

Proportional directional spool valves type PSL and PSV

The directional spool valve bank in series design is available in three sizes in type PSL for constant delivery pump systems and type PSV for variable displacement pump systems (pressure/flow controller). It is intended for load-independent, continuous control of the movement speed of hydraulic consumers. Several consumers can be operated simultaneously and independently from each other. The application area of this valve type is mostly in mobile hydraulics (e.g. crane control). Being able to select different maximum volumetric flows for consumer ports A and B as well as the option to use various additional functions (e.g. secondary pressure limitation, function deactivation, in the basic valve, in intermediate plates and ancillary blocks) guarantees optimal adaptation to the respective control tasks.

Features and benefits:

- One product for various control functions and volume quantities
- Energy-saving Closed-Center systems
- Compact and lightweight design
- Modular system with wide range of design variants

Intended applications:

- Construction/construction material machinery
- Mining machinery (incl. oil production)
- Cranes and lifting equipment
- Machines for forestry and agricultural purposes



Nomenclature:	Prop. directional spool valves as per load-sensing principle
Version:	Valve bank in series connection
Actuation:	Manual <ul style="list-style-type: none"> ■ Return spring ■ Detent Electro-hydraulic Pressure-actuated <ul style="list-style-type: none"> ■ Hydraulic ■ Pneumatic
p_{max}*	400 ... 420 bar
Q_{max, consumer}*	3 ... 240 lpm
Q_{pu max}*	approx. 300 lpm

Design and order coding example

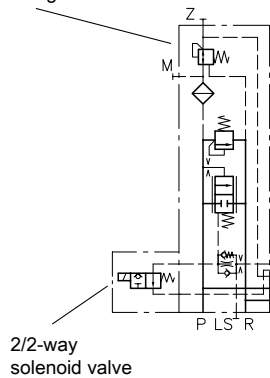
PSL41F	/380	- 3	- A2J40/40/EA/3	- E4	- G24
					Solenoid voltage 12V DC, 24V DC
					<ul style="list-style-type: none">■ Actuated via prop. amplifier or PLVC■ Solenoids with various plug versions■ Explosion proof solenoids
				End plates	
			Valve sections with actuation		
		Size			
	Connection block				<ul style="list-style-type: none">■ Ports BSPP or UNF (SAE-12)■ Pressure limiting valve (piloted main pressure limiting valve)■ Suited for both constant and variable displacement pump systems (type PSM)
Basic type	Type PSL (hydraulic oil supply by constant pump), sizes 2, 3 and 5 Type PSV (hydraulic oil supply by control pump), sizes 2, 3 and 5 Type HMPL (hydraulic oil supply by constant pump) for industrial trucks, sizes 2 and 3 Type HMPV (hydraulic oil supply by control pump) for industrial trucks, sizes 2 and 3				

Function

Connection blocks:

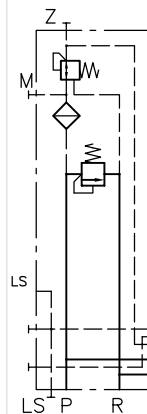
PSL

Pilot pressure reducing valve



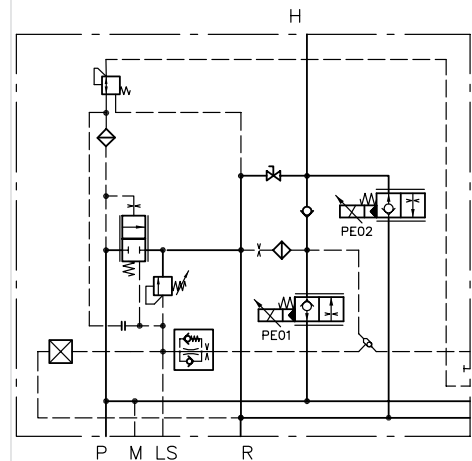
Connection block for constant delivery pump systems with incorporated 3-way controller and pressure-limiting valve

PSV



Connection block for control pump systems with or without pressure-limiting valve

HMPL (HMPV)



Connection block for constant delivery pump with incorporated proportional seated valve for lifting and lowering

Additional versions of connection blocks:

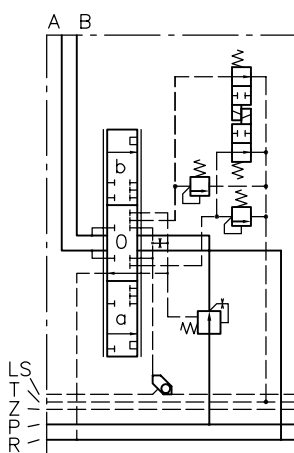
- 2/2-way solenoid valve for randomly switching the pump direction
- Additional damping option of the 3-way/pump controller
- Additional isolation valve to minimise the pump direction resistance
- Version with additional shut-off valve for the pump line, can be switched randomly
- Proportionally adjustable pressure limitation

Valve sections:

Basic symbols	Switching symbol									
	L	M	F	H	J	B	R	O	G	

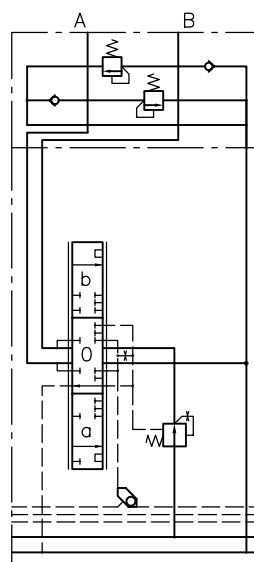
Versions of valve sections:

- Load pressure signal outputs at A, B; A and B together
- 3/3 directional spool valve with 2-way input and output controller
- Version with and without 2-way input controller
- Function deactivation feature
- Secondary pressure-limiting valves (can be selected for A and/or B)
- Prop. Pressure limitation of individual functions
- Version with ancillary blocks
- Intermediate plates for various additional functions
- Combination of various sizes possible in one valve bank
- Version with ATEX magnet for use in explosive environments
- Version with explosion-proof, intrinsically safe magnets for mining applications



Additional functions in the ancillary block:

- Shock and servo-suction valves
- Load-holding valves
- Differential circuits
- Check valves with release, no leakage
- Floating and block functions can be switched
- Proportional seated valves as per [D 7490/1](#) for lifting and lowering using plunger cylinders




Characteristic values for max. volumetric flows:

	$Q_{A, B}$							
Size 2	3	6	10	16	25	40		
Size 3	3	6	10	16	25	40	63	80
Size 5	16	25	40	63	80	120	160	

- Characteristic value corresponds to the max. volumetric flow [lpm] of input controller versions at the consumer ports A and/or B
- Volumetric flows for A and/or B can be selected separately
- Increasing the control pressure enables 60 lpm (size 2), 120 lpm (size 3) and 240 lpm (size 5) per consumer port side.
- Versions with 2-way input controller and check valve function


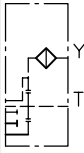
Actuations:

Basic type	Brief description	Switching symbol (example)
A	Manual actuation	 Combination of electro-hydraulic and manual actuation
C	Detent (continuous)	
K	Manual actuation via mechanical joystick	
E EA	Electro-hydraulic actuation in combination with manual actuation CAN: Actuation variant with direct CAN actuation	
H, P HA, PA	Hydraulic and pneumatic actuation in combination with manual actuation	
HEA	Combination of H, E and A actuation	

Intermediate plates:

- Electrically or hydraulically actuated shut-off valve for all downstream consumers
- With pressure-limiting valve for limiting the operating pressure of all downstream valves
- For random switchable reduction of the volumetric flow of all downstream consumers
- Priority module, size 3

End plates:

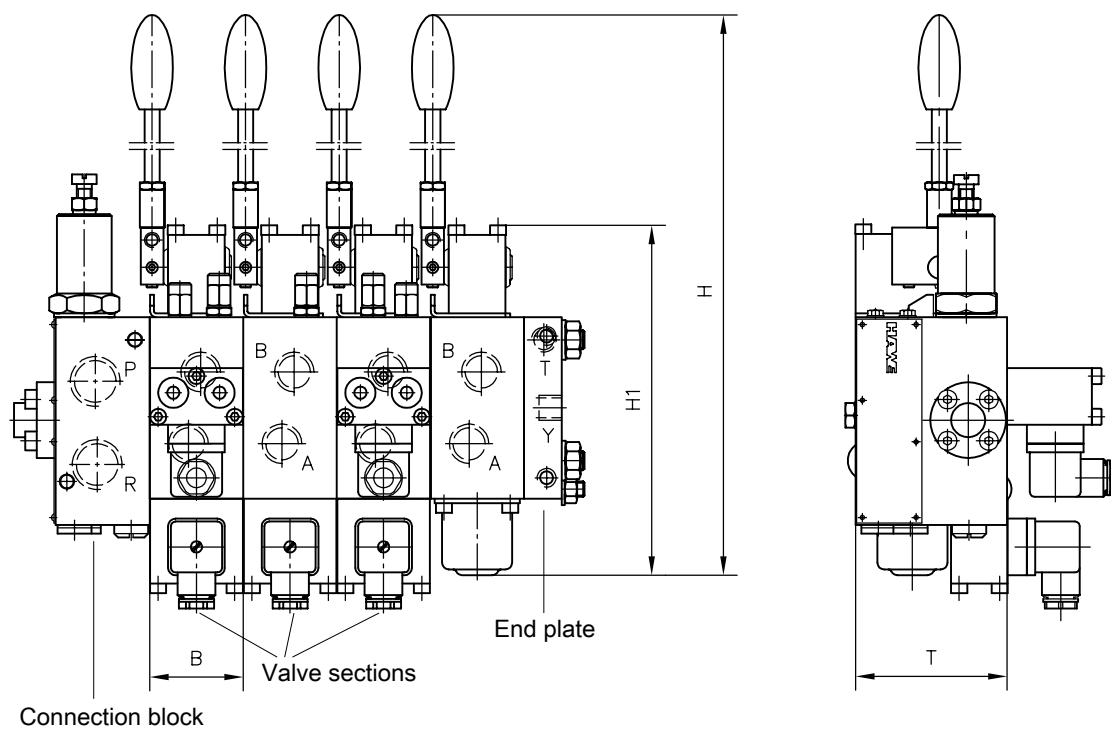
E1	E2
 Standard end plate	 With additional Y-port for LS-input signal

Additional versions of end plates:

- End plate with internal leakage oil routing (no T gallery)
- End plates with additional P and R gallery
- Adapter plate to combine size 5 and 3 (coding ZPL 53), size 5 and 2 (coding ZPL 52) and size 3 and 2 (coding ZPL 32)
- End plate with integrated connection block function for dual-pump/dual-circuit systems

General parameters and dimensions

PSL



	Flow [lpm]		Oper. pressure [bar]	Ports (BSPP)		Dimensions [mm]				m [kg]
	Q_{max}	$Q_{pu\ max}$	p_{max}	P, R	A, B	H	H1	B	T	Per valve section ¹⁾
PSL/PSV 2	3 ... 54	80	420	G 1/2, 3/4-16 UNF-2B	G 3/8, 3/4-16 UNF-2B	approx. 272	approx. 150	40	60	1.8 ... 2.9
PSL/PSV 3	3 ... 120	200	420	G 1/2, G 3/4, G 1, 1 1/16-12 UNF-2B	G 1/2, G 3/4, 7/8-14 UNF-2B	approx. 364	approx. 195	50	80	3.3 ... 4.1
PSL/PSV 5	16 ... 240	300	400	G 1, G 1 1/4, 1 5/8-12 UN-2B	G 1, 5/16-12 UNF-2B	approx. 400	approx. 224	62.5	100	3.7 ... 4.5

1) Dep. on actuation and additional functions

Example circuit:

PSL 41/350 - 3

-32 J 25/16 A300 F1/EA
-42 O 80/63 C250/EA
-42 J 63/63 A100 B120 F3/EA
-31 L 40/16/A

- E2 - G24

Type PSL valve bank for constant pump systems

Connection block:

- Coding for thread size (here 4 = G 3/4)
- Coding for pilot pressure-reducing valve (here 1)
- Coding for set pressure at pressure-limiting valve (here 350 bar)

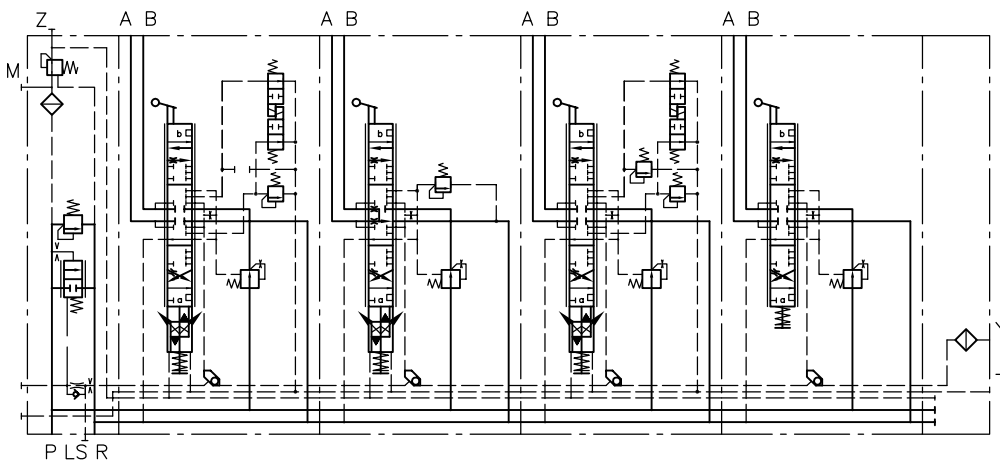
Size: 3

1. Valve section: (exemplary for all subsequent valve sections):

- Directional spool valve block with coding for consumer connection size (here 3 = G 1/2)
- Coding for the type of directional spool valve block (here 2)
- Switching symbol (here J)
- Coding for max. consumer volumetric flow to ports A and B (here 25 and 16 lpm)
- Coding of additional functions (here A 300; secondary pressure-limiting valve at port A set to 300 bar, function deactivated for port A (here F1))
- Coding for actuation type (here EA)

End plate:

- Coding for end plate (here E2)
- Coding for 24V DC solenoid voltage (here G24)



Suited products for combination:

- Type LHT, LHDV load-holding valves: [D 7918](#), [D 7770](#)
- Type KFB hydraulic joystick: [D 6600](#), [D 6600-01](#)

Additional electronic components

- Type EJ joystick: [D 7844](#)
- Type EV1M2, EV1D1 and EV22K2 prop. amplifier (module): [D 7831/1](#)
- Programmable logic valve control type PLVC: [D 7845 M](#), [D 7845-21](#), [D 7845-41](#), [D 7845-IO](#)

Associated technical data sheets:

- Type PSL/PSV prop. directional spool valves, size 2: [D 7700-2](#)
- Type PSL/PSV, size 3: [D 7700-3](#)
- Type PSL/PSV, size 5: [D 7700-5](#)
- Type PSL/PSV prop. directional spool valves with direct CAN actuation: [D 7700 CAN](#)
- Type HMPL/HMPV connection blocks
Sizes 2 and 3: [D 7700 H](#)