

Proportional Directional Control Valves Size 6



**Systemtechnik
GmbH**

**Direct controlled, electrically adjustable
Interface to DIN 24 340 and ISO 4401**

PN [p_{max.}] = 315 bar

7500455.06.02.06

Description (standard units)

Design

The proportional directional control valve size 6 is based on the 5-chamber system, and is in the form of a slide valve.

Application

The proportional directional control valve can be used to control the direction and speed of hydraulic cylinders and hydraulic motors and is employed in cases where a servo valve would be too expensive and a normal directional control valve would not offer a sufficient range of functions. The electrical control allows the wide variety of motions to be executed simply and extremely precisely by means of the continuously-controllable signal.

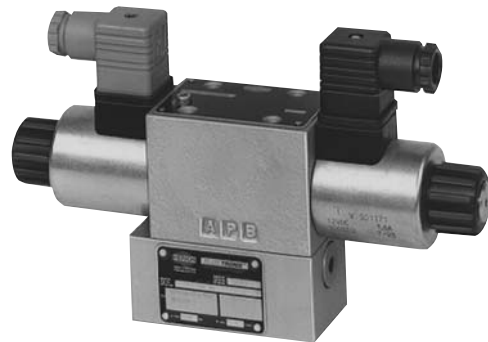
Using the pressure balance as intermediate component, the proportional directional control valve can take over a flow control function.

Mounting

The units are screwed to subplates and sealed by means of O-rings.

Line connection

Subplate, interface to DIN 24 340-A 6 and ISO 4401-AB-03-4-A.



Features

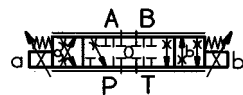
- Speed and direction control in accordance with setpoint specification
- Program control, remote control
- Spring-centred robust design
- Inexpensive system solution
- With pressure balance, load-compensated speed control.

Type key

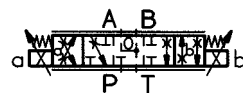
Proportional directional control valve

S	6	UP	10	G	...	...	...	O	...
					1	2	3		4

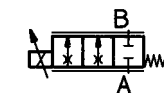
1 Symbol: **187**



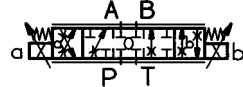
233



193



212



2 Code No.:

201 - See characteristic curve
205 - See characteristic curve
206 - See characteristic curve
101 - See characteristic curve
105 - See characteristic curve
106 - See characteristic curve

3 Engineering version:

4

4 Sealing material:

V - FKM (e.g. Viton)

Subplate

P	S	6	G	...	...	...	O	O
				1	2	3		

1 Line connection:

2 - G 1/4 (Internal thread)
3 - G 3/8 to DIN ISO 228/1)

2 Code No.:

024 - G 1/4
001 - G 3/8

3 Engineering version:

2

Parameters

Type designation	S 6 UP... 10 G...	S 6 UP... 10 G...
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General parameters

Description	Proportional directional control valve		
Symbol	See type key		
Design	Spool-type valve, pilot operated		
Type of mounting	Flange		
Line connection	Subplate		
Mounting position	Valve axis horizontal (See installation drawings)		
Type of actuator	Proportional solenoid		
Weight of valve	with 1 solenoid	[kg]	1.8
	with 2 solenoids		2.4
Weight of pressure balance as intermediate component, ports A, B, T		[kg]	1:0
Weight of pressure balance as intermediate component, ports A and B		[kg]	2.8
Weight of subplate	G 1/4	[kg]	0.7
	G 3/8	[kg]	1.0
Ambient temperature range	ϑ_u	[°C]	-20 ... +50
Size	NG		6

Hydraulic parameters

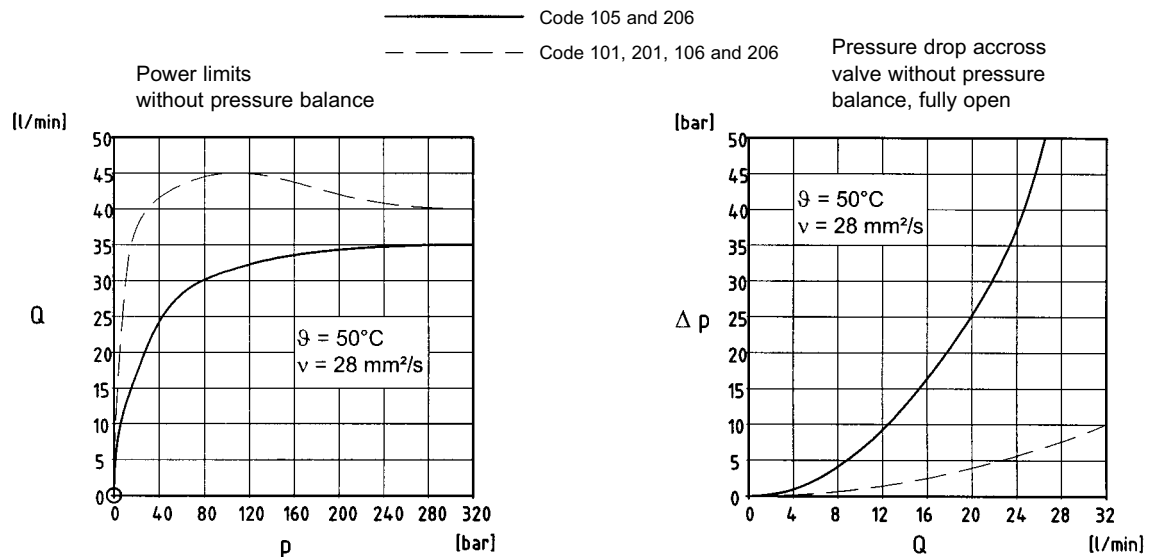
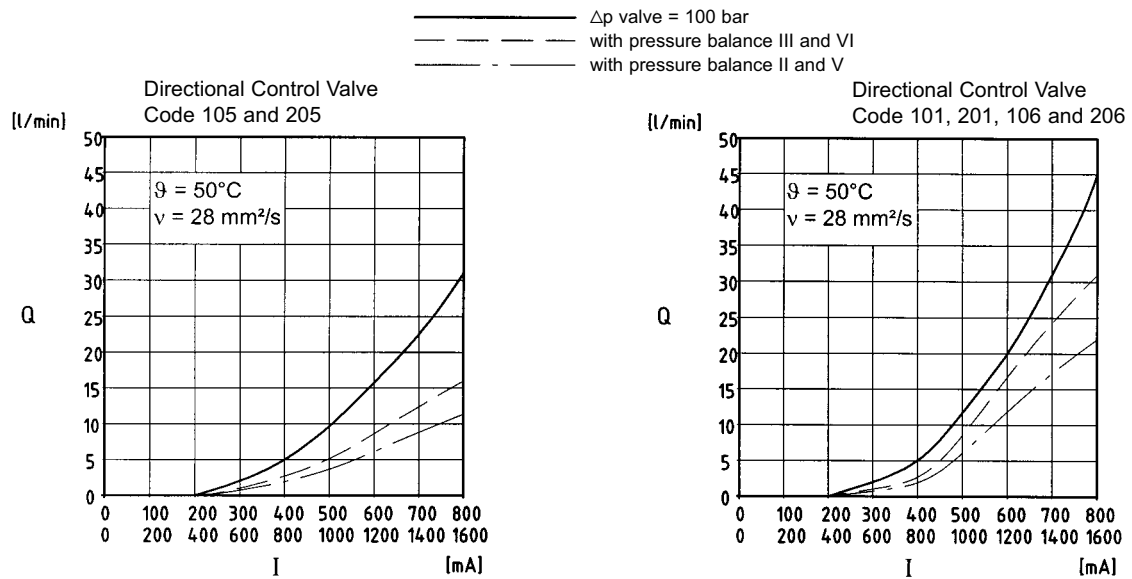
Operating pressure range at ports P, A and B	p_{max}	[bar]	up to 315
Operating pressure range at port T	p_{max}		up to 160
Temperature of pressure fluid	ϑ_m max.	[°C]	+70
Viscosity range	ν	[mm²/s]	12 ... 500
Zero flow ($\Delta p = 100$ bar)		[cm³/min]	20
Flow rate with pressure balance II and V with pressure balance III und VI	Q_{min}	[cm³/min]	50
			100
Pressure drop - with pressure balance II and V	Δp	[bar]	5
per control edge - with pressure balance III and VI	Δp	[bar]	10
Repeatability with dither ¹⁾	at Q_{min}	[%]	10
	at $I=500$ mA	[%]	1
Hysteresis			
- with pressure balance (with dither ¹⁾)	I_N	[%]	2
- without pressure balance (with dither ¹⁾)	I_N	[%]	2
Sensitivity of response, with dither ¹⁾	I_N	[%]	0.1
Width of backlash, with dither ¹⁾	I_N	[%]	0.1
Floating time	$Q = 0\% \dots 100\%$	[ms]	35
	$Q = 100\% \dots 0\%$	[ms]	70
Filtration, absolute		[µm]	25

Electrical parameters of proportional solenoid

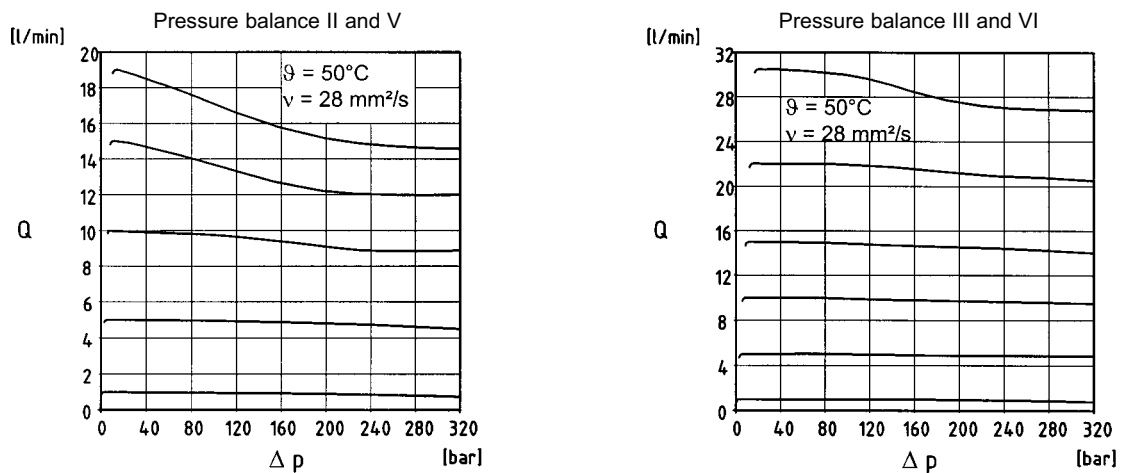
Solenoid Cat. No.		7297	7298
Rated current	I_N	[mA]	800
Resistance	R_{20}	[Ω]	21.3
Duty cycle	ED	[%]	100
Electrical connection	Connector to DIN 43 650 A		
Degree of protection to DIN 40 050	IP 65 (with connector)		
Drive electrics	DC 05 / DC 05-XLT		pQ 11, pQ 12
	see Page 6		see Page 6

¹⁾ Dither: Frequency 50 Hz, amplitude 120 mA_{ss}

Characteristic curves



Directional Control Valve
Code 101, 201, 106 and 206



Ordering

The units are designated by their type number. The composition of this number can be drawn from the type code. The standard versions are listed in the type survey. When ordering any of the standard versions, please state type number as well as catalog number to preclude possible misinterpretations.

When inquiring about or ordering units not listed in our type survey of this publication, the type number made up by you by means of the type code, however, will do. The corresponding catalog number will then be stated in our confirmation of order. O-rings are enclosed with flanged units. Pressure balance, subplate, drive electronics and mounting screws must be ordered separately.

Example of order

Proportional directional control valve, size 6, for flange mounting, Symbol 187, with Code 205, pressure balance, mating subplate G 1/4 and drive electronics.

Proportional directional control valve:

Type: S 6 UP 10 G 187 205 4 O V
Cat. No.: **5204807.7298**

Pressure balance:

Cat. No.: **6015190**

Subplate:

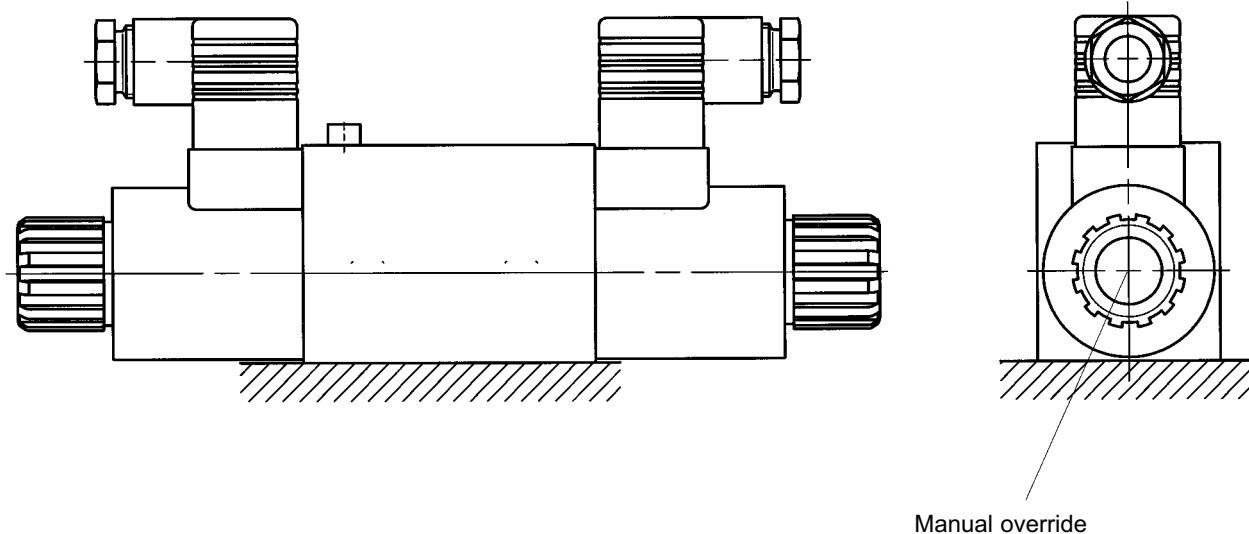
Type: P S 6 G 2 024 2 O O
Cat. No.: **1065173**

Mounting screws: (4 pcs. required)

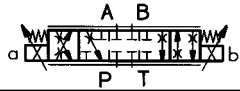
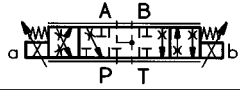
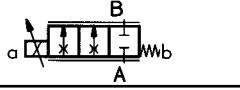
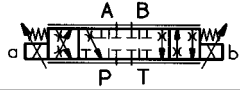
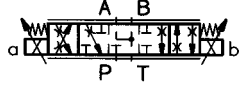
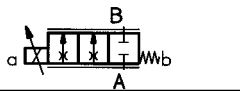
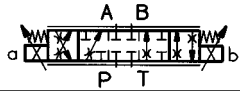
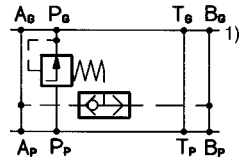
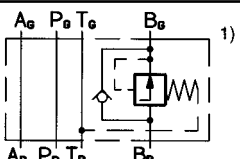
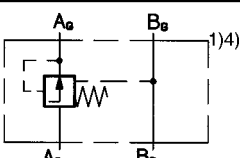
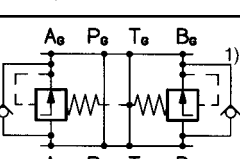
Socket head screw (M 5 x 70 DIN 912-10.9)
Cat. No.: **0662315**

Drive electronics to be ordered separately, see Page 6.

Installation drawing



Equipment survey and possibilities of combination (standard designs)

Designation	Symbol	Symbol-No.	Type	Cat. No.	Combination ²⁾			
Proportional directional control valve		187	S 6 UP 10 G 187 201 4 O V S 6 UP 10 G 187 205 4 O V	5204789.7298 5204807.7298	X	X		
		233	S 6 UP 10 G 233 201 4 O V S 6 UP 10 G 233 205 4 O V	5204811.7298 5204812.7298	X	X		
		193	S 6 UP 10 G 193 206 4 O V	5204808.7298	X		X	
		212	S 6 UP 10 G 212 201 4 O V S 6 UP 10 G 212 205 4 O V	5204809.7298 5204810.7298	X			X
		187	S 6 UP 10 G 187 101 4 O V S 6 UP 10 G 187 105 4 O V	5204827.7297 5204828.7297	X	X		
		233	S 6 UP 10 G 233 101 4 O V S 6 UP 10 G 233 105 4 O V	5204829.7297 5204830.7297	X	X		
		193	S 6 UP 10 G 193 106 4 O V	5204833.7297	X		X	
		212	S 6 UP 10 G 212 101 4 O V S 6 UP 10 G 212 105 4 O V	5204831.7297 5204832.7297	X			X
Pressure balance II		Pressure balance port P		6015189		X		
Pressure balance III				6015190		X		
Pressure balance II		Pressure balance port B → T (return)		0723311				X
Pressure balance II		Pressure balance port A → B		0723116			X	
Pressure balance III				0723065			X	
Pressure balance V		Pressure balance port A → T; B → T (return)		6015532				X
Pressure balance VI				6015533				X
Subplates G 1/4	-	-	P S 6 G 2 024 2 O O	1065173	X			
G 3/8	-	-	P S 6 G 3 001 2 O O	1065183	X			
Mounting screws ³⁾	Socket head screws (M 5 x 30 DIN 912-10.9) Socket head screws (M 5 x 70 DIN 912-10.9) Socket head screws (M 5 x 110 DIN 912-10.9)			0700387 0662315 0661664	X		X	X

1) Port designation at symbol: Index "G" = valve side, Index "P" = plate side

2) Possibilities of combination between proportional directional control valve, pressure balance, subplate and mounting screws.

3) Tightening torque = 7.6 Nm

4) See 2-way proportional flow control valves, Publication 7502022

Drive electronics DC 05 / DC 05-XLT

Digital amplifier with constant current regulator PWM
Power supply: 18 ... 30 VDC, incl. residual ripple
Ambient temperature ϑ_{a} : 0 ... +50 °C
Weight: 0,4 kg
Mounting position: Upright
Free air circulation must be ensured
Space requirement for installation of 19" card rack: 50 mm
European format: 100 x 160 mm



Type	Setpoint input (switchable)		Internal setpoints	Ramps	Terminal strip Form F DIN 41612	PID controller for external control loops	Cat. No.	For Further information, see script
	[V]	[mA]	Pcs.	Pcs.	Number of pins			
For proportional directional control valves Rated current I_N: 0 ... 1600 mA								
DC 05	2x0...±10V	0(4)...20 mA	4	4	48	● / ○ (switchable)	5150000 ¹⁾	7503503
DC 05-XLT	0...±10V		4	2	48	○	5150001 ¹⁾	7503504
			Functional compatible to pQ 03					

1) Pre-parametrred electronics on request.

Drive electronics pQ 11

Plug-in amplifier with constant current regulator PWM
Degree of protection: IP 65
Power supply: 18 ... 32 VDC, Residual ripple: ≤ 10 %
Ambient temperature ϑ_{a} : -20 ... +50 °C
Mounting position: Optional



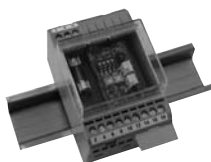
Setpoint input (switchable)		Type of connection		Weight	Cat. No.	For Further information, see script
[V]	[mA]	Connecting cable, 2 m	Connector acc. to DIN 43651	[kg]		
For proportional valves with 2 solenoids 2 pQ 11 necessary Rated current I_N: 0 ... 2400 mA, allowed resistance of solenoid R_{20}: 2,5...4,5 Ω						HERION 7502961
0 ... 10	0 (4)...20	●	○	0,18	5980085	
0 ... 10	0 (4)...20	○	●	0,18	5980081 ¹⁾	

Mark in table: ○ without, ● with

1) Cable connector to be ordered separately. Cat. No. **0660689**

Drive electronics pQ 12

Amplifier module with constant current regulator PWM
Degree of protection: IP 65
Power supply: 18 ... 32 VDC, Residual ripple: ≤ 10 %
Ambient temperature ϑ_{a} : -20 ... +50 °C
Mounting position: Optional
For attachment on mounting rail acc. to EN 50022

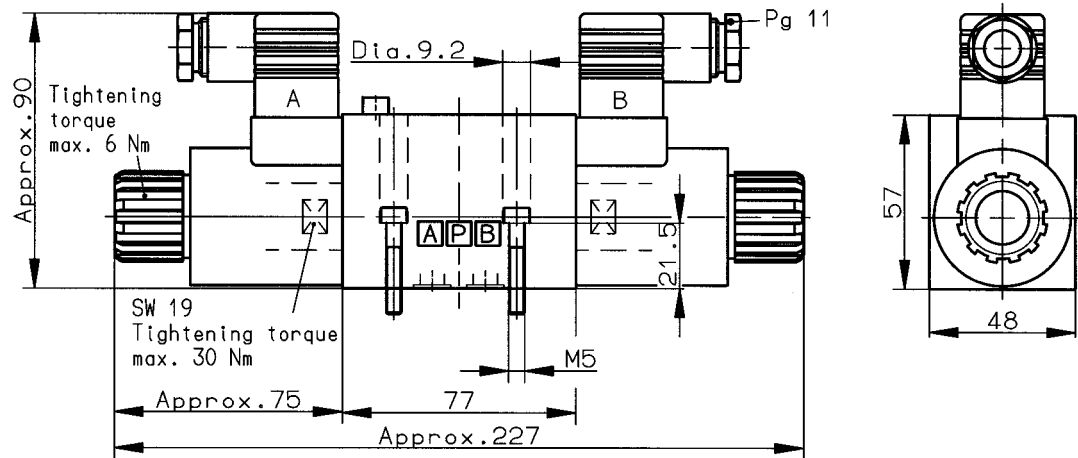


Setpoint input (switchable)	Output currents		Cat. No.	For Further information, see script
[V] [mA]	[mA]			
For proportional valves with 2 solenoids 2 pQ 11 necessary				HERION 7503109
0 ... 10	0 (4)...20	0 ... 1600 / 2400	5980126	

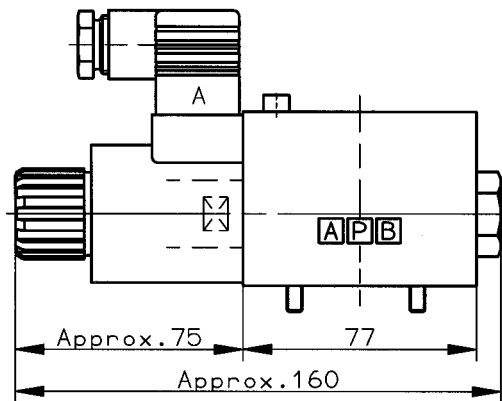
Dimensional drawings [mm]

Proportional directional control valve

S 6 UP 10 G 187 ... 4 O V
S 6 UP 10 G 233 ... 4 O V
S 6 UP 10 G 212 ... 4 O V

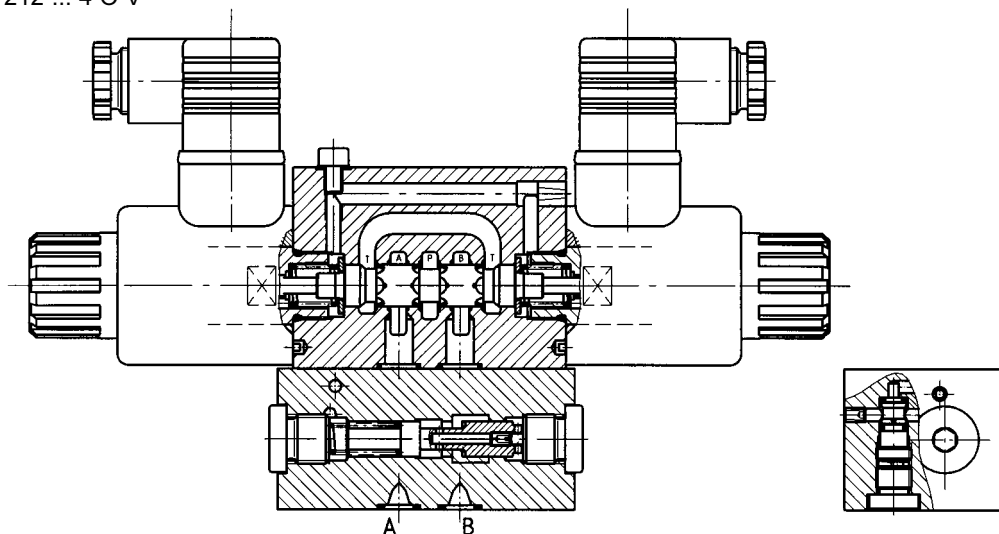


S 6 UP 10 G 193 ... 4 O V



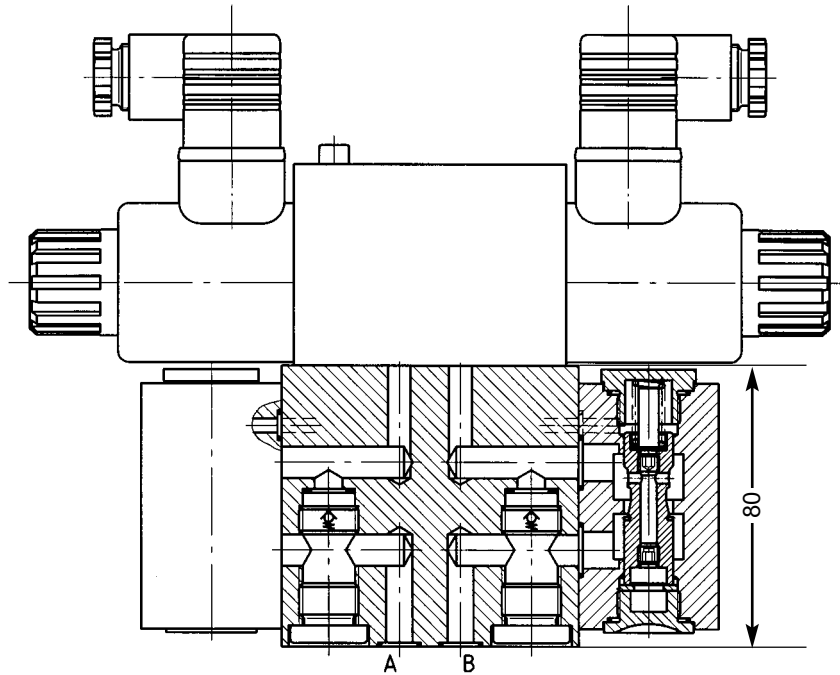
Proportional directional control valve with pressure balance in port P to B → T

S 6 UP 10 G 187 ... 4 O V
S 6 UP 10 G 233 ... 4 O V
S 6 UP 10 G 212 ... 4 O V



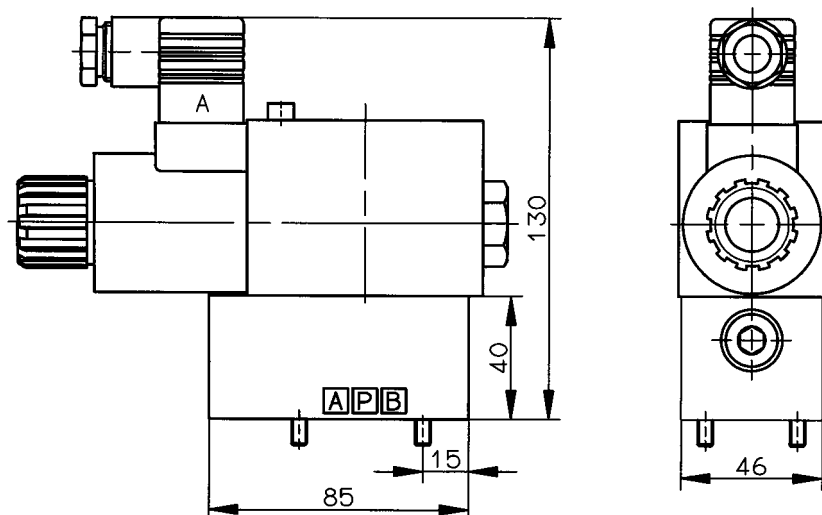
Proportional directional control valve pressure balance in port A → T to B → T (return flow)

S 6 UP 10 G 212 ... 4 O V



Proportional directional control valve in port A → B

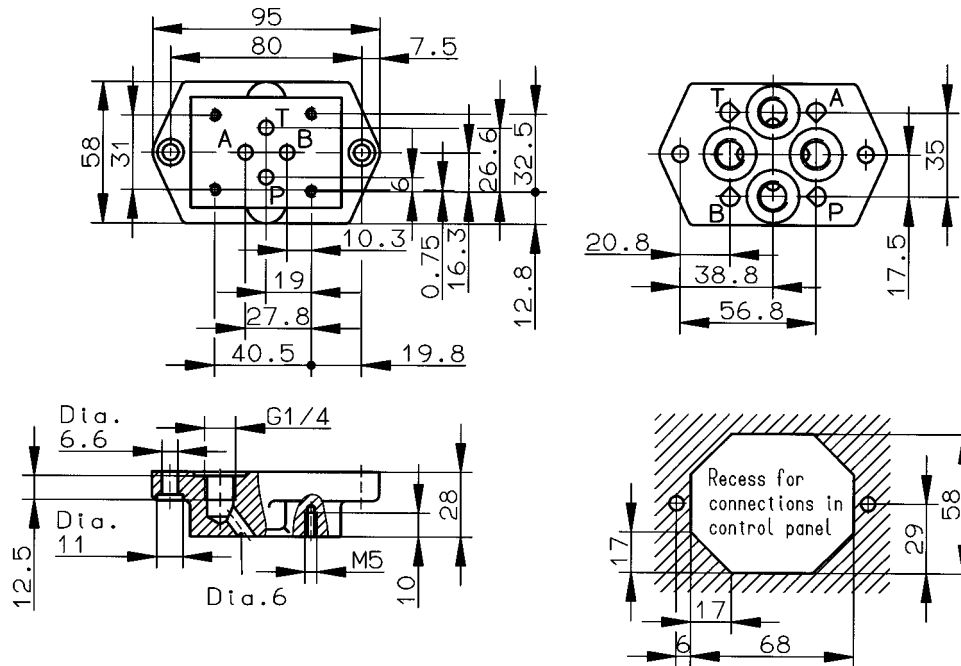
S 6 UP 10 G 193 ... 4 O V



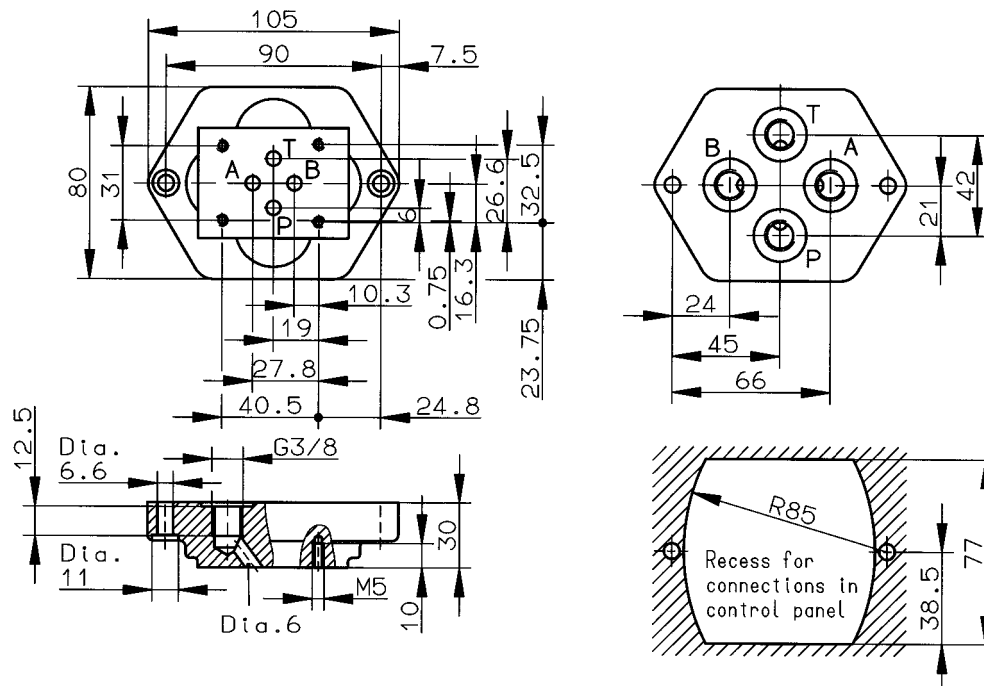
Dimensional drawings [mm]

Subplate with interface to DIN 24 340-A6 and ISO 4401-AB-03-4-A

G 1/4



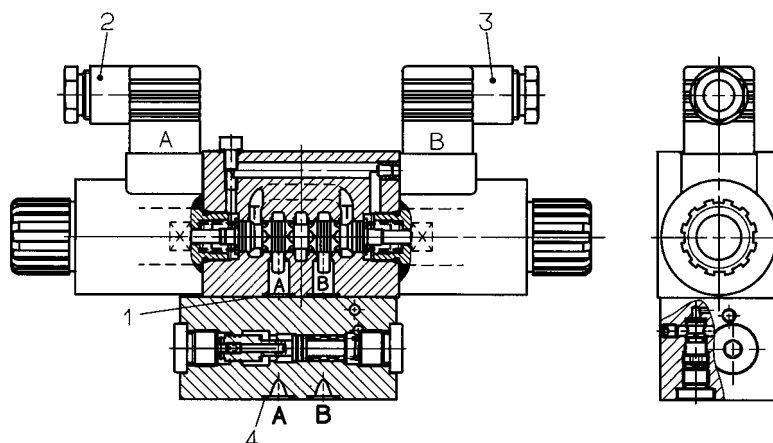
G 3/8



Proportional directional control valve

S 6 UP 10 G 187 ... 4 O V
S 6 UP 10 G 233 ... 4 O V

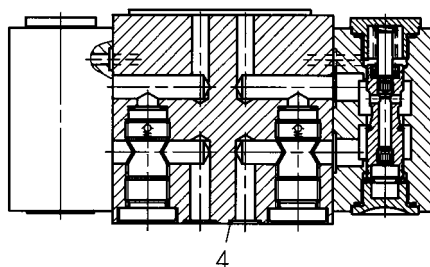
With pressure balance in port P



Proportional directional control valve

S 6 UP 10 G 212 ... 4 O V

With pressure balance
in port A → T or B → T
(return flow)



Spare parts (number of pieces) for proportional directional control valve

Part	Description	S 6 UP 10 G 187 ... 4 O V S 6 UP 10 G 233 ... 4 O V	S 6 UP 10 G 212 ... 4 O V	S 6 UP 10 G 212 ... 4 O V	Cat. No.
		With pressure balance in port P	With pressure balance in port B → T	With pressure balance in port A → T; B → T	
1	O-ring (9.2 x 1.8)	4	4	4	0701728
2	Connector	1	1	1	0657859
3	Connector	1	1	1	0570275

for pressure balance

-	Pressure balance II	1	-	-	6015189
-	Pressure balance III	1	-	-	6015190
-	Pressure balance II	-	1	-	0723311
-	Pressure balance V	-	-	1	6015532
-	Pressure balance VI	-	-	1	6015533
4	O-ring (9.2 x 1.8)	4	4	4	0701728

Spare parts (number of pieces)**for proportional directional control valve**

Part	Description	S 6 UP 10 G 193 ... 4 O V	Cat. No.
		With plate type pressure balance in port A	
1	O-ring (9.2 x 1.8)	4	0701728
2	Connector	1	0657859

for pressure balance

Part	Description	Pressure balance II	Pressure balance III	Cat. No.
-	Pressure balance II	1	-	0723116
-	Pressure balance III	-	1	0723065
3	O-ring (9.2 x 1.8)	2	2	0701728