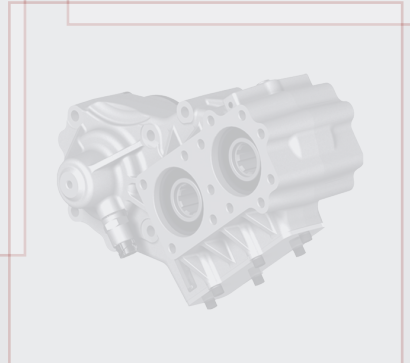
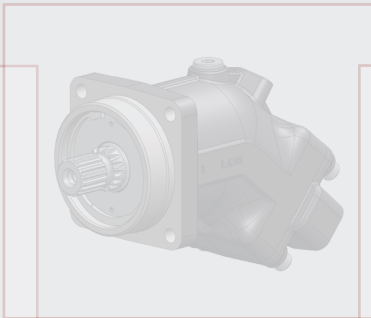
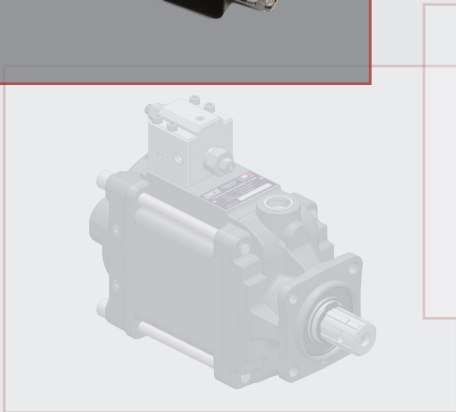
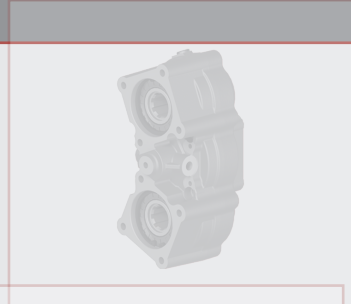
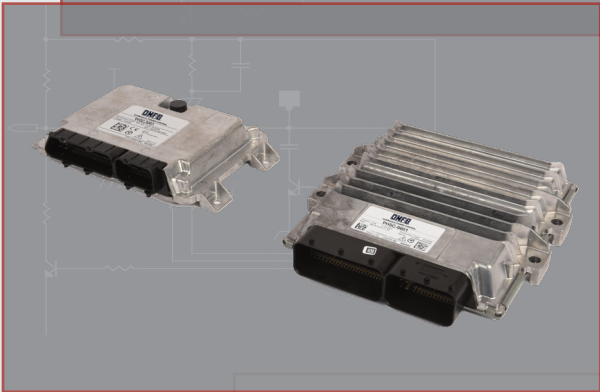
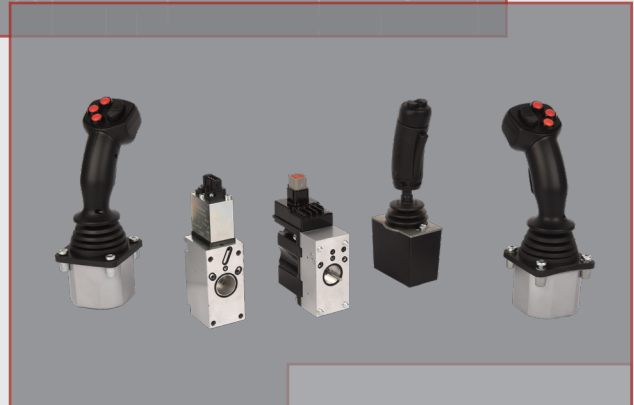
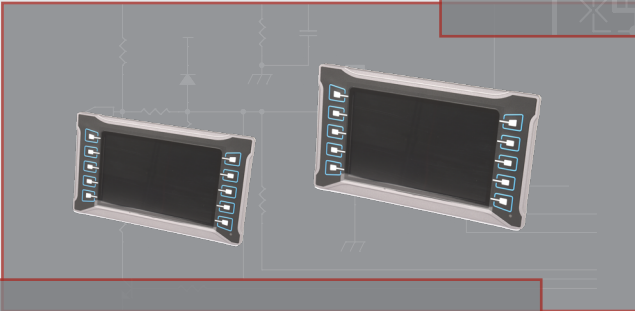
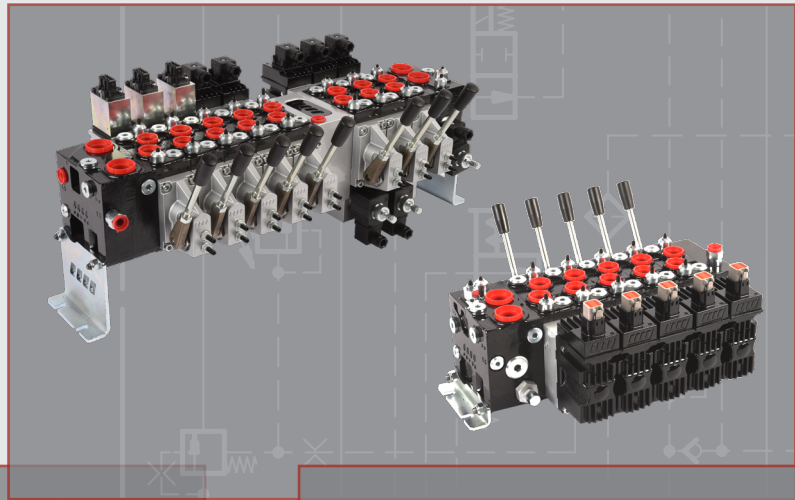


OMFB[®]

HYDRAULIC POWER CONTROL

PDV 37 - PDV 74 - PDV 114 - PDV 315
PROPORTIONAL DIRECTIONAL VALVES, I/O ELECTRONIC CONTROLLERS AND JOYSTICKS



OMFB[®]

HYDRAULIC POWER CONTROL



PDV74 and PDV74D are new breakthrough products with upgraded hydraulic functions that fulfill the ever increasing market demands for improved machines productivity, safety requirements, energy efficient and environmental operation.

Based on load sensing technology, the ability to meter in or out any load actuators, provides 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.



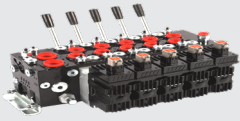
HYDRAULIC POWER CONTROL

OMFB, established since 1951, today is among the worldwide leading manufacturers of hydraulic mobile powered solutions for off-highway vehicles, and our extensive products portfolio, ranging from:

- Power Take Off's units
- Variable and fixed displacement piston pumps
- Proportional Directional Valves
- Electronic controls
- I/O controllers and related software
- Electronic joysticks
- Piston motors
- Gears pumps
- Tipping valves
- Pneumatic joysticks
- Integrated Hydraulic Manifolds

supplied as either components or package integrated system, make it possible to meet virtually any market needs.

The evolution through 1951s to large globally positioned suppliers combined with clear system capabilities was what the worldwide marketplace told us they wanted, and that's what we organized **OMFB** to be.



PDV series PROPORTIONAL DIRECTIONAL VALVE
upstream pressure compensated

Valve system

Based on load sensing technology and developed with the most advanced state-of-the-art valves element concept, to provide machine's velvet smooth functionality control, easily tailored to customer needs and ensuring trouble free operation under demanding conditions.

The design principle of PDV series, allows an easier configuration according to pump supplying request with no need of changing any internal components, and carry out safely electrohydraulic circuits that shut the system down in the event of any failure or outputs not relevant to the demand.

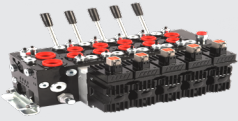
PDV SERIES platforms can be matched with PDV SERIES, down stream pressure compensated valve.

Safety Conformity Assessment

FMEA, failure modes effects and diagnostic analysis, **FMEDA**, are systematic analysis technique to define and minimise the known and potential failure from a given system.

When it comes to more complex products and assemblies involving a combination of both electrical and hydraulic parts, the need to ensure that adequate surveillance over the design and manufacturing of key parts is paramount to be compliance with the on-going series Standards **IEC 61508**.

For hazards and risk analysis please refer to **EN ISO 12100**, the EU Machine Directive and the **EN ISO 13849**.

**PDV general features**

- Up-stream pressure compensated
- Load independent flow
- Can operate with both fixed and variable displacement pumps
- Excellent metering control
- Symmetrical spool flow characteristics
- High power capability control in compact dimension
- High repeatability flow accuracy
- Low hysteresis
- Flexible high-quality product

PDI pump side inlet section

- System pressure up to 400 bar
- Built-in system for inlet configuration / pump selection
 - Open centre for fixed displacement pumps
 - Closed centre for variable displacements pumps
- Built-in system for pump unloading
- Built-in system for LS unloading
- Built-in system for pilot oil supply
- MID inlet version
- Internal / external feeding pilot oil supply

PDW working sections modules

- Pilot LsA / LsB relief valves
- Electrical unloading pilot LsA / LsB pilot
- Shock and suction valve
- Pump cut-off version (for downstream working sections)
- Priority flow for steering unit version
- Symmetrical flow distribution
- Pressure compensator built-in check-valve

Electrohydraulic actuators

- **PEAC** – proportional closed loop spool control (diagnostic and fault monitoring built-in system)

Input signal: Ratiometric
 U_{DC} , 0 – 10 V, 4 – 20 mA

- **PEAP** – proportional open loop control, PWM input signal
- **PEAO** – on/off control
- **PEAZ** – CAN-Bus configuration (CAN-open or SAE J1939 communication protocol)

PDE – end section module

- With and without ports
- MID end section version



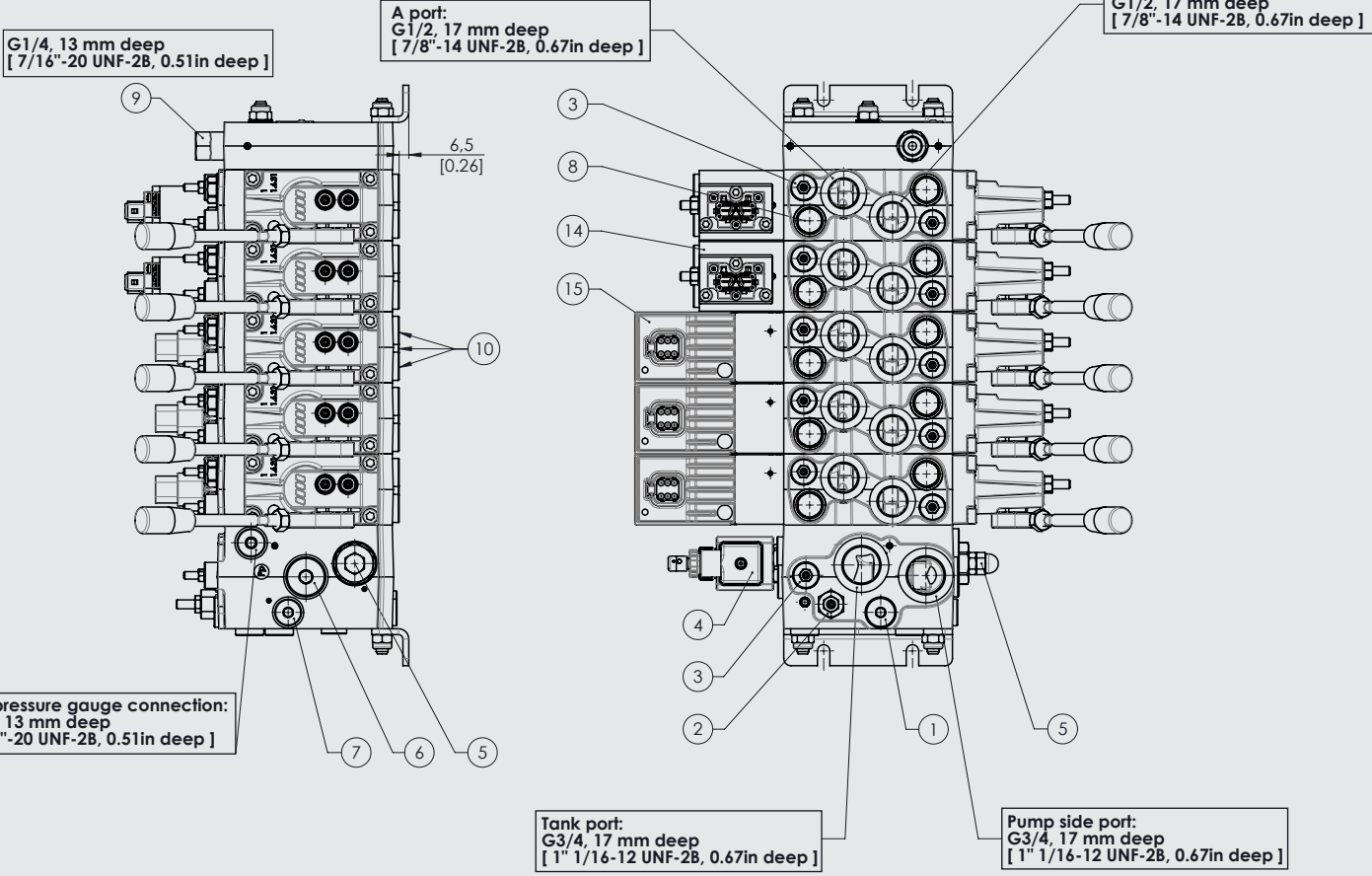
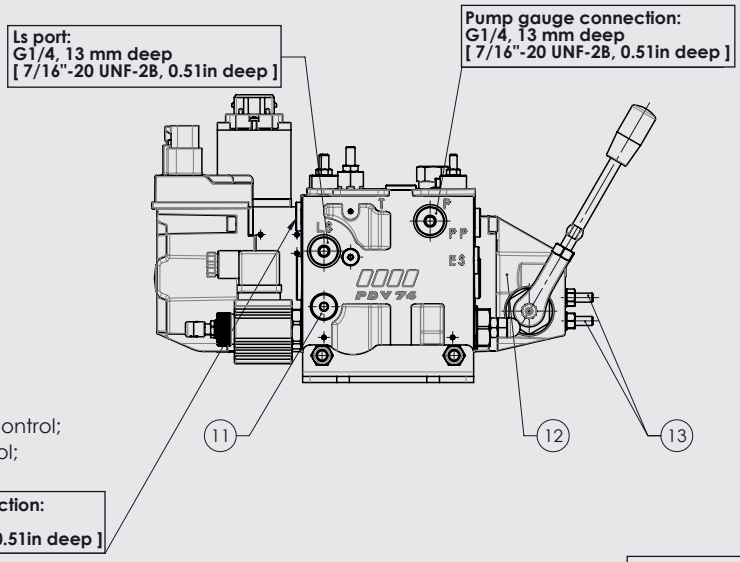
HYDRAULIC POWER CONTROL

PDV series PROPORTIONAL DIRECTIONAL VALVE
upstream pressure compensated

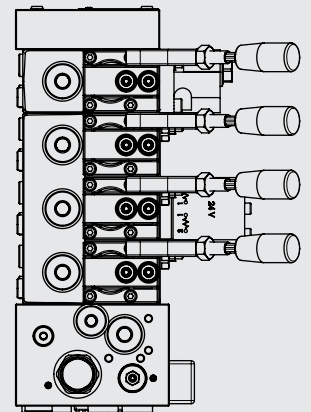
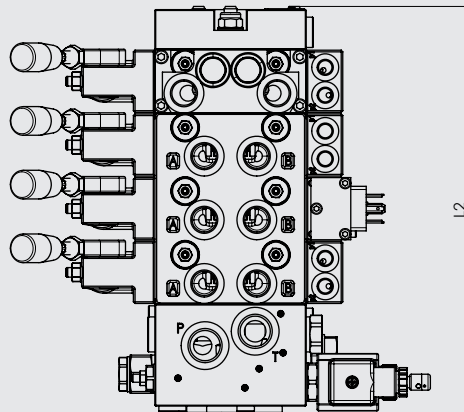
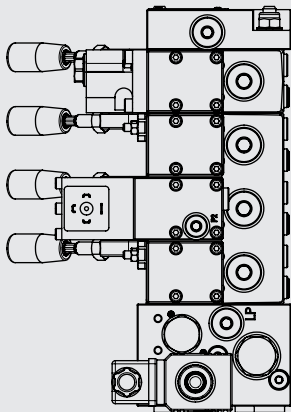
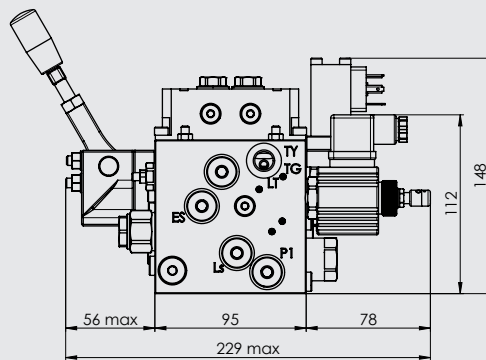
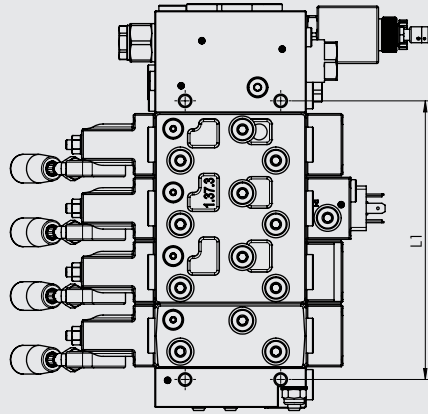
			PDV 37	PDV 74	PDV 114	PDV 315
Max. working pressure	P port	Pressure relief valve setting	400 bar	400 bar	400 bar	400 bar
		Working pressure	370 bar	370 bar	370 bar	370 bar
	A - B ports	Working pressure	370 bar	370 bar	370 bar	370 bar
	T port	Static	25 bar	25 bar	25 bar	25 bar
		Dynamic	35 bar	35 bar	37 bar	35 bar
Oil flow rated	Inlet section standard		90 l/min	160 l/min	260 l/min	600 l/min
	Mid inlet section		-	250 l/min	380 l/min	600 l/min
	A,B ports with pressure compensator		60 l/min	130 l/min	190 l/min	500 l/min
	A,B ports without pressure compensator		70 l/min	140 l/min	205 l/min	550 l/min
Pilot pressure oil supply			18 → 22 bar	18 → 22 bar	18 → 22 bar	30 bar
Main pressure reducing valve oil consumption			0,9 l/min	0,9 l/min	0,9 l/min	0,9 l/min
Oil temperature	Recommended		30 → 60 °C	30 → 60 °C	30 → 65 °C	30 → 65 °C
	Min		- 25 °C	- 25 °C	- 30 °C	- 30 °C
	Max		+ 80 °C	+ 80 °C	+ 90 °C	+ 90 °C
Ambient temperature			-30 → 60 °C	-30 → 60 °C	-30 → 60 °C	-30 → 60 °C
Oil viscosity	Recommended		12 → 80 mm ² /s	12 → 80 mm ² /s	12 → 75 mm ² /s	12 → 75 mm ² /s
	Min		4 mm ² /s	4 mm ² /s	4 mm ² /s	4 mm ² /s
	Max		460 mm ² /s	460 mm ² /s	460 mm ² /s	460 mm ² /s
Filtration according to ISO 4406			20/18/15	20/18/15	20/18/15	20/18/15
Spool travel	Total stroke		± 6 mm	± 7 mm	± 8 mm	± 9 mm
	Proportional stroke		± 4,75 mm	± 5,5 mm	± 6,5 mm	± 7,5 mm
Dead band			± 1,5 mm	± 1,5 mm	± 1,5 mm	± 1,5 mm
Maximum internal leakage at 100 bar [2611 psi] and 21 mm ² /s [102 SUS]		With shock/suction valves	25 cm ³ /min	25 cm ³ /min	21 cm ³ /min	100 cm ³ /min
		Without shock/suction valves	25 cm ³ /min	25 cm ³ /min	25 cm ³ /min	115 cm ³ /min

PDV series PROPORTIONAL DIRECTIONAL VALVE
upstream pressure compensated

- 1) Main pressure reducing valve;
- 2) Shuttle valve pump configuration;
- 3) LsA/LsB pilot relief valve;
- 4) Pump unloading solenoid valve;
- 5) Pump unloading manual override;
- 6) Three way flow regulator plug;
- 7) Internal/external pilot oil supply cartridge;
- 8) Shock and suction valve;
- 9) Electric actuators drain line cartridge;
- 10) Pilot LsA/LsB/Ls ports;
- 11) Ls filter cartridge;
- 12) Manual spool control;
- 13) Mechanical spool flow adjustment;
- 14) PEAP electrohydraulic actuator, PWM open loop control;
- 15) PEAC electrohydraulic actuator, closed loop control;

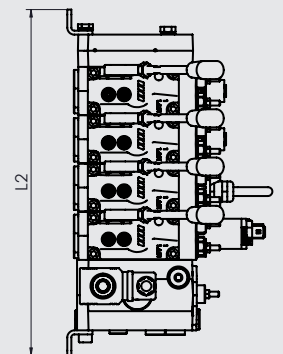
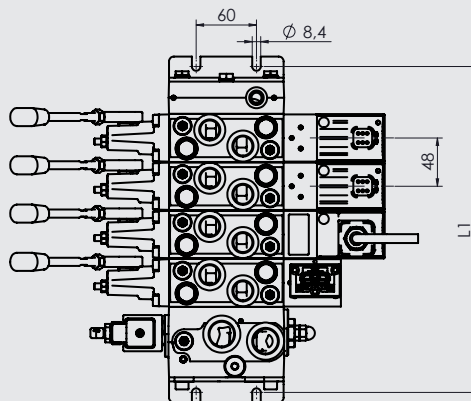
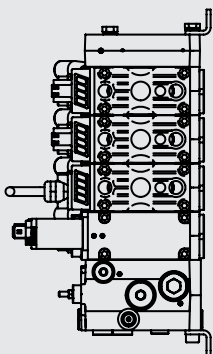
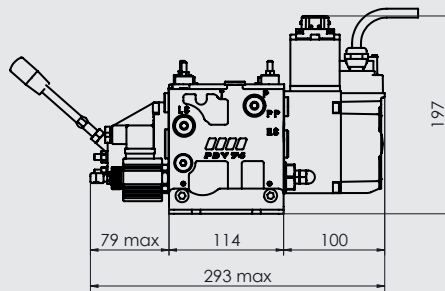
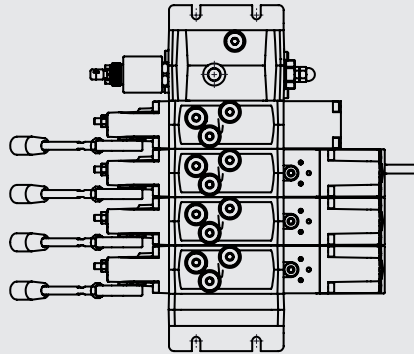


PDV 37 PROPORTIONAL DIRECTIONAL VALVE
upstream pressure compensated



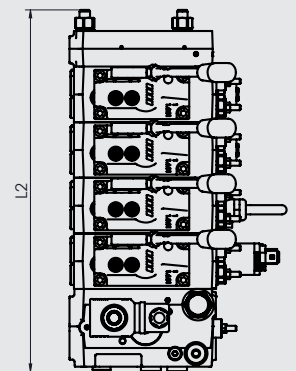
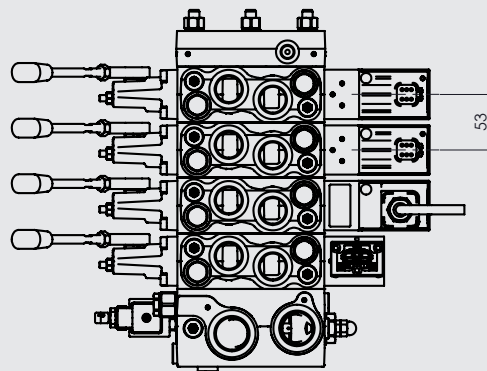
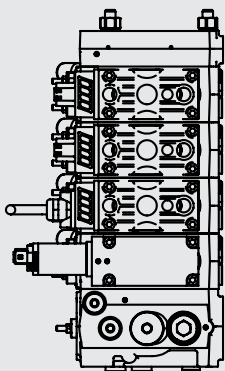
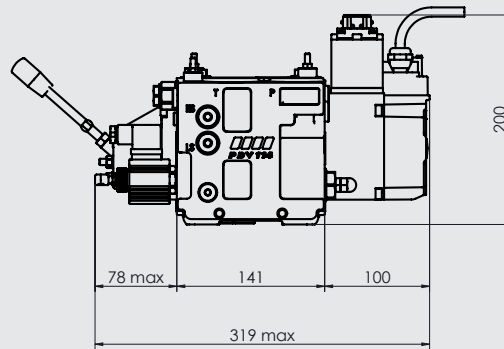
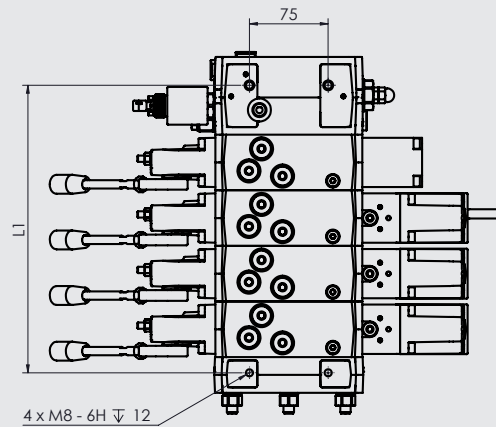
PDW		1	2	3	4	5	6	7	8	9	10	11	12
L1	mm	55	95	135	175	215	255	295	335	375	415	455	495
L2	mm	136	176	216	256	296	336	376	416	456	496	536	576

PDV 74 PROPORTIONAL DIRECTIONAL VALVE
upstream pressure compensated



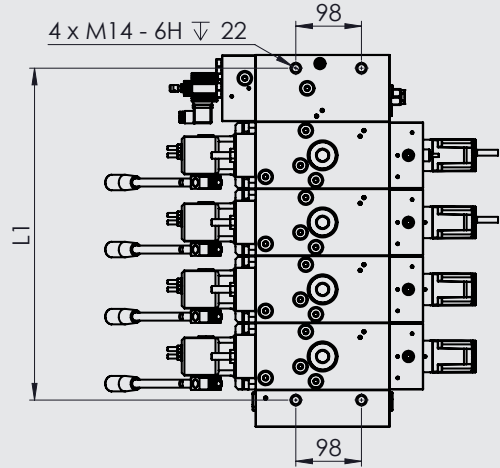
PDW		1	2	3	4	5	6	7	8	9	10	11	12
L1	mm	180	228	276	324	372	420	468	516	564	612	660	708
L2	mm	200	248	296	344	392	440	488	536	584	632	680	728

PDV 114 PROPORTIONAL DIRECTIONAL VALVE
upstream pressure compensated

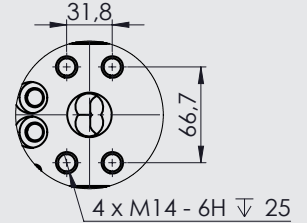


	PDW	1	2	3	4	5	6	7	8	9	10
L1	mm	115	168	221	274	327	380	433	486	539	592
L2	mm	186	239	292	345	398	451	504	557	610	663

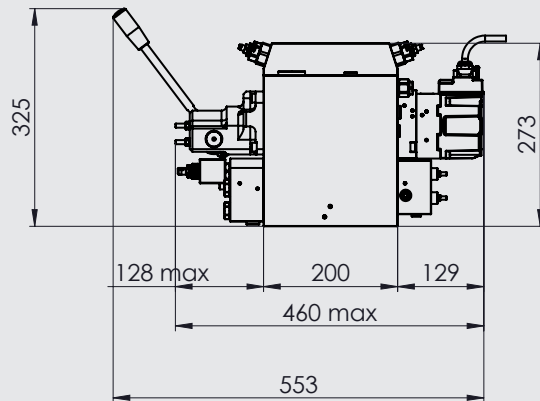
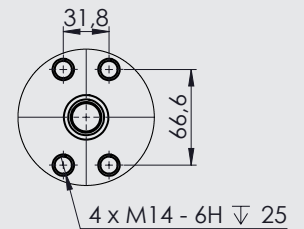
PDV 315 PROPORTIONAL DIRECTIONAL VALVE
upstream pressure compensated



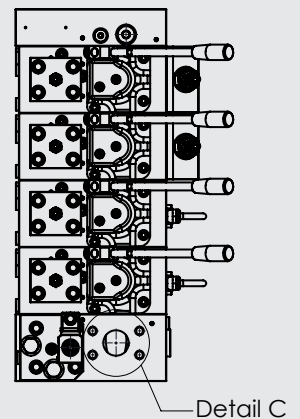
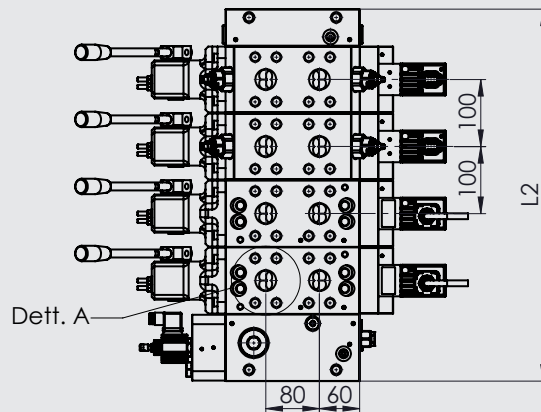
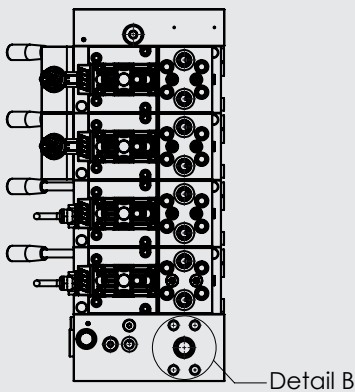
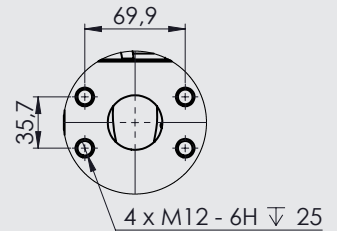
DETAIL Dett. A
SCALE 1 : 3.5



DETAIL Dett. B
SCALE 1 : 3.5



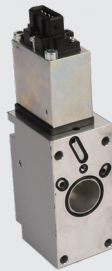


DETAIL Dett. C
SCALE 1 : 3.5



PDW		1	2	3	4	5	6	7	8
L1	mm	195	295	395	495	595	695	795	895
L2	mm	255	355	455	555	655	755	855	955

PDV SERIES ELECTRICAL ACTUATIONS FEATURES

  	Supply voltage U_{DC}		Rated	11 V to 32 V	
			Range	11 V to 32 V	
			Max ripple	5%	
	K	Input signal control		Neutral	$0,5 \cdot U_{DC}$
				Control range	$0,25 \cdot U_{DC}$ to $0,75 \cdot U_{DC}$
		Neutral spool position current consumption			30 mA
		End stroke spool position current consumption		→	680 mA
	Input impedance in relation to $0,5 \cdot U_{DC}$			12 kΩ	
	M	Input signal control		0 10 V _{DC}	
				Neutral	5 V _{DC}
				Control range	$0,25 \cdot V_{DC}$ to $0,75 \cdot V_{DC}$
		Neutral spool position current consumption			30 mA
		End stroke spool position current consumption		→	680 mA
	Input impedance in relation to $0 \div 10$ V _{DC}			20 kΩ	
	Z	Input signal control		4 20 mA	
Neutral				12 mA	
Control range				$0,25 \cdot 16$ mA to $0,75 \cdot 16$ mA	
Neutral spool position current consumption			30 mA		
End stroke spool position current consumption			680 mA		
Input impedance in relation to $4 \div 20$ mA			0,5 kΩ		
Y	CAN - BUS		CAN Open Protocol		
			SAE J1939 Protocol		
Current consumption at end stroke			510 mA (12V)	250 mA (24V)	
Current consumption in neutral			35 mA (12V)	45 mA (24V)	
Power consumption			7 W		
Material temperaure class			F (155°C)		
Fault monitoring system		Max current on safety output		55 mA	
		Reaction time at fault		540 ms	
Reaction time (constant voltage)		From neutral position to max spool travel		105 → 135 ms	
		From max spool travel to neutral position		65 → 85 ms	
Reaction time (neutral switch)		From neutral position to max spool travel		125 → 165 ms	
		From max spool travel to neutral position		65 85 ms	
Connector		PEAC standard		DIN 43650/ISO 4400 Enclosure to IEC 529: IP 65	
		PEAC advanced		Deutsch DT04 - 6P Enclosure to IEC 529: IP 68	

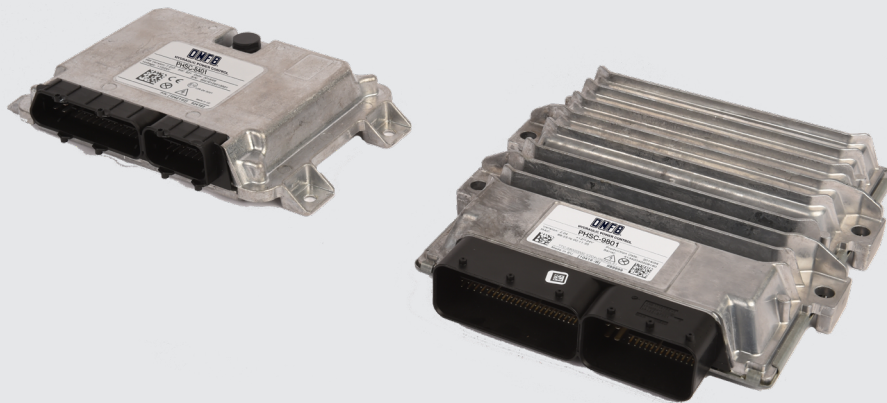
PHSC-8401 and 9801 High Performance Safety Controllers

Are high standards electronic controls units that use a master – slave principle of operation.

The essential function of input / output controller in an industrial automation is to broker conversations between the physical machines' world and the digital world of today's microprocessor based controllers.

Real world measurements must be communicated and converted into controller's decisions, which in turn, will be translated into the real world of proportional directional valve input signals and actuators movements.

PHSC-8401 and **9801** are parts of a complete and compatible product family, and are protected by a compact automotive style housing suited to mobile applications.





HYDRAULIC POWER CONTROL

PDV SERIES HIGH PERFORMANCE ELECTRONIC CONTROLLERS

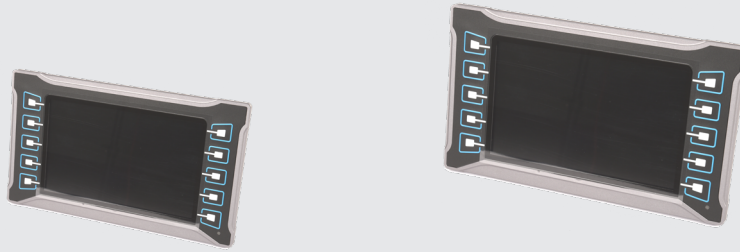
PHSC-8401
CPU CORE <ul style="list-style-type: none">• 32-Bit TI TMS570, ARM cortex-R4F based• Dual-core lockstep CPU and memory protection for safety-relevant applications• 180 MHz, 298 DMIPS, Floating-Point Unit• 3 MB int. Flash, 256 kB int. RAM• 2 MB ext. Flash, 2 MB ext. RAM, 64 kB ext. EEPROM• Safety Companion CPU
INTERFACES <ul style="list-style-type: none">• 4 x CAN 50 kbit/s up to 1 Mbit/s• 4 x CAN bus termination configurable via connector pins
OUTPUTS <ul style="list-style-type: none">• 28 x PWM OUT or digital OUT, up to 4 A, high side, with high side current-measurement• 8 x digital OUT up to 4 A, high side, overload and open load detection, current sense alternative use as LED control OUT or analog IN 0 – 32 V, with configurable pull-up/down• 8 x digital OUT up to 4 A, low side, current sense, overload and open load detection, alternative use as analog IN, 0 – 32 V• Wiring option to use up to 8 of the digital OUT, high side and 8 digital OUT, low side, as full H-bridge for motor control
INPUTS <ul style="list-style-type: none">• 8 x analog IN 12 bit, 0 - 5 V, 0 - 25 mA, 0 - 100 kOhm• 8 x analog IN 12 bit, 0 - 5 V, 0 - 10 V, 0 - 25 mA• 8 x analog IN 12 bit, 0 - 5 V, 0 - 32 V, 0 - 25 mA• 6 x digital timer IN (0.1 Hz - 20 kHz), encoder supporting digital voltage sensors with configurable pull-up/down, digital (7/14 mA) current loop speed-sensor alternative use as analog IN 12bit, 0 – 32 V• 6 x digital timer IN (0.1 Hz - 20 kHz), encoder supporting digital voltage sensors with configurable pull-up/down, alternative use as analog IN 12bit, 0 – 32 V• 8 x digital timer IN (0.1 Hz - 10 kHz) with pull-up• 8 x analog IN 12 bit, 0 – 32 V• K15 and wake up

PHSC-9801
CPU CORE <ul style="list-style-type: none">• 32-Bit TI TMS570, ARM cortex-R4F based• Dual-core lockstep CPU and memory protection for safety-relevant applications• 180 MHz, 298 DMIPS, Floating-Point Unit• 3 MB int. Flash, 256 kB int. RAM• 8 MB ext. Flash, 2 MB ext. RAM, 64 kB ext. EEPROM• Safety Companion CPU
INTERFACES <ul style="list-style-type: none">• 7 x CAN 50 kbit/s up to 1 Mbit/s• 4 x CAN bus termination configurable via connector pins• 1 x Ethernet (10 Mbit/s), for download/debug purpose• 1 x LIN, 1 x RS232• 1 x Real Time Clock
OUTPUTS <ul style="list-style-type: none">• 36 x PWM OUT or digital OUT, up to 4 A, high side, with high side current-measurement8 of these outputs can be alternatively used as digital timer IN (0.1 Hz - 10 kHz)• 8 x digital OUT up to 4 A, high side, overload and open load detection, current sense alternative use as LED control OUT or analog IN 12 bit, 0 – 32 V with configurable pull-up/down• 8 x digital OUT up to 4 A, low side, current sense, overload and open load detection, alternative use as analog IN 12 bit, 0 – 32 V• Wiring option to use up to 8 of the digital OUT, high side and 8 digital OUT, low side, as full H-bridge for motor control
MULTI-PURPOSE I/O'S <ul style="list-style-type: none">• 8 x configurable as<ul style="list-style-type: none">- Ratiometric OUT, 10 - 90% of BAT+ or- voltage OUT, 0 - 100% of BAT+ or- digital OUT up to 4 A high side or- LED control OUT or- analog IN 12 bit, 0 - 32 V
INPUTS <ul style="list-style-type: none">• 8 x analog IN 12 bit, 0 - 5 V, 0 - 25 mA, 0 - 100 kOhm• 8 x analog IN 12 bit, 0 - 5 V, 0 - 10 V, 0 - 25 mA• 8 x analog IN 12 bit, 0 - 5 V, 0 - 32 V, 0 - 25 mA• 6 x digital timer IN (0.1 Hz - 20 kHz), encoder supporting<ul style="list-style-type: none">- digital voltage sensors with configurable pull-up/down,- digital (7/14 mA) current loop speed-sensor- alternative use as analog IN 12 bit, 0 – 32 V• 6 x digital timer IN (0.1 Hz - 20 kHz), encoder supporting<ul style="list-style-type: none">- digital voltage sensors with configurable pull-up/down,- alternative use as analog IN 12 bit, 0 – 32 V• K15 and wake up

PDHI – visualization & HMI solutions

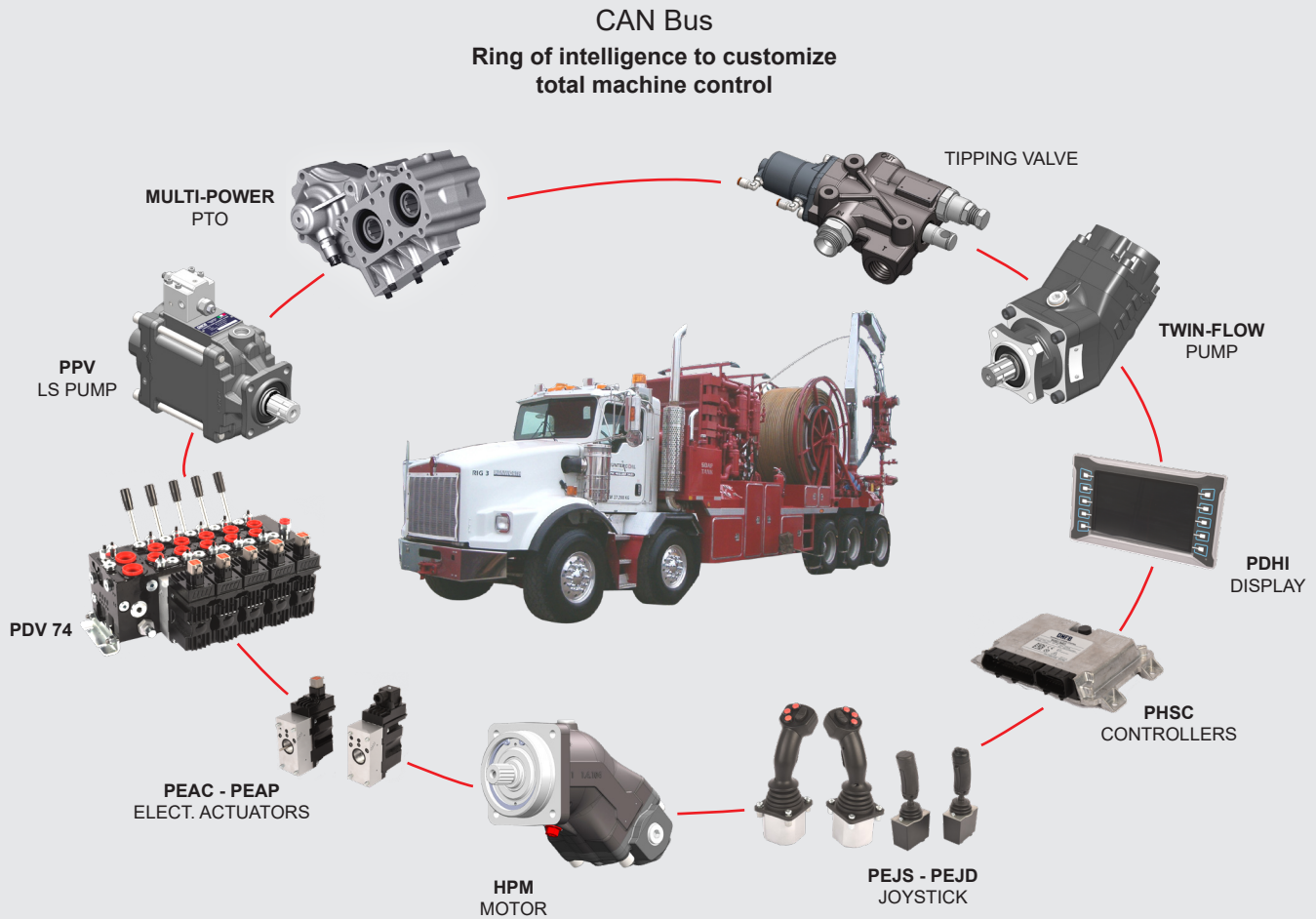
Are robust interactive operator interface, that gather and handling almost seamless data and informations. Dashboard design, allows you to get fully customized graphics developed with customer specifications, and operators can visualize and identify machine key informations, then take the right actions.

The modularity designed operator terminals are available in a large 10.4-inch variant with touchscreen, and a smaller 7-inch version with or without touchscreen.



Key Features

- Best-in-class CPU performance and boot-up time
- Capable of displaying two simultaneous video feeds - everything in sight
- Excellent sunlight readability
- Interface for Ethernet cameras
- Ability to display and generate PDF documents
- Dashboard Design Elements library with more than 6000 pre-designed elements like buttons, gauges or icons
- High-end graphics (picture-in-picture, overlay, 3D, transparency effects)
- Sleep mode - wake up within < 0,5 sec
- Software update of display and connected ECUs via USB
- Up to 4 CAN interfaces
- GPS, GSM as well as WLAN enabled (fleet management / remote maintenance)
- Robust and easy to clean



CAN (Controller Area Network) was originally thought in 1986 by Robert Bosch GmbH, as internal project to develop an invehicle network to replace the complex wiring harness with a two-wire bus.

Defined by ISO 11898 architecture, has become one of the most successful network protocol ever. CAN is a serial bus system with multi-master capabilities that allows ECUs to communicate to each other without complex dedicated wiring in between, and in turn this allows for several features to be added via software simultaneously.

The specification calls for high immunity to electrical interference and the ability to self-diagnose and repair data errors, have led the CAN's popularity in variety of industries fields including building and manufacturing.



PEJS - PEJD – electronic joysticks series

Is a fast growing area of machine control,
where OEMs shift from traditional hydraulic / mechanical solutions.

Our joysticks range, as a part of an integrated system solution, is under constant development in close cooperation with our costumers and can be tailored to specific end-user requirements.

These devices have been designed and built with particular adaptation to the PDV directional proportional valve and are used in industrial and mobile markets including construction, drilling, agriculture, forestry, utility, offshore and material handling.

Today, the Company offers a wide variety of electronics products
and it is committed to meet industry's most demanding design standards.

PEJS - PEJD single and double joysticks are compact and rugged electronics devices designed to control mobile machine work functions, and to meet operator input needs.



HYDRAULIC POWER CONTROL

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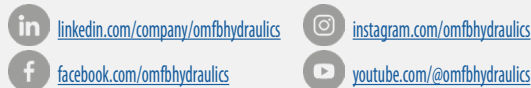


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