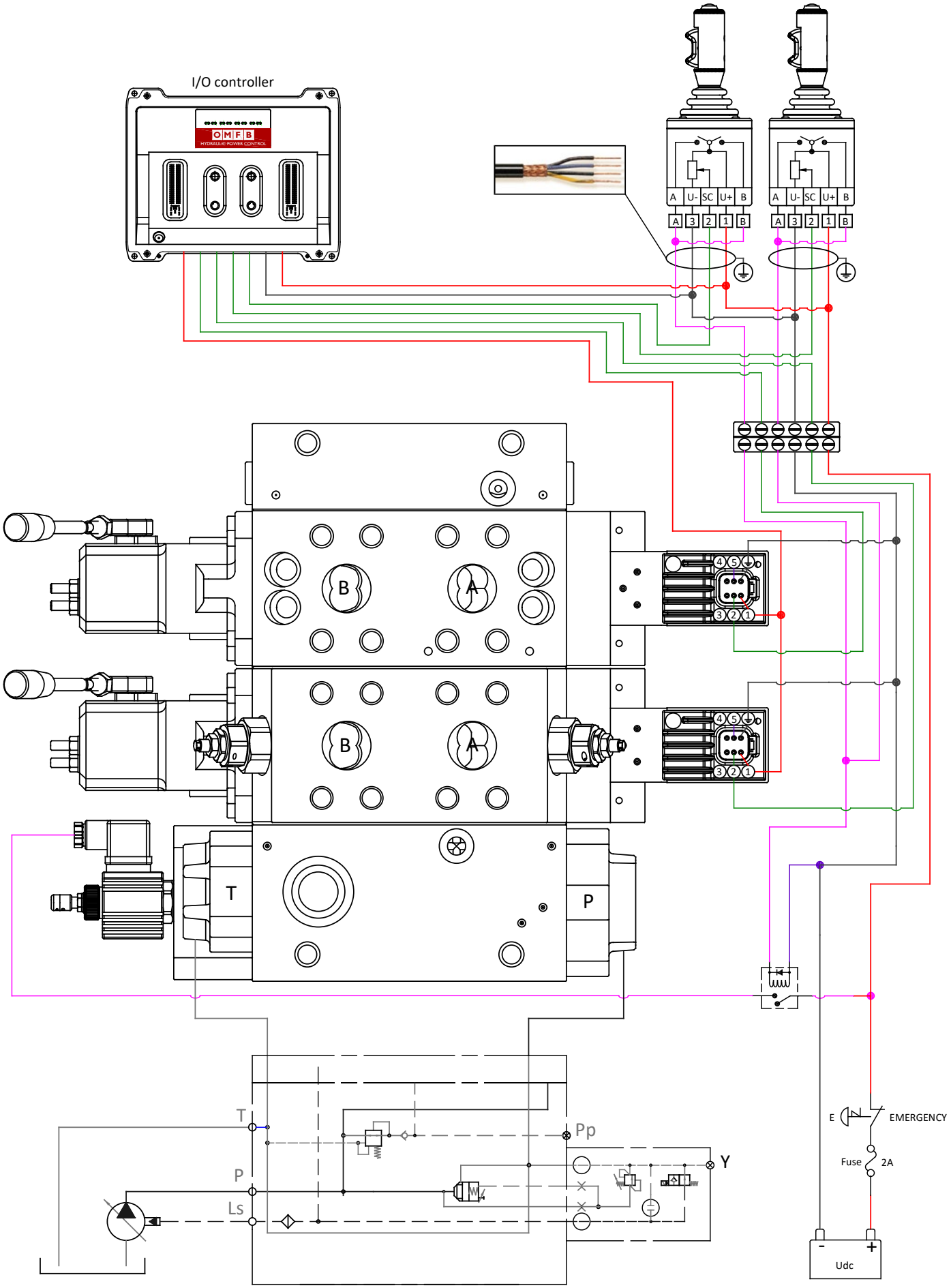
PDV315 - PEAC132 Electro-hydraulic proportional actuation.
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



PDV315 - PEAC132 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V

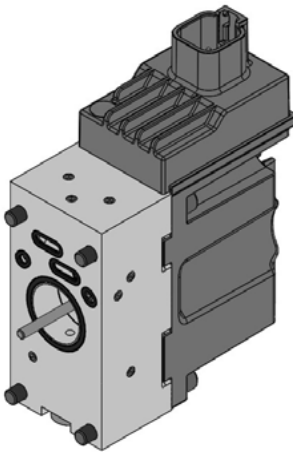


PDV315 - PEAC132 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAC136 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 4 ÷ 20 mA



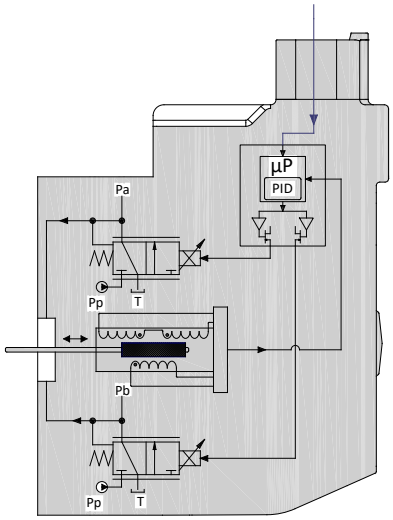
PEAC136 is a proportional high performance PDV spool actuation with integrated electronics and inductive transducer (LVDT) that operates safely and precisely the main spool movement according to an electrical signal coming from a remote control.
The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.
The spool position is detected in the LVDT transducer which generates an electric feed-back signal registered by the electronics.
The variation between the input signal and the feed-back signal, actuates the solenoid valves accordingly, so that, the hydraulic pilot pressure will drive the main spool in the right position.

All PEAC136 modules comes with integrated fault monitoring system, available in two version:

Active version
Passive version

Active fault monitoring

When an error state is detected, the two proportional solenoid valves will be automatically deactivated, a red lamp will light-up and drive the spool in neutral position (if it's not seized up).
The system will only react to failures of more than 500 ms (in other words there is delay of half a second before anything happens). An alarm signal is sent out through the connector, and minus is opened.
This error state is memorized, and continues until the system is being reset by switching off the supply voltage.
Shortly, when the active fault monitoring system is connected and an error state is detected, the system ensures a fast and operator free reaction, that will put the complete hydraulic circuit into venting conditions, thus preventing uncontrollable machine movements.



Passive fault monitoring

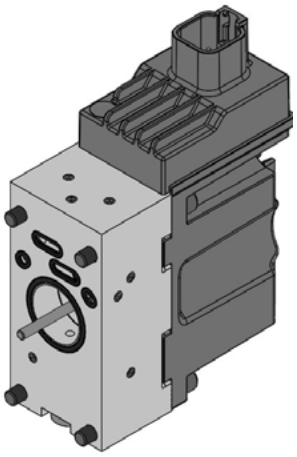
When an error state is detected, the two proportional solenoid valves will not be deactivated, a red lamp will light-up, but still control the main spool.
When a fault condition occurs, after a delay of 250 ms an alarm signal is sent out through a devoted pin
This state is not memorized, and when the faulty state disappears, the alarm signal will turn to passive again.
In order to prevent the electronic from going into an undefined state, any time the system is being triggered or reset, a general check of power supply and the internal clock frequency is made.

The use of PEAC136 module both passive or active version, allows the machines hydraulic system to be made with different level of safety degree that for the choice of which it is essential to know the exactly required functions.

When the PEAC136 module active version is connected with the pump unloading system, the level of safety degree protection for the complete hydraulic system becomes very high, operator free, and helps OEM to meet the PL (Performance Level) required to be comply with the safety demands of Machinery Directive 2006/42/EC.

OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAC136 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA

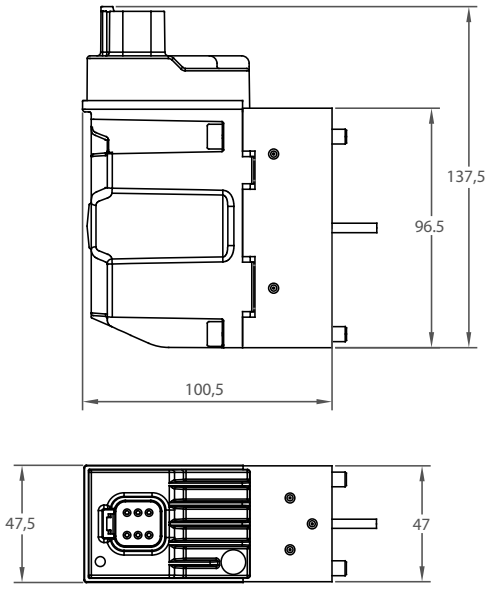


PEAC136 is defined by:

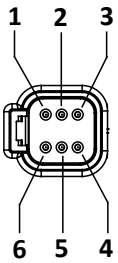
- Inductive transducer with resolution < 12 µm
- Integrated diagnosis and error memory
- Fault monitoring transistor output for signal source
- Higher spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Low hysteresis
- Quicker reaction time
- Spool direction movement output
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAC136 Technical data		
Rated supply voltage		**10 ÷ 30 Vdc**
Max ripple		**5%**
Signal control		**4 ÷ 20 mA**
Range control signal		**4 mA to 20 mA**
Neutral spool position		**12 mA**
Max threshold signal, **A** port		**1,5 mA**
Max threshold signal, **B** port		**1,5 mA**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**220 Ω**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50 ÷ 200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP65 - IP66 - IP69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available with Deutsch connector DT06-6S, only		
Fault monitoring system	Max current on safety output (pin 5)	**50 mA**
	Reaction time a fault	**500 ms**
Max current output signal for spool direction moviment		**50 mA**
Reaction time (constant voltage)	From neutral position to max spool travel	**110 ÷ 140 ms**
	From max spool travel to neutral	**70 ÷ 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 ÷ 170 ms**
	From max spool travel to neutral	**70 ÷ 90 ms**

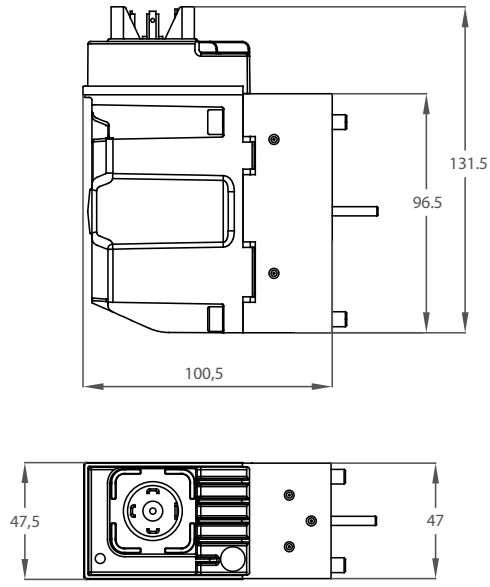
PDV315 - PEAC136 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA - Electrical connectors



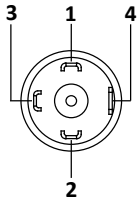
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply	
2	Input signal control	
3	CAN-high	**A** port-spool movement signal
4	CAN-low	**B** port-spool movement signal
5	Fault monitoring signal	
6	Ground	



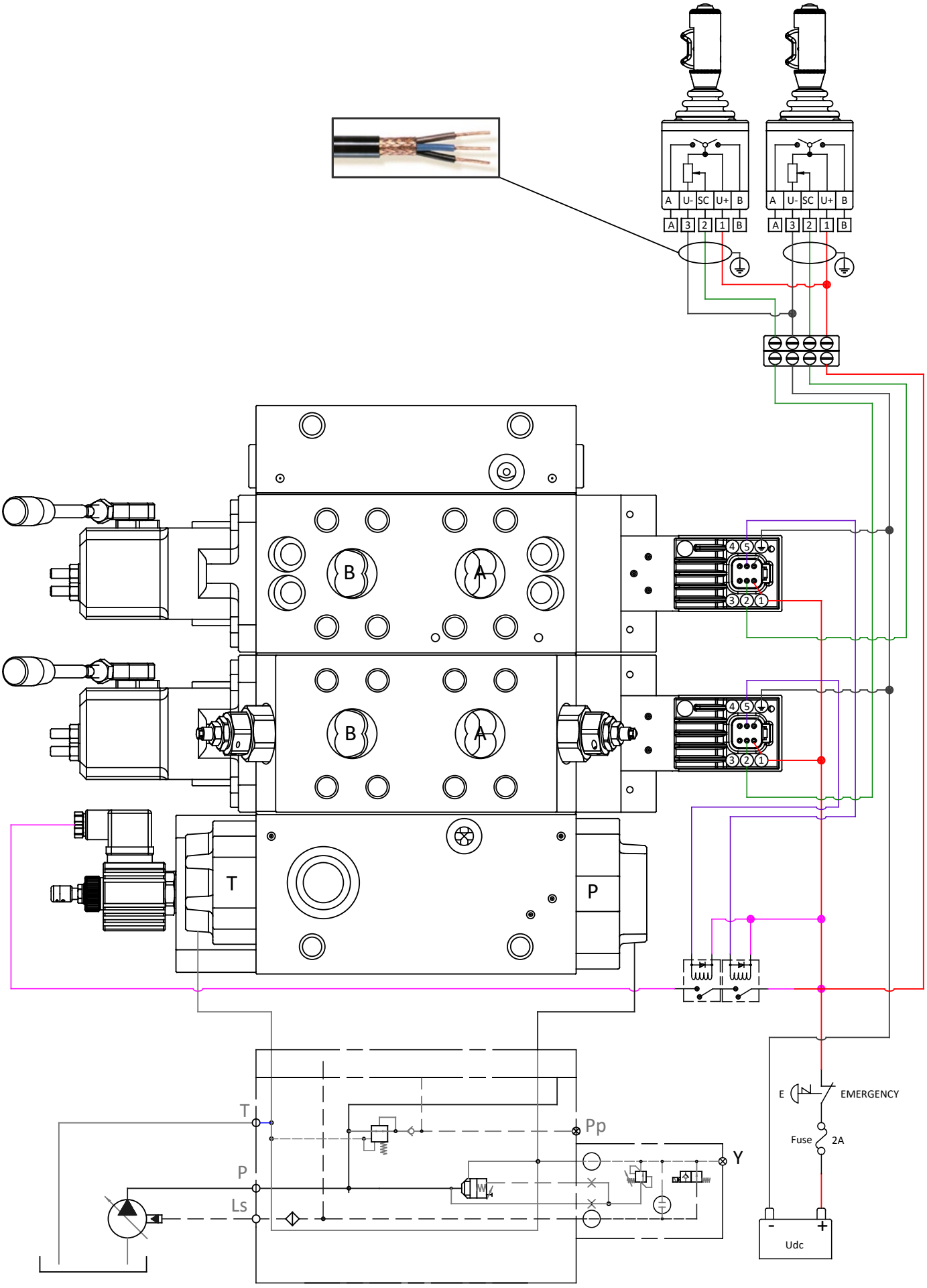
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



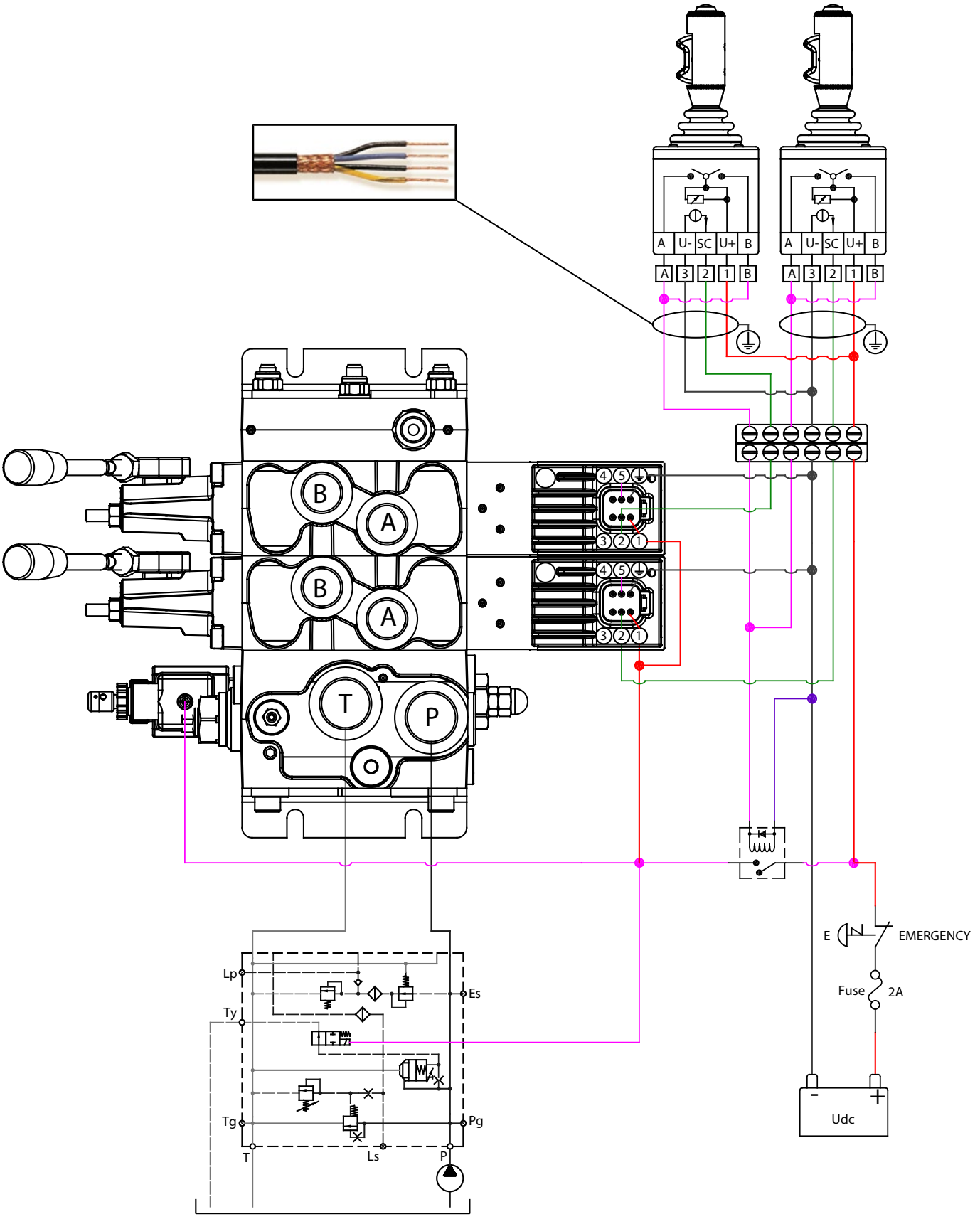
1	Power supply
2	Input signal control
3	Fault monitoring signal
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0186000**	**PEAC1186000**	**PEAC0176000**	**PEAC1176000**
DIN 43650	**PEAC0186200**	**PEAC1186200**	**PEAC0176200**	**PEAC1176200**

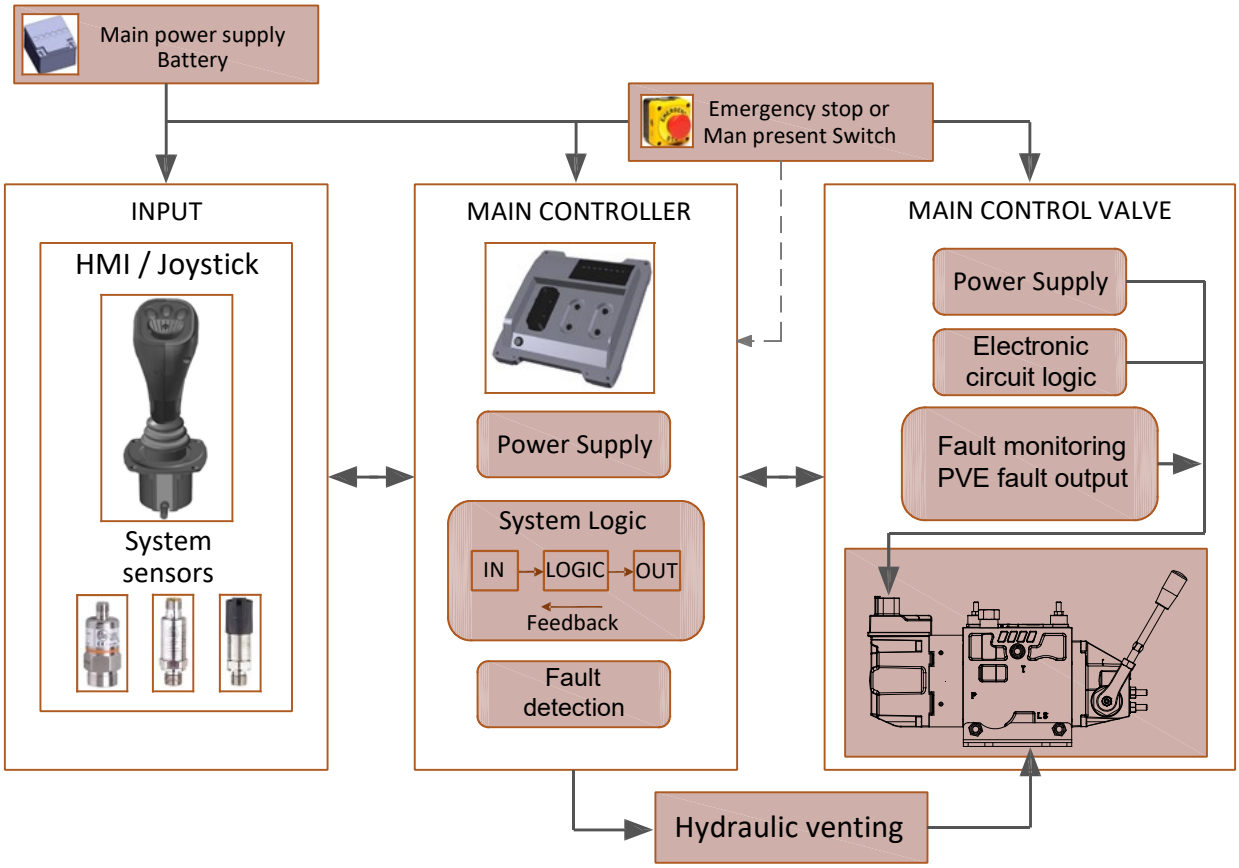
PDV315 - PEAC136 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal 4 ÷ 20 mA



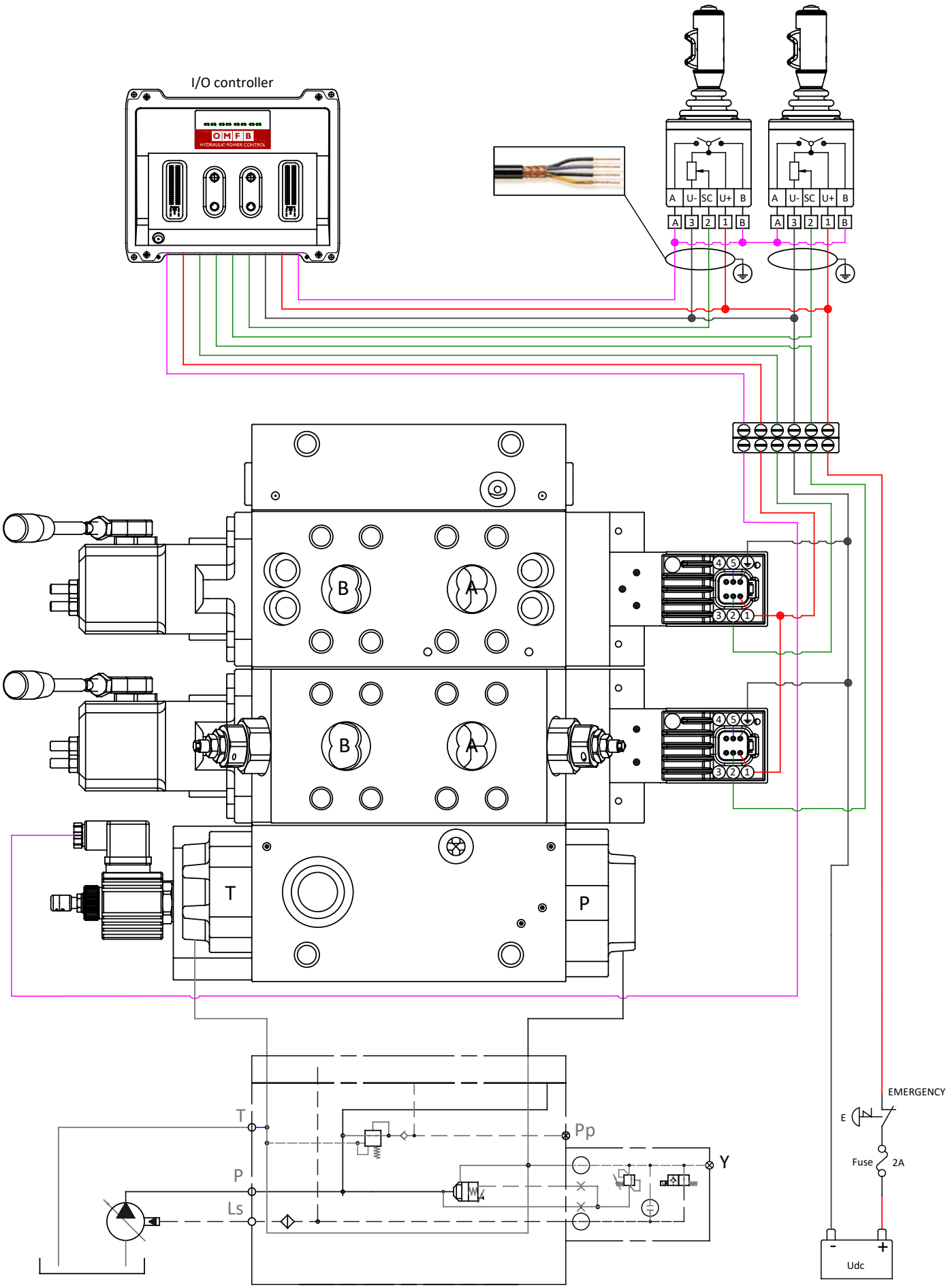
PDV315 - PEAC136 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Input signal control 4 ÷ 20 mA



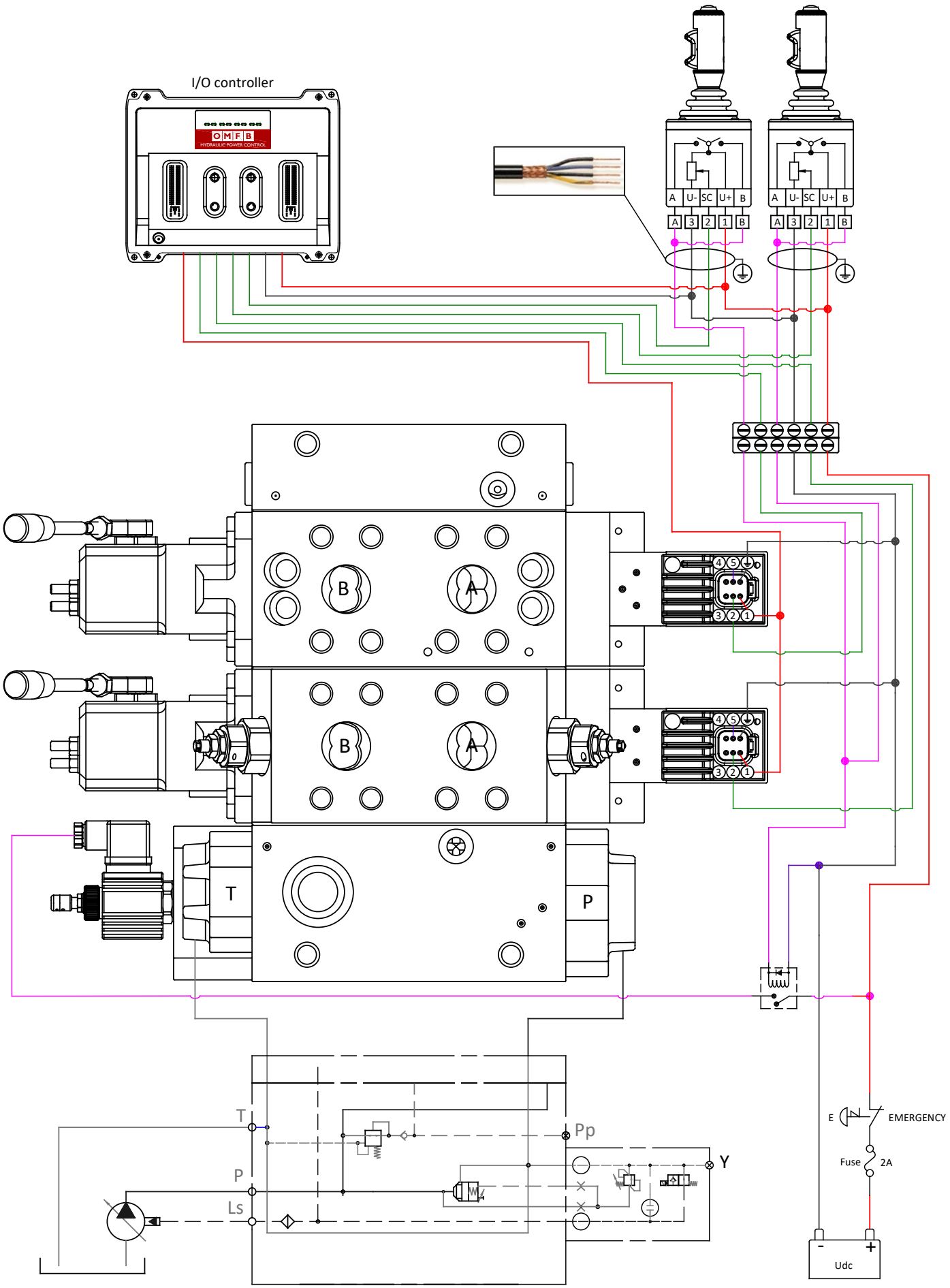
PDV315 - PEAC136 Electro-hydraulic proportional actuation
Closed loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



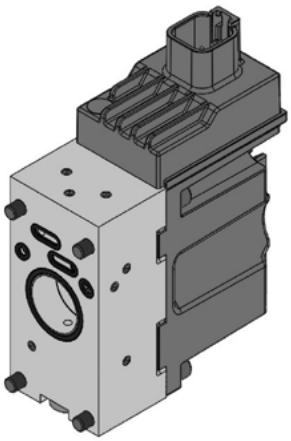
PDV315 - PEAC136 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Input signal 4 ÷ 20 mA



PDV315 - PEAC136 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 4 ÷ 20 mA



PDV315 - PEAC031 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc

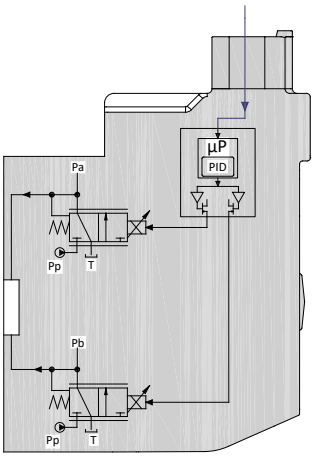


PEAC031 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

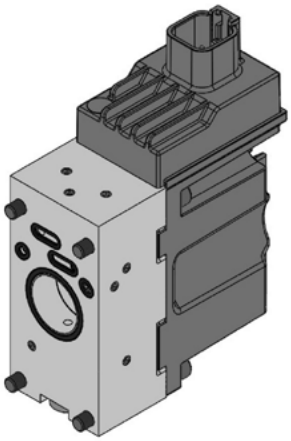
PEAC031 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC031 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAC031 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc

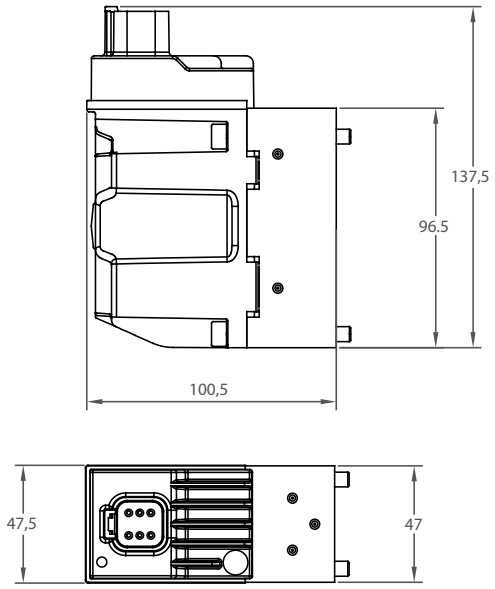


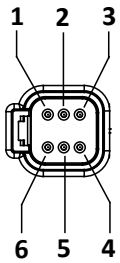
PEAC031 is defined by:

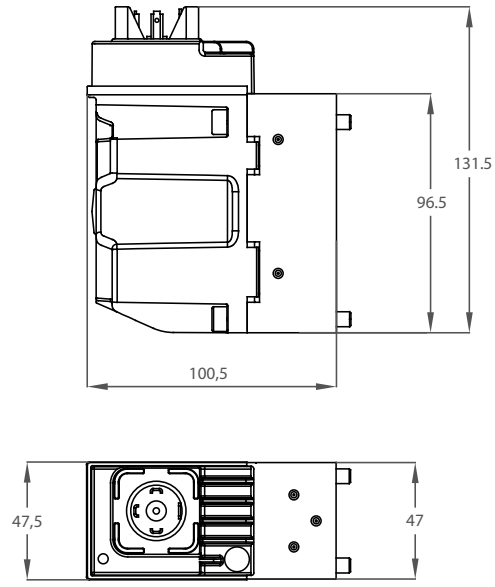
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

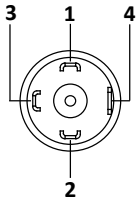
PEAC031 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0,5 Udc**
Range control signal		**0,25 Udc to 0,75 Udc**
Neutral spool position		**0,5 Udc**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV315 - PEAC031 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal 0,5 Udc - Electrical connectors



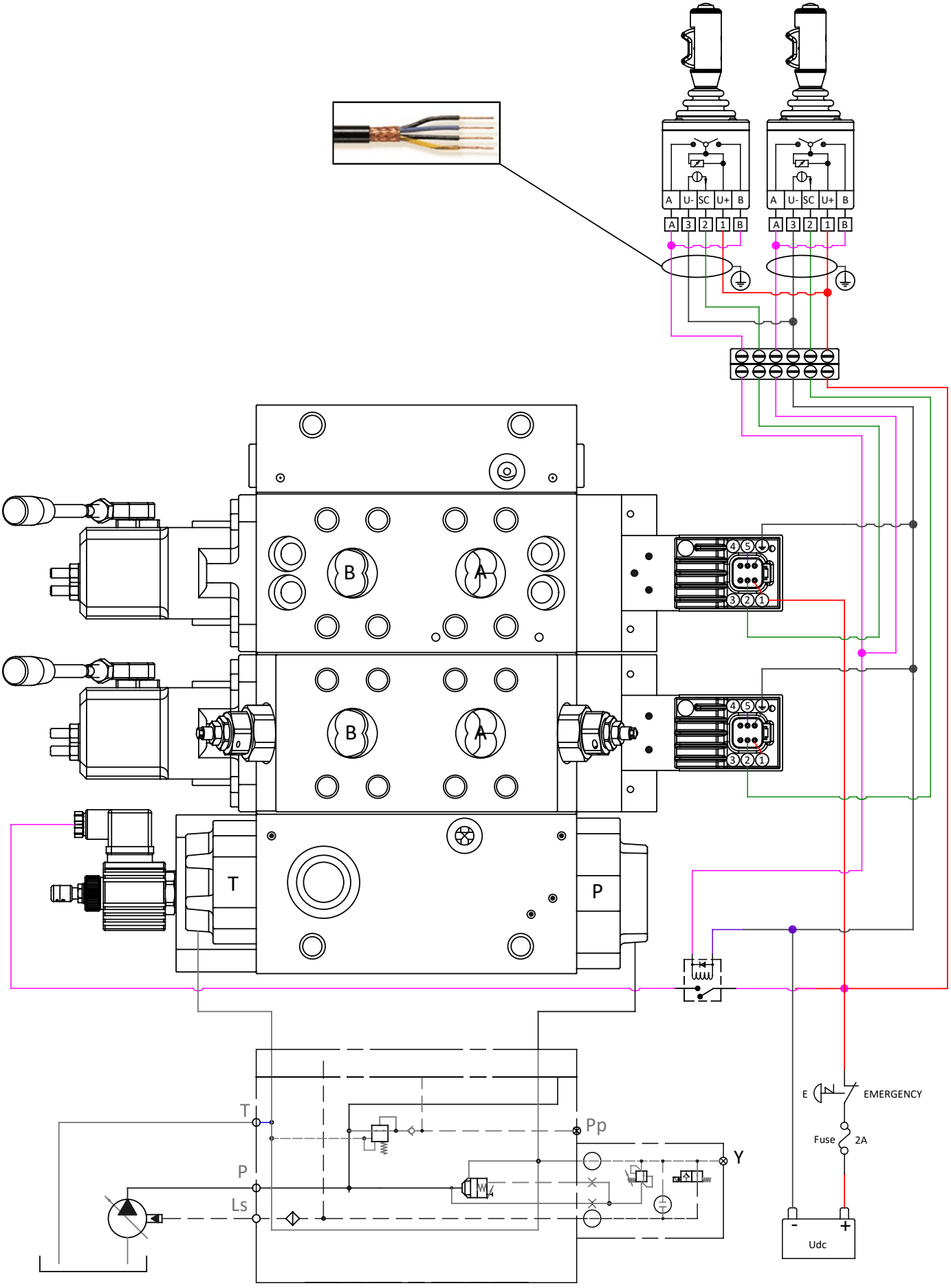
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	CAN-high
	4	CAN-low
	5	Free
	6	Ground



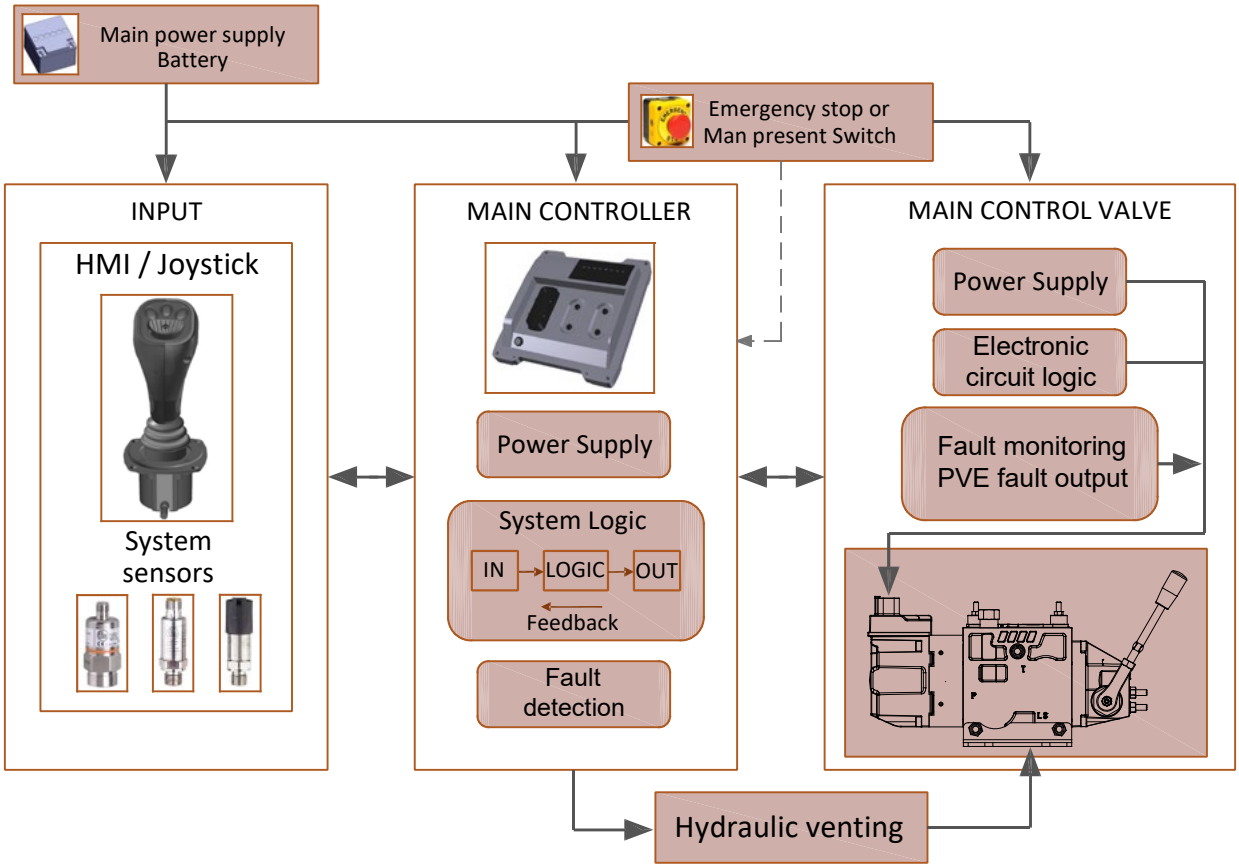
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Free
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0081000**	**PEAC1081000**	**PEAC0071000**	**PEAC1071000**
DIN 43650	**PEAC0081200**	**PEAC1081200**	**PEAC0071200**	**PEAC1071200**

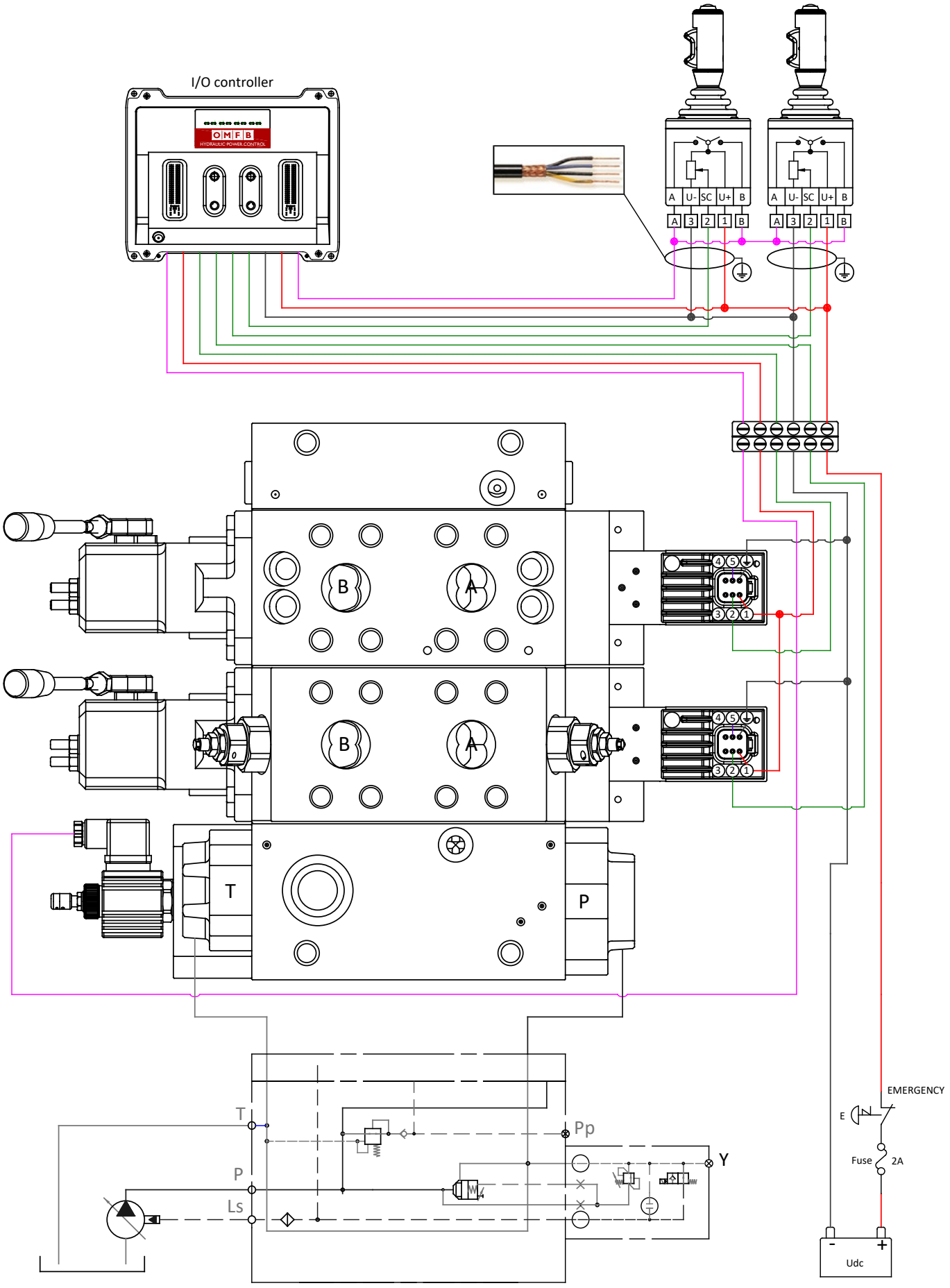
PDV315 - PEAC031 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0,5 Udc



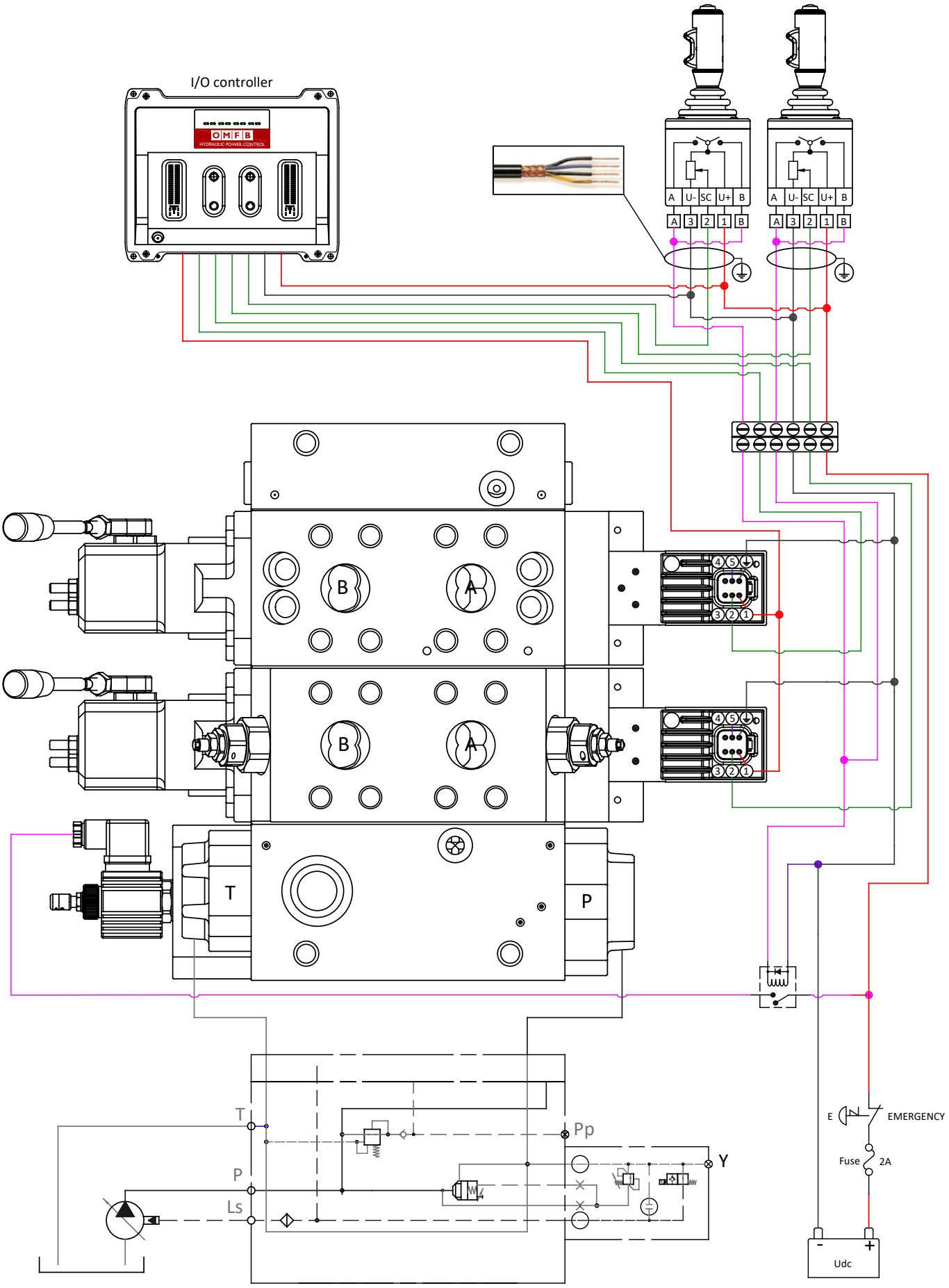
PDV315 - PEAC031 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



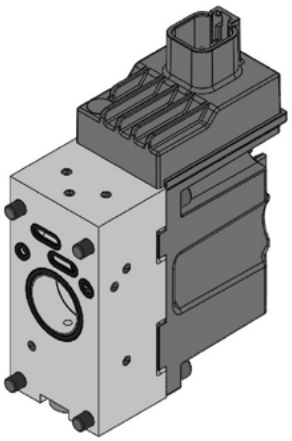
PDV315 - PEAC031 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV315 - PEAC031 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0,5 Udc



PDV315 - PEAC032 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

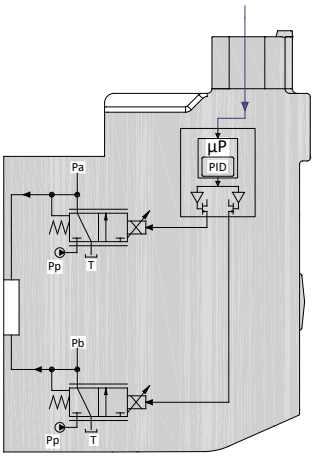


PEAC032 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

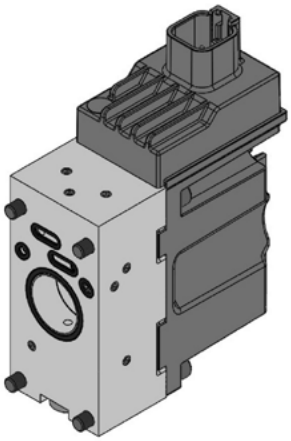
PEAC032 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC032 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAC032 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V

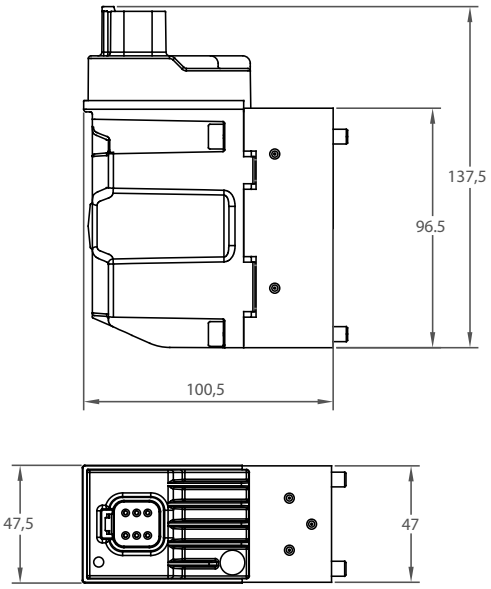


PEAC032 is defined by:

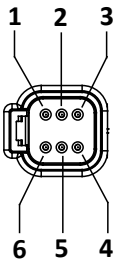
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAC032 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**0-10 V**
Range control signal		**2,5 V to 7,5 V**
Neutral spool position		**5 V**
Max threshold signal, **A** port		**1 V**
Max threshold signal, **B** port		**1 V**
Max current signal @ rated voltage		**48 mA**
Input capacitor		**100 ηF**
Signal control impedance		**25 kΩ**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Coil impedance @ 20°C		**8,9 Ω**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP 66 - IP 67 - IP 69K**
Weight cast iron body		**1,8 kg**
Weight aluminium body		**1,3 kg**
Bootloader function, debugging parameters and set-up function available only with Deutsch connector DT06-6S		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

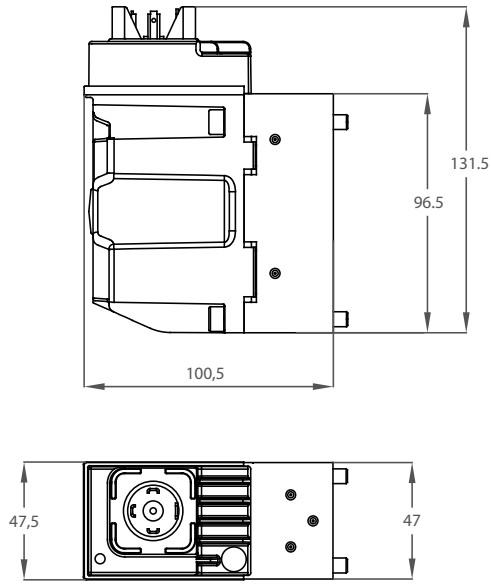
PDV315 - PEAC032 Electro-hydraulic proportional actuation
Open loop spool control, high performance resolution
Input signal 0 ÷ 10 V - Electrical connectors



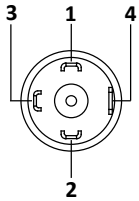
Deutsch connector DT06-6S
Enclousure degree IP 69K
PIN-assignment



1	Power supply
2	Input signal control
3	CAN-high
4	CAN-low
5	Free
6	Ground



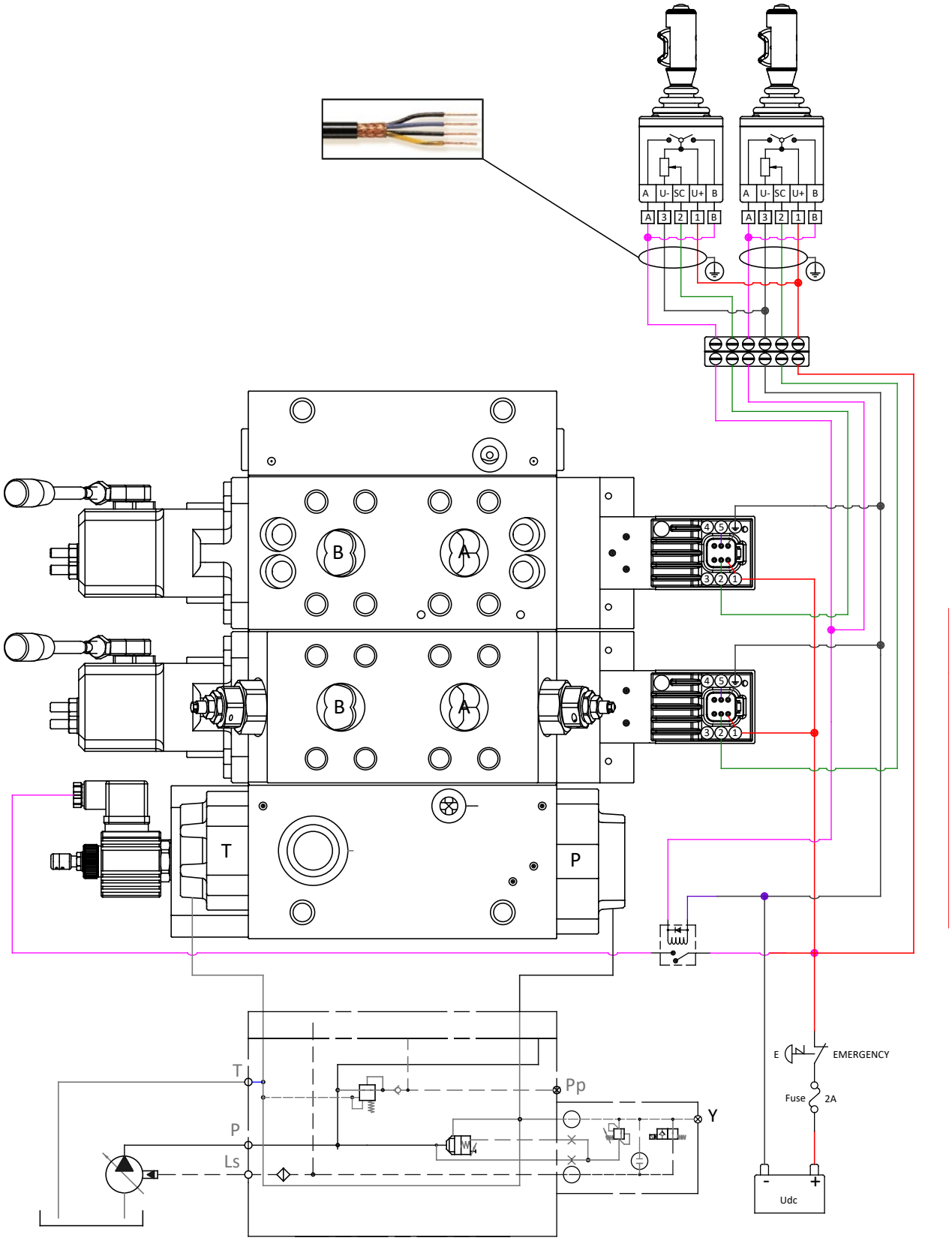
Hirschmann connector DIN 43650
Enclousure degree IP 65
PIN-assignment



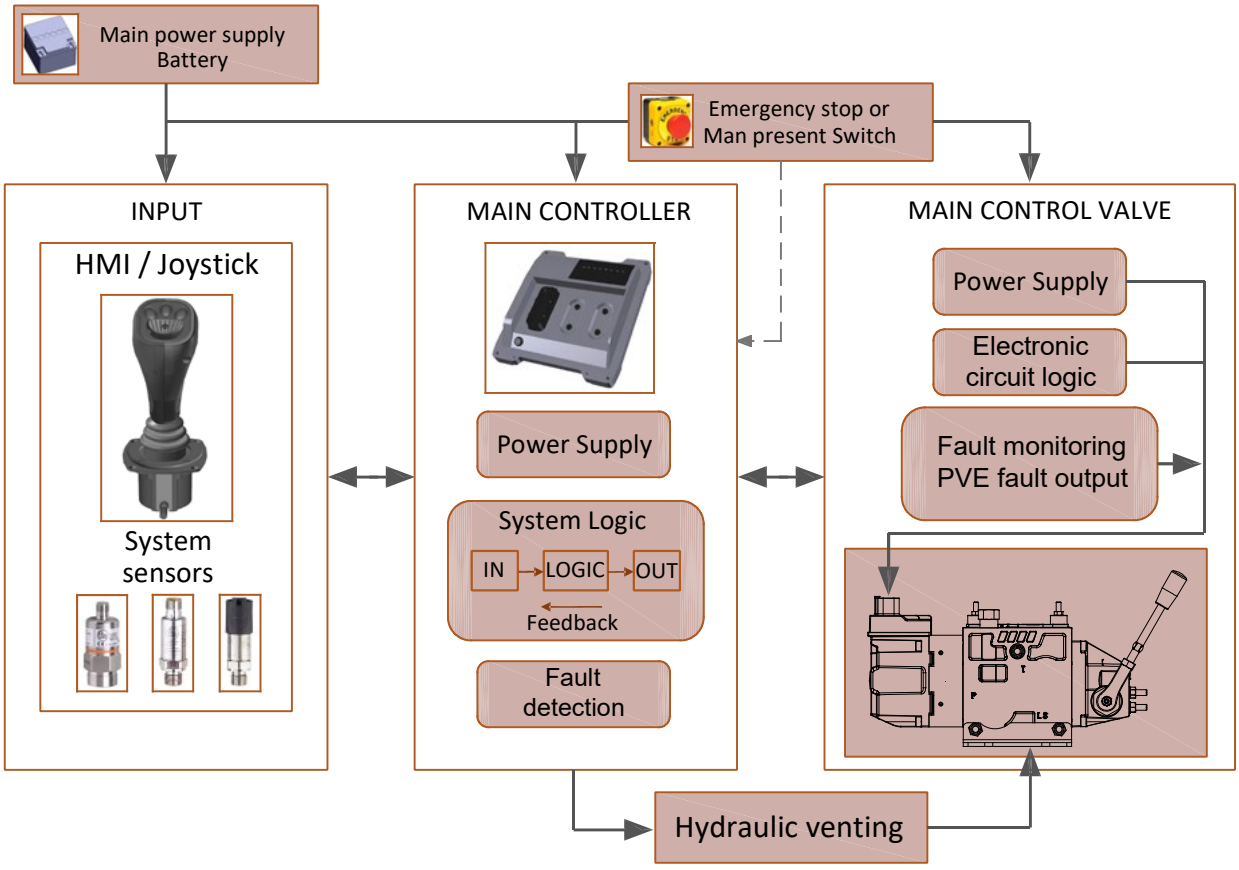
1	Power supply
2	Input signal control
3	Free
4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0082000**	**PEAC1082000**	**PEAC0072000**	**PEAC1072000**
DIN 43650	**PEAC0082200**	**PEAC1082200**	**PEAC0072200**	**PEAC1072200**

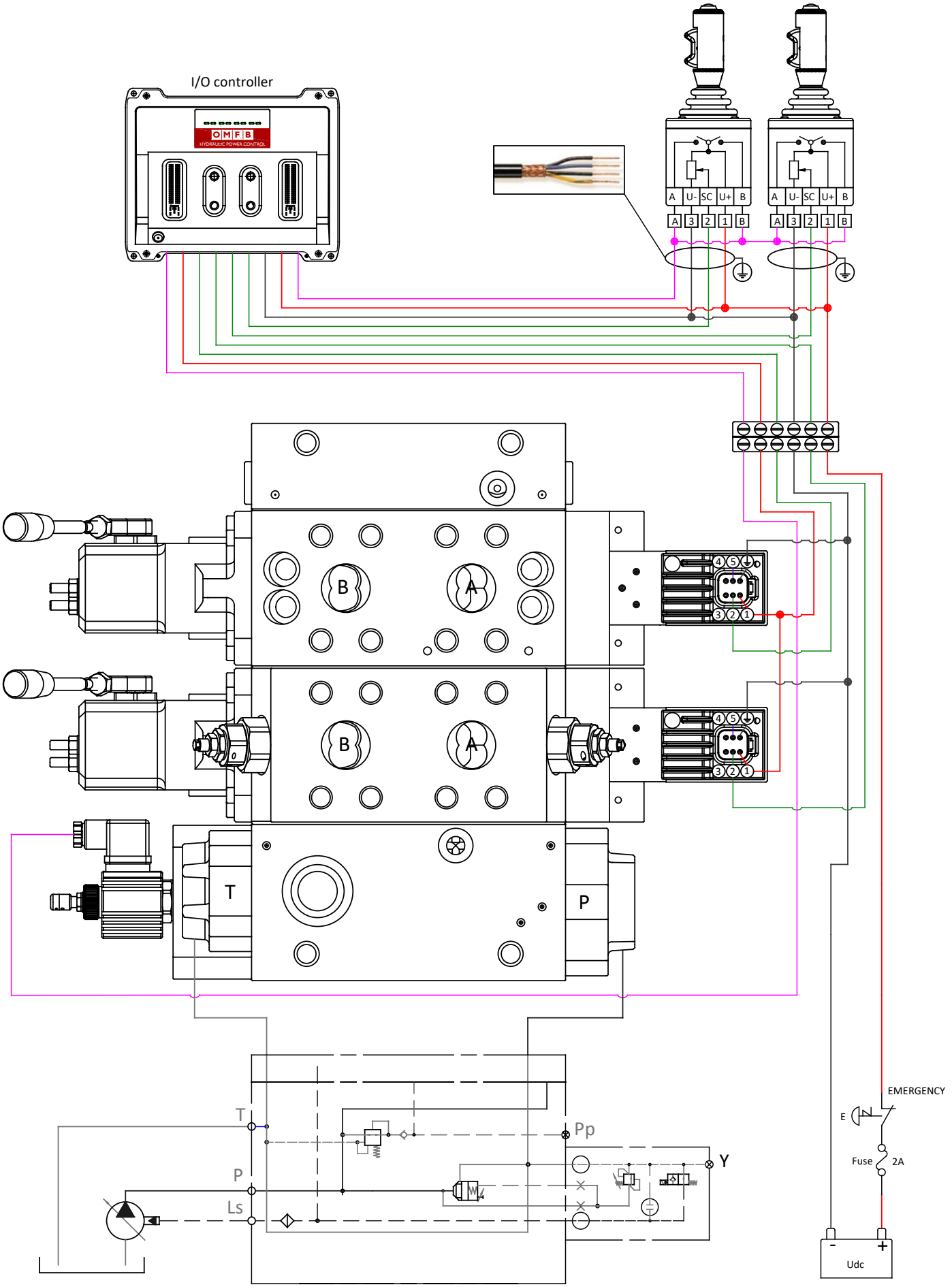
PDV315 - PEAC032 Electro-hydraulic proportional actuation.
Open loop spool control, high performance resolution
Input signal control 0 ÷ 10 V



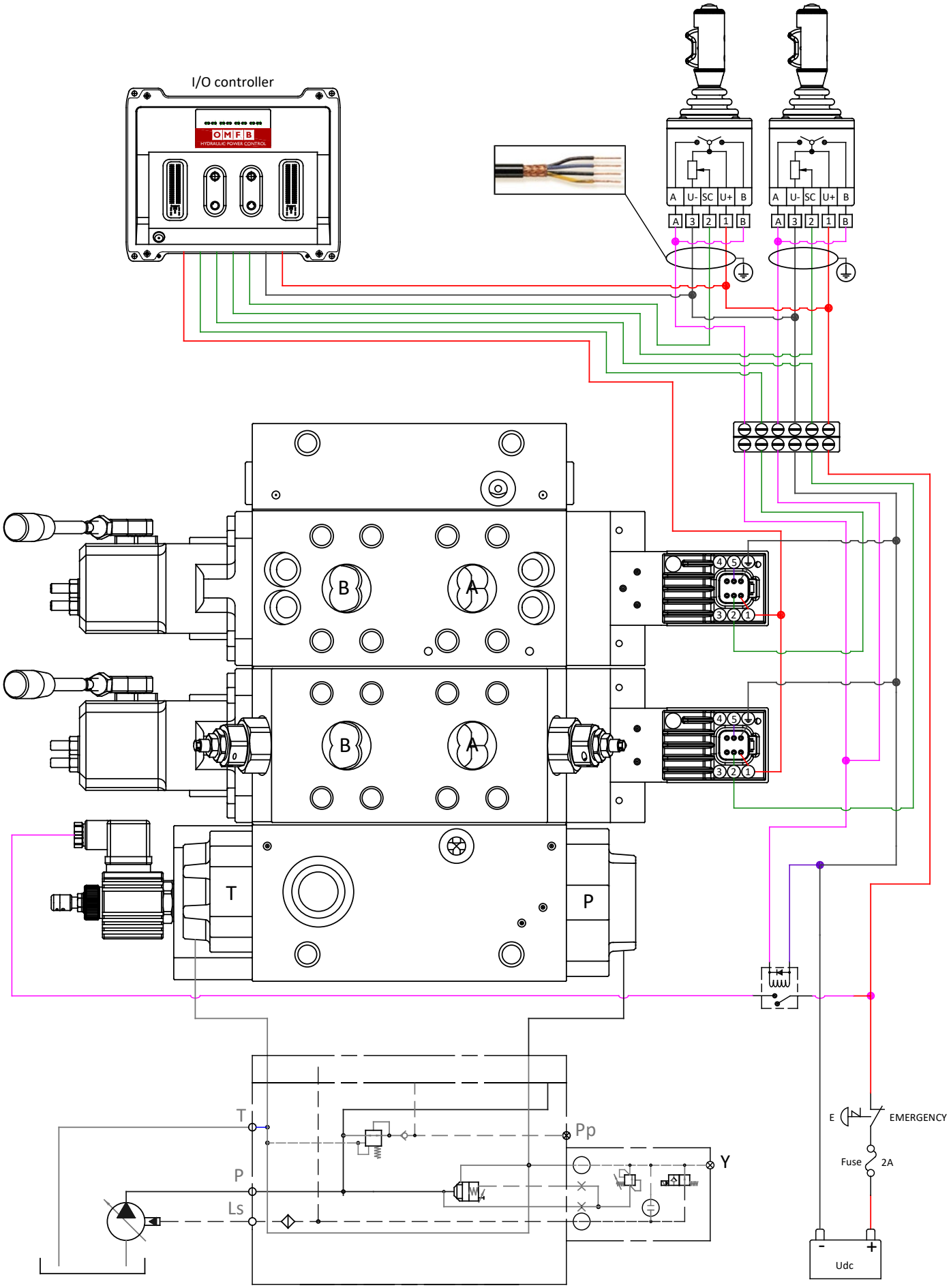
PDV315 - PEAC032 Electro-hydraulic proportional actuation.
Open loop spool control, high performance resolution
Electrical block diagram for intelligent ring machine control



PDV315 - PEAC032 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V

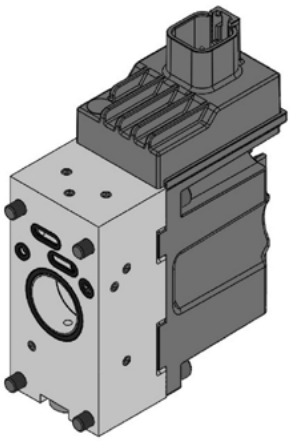


PDV315 - PEAC032 Electro-hydraulic proportional actuation
Electrical wiring diagram with OMFB I/O controller
Input signal 0 ÷ 10 V



OMFB HYDRAULIC POWER CONTROL

PDV315 - PEAC036 Electro-hydraulic proportional actuation
Open loop spool control
Input signal 4 ÷ 20 mA

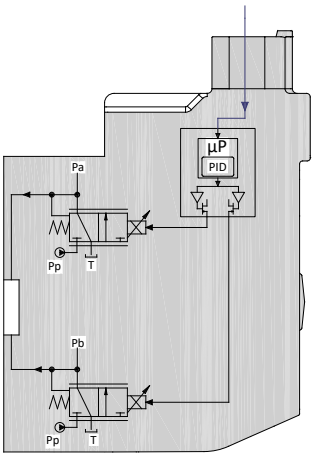


PEAC036 is a proportional open loop spool actuation with integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the PCB and the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

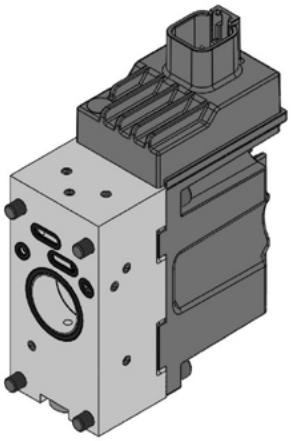
PEAC036 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAC036 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAC036 Electro-hydraulic proportional actuation
Open loop spool control
Input signal 4 ÷ 20 mA

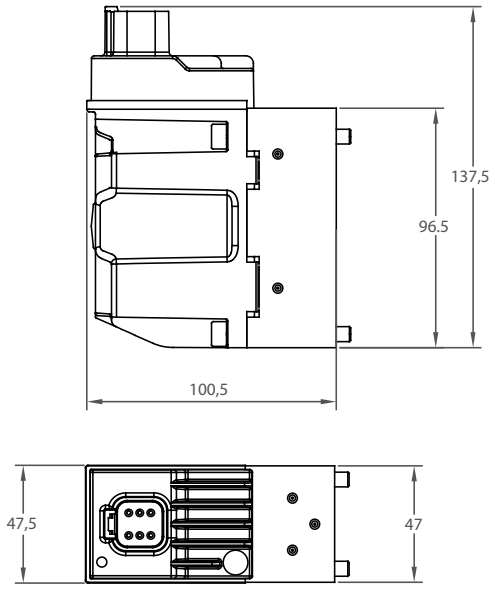


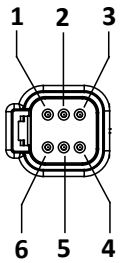
PEAC036 is defined by:

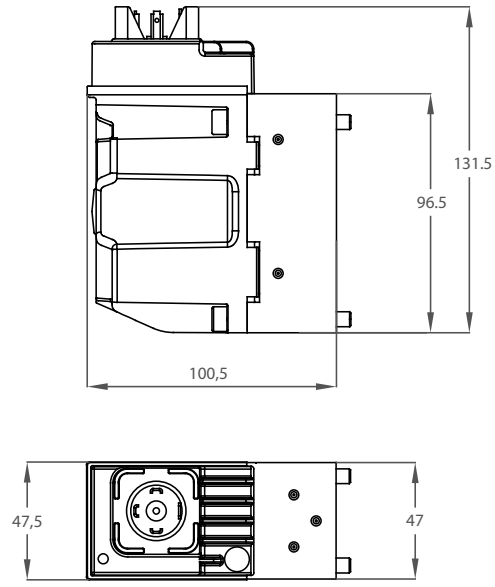
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

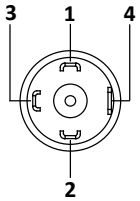
PEAC036 Technical data		
Rated supply voltage		**10-30 Vdc**
Max ripple		**5%**
Signal control		**4-20 mA**
Range control signal		**4 mA to 20 mA**
Neutral spool position		**12 mA**
Max threshold signal, **A** port		**1,5 mA**
Max threshold signal, **B** port		**1,5 mA**
Input capacitor		**100 ηF**
Input impedance		**220 Ω**
Power consumption		**8,7 W**
Heat insulation		**Class H (180°C)**
Duty cycle		**ED 100%**
Max current consumption		**650 mA**
Current consumption in neutral position		**80 mA**
Max current start spool travel		**140 mA**
Max current end spool travel		**450 mA**
Coil impedance @ 20°C		**8,9 Ω**
Signal control impedance		**50 KΩ**
Dither frequency		**50-200 Hz**
Recommended frequency		**100 Hz**
Enclouser degree **(Electrical wiring excepted)**		**IP65 - IP66 - IP69K**
Bootloader function, debugging parameters and set-up function available with Deutsch connector DT06-6S, only		
Reaction time (constant voltage)	From neutral position to max spool travel	**110 - 140 ms**
	From max spool travel to neutral	**70 - 90 ms**
Reaction time (neutral switch)	From neutral position to max spool travel	**130 - 170 ms**
	From max spool travel to neutral	**70 - 90 ms**

PDV315 - PEAC036 Electro-hydraulic proportional actuation.
Input signal control 4 ÷ 20 mA
Electrical connectors



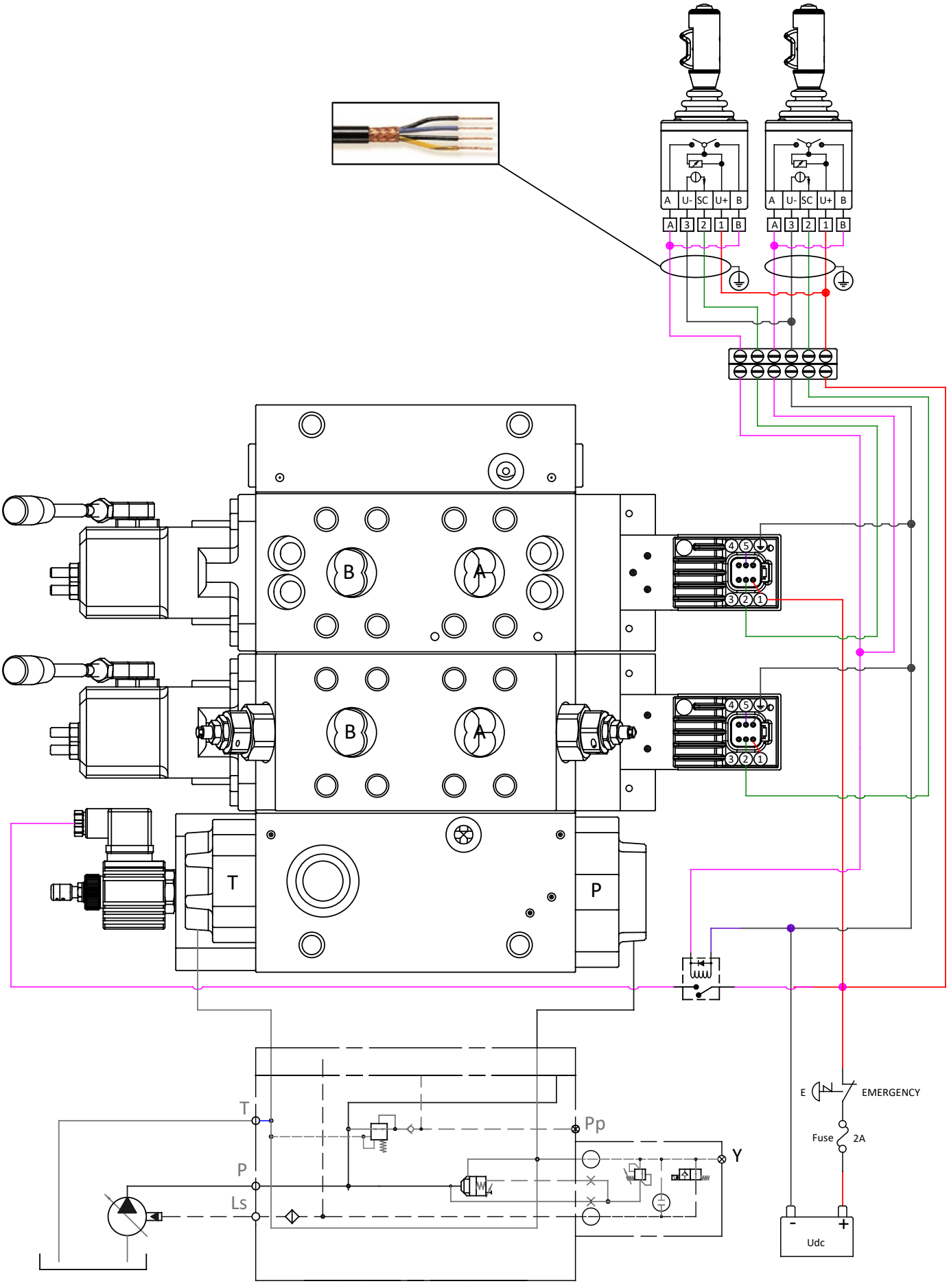
Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	CAN-high
	4	CAN-low
	5	Free
	6	Ground



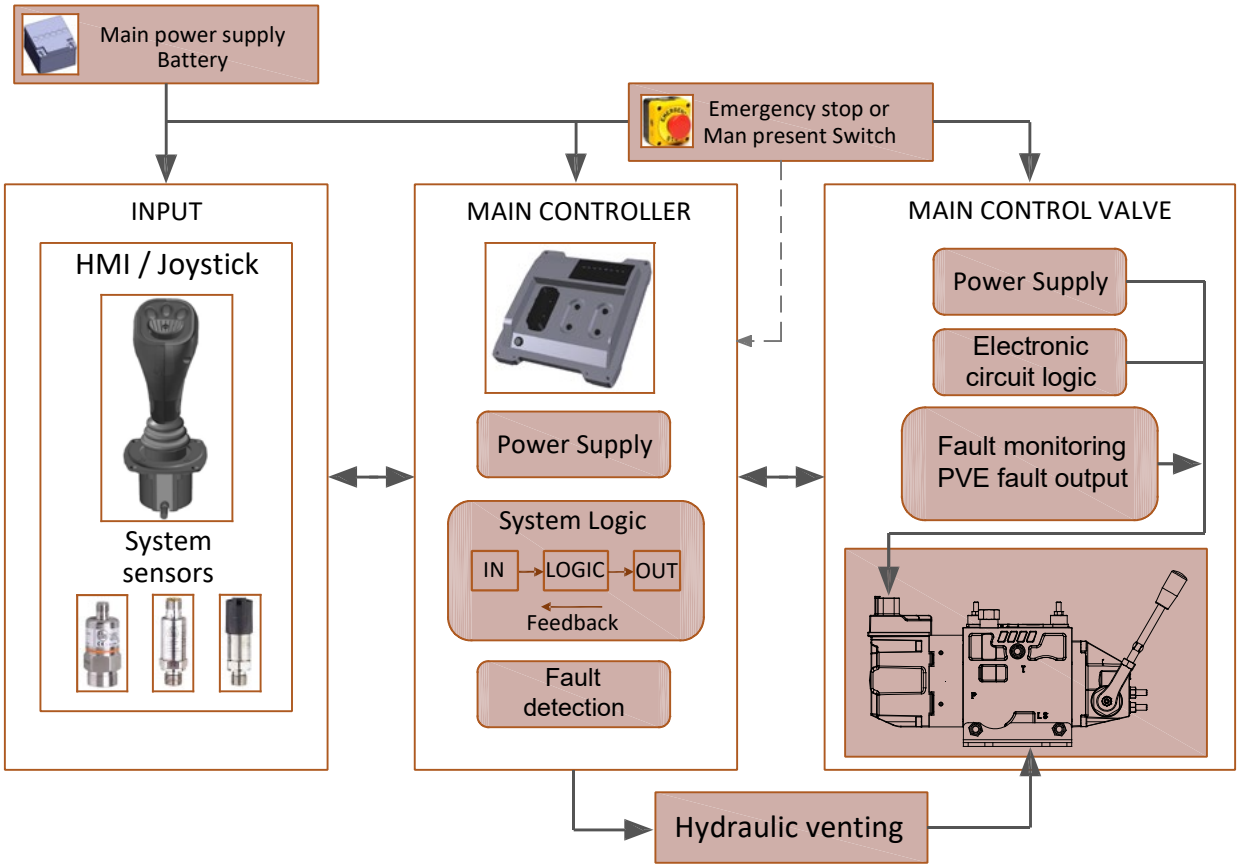
Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	Power supply
	2	Input signal control
	3	Free
	4	Ground

Connector version	Code numbers			
	Active version		Passive version	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAC0086000**	**PEAC1086000**	**PEAC0076000**	**PEAC1076000**
DIN 43650	**PEAC0086200**	**PEAC1086200**	**PEAC0076200**	**PEAC1076200**

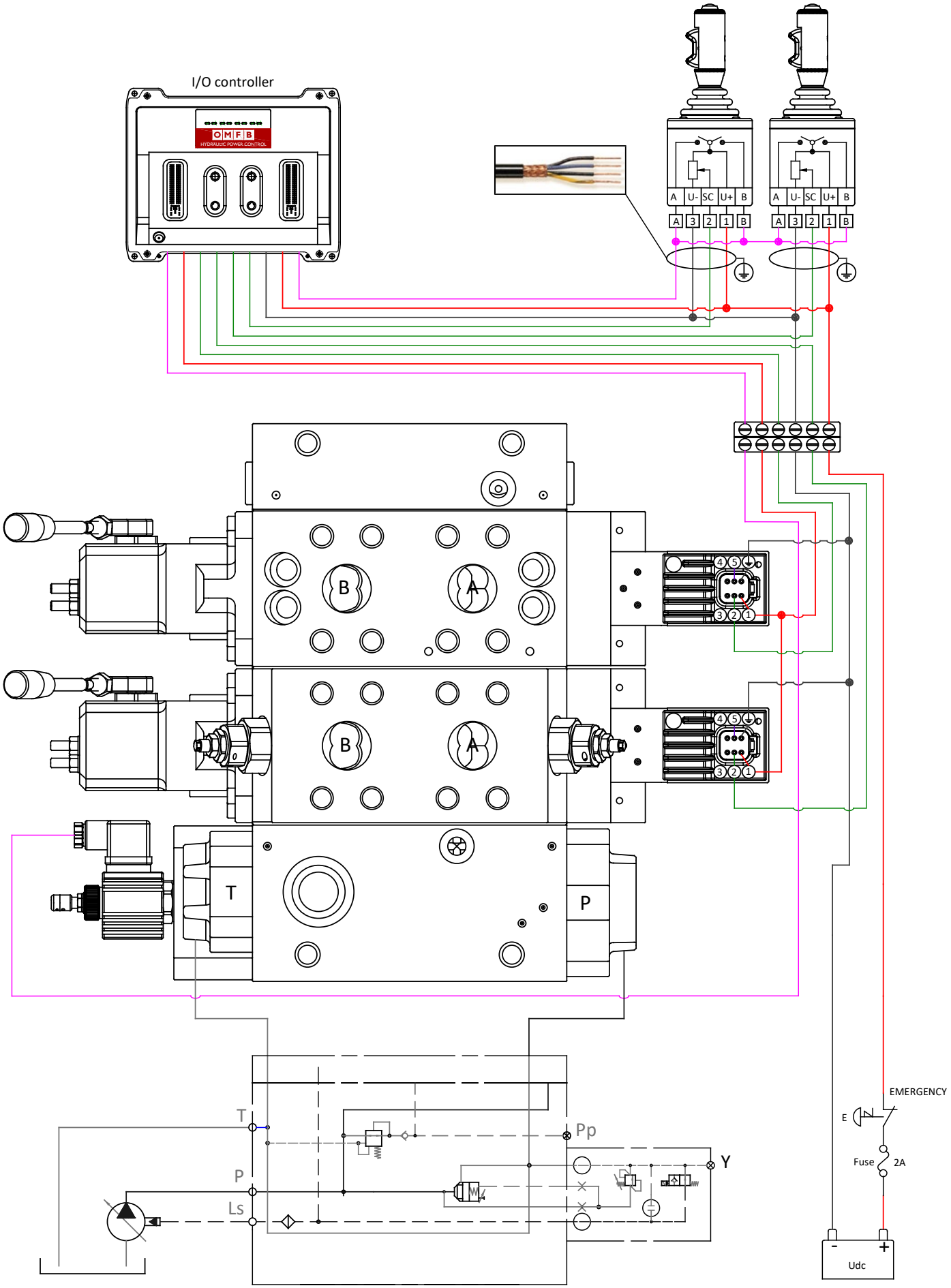
PDV315 - PEAC036 Electro-hydraulic proportional actuation.
Input signal control 4-20 mA
Electrical wiring



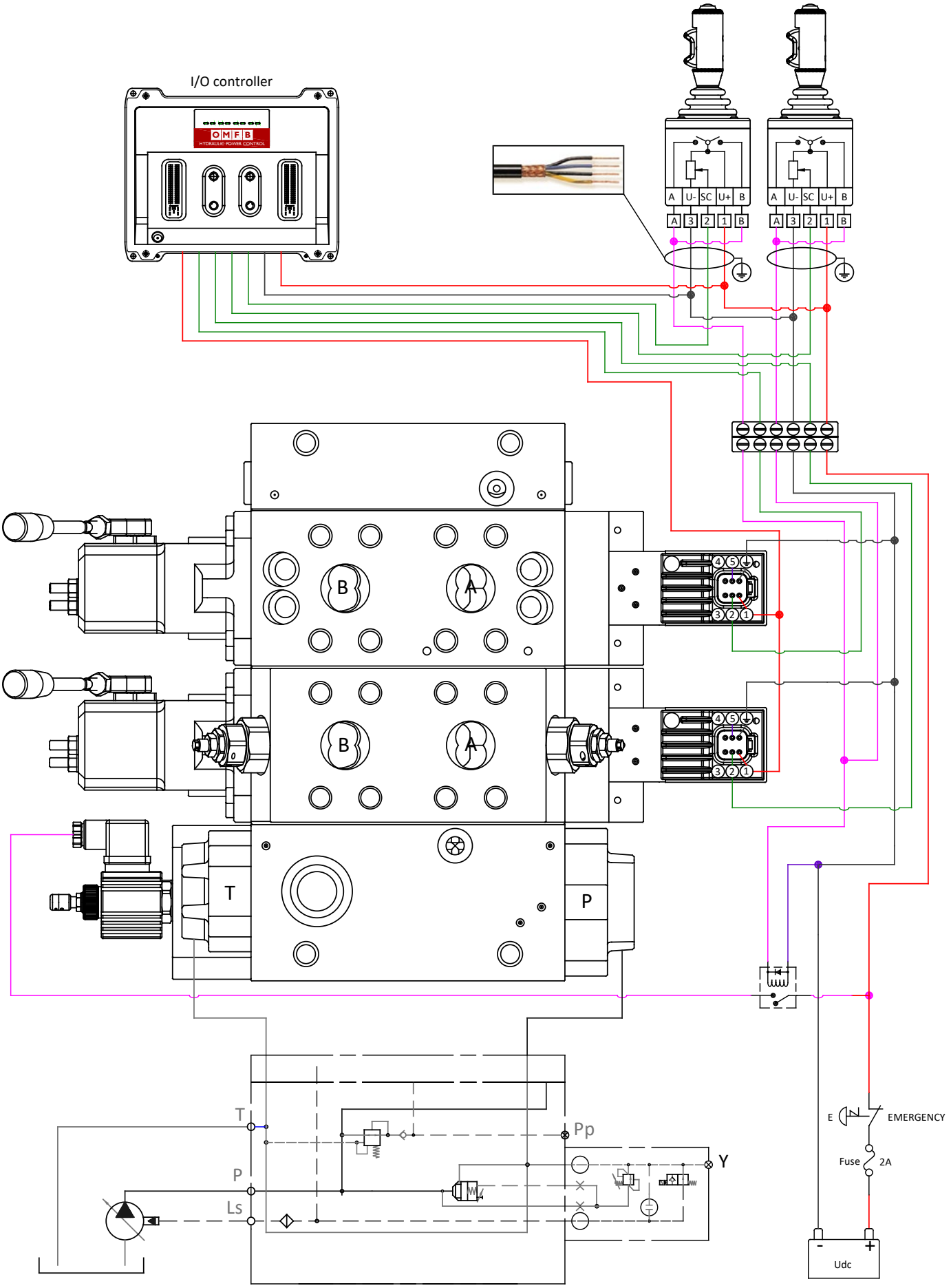
PDV315 - PEAC036 Electro-hydraulic proportional actuation
Open loop spool control
Current input signal 4-20 mA



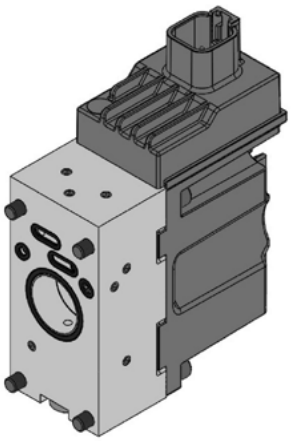
PDV315 - PEAC036 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Current input signal 4 ÷ 20 mA



PDV315 - PEAC036 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller
Current input signal 4 ÷ 20 mA



PDV315 - PEAD3 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

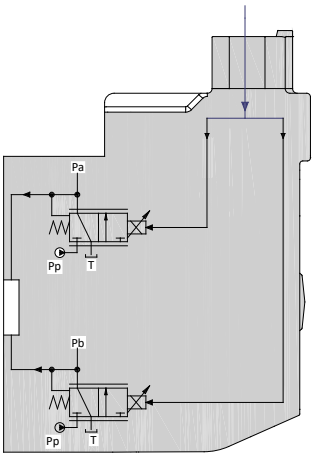


PEAD3 is a proportional open loop spool actuation without integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

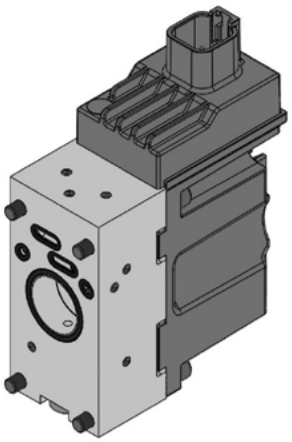
PEAD3 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAD3 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAD3 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

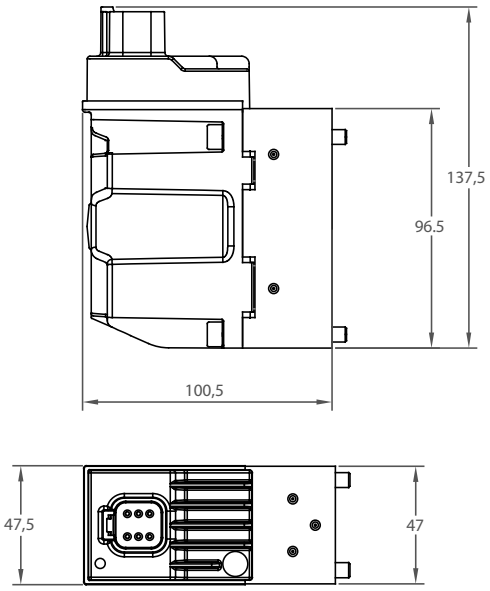


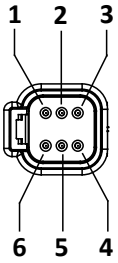
PEAD3 is defined by:

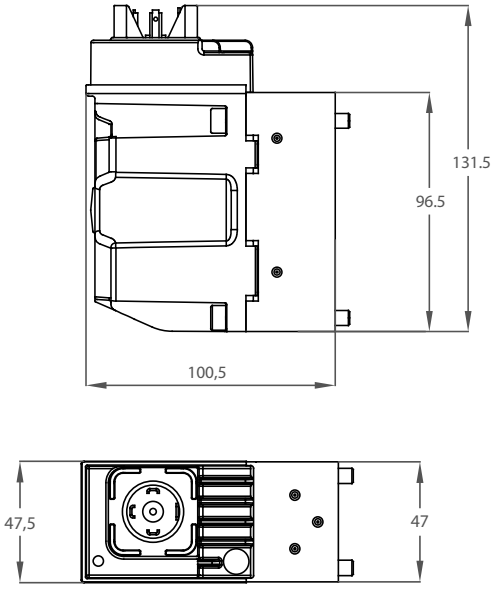
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

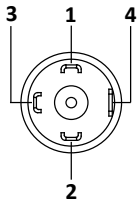
PEAD3 Technical data			
Supply voltage		12 Vdc	24 Vdc
Voltage range		10-16 V	20-30 V
Max ripple		5%	5%
Current consuption at rated voltage		750 mA @ 12 Vdc	400 mA @ 24 Vdc
Power consumption		9 W	9,6 W
R @ 20°C		8,9 Ω	35 Ω
Start spool travel		220 mA	140 mA
End spool travel flow control		650 mA	350 mA
Max spool flow in pre-floating position		650 mA	350 mA
Spool floating position		750 mA	400 mA
Heat insulation		Class H (180°C)	
Oil temperature	(Recommended)	20 ÷ 60 °C	
Oil temperature	(Min)	-30 °C	
Oil temperature	(Max)	80 °C	
Ambient temperature		-30 ÷ 60 °C	
PWM frequency		50 ÷ 200 Hz	
Best frequency		100 Hz	
Duty cycle		100% ED	
Plug connector		6 pins Deutsch or 4 pins DIN	
Enclouser degree	(Electrical wiring excepted)	IP69K	
Weight cast iron body		1, 8 kg	
Weight Aluminium body		1,3 kg	
Max current output signal for spool direction moviment		50 mA	
Reaction time (constant voltage)	From neutral position to max spool travel	110 - 140 ms	
	From max spool travel to neutral	70 - 90 ms	
Reaction time (neutral switch)	From neutral position to max spool travel	130 - 170 ms	
	From max spool travel to neutral	70 - 90 ms	

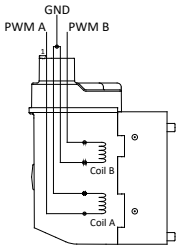
PDV315 - PEAD3 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control - Electrical connectors



Deutsch connector DT06-6S Enclousure degree IP 69K PIN-assignment		
	**1**	**A** port +
	2	Free
	3	**A** port -
	4	**B** port +
	5	Free
	6	**B** port -

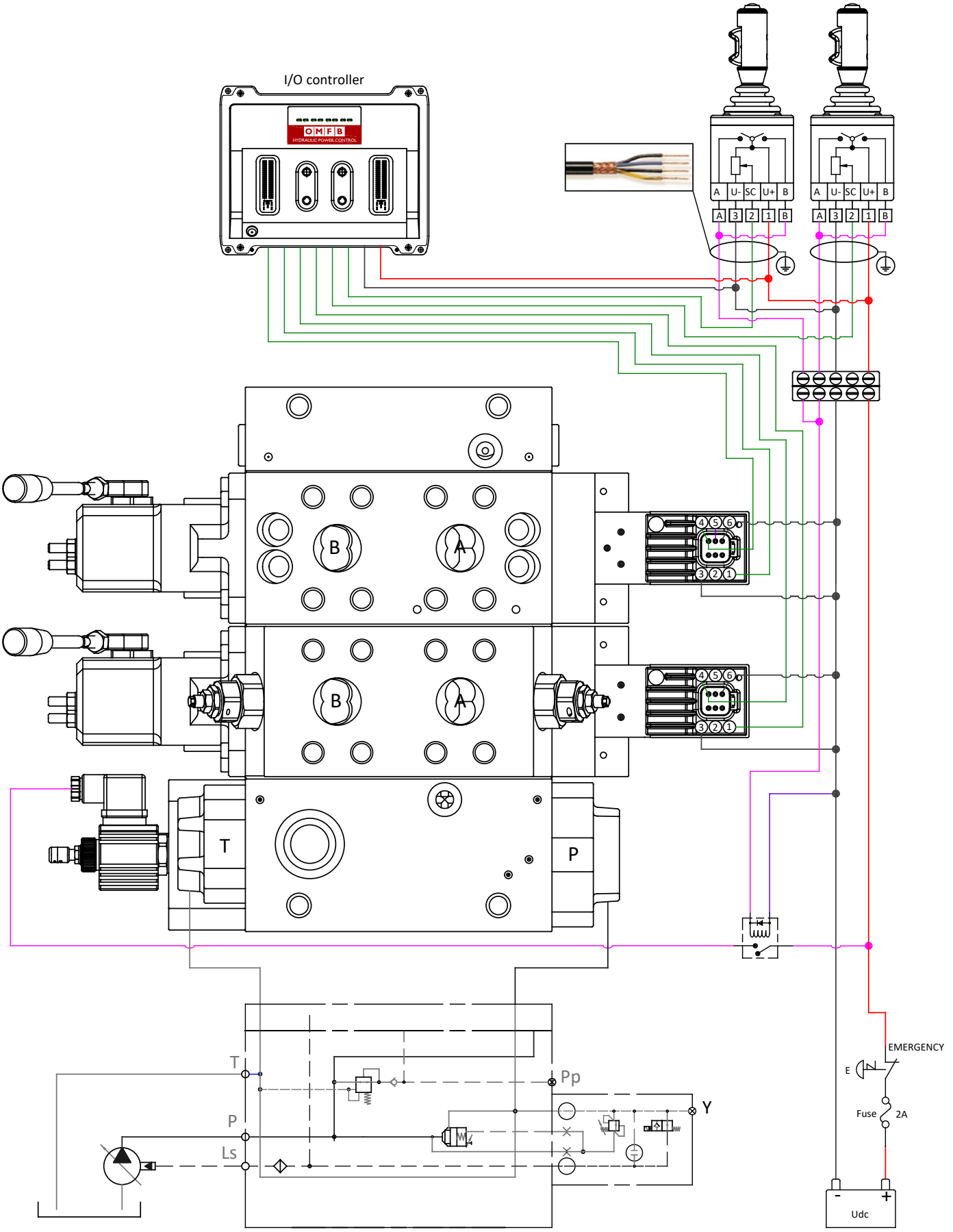


Hirschmann connector DIN 43650 Enclousure degree IP 65 PIN-assignment		
	**1**	**A** port +
	2	**B** port +
	3	Free
	4	Ground

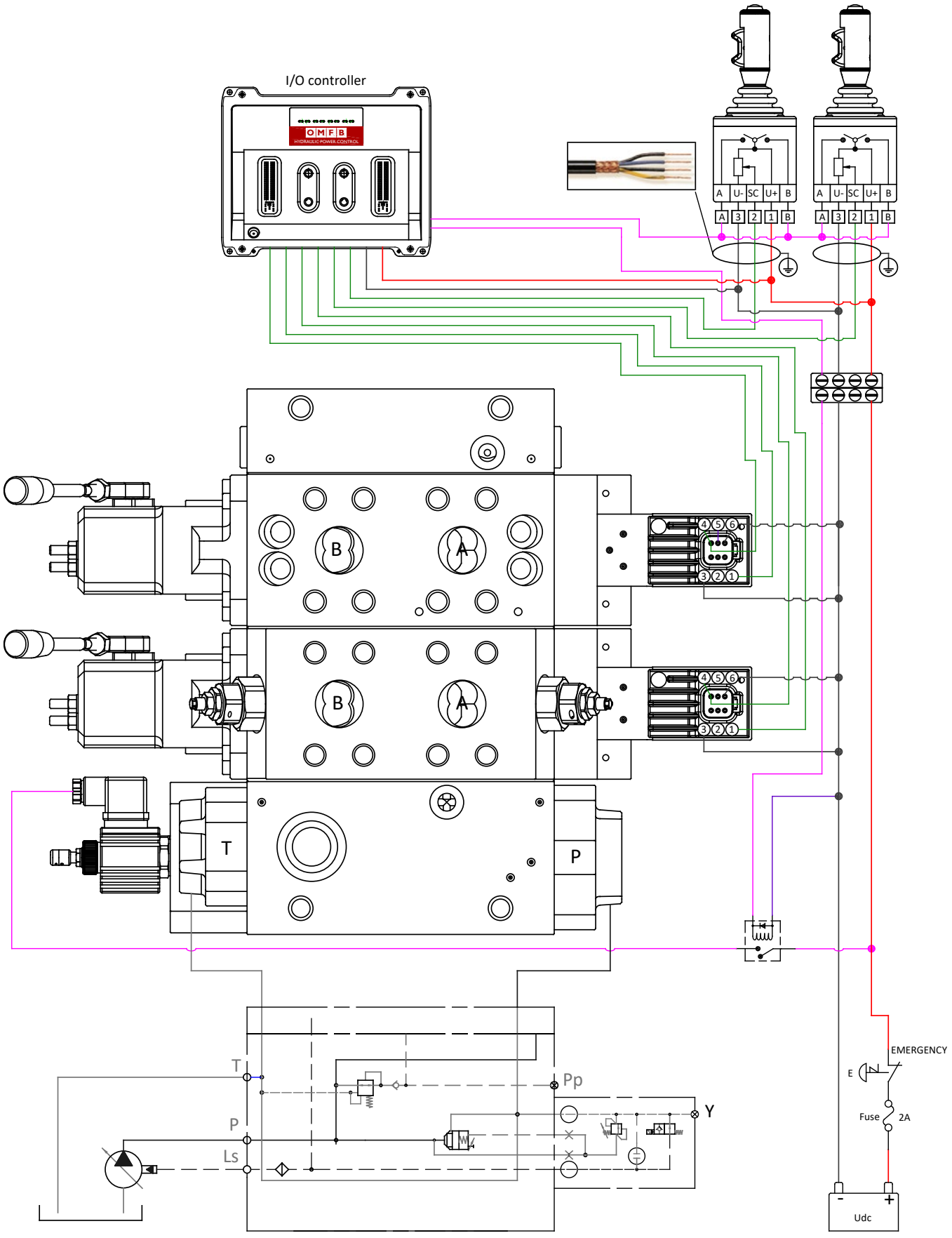


Connector version	Code numbers			
	12 V		24 V	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
Deutsch DT06-6S	**PEAD0100002**	**PEAD1100002**	**PEAD0200002**	**PEAD1200002**
DIN 43650	**PEAD0120002**	**PEAD1120002**	**PEAD0220002**	**PEAD1220002**

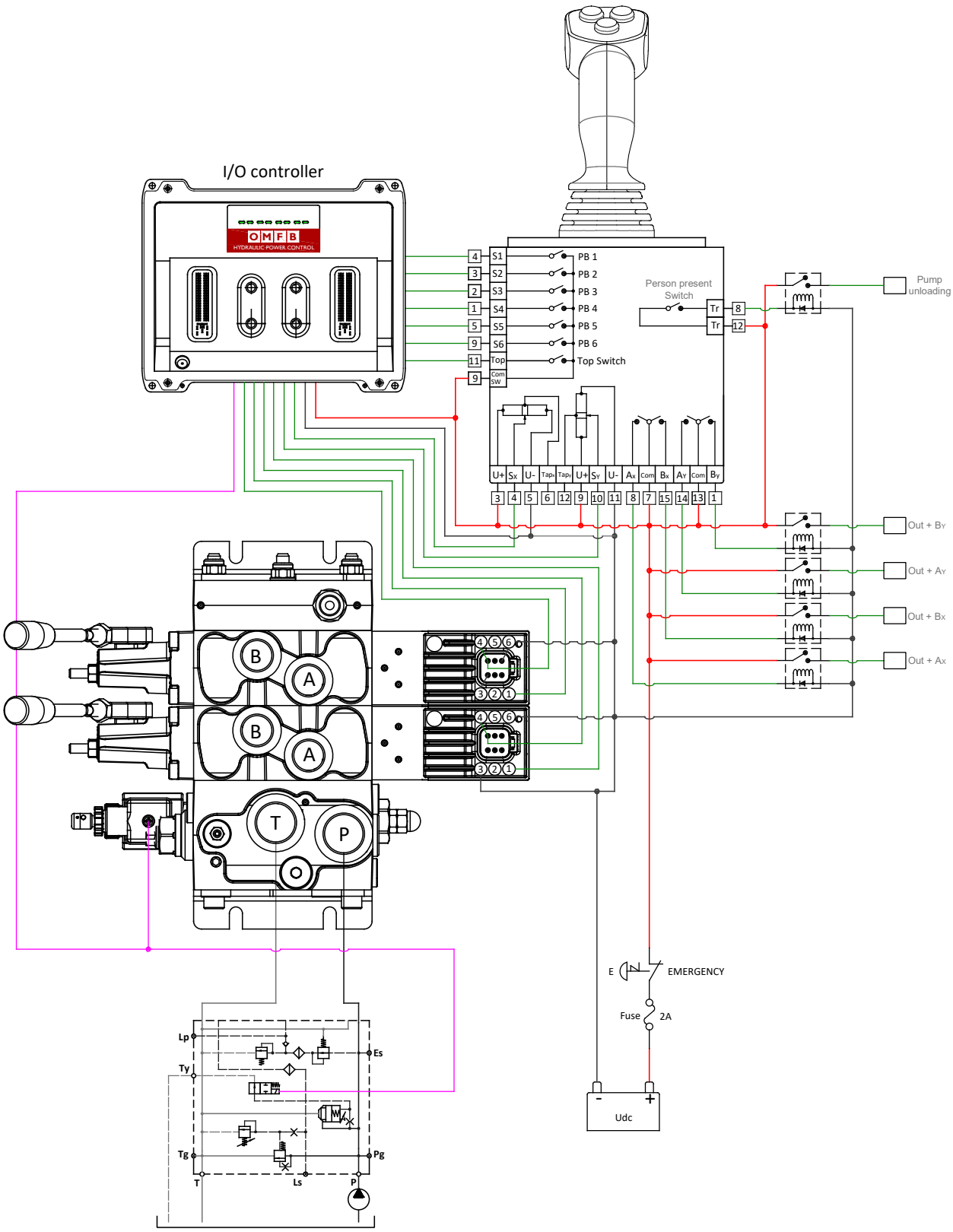
PDV315 - PEAD3 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



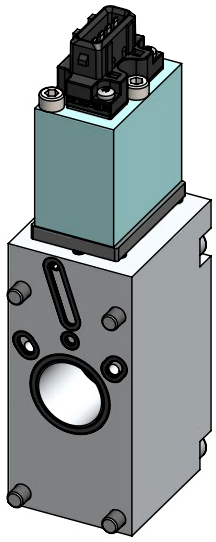
PDV315 - PEAD3 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV315 - PEAD3 Electro-hydraulic proportional actuation.
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV315 - PEAP3 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

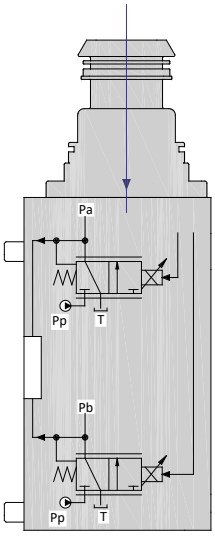


PEAP3 is a proportional open loop spool actuation without integrated electronics that operates the main spool movement according to an electrical signal coming from a remote control.

The input signal by means of the two proportional pressure reducing valves, determines the level of the pilot pressure which moves the main spool.

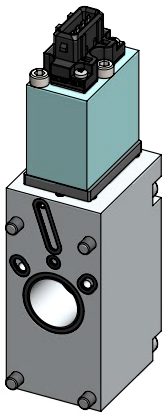
PEAP3 does not have neither the transducer spool position control nor fault monitoring system, this means that any forces which override the pilot pressure spool forces, may chenge the spool position with no error signal, and the safety of the whole system is left to the operator's visual control, only.

PEAP3 is recommended where a simple proportional control is required, and where hysteresis and reaction time are not so critical.



OMFB
HYDRAULIC POWER CONTROL

PDV315 - PEAP3 Electro-hydraulic proportional actuation
Open loop spool control - Current input signal for PWM or supply voltage for ON/OFF control

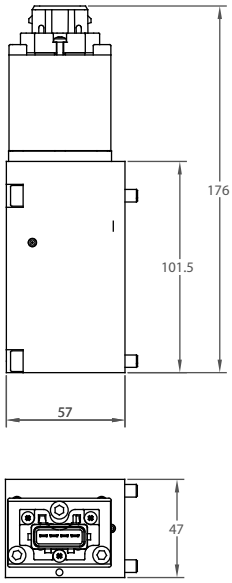


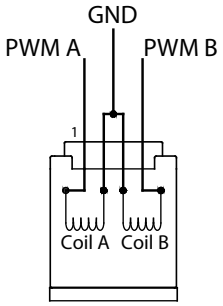
PEAP3 is defined by:

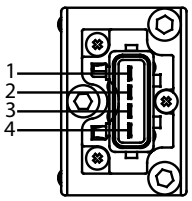
- High spool control accuracy
- EMC performace according to Directive 2014/30/UE
- Quick reaction time
- Integrated PWM/Pulse Width Modulation
- Low electrical power
- Robust and reliable design

PEAP3 Technical data			
Supply voltage		12 Vdc	24 Vdc
Voltage range		10-16 V	20-30 V
Max ripple		5%	5%
Current consuption at rated voltage		1330 mA @ 12 Vdc	630 mA @ 24 Vdc
Power consumption		23 W	21 W
R @ 20°C		6,3 Ω	27 Ω
Start spool travel		220 mA	140 mA
End spool travel flow control		650 mA	350 mA
Max spool flow in pre-floating position		650 mA	350 mA
Spool floating position		750 mA	400 mA
Heat insulation		Class H (180°C)	
Oil temperature	(Recommended)	-20 ÷ 60 °C	
Oil temperature	(Min)	-30 °C	
Oil temperature	(Max)	80 °C	
Ambient temperature		-30 ÷ 60 °C	
PWM frequency		50 ÷ 200 Hz	
Best frequency		100 Hz	
Duty cycle		100% ED	
Plug connector		Amp Junior Power Timer 4 pins	
Enclouser degree	(Electrical wiring excepted)	IP69K	
Max current output signal for spool direction moviment		50 mA	
Reaction time (constant voltage)	From neutral position to max spool travel	110 - 140 ms	
	From max spool travel to neutral	70 - 90 ms	
Reaction time (neutral switch)	From neutral position to max spool travel	130 - 170 ms	
	From max spool travel to neutral	70 - 90 ms	

PDV315 - PEAP3 Electro-hydraulic proportional actuation
Input signal control PWM - Current input signal for PWM or supply voltage for ON/OFF control - Electrical connector

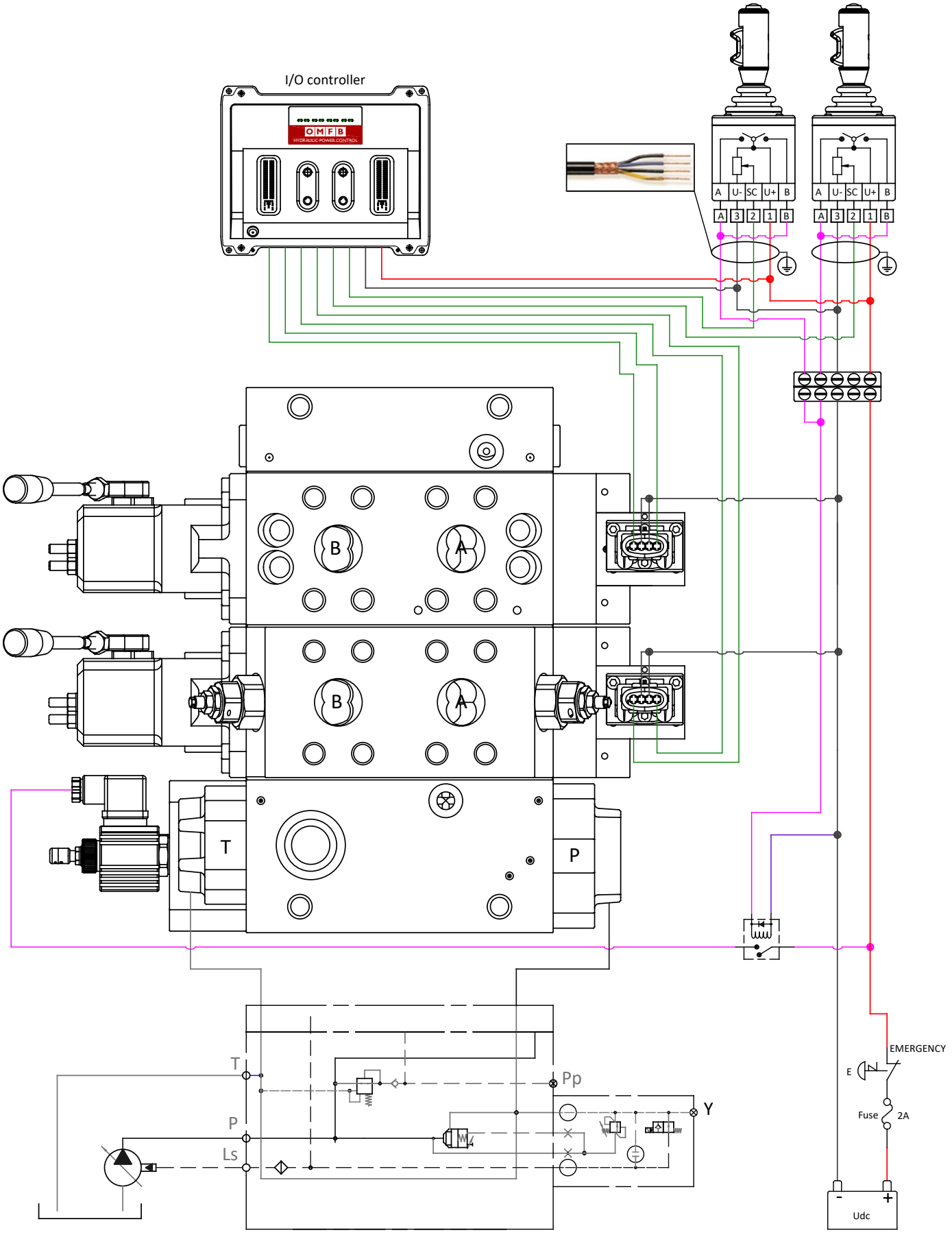




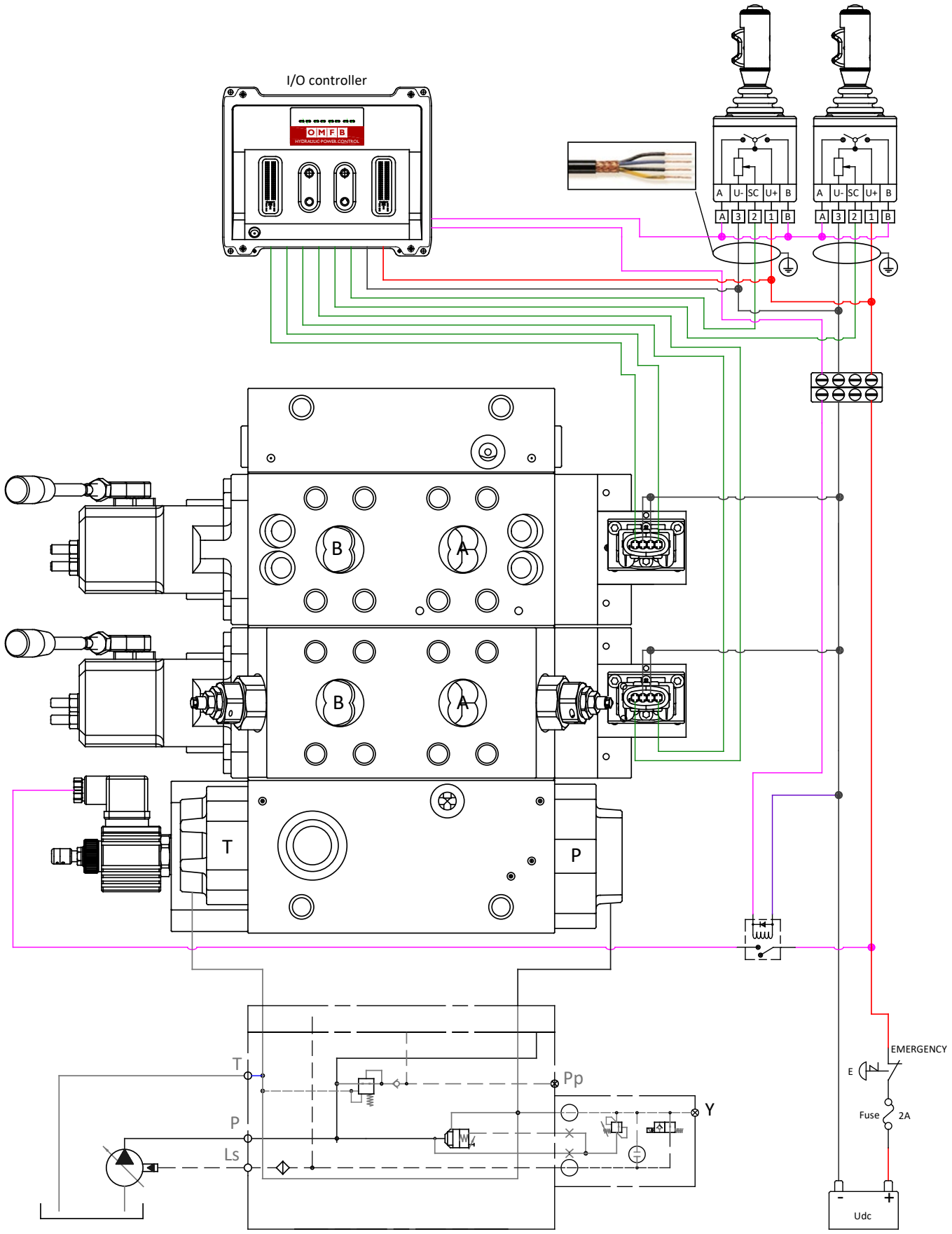
Amp Junior Power Timer 4 pin connector Enclousure degree IP 65 PIN-assignment		
	**1**	**A** port +
	2	**A** port -
	3	**B** port -
	4	**B** port +

Connector version	Code numbers			
	12 V		24 V	
	Cast-iron body	Aluminium body	Cast-iron body	Aluminium body
AMP Junior timer 4 Pin	**PEAP0312002**	**PEAP1312002**	**PEAP0412002**	**PEAP1412002**

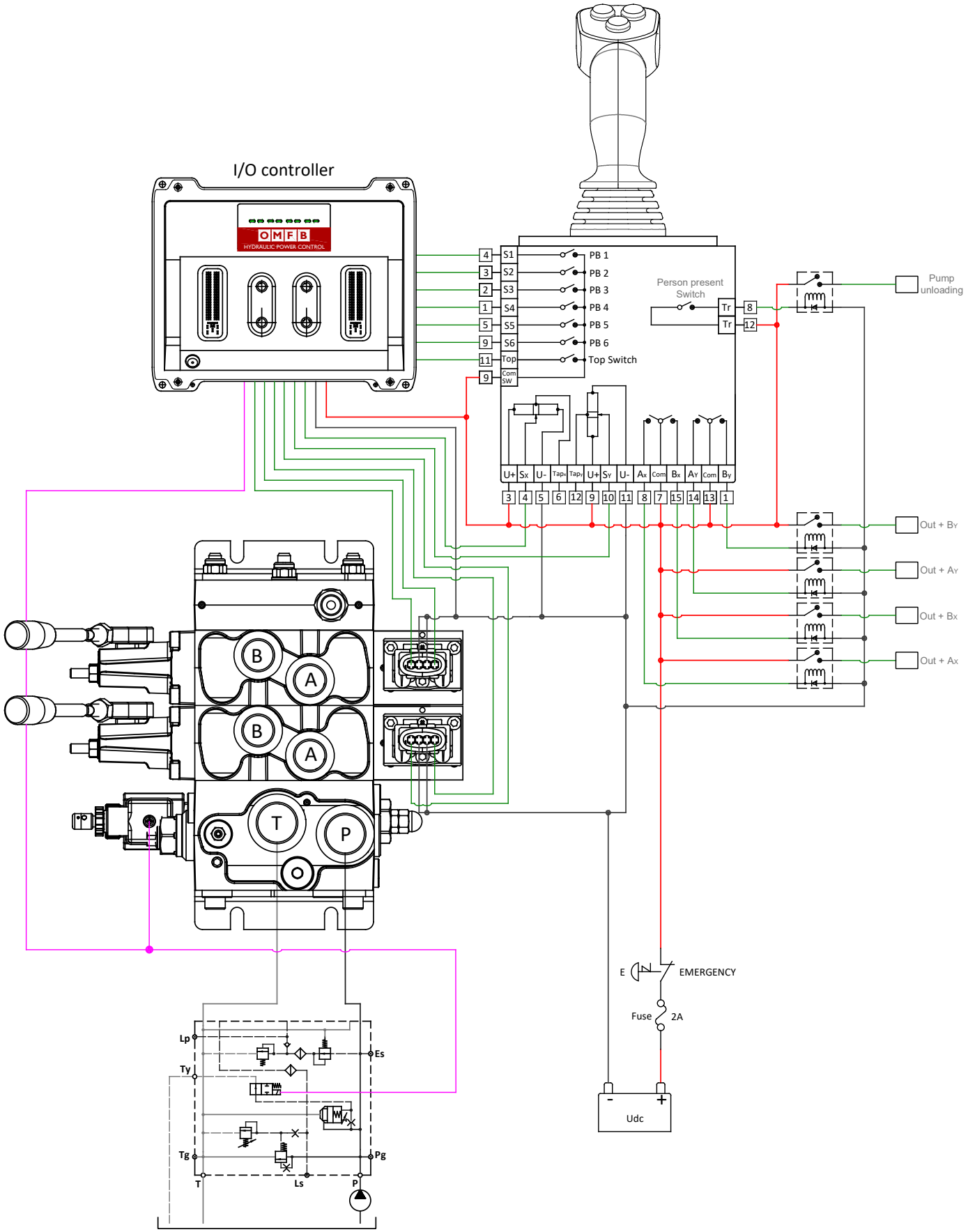
PDV315 - PEAP3 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



PDV315 - PEAP3 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



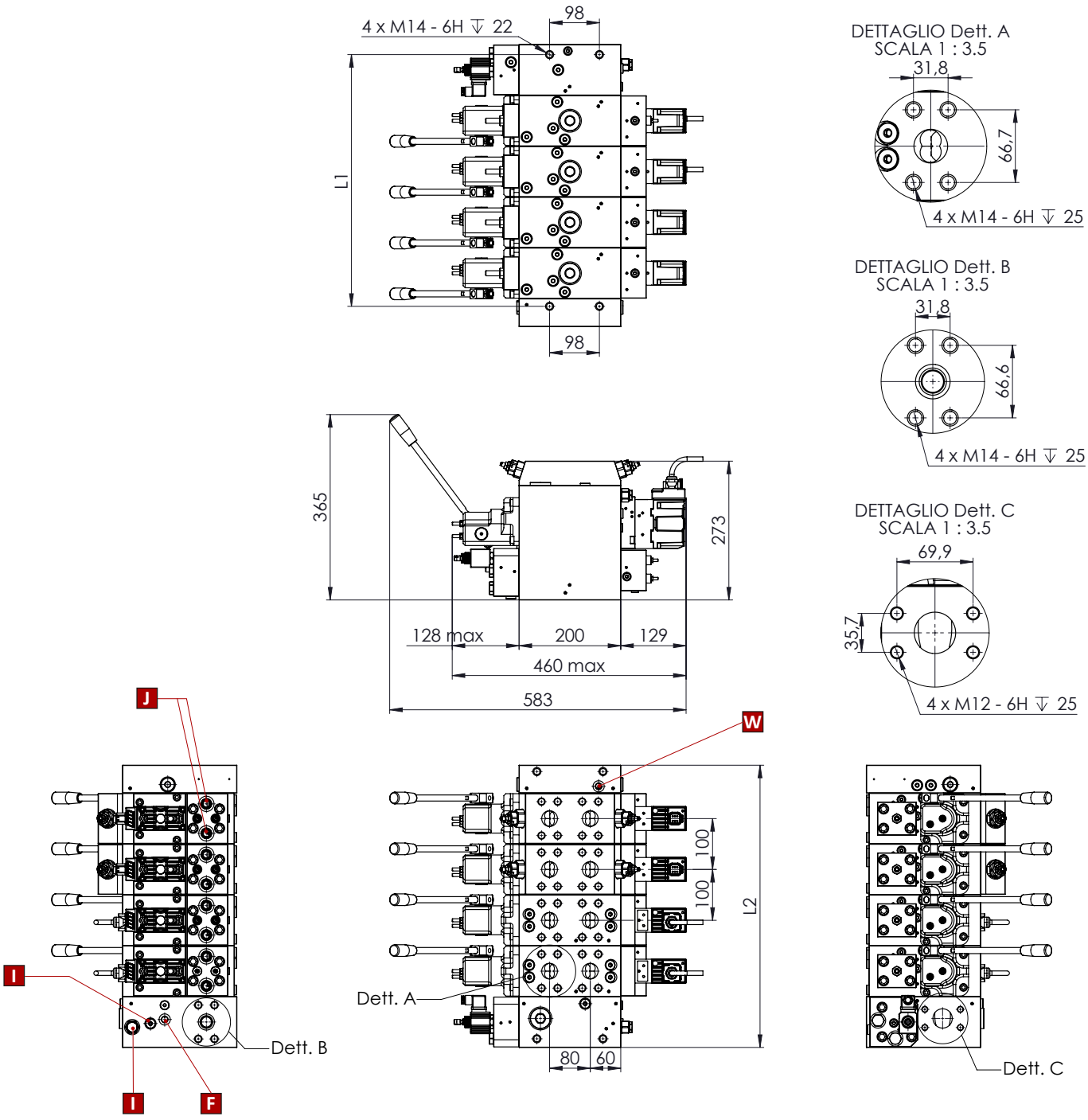
PDV315 - PEAP3 Electro-hydraulic proportional actuation
Electrical wiring with OMFB I/O controller - Current input signal for PWM or supply voltage for ON/OFF control



OMFB
HYDRAULIC POWER CONTROL

PDV315 Proportional valve

Overall dimensions drawing with standard inlet section
Right assembly version

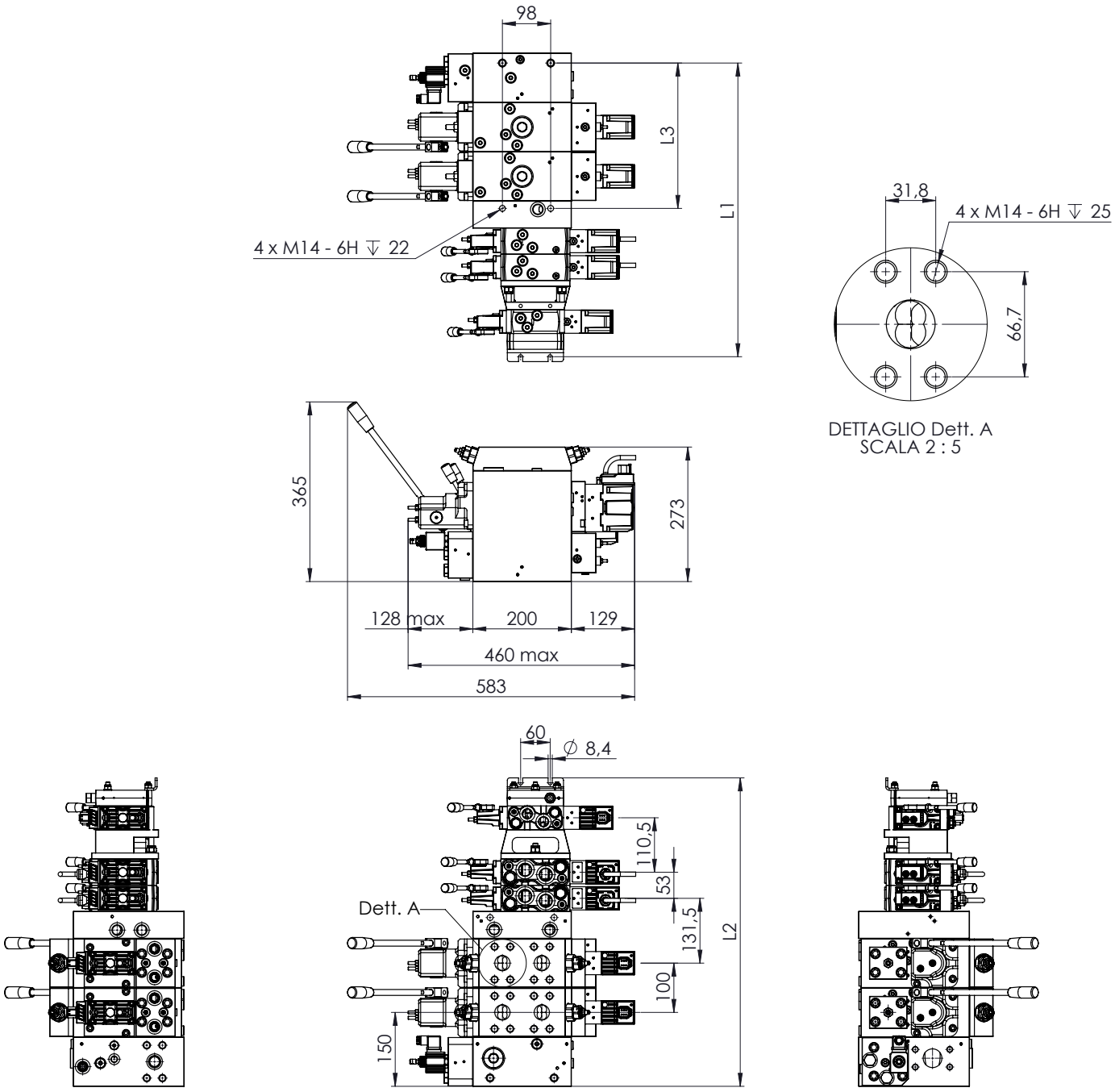


PDW		1	2	3	4	5	6	7	8	9	10	11	12
L1	mm	180	228	276	324	372	420	468	516	564	612	660	708
	in	7,09	8,98	10,87	12,76	14,65	16,54	18,43	20,31	22,20	24,09	25,98	27,87
L2	mm	200	248	296	344	392	440	488	536	584	632	680	728
	in	7,87	9,76	11,65	13,54	15,43	17,32	19,21	21,10	22,99	24,88	26,77	28,66

PDV315 Proportional valve
Overall dimensions drawing with standard inlet section
Right assembly version

A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB } remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
P = LS
Q = Port A
R = Port B } 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A } pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]

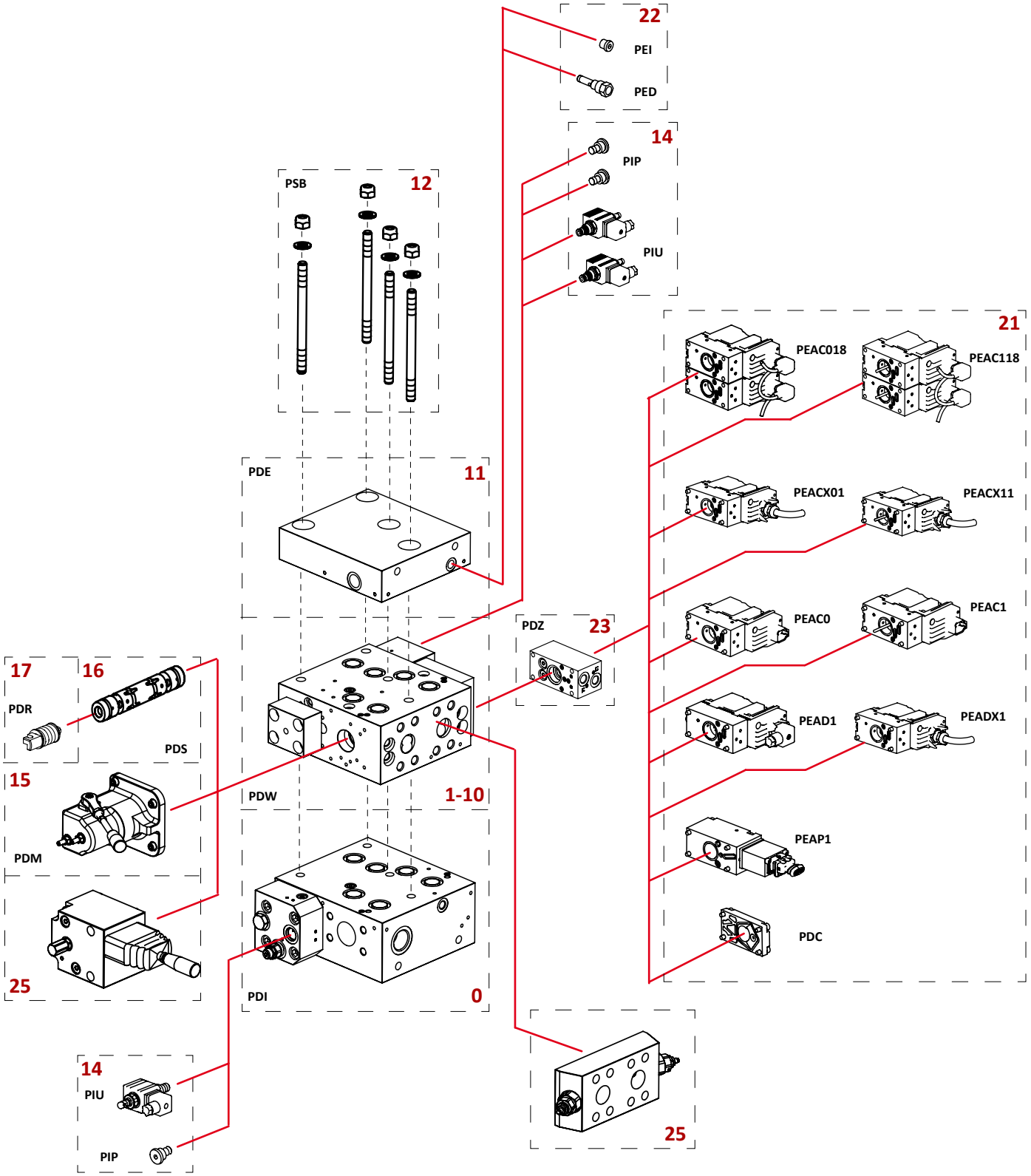
PDV315 Proportional valve
Overall dimensions drawing with double inlet and MID end section



PDW		2	3	4	5	6	7	8	9	10	11	12
L1	mm	331	379	427	475	523	571	619	667	715	763	811
	in	13,03	14,92	16,81	18,70	20,59	22,48	24,37	26,26	28,15	30,04	31,93
L2	mm	351	399	447	495	543	591	639	687	735	783	831
	in	13,82	15,71	17,60	19,49	21,38	23,27	25,16	27,05	28,94	30,83	32,72

PDV315 Proportional valve
Overall dimensions drawing with double inlet and MID end section

A = Pump side port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN-2B - 0,67 in deep]
B = T port - 3/4" BSPP - 17 mm deep [1 1⁄16 in 12 UN - 2B - 0,67 in deep]
C = Main pressure relief valve
D = Main pressure reducing valve
E = Pump pressure gauge connection - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
F = LS connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
G = External pilot pressure supply connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
H = External feeding main pressure reducing valve 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
I = Tank pressure gauge connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]
J = Electrical LS/pump unloading function
K = Pump unloading drain port, 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
L = Pump unloading mechanical override
M = A-B port mechanical flow adjustment
N = LSA
O = LSB
P = LS
} remote pilot pressure connection 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF - 2B - 0,47 in deep]
Q = Port A
R = Port B
} 1/2" BSPP - 17 mm deep [7⁄8 in-14 UNF-2B - 0,67 in deep]
S = Ls_B
T = Ls_A
} pilot pressure relief valve
U = Shock/suction valve B port
V = Shock/suction valve A port
W = External drain connection electric actuations - 1/4" BSPP - 12 mm deep [7⁄16 in-20 UNF-2B - 0,47 in deep]


22
PEI
PED
14
PIP
PIU
PSB
12
21
PEAC018
PEAC118
PDE
11
PEACX01
PEACX11
PEAC0
PEAC1
PDZ
23
17
16
PDR
PDS
PEAD1
PEADX1
15
PDM
PDW
1-10
PEAP1
PDC
25
PDI
0
14
PIU
PIP
25

PDV315 Proportional valve, Product selection chart

Reference field	Description			Code numbers see pag
0	Inlet sections	Open centre	**PDI**	
		Closed centre		
1-10	Working sections	with pressure compensator	**PDW**	
		without pressure compensator		
11	End sections		**PDE**	
12	Stay bolt set		**PSB**	
14	Solenoid Ls unloading		**PIU**	
	Plug for LS unloading cavity		**PIP**	
15	Mechanical actuation		**PDM**	
16	Spool		**PDS**	
17	Spool centered set		**PDR**	
21	Proportional electro-hydraulic actuations	Open loop spool control current signal for PWM and ON-OFF control	**PEAD1**	
		Open loop spool control high resolution	**PEAC0**	
		Closed loop spool control high performance resolution	**PEAC1**	
		Open loop spool control high resolution CAN-Bus	**PEAC018**	
		Closed loop spool control high performance resolution CAN-Bus	**PEAC118**	
		Open loop spool control high resolution ATEX	**PEACX01**	
		Closed loop spool control high performance resolution ATEX version	**PEACX11**	
		Open loop spool control current signal for PWM and ON-OFF control ATEX version	**PEADX1**	
		Open loop spool control current input signal for PWM and ON-OFF control - AMP JPT 4 pin	**PEAP1**	
	Rear cover for	Hydraulic control	**PDH**	
		Detent	**PDD**	
		Friction detent	**PDF**	
		Mechanical actuation	**PDC**	
22	End sections	External drain line cartridge	**PED**	
		Internal plug	**PEI**	
23	Dual function control body		**PDZ**	
25	Antishock body			

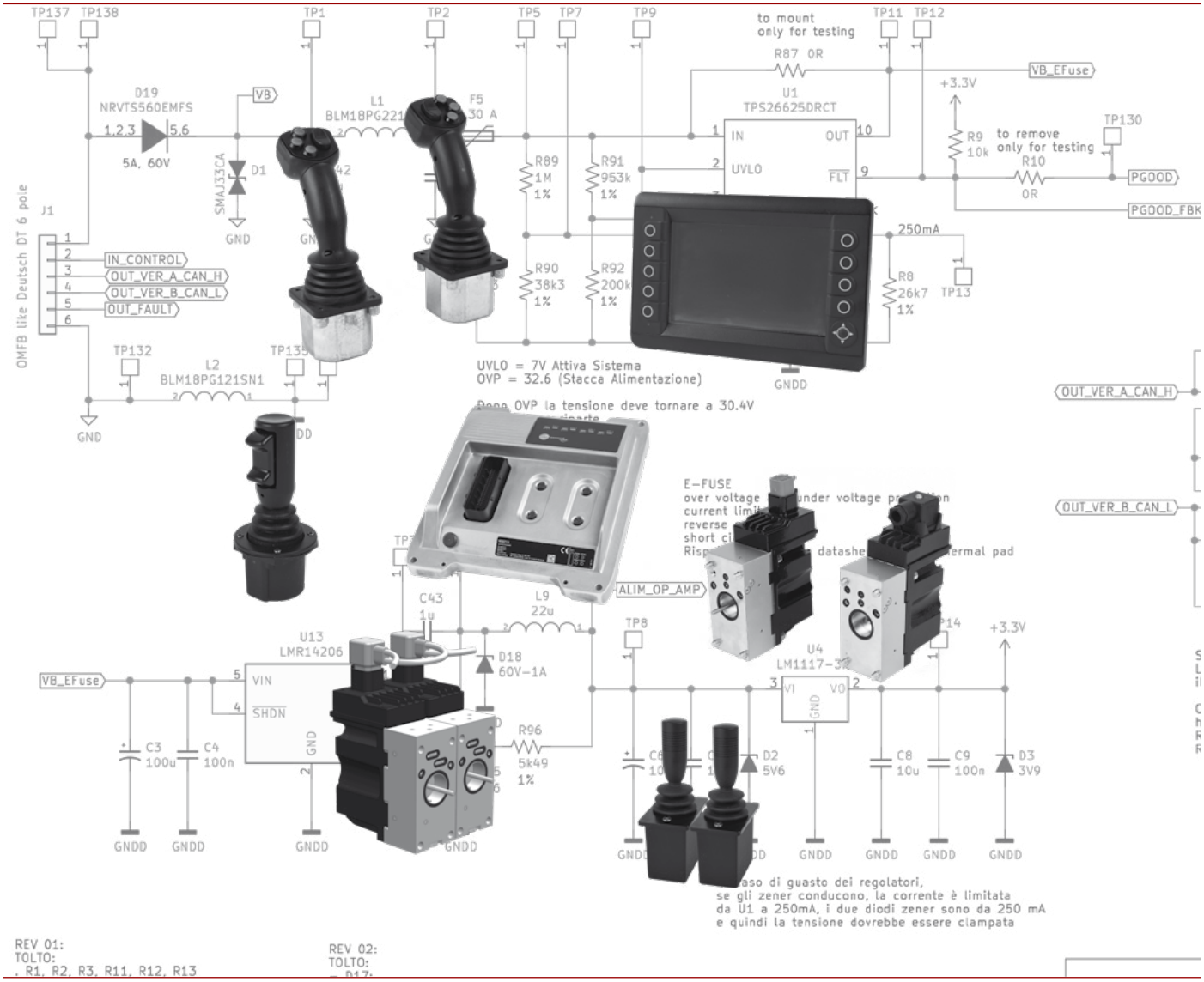
OMFB
HYDRAULIC POWER CONTROL

OMFB HYDRAULIC POWER CONTROL			Code:	**PDV315**		Customer:		
			Date:	__/__/____		Customer ref:		
			Review index:	-		Issued by:		
			Review date:	-		OMFB sales ref:		

I	Valve type:	PDV 315	V	Working sections Up:	8	IX	Rated voltage [V]:	12
II	Type of threads:	BSPP	VI	Working sections Down:		X	Certifications:	None
III	Type of inlet:	standard	VII	Inlet section side:	Right version	XI		
IV	Pump type:	Open Center	VIII	2nd pump type:		XII	Pump flow [l/min]:	

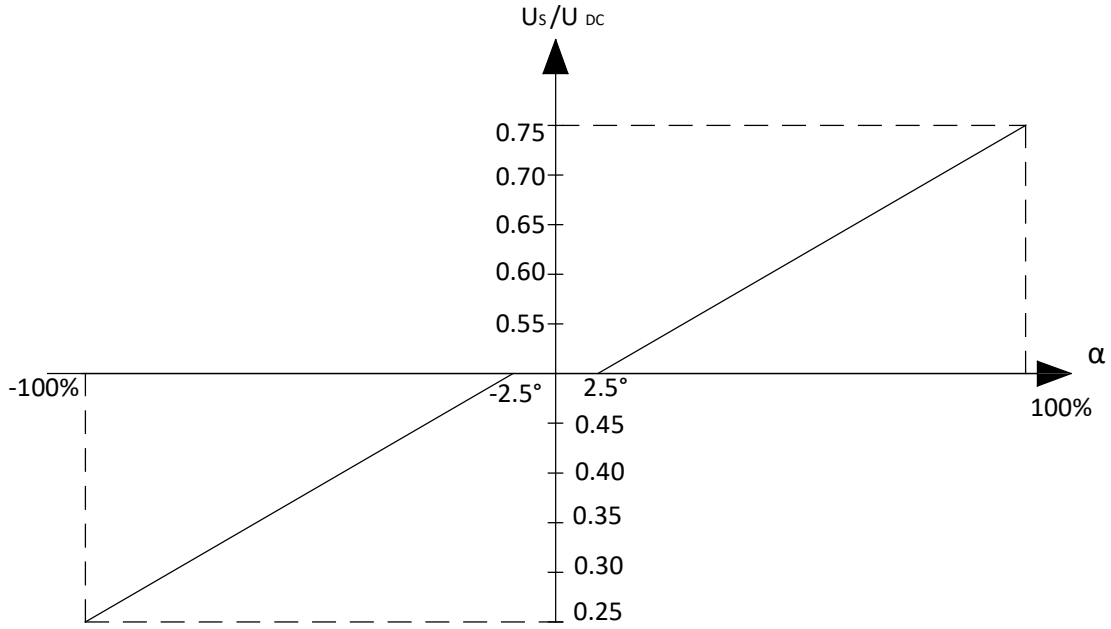
0	Notes													Notes
			B Port	0	bar				13		**A** Port			
				23					14					
			Actuation side								**Handle side**			
1		21		1	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
2		21		2	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
3		21		3	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
4		21		4	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
5		21		5	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
6		21		6	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
7		21		7	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
8		21		8	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
9		21		9	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
10		21		10	bar			bar	16			15		
		17		20					20					
				19					19					
				18					23					
11														
				11					12					
				22										

Customizing total machine control

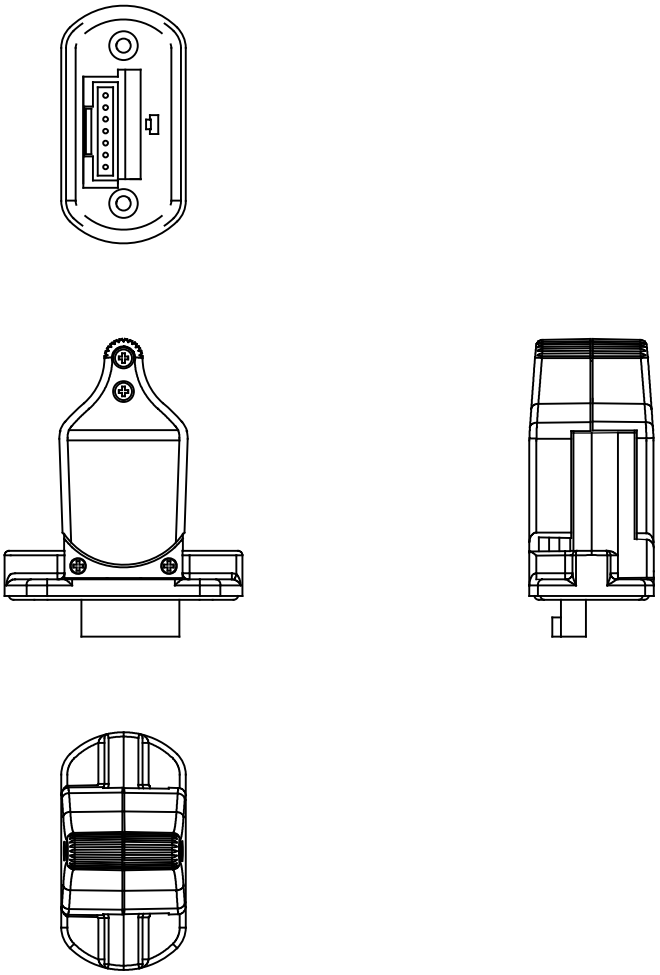


PSJF Single axis fingertip joystick with floating lock position fuction

Signal inversion



Overall dimensions



PSJF Single axis fingertip joystick with floating lock position fuction

Mechanical performance		Short handle	Long handle
Breakout force	N	3.1	2.3*
Lever operating force	N	5.1*	3.4*
Maximum allowable force**	N	50*	35*
Lever operating angle	°	± 30	± 30
Expected life (operations)		> 5 milion	> 5 milion
Weight	g	45	45

* At top of handle

Environmental		
Operating temperature	°C	-20 to +70
Storage temperature	°C	-40 to +85
Environmental protection above the flame		IP65 IEC 60529

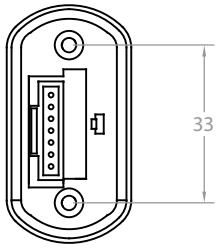
Analog track		
Resolution		Virtually infinite
Track resistance (±20%)	KΩ	4 or 5
Track electrical angle	°	± 28
Output voltage range	%	0-100, 10-90, 25-75 of input voltage
Center tap voltage	%	48 - 52 of applied voltage
Center tap angle	°	± 2.5
Supply voltage - maximum	V_{DC}	32
Wiper circuit impedance	MΩ	Greater than 0.1**
Power dissipation @ 25°C	W	0.25 (no load)
Insulation resistance		Greater than 50 MΩ at 500Vdc

***The long life resistive elements require a high impedance load in the wiper circuit to minimise the current flowing through the wiper for optimum life conditions

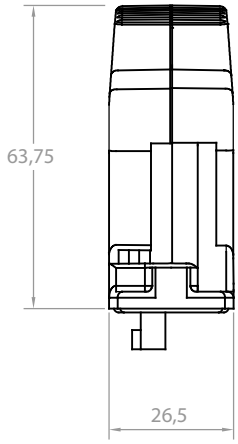
Switch directional or center off		
Switch operating angle	°	5 either side of center
Supply voltage - maximum	V_{DC}	35
Load resistance - minimum	KΩ	10
Load current - maximum	mA	2 (resistive)
Typical contact resistance	Ω	150

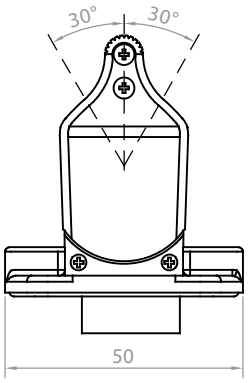
PSJF Single axis fingertip joystick with floating lock position fuction

Overall dimensions

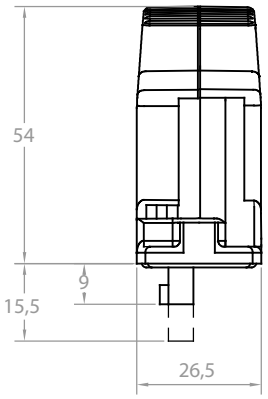


Long handle

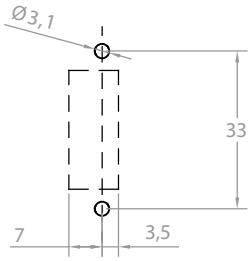




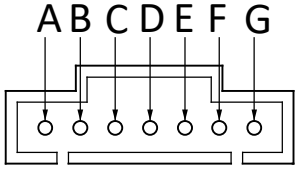
Short handle



Panel cut out



Elettrical Connections



A = Center Tap
B = Positive voltage supply
C = Output voltage signal
D = Negative or zero voltage supply
E = N/O switch, lever backward (-Y)
F = N/O switch, lever forward (+Y)
G = Common terminal for switches

PSJF Single axis fingertip joystick with floating lock position fuction

Mechanical		
Lever action		Self centering (standard) or friction lock (FL option)
Lever breakout force*	N	4.9 to 10.7 (standard)
	N	13 to 17 to overcome detent - FL option
Lever operating force**	N	16.8 to 21.5 (Standard - full lever deflection)
	N	8 to 12 when out of detent - FL option
Maximum allowable force**	N	300
Lever operating angle	°	± 34
Expected life (operations)		Greater than 2 million (0.5 million for Friction Lock (FL) action or handle options CL and EL)
Weight	g	560 without handle fitted

* Measured at 75mm above upper flange face (80mm for FL option) ** Measured at 135mm above upper flange face

Environmental		
Operating temperature	°C	-20 to +70
Storage temperature	°C	-40 to +85
Environmental protection above the flame		IP65 IEC 60529

Analog track		
Resolution		Virtually infinite
Track resistance (±20%)	KΩ	1.6, 2, 2.9, 5, 10
Track electrical angle	°	± 32
Output voltage range	%	0-100, 10-90, 25-75 of input voltage
Center tap voltage	%	48 - 52 of applied voltage
Center tap angle	°	± 2.5
Supply voltage - maximum	VDC	35
Wiper circuit impedance	MΩ	1 minimum recommended***
Power dissipation @ 25°C	W	0.25 (no load)
Insulation resistance		Greater than 50 MΩ at 500Vdc

***The long life resistive elements require a high impedance load in the wiper circuit to minimise the current flowing through the wiper for optimum life conditions

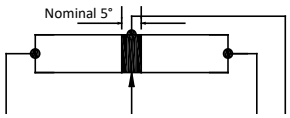
Switch directional or center off		
Switch operating angle	°	5 or 7.5 either side of center

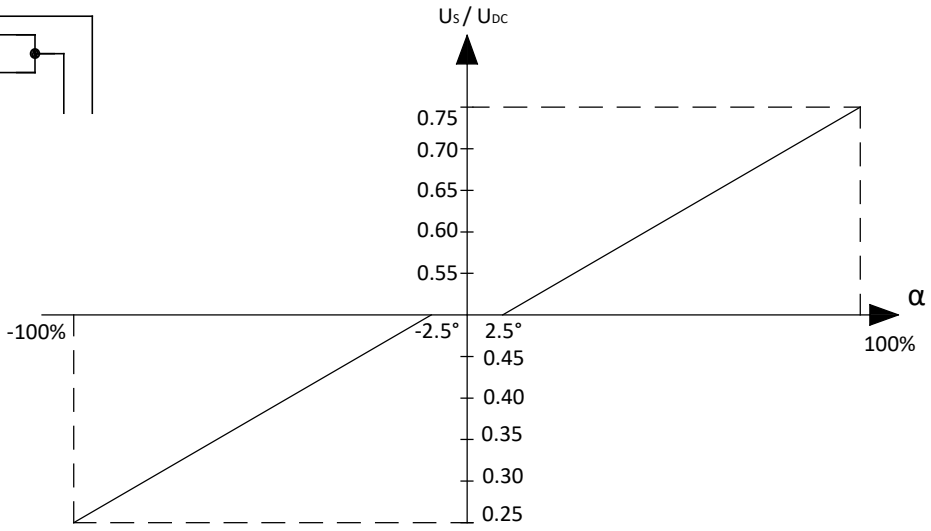
End Switch		
Switch operating angle	°	28.5 either side of center

Supply voltage - maximum	VDC	35
Load current maximum	mA	10 (resistive)

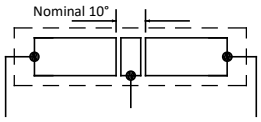
PSJF Single axis fingertip joystick with floating lock position fuction

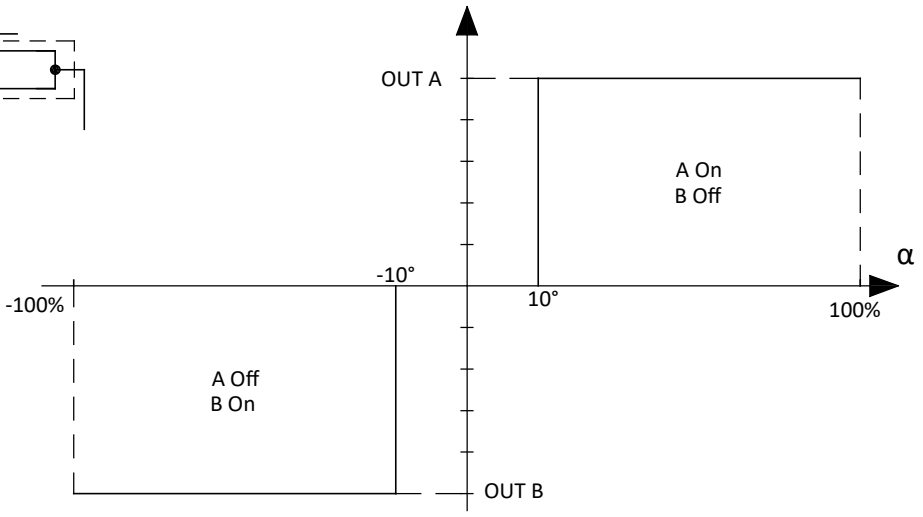
Analog track



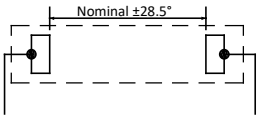


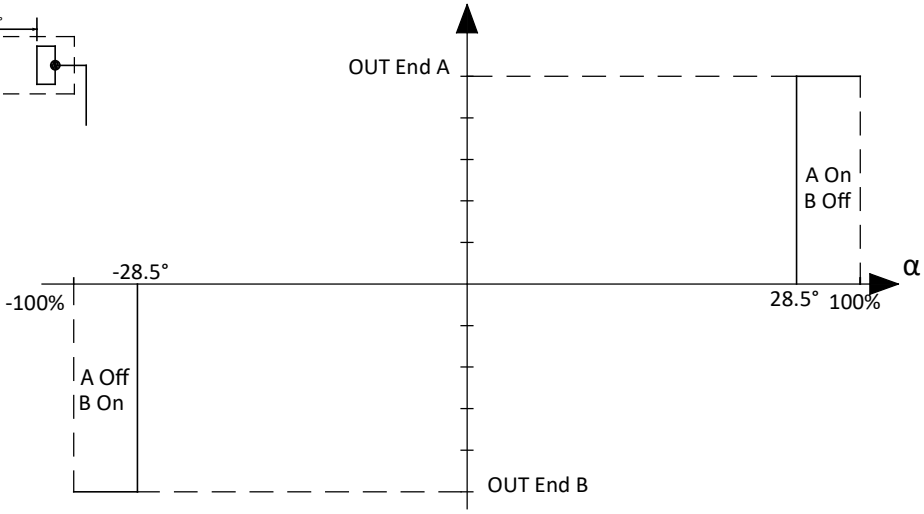
Directional / center off switch

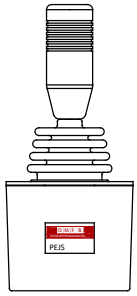
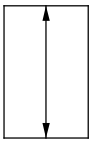
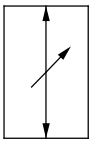


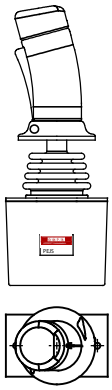
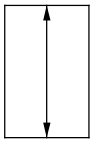
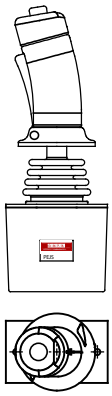
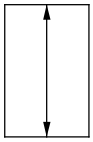
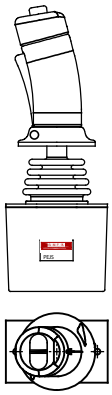
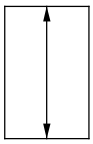


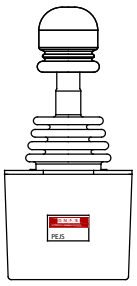
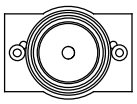
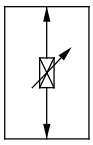
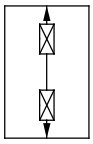
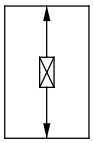
End switch



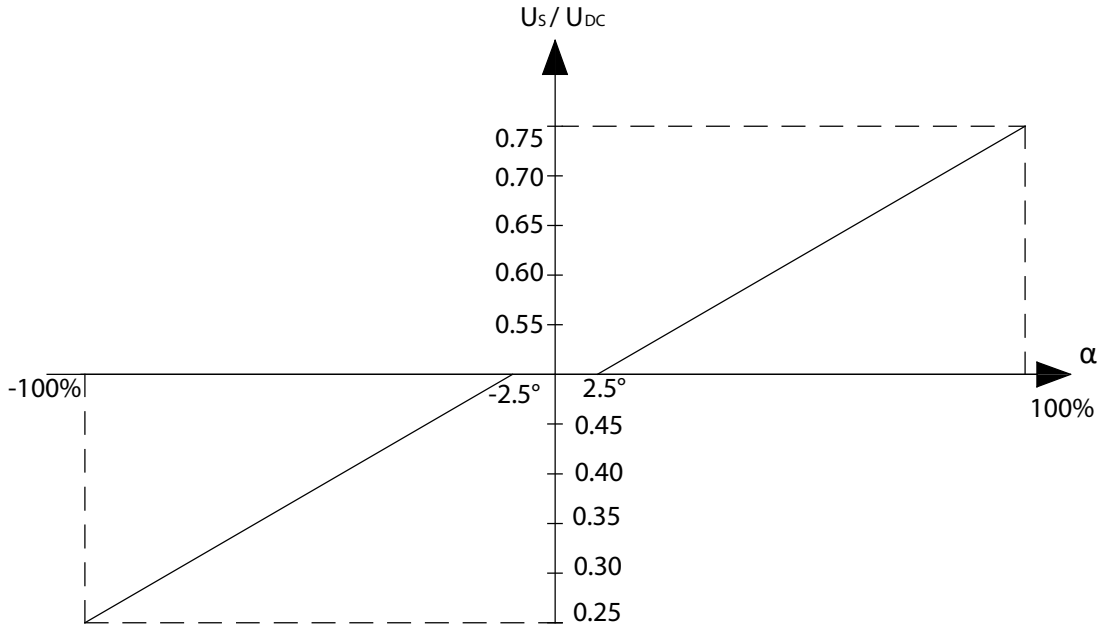


Joystick	Function	Symbol	Description	Code	Weight
	1 Proportional bidirectional		Spring centered	PEJS	
			Put & stay (friction lock) The friction lock mechanism offers a braking feature that allows the joystick to come to stop at any point along the joystick axis	PEJS	

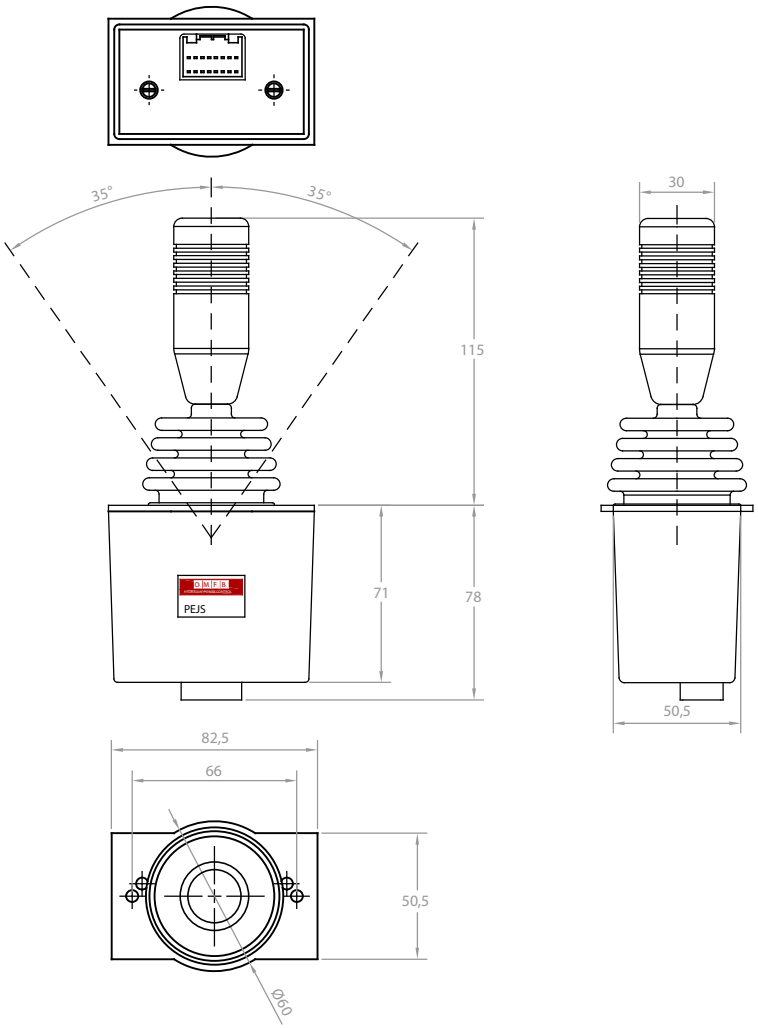
Joystick	Function	Symbol	Description	Code	Weight
	1 Proportional bidirectional		Spring centered with person present lever trigger switch	PEJS	
	1 Proportional bidirectional		Spring centered with person present lever trigger switch and single top switch	PEJS	
	1 Proportional bidirectional		Spring centered with person present lever trigger switch and dual top switch	PEJS	

Joystick	Function	Symbol	Description	Code	Weight
 	1 Proportional bidirectional		**Put & stay with neutral position lock** The joystick is fitted with neutral lock that prevent the joystick from begin unintentionally operated. The mechanism can be released by lifting the release ring at the base of the hendle. Beside of this, the friction lock offers a braking feature that allows the joystick to come to stop at any point along the joystick axis.	PEJS	
			**Spring centred with full end travel position lock** The joystick is fitted with an end travel position lock, such that, if the joystick is operated to full travel in either direction, the handle will lock at this position and not return to centre. The lock mechanism is released by lifting the collar at the base of the handle, and the joystick will return to neutral position.	PEJS	
			**Put & stay with neutral position lock** The joystick is fitted with neutral lock that prevent the joystick from being unintentionally operated. The mechanism can be released by lifting the release ring at the base of the hendle. Besides of this, the friction lock offers a braking feature that allows the joystick to come to stop at any point along the joystick axis.		

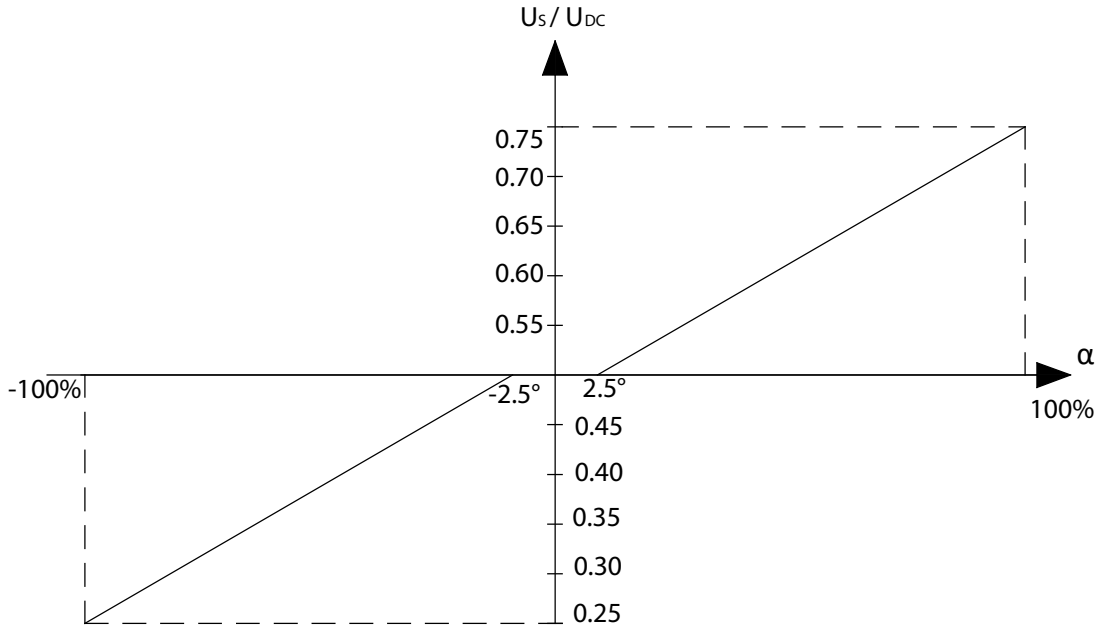
Signal inversion



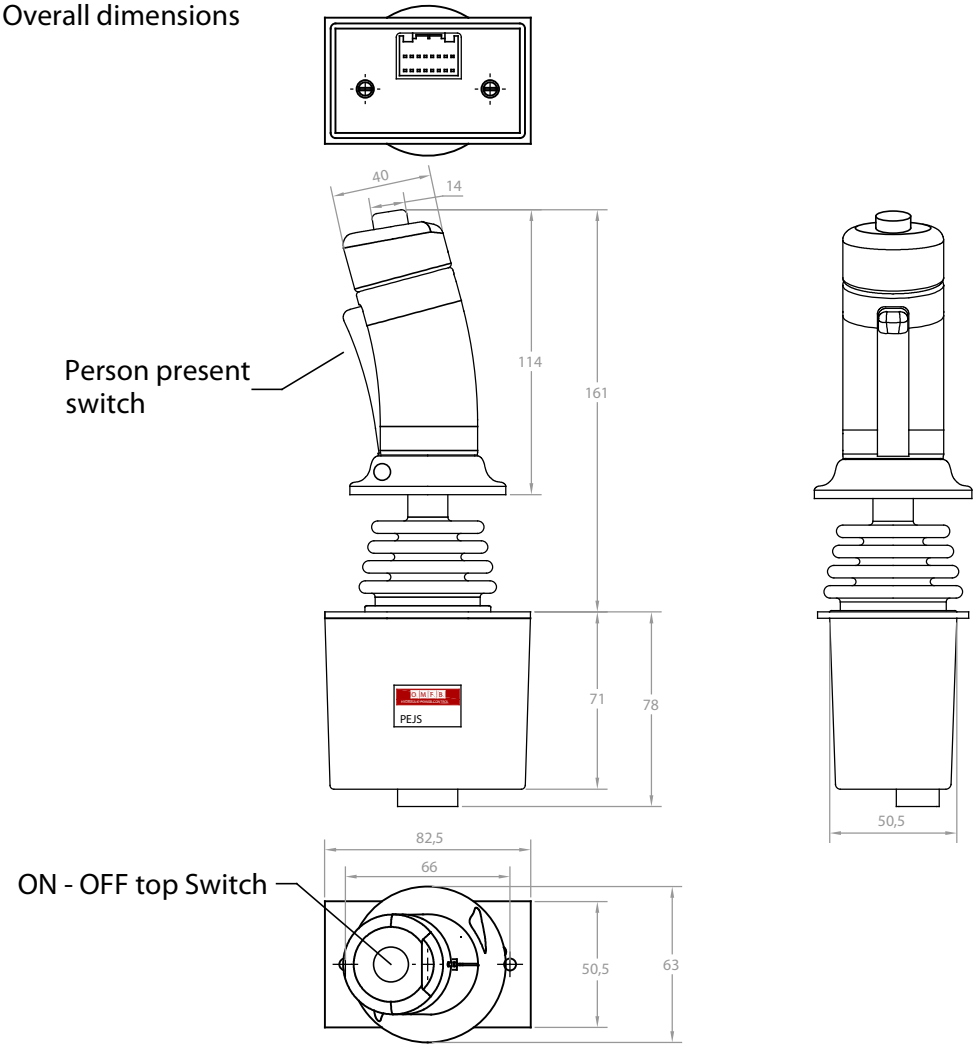
Overall dimensions



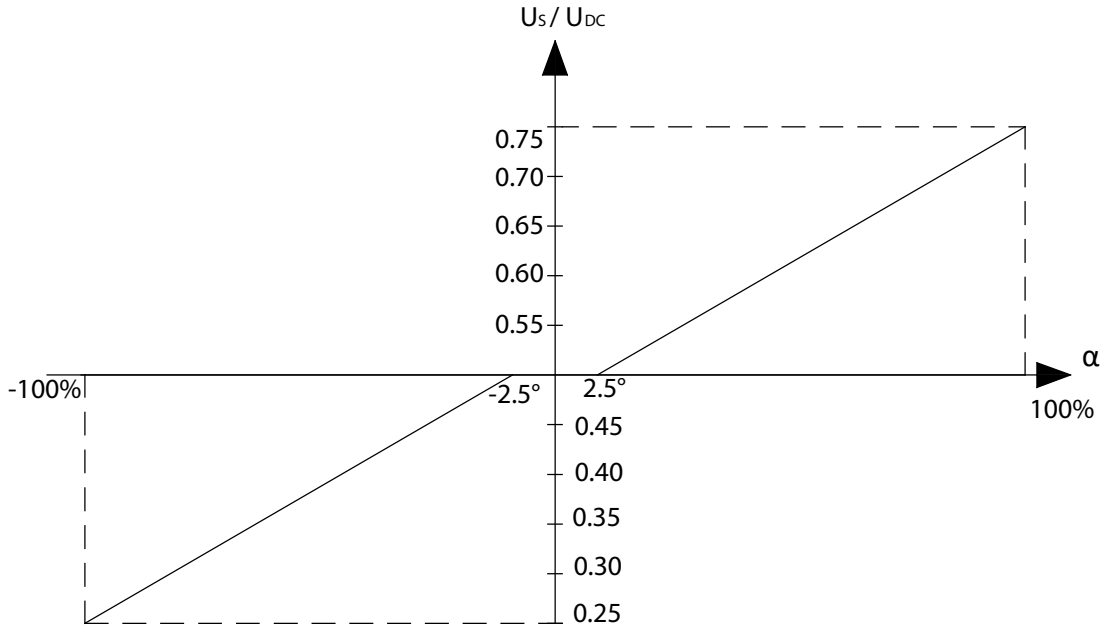
Signal inversion



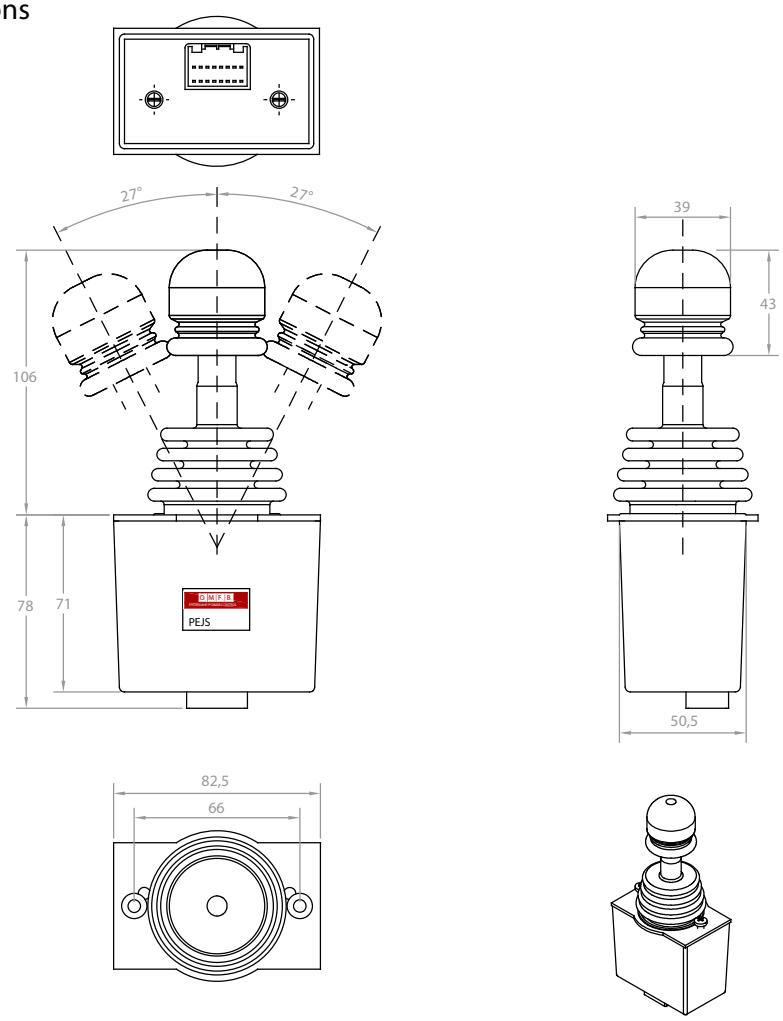
Overall dimensions

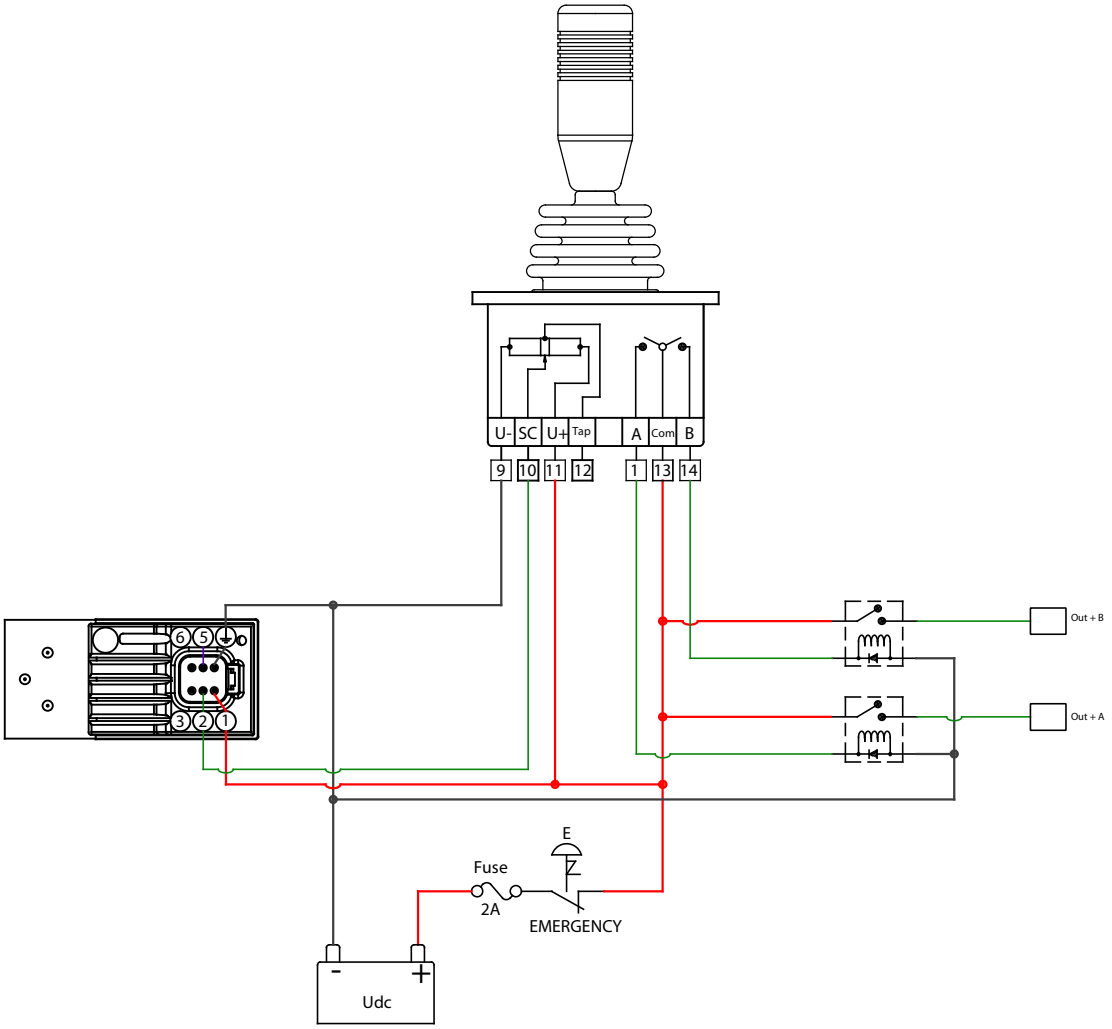


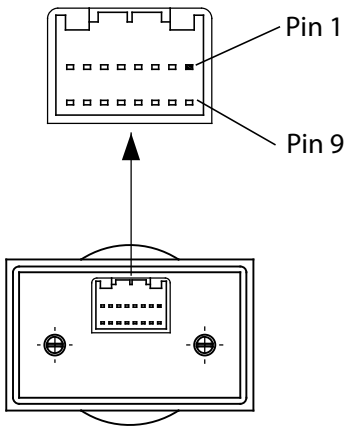
Signal inversion



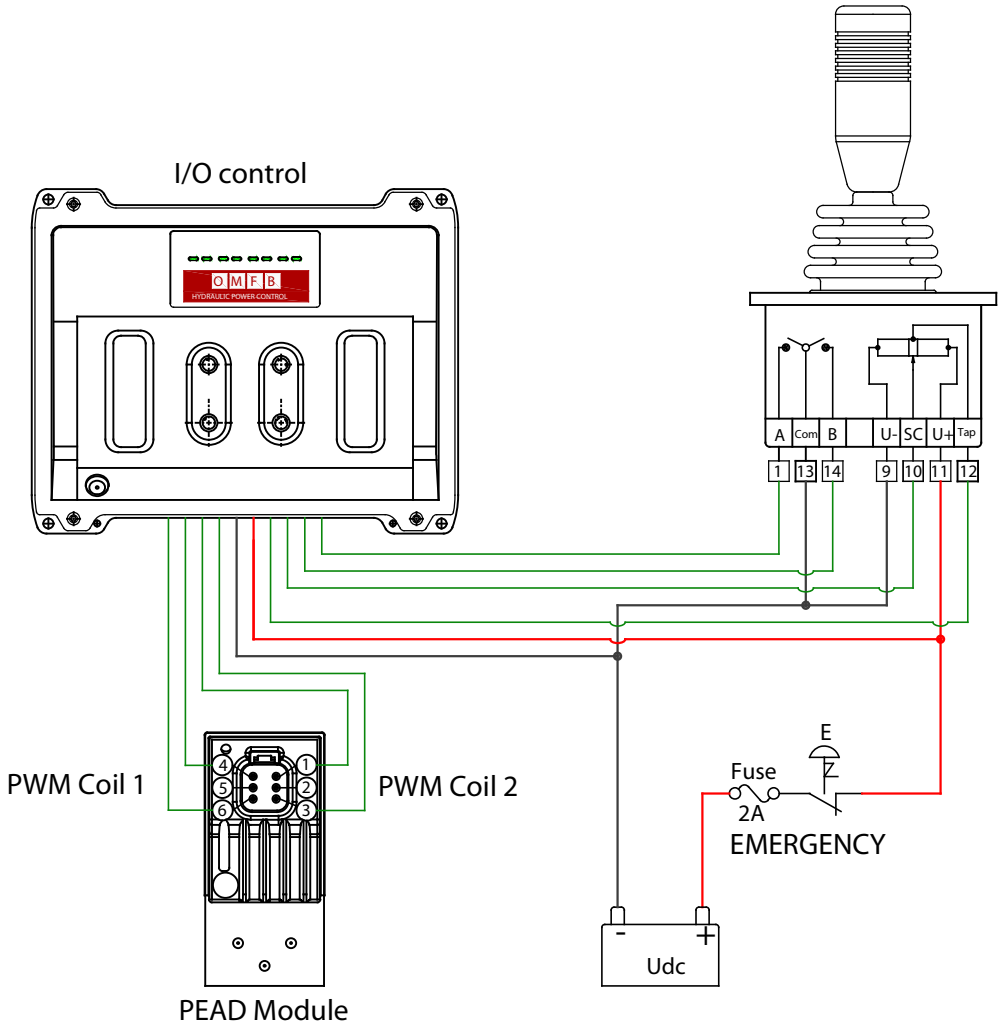
Overall dimensions

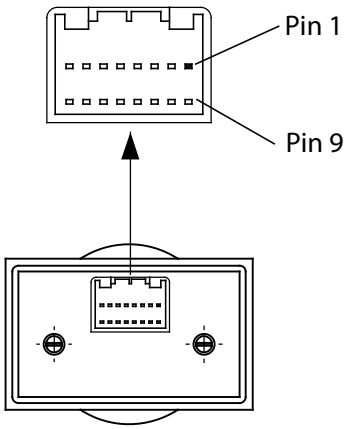




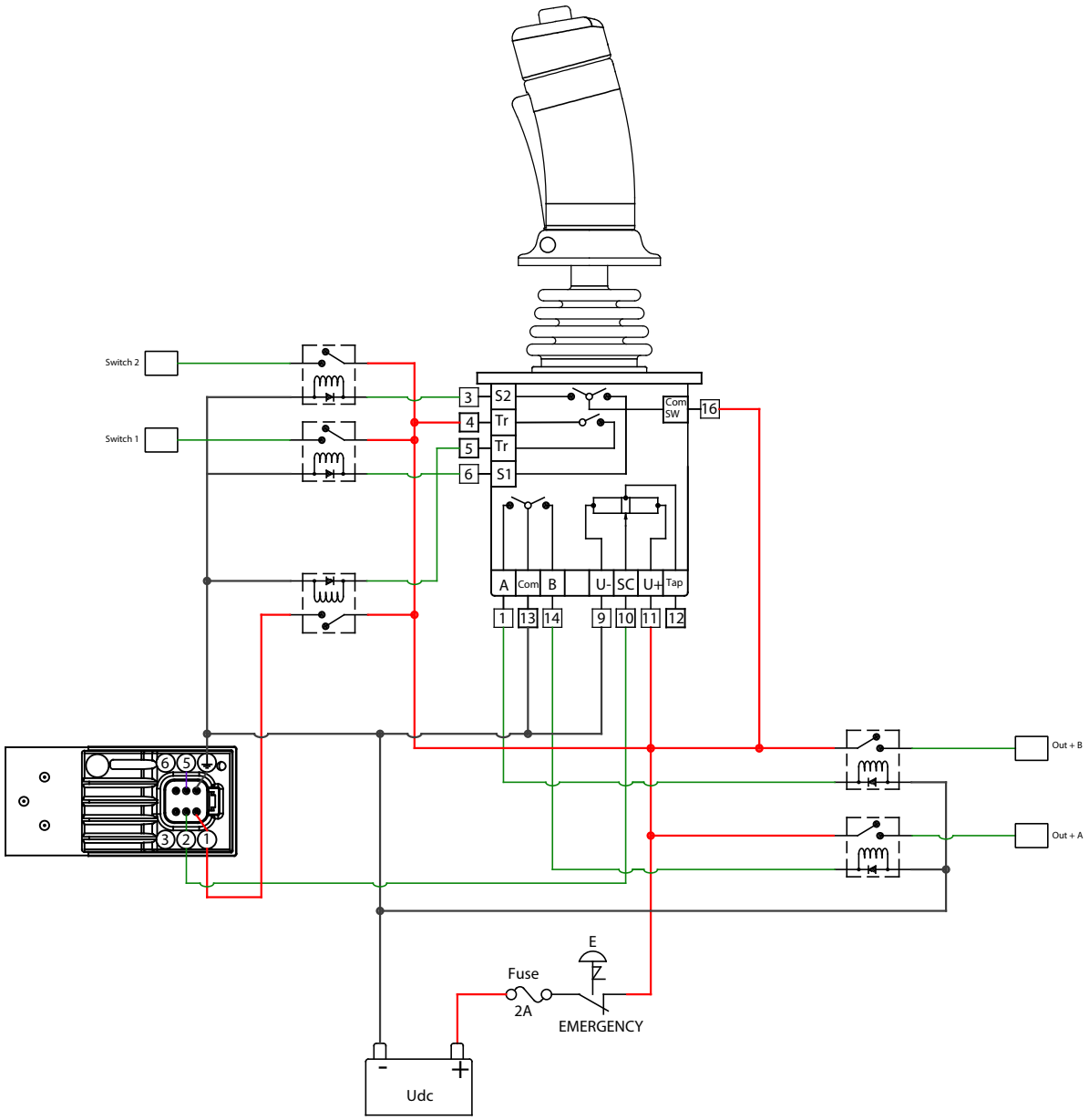


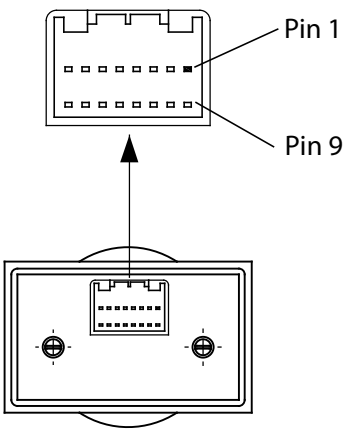
1 = Directional switch track N/O signal (lever backward -Y)
2 = End switch track N/O signal (lever fully backward -Y) *
3 = Not used
4 = Not used
5 = Not used
6 = Not used
7 = Not used
8 = Not used
9 = Negative or zero voltage supply
10 = Output voltage signal
11 = Positive voltage supply
12 = Center tap
13 = Common terminal for directional switches
14 = Directional switch track N/O signal (lever forward +Y)
15 = End switch track N/O signal (lever fully forward +Y) *
16 = Common terminal for handle switches





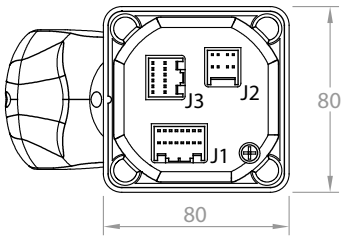
1 = Directional switch track N/O signal (lever backward -Y)
2 = End switch track N/O signal (lever fully backward -Y) *
3 = Not used
4 = Not used
5 = Not used
6 = Not used
7 = Not used
8 = Not used
9 = Negative or zero voltage supply
10 = Output voltage signal
11 = Positive voltage supply
12 = Center tap
13 = Common terminal for directional switches
14 = Directional switch track N/O signal (lever forward +Y)
15 = End switch track N/O signal (lever fully forward +Y) *
16 = Common terminal for handle switches

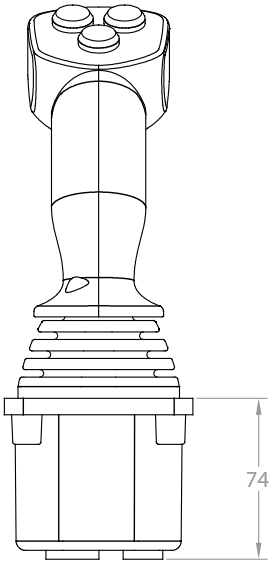


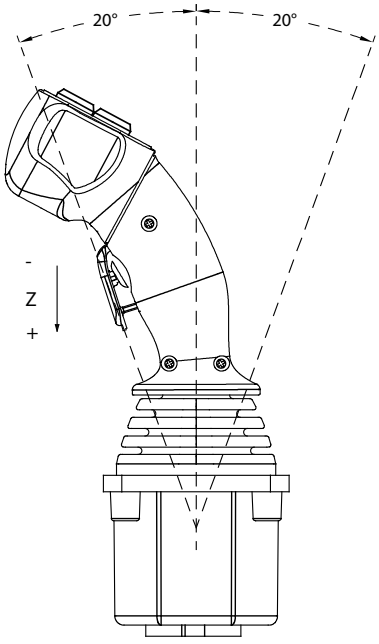


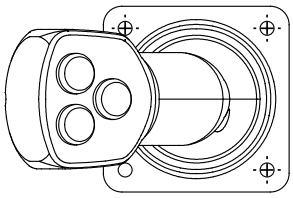
1 = Directional switch track N/O signal (lever backward -Y)
2 = End switch track N/O signal (lever fully backward -Y) *
3 = Handle switch 2
4 = Trigger switch
5 = Trigger switch
6 = Handle switch 1
7 = Not used
8 = Not used
9 = Negative or zero voltage supply
10 = Output voltage signal
11 = Positive voltage supply
12 = Center tap
13 = Common terminal for directional switches
14 = Directional switch track N/O signal (lever forward +Y)
15 = End switch track N/O signal (lever fully forward +Y) *
16 = Common terminal for handle switches

PEJW Ragged multi-axis joystick

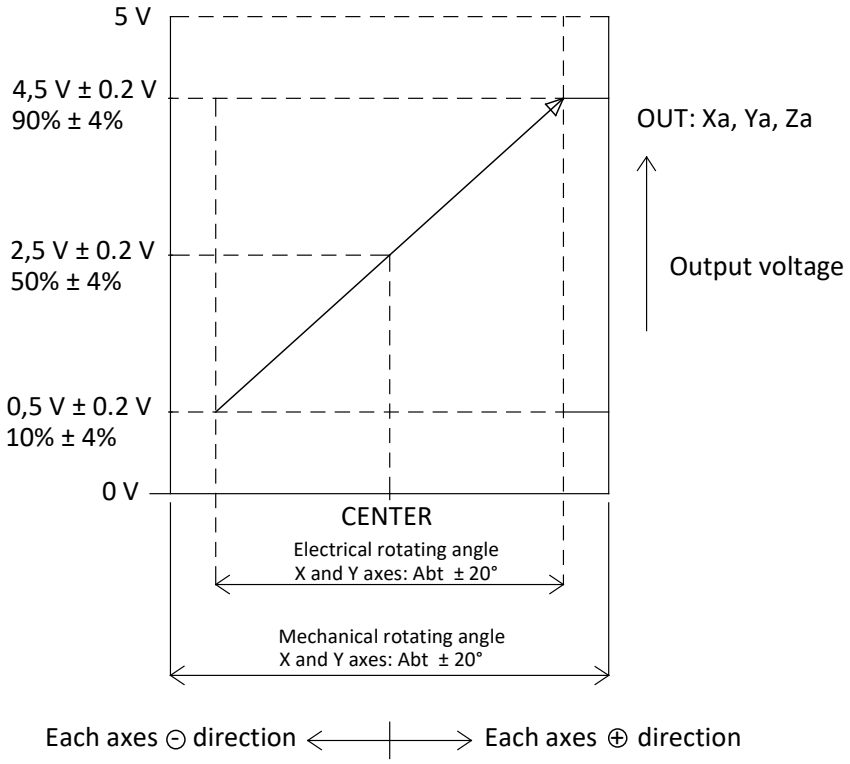




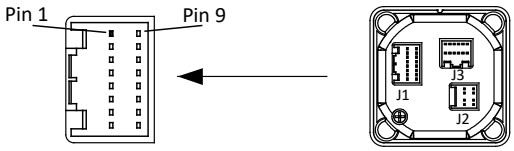




Output characteristics

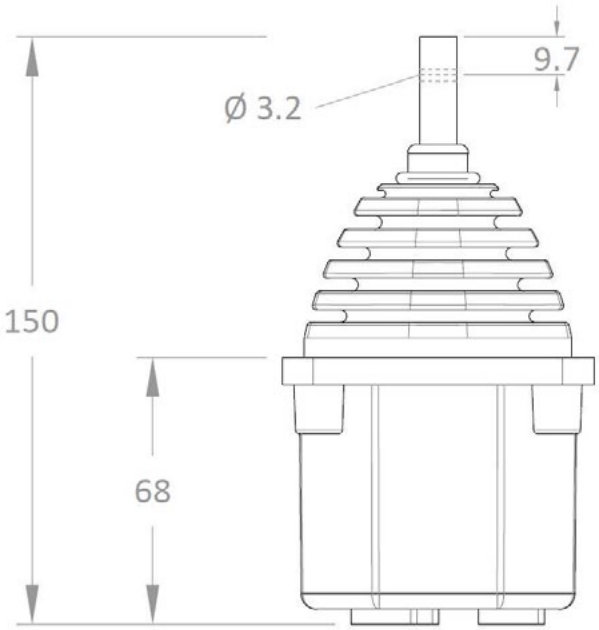


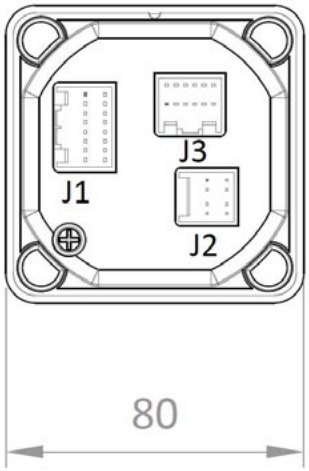
J1 Connector - 16 Pins

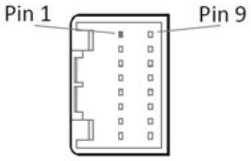


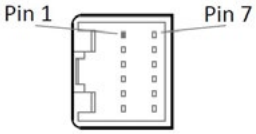
Pin	Function (potentiometer)
1	Y switch track N/O (lever forward +Y)
2	X switch track center on
3	X pot track left
4	X pot track wiper signal
5	X pot track right
6	X pot track center tap
7	X switch track common
8	X switch track N/O (lever left -X)
9	Y pot track backward
10	Y pot track wiper signal
11	Y pot track forward
12	Y pot track center tap
13	Y switch track common
14	Y switch track N/O (lever backward -Y)
15	X switch track N/O (lever right +X)
16	Y switch track center on

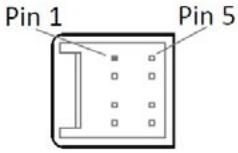
Overall dimensions





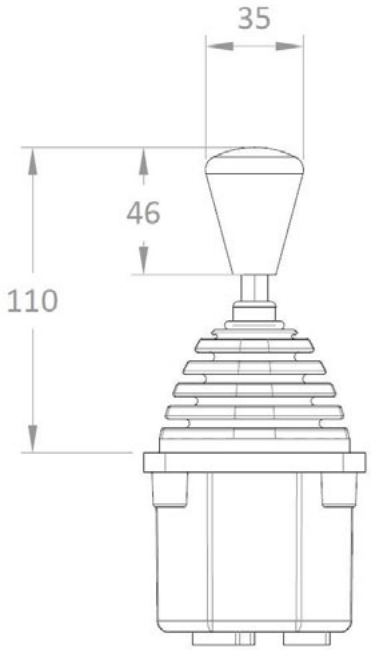




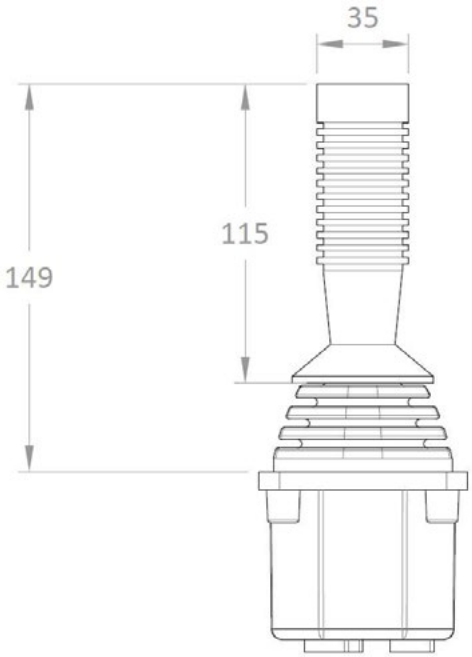


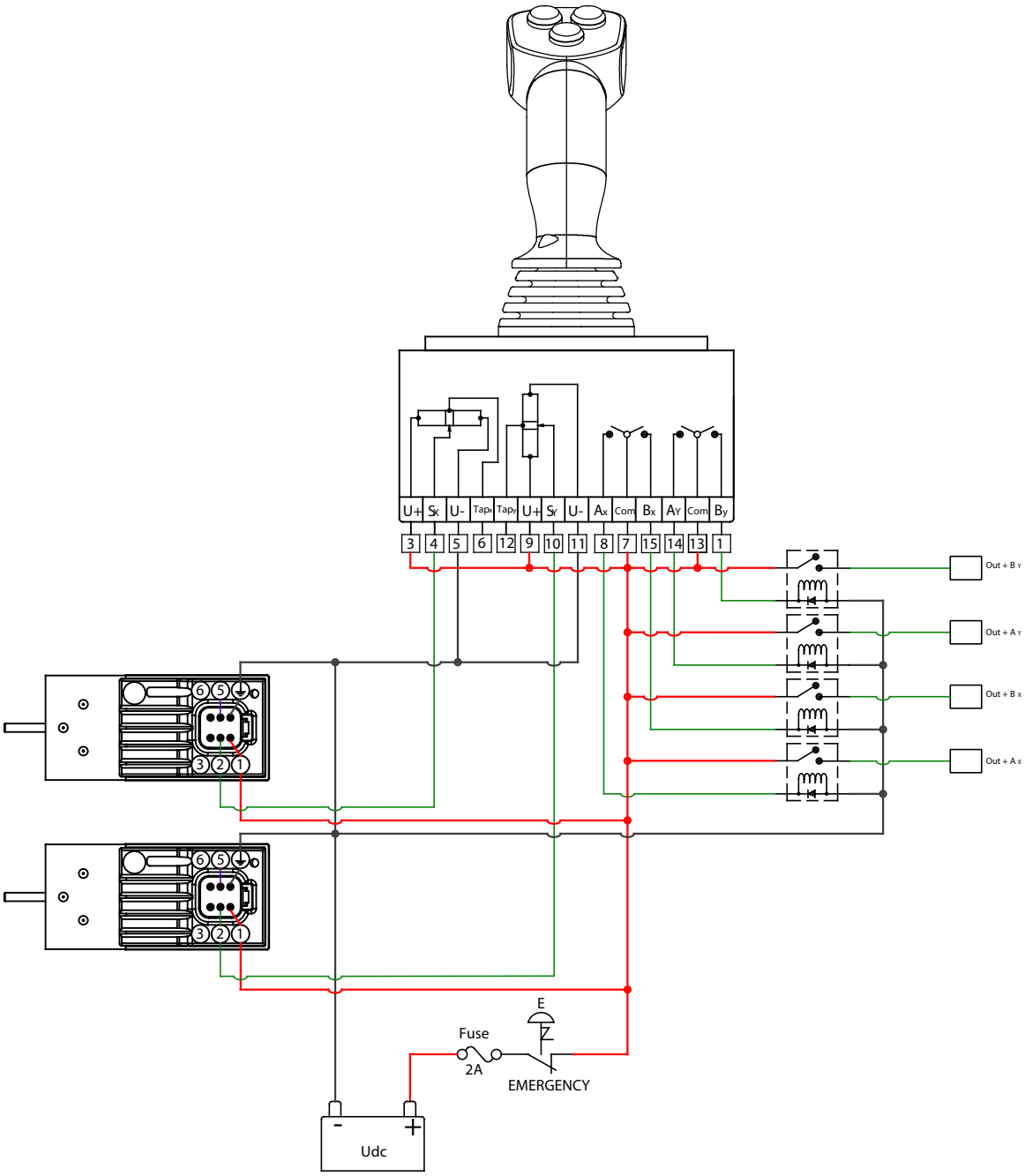
Handle options:

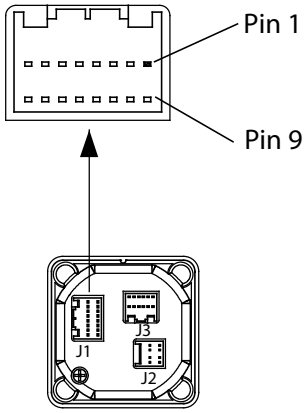
HKN MECHANICAL DIMENSIONS



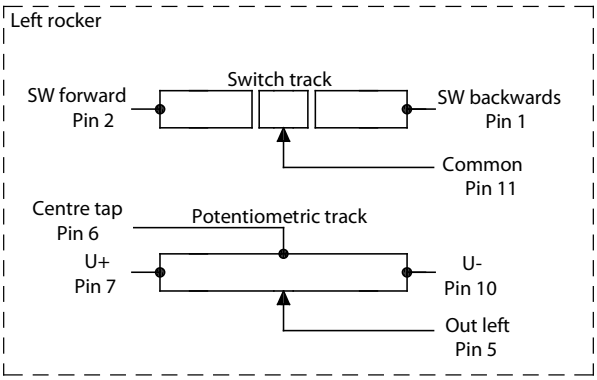
HB MECHANICAL DIMENSIONS

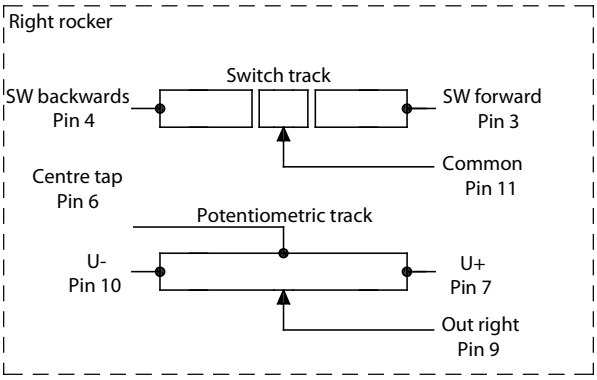


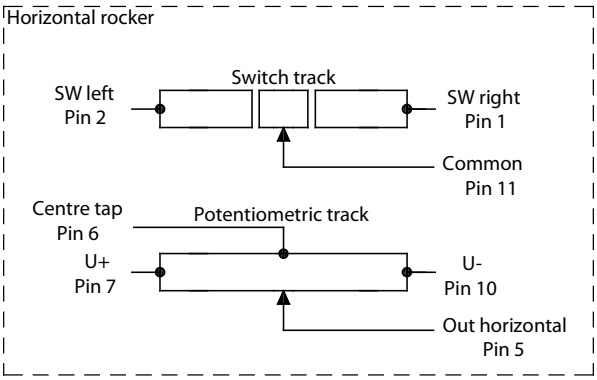




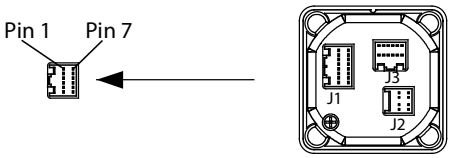
1 = Directional switch track N/O signal (lever backward -Y)
2 = X switch track center on
3 = X pot track left
4 = X pot track wiper signal
5 = X pot track right
6 = X pot track center tap
7 = X switch track common
8 = X switch track N/O (lever left -X)
9 = Y pot track backward
10 = Y pot track wiper signal
11 = Y pot track forward
12 = Y pot track center tap
13 = Y switch track common
14 = Y switch track N/O signal (lever backward -Y)
15 = X switch track N/O signal (lever right +X) *
16 = Y switch track center on





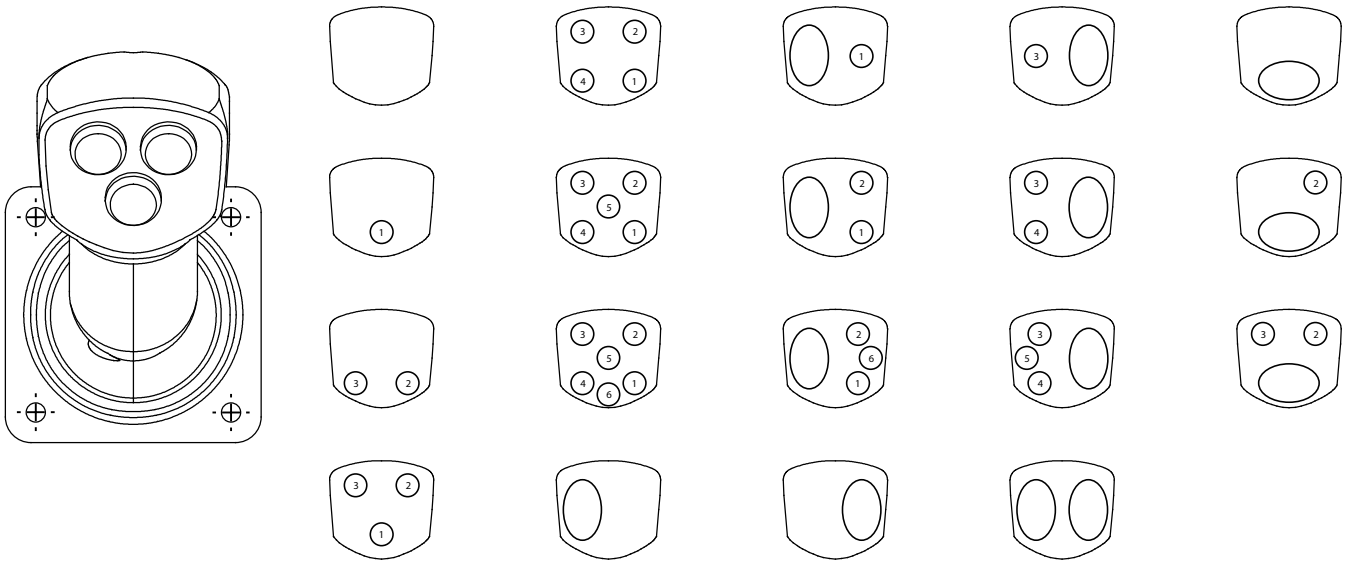


J3 Connector - 12 Pins

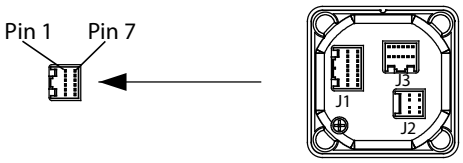


Pin	Function (Rockers)	Wire color
1	Left switch backward	Green
2	Left switch forward or horizontal left	Blue / Orange
3	Right switch forward	Yellow
4	Right switch backward	Blue
5	Left output or horizontal output signal	Pink
6	Rockets center tap	Yellow / Red
7	Rockets positive power supply U+	White / Red
8	Person present switch	Black / White
9	Right output signal	White
10	Rockets negative power supply U-	Pink / Grey
11	Rockets switch common	Black
12	Person present switch	Red / Green

Faceplate options



J3 Connector - 12 Pins

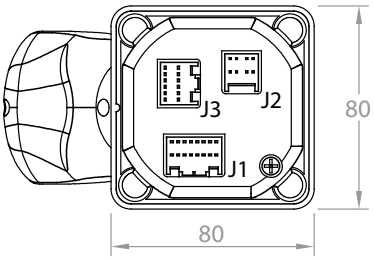


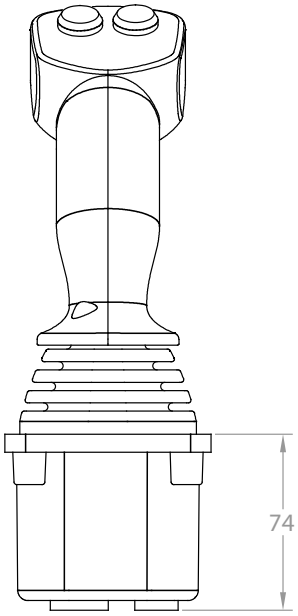
Pin	Function (Switches)	Wire color
1	Switch 4	White / Green
2	Switch 3	Blue / White
3	Switch 2	Yellow
4	Switch 1	Blue
5	S witch 5	R ed
6	-	Yellow / Red
7	-	White / Red
8	Person present switch	Black / White
9	S witch 6	V iolet
10	-	Pink / Grey
11	Common terminal for all switches	Black
12	Person present switch	Red / Green

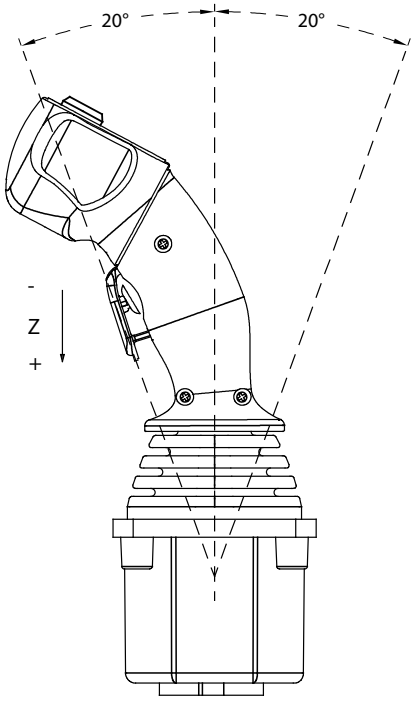
PERFORMANCE		
MECHANICAL		
Lever operating force		
breakout*	N	7 or 16
operating*	N	19 or 39 (full deflection)
maximum allowable**	N	390 (490 overload)
Lever mechanical angle		
single axis only	°	±20 forward/reverse
square gate	°	±20 in X and Y directions
Seat		preferred bias on axis
Expected life		15 million operations (5 million for potentiometer track version)
Weight	g	750 without handle fitted
* Measured at 55mm above upper flange face		** Measured 130mm above upper flange face
ENVIRONMENTAL		
Operating temperature	ºC	-25 to +80 (-25 to +80 with microswitches)
Storage temperature	ºC	-25 to +85 (-25 to +85 with microswitches)
Environmental protection(above the flange) (above the flange)		IP66 IEC 60529 (fitted with HKN handle)
Vibration		Level ±3g,10Hz to 200Hz (random) @ 3.6g(rms)
Shock		20g, 6mS, half sine profile
EMC immunity level		100V/m, 30MHz to 1GHz, 1KHz 80% sine wave modulation, EN50082-2 (1995)
EMC emissions level		Complies with EN50081-2 (1993), 150kHz to 30MHz, level B
ESD immunity level		IEC61000-4-2 level 4 8kV contact discharge, 15kV air discharge
ELECTRICAL – HALL EFFECT SENSOR		
Resolution		Infinite
Supply voltage range	Vdc	5 ± 0.5 regulated transient free
Over voltage (maximum)	Vdc	15 continuous
Reverse polarity (maximum)	Vdc	14.5
Output voltage span - options	Vdc	±25% span - nominal 1.1 to 3.9
		±30% span - nominal 1.0 to 4.0
		±40% span - nominal 0.5 to 4.5
Load impedance (minimum)	kΩ	5
Center voltage (no load)	%	48 - 52 of supply voltage
Current consumption	mA	13 per axis (6.5 per sensor)
Insulation resistance		Greater than 50MΩ at 50Vdc
Output sense		The dual outputs rise together in the same direction, increasing with lever forward (and right), decreasing with lever backward (and left)
Output matching		See maximum output difference diagram below
ELECTRICAL CONNECTIONS		
Mating 12 way connector and pins		SA48061 (AMP 040 12 way connector 174045-2; pins 175062-1)
Mating 12 way harness		P49779 (connector, pins and 380mm long cable)

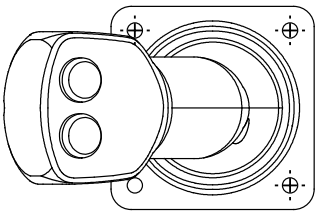
ELECTRICAL – POTENTIOMETER TRACK		
Resolution		Virtually infinite
Track resistance Â±20%	KΩ	1.8, 2, 2.9, 5
Track operating angle	°	±18
Output voltage range	%	0-100, 10-90, 25-75 of input
Center tap voltage	%	48 - 52 of applied voltage
Center tap angle	°	±2.5
Center tap to switch alignment	°	Within 0.5
Supply voltage maximum	Vdc	32
Wiper circuit impedance	MΩ	1 minimum recommended*
Power dissipation @ 25°C	W	0.25
Insulation resistance		Greater than 15MÎ© at 50Vdc
		* The long life resistive elements require a high impedance load in the wiper circuit to minimise the current flowing through the wiper for optimum life conditions
ELECTRICAL – DIRECTIONAL OR CENTER SWITCH (LOW CURRENT)		Not available with CANbus output
Switch operating angle	°	1.5 or 5 either side of center
Supply voltage maximum	Vdc	35
Load current maximum	mA	200 resistive
ELECTRICAL CONNECTIONS		All primary potentiometer track and directional/center switch connections terminate in a 16-way AMP 040 series multi-lock connector in the joystick base. Secondary potentiometer track connections terminate in an 8-way AMP 040 series multi-lock connector.
Mating 16 way connector and pins		SA47931 (AMP 040 16 way connector 174046-2; Pins 175062-1)
Mating 16 way harness		P49780 (connector, pins and 380mm long cable)
Mating 8 way connector and pins		SA304522 (AMP 040 8 way connector 174044-2; pins 175062-1)
Mating 8 way harness		P303083 (connector, pins and 380mm long cable)
ELECTRICAL MICROSWITCH		Not available with CANbus output
Switch configuration		Two switches per axis Normally open at lever center position
Switch operating angle	°	. 2 to 5 either side of
Contact rating		center 3A @125Vac, 2A @ 30Vdc
Switch life minimum		100,000 cycles, cycled at 1Hz, 1A and 12Vdc
Operating temperature	ºC	-25 to +85
ELECTRICAL CONNECTIONS		Microswitch connections in the potentiometer joystick will replace the low current directional/center switches in the 16-way AMP 040 series multi-lock connector in the joystick base. In the Hall sensor joystick, switches terminate in the 8-way connector.
CAN OUTPUT VERSION		JC6000 with Hall sensing option can also be supplied with an integrated CANBUS output offering the J1939 protocol. This CANBUS interface meets the requirements of IEC61508 SIL level 1
Supply voltage range	Vdc	9 to 36
CAN version		CAN 2.0b
Protocol		J1939
Under-panel sealing		IP66 IEC60529
ELECTRICAL CONNECTIONS		
Mating connector and pins		All connections terminate in the 6-way Deutsch DTM04-6P integrated connector P304844 (includes 390mm flying leads)

PEJD double axis proportional joystick
code number: **PEJD26020D0**
with person present switch and two on-off push button switch



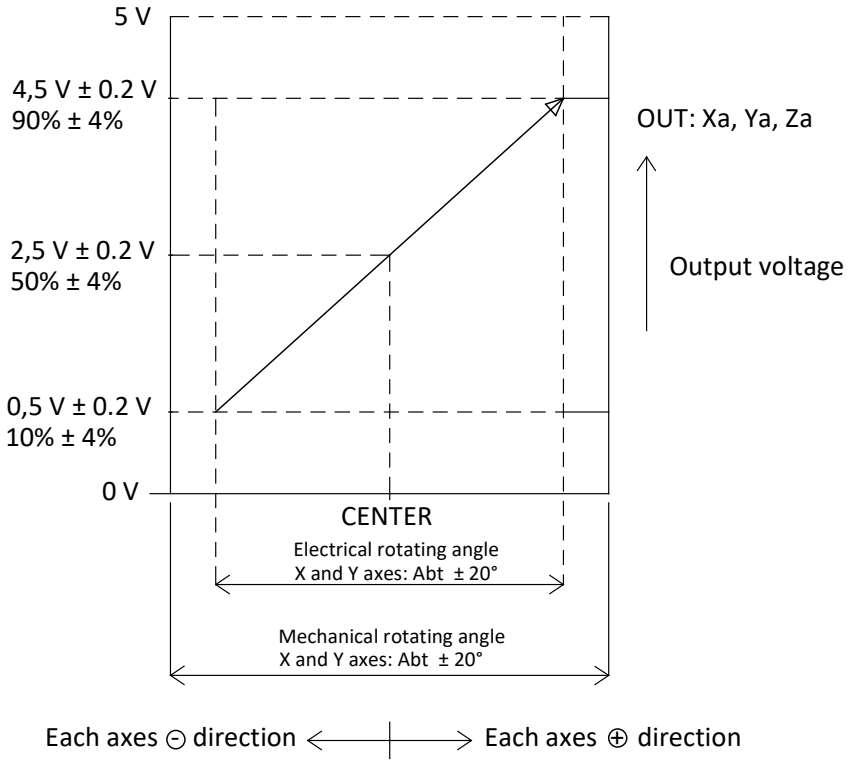




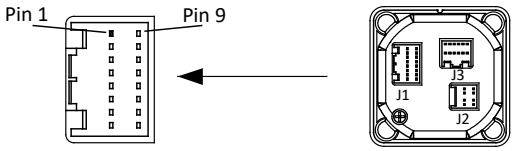


PEJD double axis proportional joystick
code number: PEJD26020D0
with person present switch and two on-off push button switch

Output characteristics



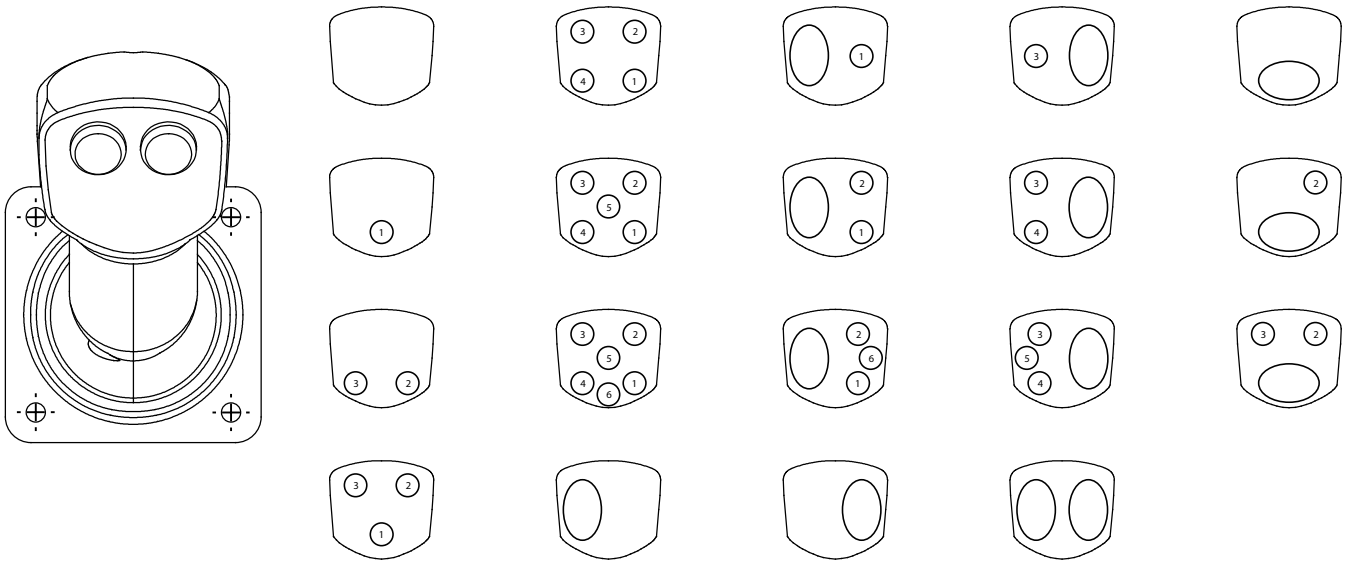
J1 Connector - 16 Pins



Pin	Function (potentiometer)
1	Y switch track N/O (lever forward +Y)
2	X switch track center on
3	X pot track left
4	X pot track wiper signal
5	X pot track right
6	X pot track center tap
7	X switch track common
8	X switch track N/O (lever left -X)
9	Y pot track backward
10	Y pot track wiper signal
11	Y pot track forward
12	Y pot track center tap
13	Y switch track common
14	Y switch track N/O (lever backward -Y)
15	X switch track N/O (lever right +X)
16	Y switch track center on

PEJD double axis proportional joystick
code number: **PEJD26020D0**
with person present switch and two on-off push button switch

Faceplate options



Pin	Function (Switches)	Wire color
1	Switch 4	White / Green
2	Switch 3	Blue / White
3	Switch 2	Yellow
4	Switch 1	Blue
5	S witch 5	R ed
6	-	Yellow / Red
7	-	White / Red
8	Person present switch	Black / White
9	S witch 6	V iolet
10	-	Pink / Grey
11	Common terminal for all switches	Black
12	Person present switch	Red / Green

OMFB
HYDRAULIC POWER CONTROL

PEJD double axis proportional joystick
code number: **PEJD26020D0**
with person present switch and two on-off push button switch

PERFORMANCE		
MECHANICAL		
Lever operating force		
breakout*	N	7 or 16
operating*	N	19 or 39 (full deflection)
maximum allowable**	N	390 (490 overload)
Lever mechanical angle		
single axis only	°	±20 forward/reverse
square gate	°	±20 in X and Y directions
Seat		preferred bias on axis
Expected life		15 million operations (5 million for potentiometer track version)
Weight	g	750 without handle fitted
* Measured at 55mm above upper flange face		** Measured 130mm above upper flange face
ENVIRONMENTAL		
Operating temperature	°C	-25 to +80 (-25 to +80 with microswitches)
Storage temperature	°C	-25 to +85 (-25 to +85 with microswitches)
Environmental protection(above the flange) (above the flange)		IP66 IEC 60529 (fitted with HKN handle)
Vibration		Level ±3g,10Hz to 200Hz (random) @ 3.6g(rms)
Shock		20g, 6mS, half sine profile
EMC immunity level		100V/m, 30MHz to 1GHz, 1KHz 80% sine wave modulation, EN50082-2 (1995)
EMC emissions level		Complies with EN50081-2 (1993), 150kHz to 30MHz, level B
ESD immunity level		IEC61000-4-2 level 4 8kV contact discharge, 15kV air discharge
ELECTRICAL – HALL EFFECT SENSOR		
Resolution		Infinite
Supply voltage range	Vdc	5 ± 0.5 regulated transient free
Over voltage (maximum)	Vdc	15 continuous
Reverse polarity (maximum)	Vdc	14.5
Output voltage span - options	Vdc	±25% span - nominal 1.1 to 3.9
		±30% span - nominal 1.0 to 4.0
		±40% span - nominal 0.5 to 4.5
Load impedance (minimum)	kΩ	5
Center voltage (no load)	%	48 - 52 of supply voltage
Current consumption	mA	13 per axis (6.5 per sensor)
Insulation resistance		Greater than 50MΩ at 50Vdc
Output sense		The dual outputs rise together in the same direction, increasing with lever forward (and right), decreasing with lever backward (and left)
Output matching		See maximum output difference diagram below
ELECTRICAL CONNECTIONS		
Mating 12 way connector and pins		SA48061 (AMP 040 12 way connector 174045-2; pins 175062-1)
Mating 12 way harness		P49779 (connector, pins and 380mm long cable)

OMFB HYDRAULIC POWER CONTROL

PEJD double axis proportional joystick
code number: **PEJD26020D0**
with person present switch and two on-off push button switch

ELECTRICAL – POTENTIOMETER TRACK		
Resolution		Virtually infinite
Track resistance Â±20%	KΩ	1.8, 2, 2.9, 5
Track operating angle	°	±18
Output voltage range	%	0-100, 10-90, 25-75 of input
Center tap voltage	%	48 - 52 of applied voltage
Center tap angle	°	±2.5
Center tap to switch alignment	°	Within 0.5
Supply voltage maximum	Vdc	32
Wiper circuit impedance	MΩ	1 minimum recommended*
Power dissipation @ 25°C	W	0.25
Insulation resistance		Greater than 15MÎ© at 50Vdc
		* The long life resistive elements require a high impedance load in the wiper circuit to minimise the current flowing through the wiper for optimum life conditions
ELECTRICAL – DIRECTIONAL OR CENTER SWITCH (LOW CURRENT)		Not available with CANbus output
Switch operating angle	°	1.5 or 5 either side of center
Supply voltage maximum	Vdc	35
Load current maximum	mA	200 resistive
ELECTRICAL CONNECTIONS		All primary potentiometer track and directional/center switch connections terminate in a 16-way AMP 040 series multi-lock connector in the joystick base. Secondary potentiometer track connections terminate in an 8-way AMP 040 series multi-lock connector.
Mating 16 way connector and pins		SA47931 (AMP 040 16 way connector 174046-2; Pins 175062-1)
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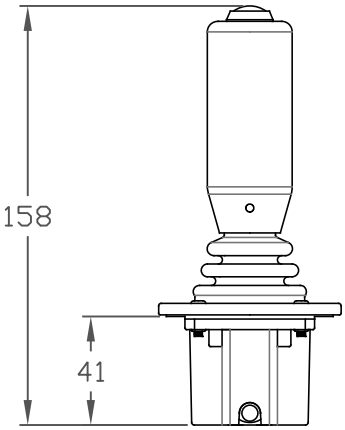
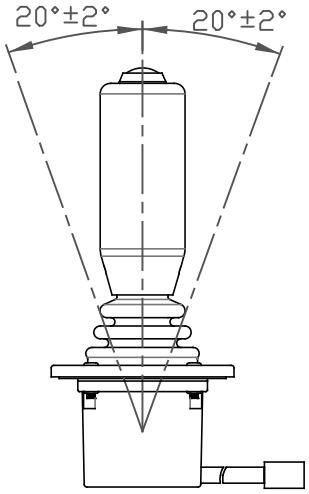
Mating 8 way harness		P303083 (connector, pins and 380mm long cable)
ELECTRICAL MICROSWITCH		Not available with CANbus output
Switch configuration		Two switches per axis Normally open at lever center position
Switch operating angle	°	. 2 to 5 either side of
Contact rating		center 3A @125Vac, 2A @ 30Vdc
Switch life minimum		100,000 cycles, cycled at 1Hz, 1A and 12Vdc
Operating temperature	°C	-25 to +85
ELECTRICAL CONNECTIONS		Microswitch connections in the potentiometer joystick will replace the low current directional/center switches in the 16-way AMP 040 series multi-lock connector in the joystick base. In the Hall sensor joystick, switches terminate in the 8-way connector.
CAN OUTPUT VERSION		JC6000 with Hall sensing option can also be supplied with an integrated CANBUS output offering the J1939 protocol. This CANBUS interface meets the requirements of IEC61508 SIL level 1
Supply voltage range	Vdc	9 to 36
CAN version		CAN 2.0b
Protocol		J1939
Under-panel sealing		IP66 IEC60529
ELECTRICAL CONNECTIONS		
Mating connector and pins		All connections terminate in the 6-way Deutsch DTM04-6P integrated connector P304844 (includes 390mm flying leads)

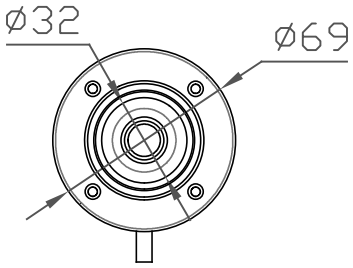
Mechanical dimensions



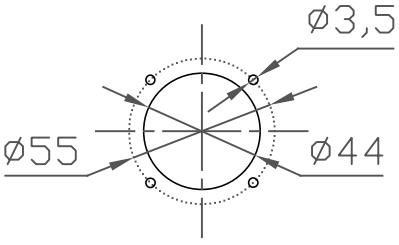
Joystick angle movement



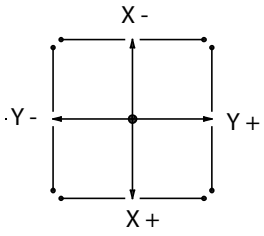
Bottom view



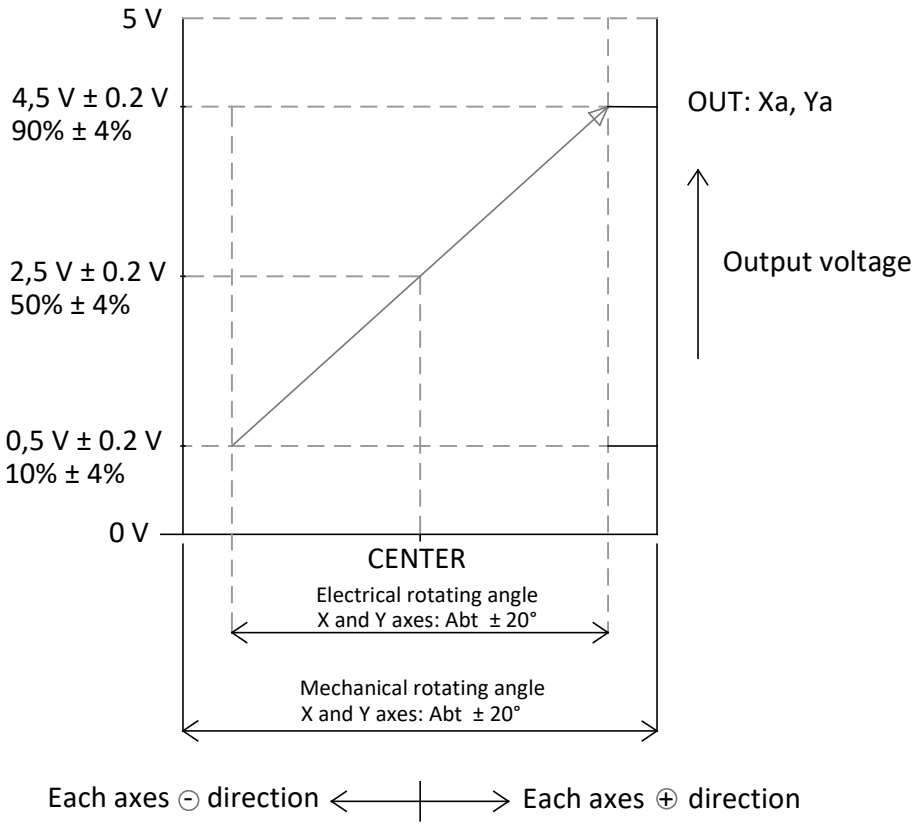
Panel cutout



Direction of lever opertion

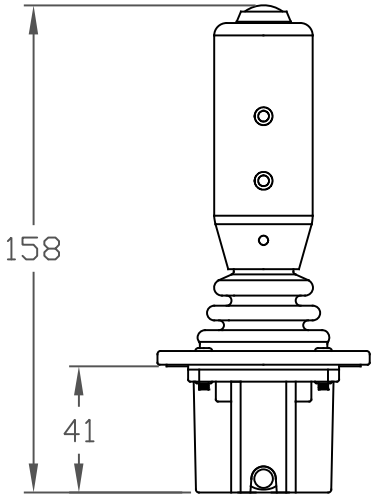


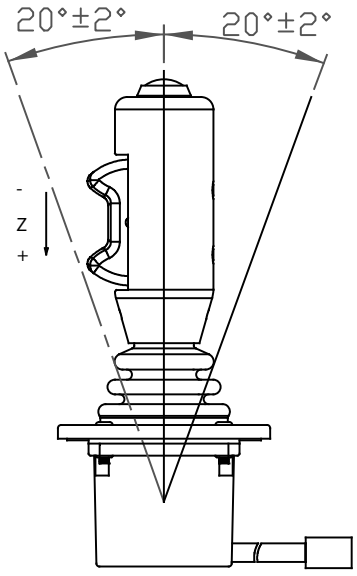
Output characteristics



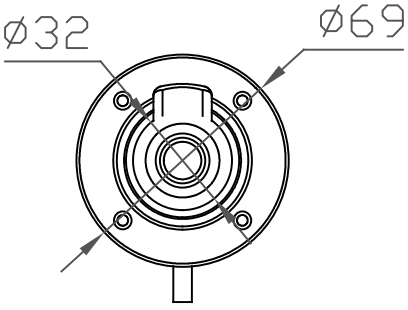
Terminal configuration			
DTM04-6P			
Pin	Function	Color	Part number
1	+5VDC - X, Y	Red	
2	XA	White	
3	YA	Blue	
4	-	-	
5	GND - X, Y	Black	
6	-	-	
Flaying Leads	PB	Grey	
	PB	Grey	

PEJZ Ragged multi-axis joystick

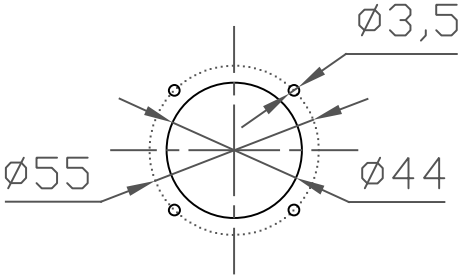




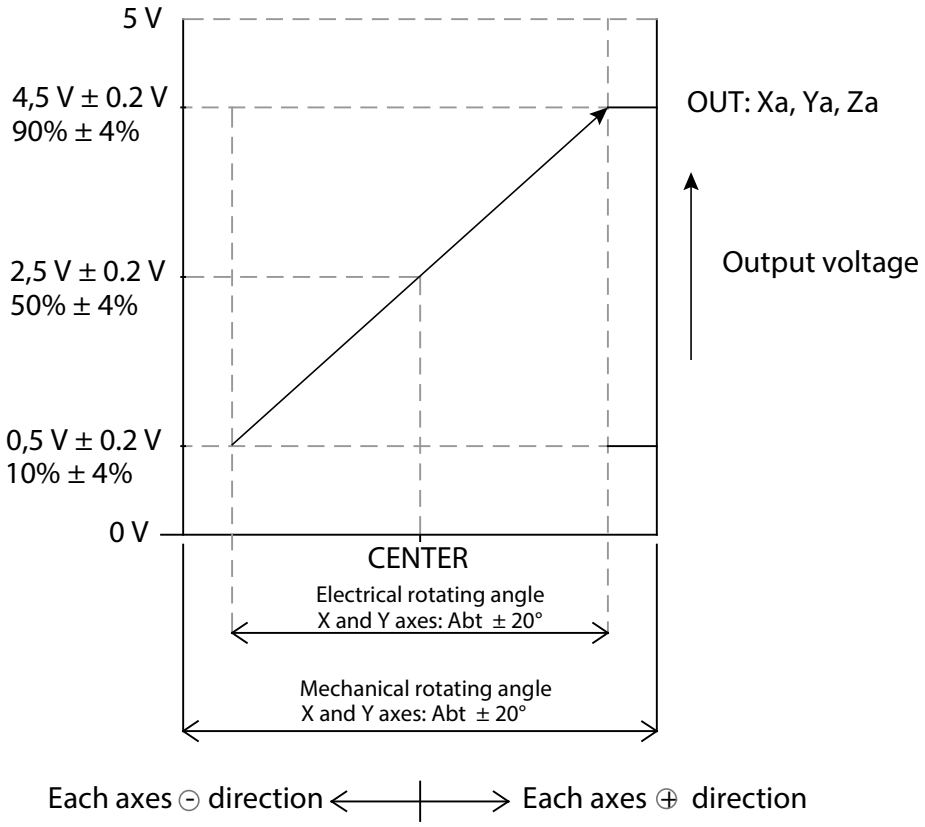
Bottom view



Panel



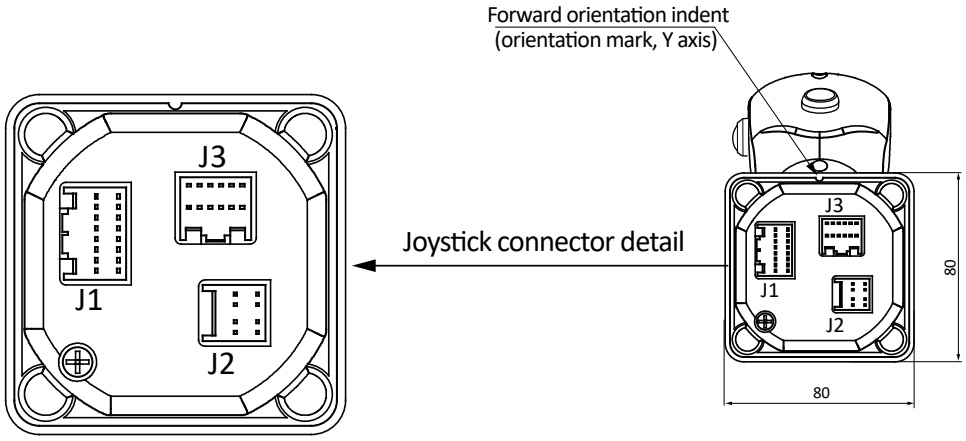
Output characteristics

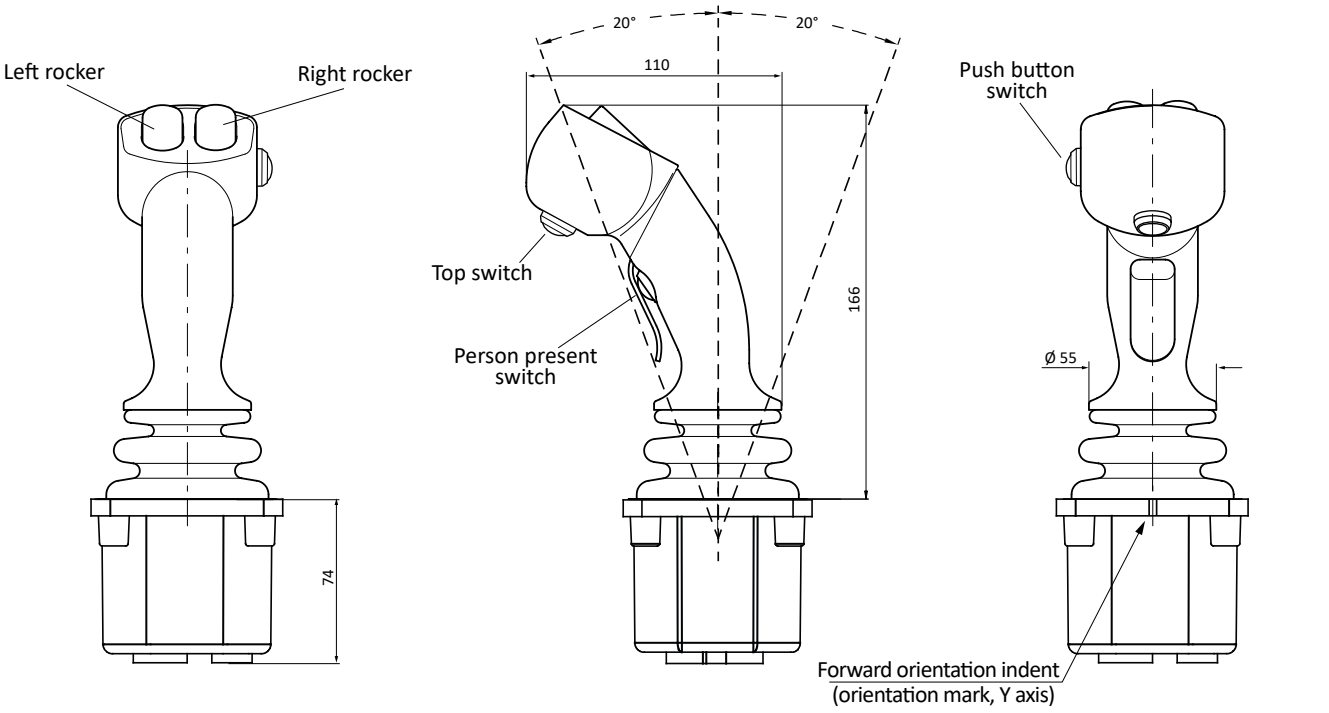


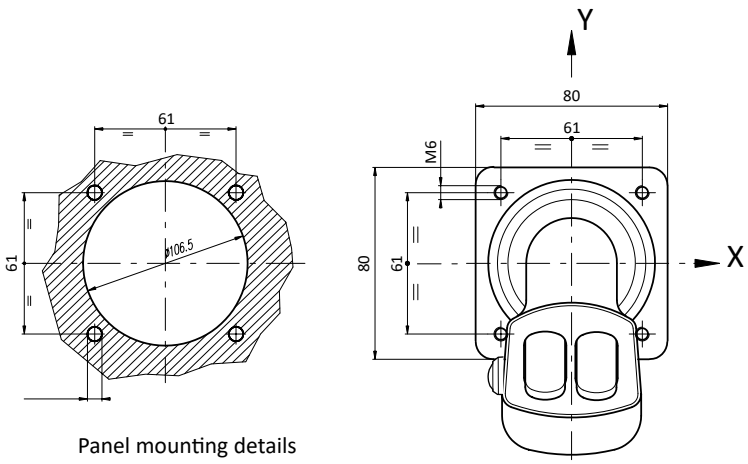
Terminal configuration			
DTM04-6P			
Pin	Function	Color	Part number
1	+5VDC - X, Y, Z	Red	
2	XA	White	
3	YA	Blue	
4	ZA	Yellow	
5	GND - X, Y, Z	Black	
6	-	-	
Flaying Leads	PB	Grey	
	PB	Grey	

OMFB
HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip - Right version
Code number: **PEJD2002B0D**
4 proportional axis, 2 on-off push button, person present switch







Panel mounting details

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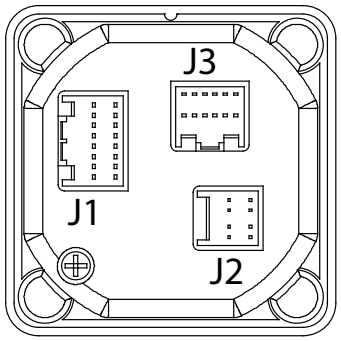
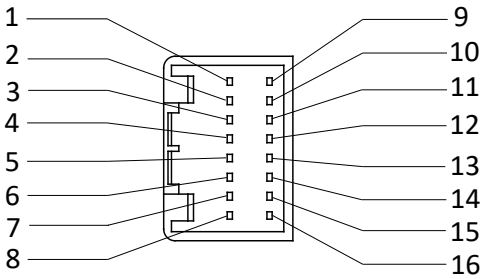
HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip
Code number: **PEJD2002B0D**
4 proportional axis, 2 on-off push button, person present switch

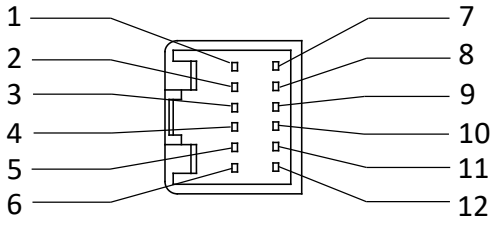


Pin	Function (potentiometer)
1	Y switch track N/O (lever forward +Y)
2	X switch track center on
3	X pot track left
4	X pot track wiper signal
5	X pot track right
6	X pot track center tap
7	X switch track common
8	X switch track N/O (lever left -X)
9	Y pot track backward
10	Y pot track wiper signal
11	Y pot track forward
12	Y pot track center tap
13	Y switch track common
14	Y switch track N/O (lever backward -Y)
15	X switch track N/O (lever right +X)
16	Y switch track center on

J1 connector

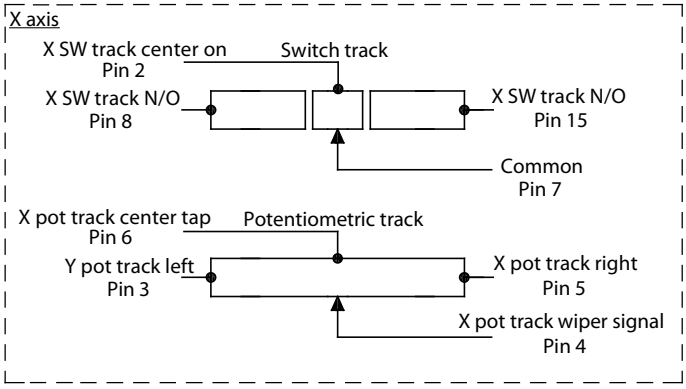


J3 connector

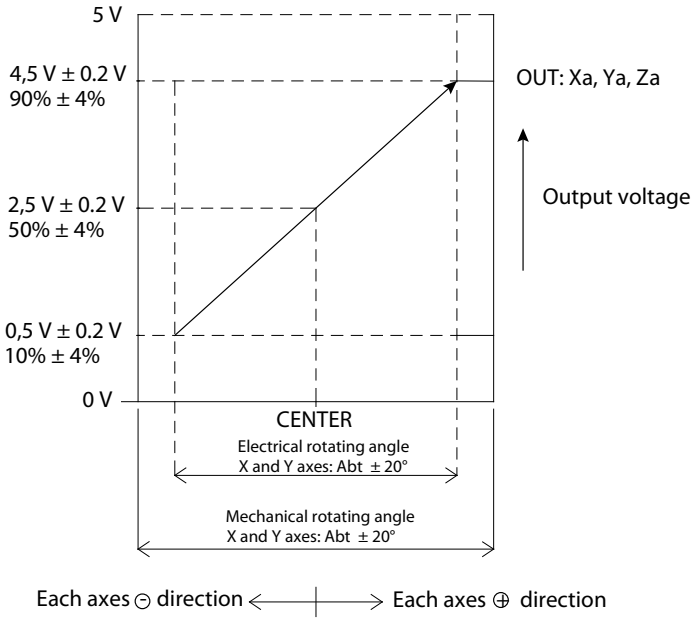


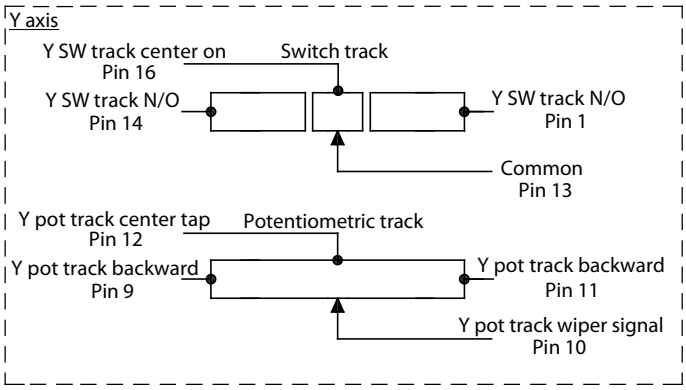
Pin	Function (Rocker)
1	Left switch backward
2	Left switch forward or horizontal left
3	-
4	-
5	Left output or horizontal output signal
6	Rocker center tap
7	Rocker positive power supply U+
8	-
9	-
10	Rocker negative power supply U-
11	Rocker switch common
12	-

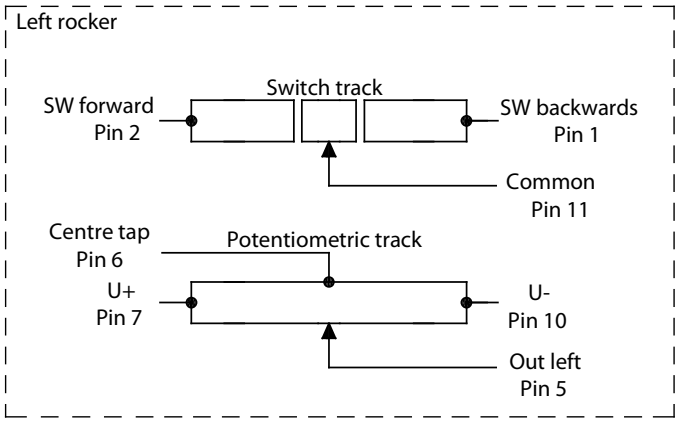
PEJD joystick controller multifunction grip - Right version
Code number: **PEJD2002B0D**
4 proportional axis, 2 on-off push button, person present switch



Output characteristics





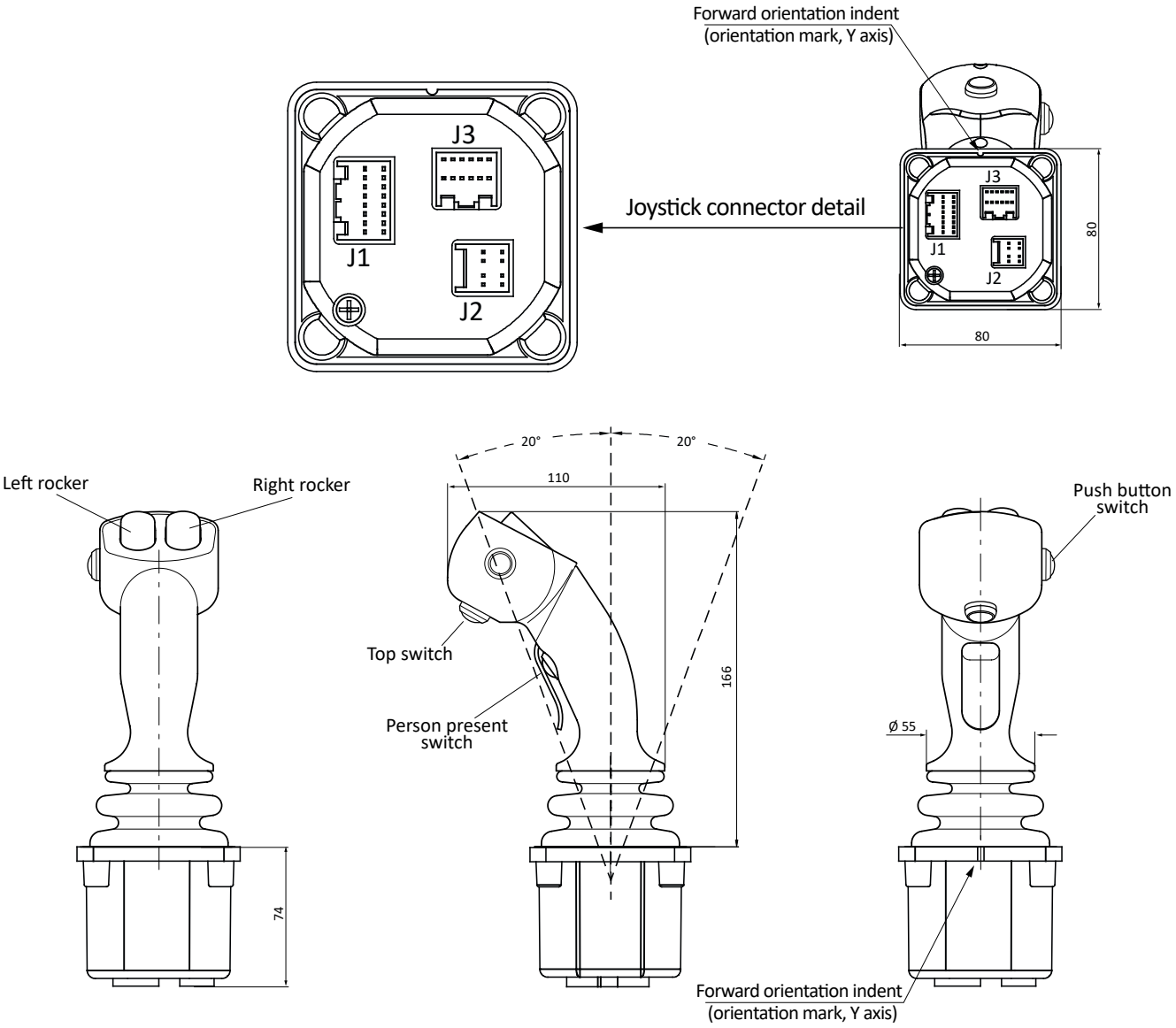


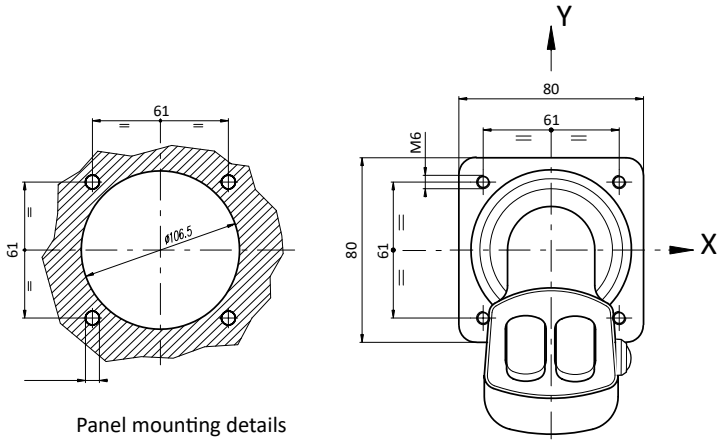
OMFB HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip
Code number: **PEJD2002B0D**
4 proportional axis, 2 on-off push button, person present switch

PERFORMANCE		
MECHANICAL		
Lever operating force		
breakout*	N	7 or 16
operating*	N	19 or 39 (full deflection)
maximum allowable**	N	390 (490 overload)
Lever mechanical angle		
single axis only	°	±20 forward/reverse
square gate	°	±20 in X and Y directions
Seat		preferred bias on axis
Expected life		15 million operations (5 million for potentiometer track version)
Weight	g	750 without handle fitted
* Measured at 55mm above upper flange face		** Measured 130mm above upper flange face
ENVIRONMENTAL		
Operating temperature	°C	-25 to +80 (-25 to +80 with microswitches)
Storage temperature	°C	-25 to +85 (-25 to +85 with microswitches)
Environmental protection(above the flange) (above the flange)		IP66 IEC 60529 (fitted with HKN handle)
Vibration		Level ±3g,10Hz to 200Hz (random) @ 3.6g(rms)
Shock		20g, 6mS, half sine profile
EMC immunity level		100V/m, 30MHz to 1GHz, 1KHz 80% sine wave modulation, EN50082-2 (1995)
EMC emissions level		Complies with EN50081-2 (1993), 150kHz to 30MHz, level B
ESD immunity level		IEC61000-4-2 level 4 8kV contact discharge, 15kV air discharge
ELECTRICAL – HALL EFFECT SENSOR		
Resolution		Infinite
Supply voltage range	Vdc	5 ± 0.5 regulated transient free
Over voltage (maximum)	Vdc	15 continuous
Reverse polarity (maximum)	Vdc	14.5
Output voltage span - options	Vdc	±25% span - nominal 1.1 to 3.9
		±30% span - nominal 1.0 to 4.0
		±40% span - nominal 0.5 to 4.5
Load impedance (minimum)	kΩ	5
Center voltage (no load)	%	48 - 52 of supply voltage
Current consumption	mA	13 per axis (6.5 per sensor)
Insulation resistance		Greater than 50MΩ at 50Vdc
Output sense		The dual outputs rise together in the same direction, increasing with lever forward (and right), decreasing with lever backward (and left)
Output matching		See maximum output difference diagram below
ELECTRICAL CONNECTIONS		
Mating 12 way connector and pins		SA48061 (AMP 040 12 way connector 174045-2; pins 175062-1)
Mating 12 way harness		P49779 (connector, pins and 380mm long cable)

PEJD joystick controller multifunction grip - Left version
Code number: **PEJD2002B0S**
4 proportional axis, 2 on-off push button, person present switch





Panel mounting details

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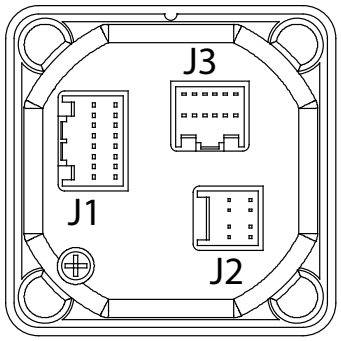
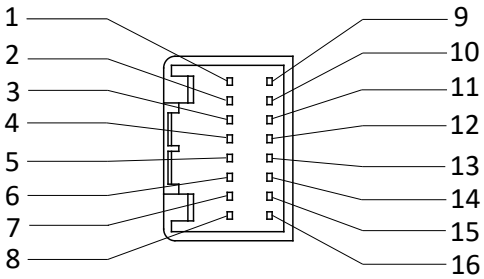
HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip - Left version
Code number: **PEJD2002B0S**
4 proportional axis, 2 on-off push button, person present switch

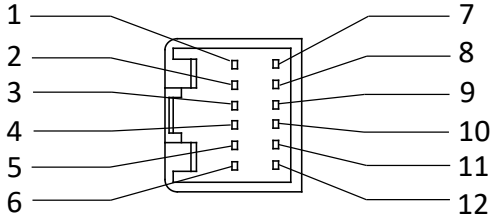


J1 connector



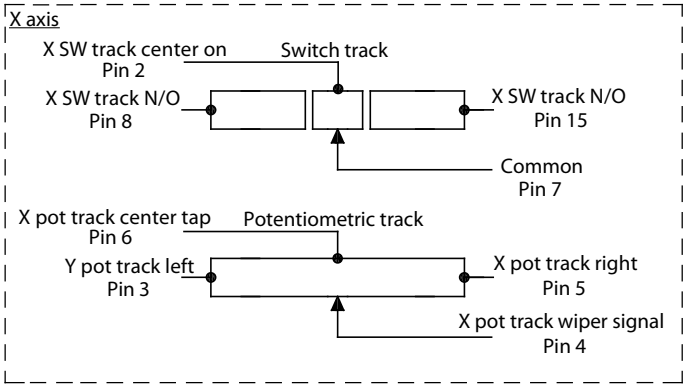
Pin	Function (potentiometer)
1	Y switch track N/O (lever forward +Y)
2	X switch track center on
3	X pot track left
4	X pot track wiper signal
5	X pot track right
6	X pot track center tap
7	X switch track common
8	X switch track N/O (lever left -X)
9	Y pot track backward
10	Y pot track wiper signal
11	Y pot track forward
12	Y pot track center tap
13	Y switch track common
14	Y switch track N/O (lever backward -Y)
15	X switch track N/O (lever right +X)
16	Y switch track center on

J3 connector

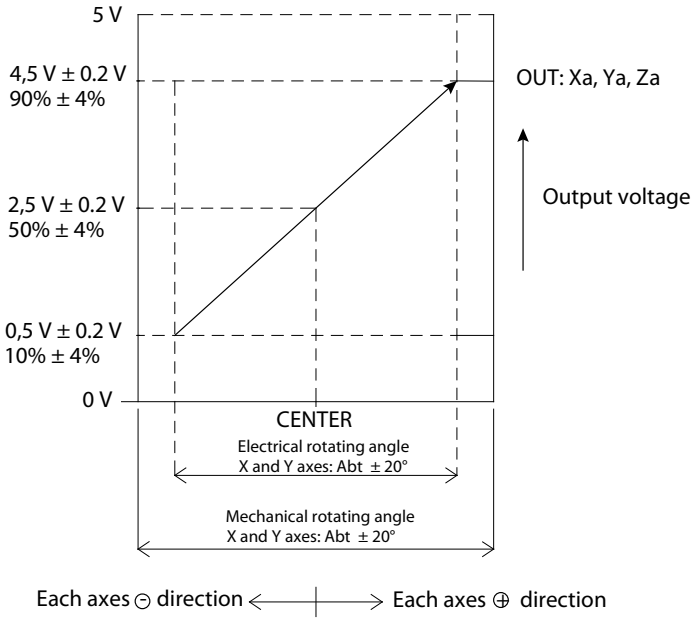


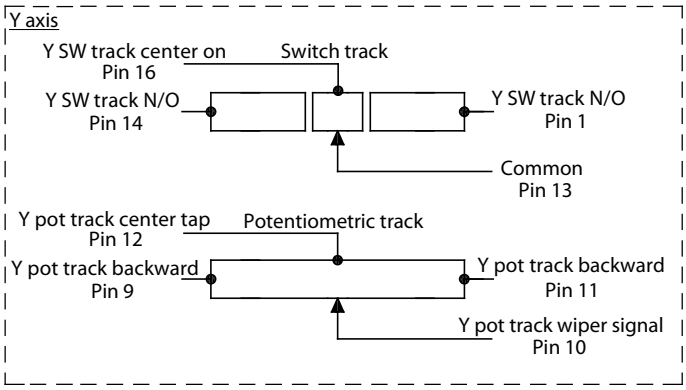
Pin	Function (Rocker)
1	Left switch backward
2	Left switch forward or horizontal left
3	-
4	-
5	Left output or horizontal output signal
6	Rocker center tap
7	Rocker positive power supply U+
8	-
9	-
10	Rocker negative power supply U-
11	Rocker switch common
12	-

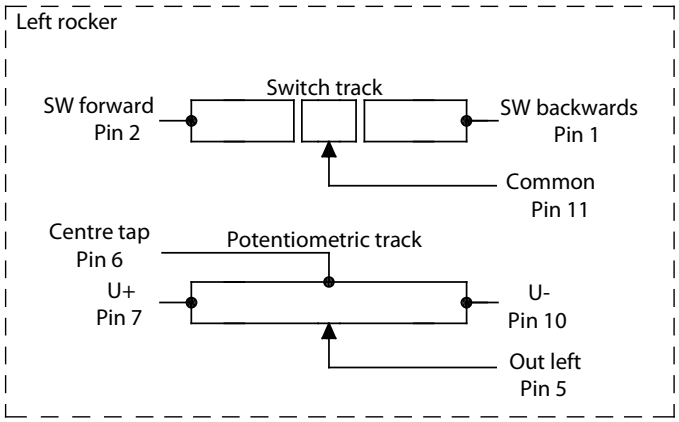
PEJD joystick controller multifunction grip - Left version
Code number: **PEJD2002B0S**
4 proportional axis, 2 on-off push button, person present switch



Output characteristics







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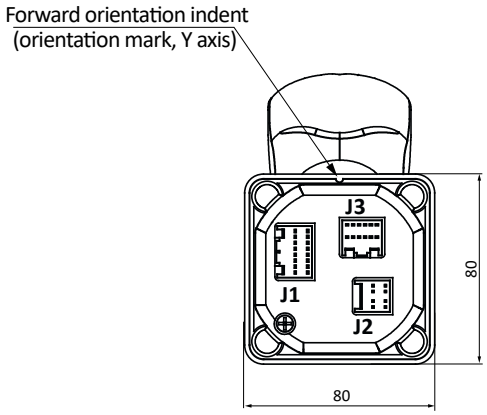
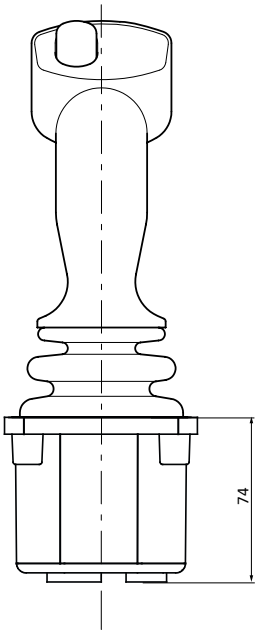
HYDRAULIC POWER CONTROL

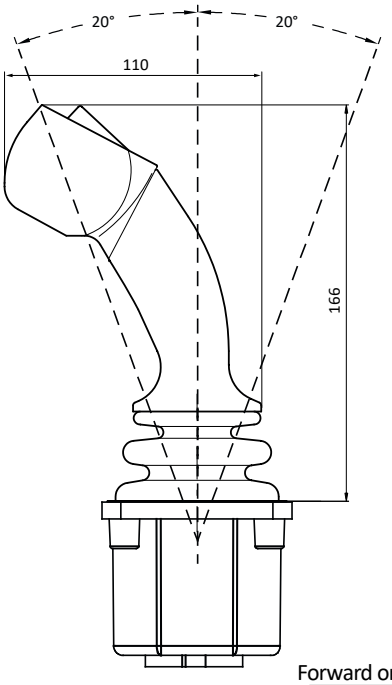
PEJD joystick controller multifunction grip - Left version
Code number: **PEJD2002B0S**
4 proportional axis, 2 on-off push button, person present switch

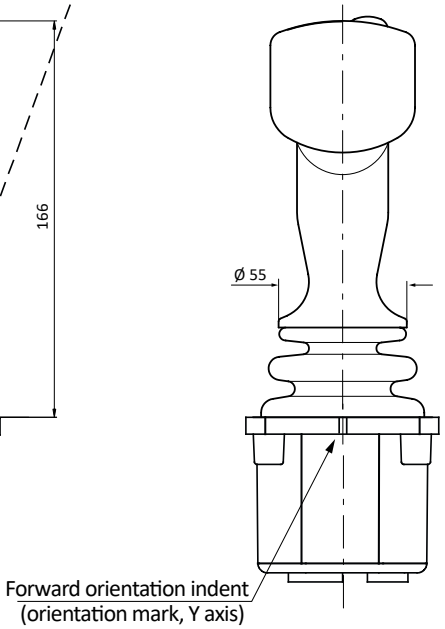
PERFORMANCE		
MECHANICAL		
Lever operating force		
breakout*	N	7 or 16
operating*	N	19 or 39 (full deflection)
maximum allowable**	N	390 (490 overload)
Lever mechanical angle		
single axis only	°	±20 forward/reverse
square gate	°	±20 in X and Y directions
Seat		preferred bias on axis
Expected life		15 million operations (5 million for potentiometer track version)
Weight	g	750 without handle fitted
* Measured at 55mm above upper flange face		** Measured 130mm above upper flange face
ENVIRONMENTAL		
Operating temperature	°C	-25 to +80 (-25 to +80 with microswitches)
Storage temperature	°C	-25 to +85 (-25 to +85 with microswitches)
Environmental protection(above the flange) (above the flange)		IP66 IEC 60529 (fitted with HKN handle)
Vibration		Level ±3g,10Hz to 200Hz (random) @ 3.6g(rms)
Shock		20g, 6mS, half sine profile
EMC immunity level		100V/m, 30MHz to 1GHz, 1KHz 80% sine wave modulation, EN50082-2 (1995)
EMC emissions level		Complies with EN50081-2 (1993), 150kHz to 30MHz, level B
ESD immunity level		IEC61000-4-2 level 4 8kV contact discharge, 15kV air discharge
ELECTRICAL – HALL EFFECT SENSOR		
Resolution		Infinite
Supply voltage range	Vdc	5 ± 0.5 regulated transient free
Over voltage (maximum)	Vdc	15 continuous
Reverse polarity (maximum)	Vdc	14.5
Output voltage span - options	Vdc	±25% span - nominal 1.1 to 3.9
		±30% span - nominal 1.0 to 4.0
		±40% span - nominal 0.5 to 4.5
Load impedance (minimum)	kΩ	5
Center voltage (no load)	%	48 - 52 of supply voltage
Current consumption	mA	13 per axis (6.5 per sensor)
Insulation resistance		Greater than 50MΩ at 50Vdc
Output sense		The dual outputs rise together in the same direction, increasing with lever forward (and right), decreasing with lever backward (and left)
Output matching		See maximum output difference diagram below
ELECTRICAL CONNECTIONS		
Mating 12 way connector and pins		SA48061 (AMP 040 12 way connector 174045-2; pins 175062-1)
Mating 12 way harness		P49779 (connector, pins and 380mm long cable)

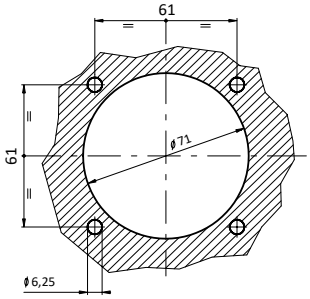
PEJD joystick controller multifunction grip - Right version
Code number: **PEJD2000L0D**
3 proportional axis



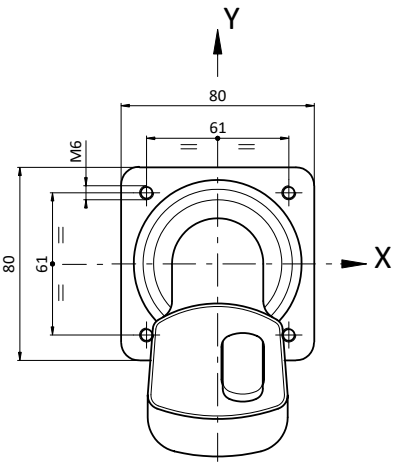








Panel mounting details



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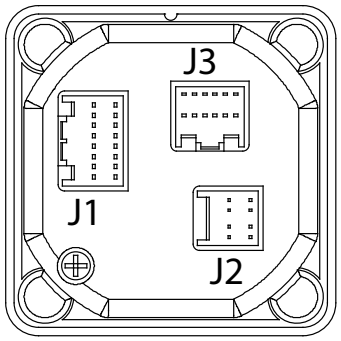
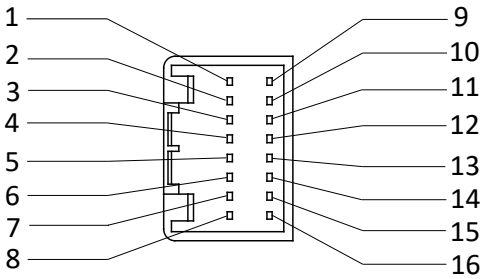
PEJD joystick controller multifunction grip
Code number: **PEJD2000L0D**
3 proportional axis



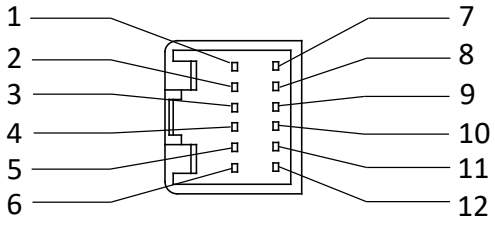
Pin	Function (potentiometer)
1	Y switch track N/O (lever forward +Y)
2	X switch track center on
3	X pot track left
4	X pot track wiper signal
5	X pot track right
6	X pot track center tap
7	X switch track common
8	X switch track N/O (lever left -X)
9	Y pot track backward
10	Y pot track wiper signal
11	Y pot track forward
12	Y pot track center tap
13	Y switch track common
14	Y switch track N/O (lever backward -Y)
15	X switch track N/O (lever right +X)
16	Y switch track center on

J1 connector



Pin	Function (Rocker)
1	Left switch backward
2	Left switch forward or horizontal left
3	-
4	-
5	Left output or horizontal output signal
6	Rocker center tap
7	Rocker positive power supply U+
8	-
9	-
10	Rocker negative power supply U-
11	Rocker switch common
12	-

J3 connector



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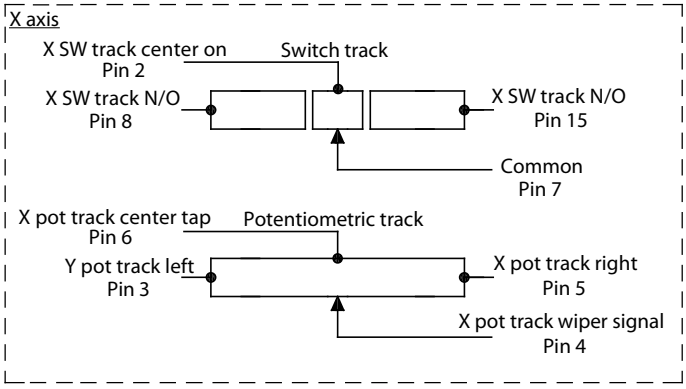
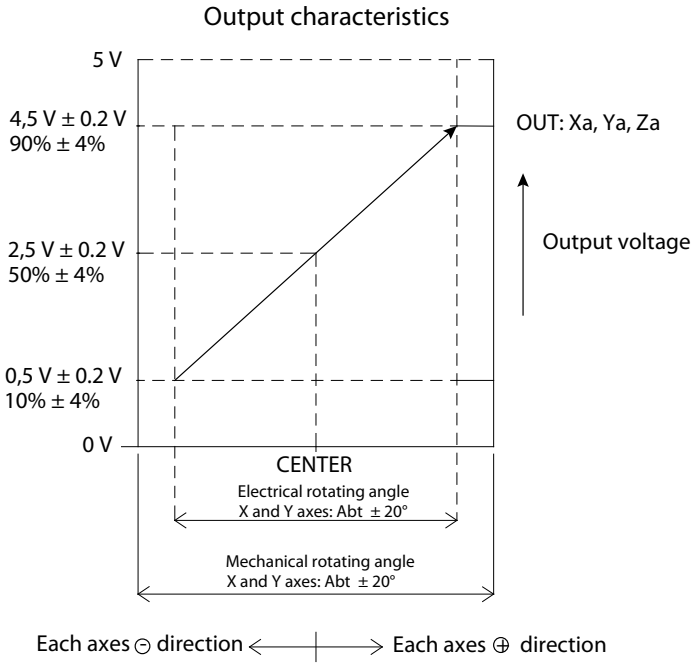
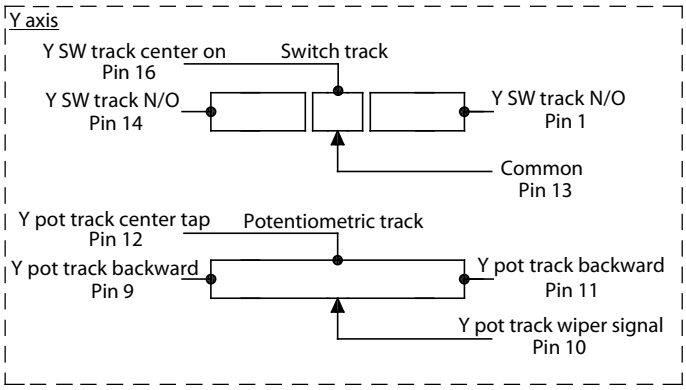
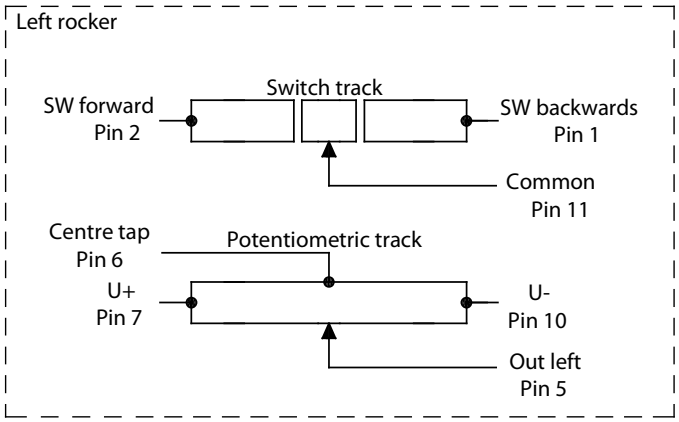
HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip - Right version
Code number: **PEJD2000L0D**
3 proportional axis









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HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip - Right version
Code number: **PEJD2000L0D**
3 proportional axis

PERFORMANCE		
MECHANICAL		
Lever operating force		
breakout*	N	7 or 16
operating*	N	19 or 39 (full deflection)
maximum allowable**	N	390 (490 overload)
Lever mechanical angle		
single axis only	°	±20 forward/reverse
square gate	°	±20 in X and Y directions
Seat		preferred bias on axis
Expected life		15 million operations (5 million for potentiometer track version)
Weight	g	750 without handle fitted
* Measured at 55mm above upper flange face		** Measured 130mm above upper flange face
ENVIRONMENTAL		
Operating temperature	°C	-25 to +80 (-25 to +80 with microswitches)
Storage temperature	°C	-25 to +85 (-25 to +85 with microswitches)
Environmental protection(above the flange) (above the flange)		IP66 IEC 60529 (fitted with HKN handle)
Vibration		Level ±3g,10Hz to 200Hz (random) @ 3.6g(rms)
Shock		20g, 6mS, half sine profile
EMC immunity level		100V/m, 30MHz to 1GHz, 1KHz 80% sine wave modulation, EN50082-2 (1995)
EMC emissions level		Complies with EN50081-2 (1993), 150kHz to 30MHz, level B
ESD immunity level		IEC61000-4-2 level 4 8kV contact discharge, 15kV air discharge
ELECTRICAL – HALL EFFECT SENSOR		
Resolution		Infinite
Supply voltage range	Vdc	5 ± 0.5 regulated transient free
Over voltage (maximum)	Vdc	15 continuous
Reverse polarity (maximum)	Vdc	14.5
Output voltage span - options	Vdc	±25% span - nominal 1.1 to 3.9
		±30% span - nominal 1.0 to 4.0
		±40% span - nominal 0.5 to 4.5
Load impedance (minimum)	kΩ	5
Center voltage (no load)	%	48 - 52 of supply voltage
Current consumption	mA	13 per axis (6.5 per sensor)
Insulation resistance		Greater than 50MΩ at 50Vdc
Output sense		The dual outputs rise together in the same direction, increasing with lever forward (and right), decreasing with lever backward (and left)
Output matching		See maximum output difference diagram below
ELECTRICAL CONNECTIONS		
Mating 12 way connector and pins		SA48061 (AMP 040 12 way connector 174045-2; pins 175062-1)
Mating 12 way harness		P49779 (connector, pins and 380mm long cable)

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HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip - Right version
Code number: **PEJD2000L0D**
3 proportional axis

ELECTRICAL – POTENTIOMETER TRACK		
Resolution		Virtually infinite
Track resistance ±20%	KΩ	1.8, 2, 2.9, 5
Track operating angle	°	±18
Output voltage range	%	0-100, 10-90, 25-75 of input
Center tap voltage	%	48 - 52 of applied voltage
Center tap angle	°	±2.5
Center tap to switch alignment	°	Within 0.5
Supply voltage maximum	Vdc	32
Wiper circuit impedance	MΩ	1 minimum recommended*
Power dissipation @ 25°C	W	0.25
Insulation resistance		Greater than 15MΩ at 50Vdc
* The long life resistive elements require a high impedance load in the wiper circuit to minimise the current flowing through the wiper for optimum life conditions		
ELECTRICAL – DIRECTIONAL OR CENTER SWITCH (LOW CURRENT)		Not available with CANbus output
Switch operating angle	°	1.5 or 5 either side of center
Supply voltage maximum	Vdc	35
Load current maximum	mA	200 resistive
ELECTRICAL CONNECTIONS		All primary potentiometer track and directional/center switch connections terminate in a 16-way AMP 040 series multi-lock connector in the joystick base. Secondary potentiometer track connections terminate in an 8-way AMP 040 series multi-lock connector.
Mating 16 way connector and pins		SA47931 (AMP 040 16 way connector 174046-2; Pins 175062-1)
Mating 16 way harness		P49780 (connector, pins and 380mm long cable)
Mating 8 way connector and pins		SA304522 (AMP 040 8 way connector 174044-2; pins 175062-1)
Mating 8 way harness		P303083 (connector, pins and 380mm long cable)
ELECTRICAL MICROSWITCH		Not available with CANbus output
Switch configuration		Two switches per axis Normally open at lever center position
Switch operating angle	°	2 to 5 either side of center
Contact rating		3A @125Vac, 2A @ 30Vdc
Switch life minimum		100,000 cycles, cycled at 1Hz, 1A and 12Vdc
Operating temperature	°C	-25 to +85

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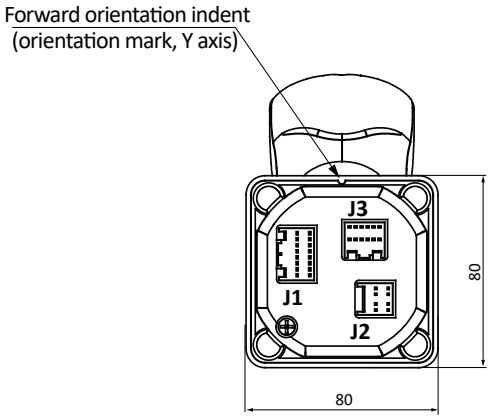
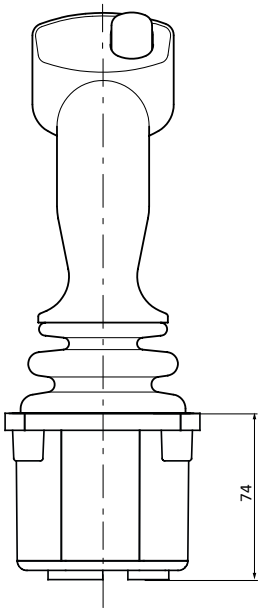
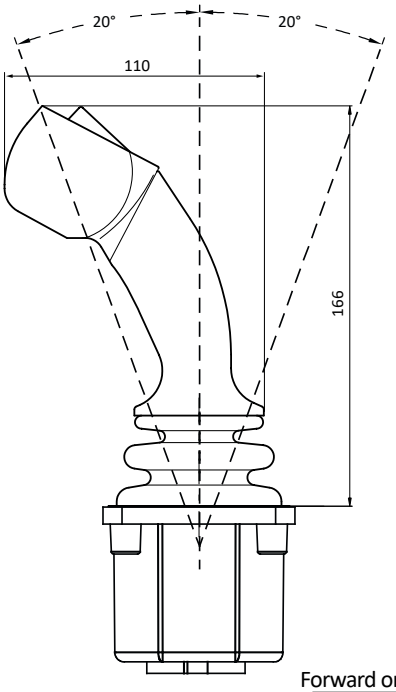
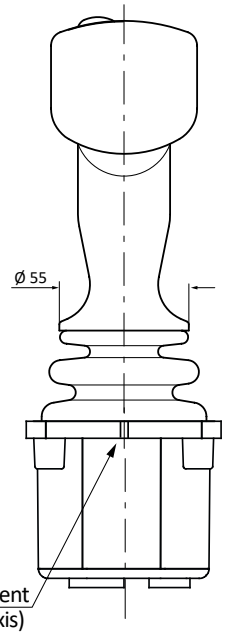
HYDRAULIC POWER CONTROL

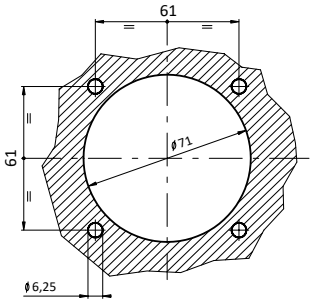
PEJD joystick controller multifunction grip - Left version
Code number: **PEJD2000R0S**
3 proportional axis



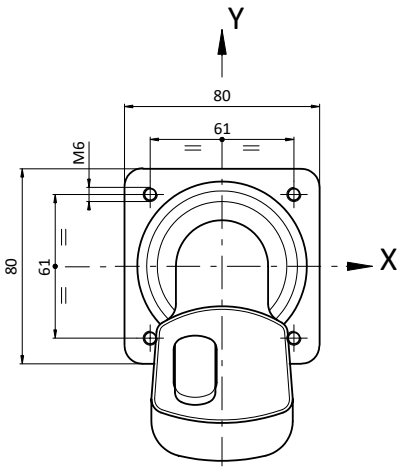








Panel mounting details



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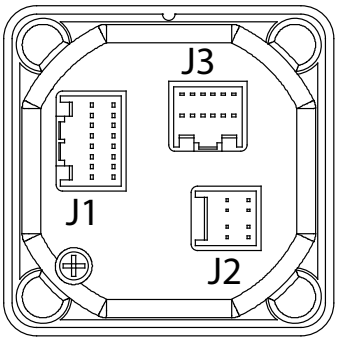
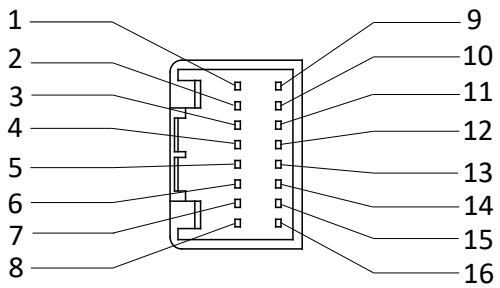
HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip
Code number: **PEJD2000R0S**
3 proportional axis



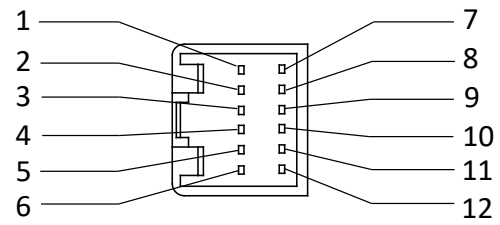
Pin	Function (potentiometer)
1	Y switch track N/O (lever forward +Y)
2	X switch track center on
3	X pot track left
4	X pot track wiper signal
5	X pot track right
6	X pot track center tap
7	X switch track common
8	X switch track N/O (lever left -X)
9	Y pot track backward
10	Y pot track wiper signal
11	Y pot track forward
12	Y pot track center tap
13	Y switch track common
14	Y switch track N/O (lever backward -Y)
15	X switch track N/O (lever right +X)
16	Y switch track center on

J1 connector

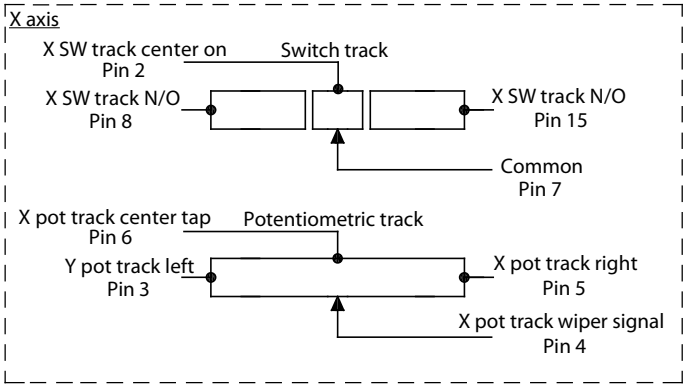


Pin	Function (Rocker)
1	-
2	-
3	Right switch forward
4	Right switch backward
5	-
6	Rocker center tap
7	Rocker positive power supply U+
8	-
9	Right output signal
10	Rocker negative power supply U-
11	Rocker switch common
12	-

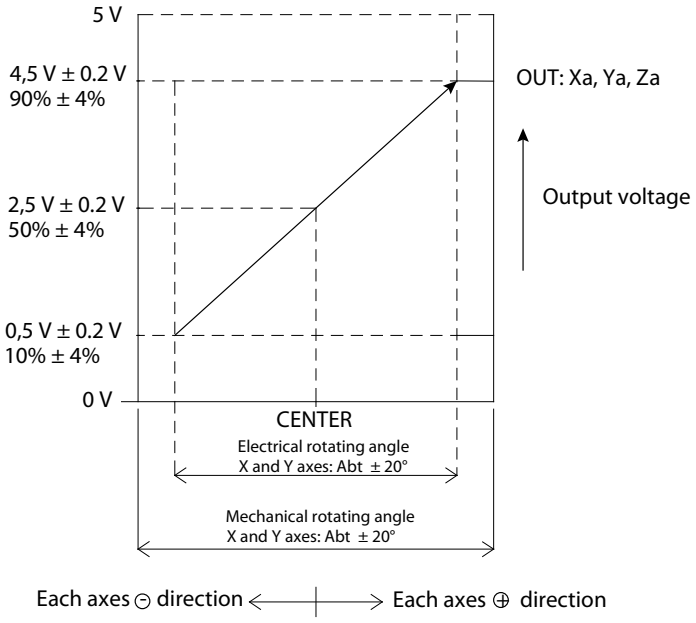
J3 connector

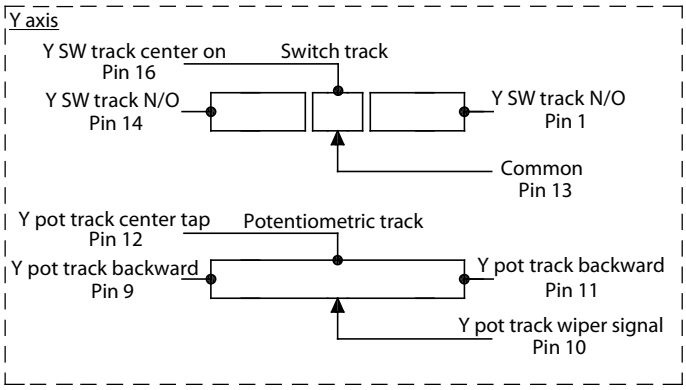


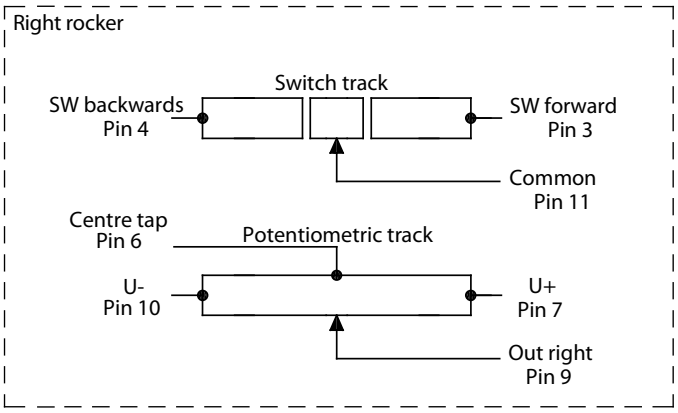
PEJD joystick controller multifunction grip - Right version
Code number: **PEJD2000R0S**
3 proportional axis



Output characteristics







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HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip - Left version
Code number: **PEJD2000R0S**
3 proportional axis

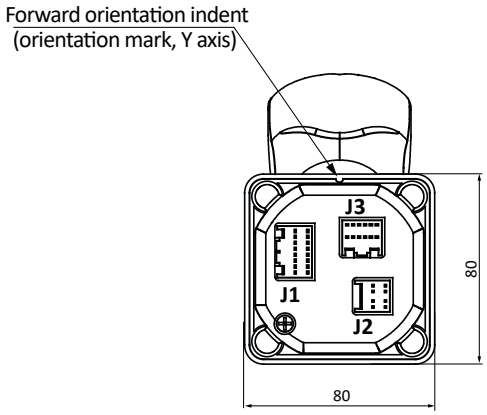
PERFORMANCE		
MECHANICAL		
Lever operating force		
breakout*	N	7 or 16
operating*	N	19 or 39 (full deflection)
maximum allowable**	N	390 (490 overload)
Lever mechanical angle		
single axis only	°	±20 forward/reverse
square gate	°	±20 in X and Y directions
Seat		preferred bias on axis
Expected life		15 million operations (5 million for potentiometer track version)
Weight	g	750 without handle fitted
* Measured at 55mm above upper flange face		** Measured 130mm above upper flange face
ENVIRONMENTAL		
Operating temperature	°C	-25 to +80 (-25 to +80 with microswitches)
Storage temperature	°C	-25 to +85 (-25 to +85 with microswitches)
Environmental protection(above the flange) (above the flange)		IP66 IEC 60529 (fitted with HKN handle)
Vibration		Level ±3g,10Hz to 200Hz (random) @ 3.6g(rms)
Shock		20g, 6mS, half sine profile
EMC immunity level		100V/m, 30MHz to 1GHz, 1KHz 80% sine wave modulation, EN50082-2 (1995)
EMC emissions level		Complies with EN50081-2 (1993), 150kHz to 30MHz, level B
ESD immunity level		IEC61000-4-2 level 4 8kV contact discharge, 15kV air discharge
ELECTRICAL – HALL EFFECT SENSOR		
Resolution		Infinite
Supply voltage range	Vdc	5 ± 0.5 regulated transient free
Over voltage (maximum)	Vdc	15 continuous
Reverse polarity (maximum)	Vdc	14.5
Output voltage span - options	Vdc	±25% span - nominal 1.1 to 3.9
		±30% span - nominal 1.0 to 4.0
		±40% span - nominal 0.5 to 4.5
Load impedance (minimum)	kΩ	5
Center voltage (no load)	%	48 - 52 of supply voltage
Current consumption	mA	13 per axis (6.5 per sensor)
Insulation resistance		Greater than 50MΩ at 50Vdc
Output sense		The dual outputs rise together in the same direction, increasing with lever forward (and right), decreasing with lever backward (and left)
Output matching		See maximum output difference diagram below
ELECTRICAL CONNECTIONS		
Mating 12 way connector and pins		SA48061 (AMP 040 12 way connector 174045-2; pins 175062-1)
Mating 12 way harness		P49779 (connector, pins and 380mm long cable)

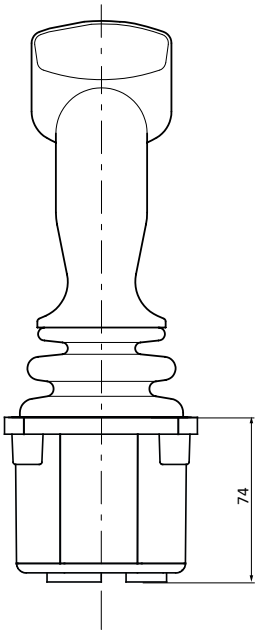
OMFB HYDRAULIC POWER CONTROL

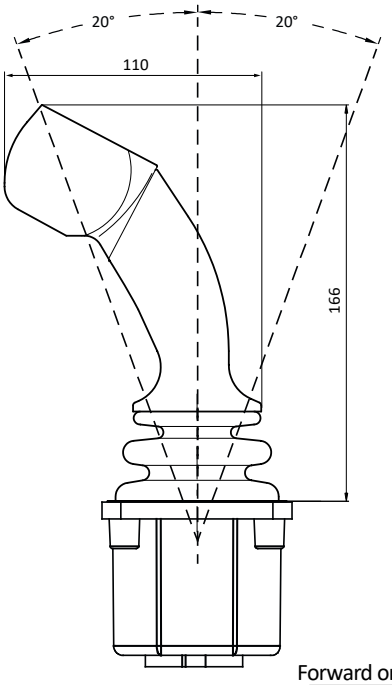
PEJD joystick controller multifunction grip - Left version
Code number: **PEJD2000R0S**
3 proportional axis

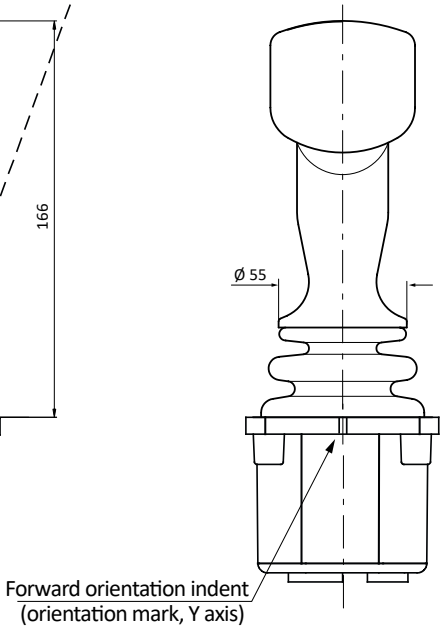
ELECTRICAL – POTENTIOMETER TRACK		
Resolution		Virtually infinite
Track resistance ±20%	KΩ	1.8, 2, 2.9, 5
Track operating angle	°	±18
Output voltage range	%	0-100, 10-90, 25-75 of input
Center tap voltage	%	48 - 52 of applied voltage
Center tap angle	°	±2.5
Center tap to switch alignment	°	Within 0.5
Supply voltage maximum	Vdc	32
Wiper circuit impedance	MΩ	1 minimum recommended*
Power dissipation @ 25°C	W	0.25
Insulation resistance		Greater than 15MΩ at 50Vdc
* The long life resistive elements require a high impedance load in the wiper circuit to minimise the current flowing through the wiper for optimum life conditions		
ELECTRICAL – DIRECTIONAL OR CENTER SWITCH (LOW CURRENT)		Not available with CANbus output
Switch operating angle	°	1.5 or 5 either side of center
Supply voltage maximum	Vdc	35
Load current maximum	mA	200 resistive
ELECTRICAL CONNECTIONS		All primary potentiometer track and directional/center switch connections terminate in a 16-way AMP 040 series multi-lock connector in the joystick base. Secondary potentiometer track connections terminate in an 8-way AMP 040 series multi-lock connector.
Mating 16 way connector and pins		SA47931 (AMP 040 16 way connector 174046-2; Pins 175062-1)
Mating 16 way harness		P49780 (connector, pins and 380mm long cable)
Mating 8 way connector and pins		SA304522 (AMP 040 8 way connector 174044-2; pins 175062-1)
Mating 8 way harness		P303083 (connector, pins and 380mm long cable)
ELECTRICAL MICROSWITCH		Not available with CANbus output
Switch configuration		Two switches per axis Normally open at lever center position
Switch operating angle	°	2 to 5 either side of center
Contact rating		3A @125Vac, 2A @ 30Vdc
Switch life minimum		100,000 cycles, cycled at 1Hz, 1A and 12Vdc
Operating temperature	°C	-25 to +85

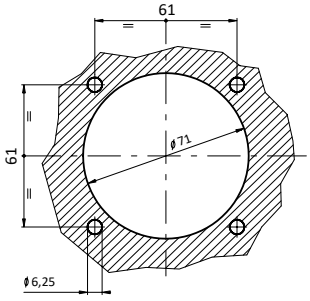
PEJD joystick controller multifunction grip
Code number: **PEJD2000000**
2 proportional axis



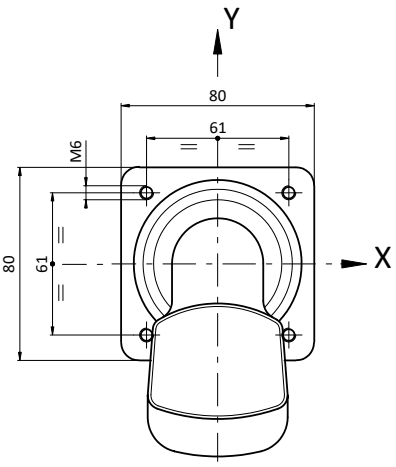




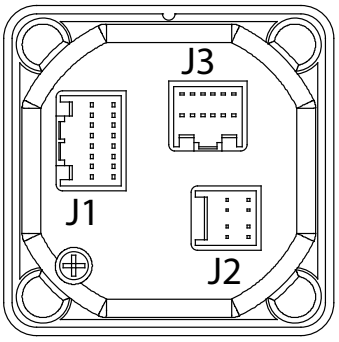




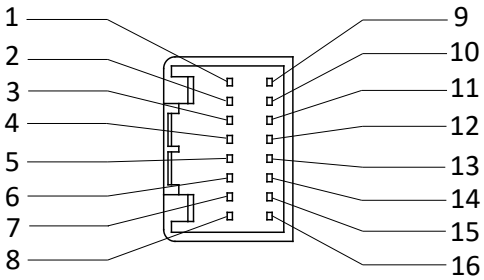
Panel mounting details



PEJD joystick controller multifunction grip
Code number: **PEJD2000000**
2 proportional axis

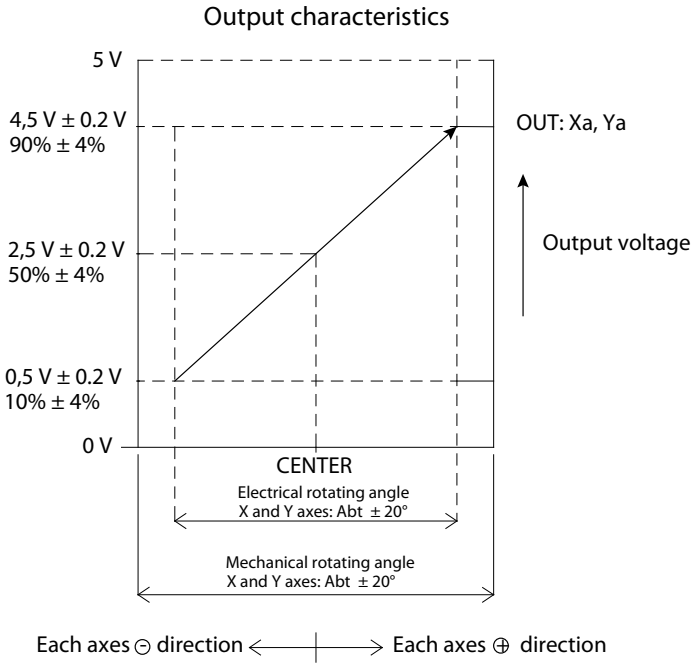


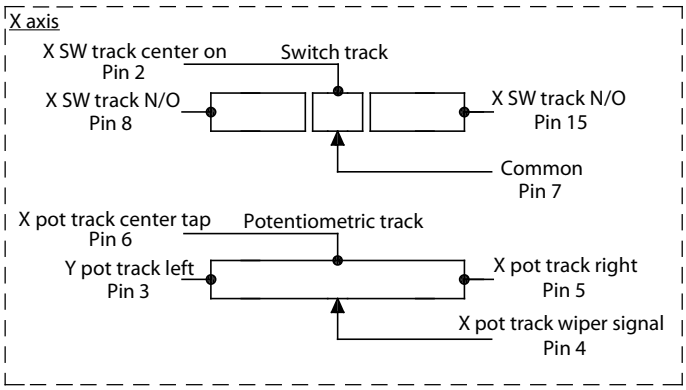
J1 connector

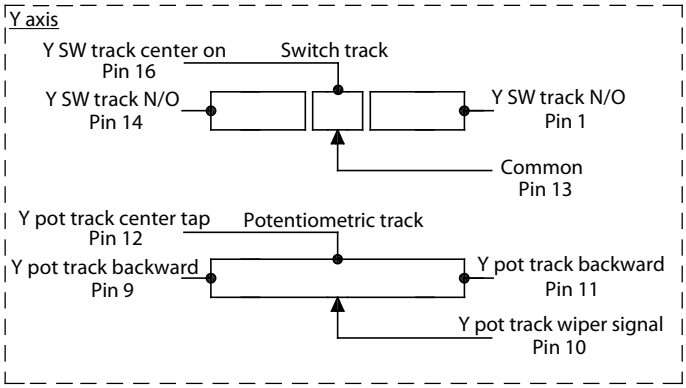


Pin	Function (potentiometer)
1	Y switch track N/O (lever forward +Y)
2	X switch track center on
3	X pot track left
4	X pot track wiper signal
5	X pot track right
6	X pot track center tap
7	X switch track common
8	X switch track N/O (lever left -X)
9	Y pot track backward
10	Y pot track wiper signal
11	Y pot track forward
12	Y pot track center tap
13	Y switch track common
14	Y switch track N/O (lever backward -Y)
15	X switch track N/O (lever right +X)
16	Y switch track center on

PEJD joystick controller multifunction grip
Code number: **PEJD2000000**
2 proportional axis







OMFB
HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip
Code number: **PEJD2000000**
2 proportional axis

PERFORMANCE		
MECHANICAL		
Lever operating force		
breakout*	N	7 or 16
operating*	N	19 or 39 (full deflection)
maximum allowable**	N	390 (490 overload)
Lever mechanical angle		
single axis only	°	±20 forward/reverse
square gate	°	±20 in X and Y directions
Seat		preferred bias on axis
Expected life		15 million operations (5 million for potentiometer track version)
Weight	g	750 without handle fitted
* Measured at 55mm above upper flange face		** Measured 130mm above upper flange face
ENVIRONMENTAL		
Operating temperature	°C	-25 to +80 (-25 to +80 with microswitches)
Storage temperature	°C	-25 to +85 (-25 to +85 with microswitches)
Environmental protection(above the flange) (above the flange)		IP66 IEC 60529 (fitted with HKN handle)
Vibration		Level ±3g,10Hz to 200Hz (random) @ 3.6g(rms)
Shock		20g, 6mS, half sine profile
EMC immunity level		100V/m, 30MHz to 1GHz, 1KHz 80% sine wave modulation, EN50082-2 (1995)
EMC emissions level		Complies with EN50081-2 (1993), 150kHz to 30MHz, level B
ESD immunity level		IEC61000-4-2 level 4 8kV contact discharge, 15kV air discharge
ELECTRICAL – HALL EFFECT SENSOR		
Resolution		Infinite
Supply voltage range	Vdc	5 ± 0.5 regulated transient free
Over voltage (maximum)	Vdc	15 continuous
Reverse polarity (maximum)	Vdc	14.5
Output voltage span - options	Vdc	±25% span - nominal 1.1 to 3.9
		±30% span - nominal 1.0 to 4.0
		±40% span - nominal 0.5 to 4.5
Load impedance (minimum)	kΩ	5
Center voltage (no load)	%	48 - 52 of supply voltage
Current consumption	mA	13 per axis (6.5 per sensor)
Insulation resistance		Greater than 50MΩ at 50Vdc
Output sense		The dual outputs rise together in the same direction, increasing with lever forward (and right), decreasing with lever backward (and left)
Output matching		See maximum output difference diagram below
ELECTRICAL CONNECTIONS		
Mating 12 way connector and pins		SA48061 (AMP 040 12 way connector 174045-2; pins 175062-1)
Mating 12 way harness		P49779 (connector, pins and 380mm long cable)

OMFB HYDRAULIC POWER CONTROL

PEJD joystick controller multifunction grip
Code number: **PEJD2000000**
2 proportional axis

ELECTRICAL – POTENTIOMETER TRACK		
Resolution		Virtually infinite
Track resistance ±20%	KΩ	1.8, 2, 2.9, 5
Track operating angle	°	±18
Output voltage range	%	0-100, 10-90, 25-75 of input
Center tap voltage	%	48 - 52 of applied voltage
Center tap angle	°	±2.5
Center tap to switch alignment	°	Within 0.5
Supply voltage maximum	Vdc	32
Wiper circuit impedance	MΩ	1 minimum recommended*
Power dissipation @ 25°C	W	0.25
Insulation resistance		Greater than 15MΩ at 50Vdc
* The long life resistive elements require a high impedance load in the wiper circuit to minimise the current flowing through the wiper for optimum life conditions		
ELECTRICAL – DIRECTIONAL OR CENTER SWITCH (LOW CURRENT)		Not available with CANbus output
Switch operating angle	°	1.5 or 5 either side of center
Supply voltage maximum	Vdc	35
Load current maximum	mA	200 resistive
ELECTRICAL CONNECTIONS		All primary potentiometer track and directional/center switch connections terminate in a 16-way AMP 040 series multi-lock connector in the joystick base. Secondary potentiometer track connections terminate in an 8-way AMP 040 series multi-lock connector.
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ELECTRICAL MICROSWITCH		Not available with CANbus output
Switch configuration		Two switches per axis Normally open at lever center position
Switch operating angle	°	2 to 5 either side of center
Contact rating		3A @125Vac, 2A @ 30Vdc
Switch life minimum		100,000 cycles, cycled at 1Hz, 1A and 12Vdc
Operating temperature	°C	-25 to +85

OMFB
HYDRAULIC POWER CONTROL

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI4110808**

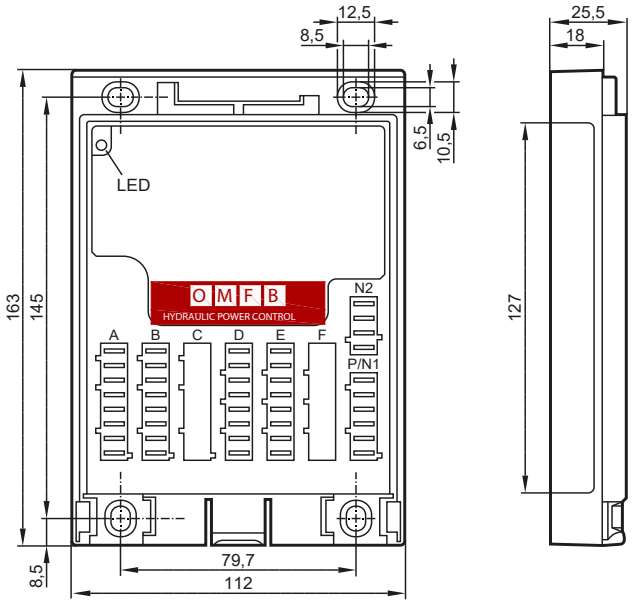
Mobile controller

8 inputs
8 outputs

2 CAN interfaces

Programming
to IEC 61131-3

8...32 V DC



Technical data	Modular control system Usable as CANopen master or intelligent I/O module
Mechanical data	
Housing	plastic housing (black)
Dimensions (H x W x D) without cover with EC0401 cover with EC0402 cover and BasicDisplay CR0451	163 x 112 x 25.5 mm 163 x 112 x 68 mm 163 x 112 x 73.4 mm
Installation	fixing by means of 4 M4 screws to DIN 912 or DIN 7984 and 4 tubular rivets to DIN 7340 (tubular rivets are supplied)
Connection	AMP blade male terminals 6.3 mm, to be clipped into place and thus vibrationresistant, protected against reverse polarity contacts AMP timer, CuZn pre-tin-plated core cross-section 0.5...2.5 mm²
Inputs Outputs Operating voltage , CAN bus	2 x 8-pole 2 x 8-pole 1 x 6-pole, 1 x 4-pole
Protection	IP 20 (with cover and cable seal IP 54)
Operating/storage temperature	-40...85° C / -40...85° C
Weight	0.30 kg
Electrical data	
Operating voltage	8...32 V DC
Current consumption	45 mA (at 24 V DC)
Overvoltage Undervoltage detection Undervoltage shutdown	36 V for t ≤ 10 s if U_B ≤ 7.8 V if U_B ≤ 7.0 V
Processor	Freescale PowerPC, 50 MHz
Memory (total)	592 Kbytes RAM / 1536 Kbytes Flash / 1 Kbyte FRAM
Memory allocation	see BasicController*plus* system manual www.ifm.com → Data sheet search → e.g. CR0411 → Additional data
Device monitoring	Undervoltage monitoring Watchdog function Checksum test for program and system Excess temperature monitoring

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI4110808**

Technical data

CAN interfaces 1/2	CAN interface 2.0 A/B, ISO 11898
Baud rate	20 Kbits/s...1 Mbit/s (default CAN1: 250 Kbits/s, CAN2: 250 Kbits/s)
Communication profi le	CANopen, CiA DS 301 version 4, CiA DS 401 version 1.4 or SAE J 1939 or free protocol
Software/programming	
Programming system	CODESYS version 2.3 (IEC 61131-3)
Inputs	8 (configurable)

Configurations

Number	Description	
4	digital for positive/negative sensor signals analogue (0...10/32 V DC, 0...20 mA, ratiometric) frequency (≤ 30 kHz)	B_L/B_H A FRQ
4	digital for positive sensor signals resistance measurement (0.016...30 kΩ)	B_L R

positive sensor signals have diagnostic capabilities

Outputs	8 (configurable)

Configurations

Number	Description	
4	positive switching (high side) PWM output (20…250 Hz), 2.5 A, current-controlled, 0.02…2.5 A, diagnosis	BH PWM PWM-I
4	positive switching (high side) negative switching (low side), 4 A PWM output (20…250 Hz), 4 A, diagnosis current-controlled, 0.02…4 A, diagnosis H-bridge function	BH B_L PWM PWM-I H bridge

Status LED	two-colour LED (red/green)

Operating states (preset)

Colour	Status	Description
–	permanently off	no operating voltage
orange	1 x on	initialisation or reset checks
green	5 Hz	no operating system loaded
	2 Hz	application running (RUN)
	permanently on	application stopped (STOP)
Red	10 Hz	application stopped (STOP with error)
	5 Hz	application stopped due to undervoltage
	permanently on	system error (fatal error)

Abbreviations

A	Analogue
BH	Binary high side
BL	Binary low side
FRQ	Frequency/pulse inputs
H	H-bridge function
PWM	Pulse width modulation
PWM-I	Pulse width modulation, current-controlled
R	Resistor input
VBBS	Supply sensors/module
VBB1	supply OUT 0...3
VBB2	supply OUT 4...7

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI4110808**

Technical data

Input characteristics

Analogue inputs (A, B_L/B_H, FRQ)
Connection A: 02, 03, 06, 07
IN0...IN3 can be confi gured as...

● Voltage inputs	
Input voltage	0...10 V or 0...32 V
Resolution	12 bits
Accuracy	± 1% FS
Input resistance	65.6 kΩ (0...10 V), 50.7 kΩ (0...32 V)
Input frequency	≤ 500 Hz
● current inputs, with diagnostic capability	
Input current	0...20 mA
Resolution	12 bits
Accuracy	± 1% FS
Input resistance	400 Ω
Input frequency	≤ 500 Hz
At a current of > 23 mA the input is switched to the voltage input!	
● Voltage inputs, 0...32 V, ratiometric	
Function	(U_{IN} ÷ U_B) x 1000 ‰
Value range	0...1000 ‰
Input resistance	50.7 kΩ
● Binary voltage inputs for positive sensor signals	
Switch-on level	> 0.7 U_B
Switch-off level	< 0.3 U_B
Input resistance	3.2 kΩ
Input frequency	50 Hz
Diagnosis wire break	> 0.95 U_B
Diagnosis short circuit	< 1 V
● Binary voltage inputs for negative sensor signals	
Switch-on level	> 0.7 U_B
Switch-off level	< 0.3 U_B
Input resistance	3.2 kΩ
Input frequency	50 Hz
● Frequency inputs	
Input resistance	3.2 kΩ
Input frequency	≤ 30 kHz
Switch-on level	> 0.35...0.48 U_B
Switch-off level	< 0.29 U_B

Digital/resistor inputs (B_L, R)
Connection B: 02, 03, 06, 07
IN4…IN7
can be confi gured as…

● Binary voltage inputs for positive sensor signals	
Switch-on level	> 0.7 U_B
Switch-off level	< 0.3 U_B
Input resistance	3.2 kΩ
Input frequency	50 Hz
Diagnosis wire break	> 0.95 U_B
Diagnosis short circuit	< 1 V
● Resistor input	
Measuring current	< 2.0 mA
Input frequency	50 Hz
Measuring range	0.016…30 kΩ
Accuracy	± 2 % FS: 16 Ω...3 kΩ ± 5 % FS: 3...15 kΩ ± 10 % FS: 15...30 kΩ
Diagnosis	> 31 kΩ
Diagnosis short circuit	to VBB

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI4110808**

Technical data

Output characteristics

Digital outputs (B_H, PWM, PWM-I)

Connection D: 01, 03, 05, 07
OUT0…OUT3

● Semiconductor outputs, positive-switching (high side) Short-circuit proof and overload protected Diagnosis via current feedback (wire break / overload) Diagnosis via voltage feedback, pullup resistance can be deactivated (wire break/ short circuit)	
Switching voltage	5.5...32 V DC
Switching current	≤ 2.5 A
Load resistance	≥ 4.8 Ω (at 12 V DC) ≥ 9.6 Ω (at 24 V DC)
● PWM outputs	
Output frequency	20...250 Hz
Pulse/pause ratio	1…1000 ‰
Switching current	≤ 2.5 A
● Current-controlled output	
Output frequency	20...250 Hz
Control range	0.02…2.5 A
Setting resolution	1 mA
Control resolution	2 mA

Max. ambient temperature in PWM mode: ≤ 70 °C

Max. switch-on current	≤ 24 A

Digital outputs ($B_{H/L}$, PWM, PWM-I, H)

Connection E: 01, 03, 05, 07
OUT4…OUT7

● Semiconductor outputs, positive-switching (high side), negative switching (low side), short-circuit and overload protection Diagnosis via current feedback (wire break / overload) Diagnosis via voltage feedback, pullup resistance can be deactivated (wire break/ short circuit)	
Switching voltage	5.5...32 V DC
Switching current	≤ 4 A
Max. clamp energy	< 3 J (at 25°C)
Load resistance	≥ 3 Ω (at 12 V DC) ≥ 6 Ω (at 24 V DC)
● PWM outputs	
Output frequency	20...250 Hz
Pulse/pause ratio	1…1000 ‰
Switching current	≤ 4 A
● current-controlled output	
Output frequency	20...250 Hz
Control range	0.02…4 A
Setting resolution	1 mA
Control resolution	2 mA

Max. ambient temperature in PWM mode: ≤ 70 °C

Max. switch-on current	≤ 24 A (high side) ≤ 16 A (low side)

Free wheel diodes	Free wheel diodes for the deactivation of inductive loads are integrated
Overload protection (valid for all outputs)	≤ 5 minutes (at 100% overload)
Short-circuit strength (valid for all inputs and outputs)	≤ 5 minutes (contacts +VBB/GND)
Total current per output supply VBB_1 or VBB_2	≤ 8 A

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI4110808**

Technical data		
Total summation current of the output supply VBB_1 and VBB_2 (continuous current load)		≤ 12 A
Test standards and regulations		
CE marking	EN 61000-6-2	Electromagnetic compatibility (EMC) Noise immunity
	EN 61000-6-4	Electromagnetic compatibility (EMC) Emission standard
E1 marking	UN/ECE-R10	Emission standard Immunity with 100 V/m
Electrical tests	ISO 7637-2	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state B Pulse 5, severity level: III; function state C (data valid for the 24 V system) Pulse 4, severity level: III; function state C (data valid for the 12 V system)
Climatic tests	EN 60068-2-30	Damp heat, cyclic Upper temperature 55°C, number of cycles: 6
	EN 60068-2-78	Damp heat, steady state Test temperature 40°C / 93% RH, Test duration: 21 days
	EN 60068-2-52	Salt spray test Severity level 3 (vehicle) Only with installed EC0401 or EC0402 cover
Mechanical tests	ISO 16750-3	Test VII; Vibration, random Mounting location: vehicle body
	EN 60068-2-6	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3	Bumps 30 g/6 ms; 24,000 shocks
Tests for railway applications	EN 50121-3-2	Electromagnetic compatibility (EMC)
	EN 50155 clause 12.2	Electronic equipment used on rolling stock

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI4110808**

Technical data

Wiring

A	B	C	D	E	F	N2	P/N1
8 poles						4 poles	6 poles
VBBs IN0 IN1 GND GND IN2 IN3 VBBs	VBBs IN4 IN5 GND GND IN6 IN7 VBBs		OUT0 GND OUT1 GND OUT2 GND OUT3 GND	OUT4 GND OUT5 GND OUT6 GND OUT7 GND		VBBs GND CAN2_H CAN2_L	VBBs VBB1 VBB2 GND CAN1_H CAN1_L

C/F = not used

A	Analogue
Bh	Binary hight side
BL	Binary low side
FRQ	Frequency/pulse inputs
H	H-bridge function
PWM	Pulse width modulation
PWM-I	Pulse width modulation, current-controlled
R	Resistor input
VBBs	Supply sensor/module
VBB1	Supply OUT 0…3
VBB2	Supply OUT 4…7

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7101008**

IEC 61508:2010 SIL 2
IEC 62061:2005 + A1:2012 + A2:2015 SIL CL 2
if used as safety controller
Suited for requirements up to:
PL d (ISO 13849-1:2015)
AgPL d(ISO 25119:2018,
DIN EN 16590:2014)

32-bit CPU TriCore processor

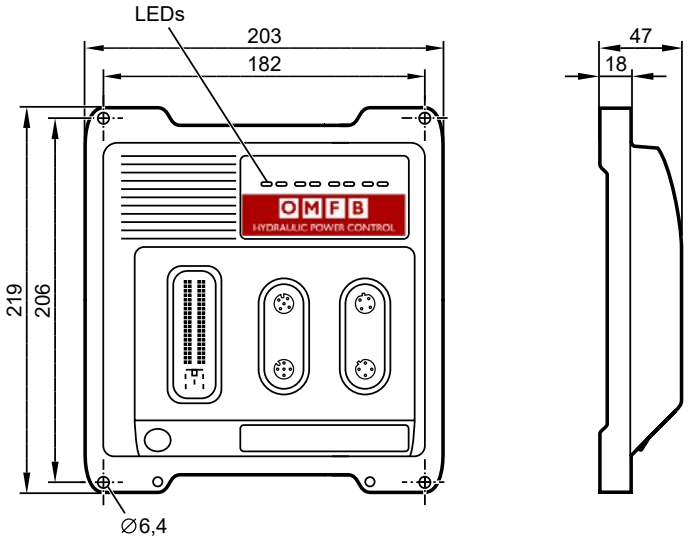
37 inputs/outputs

4 CAN interfaces

Ethernet interface

CODESYS 3.5

8...32 V DC



CE

E1

Technical data	Controller as a black-box system for the implementation of a central or decentralised system design
Mechanical data	
Housing	closed, screened metal housing with screw fixing
Dimensions (H x W x D)	219 x 203 x 47 mm
Installation	fixing with 4 M6 screws
Connection	1 connector 81 poles, locked, mechanical reverse polarity protection type Tyco / AMP AMP junior timer contacts, crimp connection 0.5/0.75/2.5 mm² 2 M12 connectors, 4 poles, D-coded 2 M12 connectors, 5 poles, A-coded shield connection Ø 4 mm for self-tapping Screw
Weight	1.4 kg
Housing/storage temperature	-40...85 °C / -40...85 °C
Max. perm. relative humidity	90 % (not condensing)
Height above sea level	max. 3000 m
Degree of soiling	2
Protection rating	IP 65 / IP 67 (for inserted connectors with individually sealed cores and inserted M12 connectors/sealing caps)
Electrical data	
Input/output channels, total	37 (20 inputs / 17 outputs)
Inputs	configurable, with diagnostic capability 8 x A (0...10/32 V, 0...20 mA, ratiometric) / B_L 8 x $FRQ_{L/H}$ (≤ 30 kHz) / $B_{L/H}$ 4 x R (0.016...30 kOhm) / B_L

OMFB HYDRAULIC POWER CONTROL

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7101008**

Technical data	
Outputs	configurable, with diagnostic capability 4 x $PWM_{H/L}$ / PWM_I / $B_{H/L}$ (20...2000 Hz, 4.0 A, H-bridge) 6 x PWM_H / PWM_I / B_H (20...2000 Hz, 2.5 A) 6 x PWM_H / B_H 2.5 A 1 x A (0...10 V)
Sensor supply	1 x 0/5/10 V, max. 2 W configurable
	for the number of inputs/outputs of the inputs and outputs also see the wiring diagrams
Operating voltage	8...32 V DC
Overvoltage	36 V for t ≤ 10 s
Reverse polarity protection	yes, in case of supply via the on-board system (battery)
Power consumption VBB_{30}	8 W
CAN interfaces 0...3	CAN interface 2.0 A/B, ISO 11898
Baud rate	20 kbit/s...1 Mbit/s (default 250 kbit/s)
Communication profile	CANopen, CiA DS 301 V4.2, CiA DS 401 V1.4 / SAE J 1939 / free protocol CANopen Safety for safe data transmission
Serial interface	RS-232
Baud rate	9.6...115.2 kbit/s (default 115.2 kbit/s)
Topology	point-to-point (max. 2 participants); master-slave connection
Ethernet interface	1 interface with integrated switch and 2 ports
Transmission rate	10/100 Mbit/s
Protocols	TCP/IP, UDP/IP, Modbus UDP
Processor	32-bit TriCore CPU Infineon AURIX™
Device monitoring	overvoltage and undervoltage monitoring watchdog function (extended safety monitoring according to IEC 62061 and ISO 13849) check sum test for program and system excess temperature monitoring
Process monitoring concept	second switch-off way per output group via semiconductor switch
Physical memory	flash: 9 MBytes RAM: 2.7 MBytes non-volatile memory: 10 kBytes
Memory allocation	Memory can be allocated for safe and non-safe applications see programming manual www.ifm.com
Software/programming	
Programming system	CODESYS version 3.5 with SIL 2 extension (IEC 61131-3)
Light indicators	
Status LED	2 x two-colour LED (R/G) for SYS0 and SYS1
Ethernet LED	2 x LED (G) for ETH0 and ETH1
Application LED	4 x three-colour LED (R/G/B) for APP0, APP1, APP2 and APP3, programmable

Technical data

Operating states system

LED SYS0		LED SYS1		System state
Colour	Status	Colour	State	
–	off	–	off	no operating voltage
green	5 Hz	–	off	no operating system loaded
red	on	–	off	hardware error (fatal error+)
red	on	red	on	system error (fatal error)
green/ yellow	2 Hz	green/ yellow	2 Hz	update

Operating states PLC/application

LED	Colour	Status	Description	
SYS0	green	on	Standard PLC	no application
		2 Hz		run
	red	10 Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
SYS1	green	on	Safety PLC	no application
		2 Hz		run
	red	10 Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
ETH0	green	flashing	data transmission Ethernet	
		on	Ethernet connection ok, no data transmission	
ETH1	green	flashing	data transmission Ethernet	
		on	Ethernet connection ok, no data transmission	
APP0	red	on	status display of the application, freely programmable	
...	green	on	status display of the application, freely programmable	
APP3	blue	on	status display of the application, freely programmable	

Safety-related characteristics

Safety Integrity Level Claim Limit	SIL CL	2

Component	PFH_D [1/h]
Input, external, single channel	$<4.0 \times 10^{-9}$
Input, external, dual channel	$<5.0 \times 10^{-10}$
Logic	$<1.0 \times 10^{-7}$
Output, external, single channel	$<2.0 \times 10^{-8}$
Output, external, dual channel	$<1.0 \times 10^{-9}$

Lifetime: 20 years

Technical data		
Test standards and regulations		
CE mark	EN IEC 62061	Safety of machinery - Functional safetyof electrical, electronic and programmable safety-related control systems
	EN 61000-6-2	Electromagnetic compatibility (EMC) Immunity
	EN 61000-6-4	Electromagnetic compatibility (EMC) Emission
	EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use
E1 mark	UN/ECE-R10	Noise emission Noise immunity with 100 V/m
Electrical tests	ISO 7637-2	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state A Pulse 5, severity level: III; function state A (data valid for the 24 V system) Pulse 4, severity level: III; function state A (data valid for the 12 V system)
Climatic tests	EN 60068-2-30	Damp heat, cyclic Upper temperature 55 °C, number of cycles: 6
	EN 60068-2-78	Damp heat, steady state Test temperature 40 °C / 93 % RH Test duration: 21 days
	EN 60068-2-52	Salt spray test Severity level 3 (vehicle)
Mechanical tests	ISO 16750-3	Test VII; vibration, random Mounting location: vehicle body
	EN 60068-2-6	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3	Bump 30 g/6 ms; 24,000 shocks
Safety-related tests	IEC 61508 parts 1-7	Functional safety of electrical/electronic/programmable electronic safety-related systems
	EN 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety-related control systems
Chemical resistance	ISO 16750-5	AA, BA, BD, CC, DB, DC, DD, only one chemical permitted at a time

ST A / input characteristics

ST A:

IN0100...0103
IN0600...0603

Multifunction inputs analogue / digital
(IN MULTIFUNCTION-A)

Current input 0 … 20 mA (A)

Resolution	12 bits
Input frequency	< 330 Hz
Measuring ranges	0...10 V, 0...32 V, 0...20 mA, ratiometric, binary low side
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Input resistance	298 Ω
Range diagnostics min./max.	0 mA / 20 mA (default)
Accuracy	± 1.5 % FS

Voltage input 0...10 V (A)

Input resistance	67.6 kΩ
Range diagnostics min./max.	0 V / 10 V (default)
Accuracy	± 1 % FS

Voltage input 0...32 V (A)

Input resistance	51.0 kΩ
Range diagnostics min./max.	0 V / 32 V (default)
Accuracy	± 1 % FS

Voltage input ratiometric (A)

Input resistance	51.0 kΩ
Range diagnostics min./max.	0 ‰ / 1000 ‰ (default)
Accuracy	± 1 % FS

Digital input (B_L)
(default)

Input resistance	9.5 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)
Accuracy	± 1 % FS

ST A:

IN0000...0003
IN0500...0503

Digital inputs, frequency measurement
(IN FREQUENCY-B)

Resolution	12 bits

Frequency input ($FRQ_{L/H}$)

Input resistance	10 kΩ
Input frequency	≤ 30 kHz
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy	± 10 µs

ST A / input characteristics

Digital input ($B_{L/H}$)
(default: B_L)

Input resistance	10 kΩ
Input frequency	< 330 Hz
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L / B_H	± 1 % FS / ± 3 % FS
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

ST A:

IN0400...0401
IN0900...0901

Digital/ resistor inputs (IN RESISTOR-B)

Resolution	12 bits
Input frequency	< 330 Hz
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)
(default)

Input resistance	3.2 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1 % FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

Resistor input (R)

Measuring current	< 2.0 mA
Measuring range	0.016...30 kΩ
Accuracy	± 2 % FS: 0.016...3 kΩ ± 5 % FS: 3...15 kΩ ± 10 % FS: 15...30 kΩ
Range diagnostics min./max.	0 Ω / 31 kΩ (default)

RESET-COM

Switch-on level	> 0,7 VBB_{30}
Switch-off level	< 0,3 VBB_{30}
Accuracy	± 5 % FS

Observe the notes on the configuration of the inputs/outputs!

Abbreviations

A analogue
B_H binary high side (CSO)
B_L binary low side (CSI)
$FRQ_{L/H}$ frequency/pulse inputs configurable low side (CSI) / high side (CSO)
PWM_H pulse width modulation high side (CSO)
PWM_L pulse width modulation low side (CSI)
PWM_I pulse width modulation current-controlled
R resistor input
$VBB_{0/1}$ $VBB_{0/1}$ supply
output group VBB_{30}
supply controller

ST A / output characteristics

ST A:

OUT0006...0007
OUT0106...0107

Digital / PWM outputs
4.0 A, H-bridge
(OUT PWM-40-BRIDGE-A)

Switching current	0.025...4 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND according to the programming manual detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Switching voltage	8...32 V DC
Range diagnostics min./max.	0 A / 4 A (default)

Digital output (B_L)

Functions	as H-bridge

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 4 A (default)

PWM output (PWM_L)

Output frequency	20...500 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.,05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω (at 12 V DC) ≥ 6 Ω (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 4 A (default)

ST A / output characteristics

ST A:

OUT0000
OUT0002
OUT0004
OUT0100
OUT0102
OUT0104

Digital / PWM outputs 2.5 A (OUT PWM-25-A)

Digital output (B_H) (default)

Switching voltage	8...32 V DC
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Range diagnostics min./max.	0 A / 2.5 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...2,5 A
Setting resolution	1 mA (at 20...250 Hz)
Control resolution	2 mA
Load resistance	≥ 4.8 Ω (at 12 V DC) ≥ 9.6 Ω (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A:

OUT0001
OUT0003
OUT0005
OUT0101
OUT0103
OUT0105

Digital outputs 2.5 A (OUT PWM-25-B)

Digital output (B_H) (default)

Switching voltage	8...32 V DC
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	5 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Range diagnostics min./max.	0 A / 2.5 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ FS (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A / output characteristics

ST A:

OUT3000

Sensor supply (OUT SUPPLY-A)

for sensors and joysticks
0 V, / 5 V, 400 mA / 10 V, 200 mA, accuracy ± 5 %
minimum current 10 mA
short-circuit proof and overload protected

ST A:

OUT3001

Analogue outputs (OUT VOLTAGE-A)

Current rating	< 5 mA
Output voltage	0...10 V
Accuracy	± 5 % FS
Step response time 10...90 %	< 1.8 ms

Output groups $VBB_{0/1}$

Load current per output group: ≤ 12 A

Internal semiconductor switches: One switch in series of 8 semiconductor outputs each
Forced controlling by means of hardware
and additional controlling by means of user program

Switching current	0.1...12 A
Current diagnostics (excessive current)	> 12 A

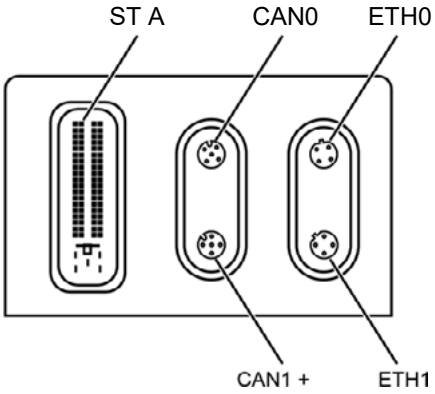
Short-circuit strength to GND: Outputs are switched off via the output driver

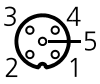
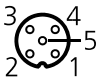
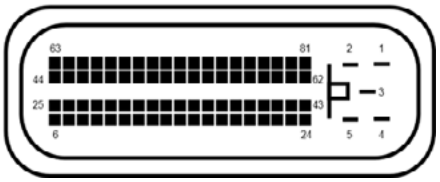
Abbreviations

A	analogue
B_H	binary high side (CSO)
B_L	binary low side (CSI)
PWM_H	pulse-width modulation high side (CSO)
PWM_L	pulse-width modulation low side (CSI)
PWM_I	pulse-width modulation current-controlled
$VBB_{0/1}$	supply output group
VBB_{30}	supply controller

Technical data

Connectors

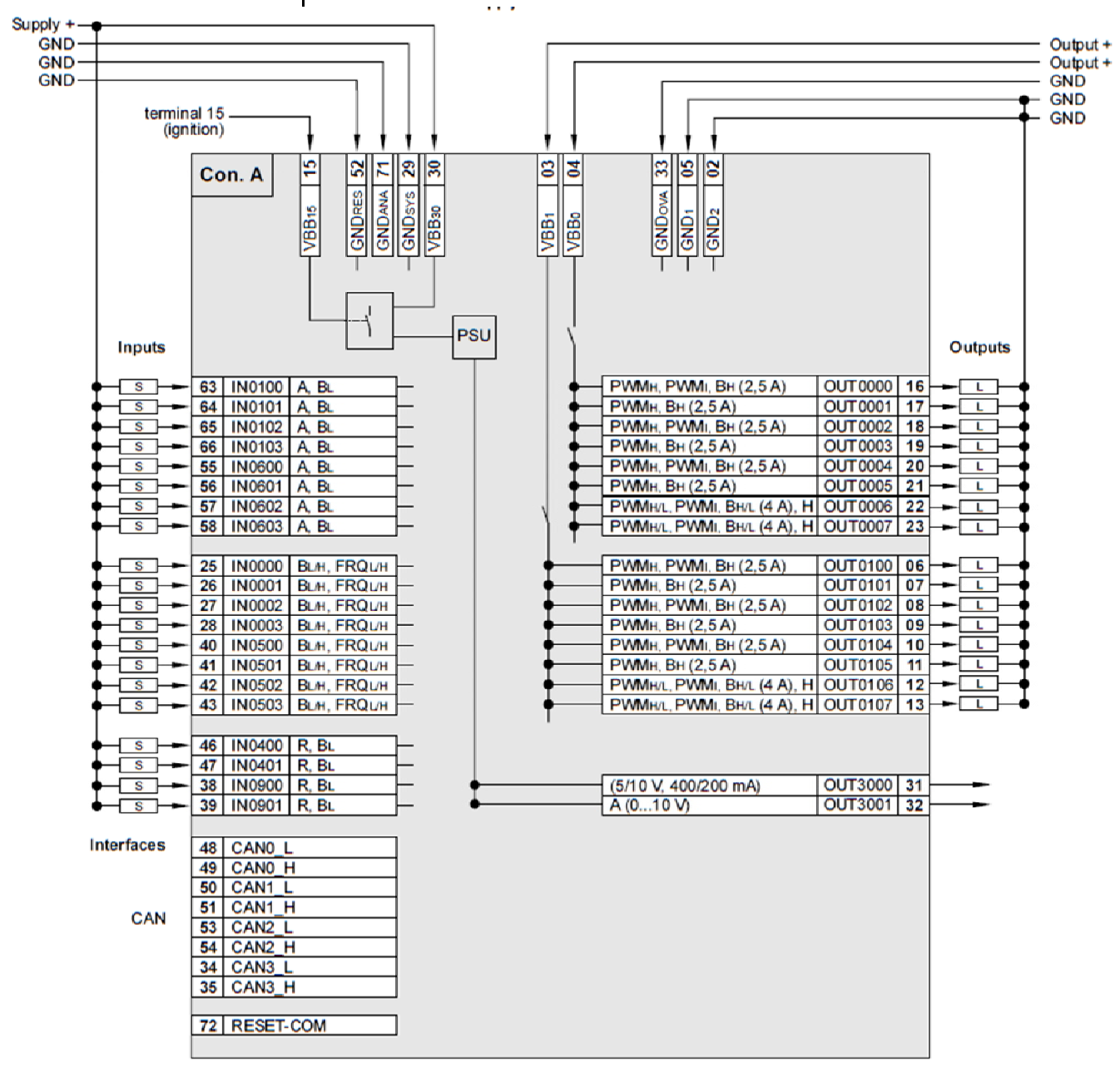


CAN0	M12 socket, 5 poles, A-coded 1: not used 2: not used 3: GND_COM 4: CAN0_H 5: CAN0_L 
CAN1 + RS-232	M12 socket, 5 poles, A-coded 1: RS-232_TxD 2: RS-232_RxD 3: GND_COM 4: CAN1_H 5: CAN1_L 
ETH0 / ETH1	M12 socket, 4 poles, D-coded 1: TxD+ 2: RxD+ 3: TxD- 4: RxD- 
ST A	AMP, 81 poles, A-coded 1-81: see wiring ST A 

Technical data

Wiring

ST A



Abbreviations

A	analogue
B_H	binary high side (CSO)
B_L	binary low side (CSI)
$FRQ_{L/H}$	frequency/pulse inputs configurable low side (CSI) / high side (CSO)
H	H-bridge function
PSU	power supply for the system
PWM_H	pulse-width modulation high side (CSO)
PWM_L	pulse-width modulation low side (CSI)
PWM_I	pulse-width modulation current-controlled
R	resistor input
$VBB_{0/1}$	supply output group
VBB_{30}	supply controller

OMFB HYDRAULIC POWER CONTROL

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7111816**

IEC 61508:2010 SIL 2
IEC 62061:2005 + A1:2012 + A2:2015 SIL CL 2
if used as safety controller
Suited for requirements up to:
PL d (ISO 13849-1:2015)
AgPL d(ISO 25119:2018,
DIN EN 16590:2014)

32-bit CPU TriCore processor

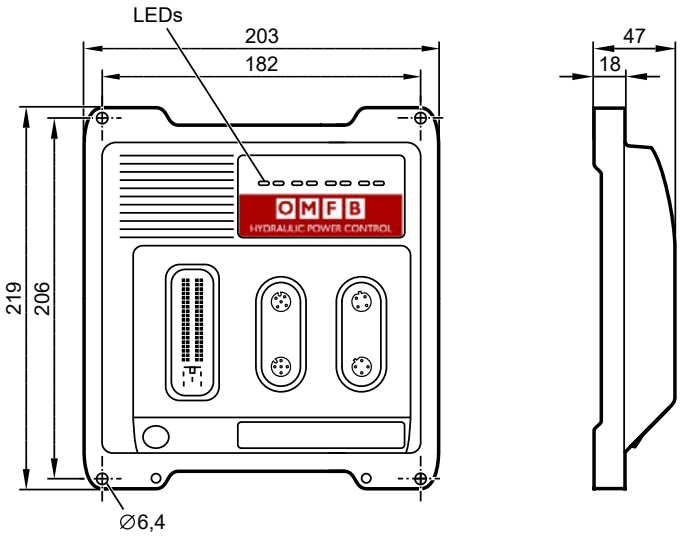
60 inputs/outputs

4 CAN interfaces

Ethernet interface

CODESYS 3.5

8...32 V DC



CE

E1

Technical data	Controller as black box system_for the implementation of a central or decentralised system design
Mechanical data	
Housing	closed, screened metal housing with screw fixing
Dimensions (H x W x D)	219 x 203 x 47 mm
Installation	fixing with 4 M6 screws
Connection	1 connector 81 poles, locked, mechanical reverse polarity protection type Tyco / AMP AMP junior timer contacts, crimp connection 0.5/0.75/2.5 mm² 2 x M12 connectors, 4 poles, D-coded 2 x M12 connectors, 5 poles, A-coded shield connection Ø 4 mm for self-tapping screw
Weight	1.4 kg
Housing/storage temperature	-40...85 °C / -40...85 °C
Max. perm. relative humidity	90 % (not condensing)
Height above sea level	max. 3000 m
Degree of soiling	2
Protection rating	IP 65 / IP 67 (for inserted connectors with individually sealed cores and inserted M12 connectors/sealing caps)
Electrical data	
Input/output channels total	60 (32 inputs / 28 outputs)
Inputs	configurable, with diagnostic capability 16 x A (0...10/32 V, 0...20 mA, ratiometric) / B_L 8 x $FRQ_{L/H}$ (≤ 30 kHz) / $B_{L/H}$ 4 x R (0.016...30 kOhm) / B_L 4 x B_L (impedance ≤ 3.2 kOhm)

OMFB HYDRAULIC POWER CONTROL

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7111816**

Technical data	
Outputs	configurable, with diagnostic capability 6 x $PWM_{H/L}$ / PWM_I / $B_{H/L}$ (20...2000 Hz, 4.0 A, H-bridge) 3 x PWM_H / PWM_I / B_H (20...2000 Hz, 4.0 A) 9 x PWM_H / PWM_I / B_H (20...2000 Hz, 2.5 A) 9 x PWM_H / B_H 2.5 A 1 x A (0...10 V)
Sensor supply	1 x 0/5/10 V, max. 2 W configurable
	for the number of inputs/outputs of the inputs and outputs also see the wiring diagrams
Operating voltage Overvoltage	8...32 V DC 36 V for t ≤ 10 s
Reverse polarity protection	yes, in case of supply via an on-board system (battery)
Power consumption VBB_{30}	8 W
CAN interfaces 0...3 Baud rate Communication profile	CAN interface 2.0 A/B, ISO 11898 20 kbits/s...1 Mbit/s (default 250 kbits/s) CANopen, CiA DS 301 V4.2, CiA DS 401 V 1.4 / SAE J 1939 / free protocol CANopen Safety for safe data transmission
Serial interface Baud rate Topology	RS-232 9.6...115.2 Kbits/s (default 115.2 Kbits/s) point-to-point (max. 2 participants); master-slave connection
Ethernet interface Transmission rate Protocols	1 interface with integrated switch and 2 ports 10/100 Mbits/s TCP/IP, UDP/IP, Modbus UDP
Processor	32-bit TriCore CPU Infineon AURIX™
Device monitoring	overvoltage and undervoltage monitoring watchdog function (extended safety monitoring according to IEC 62061 and ISO 13849) check sum test for program and system excess temperature monitoring
Process monitoring concept	second switch-off way per output group via semiconductor switch
Physical memory	flash: 9 MBytes RAM: 2.7 MBytes non-volatile memory: 10 KBytes
Memory allocation	Memory can be allocated for safe and non-safe applications see programming manual www.ifm.com
Software/programming	
Programming system	CODESYS version 3.5 with SIL 2 extension (IEC 61131-3)
Light indicators	
Status LED	2 x two-colour LED (R/G) for SYS0 and SYS1
Ethernet LED	2 x LED (G) for ETH0 and ETH1
Application LED	4 x three-colour LED (R/G/B) for APP0, APP1, APP2 and APP3, programmable

Technical data

Operating states of the system

LED SYS0		LED SYS1		System state
Colour	Status			
–	off	-	off	no operating voltage
green	5 Hz	-	off	no operating system loaded
red	on	-	off	hardware error (fatal error+)
red	on	red	on	system error (fatal error)
green / yellow	2 Hz	green / yellow	2 Hz	update

Operating states PLC/application

LED	Colour	Status	Description	
SYS0	green	on	Standard PLC	no application
		2 Hz		run
	red	10Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
SYS1	green	on	Safety PLC	no application
		2 Hz		run
	red	10Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
ETH0	green	flashing	data transmission Ethernet	
		on	Ethernet connection ok, no data transfer	
ETH1	green	flashing	data transmission Ethernet	
		on	Ethernet connection ok, no data transfer	
APP0 ... APP3	red	on	status display of the application, freely programmable	
	green	on	status display of the application, freely programmable	
	blue	on	status display of the application, freely programmable	

Safety-related characteristics

Safety Integrity Level Claim Limit	SIL CL	2

Component	PFH_D [1/h]
Input, external, single channel	$< 4.0 \times 10^{-9}$
Input, external, dual channel	$< 5.0 \times 10^{-10}$
Logic	$<1.0 \times 10^{-7}$
Output, external, single channel	$< 2.0 \times 10^{-8}$
Output, external, dual channel	$< 1.0 \times 10^{-9}$

Lifetime: 20 years
Other characteristic values: see SISTEMA library at ifm.com for download

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7111816**

Technical data		
Test standards and regulations		
CE mark	EN IEC 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety-related control systems
	EN 61000-6-2	Electromagnetic compatibility (EMC)
	EN 61000-6-4	Electromagnetic compatibility (EMC) Emission
	EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use
E1 mark	UN/ECE-R10	Noise emission Noise immunity with 100 V/m
Electrical tests	ISO 7637-2	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state A Pulse 5, severity level: III; function state A (data valid for the 24 V system) Pulse 4, severity level: III; function state A (data valid for the 12 V system)
Climatic tests	EN 60068-2-30	Damp heat, cyclic Upper temperature 55 °C, number of cycles: 6
	EN 60068-2-78	Damp heat, steady state Test temperature 40°C / 93% RH, test duration: 21 days
	EN 60068-2-52	Salt spray test Severity level 3 (vehicle)
Mechanical tests	ISO 16750-3	Test VII; vibration, random Mounting location: vehicle body
	EN 60068-2-6	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3	Bump 30 g/6 ms; 24,000 shocks
Safety-related tests	IEC 61508	parts 1-7 Functional safety of electrical/electronic/programmable electronic safety-related systems
	EN 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety- related control systems
Chemical resistance	ISO 16750-5	AA, BA, BD, CC, DB, DC, DD, Only one chemical permitted at a time

ST A / input characteristics

ST A:

IN0100...0103
IN0200...0203
IN0600...0603
IN0700...0703

Multifunction inputs analogue / digital
(IN MULTIFUNCTION-A)

Resolution	12 bits
Input frequency	< 330 Hz
Measuring ranges	0...10 V, 0...32 V, 0...20 mA, ratiometric, binary low side
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Current input 0 … 20 mA (A)

Input resistance	298 Ω
Range diagnostics min./max.	0 mA / 20 mA (default)
Accuracy	± 1.5 % FS

Voltage input 0...10 V (A)

Input resistance	67.6 kΩ
Range diagnostics min./max.	0 V / 10 V (default)
Accuracy	± 1% FS

Voltage input 0...32 V (A)

Input resistance	51.0 kΩ
Range diagnostics min./max.	0 V / 32 V (default)
Accuracy	± 1% FS

Voltage input ratiometric (A)

Input resistance	51.0 kΩ
Range diagnostics min./max.	0 ‰ / 1000 ‰ (default)
Accuracy	± 1% FS

Digital input (B_L)
(default)

Input resistance	9.5 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)
Accuracy	± 1% FS

ST A:

IN0000...0003
IN0500...0503

Digital inputs, frequency measurement
(IN FREQUENCY-B)

Resolution	12 bits

Frequency input ($FRQ_{L/H}$)

Input resistance	10 kΩ
Input frequency	≤ 30 kHz
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy	± 10 µs

ST A / input characteristics

Digital input ($B_{L/H}$)
(default: B_L)

Input resistance	10 kΩ
Input frequency	< 330 Hz
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L / B_H	± 1 % FS / ± 3 % FS
Range diagnostics	configurable minimum and maximum values
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

ST A:

IN0400...0401
IN0900...0901

Digital/ resistor inputs
(IN RESISTOR-B)

Resolution	12 bits
Input frequency	< 330 Hz
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)
(default)

Input resistance	3.2 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1% FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

Resistor input (R)

Measuring current	< 2.0 mA
Measuring range	0.016...30 kΩ
Accuracy	± 2% FS: 0.016...3 kΩ
Range diagnostics min./max.	0 Ω / 31 kΩ (default)

ST A:

IN0300... 0301
IN0800... 0801

Digital inputs 2-wire sensor
(IN DIGITAL-B)

Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 3.2 kΩ
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)

Input resistance	3.2 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1% FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

ST A / input characteristics

RESET-COM

Switch-on level	> 0,7 VBB_{30}
Switch-off level	< 0,3 VBB_{30}
Accuracy	± 5 % FS

Observe the notes on the configuration of the inputs/outputs.

Abbreviations

A analogue
B_H binary high side (CSO)
B_L binary low side (CSI)
$FRQ_{L/H}$ frequency/pulse inputs configurable low side (CSI) / high side (CSO)
PWM_H pulse width modulation high side (CSO)
PWM_L pulse width modulation low side (CSI)
PWM_I pulse width modulation current-controlled
R resistor input
$VBB_{0...2}$ supply output group
VBB_{30} supply controller

ST A / output characteristics

ST A:

OUT0006...0007
OUT0106...0107
OUT0206...0207

Digital / PWM outputs
4.0 A, H-bridge
(OUT PWM-40-BRIDGE-A)

Switching current	0.025...4 A
Protective circuit for inductive loads	Integrated
Accuracy current feedback	1% FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND according to programming manual detection TRUE: ≥ 3V detection FALSE: ≤ 1V

Digital output (B_H) (default)

Switching voltage	8...32 V DC
Range diagnostics min./max.	0 A / 4 A (default)

Digital output (B_L)

Functions	as H-bridge

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 4 A (default)

PWM output (PWM_L)

Output frequency	20...500 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via
Resolution	1 ‰ (at 20...250 Hz)

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω (at 12 V DC) ≥ 6 Ω (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive
Range diagnostics min./max.	0 A / 4 A (default)

ST A / output characteristics

ST A:

OUT0008
OUT0108
OUT0208

Digital / PWM outputs 4.0 A (OUT PWM-40-A)

Switching voltage	8...32 V DC
Switching current	0.025...4 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 %
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 4 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 4 A (default)

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω (at 12 V DC) ≥ 6 Ω (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 4 A (default)

ST A:

OUT0000
OUT0002
OUT0004
OUT0100
OUT0102
OUT0104
OUT0200
OUT0202
OUT0204

Digital / PWM outputs 2.5 A (OUT PWM-25-A)

Switching voltage	8...32 V DC
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1% FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 2.5 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A / output characteristics

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...2.5 A
Setting resolution	1 mA (at 20...250 Hz)
Control resolution	2 mA
Load resistance	≥ 4.8 Ω / (at 12 V DC) ≥ 9.6 Ω / (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A:

OUT0001
OUT0003
OUT0005
OUT0101
OUT0103
OUT0105
OUT0201
OUT0203
OUT0205

Digital outputs 2.5 A (OUT PWM-25-B)

Switching voltage	8...32 V DC
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	5 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 2.5 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ FS (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A:

OUT3000

Sensor supply (OUT SUPPLY-A)

for sensors and joysticks
0 V, / 5 V, 400 mA / 10 V, 200 mA, accuracy ± 5 %
minimum current 10 mA
short-circuit proof and overload protected

ST A:

OUT3001

Analogue outputs (OUT VOLTAGE-A)

Current rating	< 5 mA
Output voltage	0...10 V
Accuracy	± 5 % FS
Step response time 10...90	< 1.8 ms

ST A / output characteristics

Output groups $VBB_{0...2}$	
Load current per output group	≤ 12 A
Internal semiconductor switches	One switch in series of 9 semiconductor outputs each. Forced controlling by means of hardware and additional controlling by means of user program.

Switching current	0.1...12 A
Current diagnostics (excessive current)	> 12 A

Short-circuit strength to GND	Outputs are switched off via the output driver

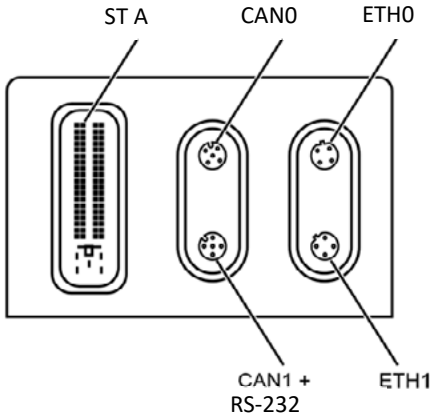
Abbreviations

A	analogue
B_H	binary high side (CSO)
B_L	binary low side (CSI)
PWM_H	pulse-width modulation high side (CSO)
PWM_L	pulse-width modulation low side (CSI)
PWM_I	pulse-width modulation current-controlled
$VBB_{0...2}$	supply output group
VBB_{30}	supply controller

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7111816**

Technical data

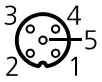
Connectors



CAN0

M12 socket, 5 poles, A-coded

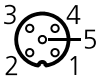
1: not used
2: not used
3: GND_COM
4: CAN0_H
5: CAN0_L



CAN1 + RS-232

M12 socket, 5 poles, A-coded

1: RS-232_TxD
2: RS-232_RxD
3: GND_COM
4: CAN1_H
5: CAN1_L



ETH0 / ETH1

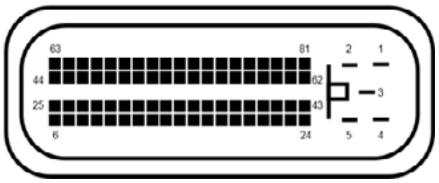
M12 socket, 4 poles, D-coded

1: TxD+
2: RxD+
3: TxD- 4: RxD-

ST A

AMP, 81-pole, A-coded

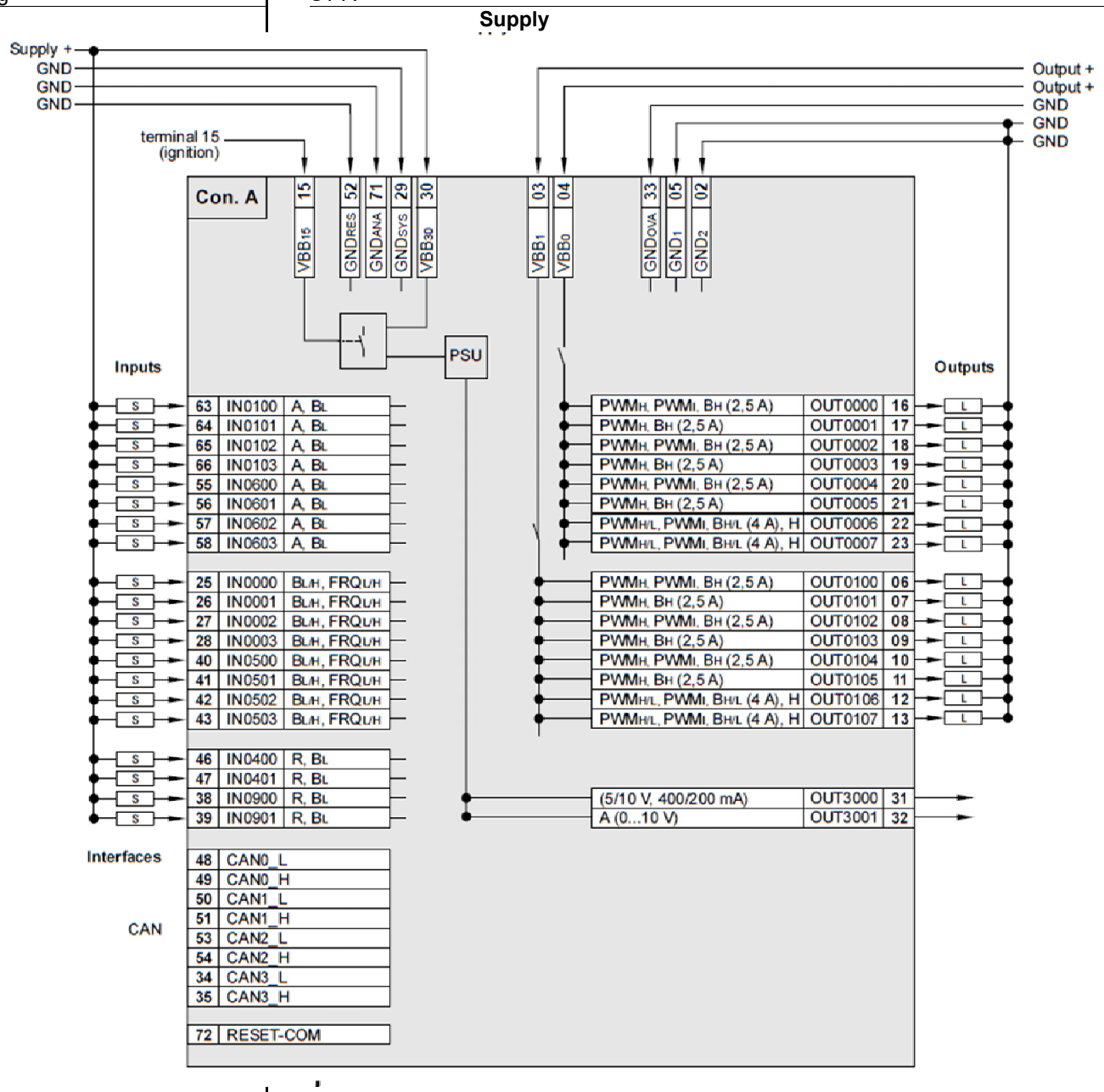
1-81: see wiring
ST A



I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7111816**

Technical data

Wiring — ST A



Abbreviations

A	analogue
BH	binary high side (CSO)
BL	binary low side (CSI)
FRQL/H	frequency/pulse inputs configurable low side (CSI) / high side (CSO)
H	H-bridge function
PSU	power supply for the system
PWMH	pulse-width modulation high side (CSO)
PWML	pulse-width modulation low side (CSI)
PWMI	pulse-width modulation current-controlled
R	resistor input
VBB0...2	supply output group
VBB30	supply controller

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7202424**

IEC 61508:2010 SIL 2
IEC 62061:2005 + A1:2012 + A2:2015 SIL CL 2
if used as safety controller
Suited for requirements up to:
PL d (ISO 13849-1:2015)
AgPL d(ISO 25119:2018,
DIN EN 16590:2014)

32-bit CPU TriCore processor

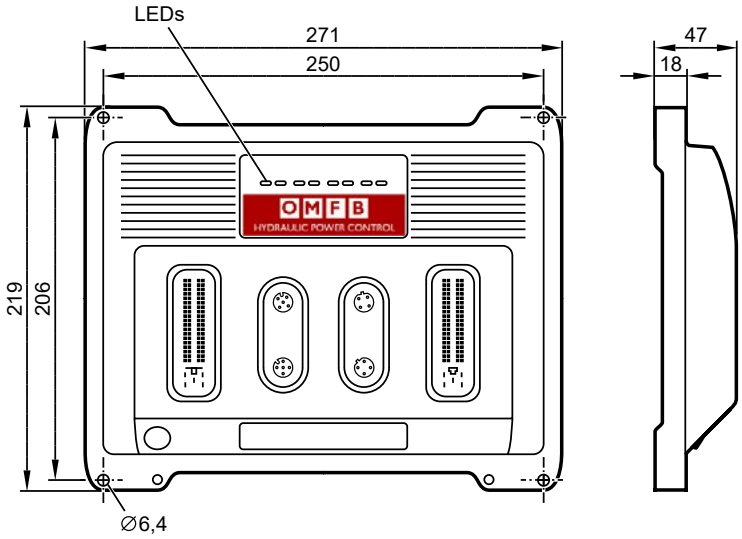
98 inputs/outputs

4 CAN interfaces

Ethernet interface

CODESYS 3.5

8...32 V DC



Technical data	Controller as a black-box system for the implementation of a central or decentralised system design
Mechanical data	
Housing	closed, screened metal housing with screw fixing
Dimensions (H x W x D)	219 x 271 x 47 mm
Installation	fixing with 4 M6 screws
Connection	2 x connector 81 poles, locked, mechanical reverse polarity and reversal protection type Tyco / AMP contacts AMP-Junior-Timer, crimp connection 0.5/0.75/2.5 mm² 2 x M12 connector 4 poles, D-coded 2 x M12 connector 5 poles, A-coded shield connection Ø 4 mm for self-tapping screw
Weight	1.6 kg
Housing/storage temperature	-40...85 °C / -40...85 °C
Max. perm. relative humidity	90 % (not condensing)
Height above sea level	max. 3000 m
Polution degree	2
Protection rating	IP 65 / IP 67 (for inserted connectors with individually sealed cores and inserted M12 connectors/sealing caps)
Electrical data	
Input/output channels, total	98 (60 inputs / 38 outputs)
Inputs	configurable, with diagnostic capability 24 x A (0...10/32 V, 0...20 mA, ratiometric) / B_L 16 x $FRQ_{L/H}$ (≤ 30 kHz) / $B_{L/H}$ 4 x R (0.016...30 kOhm) / B_L 8 x B_L (impedance ≤ 10 kOhm) 8 x B_L (impedance ≤ 3.2 kOhm)

OMFB HYDRAULIC POWER CONTROL

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7202424**

Technical data	
Outputs	configurable, with diagnostic capability 8 x $PWM_{H/L}$ / PWM_I / $B_{H/L}$ (20...2000 Hz, 4.0 A, H-bridge) 4 x PWM_H / PWM_I / B_H (20...2000 Hz, 4.0 A) 12 x PWM_H / PWM_I / B_H (20...2000 Hz, 2.5 A) 12 x PWM_H / B_H 2.5 A 2 x A (0...10 V)
Sensor supply	1 x 0/5/10 V, max. 2 W configurable
	For the number of inputs/outputs and configuration options also see the wiring diagrams
Operating voltage Overvoltage	8...32 V DC 36 V for t ≤ 10 s
Reverse polarity protection	yes, in case of supply via the on-board system (battery)
Power consumption VBB_{30}	8 W
CAN interfaces 0...3 Baud rate Communication profile	CAN interface 2.0 A/B, ISO 11898 20 kbit/s...1 Mbit/s (default 250 kbit/s) CANopen, CiA DS 301 V4.2, CiA DS 401 V1.4 / SAE J 1939 / free protocol CANopen Safety for safe data transmission
Serial interface Baud rate Topology	RS-232 9.6...115.2 kbit/s (default 115.2 kbit/s) point-to-point (max. 2 participants); master-slave connection
Ethernet interface Transmission rate Protocols	1 interface with integrated switch and 2 ports 10/100 Mbit/s TCP/IP, UDP/IP, Modbus UDP
Processor	32-bit TriCore CPU Infineon AURIX™
Device monitoring	overvoltage and undervoltage monitoring watchdog function (extended safety monitoring to IEC 62061 and ISO13849) checksum test for program and system excess temperature monitoring
Process monitoring concept	second switch-off way per output group via semiconductor switch
Physical memory	flash: 9 Mbytes RAM: 2.7 Mbytes non-volatile memory: 10 kBytes
Memory allocation	Memory can be allocated for safe and non-safe applications see programming manual
Software/programming	
Programming system	CODESYS version 3.5 with SIL 2 extension (IEC 61131-3)
Light indicators	
Status LED	2 x two-colour LED (R/G) for SYS0 and SYS1
Ethernet LED	2 x LED (G) for ETH0 and ETH1
Application LED	4 x three-colour LED (R/G/B) for APP0, APP1, APP2 and APP3, programmable

Technical data

Operating states system

LED SYS0		LED SYS1		System state
Colour	State	Colour	State	
–	off	–	off	no operating voltage
green	5 Hz	–	off	no operating system loaded
red	on	–	off	hardware error (fatal error+)
red	on	red	on	system error (fatal error)
green/ yellow	2 Hz	green/ yellow	2 Hz	update

Operating states PLC/application

LED	Colour	Status	Description	
SYS0	green	on	Standard PLC	no application
		2 Hz		run
	red	10Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
SYS1	green	on	Safety PLC	no application
		2 Hz		run
	red	10Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
ETH0	green	flashing	data transmission Ethernet	
		on	Ethernet connection ok, no data transfer	
ETH1	green	flashing	data transmission Ethernet	
		on	Ethernet connection ok, no data transfer	
APP0	red	on	status display of the application, freely	
...	green	on	status display of the application, freely	
APP3	blue	on	status display of the application, freely	

Safety-related characteristics

Safety Integrity Level Claim Limit	SIL CL	2

Component	PFH_D [1/h]
Input, external, single channel	$< 4.0 \times 10^{-9}$
Input, external, dual channel	$< 5.0 \times 10^{-10}$
Logic	$< 1.0 \times 10^{-7}$
Output, external, single channel	$< 2.0 \times 10^{-8}$
Output, external, dual channel	$< 1.0 \times 10^{-9}$

Lifetime: 20 years

Technical data		
Test standards and regulations		
CE mark	EN IEC 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety-related control systems
	EN 61000-6-2	Electromagnetic compatibility (EMC)
	EN 61000-6-4	Electromagnetic compatibility (EMC) Emission
	EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use
E1 mark	UN/ECE-R10	Noise emission Noise immunity with 100 V/m
Electrical tests	ISO 7637-2	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state A Pulse 5, severity level: III; function state A (data valid for the 24 V system) Pulse 4, severity level: III; function state A (data valid for the 12 V system)
Climatic tests	EN 60068-2-30	Damp heat, cyclic Upper temperature 55 °C, number of cycles: 6
	EN 60068-2-78	Damp heat, steady state Test temperature 40°C / 93% RH, test duration: 21 days
	EN 60068-2-52	Salt spray test Severity level 3 (vehicle)
Mechanical tests	ISO 16750-3	Test VII; vibration, random Mounting location: vehicle body
	EN 60068-2-6	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3	Bump 30 g/6 ms; 24,000 shocks
Safety-related tests	IEC 61508	parts 1-7 Functional safety of electrical/electronic/programmable electronic safety-related systems
	EN 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety- related control systems
Chemical resistance	ISO 16750-5	AA, BA, BD, CC, DB, DC, DD, Only one chemical permitted at a time

ST A and ST B / input characteristics

ST A: **ST B:**

IN0100...0103 **IN1100...1103**
IN0200...0203 **IN1600...1603**
IN0600...0603
IN0700...0703

Multifunction inputs analogue/ digital (IN MULTIFUNCTION-A)

Resolution	12 bits
Input frequency	< 330 Hz
Measuring ranges	0...10 V, 0...32 V, 0...20 mA, ratiometric, binary low side
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Current input 0 … 20 mA (A)

Input resistance	298 Ω
Range diagnostics min./max.	0 mA / 20 mA (default)
Accuracy	± 1.5 % FS

Voltage input 0...10 V (A)

Input resistance	67.6 kΩ
Range diagnostics min./max.	0 V / 10 V (default)
Accuracy	± 1 % FS

Voltage input 0...32 V (A)

Input resistance	51.0 kΩ
Range diagnostics min./max.	0 V / 32 V (default)
Accuracy	± 1 % FS

Voltage input ratiometric (A)

Input resistance	51.0 kΩ
Range diagnostics min./max.	0 ‰ / 1000 ‰ (default)
Accuracy	± 1 % FS

Digital input (B_L) (default)

Input resistance	9.5 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)
Accuracy	± 1 % FS

ST A: **ST B:**

IN0000...0003 **IN1000...1003**
IN0500...0503 **IN1500...1503**

Digital inputs, frequency measurement (IN FREQUENCY-B)

Resolution	12 bits

Frequency input ($FRQ_{L/H}$)

Input resistance	10 kΩ
Input frequency	≤ 30 kHz
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy	± 10 µs

ST A and ST B / input characteristics

Digital input ($B_{L/H}$)
(default: B_L)

Input resistance	10 kΩ
Input frequency	< 330 Hz
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L / B_H	± 1 % FS / ± 3 % FS
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

ST A:

IN0400...0401
IN0900...0901

Digital / resistor inputs
(IN RESISTOR-B)

Resolution	12 bits
Input frequency	< 330 Hz
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)
(default)

Input resistance	3.2 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1 % FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

Resistor input (R)

Measuring current	< 2.0 mA
Measuring range	0.016…30 kΩ
Accuracy	± 2 % FS: 0.016…3 kΩ ± 5 % FS: 3…15 kΩ ± 10 % FS: 15…30 kΩ
Range diagnostics min./max.	0 Ω / 31 kΩ (default)

ST B:

IN1200... 1203
IN1700... 1703

Digital inputs
(IN DIGITAL-A)

Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 10 kΩ
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)

Input resistance	10 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1 % FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

ST A and ST B / input characteristics

ST A: **ST B:**

IN0300... 0301 **IN1300... 1303**
IN0800... 0801

Digital inputs 2-wire sensor (IN DIGITAL-B)

Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 3.2 kΩ
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)

Input resistance	3.2 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1 % FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

RESET-COM

Switch-on level	> 0,7 VBB_{30}
Switch-off level	< 0,3 VBB_{30}
Accuracy	± 5 % FS

Observe the notes on the configuration of the inputs/outputs!

Abbreviations

A analogue
B_H binary high side (CSO)
B_L binary low side (CSI)
$FRQ_{L/H}$ frequency/pulse inputs configurable low side (CSI) / high side (CSO)
PWM_H pulse width modulation high side (CSO)
PWM_L pulse width modulation low side (CSI)
PWM_I pulse width modulation current-controlled
R resistor input
$VBB_{0...3}$ supply output group
VBB_{30} supply controller

ST A and ST B / output characteristics

ST A: **ST B:**

OUT0006...0007 **OUT0306...0307**
OUT0106...0107
OUT0206...0207

Digital / PWM outputs
4.0 A, H-bridge
(OUT PWM-40-BRIDGE-A)

Switching current	0.025...4 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND according to the programming manual detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Switching voltage	8...32 V DC
Range diagnostics min./max.	0 A / 4 A (default)

Digital output (B_L)

Functions	as H-bridge

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 4 A (default)

PWM output (PWM_L)

Output frequency	20...500 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω (at 12 V DC) ≥ 6 Ω (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 4 A (default)

ST A and ST B / output characteristics

ST A: **ST B:**

OUT0008 **OUT0308**
OUT0108
OUT0208

Digital / PWM outputs 4.0 A (OUT PWM-40-A)

Switching voltage	8...32 V DC
Switching current	0.025...4 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 4 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 4 A (default)

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω (at 12 V DC) ≥ 6 Ω (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 4 A (default)

ST A: **ST B:**

OUT0000 **OUT0300**
OUT0002 **OUT0302**
OUT0004 **OUT0304**
OUT0100
OUT0102
OUT0104
OUT0200
OUT0202
OUT0204

Digital / PWM outputs 2.5 A (OUT PWM-25-A)

Switching voltage	8...32 V DC
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 2.5 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A and ST B / output characteristics

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...2.5 A
Setting resolution	1 mA (at 20...250 Hz)
Control resolution	2 mA
Load resistance	≥ 4.8 Ω / (at 12 V DC) ≥ 9.6 Ω / (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A:

OUT0001
OUT0003
OUT0005
OUT0101
OUT0103
OUT0105
OUT0201
OUT0203
OUT0205

ST B:

OUT0301
OUT0303
OUT0305

Digital outputs 2.5 A (OUT PWM-25-B)

Switching voltage	8...32 V DC
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	5 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 2.5 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ FS (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A:

OUT3000

Sensor supply (OUT SUPPLY-A)

For sensors and joysticks
0 V / 5 V, 400 mA / 10 V, 200 mA, accuracy ± 5 %
Minimum current 10 mA
Short-circuit proof and overload protected

ST A and ST B / output characteristics

ST A: **ST B:**

OUT3001 **OUT3002**

Analogue outputs (OUT VOLTAGE-A)

Current rating	< 5 mA
Output voltage	0...10 V
Accuracy	± 5 % FS
Step response time 10...90 %	< 1.8 ms

Output groups $VBB_{0...3}$

Load current per output group	≤ 12 A
Internal semiconductor switches	One switch in series of 9 semiconductor outputs each Forced controlling by means of hardware and additional controlling by means of user program

Switching current	0.1...12 A
Current diagnostics excessive current)	> 12 A

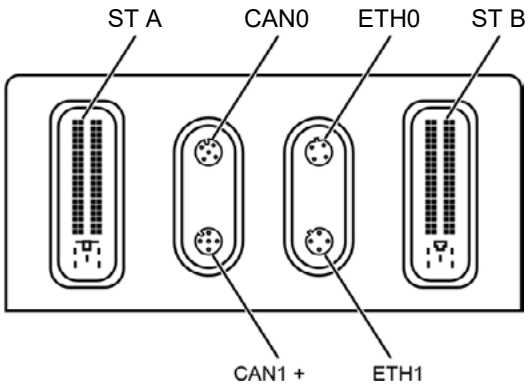
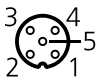
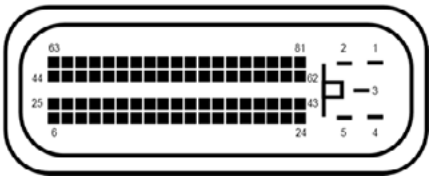
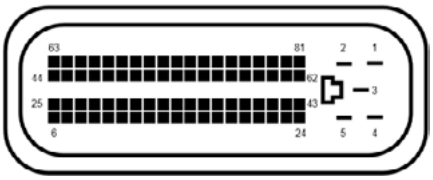
Short-circuit strength to GND	Outputs are switched off via the output driver

Abbreviations

A	analogue
B_H	binary high side (CSO)
B_L	binary low side (CSI)
PWM_H	pulse-width modulation high side (CSO)
PWM_L	pulse-width modulation low side (CSI)
PWM_I	pulse-width modulation current-controlled
$VBB_{0...3}$	supply output group
VBB_{30}	supply controller

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7202424**

Technical data

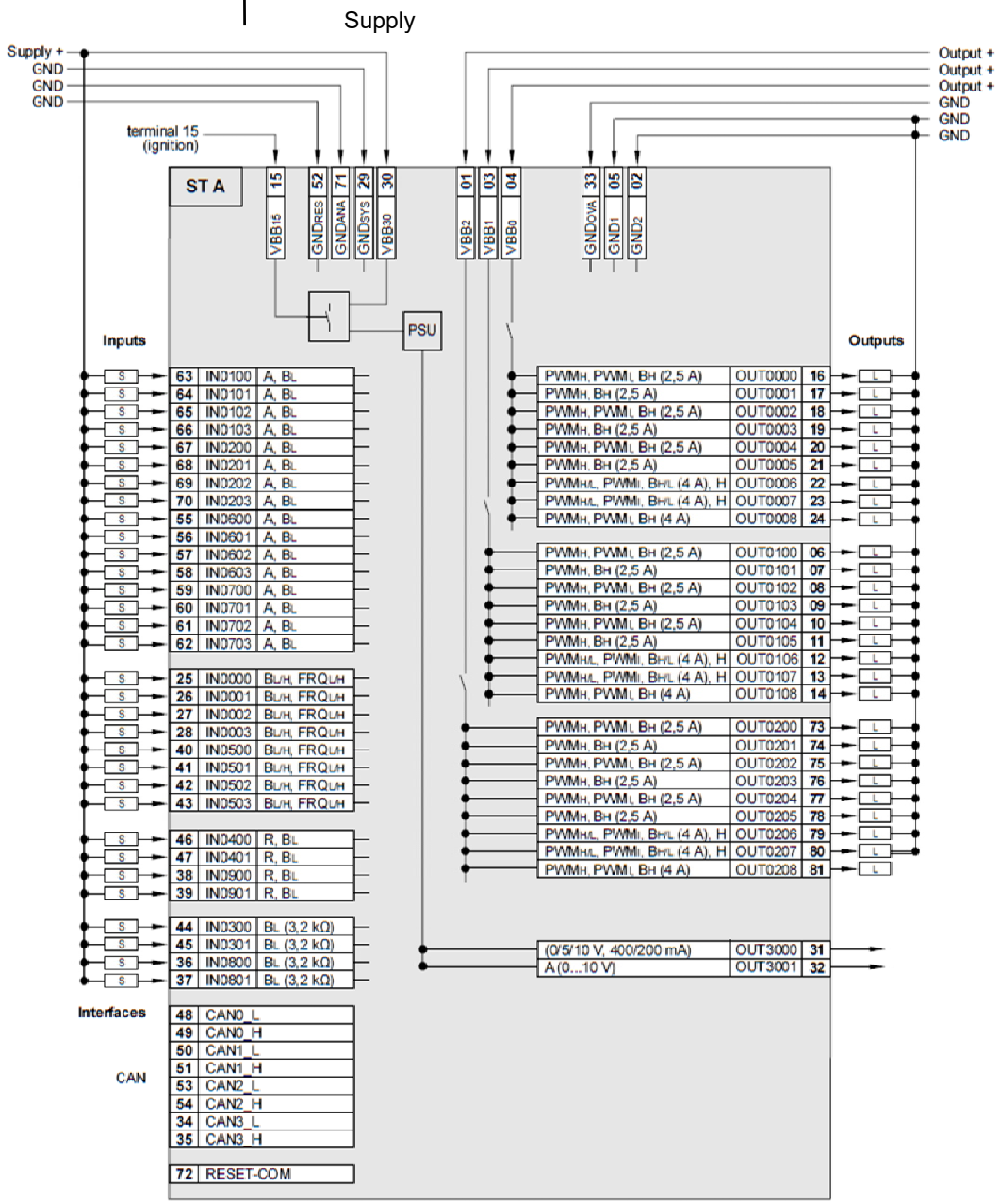
Connectors	 RS-232
CAN0	M12 socket, 5 poles, A-coded 1: not used 2: not used 3: GND_COM 4: CAN0_H 5: CAN0_L 
CAN1 + RS-232	M12 socket, 5 poles, A-coded 1: RS-232_TxD 2: RS-232_RxD 3: GND_COM 4: CAN1_H 5: CAN1_L 
ETH0 / ETH1	M12 socket, 4 poles, D-coded 1: TxD+ 2: RxD+ 3: TxD- 4: RxD- 
ST A	AMP, 81 poles, A-coded 1-81: see wiring ST A 
ST B	AMP, 81 poles, B-coded 1-81: see wiring ST B 

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7202424**

Technical data

Wiring

ST A



Abbreviations

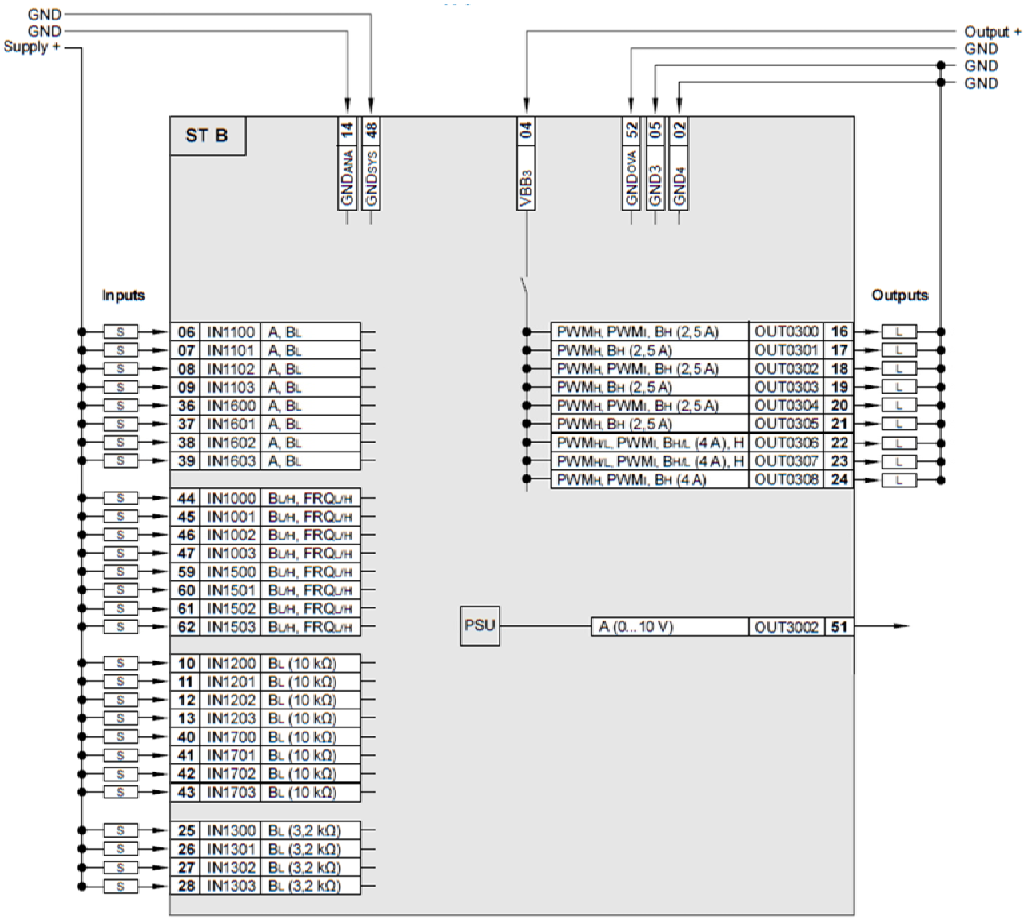
A	analogue
BH	binary high side (CSO)
BL	binary low side (CSI)
FRQL/H	frequency/pulse inputs configurable low side (CSI) / high side (CSO)
H	H-bridge function
PSU	power supply for the system
PWMH	pulse-width modulation high side (CSO)
PWML	pulse-width modulation low side (CSI)
PWMI	pulse-width modulation current-controlled
R	resistor input
VBB0...2	supply output group
VBB30	supply controller

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7202424**

Technical data

Wiring

ST B



Abbreviations

A	analogue
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H	H-bridge function
PSU	power supply for the system
PWMH	pulse-width modulation high side (CSO)
PWML	pulse-width modulation low side (CSI)
PWMI	pulse-width modulation current-controlled
R	resistor input
VBB0...2	supply output group
VBB30	supply controller

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7213624**

IEC 61508:2010 SIL 2
IEC 62061:2005 + A1:2012 + A2:2015 SIL CL 2
if used as safety controller
Suited for requirements up to:
PL d (ISO 13849-1:2015)
AgPL d(ISO 25119:2018,
DIN EN 16590:2014)

32-bit CPU TriCore processor

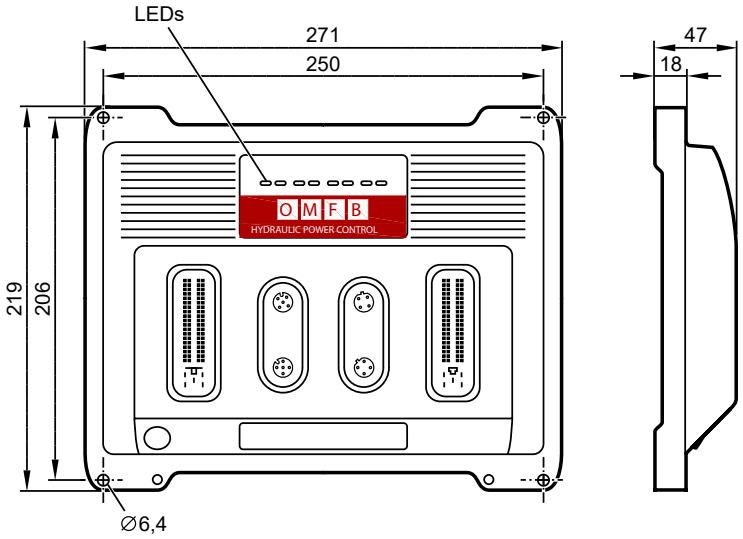
124 inputs/outputs

4 CAN interfaces

Ethernet interface

CODESYS 3.5

8...32 V DC



CE

E1

Technical data	Controller as black box system for the implementation of a central or decentralised system design
Mechanical data	
Housing	closed, screened metal housing with screw fixing
Dimensions (H x W x D)	219 x 271 x 47 mm
Installation	fixing with 4 M6 screws
Connection	2 x connector 81 poles, locked, mechanical reverse polarity and reversal protection type Tyco / AMP contacts AMP-Junior-Timer, crimp connection 0.5/0.75/2.5 mm² 2 x M12 connector 4 poles, D-coded 2 x M12 connector 5 poles, A-coded shield connection Ø 4 mm for self-tapping screw
Weight	1.6 kg
Housing/storage temperature	– 40...85 °C / – 40...85 °C
Max. perm. relative humidity	90 % (not condensing)
Height above sea level	max. 3000 m
Degree of soiling	2
Protection rating	IP 65 / IP 67 (for inserted connectors with individually sealed cores and inserted M12 connectors/sealing caps)
Electrical data	
Input/output channels, total	124 (68 inputs / 56 outputs)
Inputs	configurable, with diagnostic capability 24 x A (0...10/32 V, 0...20 mA, ratiometric) / BL 16 x $FRQ_{L/H}$ (≤ 30 kHz) / BL/H 4 x R (0.016...30 kOhm) / BL 16 x B_L (impedance ≤ 10 kOhm) 8 x B_L (impedance ≤ 3.2 kOhm

OMFB HYDRAULIC POWER CONTROL

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7213624**

Technical data	
Outputs	configurable, with diagnostic capability 12 x $PWM_{H/L}$ / PWM_I / $B_{H/L}$ (20...2000 Hz, 4.0 A, H-bridge) 6 x PWM_H / PWM_I / B_H (20...2000 Hz, 4.0 A) 18 x PWM_H / PWM_I / B_H (20...2000 Hz, 2.5 A) 18 x PWM_H / B_H 2.5 A 2 x A (0...10 V)
Sensor supply	1 x 0/5/10 V, max. 2 W configurable
	For the number of inputs/outputs and configuration options also see the wiring diagrams
Operating voltage Overvoltage	8...32 V DC 36 V for t ≤ 10 s
Reverse polarity protection	yes, in case of supply via the on-board system (battery)
Power consumption VBB_{30}	8 W
CAN interfaces 0...3 Baud rate Communication profile	CAN interface 2.0 A/B, ISO 11898 20 kbit/s...1 Mbit/s (default 250 kbit/s) CANopen, CiA DS 301 V4.2, CiA DS 401 V1.4 / SAE J 1939 / free protocol CANopen Safety for safe data transmission
Serial interface Baud rate Topology	RS-232 9.6...115.2 kbit/s (default 115.2 kbit/s) point-to-point (max. 2 participants); master-slave connection
Ethernet interface Transmission rate Protocols	1 interface with integrated switch and 2 ports 10/100 Mbit/s TCP/IP, UDP/IP, Modbus UDP
Processor	32-bit TriCore CPU Infineon AURIX™
Device monitoring	overvoltage and undervoltage monitoring watchdog function (extended safety monitoring to IEC 62061 and ISO13849) checksum test for program and system excess temperature monitoring
Process monitoring concept	second switch-off way per output group via semiconductor switch
Physical memory	flash: 9 Mbytes RAM: 2.7 Mbytes non-volatile memory: 10 kBytes
Memory allocation	Memory can be allocated for safe and non-safe applications see programming manual
Software/programming	
Programming system	CODESYS version 3.5 with SIL 2 extension (IEC 61131-3)
Indicators	
Status LED	2 x two-colour LED (R/G) for SYS0 and SYS1
Ethernet LED	2 x LED (G) for ETH0 and ETH1
Application LED	4 x three-colour LED (R/G/B) for APP0, APP1, APP2 and APP3, programmable

Technical data

Operating states system

LED SYS0		LED SYS1		System state
Colour	State	Colour	State	
–	off	–	off	no operating voltage
green	5 Hz	–	off	no operating system loaded
red	on	–	off	hardware error (fatal error+)
red	on	red	on	system error (fatal error)
green/ yellow	2 Hz	green/ yellow	2 Hz	update

Operating states PLC/application

LED	Colour	Status	Description	
SYS0	green	on	Standard PLC	no application
		2 Hz		run
	red	10Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
SYS1	green	on	Safety PLC	no application
		2 Hz		run
	red	10Hz		error application (serious error)
	yellow	2 Hz		debug run
		on		debug stop
ETH0	green	flashing	data transmission Ethernet	
		on	Ethernet connection ok, no data transfer	
ETH1	green	flashing	data transmission Ethernet	
		on	Ethernet connection ok, no data transfer	
APP0	red	on	status display of the application, freely	
...	green	on	status display of the application, freely	
APP3	blue	on	status display of the application, freely	

Safety-related characteristics

Safety Integrity Level Claim Limit	SIL CL	2

Component	PFH_D [1/h]
Input, external, single channel	$< 4.0 \times 10^{-9}$
Input, external, dual channel	$< 5.0 \times 10^{-10}$
Logic	$< 1.0 \times 10^{-7}$
Output, external, single channel	$< 2.0 \times 10^{-8}$
Output, external, dual channel	$< 1.0 \times 10^{-9}$

Lifetime: 20 years

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7213624**

Technical data		
Test standards and regulations		
CE mark	EN IEC 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety-related control systems
	EN 61000-6-2	Electromagnetic compatibility (EMC)
	EN 61000-6-4	Electromagnetic compatibility (EMC) Emission
	EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use
E1 mark	UN/ECE-R10	Noise emission Noise immunity with 100 V/m
Electrical tests	ISO 7637-2	Pulse 1, severity level: IV; function state C Pulse 2a, severity level: IV; function state A Pulse 2b, severity level: IV; function state C Pulse 3a, severity level: IV; function state A Pulse 3b, severity level: IV; function state A Pulse 4, severity level: IV; function state A Pulse 5, severity level: III; function state A (data valid for the 24 V system) Pulse 4, severity level: III; function state A (data valid for the 12 V system)
Climatic tests	EN 60068-2-30	Damp heat, cyclic Upper temperature 55 °C, number of cycles: 6
	EN 60068-2-78	Damp heat, steady state Test temperature 40°C / 93% RH, test duration: 21 days
	EN 60068-2-52	Salt spray test Severity level 3 (vehicle)
Mechanical tests	ISO 16750-3	Test VII; vibration, random Mounting location: vehicle body
	EN 60068-2-6	Vibration, sinusoidal 10...500 Hz; 0.72 mm/10 g; 10 cycles/axis
	ISO 16750-3	Bump 30 g/6 ms; 24,000 shocks
Safety-related tests	IEC 61508	parts 1-7 Functional safety of electrical/electronic/programmable electronic safety-related systems
	EN 62061	Safety of machinery - Functional safety of electrical, electronic and programmable safety- related control systems
Chemical resistance	ISO 16750-5	AA, BA, BD, CC, DB, DC, DD, Only one chemical permitted at a time

ST A and ST B / input characteristics

ST A: **ST B:**

IN0100...0103 **IN1100...1103**
IN0200...0203 **IN1600...1603**
IN0600...0603
IN0700...0703

Multifunction inputs analogue / digital (IN MULTIFUNCTION-A)

Resolution	12 bits
Input frequency	< 330 Hz
Measuring ranges	0...10 V, 0...32 V, 0...20 mA, ratiometric, binary low side
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Current input 0 … 20 mA (A)

Input resistance	298 Ω
Range diagnostics min./max.	0 mA / 20 mA (default)
Accuracy	± 1.5 % FS

Voltage input 0...10 V (A)

Input resistance	67.6 kΩ
Range diagnostics min./max.	0 V / 10 V (default)
Accuracy	± 1 % FS

Voltage input 0...32 V (A)

Input resistance	51.0 kΩ
Range diagnostics min./max.	0 V / 32 V (default)
Accuracy	± 1 % FS

Voltage input ratiometric (A)

Input resistance	51.0 kΩ
Range diagnostics min./max.	0 ‰ / 1000 ‰ (default)
Accuracy	± 1 % FS

Digital input (B_L) (default)

Input resistance	9.5 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)
Accuracy	± 1 % FS

ST A: **ST B:**

IN0000...0003 **IN1000...1003**
IN0500...0503 **IN1500...1503**

Digital inputs, frequency measurement (IN FREQUENCY-B)

Resolution	12 bits

Frequency input ($FRQ_{L/H}$)

Input resistance	10 kΩ
Input frequency	≤ 30 kHz
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy	± 10 µs

ST A and ST B / input characteristics

Digital input ($B_{L/H}$)
(default: B_L)

Input resistance	10 kΩ
Input frequency	< 330 Hz
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L / B_H	± 1 % FS / ± 3 % FS
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

ST A:

IN0400...0401
IN0900...0901

Digital / resistor inputs
(IN RESISTOR-B)

Resolution	12 bits
Input frequency	< 330 Hz
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)
(default)

Input resistance	3.2 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1 % FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

Resistor input (R)

Measuring current	< 2.0 mA
Measuring range	0.016…30 kΩ
Accuracy	± 2 % FS: 0.016…3 kΩ ± 5 % FS: 3…15 kΩ ± 10 % FS: 15…30 kΩ
Range diagnostics min./max.	0 Ω / 31 kΩ (default)

ST B:

IN1200... 1203
IN1700... 1703

Digital inputs
(IN DIGITAL-A)

Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 10 kΩ
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)

Input resistance	10 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1 % FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

ST A and ST B / input characteristics

ST A: **ST B:**

IN0300... 0301 **IN1300... 1303**
IN0800... 0801

Digital inputs 2-wire sensor (IN DIGITAL-B)

Resolution	12 bits
Input frequency	< 330 Hz
Impedance	≤ 3.2 kΩ
Range diagnostics	configurable minimum and maximum values for the measuring range to detect short circuit to VBB and short circuit to GND / wire break

Digital input (B_L)

Input resistance	3.2 kΩ
Switch-on level	> 0.7 VBB_{30}
Switch-off level	< 0.3 VBB_{30}
Accuracy B_L	± 1 % FS
Range diagnostics min./max.	1 V / 0.95 VBB_{30} (default)

RESET-COM

Switch-on level	> 0,7 VBB_{30}
Switch-off level	< 0,3 VBB_{30}
Accuracy	± 5 % FS

Observe the notes on the configuration of the inputs/outputs!

Abbreviations

A analogue
B_H binary high side (CSO)
B_L binary low side (CSI)
$FRQ_{L/H}$ frequency/pulse inputs configurable low side (CSI) / high side (CSO)
PWM_H pulse width modulation high side (CSO)
PWM_L pulse width modulation low side (CSI)
PWM_I pulse width modulation current-controlled
R resistor input
$VBB_{0...3}$ supply output group
VBB_{30} supply controller

ST A and ST B / output characteristics

ST A: **ST B:**

OUT0006...0007 **OUT0306...0307**
OUT0106...0107 **OUT0406...0407**
OUT0206...0207 **OUT0506...0507**

Digital / PWM outputs
4.0 A, H-bridge
(OUT PWM-40-BRIDGE-A)

Digital output (B_H) (default)

Switching current	0.025...4 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND according to the programming manual detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_L)

Switching voltage	8...32 V DC
Range diagnostics min./max.	0 A / 4 A (default)

PWM output (PWM_H)

Functions	as H-bridge

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 4 A (default)

PWM output (PWM_L)

Output frequency	20...500 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω (at 12 V DC) ≥ 6 Ω (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 4 A (default)

ST A and ST B / output characteristics

ST A: **ST B:**

OUT0008 **OUT0308**
OUT0108 **OUT0408**
OUT0208 **OUT0508**

Digital / PWM outputs 4.0 A (OUT PWM-40-A)

Switching voltage	8...32 V DC
Switching current	0.025...4 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 4 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 4 A (default)

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...4 A
Setting resolution	1 mA
Control resolution	2 mA
Load resistance	≥ 3 Ω (at 12 V DC) ≥ 6 Ω (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 4 A (default)

ST A: **ST B:**

OUT0000 **OUT0300**
OUT0002 **OUT0302**
OUT0004 **OUT0304**
OUT0100 **OUT0400**
OUT0102 **OUT0402**
OUT0104 **OUT0404**
OUT0200 **OUT0500**
OUT0202 **OUT0502**
OUT0204 **OUT0504**

Digital / PWM outputs 2.5 A (OUT PWM-25-A)

Switching voltage	8...32 V DC
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	1 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 2.5 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A and ST B / output characteristics

Current-controlled output (PWM_I)

Output frequency	20...2000 Hz (per channel)
Control range	0.05...2.5 A
Setting resolution	1 mA (at 20...250 Hz)
Control resolution	2 mA
Load resistance	≥ 4.8 Ω / (at 12 V DC) ≥ 9.6 Ω / (at 24 V DC)
Accuracy	± 1.5 % FS (for inductive loads)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A:

OUT0001
OUT0003
OUT0005
OUT0101
OUT0103
OUT0105
OUT0201
OUT0203
OUT0205

ST B:

OUT0301
OUT0303
OUT0305
OUT0401
OUT0403
OUT0405
OUT0501
OUT0503
OUT0505

Digital outputs 2.5 A (OUT PWM-25-B)

Switching voltage	8...32 V DC
Switching current	0.025...2.5 A
Protective circuit for inductive loads	integrated
Accuracy current feedback	5 % FS
Diagnostics current feedback	configurable minimum and maximum values to detect short circuit and wire break
Diagnostics status feedback	detection of short circuit to VBB and short circuit to GND detection TRUE: ≥ 3 V detection FALSE: ≤ 1 V

Digital output (B_H) (default)

Range diagnostics min./max.	0 A / 2.5 A (default)

PWM output (PWM_H)

Output frequency	20...2000 Hz (per channel)
Pulse/pause ratio	1...1000 ‰ (adjustable via software)
Resolution	1 ‰ FS (at 20...250 Hz)
Range diagnostics min./max.	0 A / 2.5 A (default)

ST A and ST B / output characteristics

ST A:

OUT3000

Sensor supply (OUT SUPPLY-A)

For sensors and joysticks
0 V / 5 V, 400 mA / 10 V, 200 mA, accuracy ± 5 %
Minimum current 10 mA
Short-circuit proof and overload protected

ST A: **ST B:**

OUT3001 **OUT3002**

Analogue outputs (OUT VOLTAGE-A)

Current rating	< 5 mA
Output voltage	0...10 V
Accuracy	± 5 % FS
Step response time 10...90 %	< 1.8 ms

Output groups $VBB_{0...3}$

Load current per output group	≤ 12 A
Internal semiconductor switches	One switch in series of 9 semiconductor outputs each Forced controlling by means of hardware and additional controlling by means of user program

Switching current	0.1...12 A
Current diagnostics excessive current)	> 12 A

Short-circuit strength to GND	Outputs are switched off via the output driver

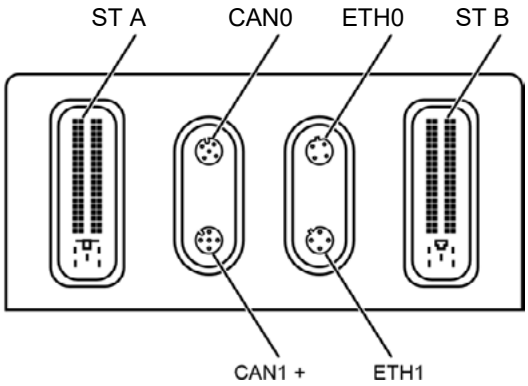
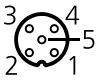
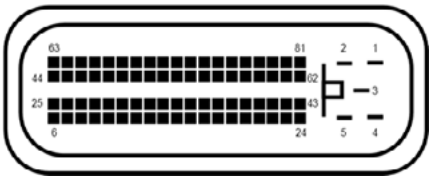
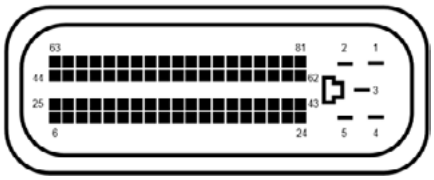
Abbreviations

A	analogue
B_H	binary high side (CSO)
B_L	binary low side (CSI)
PWM_H	pulse-width modulation high side (CSO)
PWM_L	pulse-width modulation low side (CSI)
PWM_I	pulse-width modulation current-controlled
$VBB_{0...3}$	supply output group
VBB_{30}	supply controller

I/O controller for PDV Proportional valve - PHSI series

Code number: **PHSI7213624**

Technical data

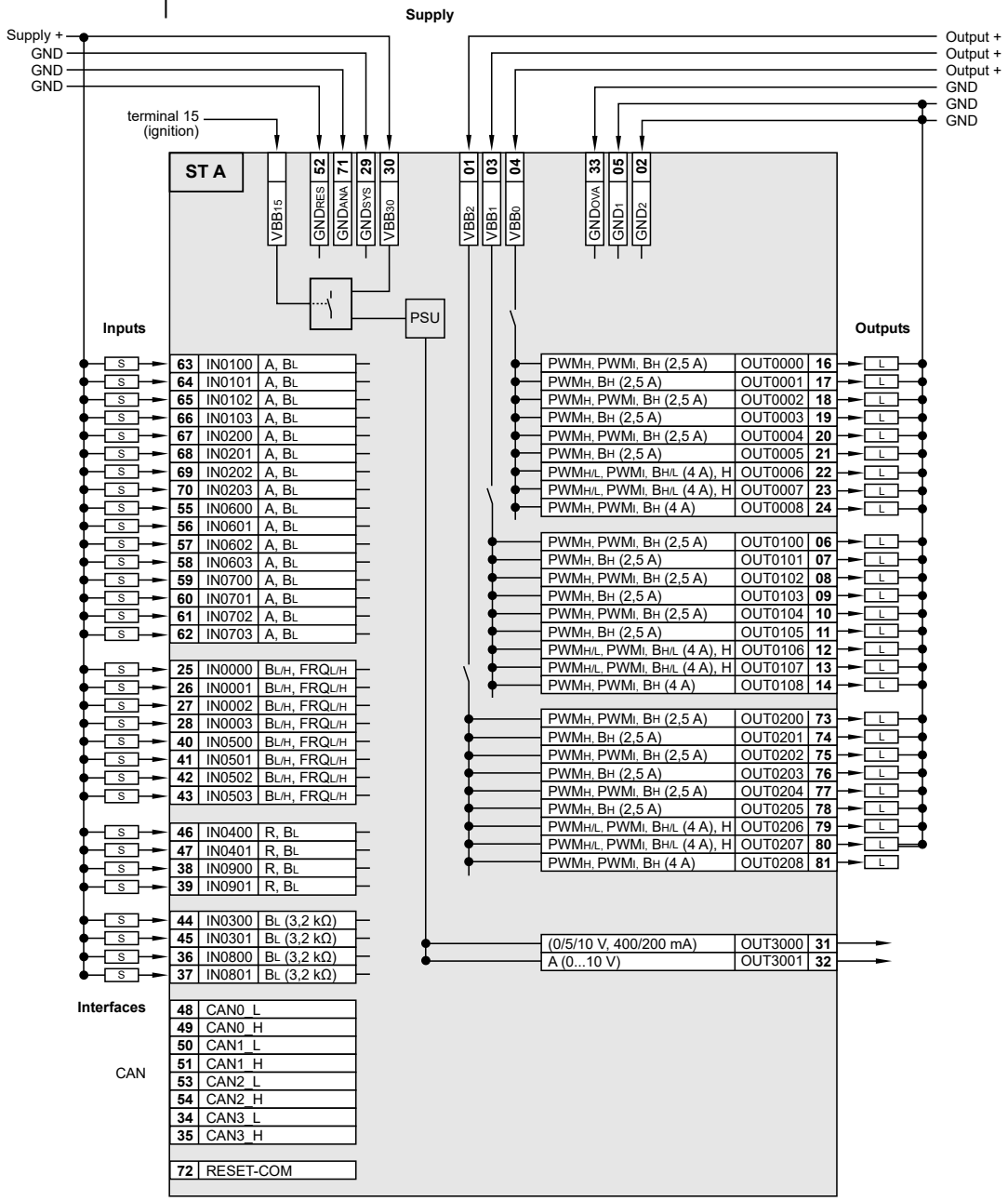
Connectors	 RS-232
CAN0	M12 socket, 5 poles, A-coded 1: not used 2: not used 3: GND_COM 4: CAN0_H 5: CAN0_L 
CAN1 + RS-232	M12 socket, 5 poles, A-coded 1: RS-232_TxD 2: RS-232_RxD 3: GND_COM 4: CAN1_H 5: CAN1_L 
ETH0 / ETH1	M12 socket, 4 poles, D-coded 1: TxD+ 2: RxD+ 3: TxD- 4: RxD- 
ST A	AMP, 81 poles, A-coded 1-81: see wiring ST A 
ST B	AMP, 81 poles, B-coded 1-81: see wiring ST B 

I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7213624**

Technical data

Wiring

ST A



Abbreviations

A	analogue
BH	binary high side (CSO)
BL	binary low side (CSI)
FRQL/H	frequency/pulse inputs configurable low side (CSI) / high side (CSO)
H	H-bridge function
PSU	power supply for the system
PWMH	pulse-width modulation high side (CSO)
PWML	pulse-width modulation low side (CSI)
PWMI	pulse-width modulation current-controlled
R	resistor input
VBB0...2	supply output group
VBB30	supply controller

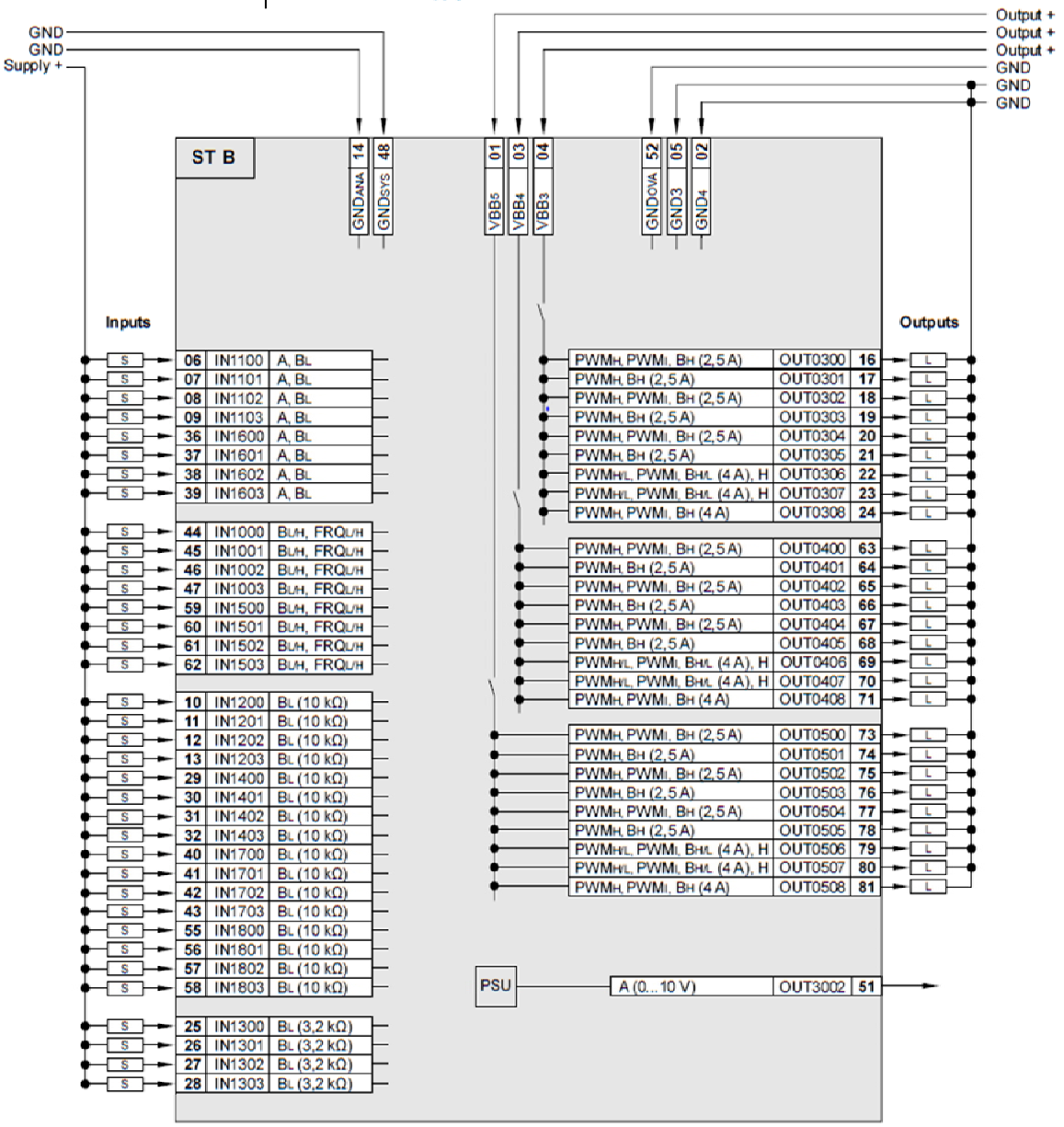
I/O controller for PDV Proportional valve - PHSI series
Code number: **PHSI7213624**

Technical data

Wiring

ST B

Supply



Abbreviations

A	analogue
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FRQL/H	frequency/pulse inputs configurable low side (CSI) / high side (CSO)
H	H-bridge function
PSU	power supply for the system
PWMH	pulse-width modulation high side (CSO)
PWML	pulse-width modulation low side (CSI)
PWMI	pulse-width modulation current-controlled
R	resistor input
VBB0...2	supply output group
VBB30	supply controller

TÜV NORD

(1) # EU-Type-Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 2014/34/EU**

(3) **Certificate Number** **TÜV CY 20 ATEX 0206305 X**

(4) for the equipment: Electro-hydraulic devices with solenoids
Types: PEAC * * * * * * *
PEAD * * * * * * *

(5) of the manufacturer: **O.M.F.B. S.p.A.**

(6) Address: Via Cave 7/9, 25050 Provaglio d'Iseo (BS).- Italy

Order number: 0206305

Date of issue: 2020-10-30

(7) The design of this equipment or protective system and any acceptable variation thereto are specified in the schedule to this EU-Type-Examination Certificate and the documents therein referred to.

(8) TÜV CYPRUS Ltd, notified body No. 2261 in accordance with Article 17 of the Council Directive of 2014/34/EU of February 26, 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. 20 0206305.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 60079-0:2018 **EN 60079-18:2014 + AMD1:2017**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EU-Type-Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment which are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:
II 2G Ex mb IIC T4 Gb
II 2D Ex mb IIIC T135°C Db

TÜV CYPRUS Ltd (TÜV NORD Group),

The head of the notified body,

D. Demosthenous

Notified Body TÜV CYPRUS Member of TUV Nord 2261

TÜV CYPRUS (TÜV NORD) Ltd,
2 Papaflessa Str., 2235 Latsia, Nicosia - P.O.Box: 20732, 1663 Nicosia, Cyprus
Tel:+357 22 44 28 40 Fax:+35722 44 28 50 email: info@tuvcyprus.com.cy
www.tuv-nord.com/cy

TÜV NORD

(13) **SCHEDULE**

(14) **EU-Type-Examination Certificate No. TÜV CY 20 ATEX 0206305 X**

(15) Description of equipment

The PEAC and PEAD modules are electric devices with solenoids that control the pressure at the ends of an oil distributor according to a specific variable input. They are used for remote control of hydraulic devices. The electric and electronic components are encapsulated in the enclosure, the equipment is provided with permanently connected cable, the cable gland and the cable are encapsulated to the enclosure. The type of protection is encapsulation "Ex mb" and the equipment is suitable for gas Group IIC and dust Group IIIC.

Different control options and functional modes come are identified in the Identification codes.

Type key:

Identification codes:

Type: **PEAC** * * * * * * * solenoids with electronic board

PEAC	*	*	*	*	*	*	*
	Certifications	**Type of Control**	**Version**	**Control Signal**	**Cable type** (n. wires x section)	**Seals type**	**Variants**
	X= ATEX (cast-iron housing only)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)	3=Cable LAPP (7x0.75mm2)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)
	A= ATEX and SIL2 (cast-iron housing only)				4= Cable LAPP (4x1mm2)		
					5= Cable IGUS (7x0.5mm2)		
					6= Cable IGUS (4x1mm2)		

Type: **PEAD** * * * * * * * solenoids without electronic control board

PEAD	*	*	*	*	*	*	*
	Certifications	**Supply Voltage**	**Cable type** (n. wires x section)	**Coil Position**	**Gauge Ports**	**Seals type**	**Variants**
	X= ATEX (cast-iron housing only)	3= 12Vdc – PWM	3=Cable LAPP (7x0.75mm2)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)
		4= 24Vdc – PWM	4= Cable LAPP (4x1mm2)				
		5= 12Vdc – ON/OFF					
		6= 24Vdc – ON/OFF					

TÜV NORD

Technical data:

Power supply:

Type	Nominal Voltage	Rated Voltage
PEAC	10Vdc up to 30Vdc	Max 30Vdc
PEADX*	12Vdc	16Vdc
	24Vdc	30Vdc

* See identification codes

The equipment must be connected by means of the cable leads to an external fuse, fitted in a safe area, with the following characteristics:

- For the PEACX ****** (Vn= 10÷30Vdc, Rated voltage=30Vdc) a time delay fuse In=0.8 A.
- For type PEADX3 ***** (PWM, Vn=12Vdc, Rated Voltage= 16Vdc) a time delay fuse In=0.8 A;
- For typePEADX4 ***** (PWM, Vn=24Vdc, Rated voltage=30Vdc) a time delay fuse In=0.315 A;
- For type PEADX5 ***** (ON-OFF, Vn=12Vdc, Rated voltage=16Vdc) a time delay fuse In=0.250 A;
- For type PEADX6 ***** (ON-OFF, Vn=24Vdc, Rated voltage=30Vdc) a time delay fuse In=0.125 A.

The short-circuit breaking capacity of these fuses shall be minimum 1500 A with rated voltage equal to or higher than the rated voltage of the equipment.

Permissible range of ambient temperature:
Ambient Temperature: -35°C ÷ + 55°C
Fluid Temperature: -20 ÷ +80°C

IP Rating
The equipment has been declared by the manufacturer to have a degree of protection of IP 6X according to IEC60529 and IP X6, IP X7 and IP X9K according to ISO 20653.

Warning Markings:
Warning: See Installation Instruction Document

(16) Test documents are listed in the test report No. 20 0206305

(17) Special conditions for safe use

- The equipment shall be protected by a suitable external fuses as indicated in technical data and in the safety instruction.
- The module has permanently connected cable. The free end of the cable has to be connected in an enclosure made in one of type protection listed in EN 60079-0 or outside of hazardous area.

(18) Essential Health and Safety Requirements
This certificate covers the Essential Health and Safety Requirements related to the Directive 2014/34/EU.

OMFB
HYDRAULIC POWER CONTROL

TÜV CYPRUS
Member of TÜV NORD Group

ATEX Assessment Report 20 0206305 dated 2020-10-30

Customer:	O.M.F.B. S.p.A. Via Cave 7/9 25050 Provaglio d'Iseo (BS) ITALY
Order number:	0206305
Test object:	Electro-hydraulic devices with solenoids type: PEAC******* PEAD*******
Evaluation principles:	Harmonized standards/ EHRS EN 60079-0:2018 General requirements EN 60079-18:2014 + AMD1:2017 Encapsulation "m"
Test laboratory :	TÜV CYPRUS Ltd 2 Papaflessa Str., 2235, Latsia, Lefkocia P.O.Box: 20732 Nicosia 1663
Test location :	Republic of Croatia – Ministry of the Interior - Laboratory EXLAB Industrijska 25 - 10431 - Sveta Nedelja, Croatia FIDITAS Ltd. Laboratory for Explosion Protection Karlovačka cesta 197, 10250 Zagreb-Lučko, Croatia O.M.F.B. S.p.A. 25050 Provaglio d'Iseo (BS) Via Cave 7/9
Date of receipt of the test object:	2019 October
Test date:	From 2019 October to 2020 October
Interpretation s:	The test results confirm the compliance of the "equipment" with the requirements of the Evaluation principles mentioned above.

Compiled
The Inspector:
(Pietro Scavello)

Approved
The Reviewer:
(Marco Ghisu)

1. Order description :

Assessment of PEAC and PEAD electro-hydraulic actuators for issuing of EU Type examination certificate according to ATEX directive 2014/34/UE Annex III.

2. Spe ci fication of the test object :

Description :

The PEAC and PEAD modules are electric devices with solenoids that control the pressure at the ends of an oil distributor according to a specific variable input. They are used for remote control of hydraulic devices. The electric and electronic components are encapsulated in the enclosure, the equipment is provided with permanently connected cable, the cable gland and the cable are encapsulated to the enclosure. The type of protection is encapsulation “Ex mb” and the equipment is suitable for gas Group IIC and dust Group IIIC.

Different control options and functional modes come are identified in the Identification codes.

Type key:

Identification codes:

Type: PEAC * * * * * * * solenoids with electronic board (Supply voltage 10 ÷ 30Vdc)

PEAC	*	*	*	*	*	*	*
	Certifications	Type of Control	Version	Control Signal	Cable type (n. wires x section)	Seals type	Variants
	X= ATEX (cast-iron housing only)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)	3=Cable LAPP (7x0.75mm2 wires)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)
	A= ATEX and SIL2 (cast-iron housing only)				4= Cable LAPP (4x1mm2 wires)		
					5= Cable IGUS (7x0.5mm2 wires)		
					6= Cable IGUS (4x1mm2 wires)		

Type: PEAD * * * * * * * solenoids without electronic control board

PEAD	*	*	*	*	*	*	*
	Certifications	Supply Voltage	Cable type (n. wires x section)	Coil Position	Gauge Ports	Seals type	Variants
	X= ATEX (cast-iron housing only)	3= 12Vdc – PWM	3=Cable LAPP (7x0.75mm2 wires)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)	Numeral (Not relevant for certification)
		4= 24Vdc – PWM	4= Cable LAPP (4x1mm2 wires)				
		5= 12Vdc – ON/OFF					
		6= 24Vdc – ON/OFF					

Technical data:

Power supply:

Type	Nominal Voltage	Rated Voltage
PEAC	10Vdc up to 30Vdc	Max 30Vdc
PEADX*	12Vdc	16Vdc
	24Vdc	30Vdc

* See identification codes

The equipment must be connected by means of the cable leads to an external fuse, fitted in a safe area, with the following characteristics:

- For the PEACX ****** (Vn= 10÷30Vdc, Rated voltage=30Vdc) a time delay fuse In=0.8 A.
- For type PEADX3 ***** (PWM, Vn=12Vdc, Rated Voltage= 16Vdc) a time delay fuse In=0.8 A;
- For typePEADX4 ***** (PWM, Vn=24Vdc, Rated voltage=30Vdc) a time delay fuse In=0.315 A;
- For type PEADX5 ***** (ON-OFF, Vn=12Vdc, Rated voltage=16Vdc) a time delay fuse In=0.250 A;
- For type PEADX6 ***** (ON-OFF, Vn=24Vdc, Rated voltage=30Vdc) a time delay fuse In=0.125 A.

The short-circuit breaking capacity of these fuses shall be minimum 1500 A with rated voltage equal to or higher than the rated voltage of the equipment.

Warning labels:

"Warning: See Installation Instruction Document"

Allowable ambient temperature range:
Ambient Temperature: -35°C ÷ + 55°C
Fluid Temperature: -20 ÷ +80°C

IP Rating
The equipment has been declared by the manufacturer to have a degree of protection of IP 6X according to IEC60529 and IP X6, IP X7 and IP X9K according to ISO 20653.

3. Marking of test object :

II 2G Ex mb IIC T4 Gb
II 2D Ex mb IIIC T135°C Db

4. Details to the evaluation principles :

The above mentioned equipment is tested according the standards on the first sheet.

5. Tests performed :

1. Service temperature - EN IEC 60079-0 26.5.1.2
2. Maximum surface temperature – EN IEC 60079-0 26.5.1.3
3. Maximum temperature - EN IEC 60079-18 8.2.2
4. Cable pull test EN IEC 60079-18 8.2.5
5. Dielectric strength test EN IEC 60079-18 8.2.4
6. Surface resistance test of parts of the enclosure of non-metallic materials – EN IEC 60079-0 26.13
7. Thermal endurance to heat - EN IEC 60079-0 26.8
8. Thermal endurance to cold - EN IEC 60079-0 26.9

9. Resistance to impact - EN IEC 60079-0 26.4.2
10. Resistance to UV light – EN IEC 60079-0 26.10
11. Water absorption test (on the compound) - EN IEC 60079-18 8.1.1
12. Dielectric strength test (on the compound) - EN IEC 60079-18 8.1.2

6. Test documents submitted :

Designation	Number	N. Pag.	Date
Technical Files			
Technical file	M.76.A	30	2020.05.03
Risk analysis: PEA_X modules	M.74.A	5	2020.03.02
Manufacturing Procedure			
Assembly Instructions PEA_X	I.277.A	8	2020.10.04
Resin Instructions PEA_X	I.279.A	8	2020.10.04
Dielectric Strenght Test PEA_X	I.280.A	6	2020.10.04
Control Plan PEA_X	I.281.A	3	2020.02.19
A-PRO2 Technical Spec. Electronic Board	0001/20	18	2020.02.11
Bill of materials			
BOM Electronic Board Version 02_00	BOM OMFB_VALVE_DRIVER_002_00 _20200115	7	2020.01.15
BOM Electronic Board Version 03_00	BOM OMFB_VALVE_DRIVER_003_00 _20200518	7	2020.05.18
Test Report			
Ministry of Interior EXLAB Laboratory Test Report Dokument	20TR008	7	2020.03.25
Fiditas Laboratory Test Report	TR 20 LAB 002	7	2020.05.13
O.M.F.B. Test Report - Service and maximum surface temperatures	AT 0206305 TUV Nord Witnessing	23	2019.12.17
Instruction Manual			
Electrohydraulic actuators safety instruction	99701020002	22	2020.04.29
Drawings			
Electrohydraulic Module 12 V PWM	50055060280	1	2020.06.18
Electrohydraulic Module 24 V PWM	50055060299	1	2020.06.18
Electrohydraulic Module 12 V ON-OFF	50055060306	1	2020.06.18
Electrohydraulic Module 24 V ON-OFF	50055060315	1	2020.06.18
Electrohydraulic Module closed loop 10-30 V and Verification of Distances EN 60079-18	50055060333 50055060333_quoted	2	2020.06.18
Electrohydraulic Module open loop 10-30V	50055060217	1	2020.06.18
Electrohydraulic Module closed loop 10-30 V. HPV,	50055060351	1	2020.06.18
Electrohydraulic Module closed loop 10-30 V. HPV,	50055060191	1	2020.06.11
COIL 12V Proportional	50056020062	1	2019.06.12
Coil 24V Proporzional	50056020071	1	2019.06.12
Coil 12V ON-OFF	50056020080	1	2019.06.12
Coil 24V ON-OFF	50056020099	1	2019.06.12
Position sensor coil LVDT	50056020044	1	2020.06.22
Enclosure Box	50900002330	1	2020.07.17

Connector plate	50900002349	1	2020.02.24
Label	51302300014	1	2020.07.01
OMFB_Valve_Driver_PCB_Layout	20200110_02_00	12	2020.01.10
Electronic Board Electrical Scheme	31600500023_rev002	7	2020.01.15
Electronic Board Electrical Scheme	31600500023_rev003	7	2020.05.18
Data Sheets			
Enclosure			
Plastic Material Enclosure	LATIOHM_62-03_PD01_G_20 – LET01c	4	2015.11.17
Label material	Bollettino Tecnico 3690	5	2018.02
3M Scotchcal™ Graphic Film			
Electronic Components			
F1 – F3 – F4 Fuses Littelfuse PTC Data Sheet: PICOSMDC012S-2, NANOSMDC016F-2	Littelfuse_PTC_NANOSMD	26	2016
F2- F5 Fuses PFMF.050.2	Schurter-PFMF.050.2-datasheet	3	2014.10.01
U4 - LM1117MPX-3.3/NOPB	Texas Instruments lm1117	41	2020.06
U13 - LMR14206XMK/NOPB	Texas Instruments LMR14206	21	2013.04
U5 - STM32F303CCT6	STM Arm Cortex STM32F303	149	2018.10
eFuse U1 - TPS26625DRCT	Texas Instruments TPS2662x	47	2019.08
U8.- U9 - U12 - VND5160JTR-E	STM VND5160J-E	31	2013.09
Resins			
Elan-Tron resin PU 515/PH 27	Elan-tron PU 515/PH 27	5	2019.06
Cable			
IGUS CF78.UL.05.07 (7G0.5)C	12201103649	2	-
IGUS CF78.UL.10.04 (4G1)C	12201103658	2	-
LAPP OLFLEX PETRO FD 865 CP (7G0.75) 0023315	12201103667	5	2019.04.01
LAPP OLFLEX PETRO FD 865 CP (4G1) 0023324	12201103694	5	2019.04.01
Cable Gland 12201103676	Cembre Data Sheet 2900.M20N	2	2018.07.12
Nut for Cable Gland 12201103685	Cembre	1	-
EU Decl. of Conformity	M75.A	1	2020.04.20

7. Test result:

The individual tests are documented in the confidential test protocol 20 0206305

8. Ambient co nditions :

Temperature: As specified above
Air humidity: no requirements

9. P icture documentation:
See Test Reports above listed.

10. Measurement equipment used:
See Test Reports above listed.

11. Notes for the erection and operation:
Symbol "X" in the certification number for special condition of use.

The equipment shall be protected by a suitable external fuses as indicated in technical data and in the safety instruction.

The module has permanently connected cable. The free end of the cable has to be connected in an enclosure made in one of type protection listed in EN 60079-0 or outside of hazardous area.

12. Routine tests :

The visual inspection in compliance with clause 9.1 of EN 60079-18
Dielectric strength test in compliance with clause 9.2 of EN 60079-18

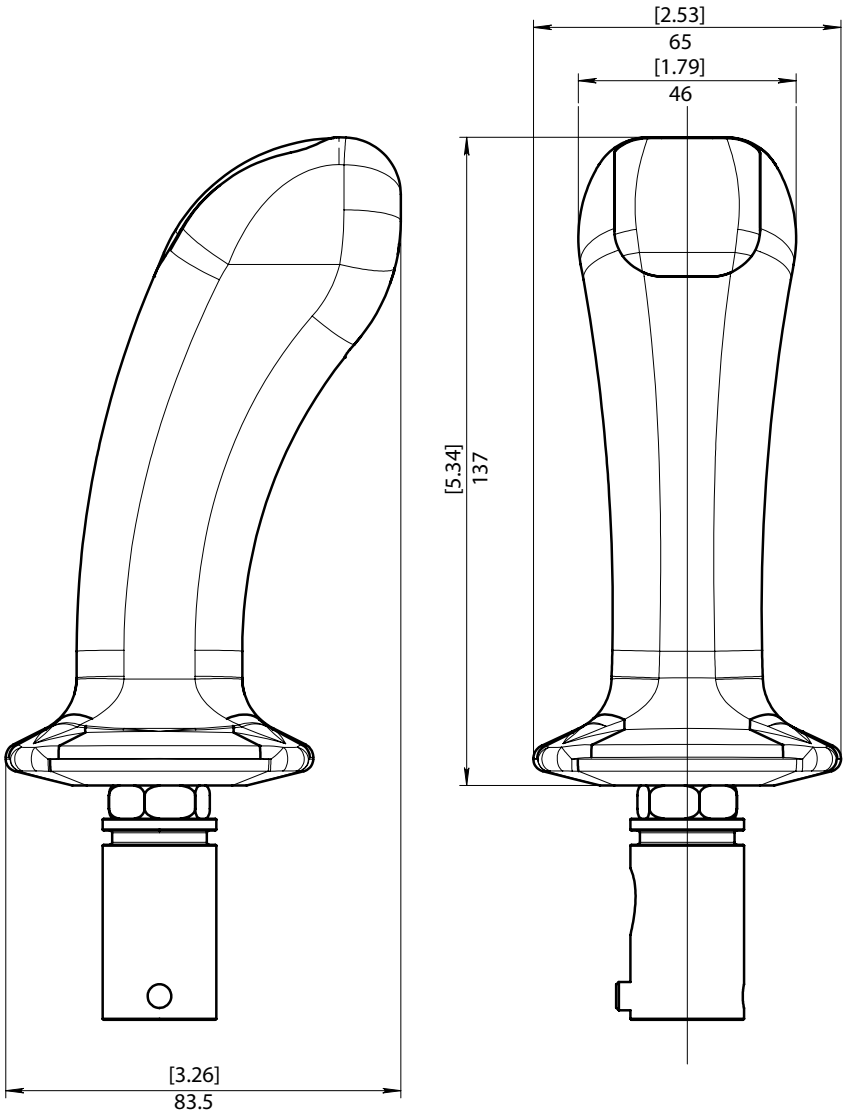
--- End of the Assessment Report ---

PEJD Proportional electronic joystic double Grips

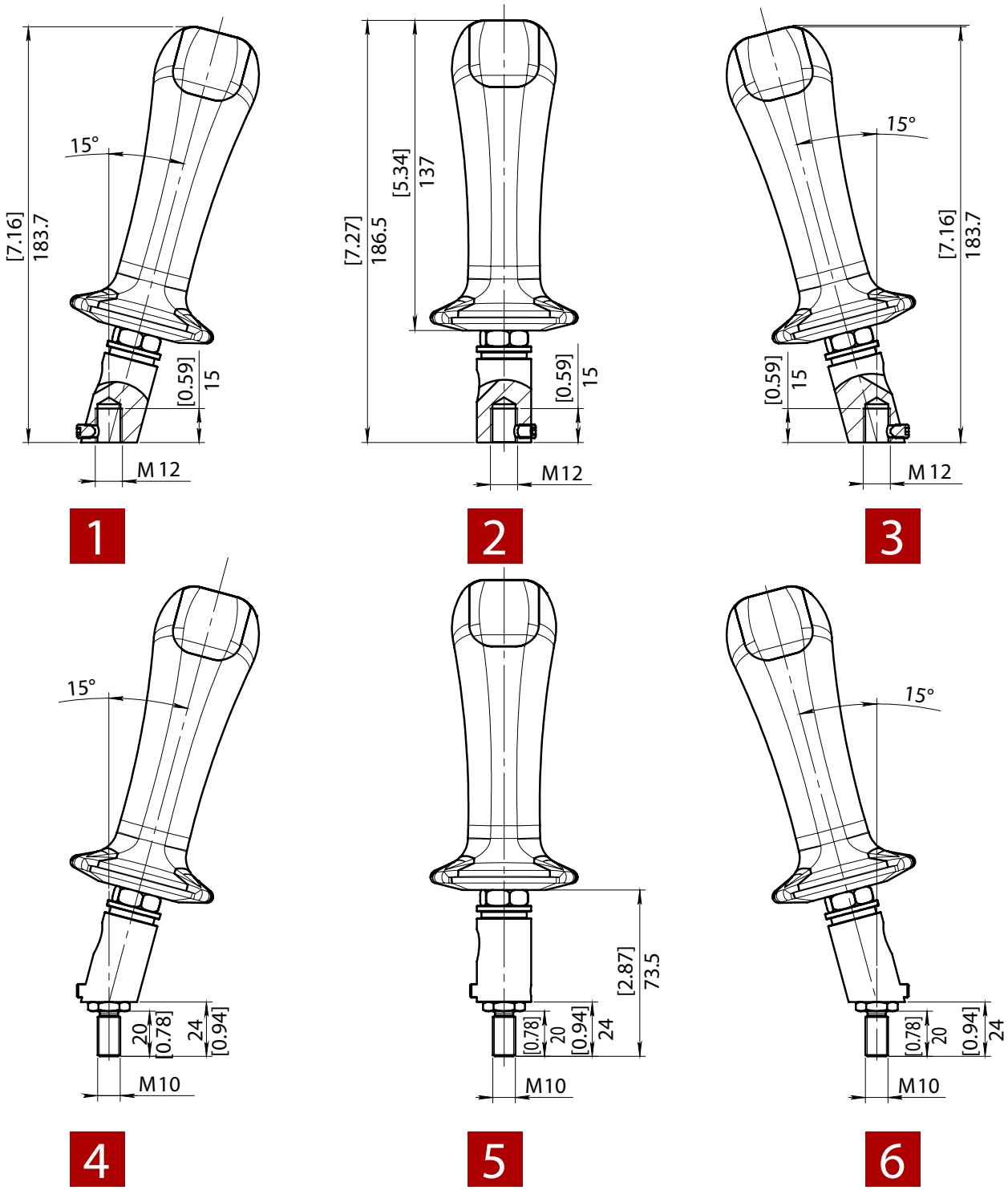
INTRODUZIONE

OMFB Hydraulic Components produces a full range of hand grips designed for use on working vehiles in earthmoving applications, on building sites, and also in the farming industry.
To find the right grip for each application, the characteristics and astandard configurations are indicated for each one.
For specialapplications or configuration, please contact our offices

S



PEJD Proportional electronic joystic double Grip pivots



1 RIGHT TILTED 15° M12

2 STRAIGHT M12

3 LEFT TILTED 15° M12

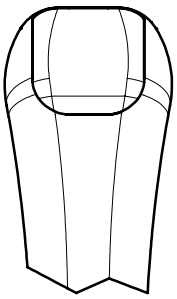
4 RIGHT TILTED 15° M10

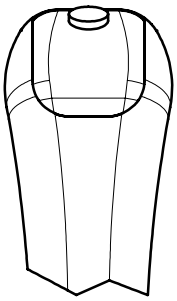
5 STRAIGHT M10

6 LEFT TILTED 15° M10

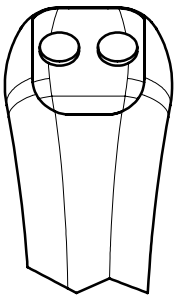
PEJD Proportional electronic joystic double Electric controls

TOP CONFIGURATIONS

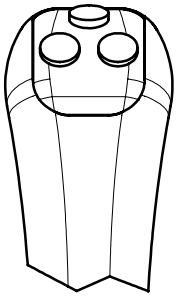




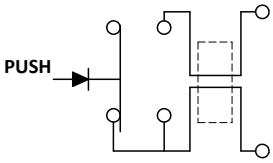
M1



M2+M3

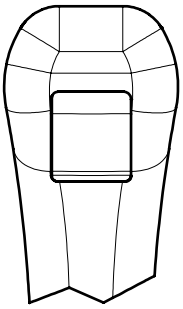


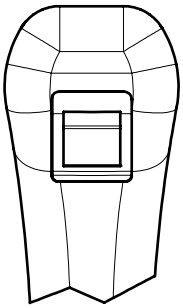
M1+M2+M3



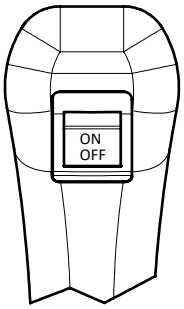
MICRO CAPACITY: DC 12V x 2A

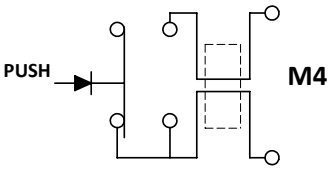
FRONT CONFIGURATIONS



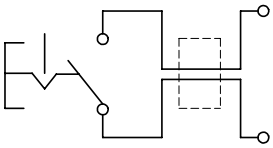


M4: Spring back





M4: On / Off



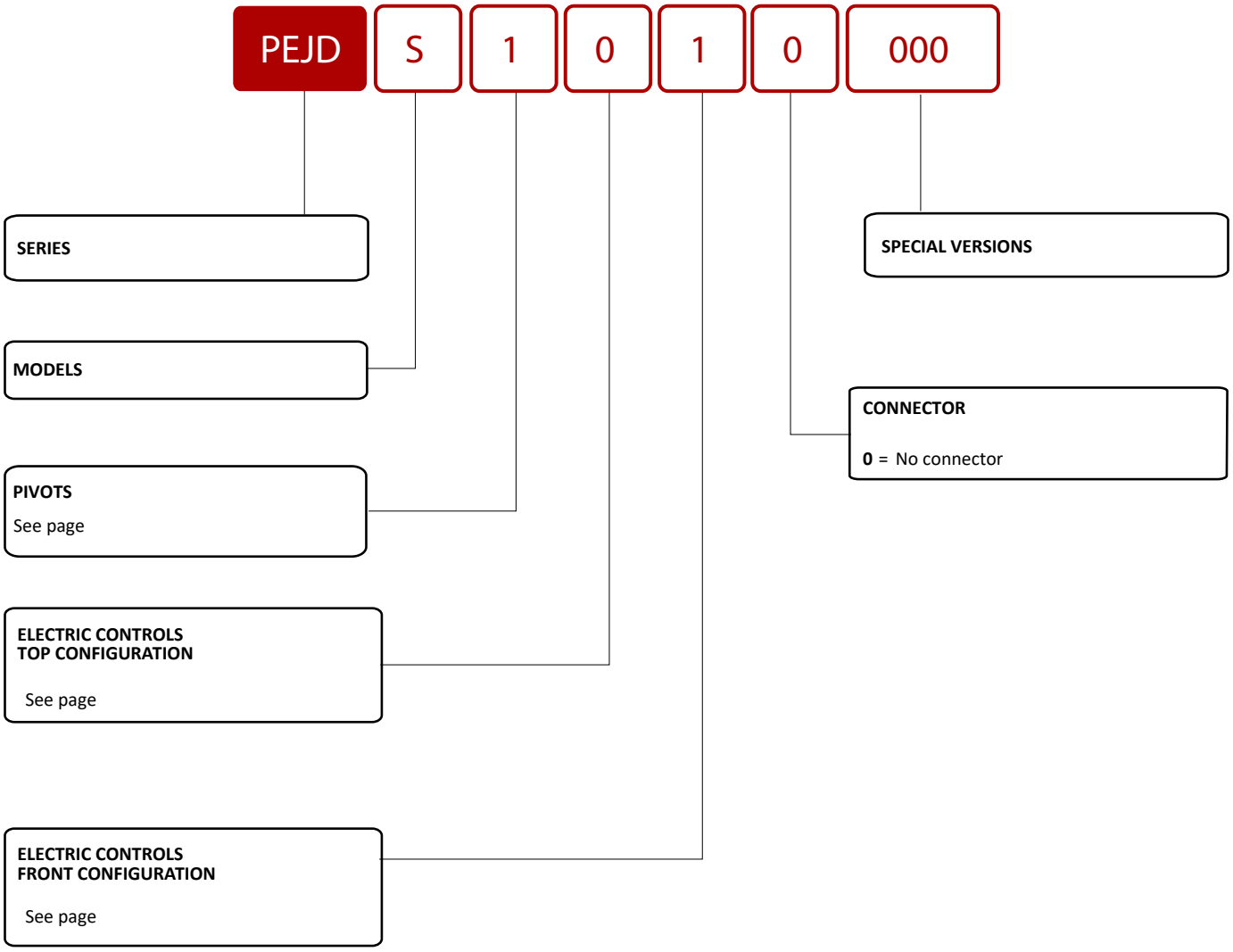
M4 On / Off

MICRO CAPACITY: DC 12V x 2A

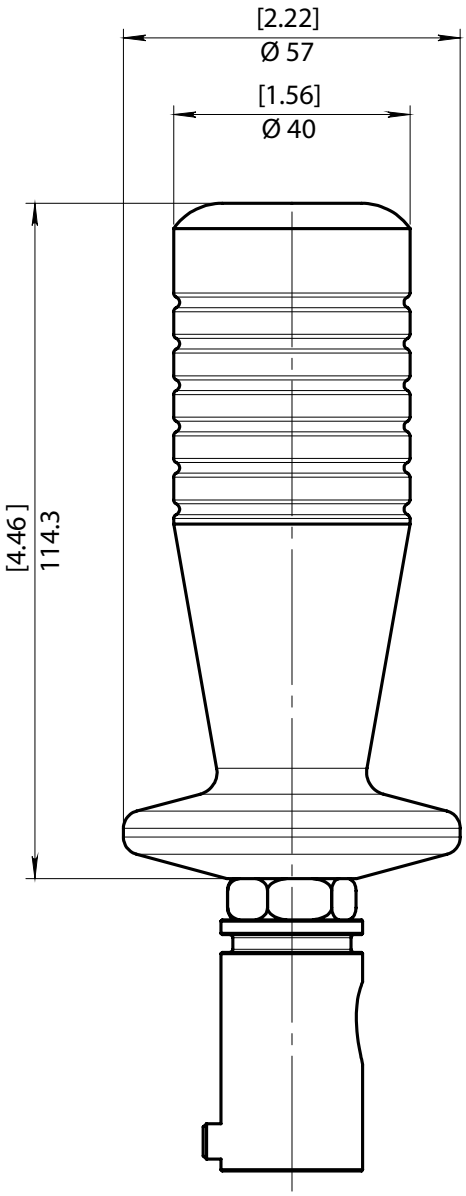
0	NO TOP BUTTON
1	M1
2	M2+M3
3	M1+M2+M3

0	NO M4 BUTTON
1	1 FRONT SWITCH M4 WITH ROCKING LEVER WITH SPRING RETURN-TO-CENTRE
2	M4 ON/OFF SWITCH

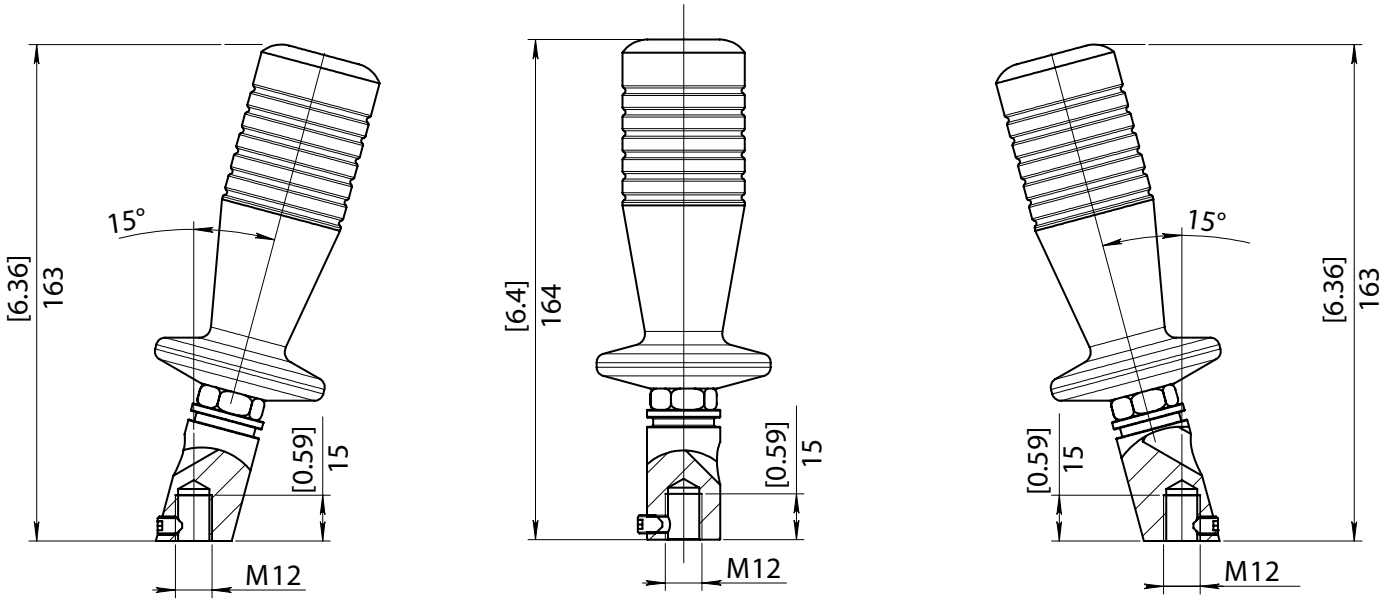
PEJD Proportional electronic joystic double
Ordering instructions

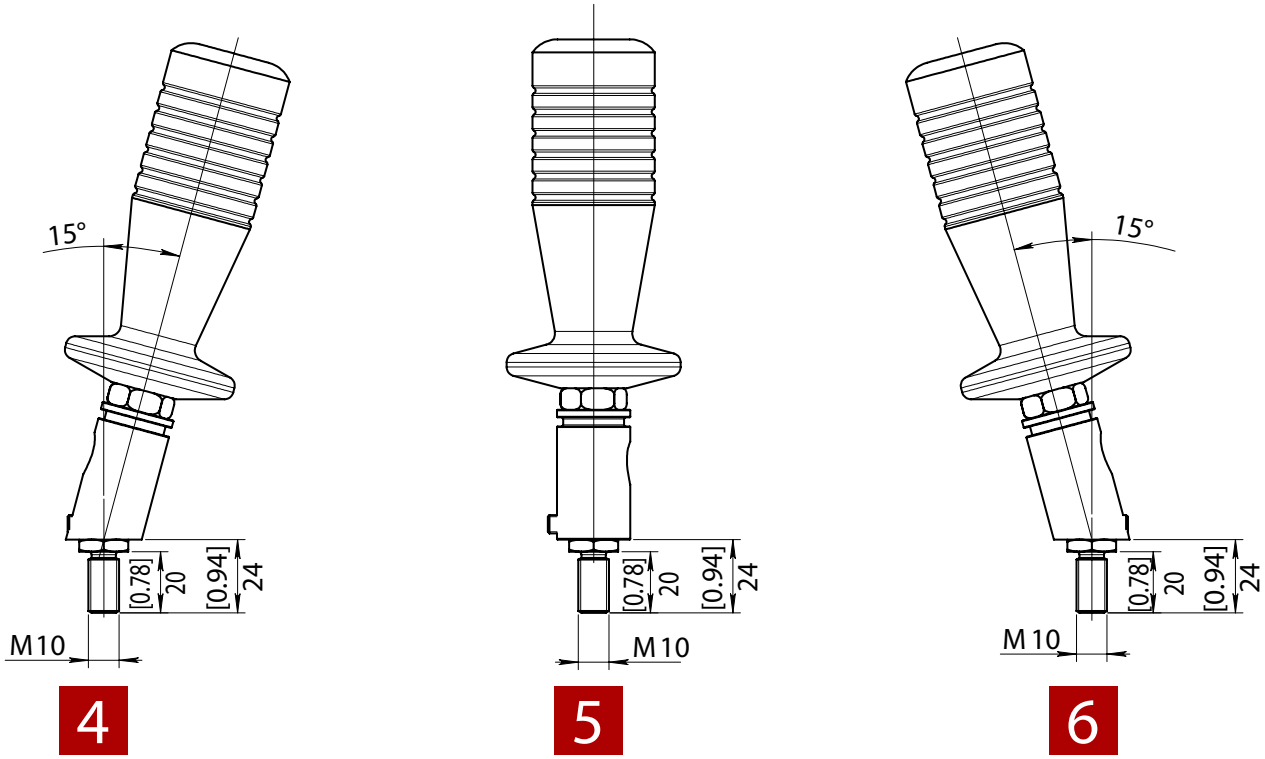


K



PEJD Proportional electronic joystic double Grip pivots





1 RIGHT TILTED 15° M12

2 STRAIGHT M12

3 LEFT TILTED 15° M12

4 RIGHT TILTED 15° M10

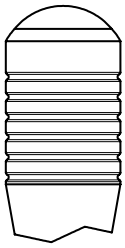
5 STRAIGHT M10

6 LEFT TILTED 15° M10

PEJD Proportional electronic joystic double Electric controls

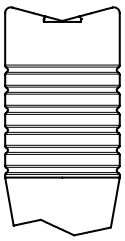
TOP CONFIGURATIONS

T1

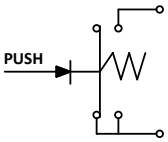


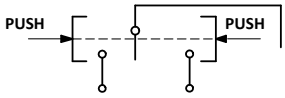
SINGLE BUTTON WITH SPRING RETURN

T2



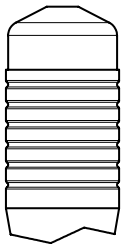
TOGGLE BUTTON



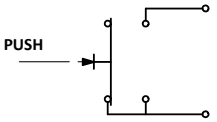


MICRO CAPACITY: DC 12V x 8A

T3

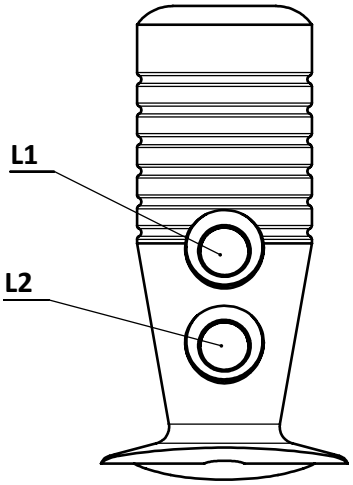


SINGLE PUSH-PUSH BUTTON

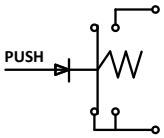


MICRO CAPACITY:
DC 28V x 10A RESISTIVE;
DC 28V x 5A INDUCTIVE

FRONT CONFIGURATIONS



SINGLE MOMENTARY BUTTON

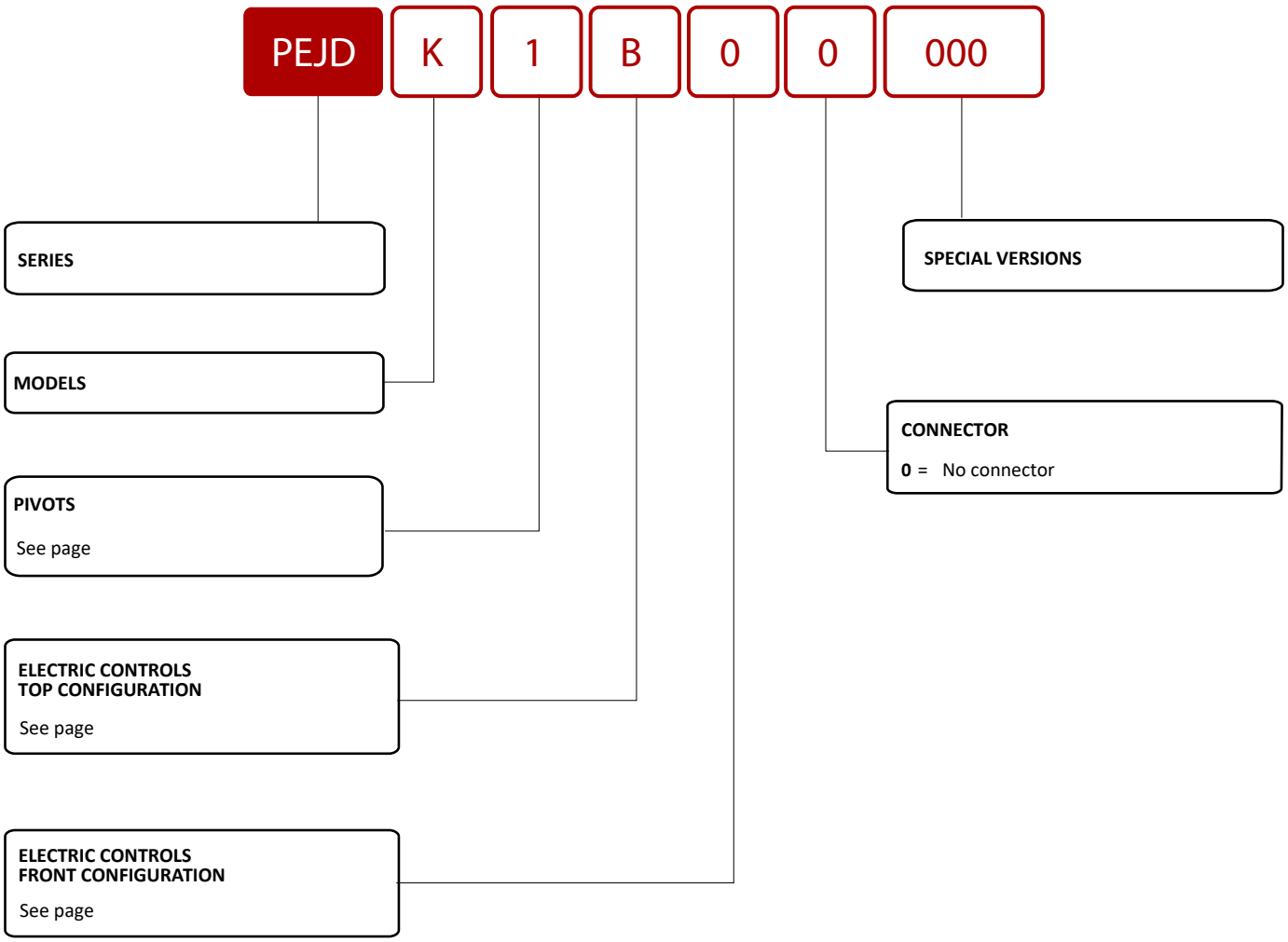


MICRO CAPACITY: DC 28V x 5A RESISTIVE;
DC 28V x 3A INDUCTIVE

0	NO TOP BUTTON
B	T1 SINGLE TOP BUTTON
C	T2 TOGGLE TOP BUTTON
D	T3 PUSH-PUSH TOP BUTTON

0	NO SIDE BUTTON
F	L1 MOMENTARY BUTTON
G	L2 MOMENTARY BUTTON
H	L1 + L2

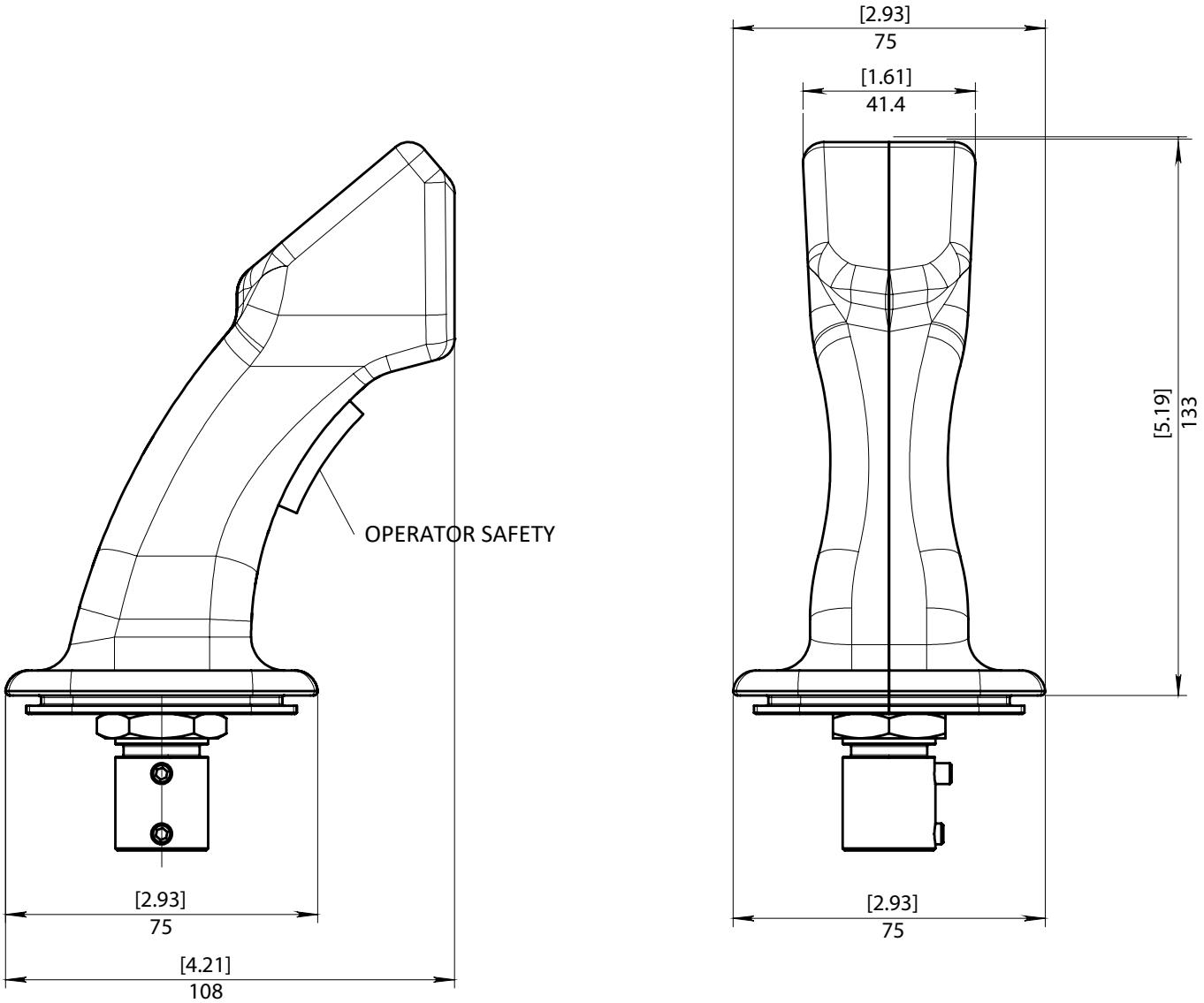
PEJD Proportional electronic joystic double
Ordering instructions



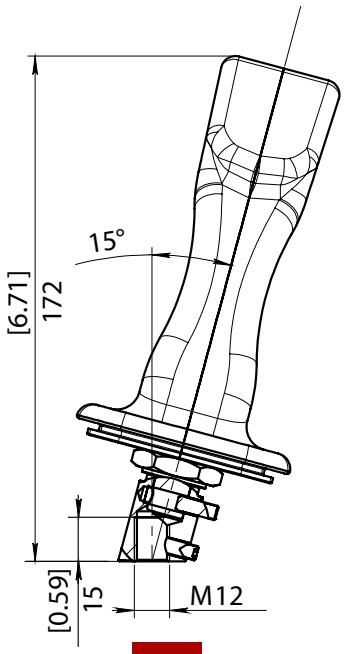
PEJD Proportional electronic joystic double Multifunction grip

E ERGONOMIC HANDLE

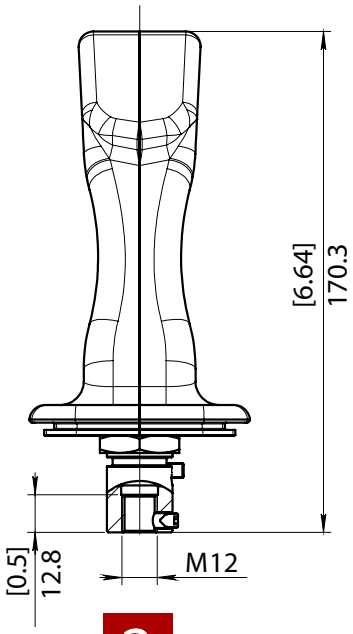
F VERSION "E" + NO OPERATOR SAFETY



PEJD Proportional electronic joystic double Grip pivots



1



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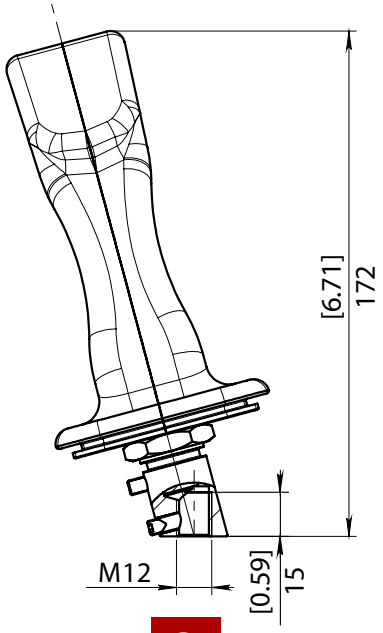

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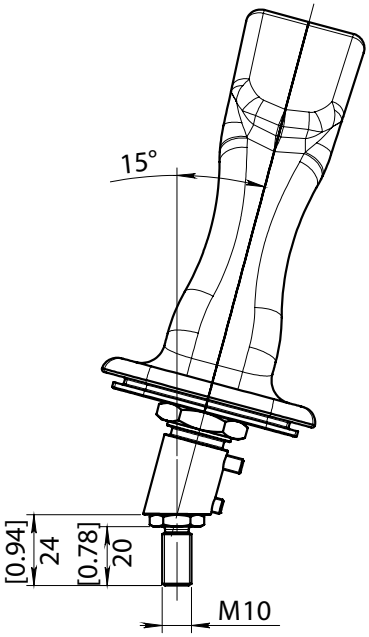

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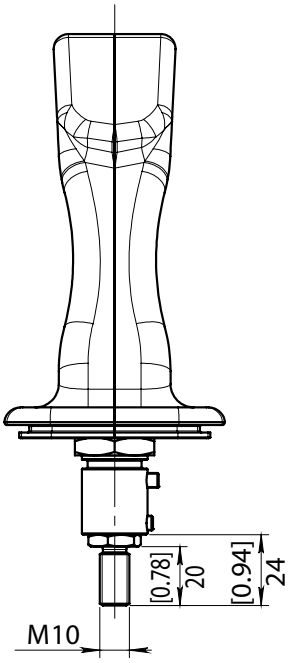
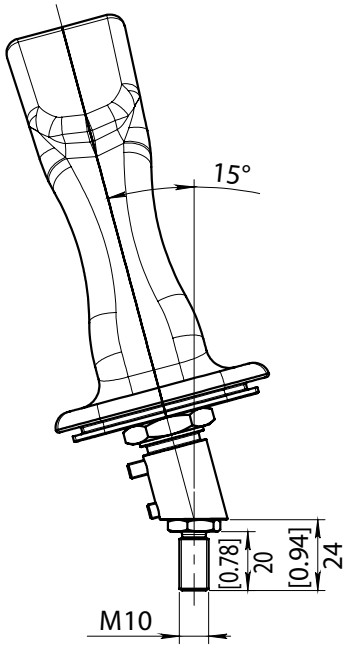


5



6

1 RIGHT TILTED 15° M12

2 STRAIGHT M12

3 LEFT TILTED 15° M12

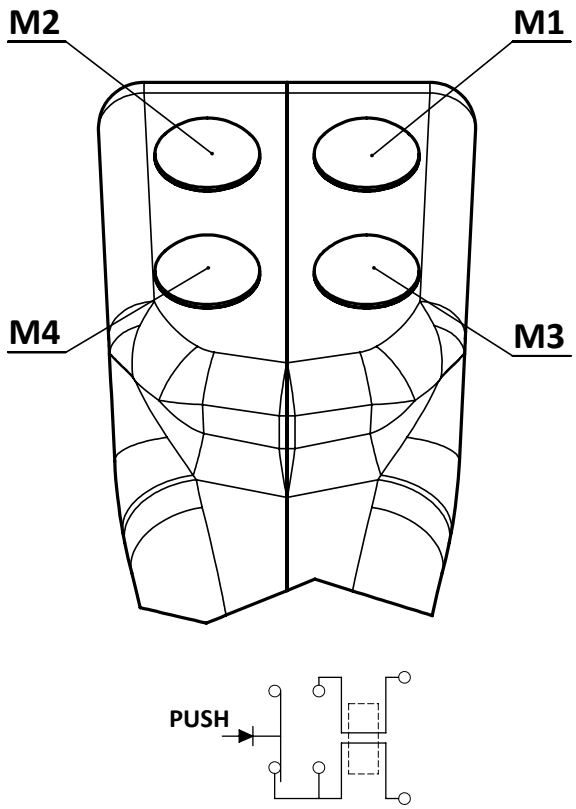
4 RIGHT TILTED 15° M10

5 STRAIGHT M10

6 LEFT TILTED 15° M10

PEJD Proportional electronic joystic double Electric controls

TOP CONFIGURATIONS

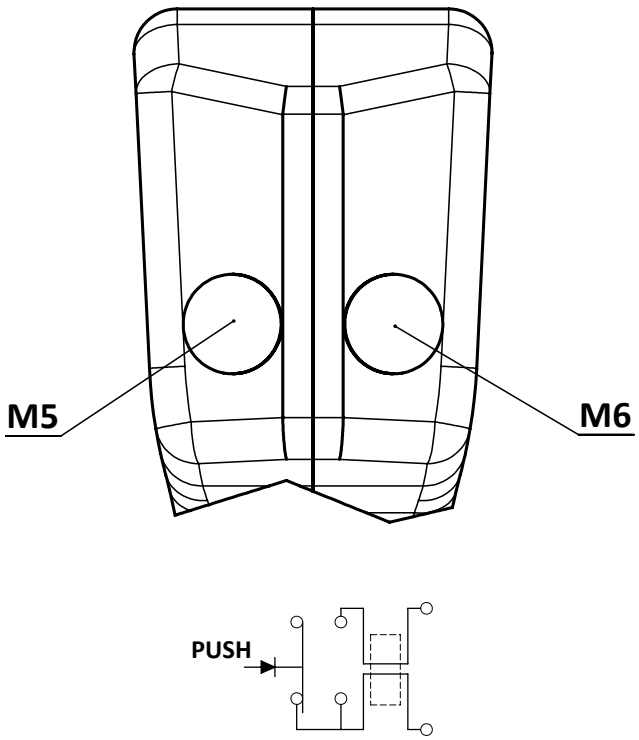


MICRO CAPACITY: DC 12V x 2A

BUTTONS ONLY AVAILABLE IN GREEN

- 0 NO TOP BUTTON
- 1 M1
- 2 M1+M2
- 3 M1+M2+M3
- 4 M1+M2+M3+M4
- 5 M2

FRONT CONFIGURATIONS

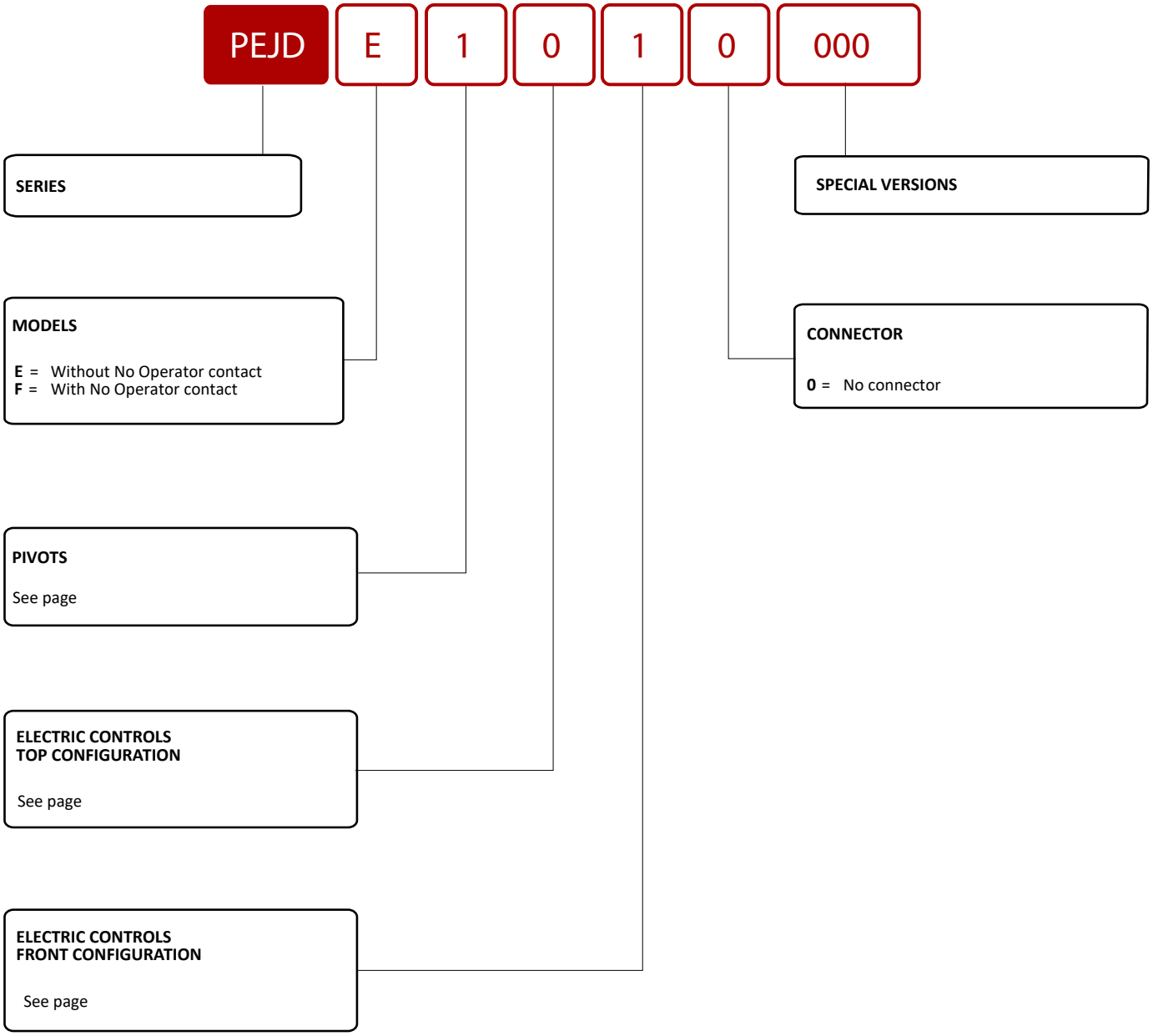


MICRO CAPACITY: DC 12V x 2A

BUTTONS ONLY AVAILABLE IN GREEN

- 0 NO TOP BUTTON
- 1 M5
- 2 M5+M6
- 3 M6

PEJD Proportional electronic joystic double Grip pivots

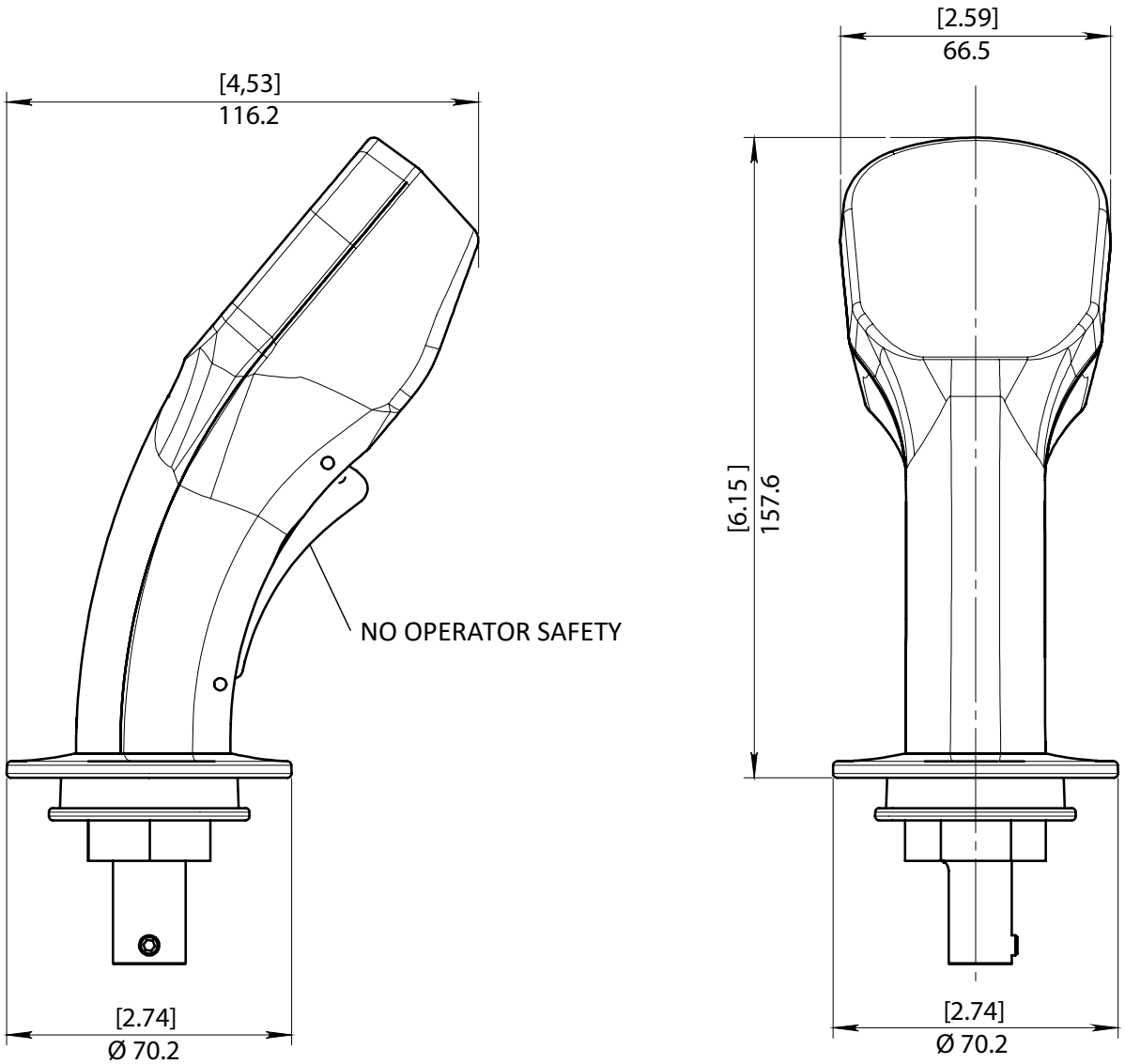


T MULTIFUNCTION HANDLE

H VERSION "T" WITH NO OPERATOR CONTACT

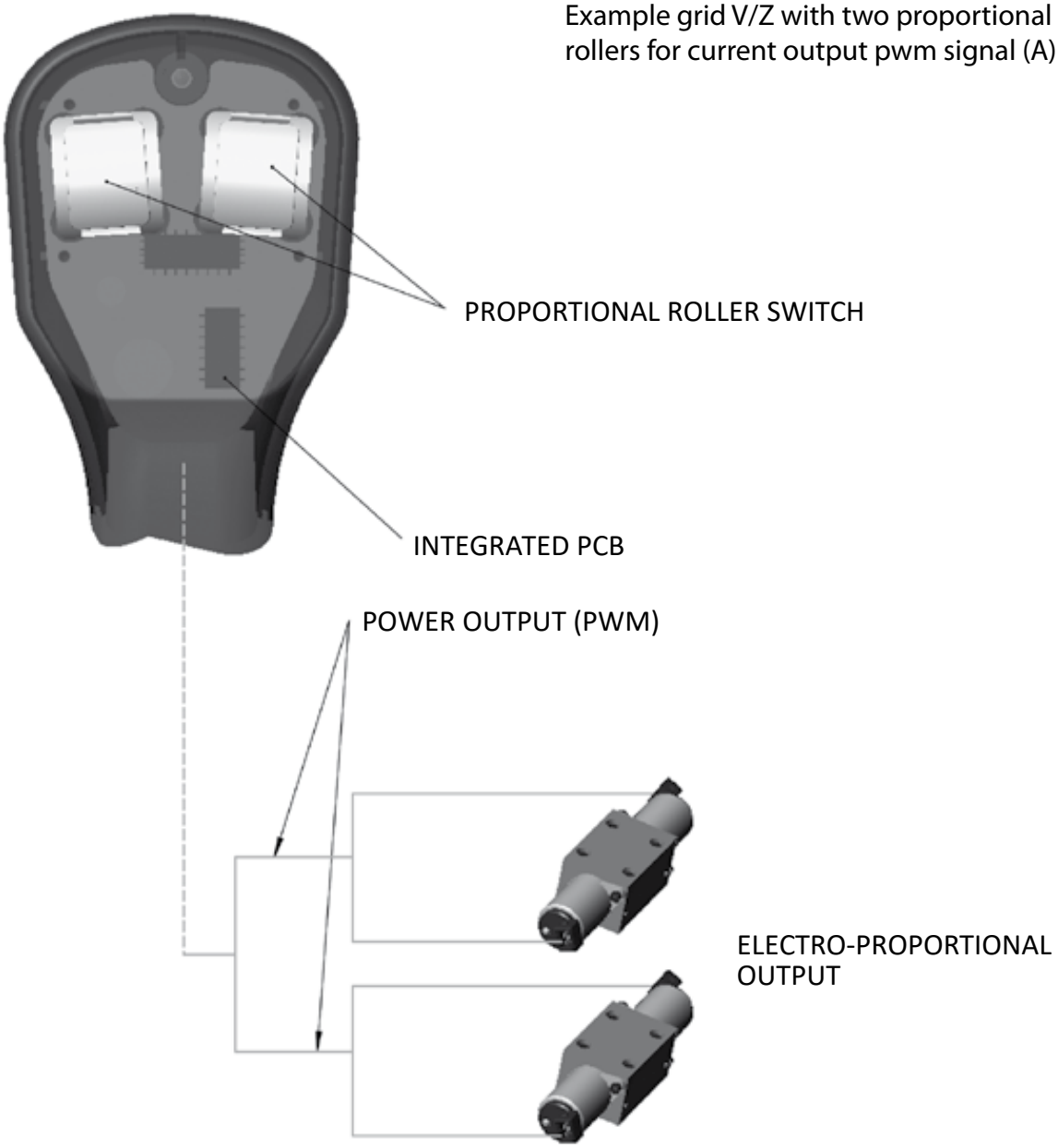
V MULTIFUNCTION GRIP WITH PROPORTIONAL PWM SIGNAL

Z VERSION "V" NO OPERATOR CONTACT

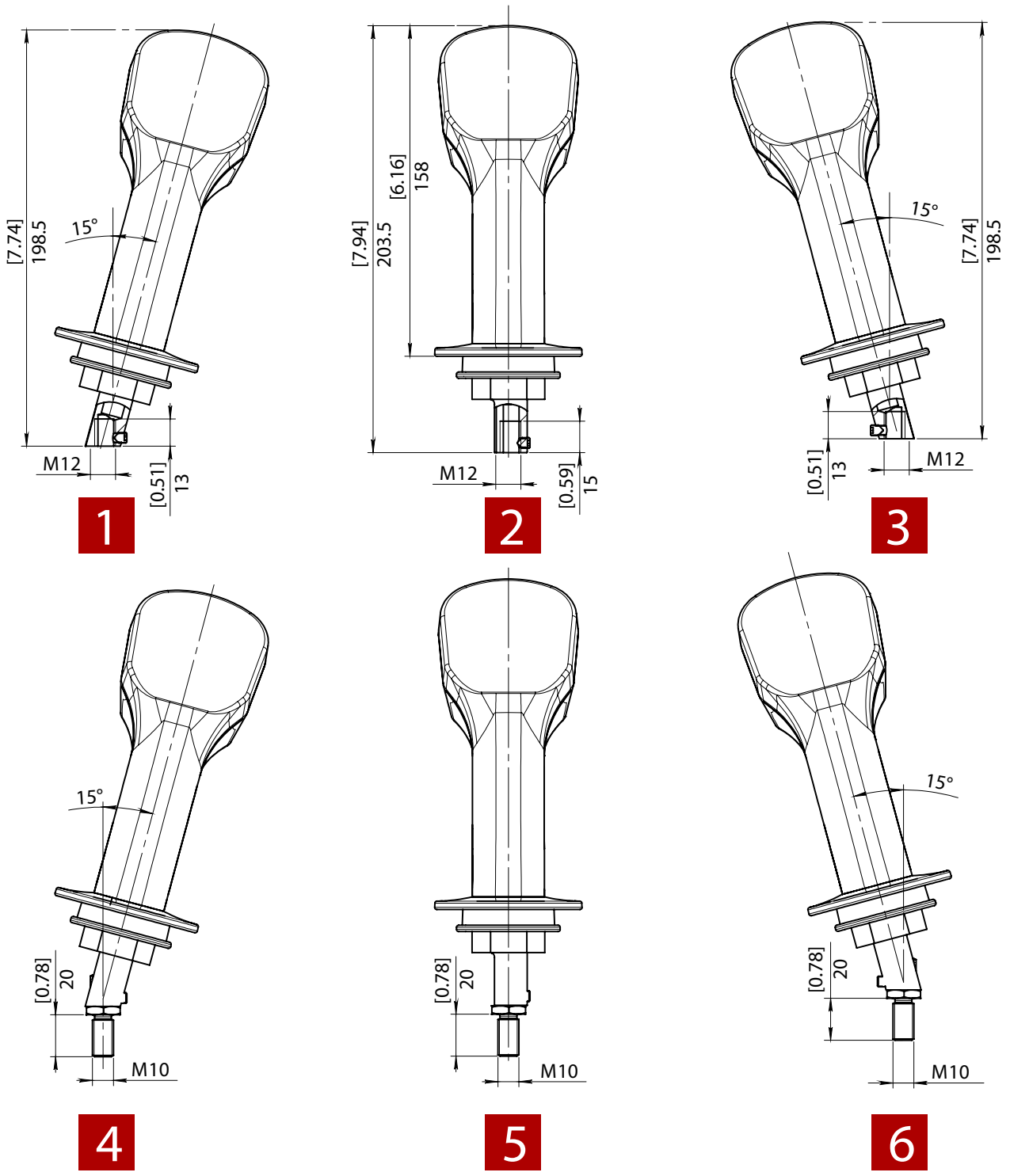


Handles are available with electric controls, with electronic proportional controls (two controls maximum), or with both.
The power signal (PWM) is generated by a control unit integrated into the handle. Nonetheless if the system already features an exteral electronic unit, the roller switch will deliver exclusively the potential difference, which is then processed in power signal.
In case of a handle with two electro-proportional controls, fitted on a two-axle servocontrol, the control on 4-axle is achieved.

Example grid V/Z with two proportional rollers for current output pwm signal (A)



PEJD Proportional electronic joystic double
Grid pivots



1 RIGHT TILTED 15° M12

2 STRAIGHT M12

3 LEFT TILTED 15° M12

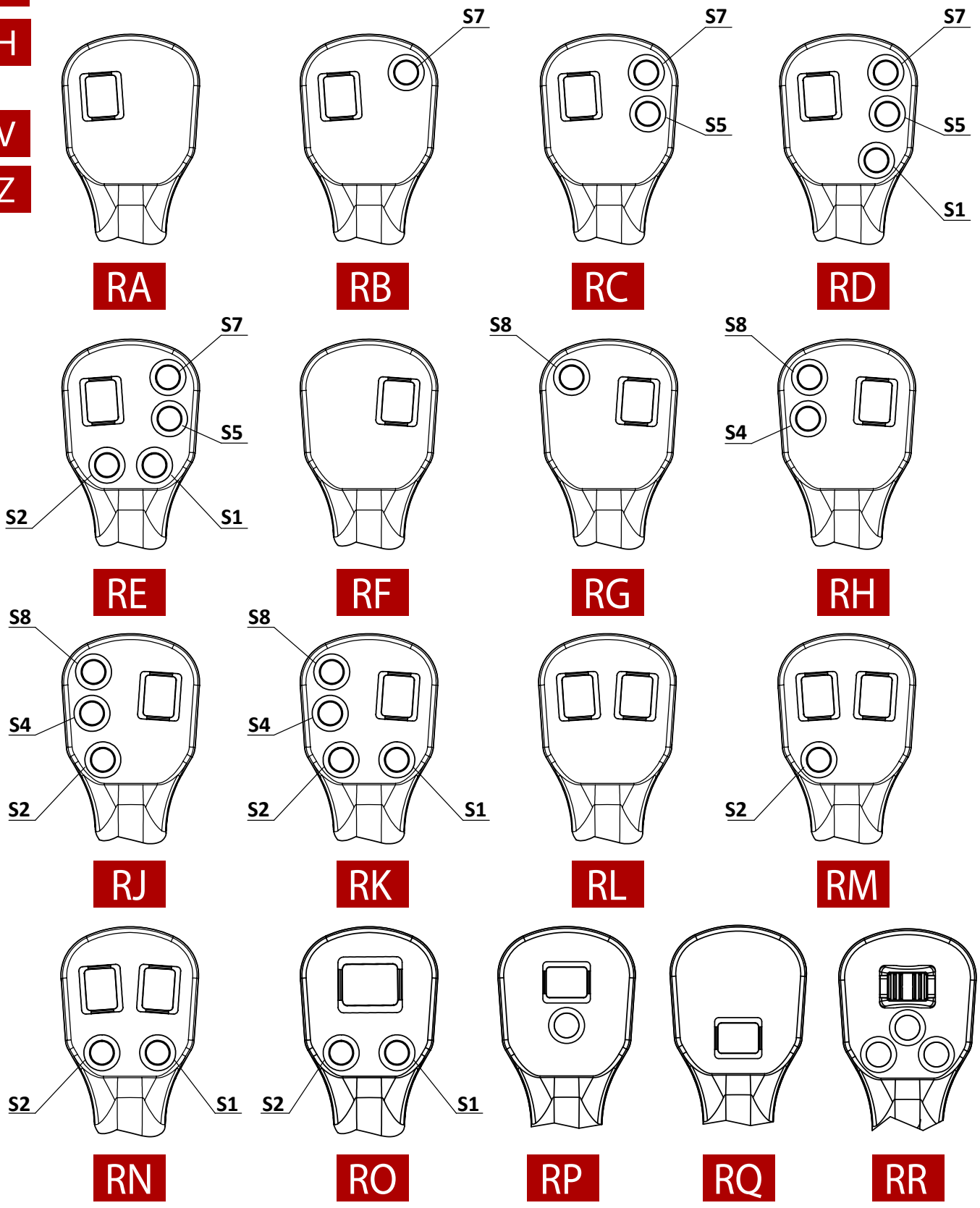
4 RIGHT TILTED 15° M10

5 STRAIGHT M10

6 LEFT TILTED 15° M10

T
H
V
Z

TOP CONFIGURATIONS



PEJD Proportional electronic joystic double
Electric controls - Push buttons

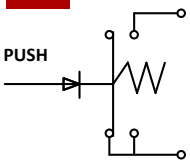
TOP CONFIGURATIONS

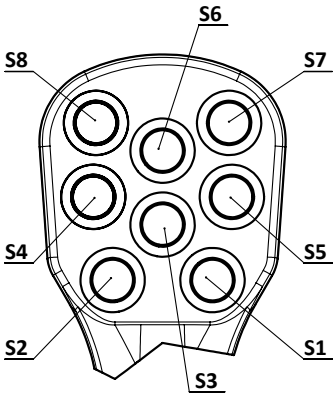
T

H

V

Z

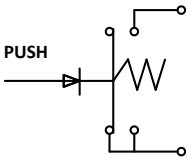


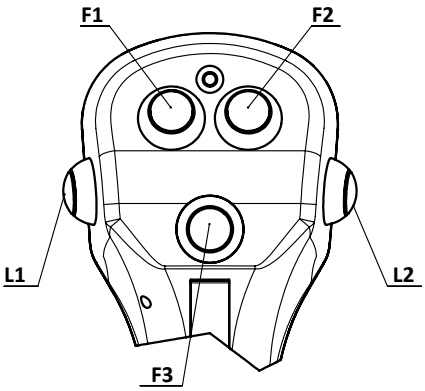


FRONT CONFIGURATIONS

T

H





00	NO TOP BUTTON
01	S1
02	S3
03	S1+S2
04	S4+S5
05	S1+S2+S5
06	S1+S2+S4+S5
07	S1+S2+S3+S4+S5
08	S1+S2+S3+S4+S5+S6
09	S1+S2+S3+S4 +S5+S7+S8
0A	S1+S2+S3+S4 +S5+S6+S7+S8
0B	S3+S7+S8
0C	S1+S2+S4+S5+S7+S8
0D	S4+S8
0E	S5
0F	S4
0G	S5+S7
0H	S3+S4+S5+S6
0I	S4+S5+S6
0J	S1+S2+S3
0K	S4+S5+S7+S8
0L	S6
0M	S1+S2+ S4+S5+S6
0N	S3+S7
0P	S1+S5+S7
0Q	S1+S2+S7+S8
0R	S2+S4
0S	S3+S4+S5+S7+S8
0T	S1+S7
0U	S3+S6
0V	S8
0W	S2+S8
0Z	S1+S2+S6

MICRO CAPACITY : DC 28V x 5A RESISTIVE
DC 28V x 3A INDUCTIVE

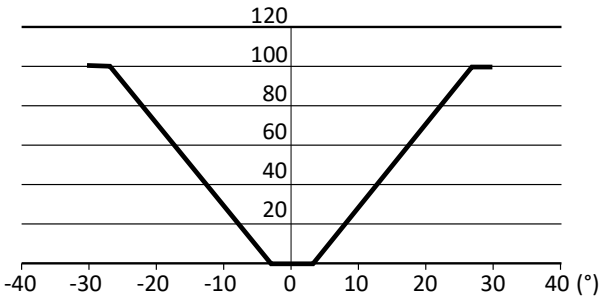
The versions “V” and “Z” are not prepared for front switches.

0	NO TOP BUTTON
1	L1
2	L2
3	L1+L2
4	F1
5	F2
6	F3
7	F1+F2
8	F1+F2+F3
9	F1+F2+F3+L1+L2
A	F1+F2+L1+L2
B	F3+L1+L2
C	F1+L1
D	F1+F3
E	F1+F3+L1+L2

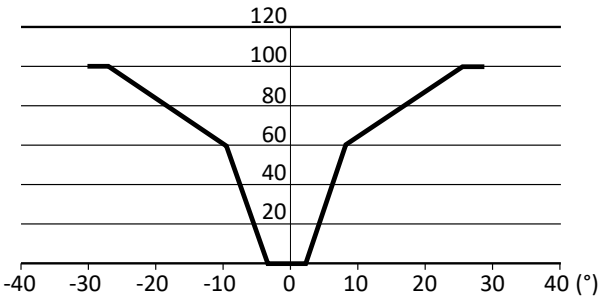
The integrated PCB in the H/T hand grip is programmed specifically for each application as the ramp is designed to respond optimally to each operating condition.
You will therefore have to ask OMFB Hydraulic Components S.p.A. to assign you a 3-figure code once the application and correct ramp have been agreed (current delivered, % Imax, depending on the position of the roller switch, degree).
Below are some exmples of ramps available in standard configurations for the voltage, current and PWM frequency of the PCB.

V

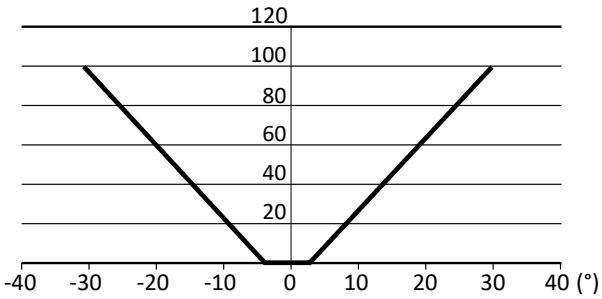
Z



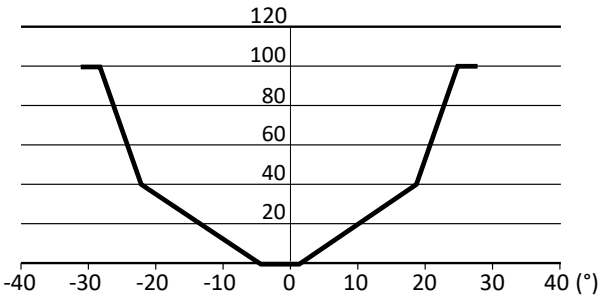
5 0 0



5 0 1



5 0 2



5 0 3

0 0 0 NO PWM SIGNAL

x = Angle of rotation of the roller switch (degrees) - y = current delivered, percentage of max (%imax)

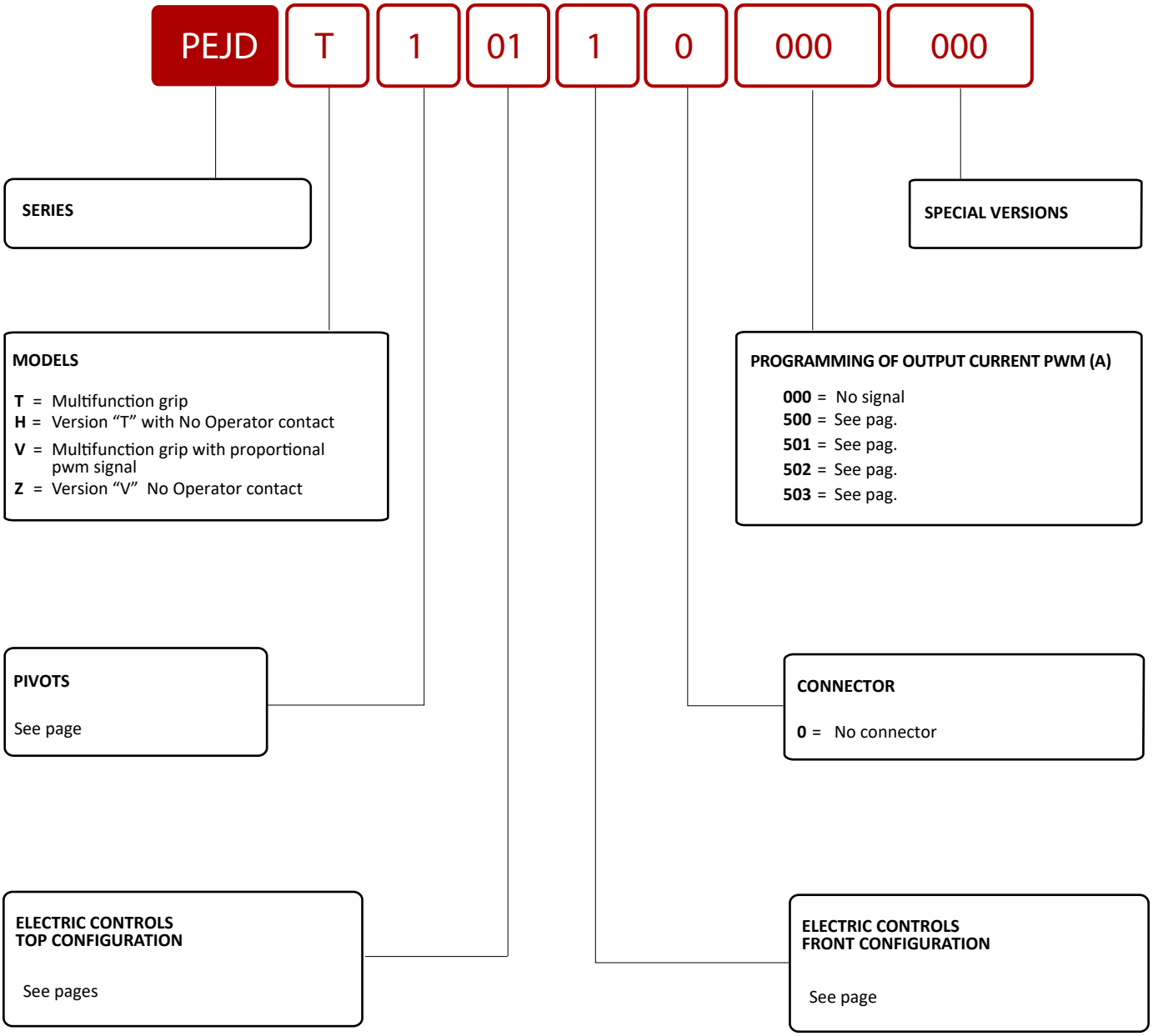
V

Z

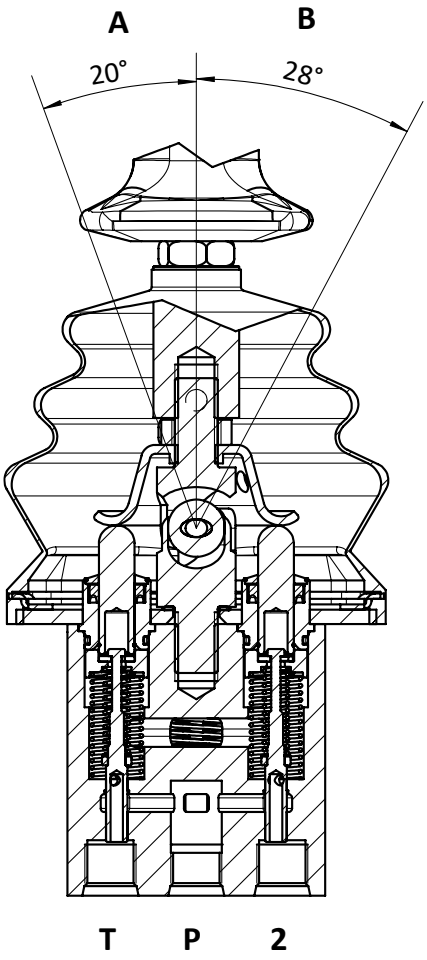
INPUT VOLTAGE	***POWER OUTPUT (PWM)***	***STANDARD CONFIGURATIONS***
POWER SUPPLY VOLTAGE Nominal 12 Vdc battery: 9-16 Vdc effective Nominal 24 Vdc battery: 18-30 Vdc effective	Maximum current - 1 channel 3 A (@ 12 Vdc) 2 A (@ 24 Vdc) Maximum current - total 6.5 A (@ 12 Vdc) 4.5 A (@ 24 Vdc) PWM frequency 100 - 400 Hz	Standard programming configurations share the following parameters: Supply voltage: 12V DC Maximum current (per single channel) Imax 1.5A PWM frequency: 200Hz Soft current ramps both when increasing and decreasing, and different output curves (current supplied in accordance with the position of the roller switch).

PROTECTION RATING
In configurations with buttons and roller switches, the hand grip is IP67 protected.

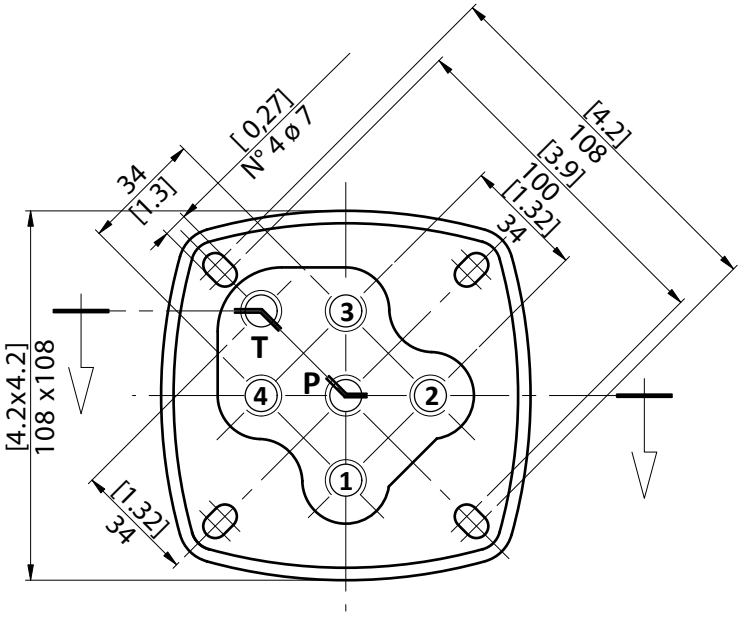
PEJD Proportional electronic joystic double
Ordering instructions



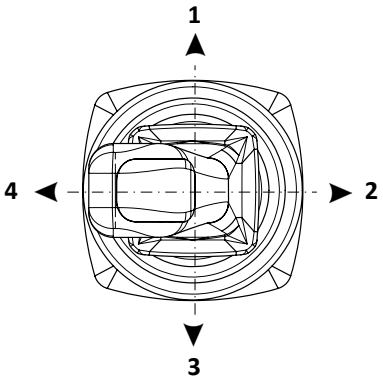
PHJD Proportional hydraulic joystic double
Dimensions



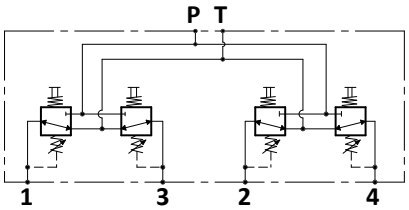
A	Angle of the lever with just one actuator operated
B	Angle of the lever with two actuators operated simultaneously



Actuator directions

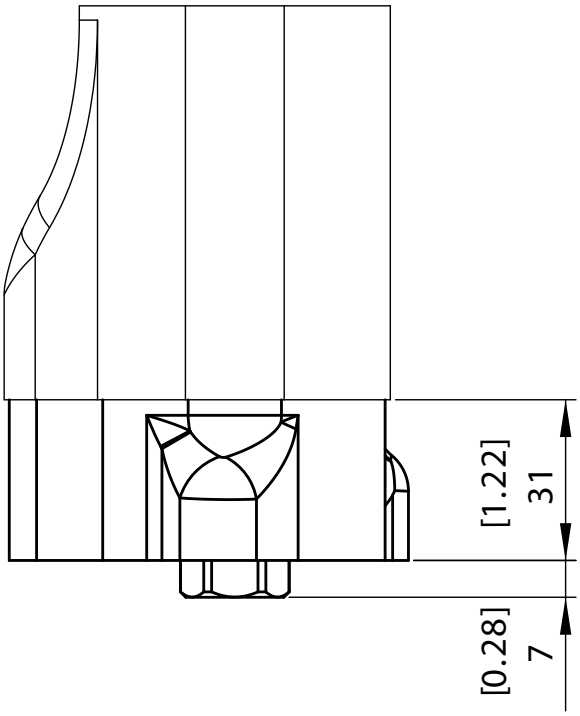


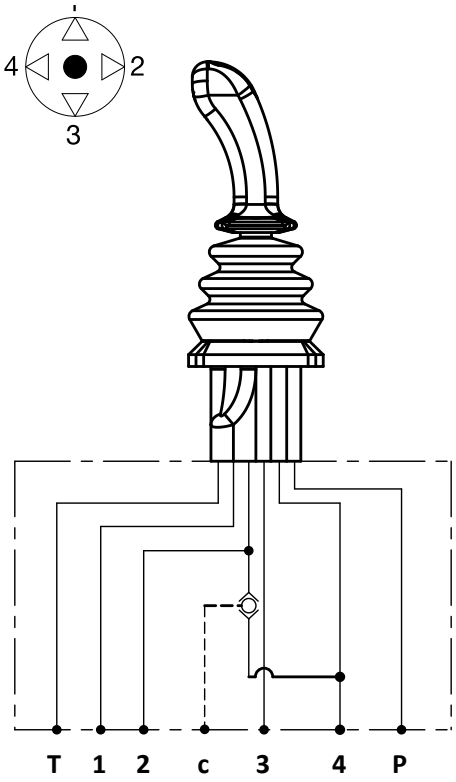
Hydraulic diagram



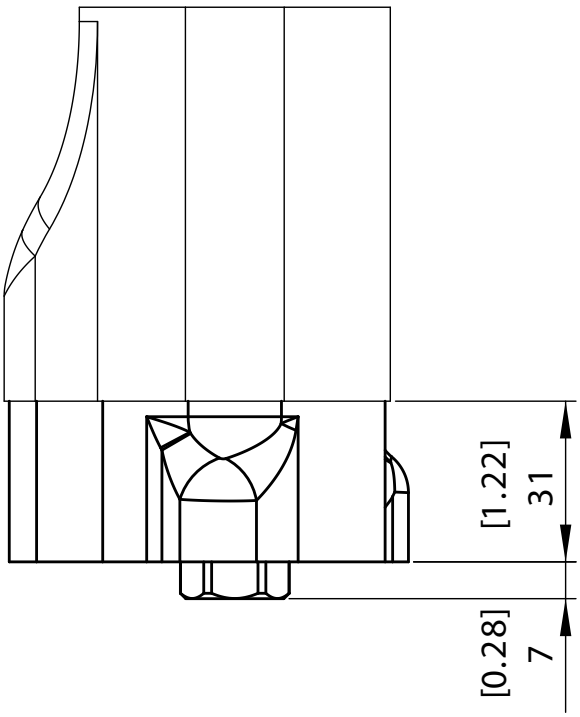
1, 2, 3, 4	Uses
T	Tank
P	Inlet

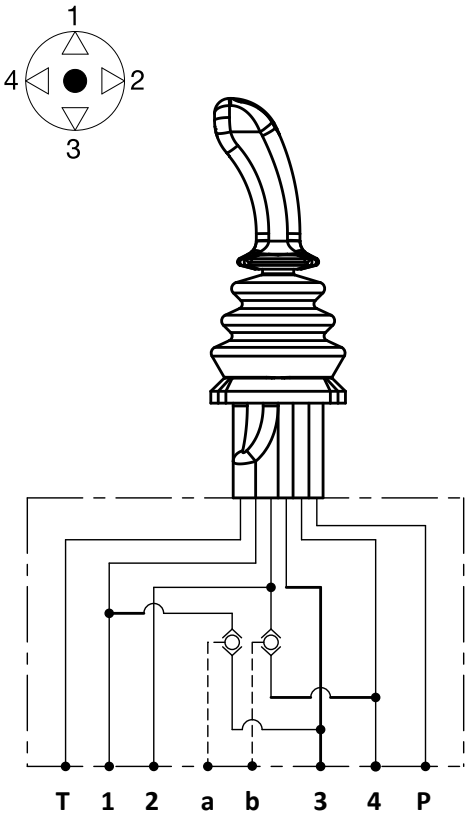
1 A pressure signal from axis 2-4



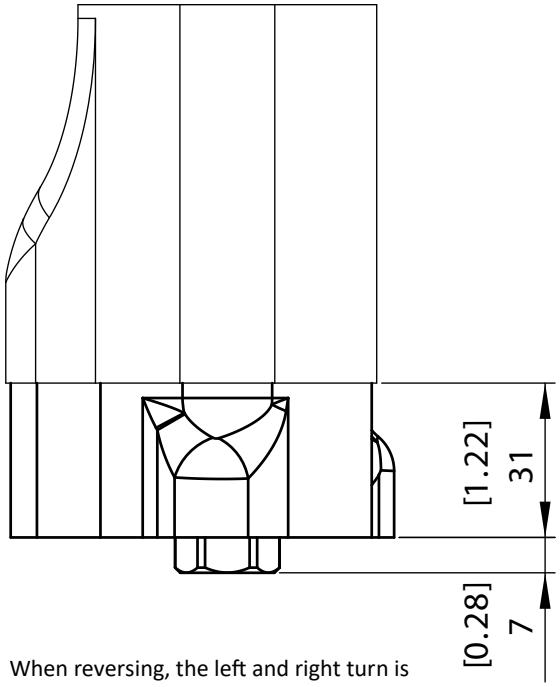


2 Two pressure signals from axis 1-3 and 2-4

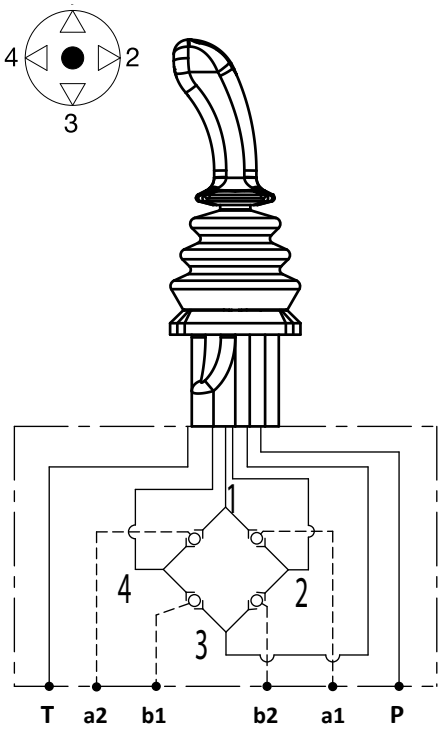




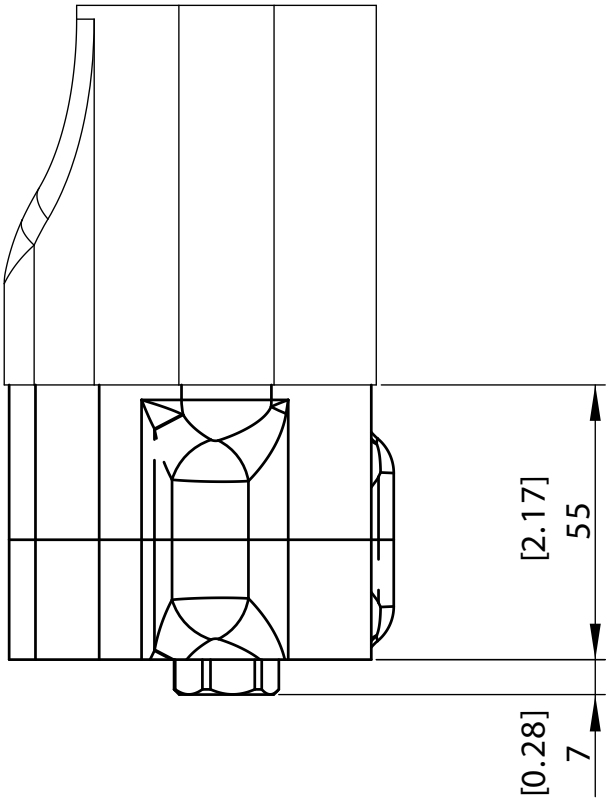
3 Opposite counter rotation

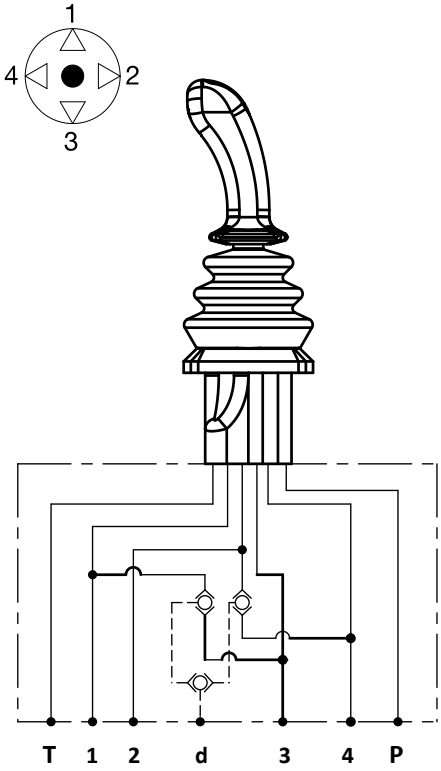


When reversing, the left and right turn is opposite to the inclination of the lever.

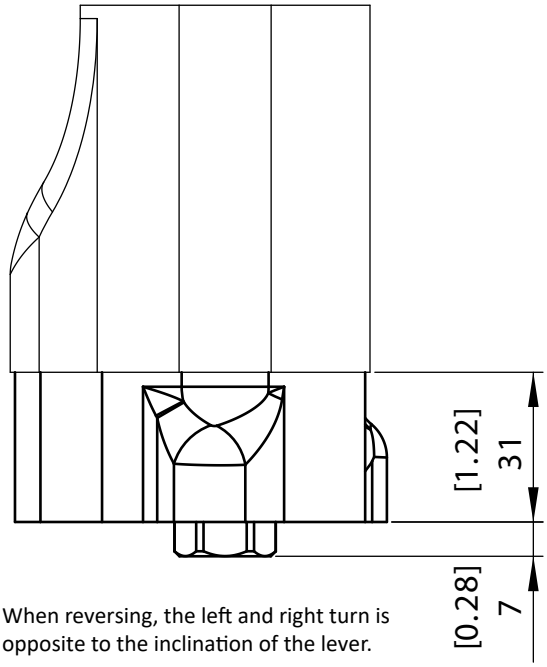


4 One pressure signal from each position

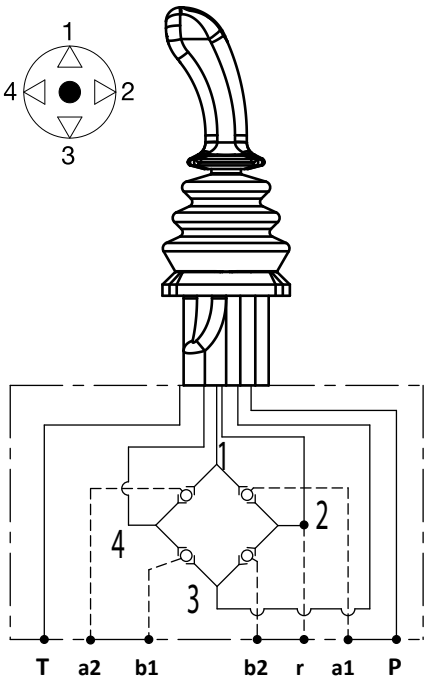




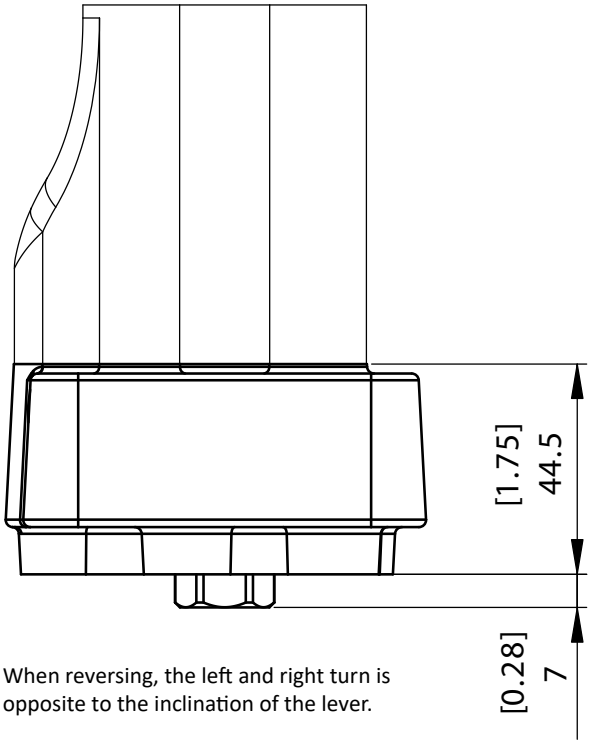
5 Opposite counter rotation with reverse signal



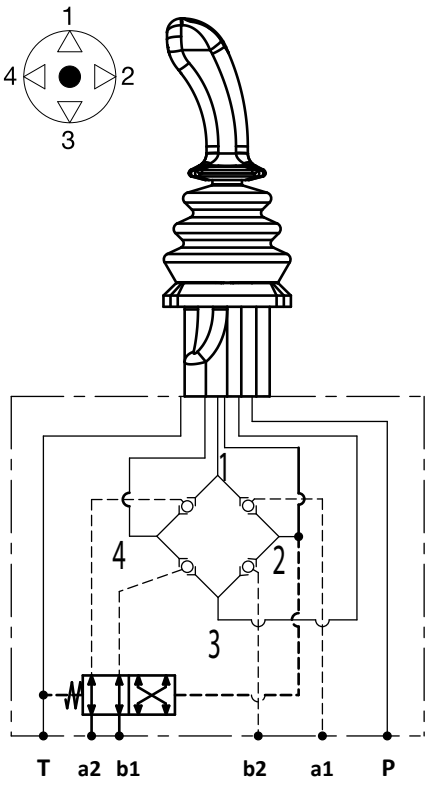
When reversing, the left and right turn is opposite to the inclination of the lever.



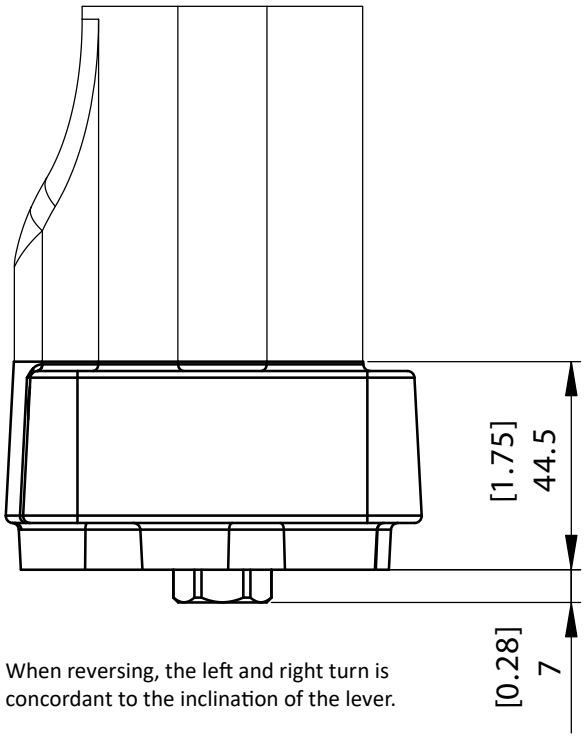
6 Concordant counter rotation



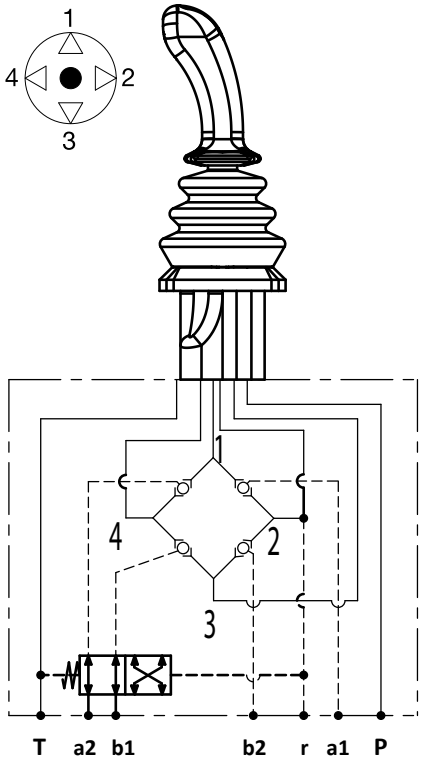
When reversing, the left and right turn is opposite to the inclination of the lever.

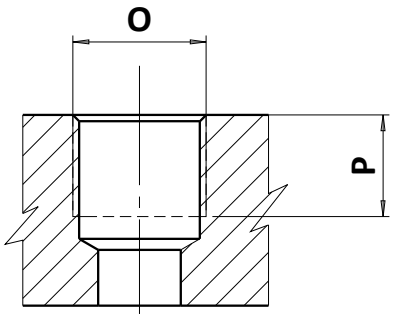


7 Concordant counter rotation and reverse signal



When reversing, the left and right turn is concordant to the inclination of the lever.



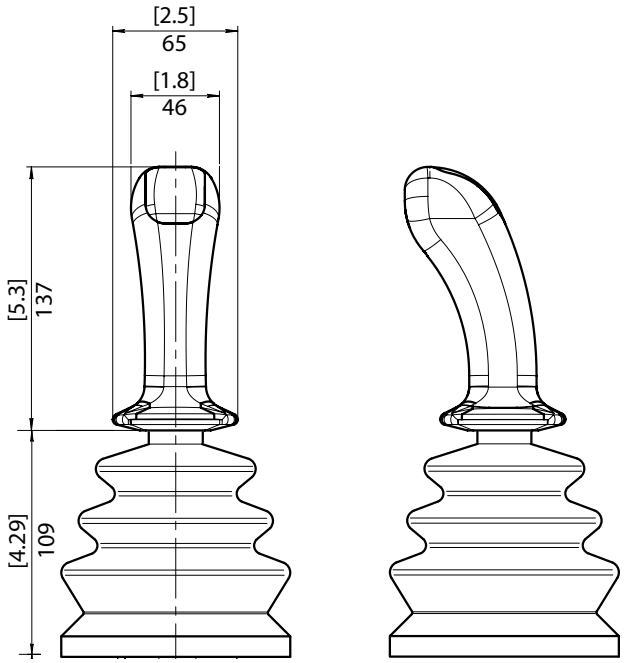


Type G2- U3

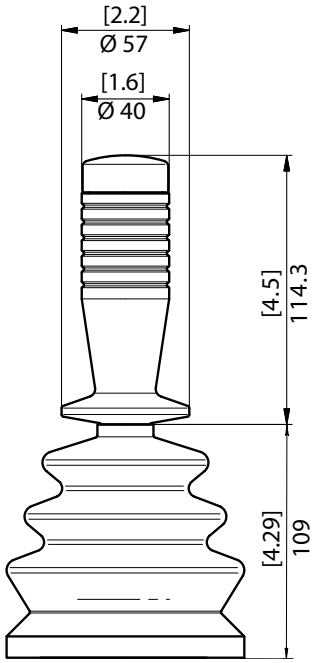
Type	O		P	
		Nm	**mm**	**in**
G2	1/4"	17	12	0.47
U3	9/16-18 UNF	25	13	0.47

PHJD Proportional hydraulic joystic double Grips

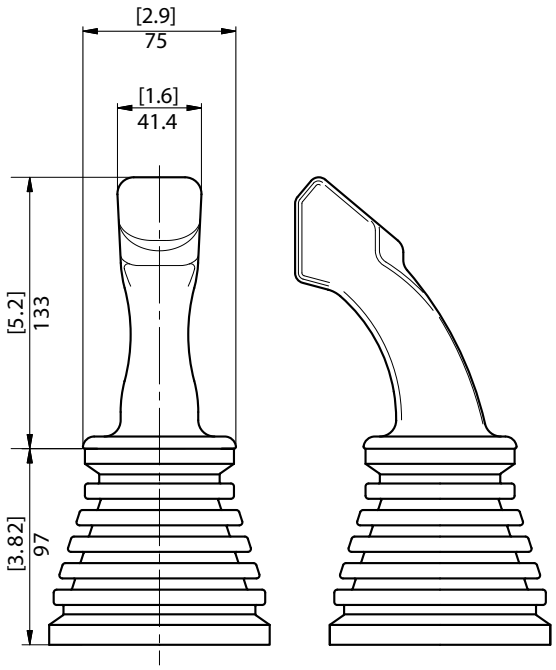
S Anatomical



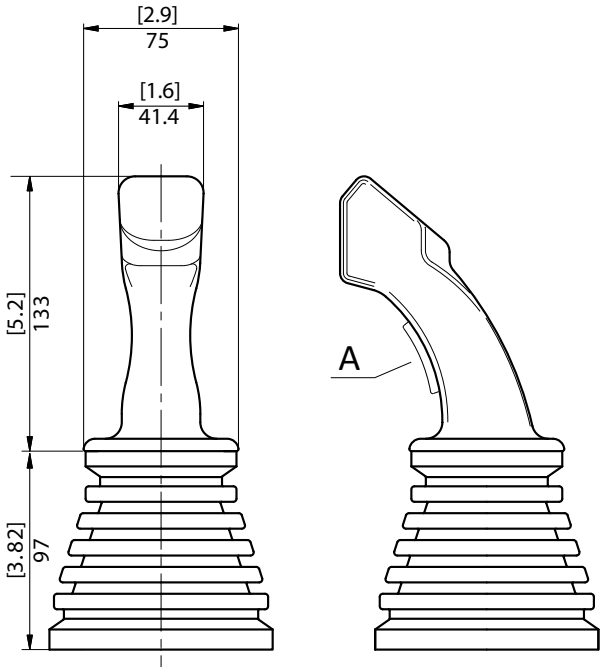
K Cylindrical



E Ergonomic



F Ergonomic present person

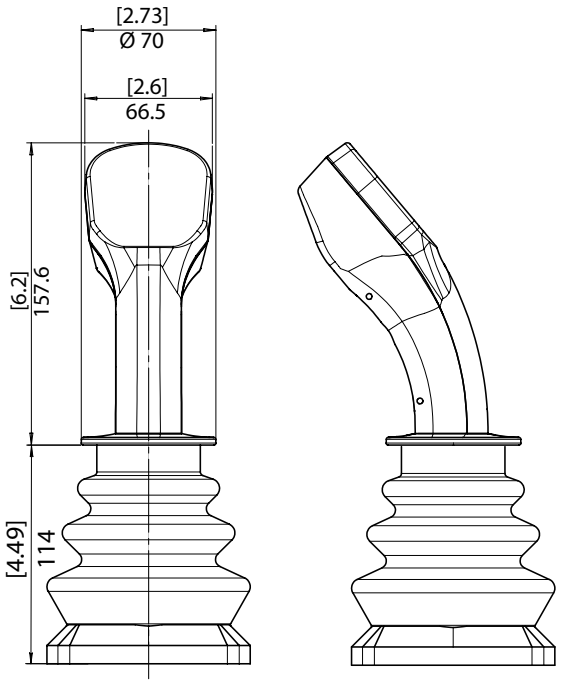


A Present person button

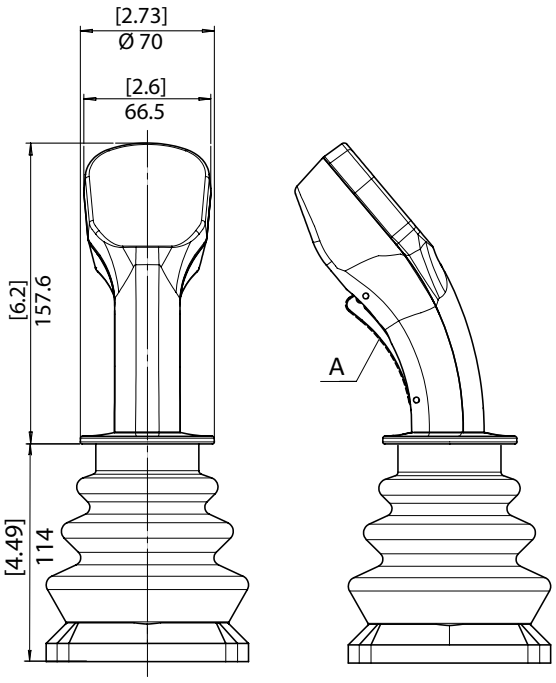
OMFB HYDRAULIC POWER CONTROL

PHJD Proportional hydraulic joystic double Grips

T Multifunctional

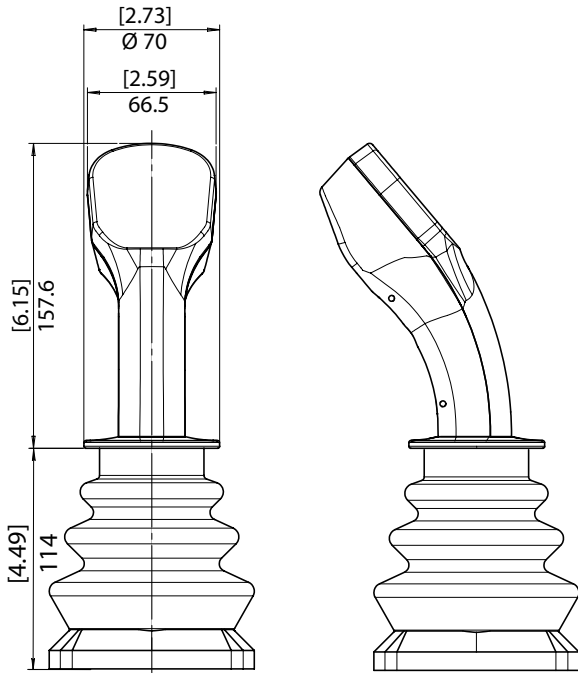


H Multifunctional present person



A Present person button

V Multifunctional PWM

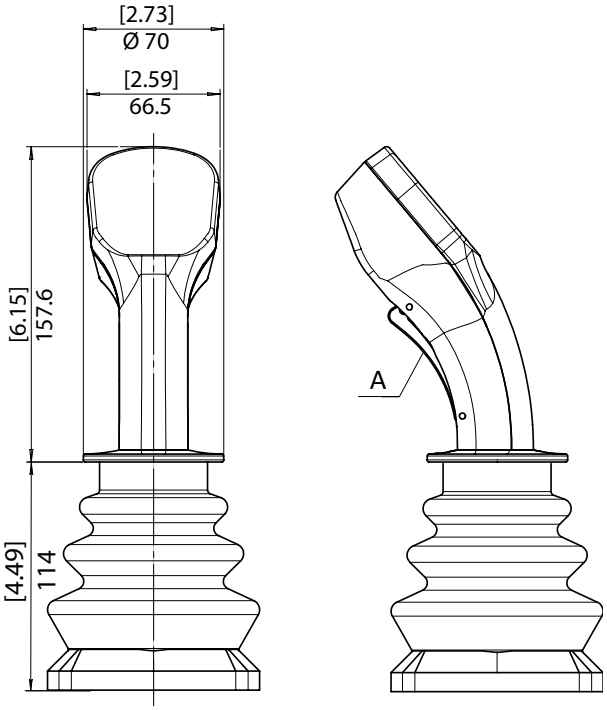


Power supply voltage 12 V	**9-16 Vdc effective**
Power supply voltage 24 V	**18-30 Vdc effective**
Maximum output current 1 channel	**3 A (@ 12 Vdc)** **2 A (@ 24 Vdc)**
Maximum output current Total	**6.5 A (@ 12 Vdc)** **4.5 A (@ 24 Vdc)**
PWM frequency	**100 - 400 Hz**
Standard configuration	**12 Vdc** **I max=1.5 A** **PWM = 200 Hz**
Handle protection level	**IP67**

* Soft current ramps, both increasing and decreasing and different output curves (current supplied according to the roller position

PHJD Proportional hydraulic joystic double Grips

Z Multifunctional PWM Present person

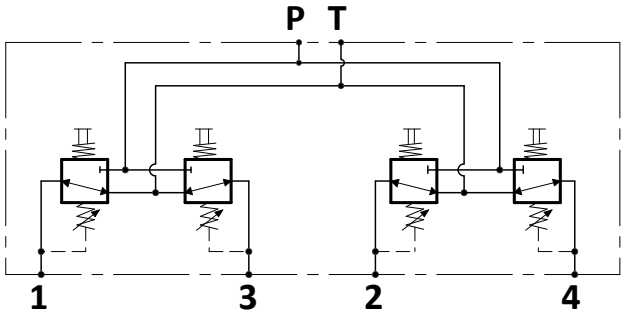


A - Present person button

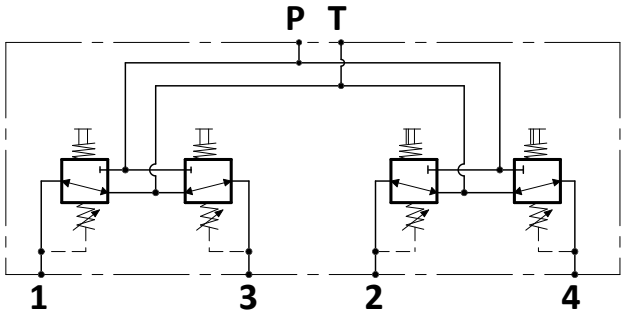
Power supply voltage 12 V	**9-16 Vdc effective**
Power supply voltage 24 V	**18-30 Vdc effective**
Maximum output current 1 channel	**3 A (@ 12 Vdc)** **2 A (@ 24 Vdc)**
Maximum output current Total	**6.5 A (@ 12 Vdc)** **4.5 A (@ 24 Vdc)**
PWM frequency	**100 - 400 Hz**
Standard configuration	**12 Vdc** **I max=1.5 A** **PWM = 200 Hz**
Handle protection level	**IP67**

* Soft current ramps, both increasing and decreasing and different output curves (current supplied according to the roller position

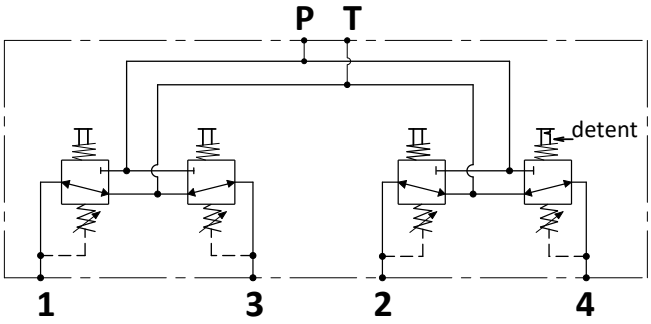
S With spring return to centre



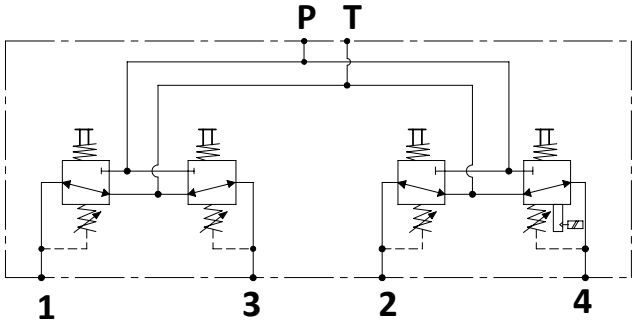
A Clutch controller forward/back 2-4



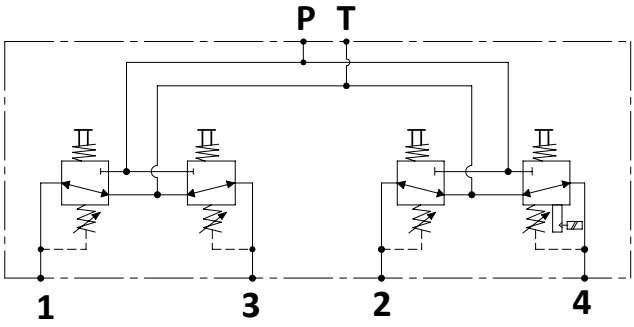
M Mechanical position 4



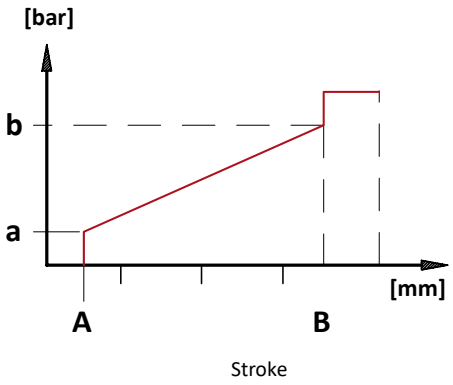
E Electromagnetic position 4 12 V



F Electromagnetic position 4 24 V

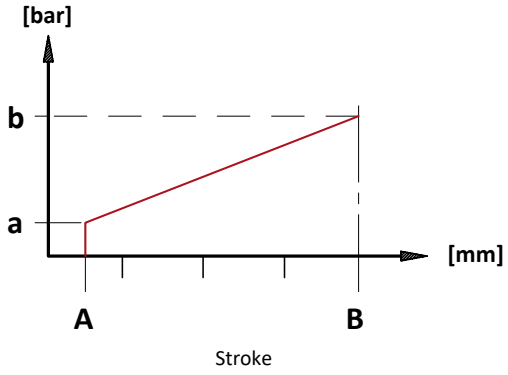


S.. Single ramp with step



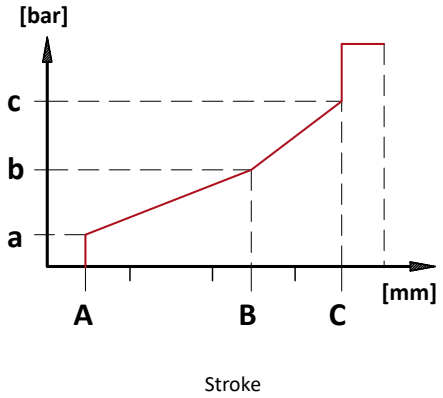
Type	Pressure a		Pressure b	
	bar	psi	bar	psi
S00	2	29	16	232
S01	5	73	20	290
S02	6.5	94	24.5	355
S04	3	46	17	249
S08	5	73	16	232
S11	4	58	15	218
S12	1.5	22	7	102
S13	5	73	28	406

L.. Single ramp without step



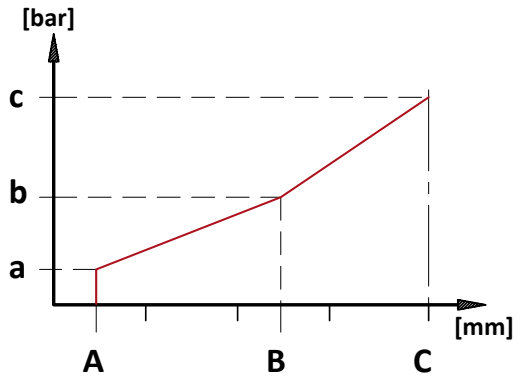
Type	Pressure a		Pressure b	
	bar	psi	bar	psi
L00	2	29	18	261
L01	5	73	22	319
L02	6.5	94	26.5	384
L04	3	46	19	276
L08	5	73	18	261
L11	4	58	16	218
L12	1.5	22	9	131
L13	5	73	30	435

M60 Double ramp with step



Type	Pressure a		Pressure b		Pressure c		Stroke A	Stroke B	Stroke C
	bar	psi	bar	psi	bar	psi	mm	mm	mm
M60	5	73	12	174	21	306	1.2	5.4	7.8

G60 Double ramp without step

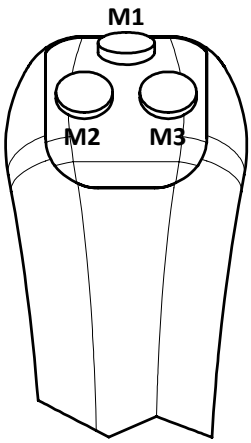


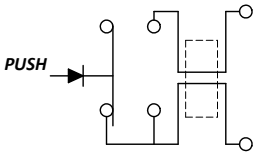
Stroke

Type	Pressure a		Pressure b		Pressure c		Stroke A	Stroke B	Stroke C
	bar	psi	bar	psi	bar	psi	mm	mm	mm
G60	5	73	12	174	23	334	1.2	5.4	8.3

PHJD Proportional hydraulic joystic double
Anatomic grip

Upper electric controls



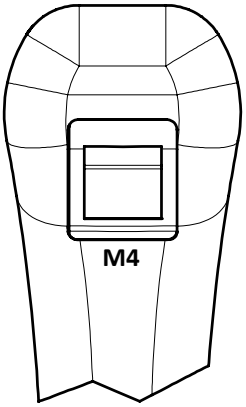


DC 12V x 2A

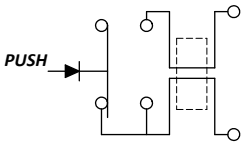
Configurations

Code	Description
00	No button
01	M1
02	M2+M3
03	M1+M2+M3

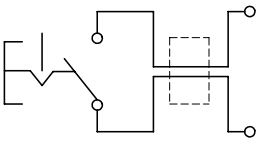
Front electric controls



Rocker switch



ON/OFF switch

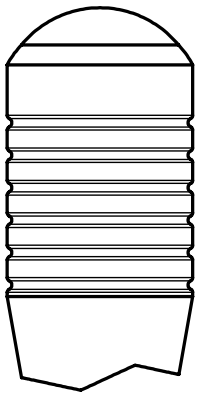


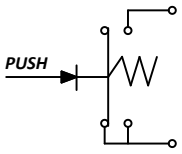
Configurations

Code	Description
0	No switch
1	M4 rocker with spring-back
2	M4 ON/OFF switch

PHJD Proportional hydraulic joystic double Cilindrical grip

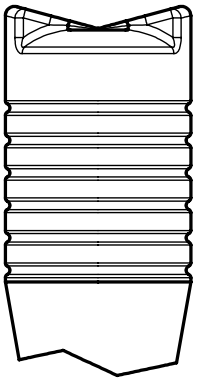
0B Single top button with return

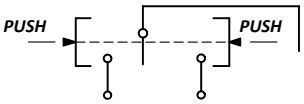




DC 12V x 8A

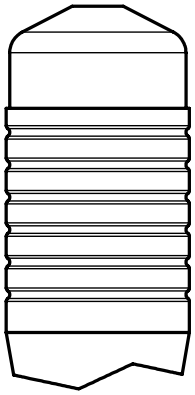
0C Rocker top button

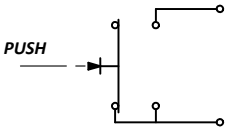




DC 12V x 8A

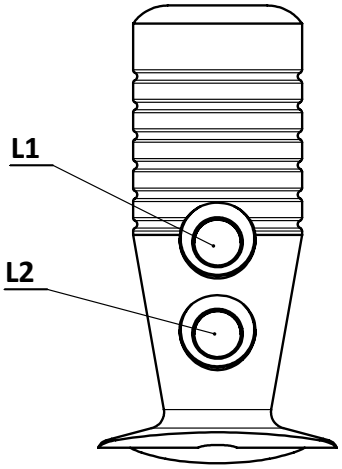
0D Stable top button

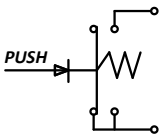




DC 28V x 10A resistive
DC 28V x 5A
Inductive

Front electric controls





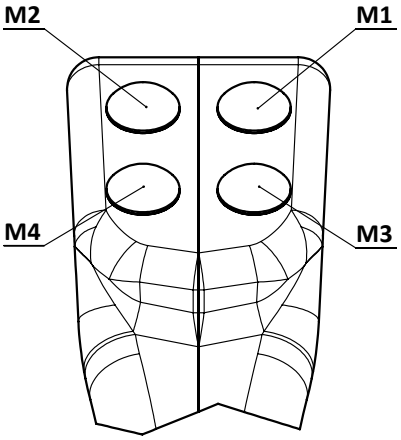
DC 28V x 5A resistive
DC 28V x 3A
Inductive

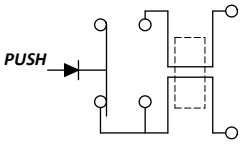
Configurations

Code	Description
0	No button
F	L1
G	L2
H	L1+L2

PHJD Proportional hydraulic joystic double
Ergonomic grip

Upper electric controls



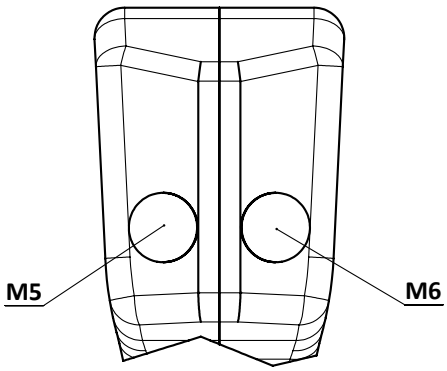


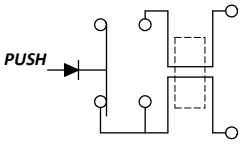
DC 12V x 4A resistive
DC 12V x 2A
Inductive

Configurations

Code	Description
00	No button
01	M1
02	M1+M2
03	M1+M2+M3
04	M1+M2+M3+M4
05	M2
06	M3+M4

Front electric controls





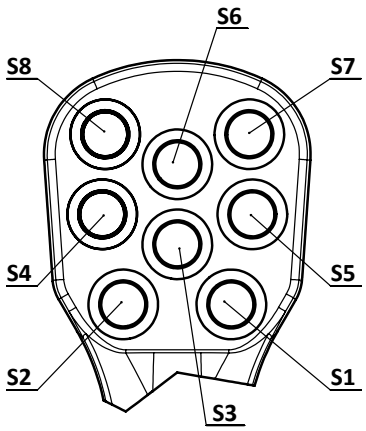
DC 12V x 4A resistive
DC 12V x 2A
Inductive

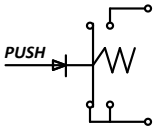
Configurations

Code	Description
0	No button
1	M5
2	M5+M6
3	M6

PHJD Proportional hydraulic joystic double Multifunction grip

Upper electric controls





DC 28V x 5A resistive
DC 28V x 3A
Inductive

Configurations

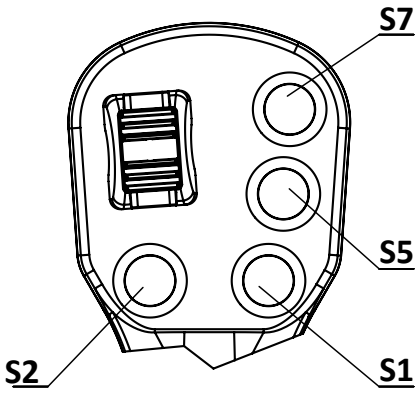
Code	Description
00	No button
01	S1
02	S3
03	S1+S2
04	S4+S5
05	S1+S2+S5
06	S1+S2+S4+S5
07	S1+S2+S3+S4+S5
08	S1+S2+S3+S4+S5+S6
09	S1+S2+S3+S4+S5+S7+S8
0A	S1+S2+S3+S4+ S5+S6+S7+S8
0B	S3+S7+S8

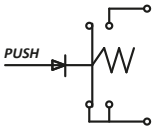
Code	Description
0C	S1+S2+S4+S5+S7+S8
0D	S4+S8
0E	S5
0F	S4
0G	S5+S7
0H	S3+S4+S5+S6
0I	S4+S5+S6
0J	S1+S2+S3
0K	S4+S5+S7+S8
0L	S6
0M	S1+S2+S4+S5+S6
0N	S3+S7

Code	Description
0P	S1+S5+S7
0Q	S1+S2+S7+S8
0R	S2+S4
0S	S3+S4+S5+S7+S8
0T	S1+S7
0U	S3+S6
0V	S8
0W	S2+S8
0Y	S7+S8
0Z	S1+S2+S6
1A	S2+S4+S8

PHJD Proportional hydraulic joystic double Multifunction grip

Upper electric controls and Left Roller



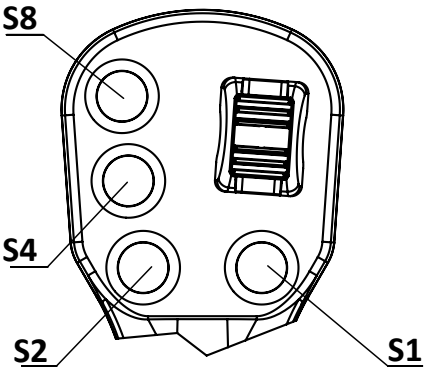


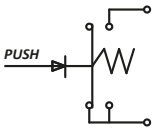
DC 28V x 5A resistive
DC 28V x 3A
Inductive

Configurations

Code	Description
RA	Left Roller
RB	Left Roller+S7
RC	Left Roller+S5+S7
RD	Left Roller+S1+S5+S7
RE	Left Roller+ S1+S2+S5+S7

Upper electric controls and Right Roller



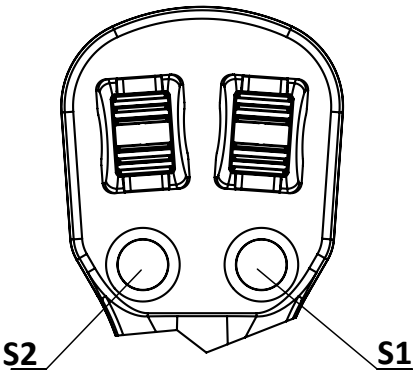


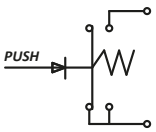
DC 28V x 5A resistive
DC 28V x 3A
Inductive

Configurations

Code	Description
RF	Right Roller
RG	Right Roller+S8
RH	Right Roller+S4+S8
RJ	Right Roller+S2+S4+S8
RK	Right Roller+S1+S2+S4+S8

Upper electric controls, Right Roller and Left Roller





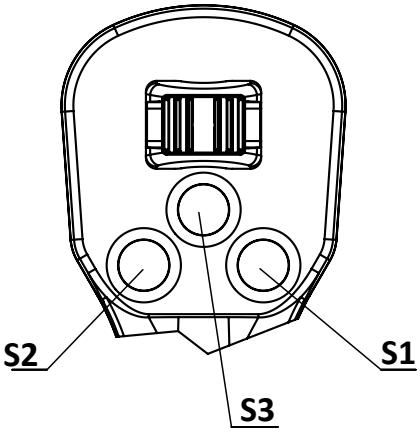
DC 28V x 5A resistive
DC 28V x 3A
Inductive

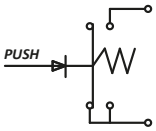
Configurations

Code	Description
RL	Right Roller+Left Roller
RM	Right Roller+ Left Roller+S2
RN	Right Roller+ Left Roller+S2+S1

PHJD Proportional hydraulic joystic double Multifunction grip

Upper electric controls and Roller Up



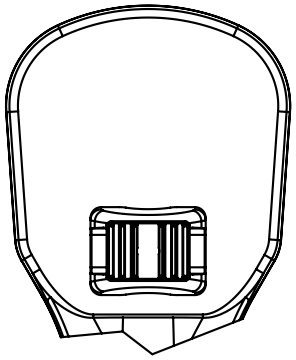


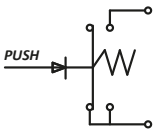
DC 28V x 5A resistive
DC 28V x 3A
Inductive

Configurations

Code	Description
RO	Roller Up+S1+S2
RP	Roller Up+S3
RR	Roller Up+S1+S2+S3

Roller Down



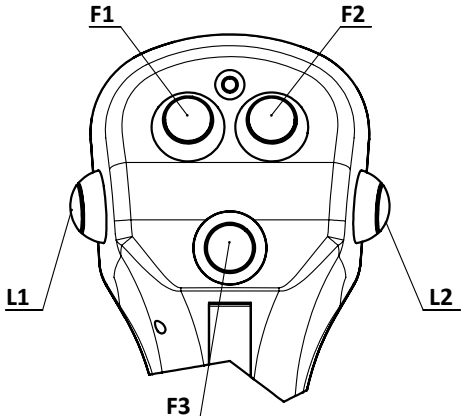


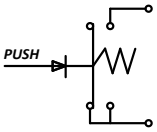
DC 28V x 5A resistive
DC 28V x 3A
Inductive

Configurations

Code	Description
RQ	Roller Down

Upper electric controls and Left Roller





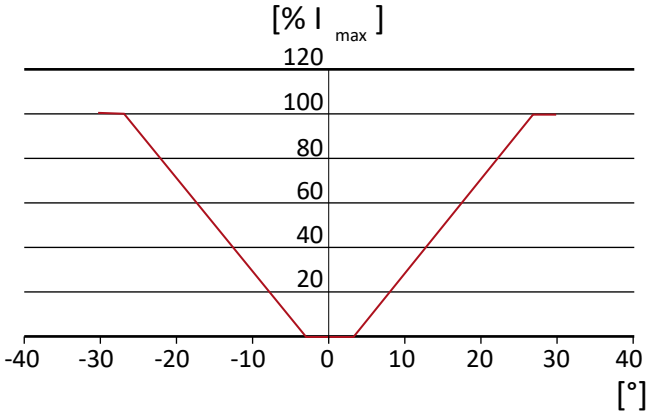
DC 28V x 5A resistive
DC 28V x 3A
Inductive

Configurations

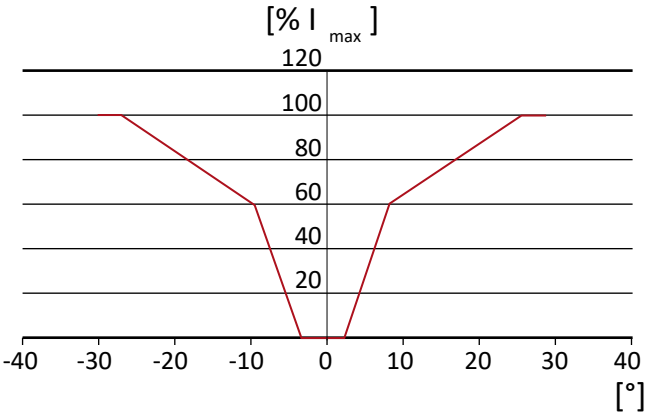
Code	Description	Code	Description	Code	Description
0	No button	**5**	F2	**A**	F1+F2+L1+L2
1	L1	**6**	F3	**B**	F3+L1+L2
2	L2	**7**	F1+F2	**C**	F1+L1
3	L1+L2	**8**	F1+F2+F3	**D**	F1+F3
4	F1	**9**	F1+F2+F3+L1+L2	**E**	F1+F3+L1+L2

Front buttons are not foreseen for versions “V” and “Z”.

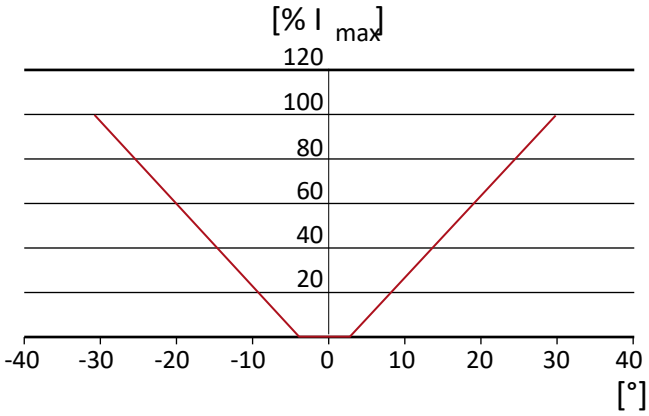
500 PWM output profile



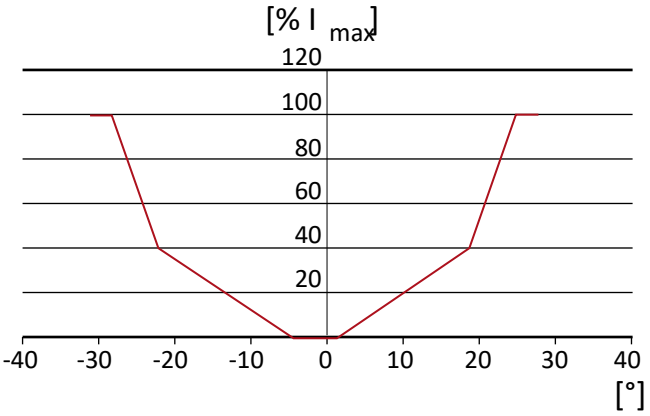
501 PWM output profile



502 PWM output profile



503 PWM output profile



The programming of the electronic card, integrated in the H/T handle, is specific for each application as the ramp is designed to best meet the application working conditions. You will therefore have to ask HP Hydraulic to assign the 3-digit code once the application and the correct ramp has been agreed (current delivered, % I_{max}, depending on the roller position, degrees). Below are examples of ramps available to the standard configutation of the parameters of voltage, current and PWM frequency of the electronic board.

OMFB HYDRAULIC POWER CONTROL

PHJD Proportional hydraulic joystic double
Ordering instructions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
PHJD	**0**	**G**	**2**	**1**	**K**	**S**	**S**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

1 Models

1	1 pressure signal from axis 2-4	**3**	Opposite counter rotation	**5**	Opposite counter rotation with reverse signal	**7**	Concordant counter rotation with reverse signal
2	2 pressure signals from axis 1-3 and 2-4	**4**	1 pressure signal from each position	**6**	Concordant counter rotation		

2 3 Ports

G2	1/4" gas-BSPP	**U3**	SAE 9/16"-18UNF

4 Seals

1	NBR	**2**	Viton

5 Grips

0	Without handle	**E**	Ergonomic	**H**	Multifunctional Deadman
S	Anatomical	**F**	Ergonomic deadman	**V**	Multifunctional PWM output
K	Cylindrical	**T**	Multifunctional	**Z**	Multifunctional PWM output Deadman

6 Positioner

S	With spring return to centre	**M**	Mechanical position 4	**F**	Electromagnetic position 4 24 V
A	Clutch controlled forward/ back 2-4	**E**	Electromagnetic position 4 12 V		

7 8 9 Adjustment curve

S	Single ramp with step	**M**	Double ramp with step
L	Single ramp without step	**G**	Double ramp without step

10 11 Upper electric controls

00	No button	**...**	See upper electric controls

12 Front electric controls

0	No switch	**...**	See front electric controls

13 14 15 Special versions

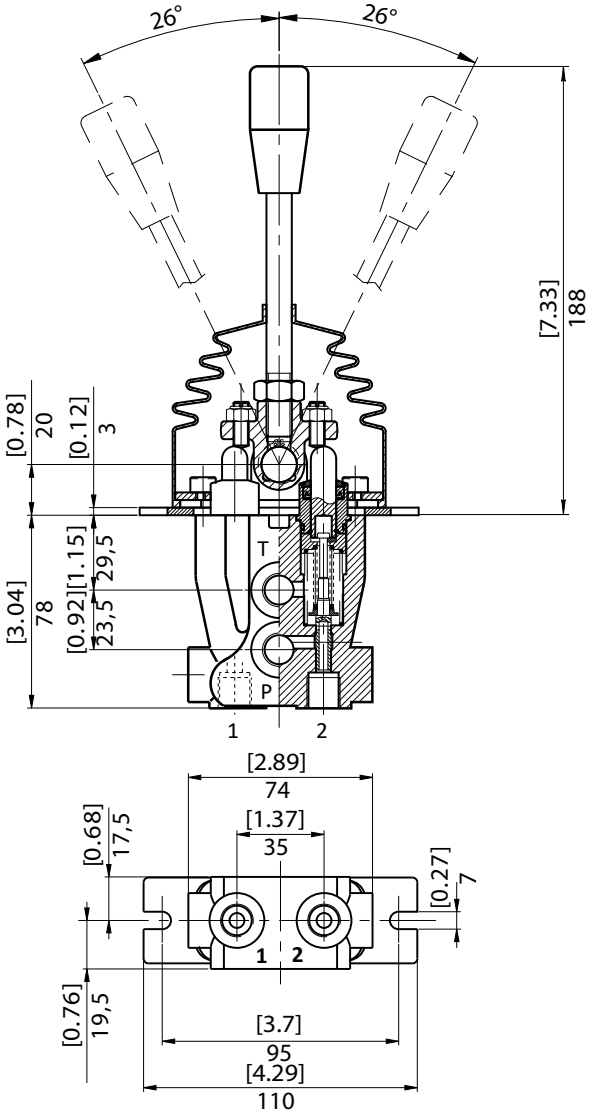
000	No special execution	**001**	Lever inclined right by 15°	**002**	Lever inclined left by 15°

16 17 18 **PWM output profile programming (A)**

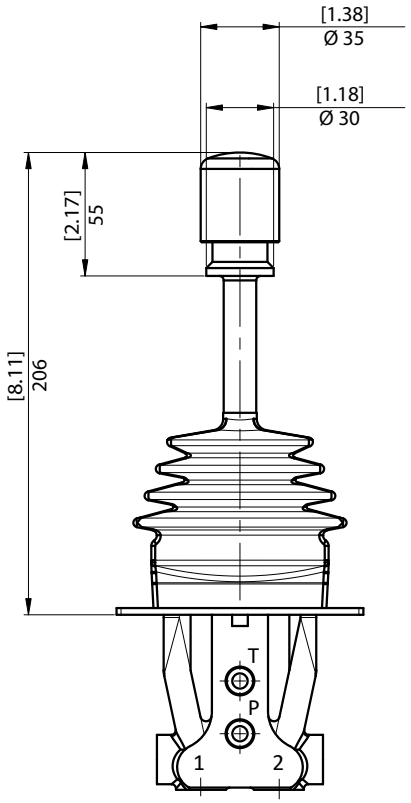
000	No PWM signal	**501**	PWM output profile	**503**	PWM output profile
500	PWM output profile	**502**	PWM output profile		

PHJM Proportional hydraulic joystic multiple
Single axis servo control (lever mechanism)

S A

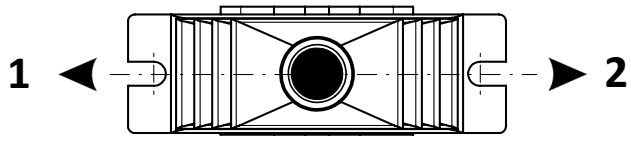


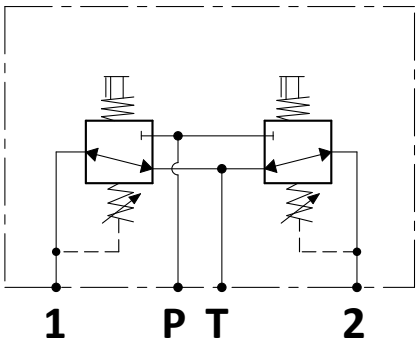
B C



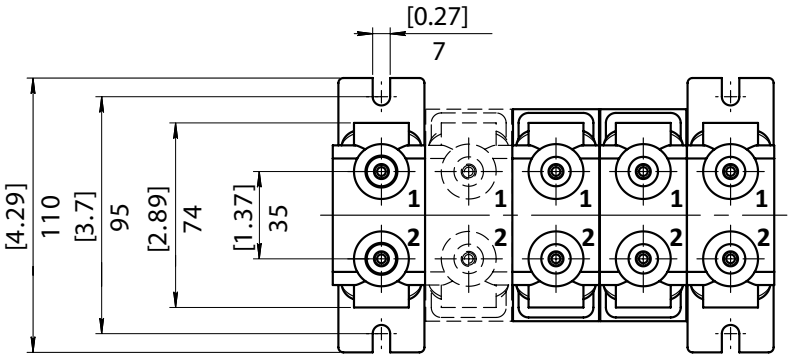
1 **2**	PORTS
T	TANK
P	INLET

Direction of actuation



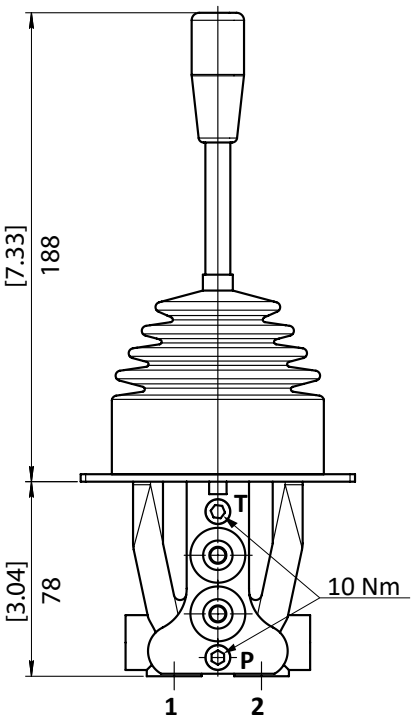


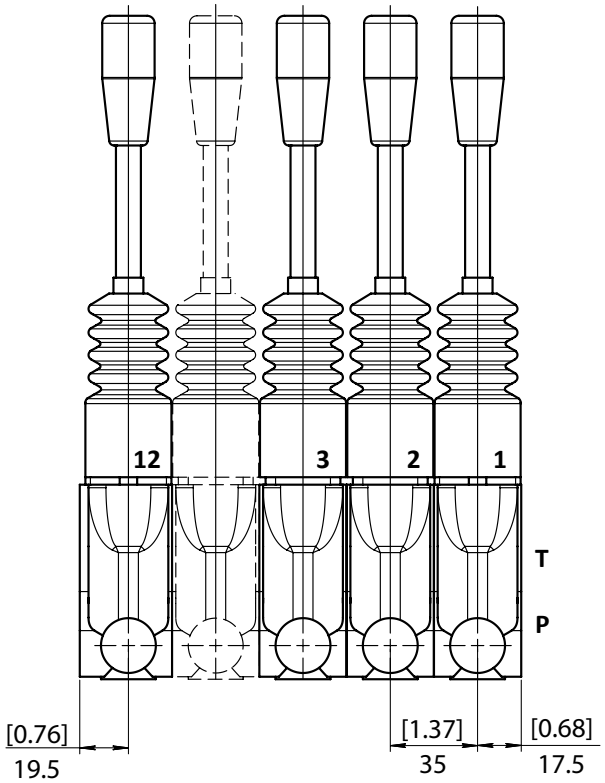
PHJM Proportional hydraulic joystic multiple Models

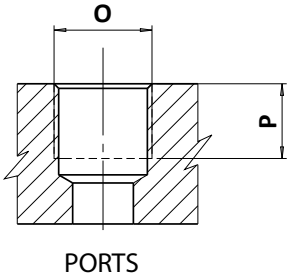


From 1 to sections

- 1 N° 1 Section
- 2 N° 2 Section
- 3 N° 3 Section
- 4 N° 4 Section
- 5 N° 5 Section
- 6 N° 6 Section
- 7 N° 7 Section
- 8 N° 8 Section
- 9 N° 9 Section
- A N° 10 Section
- B N° 11 Section
- C N° 12 Section



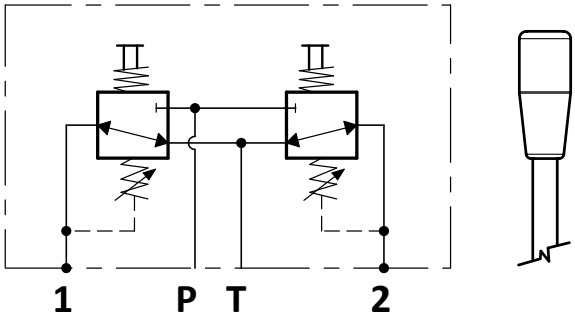




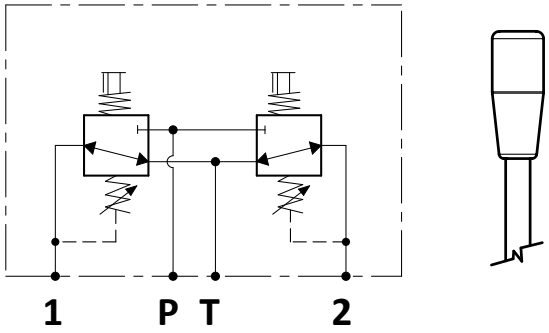
PORTS

TYPE	O		P	
		Nm	mm	in
G2	1/4”	17	12	0,47
U3	9/16-18 UNF	25	13	0,47

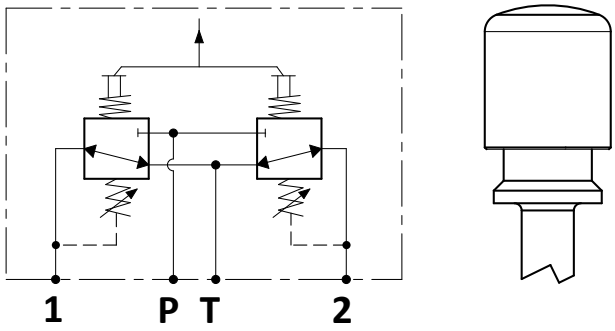
S Standard with spring back



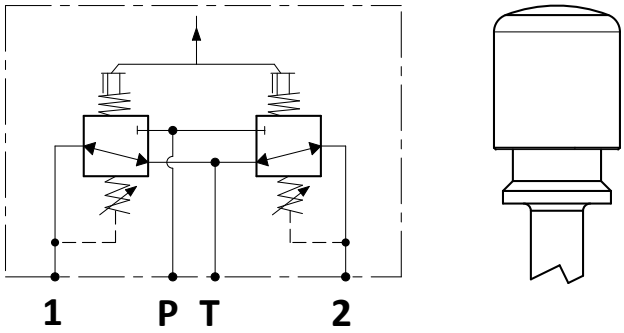
A Clutch controlled



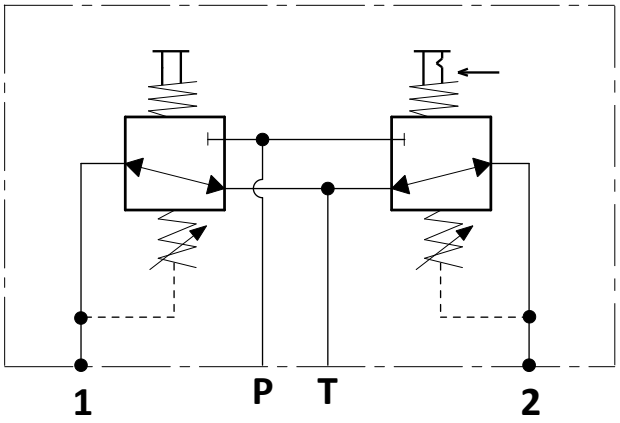
L Central with spring back



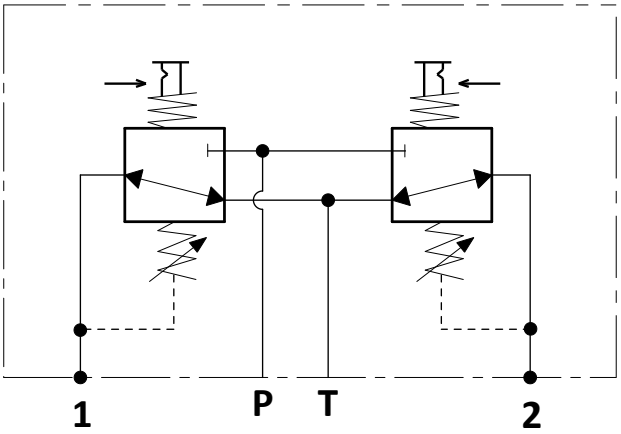
F Central clutch controlled



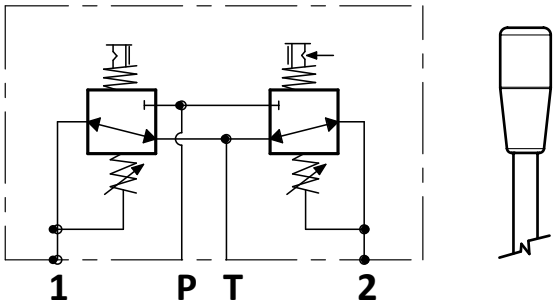
Q Mechanical detent pos. 2



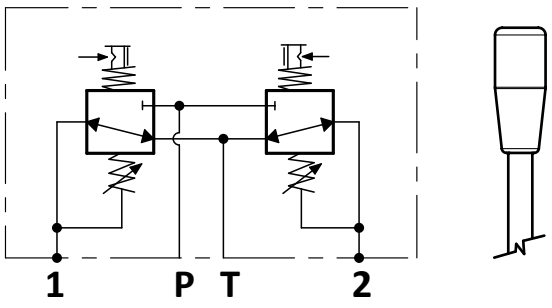
D Mechanical detent pos. 1-2



U Mechanical detent pos. 2 clutch controlled

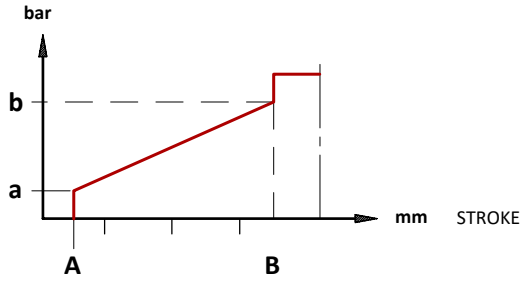


Y Mechanical detent pos. 1-2 clutch cotrolled

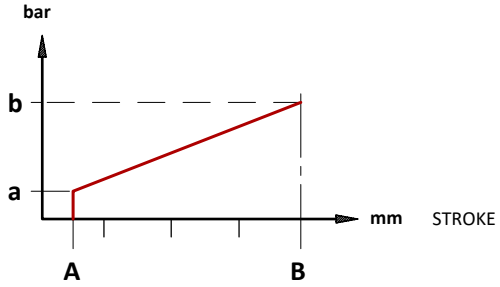


PHJM Proportional hydraulic joystic multiple
Pressure curves

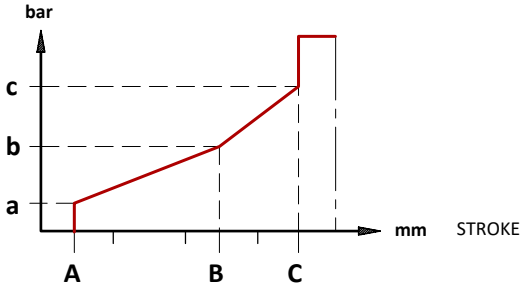
S.. With step



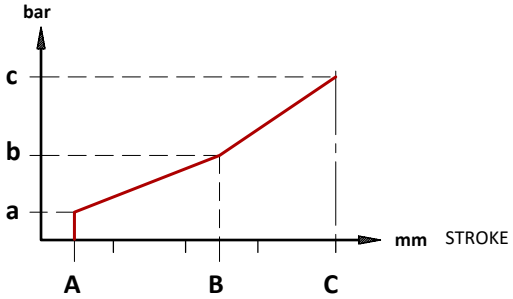
L.. Without step



M.. With step



G.. Without step



Adjustment curves

TYPE S	PRESSURE a		b	
	bar	psi	bar	psi
S00	2	29	16	232
S01	5	73	20	290
S02	6,5	94	24,5	355
S04	3	46	17	249
S08	5	73	16	232
S11	4	58	15	218
S12	1,5	22	7	102
S13	5	73	28	406

TYPE L	PRESSURE a		b	
	bar	psi	bar	psi
L00	2	29	18	261
L01	5	73	22	319
L02	6,5	94	26,5	384
L04	3	46	19	276
L08	5	73	18	261
L11	4	58	15	218
L12	1,5	22	9	131
L13	5	73	30	435

TYPE M	PRESSURE a		b		c		STROKE A	B	C
	bar	psi	bar	psi	bar	psi	mm	mm	mm
M60	5	73	12	174	21	306	1,2	5,4	7,8

TYPE G	PRESSURE a		b		c		STROKE A	B	C
	bar	psi	bar	psi	bar	psi	mm	mm	mm
G60	5	73	12	174	23	334	1,2	5,4	8,3

PHJM Proportional hydraulic joystic multiple
Ordering instructions

SERIES

MODELS

1 = N° 1 section
2 = N° 2 sections
3 = N° 3 sections
4 = N° 4 sections
5 = N° 5 sections
6 = N° 6 sections
7 = N° 7 sections
8 = N° 8 sections
9 = N° 9 sections
A = N° 10 sections
B = N° 11 sections
C = N° 12 sections

STANDARD PORT

G2 = 1/4" gas-BSPP
U3 = SAE 9/16"-18UNF

SEALS

1 - NBR
2 - Viton

HANDLES

0 = Without grip
G = Knob cylinder
J = Knob (positioner L and F only)

SPECIAL VERSIONS

000 = No special execution
001 = Lever tilted to right 20°
002 = Lever tilted to left 20°

ELECTRIC CONTROLS

1N 12V Neutral switch

1R 12V reverse micro

1R as standard on 2

CURVES See pag.

POSITIONER

S = Spring-back

A = Clutch Controlled

L = Central, with spring-back

F = Central, clutch-controlled

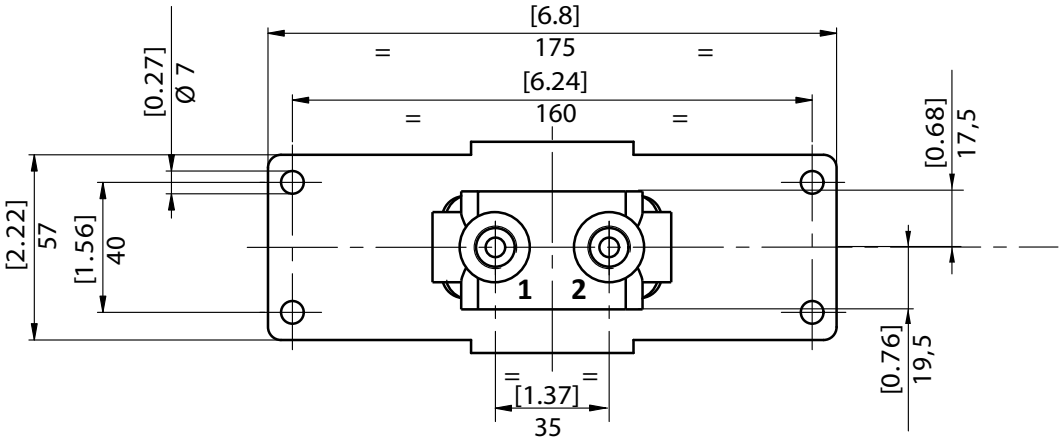
Q = Mechanical detent pos.2

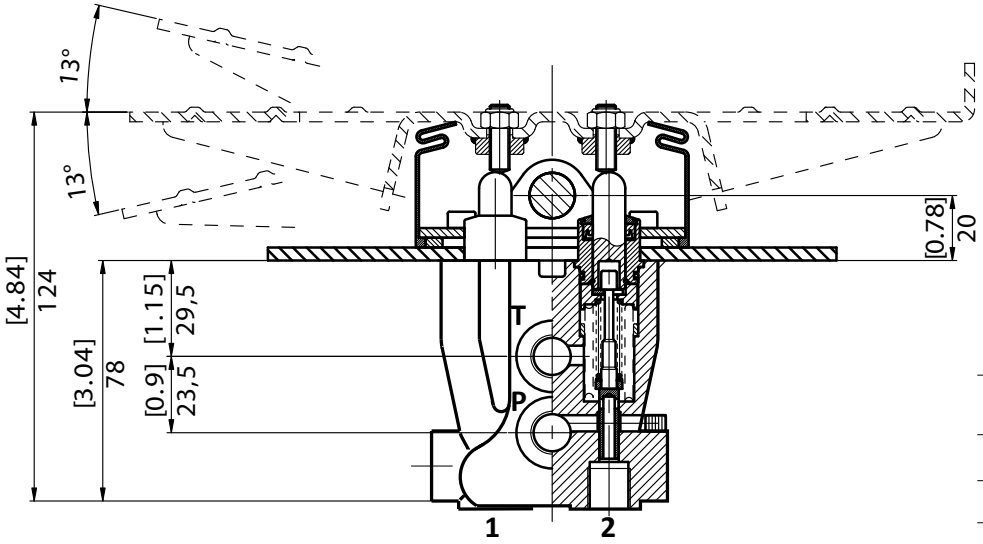
D = Mechanical detent pos.1-2

U = Mechanical detent pos. 2 clutch controlled

Y = Mechanical detent pos.1-2 clutch controlled

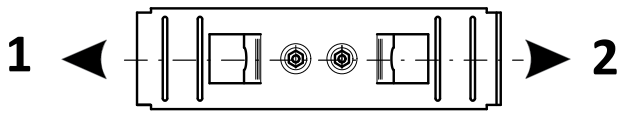
PHP Proportional hydraulic pedal
Servo control with pedal mechanism

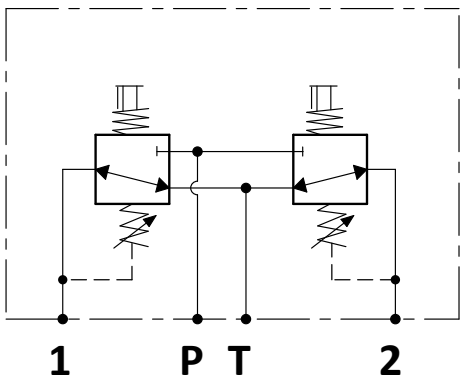




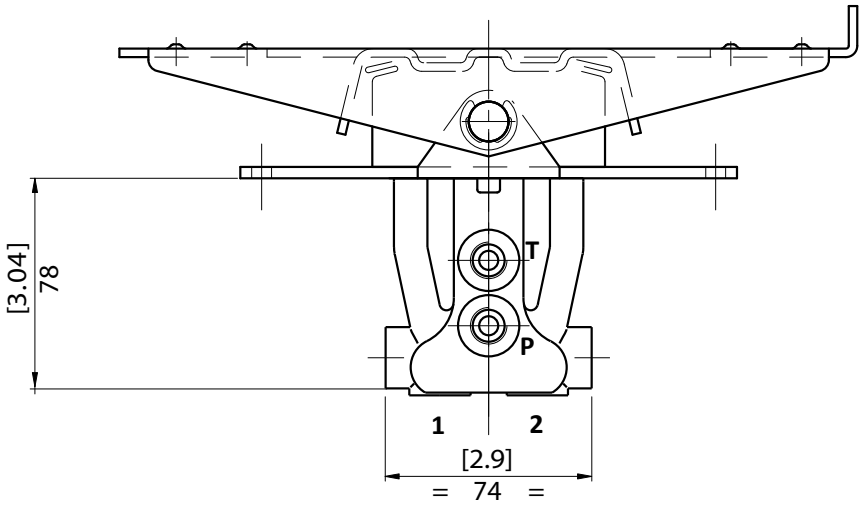
1 2	PORTS
T	TANK
P	INLET

Direction of actuation

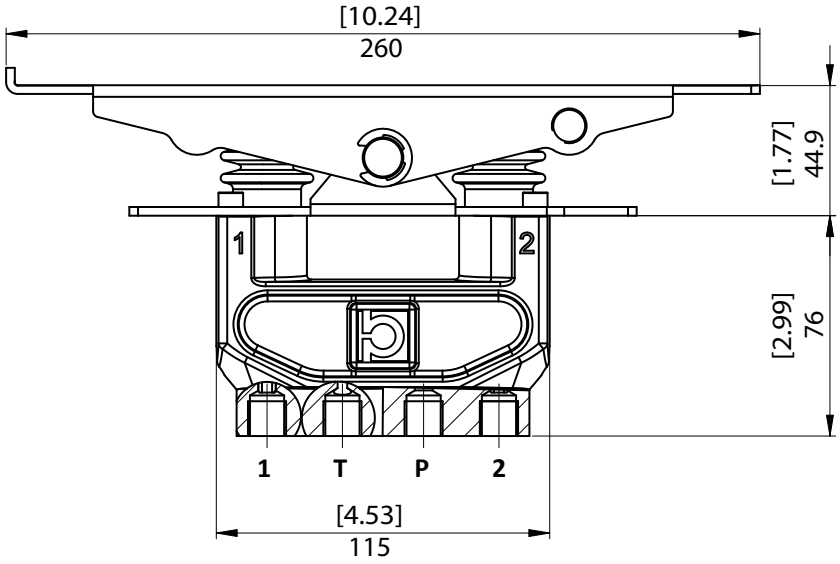


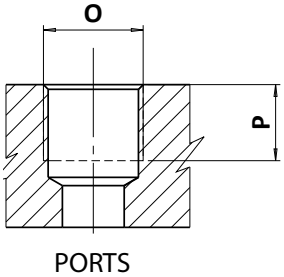


0 Standard



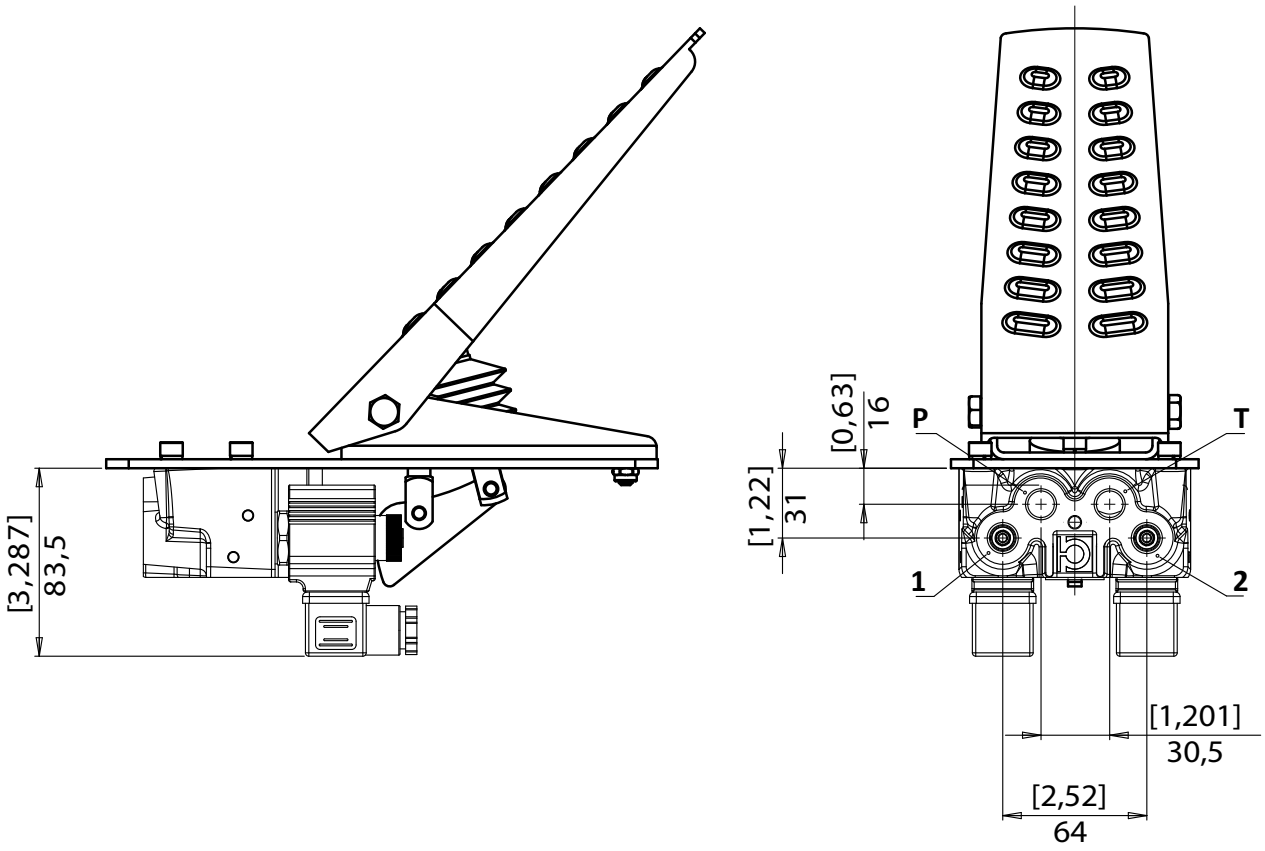
2 Long step (pedals 1 - 4 only)

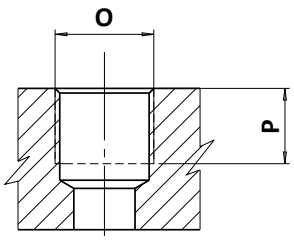




TYPE	O		P	
		Nm	mm	in
G2	1/4"	17	12	0,47
U3	9/16-18 UNF	25	13	0,47

3 With directional electricvalves (padals D - W only)

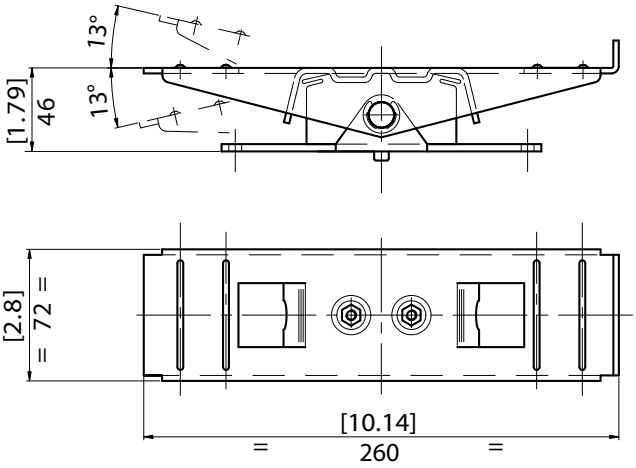




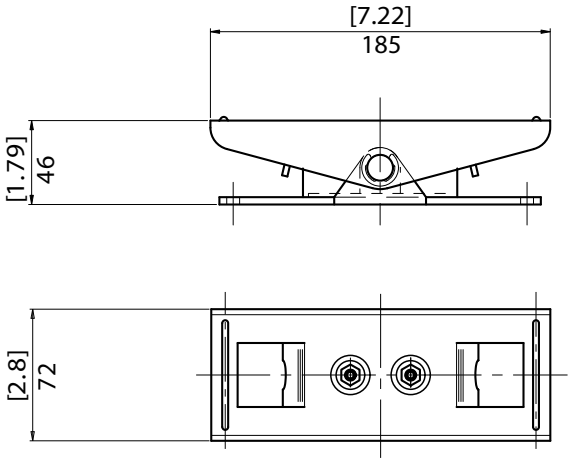
PORTS

TYPE	O	P		
		Nm	mm	in
G2	1/4”	17	12	0,47
U3	9/16-18 UNF	25	13	0,47

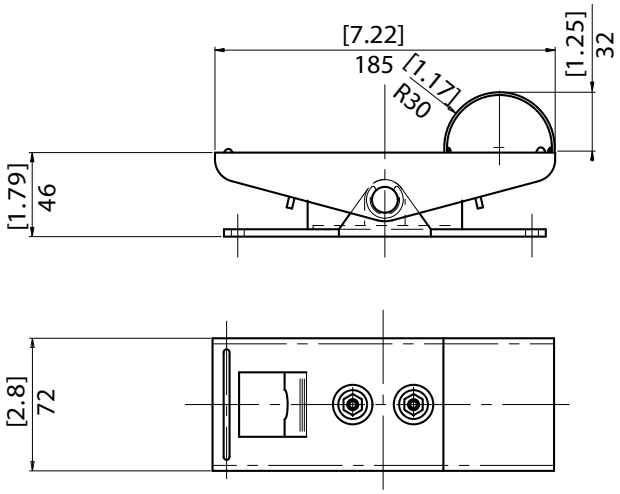
1 Standard toggle pedal



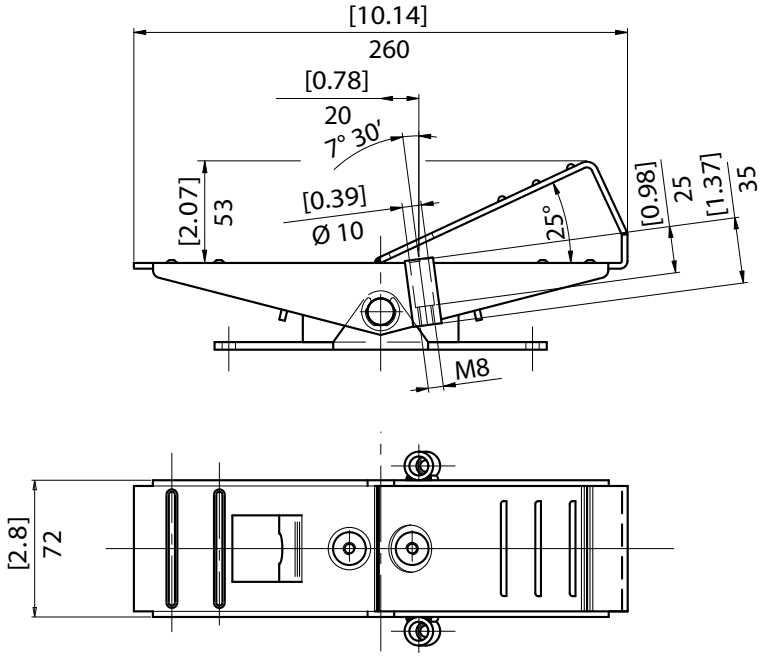
2 Standard short pedal



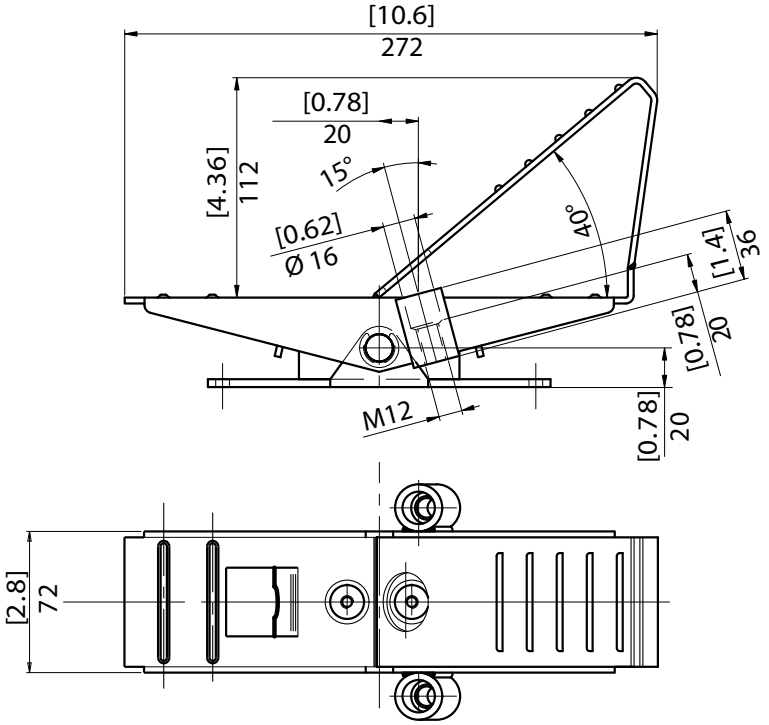
3 Convex short pedal



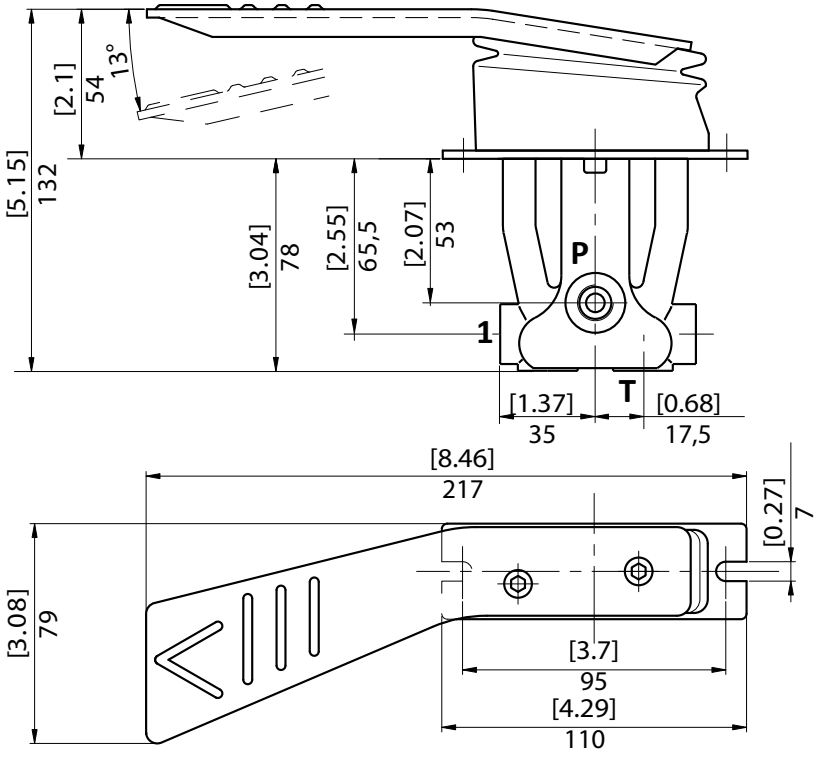
4 Pedal with shim

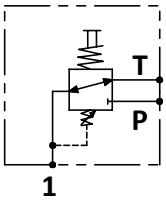


5 Pedal with high shim

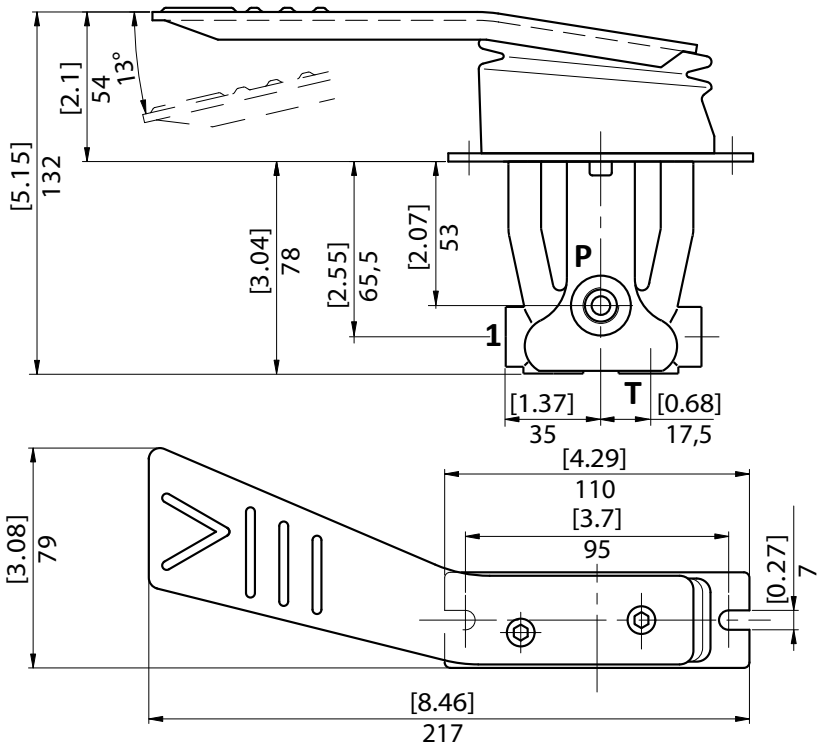


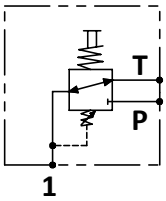
6 Single right pedal



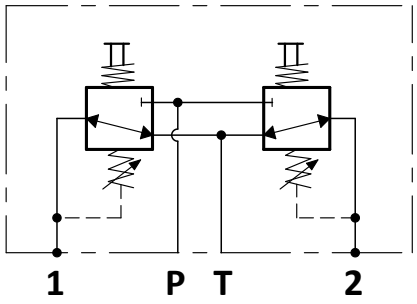


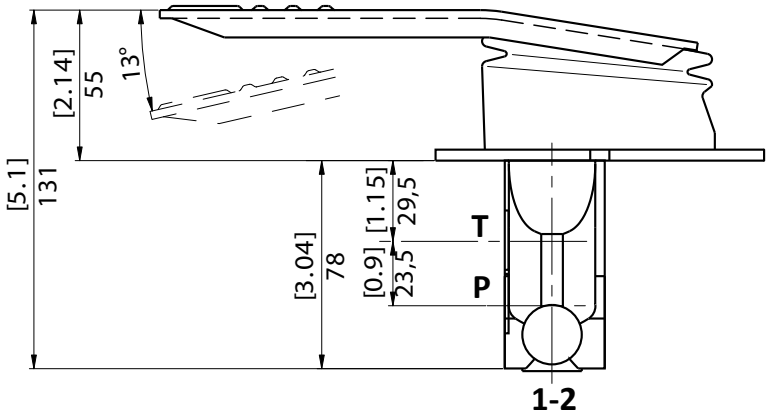
7 Single left pedal

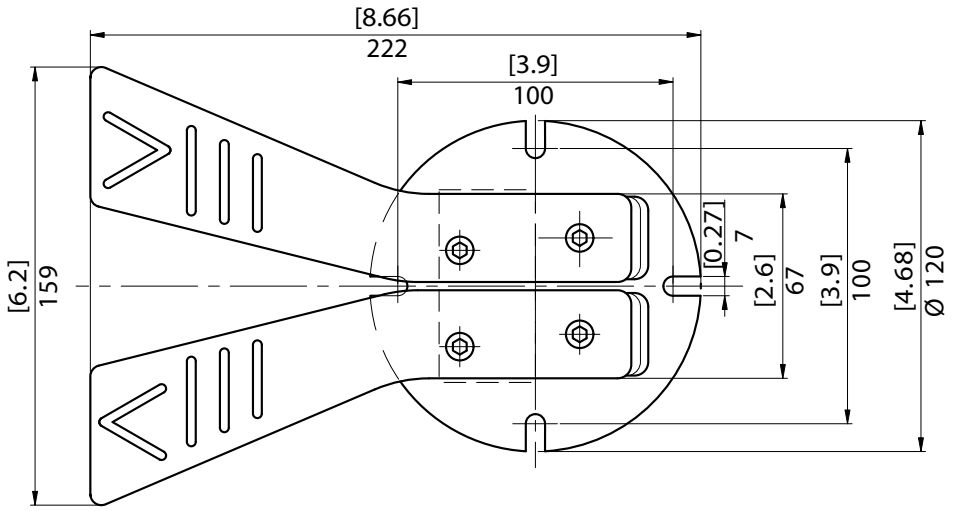




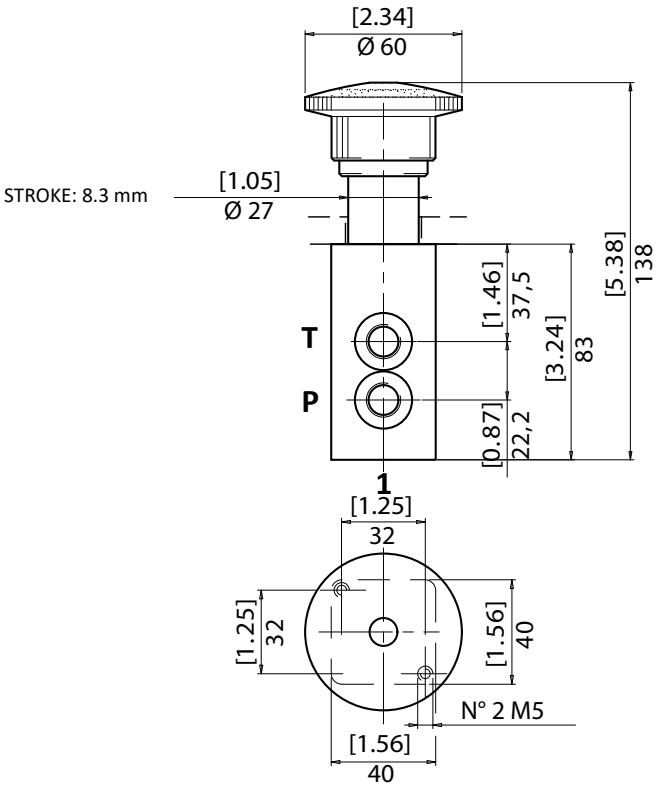
8 Double pedal

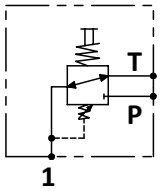




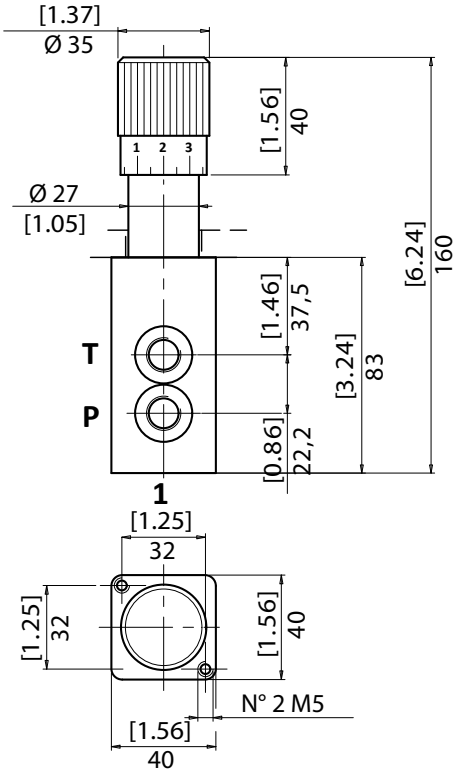


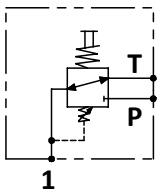
9 Button pedal



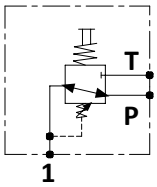


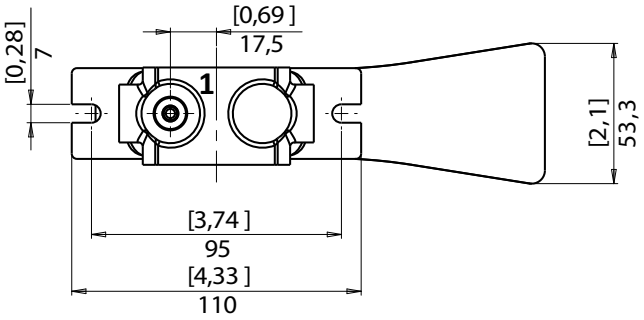
R Pression regulator

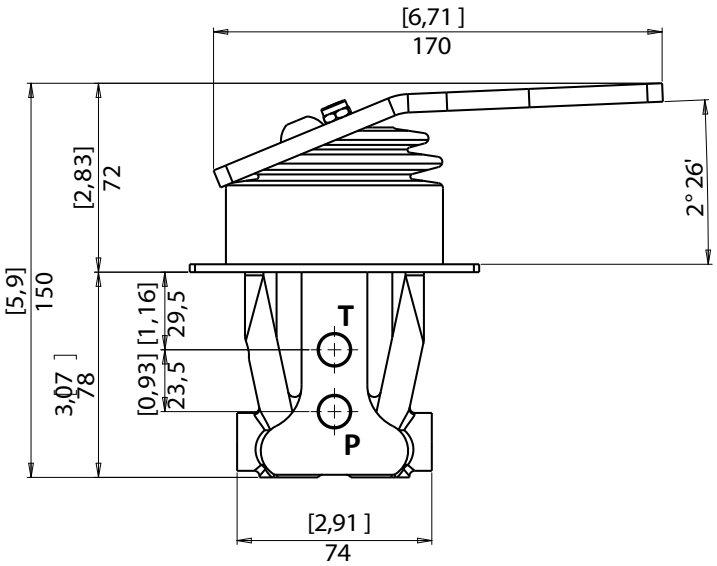




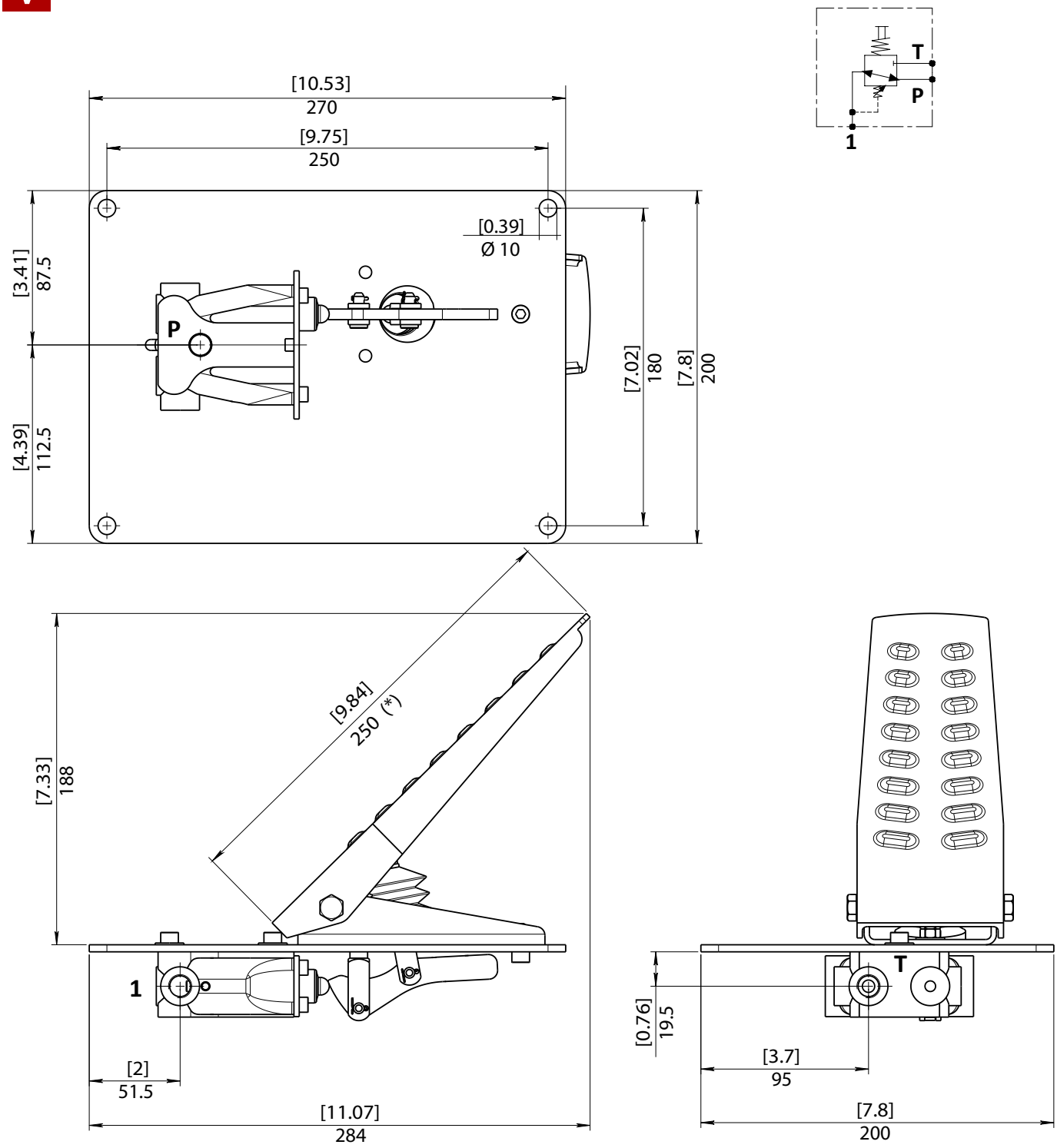
N Negative single pedal negative



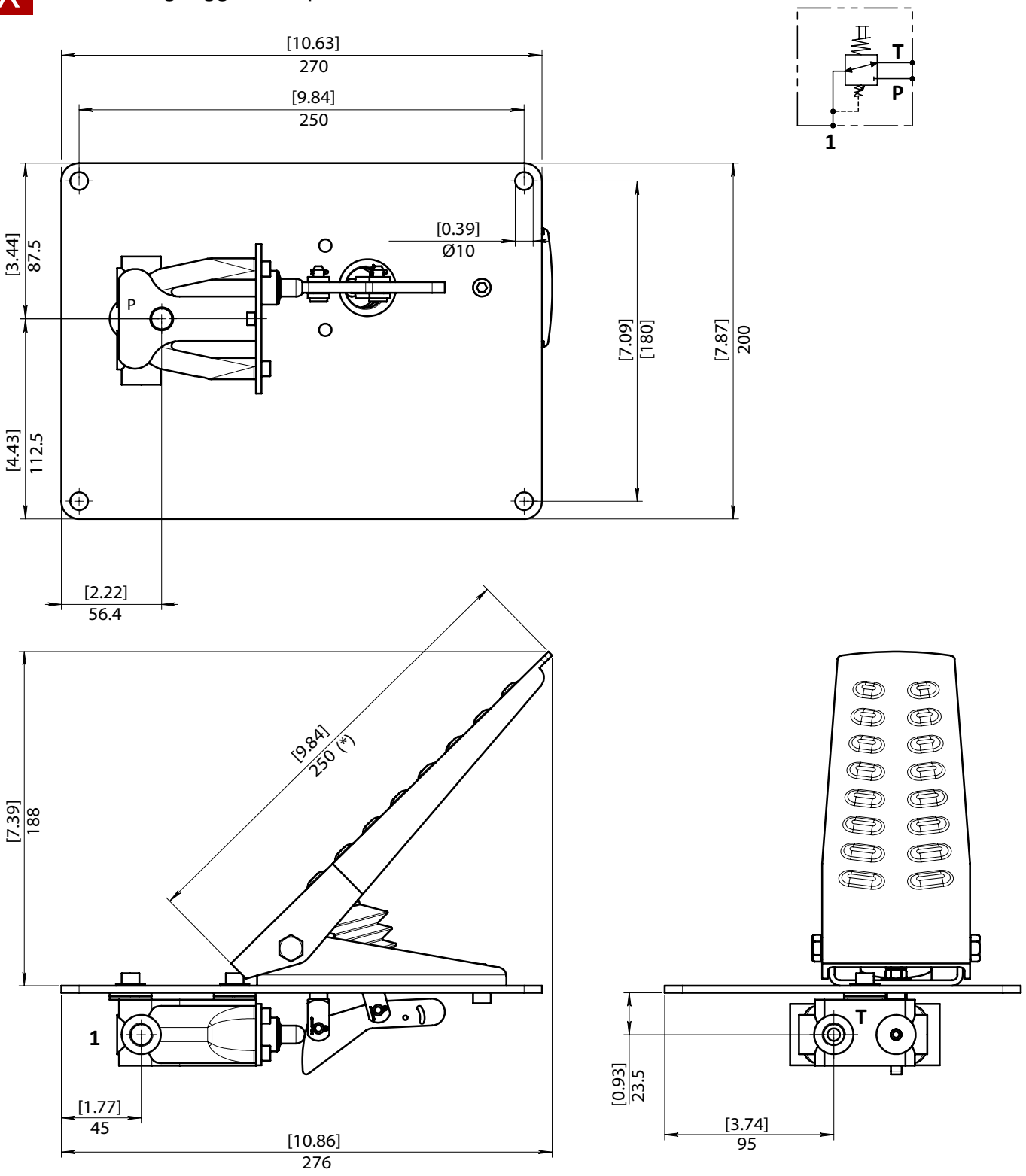




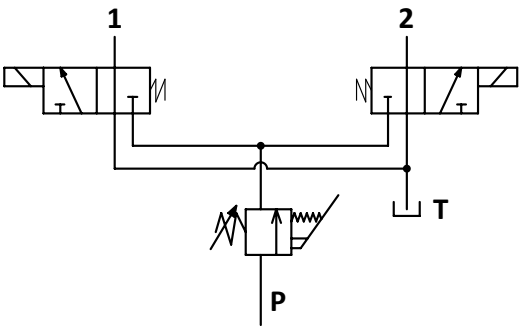
V Negative toggle lever pedal



X Positive long toggle lever pedal

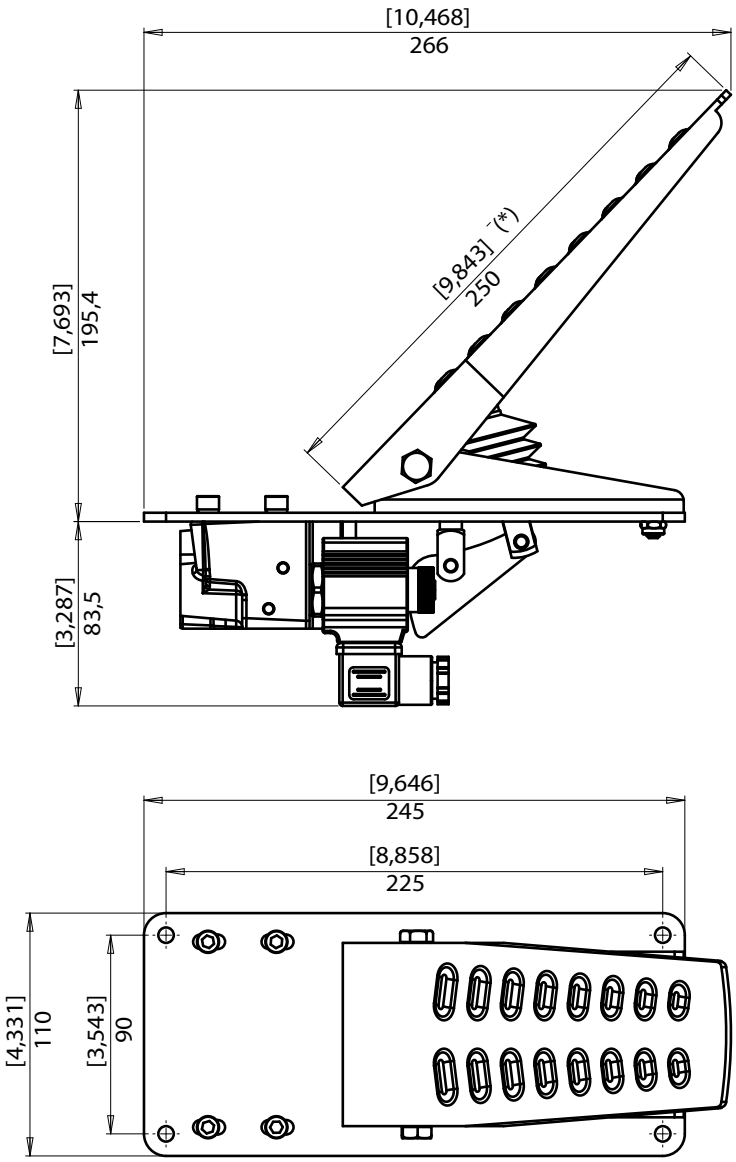


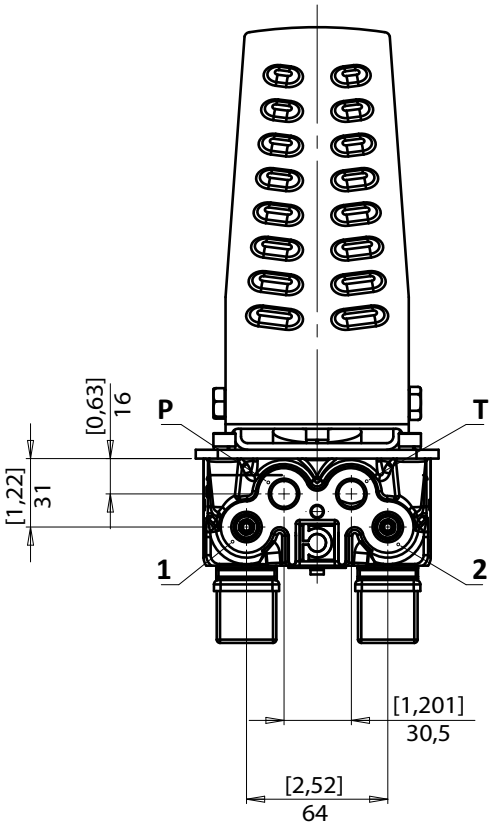
W Long toggle lever pedal with directional electrovalves



FEATURES COIL

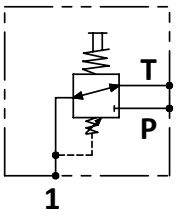
Voltage (V)	Current draw (A)	Power (W)	Resistance (Ω)
12VDC +5/-10%	1.9	22.8	6.3(20°) -9.2+/-7% IP:65
24VDC +5/-10%	0.95	22.5	25.6(20°) -37+/-7% IP:65

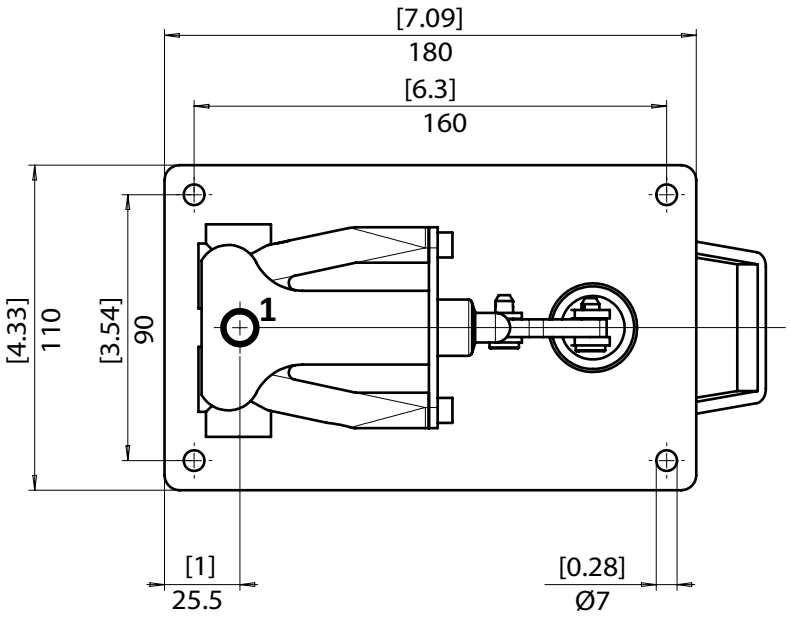


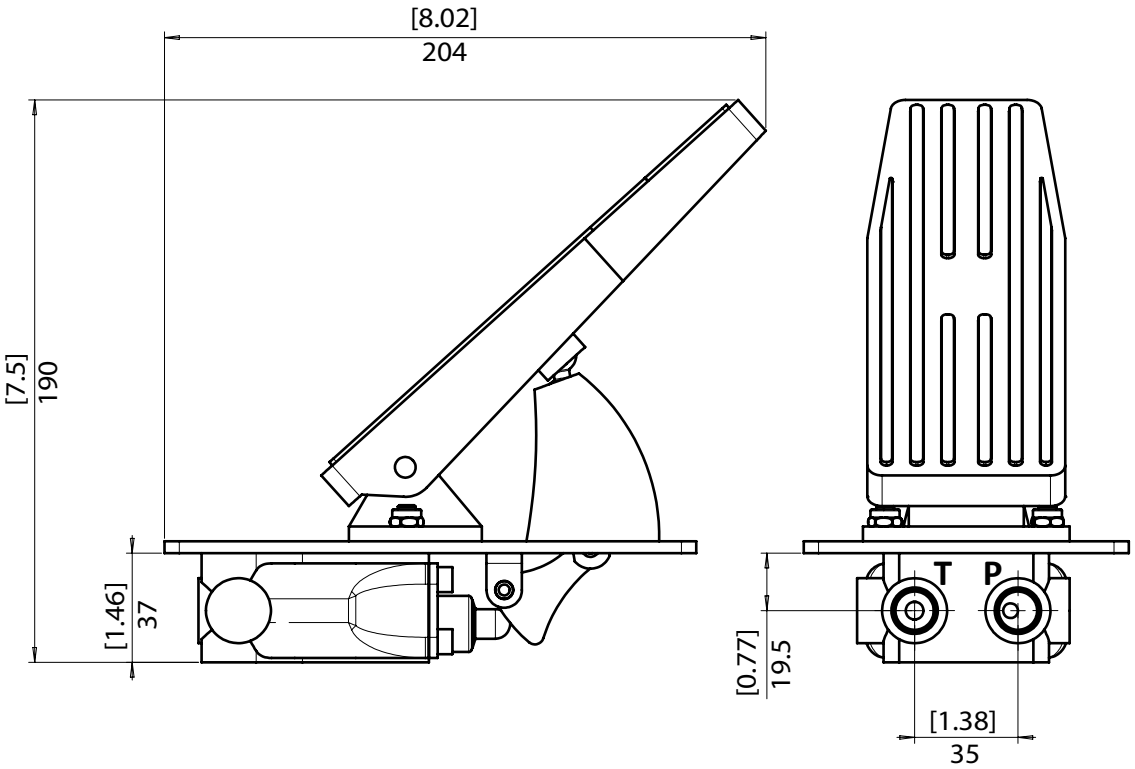


(*)Available in a version with pedal length 190 mm too

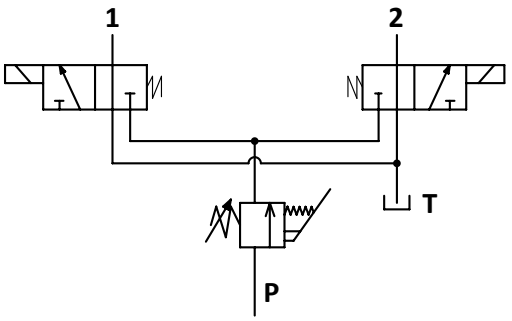
Z Resin toggle lever pedal





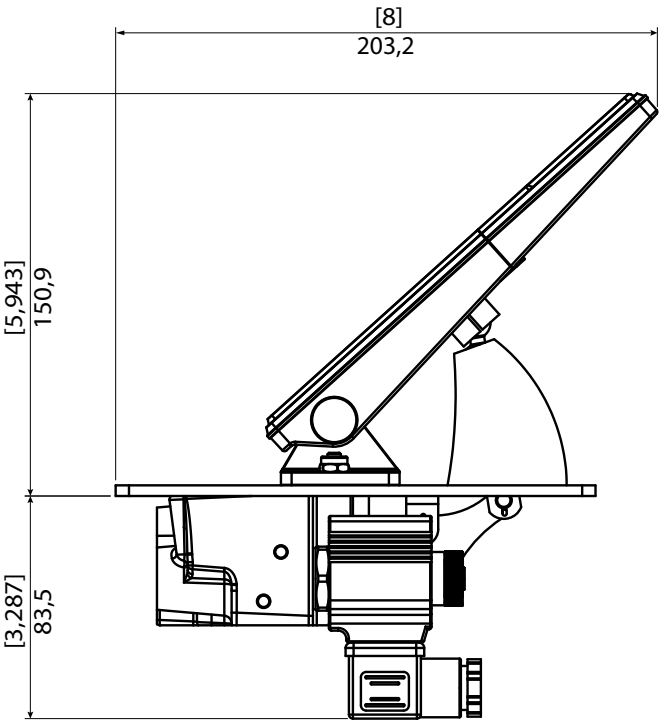


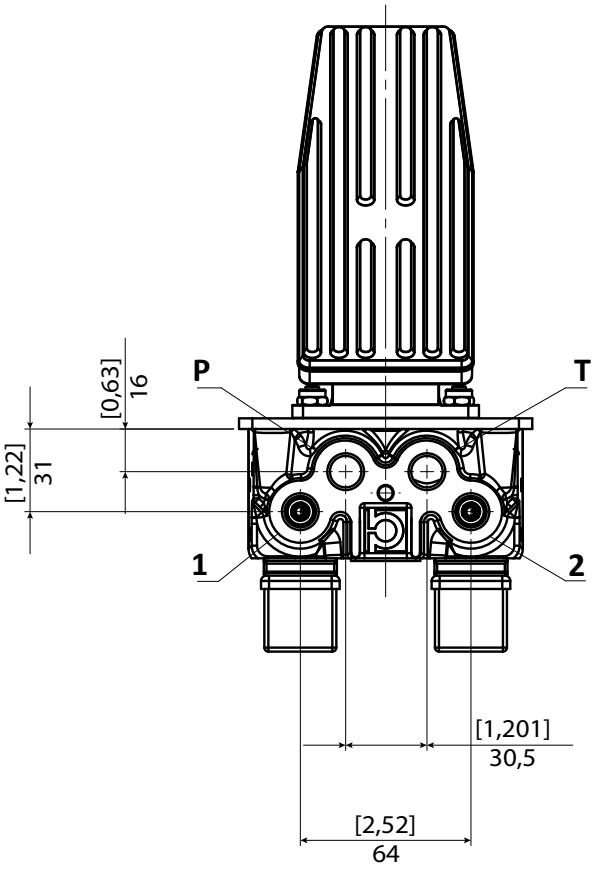
D Resin toggle lever pedal with directional electrovalves

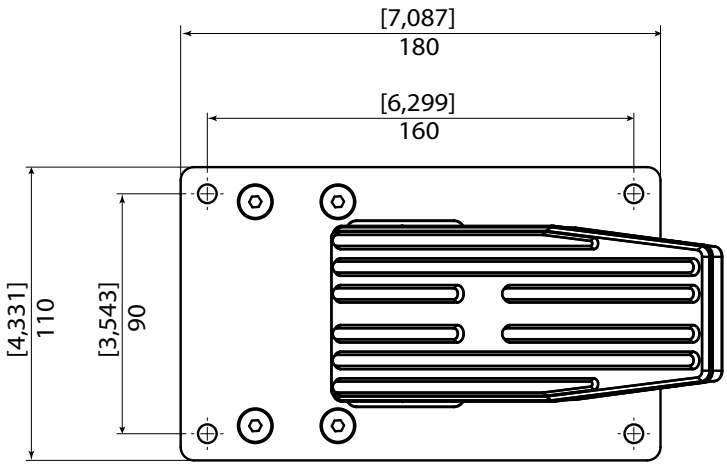


FEATURES COIL

Voltage (V)	Current draw (A)	Power (W)	Resistance (Ω)
12VDC +5/-10%	1.9	22.8	6.3(20°) -9.2+/-7% IP:65
24VDC +5/-10%	0.95	22.5	25.6(20°) -37+/-7% IP:65

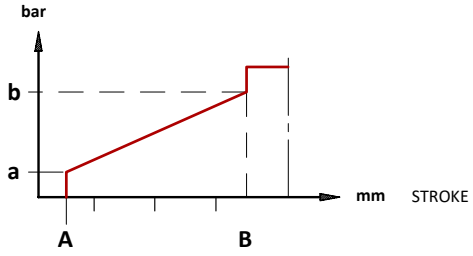




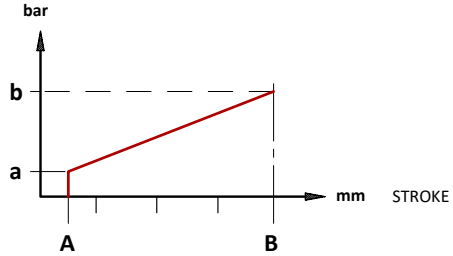


Single slope pressure curves

P.. With step



R.. Without step



Adjustment curves

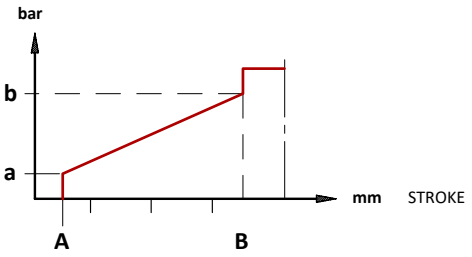
TYPE	PRESSURE			
P	a		b	
	bar	psi	bar	psi
P00	2	29	16	232
P01	3	43	18	261

TYPE	PRESSURE			
R	a		b	
	bar	psi	bar	psi
R00	2	29	18	261
R01	3	44	22	290

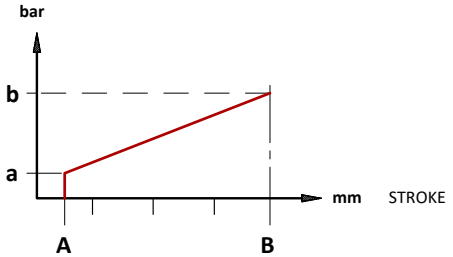
Pressure curves for 9, R, D, HPCF1

Single slope pressure curves

S.. With step



L.. Without step



Adjustment curves

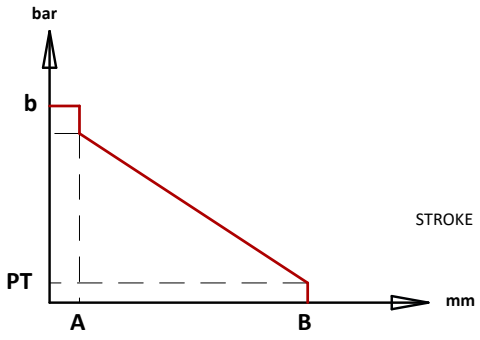
TYPE	PRESSURE			
S	a		b	
	bar	psi	bar	psi
S00	2	29	16	232
S01	5	73	20	290
S02	6,5	94	24,5	355
S04	3	46	17	249
S08	5	73	16	232
S11	4	58	15	218
S12	1,5	22	7	102
S13	5	73	28	406

TYPE	PRESSURE			
L	a		b	
	bar	psi	bar	psi
L00	2	29	18	261
L01	5	73	22	319
L02	6,5	94	26,5	384
L04	3	46	19	276
L08	5	73	18	261
L11	4	58	15	218
L12	1,5	22	9	131
L13	5	73	30	435

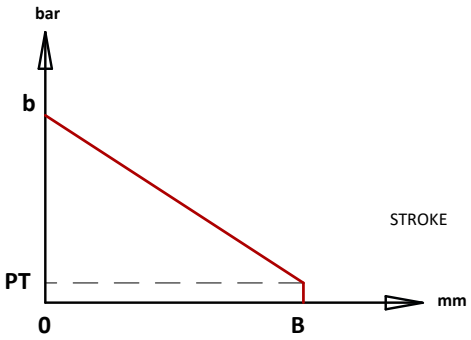
PHP Proportional hydraulic pedal
Pressure curves for N, V (Negative pedals)

Single slope pressure curves

P.. With step



R.. Without step



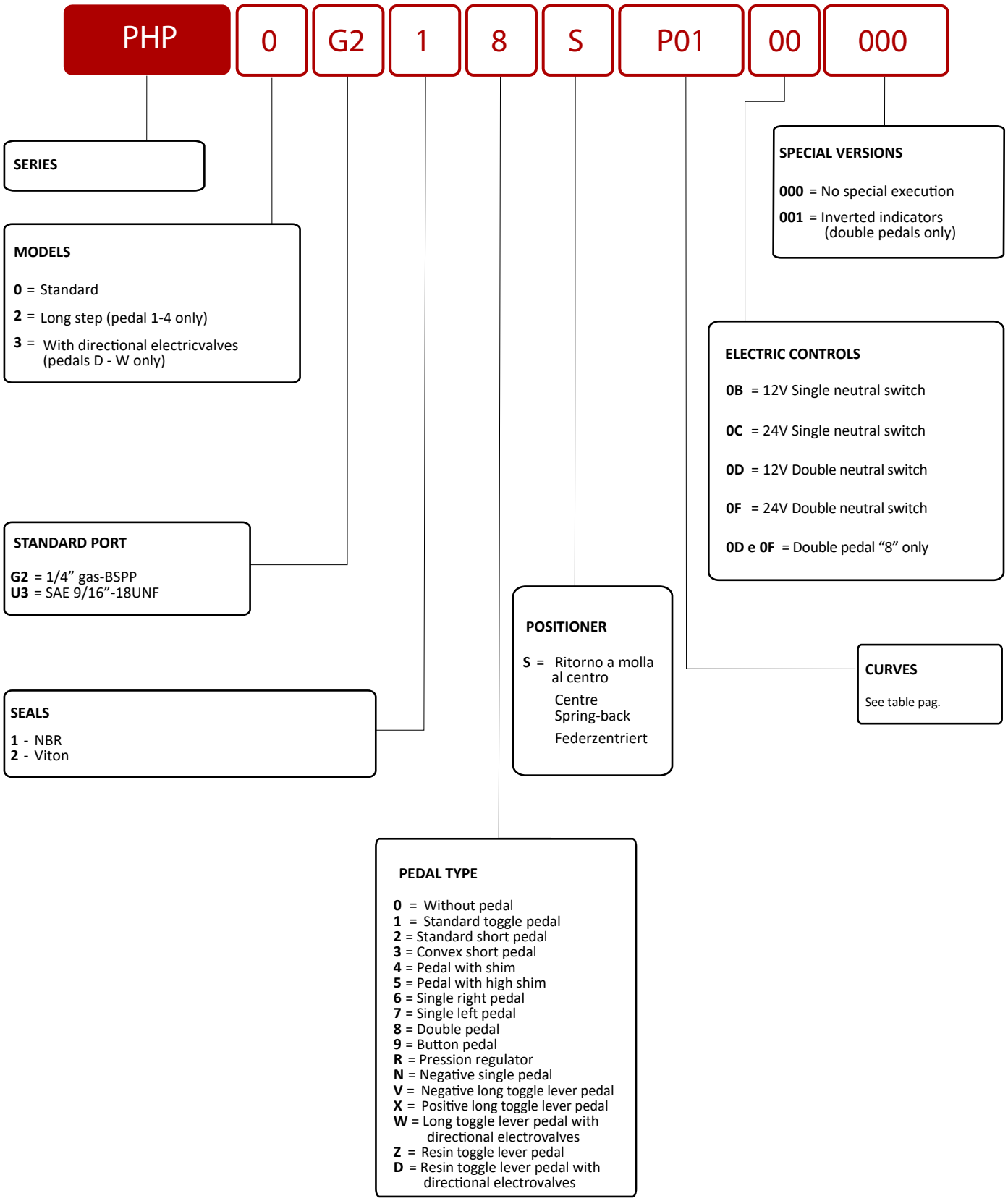
Adjustment curves

TYPE	PRESSURE		
P	b		
	bar	psi	
P00	16	232	PT
P01	18	261	

TYPE	PRESSURE		
R	b		
	bar	psi	
R00	16	261	PT
R01	22	290	

OMFB HYDRAULIC POWER CONTROL

PHP Proportional hydraulic pedal
Ordering instructions



OMFB
HYDRAULIC POWER CONTROL

Sales network

Dealers' network available in the following countries:

ALGERIA
ARABIA SAUDITA
ARGENTINA
AUSTRALIA
AUSTRIA
AZERBAIJAN
BAHRAIN
BELGIO
BIELORUSSIA
BOLIVIA
BOSNIA HERZEGOVINA
BOTSWANA
BRASILE
BULGARIA
CANADA
CILE
CINA
CIPRO
COLOMBIA
CONGO
COREA DEL SUD
COSTA RICA
CROAZIA
CUBA
DANIMARCA
DJIBOUTI
EGITTO
EMIRATI ARABI UNITI
EQUADOR
ESTONIA
FINLANDIA
FRANCIA
GERMANIA
GIAPPONE
GIORDANIA
GRAN BRETAGNA
GRECIA
HONDURAS
INDIA
INDONESIA
IRAN
IRLANDA
ISLANDA
ISRAELE
ITALIA
KAZAKISTAN
KENYA
KUWAIT
LETTONIA
LIBANO
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