

3-Way Proportional Pressure Reducing Valves

Nominal size 10



Systemtechnik GmbH

Indirectly controlled
HERION interface

PN [$p_{max.}$] = 315 bar

7501249.06.03.06

Description (standard units)

Design

With these proportional pressure valves, the pressure is controlled by means of a variable magnetic force which acts on the piston. The indirectly controlled design consists of the pilot stage with the proportional solenoid, and the main stage, which is controlled by the pilot stage.

The hydraulic pressure can be controlled by varying the current I which is fed to the proportional solenoid; this is carried out with the aid of a potentiometer and amplifier.

Application

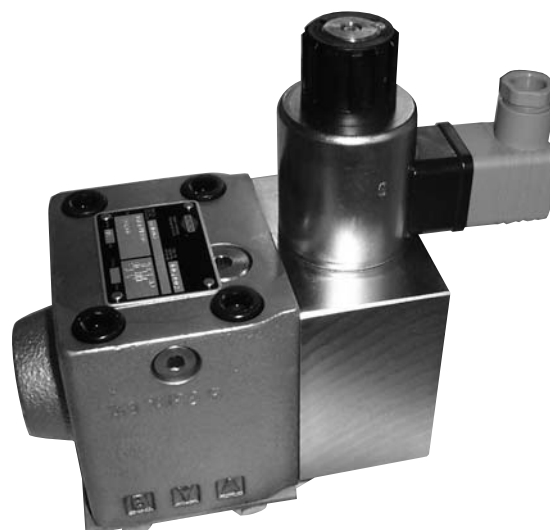
In hydraulic control circuits, there is often a requirement to control the pressure by means of an electrical signal, e.g. for pure remote control, in order to avoid long hydraulic lines, or for program controls where the pressure must be automatically adjusted. These proportional relief valves are very often fitted in process-controlled plastic moulding machines.

Mounting

The units are bolted to subplates and sealed by O-rings.

Line connection

Subplate, interface to HERION.
(Similar to 2-way pressure reducing valve to DIN 24 340).



Features

- High flow rate
- Simple electrical programmed control and remote pilot
- Stable control characteristics

Type key

Proportional pressure reducing valve

D	Y	K	10	UP	A	90	O	...
						1	2			3

1 Code No.: **101** - Solenoid 800 mA
201 - Solenoid 1600 mA

2 Engineering version: **3**

3 Sealing material: **O** - Perbunan
V - Viton

Subplate

P	DY	10	A	4	001	...	O	O
						1		

1 Engineering version: **1**

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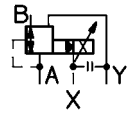
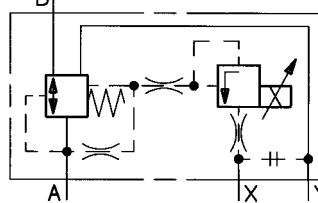


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Parameters

Type designation	D Y K 10 UP A90 101 3 O O	D Y K 10 UP A90 201 3 O O
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General parameters

Description	3-way proportional pressure reducing valve	
Symbol	simplified	complete
		
Design	Piston valve, indirectly controlled	
Type mounting	Flange	
Line connection	Subplate	
Mounting position	free, preferably vertical (solenoid on top), to be vented at installation via screw at solenoid actuation system	
Flow direction	From B to A and A to Y	
Actuation	Proportional solenoid	
Weight pressure reducing valve	[kg]	6.4
Weight of subplate	[kg]	1.6
Ambient temperature	ϑ_u [°C]	-20 ... +50
Nominal size		10

Hydraulic parameters

Operating pressure	p_e	[bar]	... 315
Adjustable pressure range	p_v	[bar]	p_v min.: 10 (at $Q = 0$ l/min) p_v max.: Pressure stage 90: Up to 315 ¹⁾
Pressure fluid temperature	$\vartheta_{max.}$	[°C]	+70
Viscosity range	ν	[mm ² /s]	12 ... 500
Flow	Q	[l/min]	See characteristic curves
Regulating time for adjustable pressure range from p_v min. to p_v max.		[ms]	See characteristic curve
Hysteresis ²⁾		[% I_N]	<4
Repeatability ²⁾		[% p_v max.]	approx. ± 1
Sensitivity of response ²⁾		[% I_N]	<1
Filtering, absolute		[μ m]	25

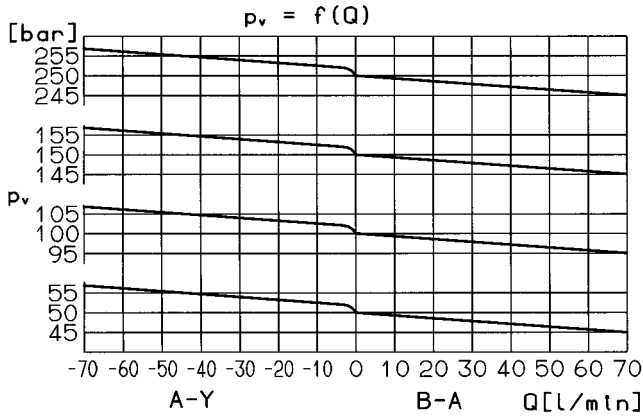
Electrical parameters of proportional solenoids

Solenoid Cat. No.		7289	7292	
Rated current	I_N	[mA]	800	1600
Max. input		[W]	21	21
Resistance	R_{20}	[Ω]	21,3	5,7
Duty cycle		[%]	100	100
Degree of protection and electric connection acc. to DIN 40 050			IP 65	IP 65
Drive electronics			DC 05 / DC 05-XLT, pQ 11 and pQ 12 see table, Page 4	

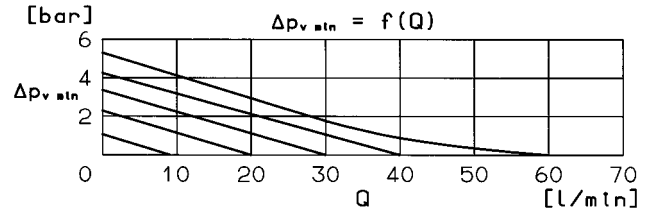
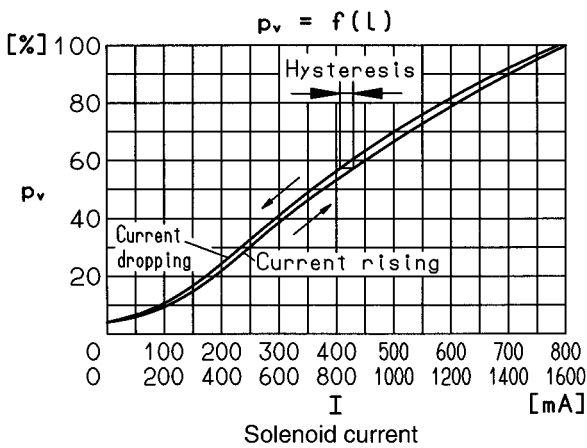
¹⁾ Smaller p_v max. can be set at amplifier.

²⁾ With dither: Frequency 50 Hz, amplitude 15 % I_N .

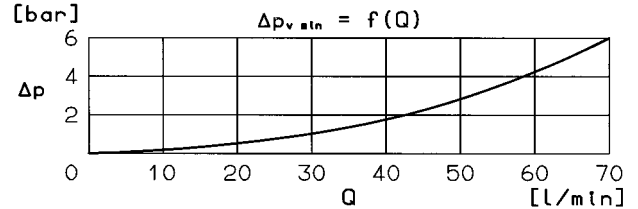
Characteristic curves



p_v -values based on $p_Y = 0$ bar



Pressure increase at outlet



Flow resistance B → A with piston in open position

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. Mounting bolts and O-rings are included in the delivery. Subplate and drive electronics to be ordered separately.

Example of order

Wanted: 3-way proportional pressure reducing valve nominal size 10, electrically adjustable, for flanged mounting. Setting pressure range max. 315 bar, with mating subplate.
Drive electronics to be ordered separately.

3-way proportional pressure reducing valve:
Type No.: D Y K 10 UP A 90 201 3 O O
Cat. No. **6016063.7292**

Subplate:
Type No.: P DY 10 A 4 001 1 O O
Cat. No. **2840007**

Valve survey

Nominal size	p_v max. [bar]	Proportional solenoid current	Drive electronics	Line connection	Type	Cat. No.
10	315	0 ... 1600 mA	DC 05, DC 05-XLT or pQ 11 / pQ 12 (see tables below)	Subplate G 1/2 P DY 10 A 4 001 1 O O Cat. No. 2840007	D Y K 10 UP A 90 201 3 O O ¹⁾	6016063.7292
		0 ... 800 mA			D Y K 10 UP A 90 101 3 O O ¹⁾	6016064.7289

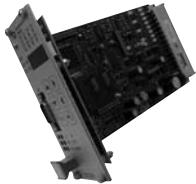
1) Note: Valve delivered with "internal" control oil return via Y
For units with external control oil return via X, please observe instructions given in spare parts drawings

2) Not for new constructions.

Drive electronics

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_u : 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-parametered 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_u : -20 ... +50 °C
 Mounting position: Optional



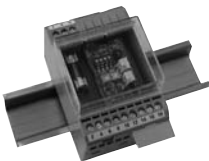
Setpoint input (switchable)	Type of connection		Weight	Cat. No.	For Further information, see script
[V] [mA]	Connecting cable, 2 m	Connector acc. to DIN 43651	[kg]		
For proportional valves with 2 solenoids 2 pQ 11 necessary					HERION 7502961
Rated current I_N: 0 ... 2400 mA, allowed resistance of solenoid R₂₀: 2,5...4,5 Ω					
0 ... 10	0 (4)...20	●	○	0,18	
0 ... 10	0 (4)...20	○	●	0,18	5980081 ¹⁾

Mark in table: ○ without, ● with

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

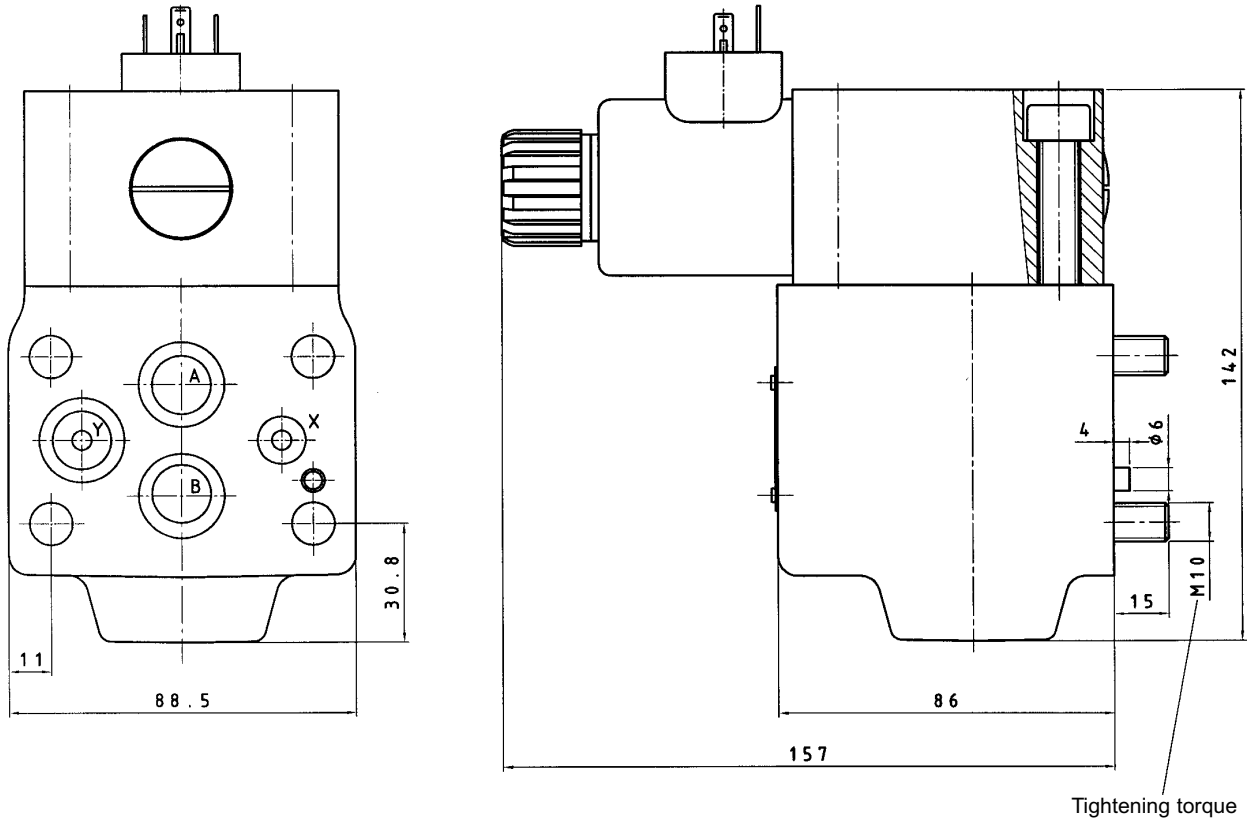
Drive electronics pQ 12

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

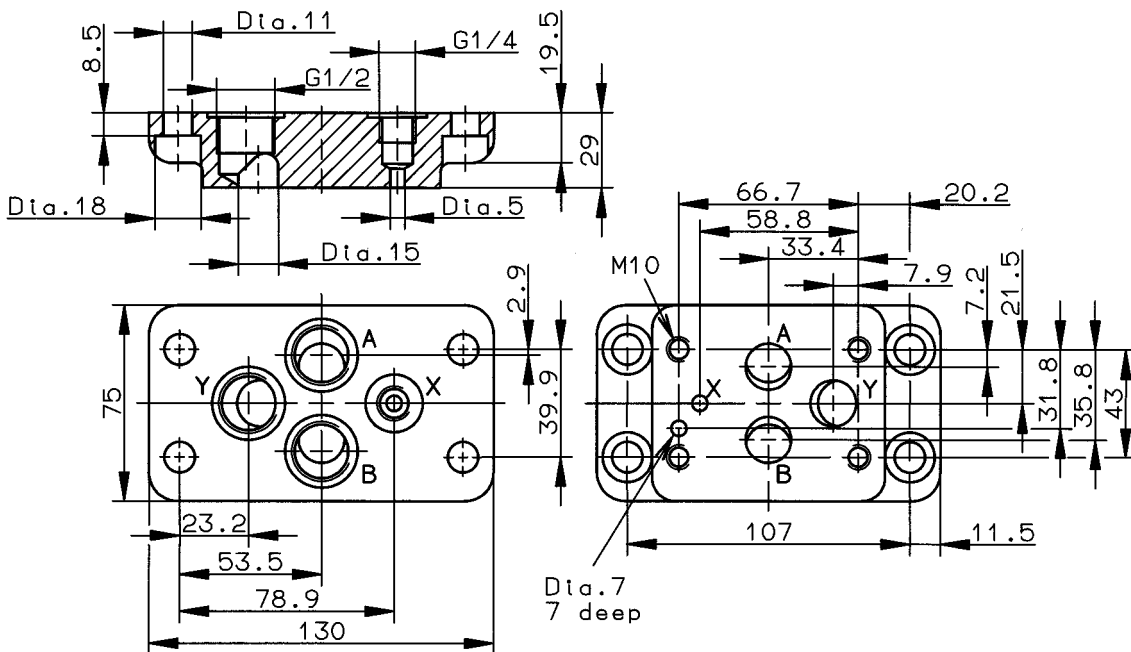


Setpoint input (switchable)	Output currents		Cat. No.	For Further information, see script
[V] [mA]	[mA]	[mA]		
For proportional valves with 2 solenoids 2 pQ 11 necessary				HERION 7503109
0 ... 10	0 (4)...20	0 ... 1600 / 2400	5980126	

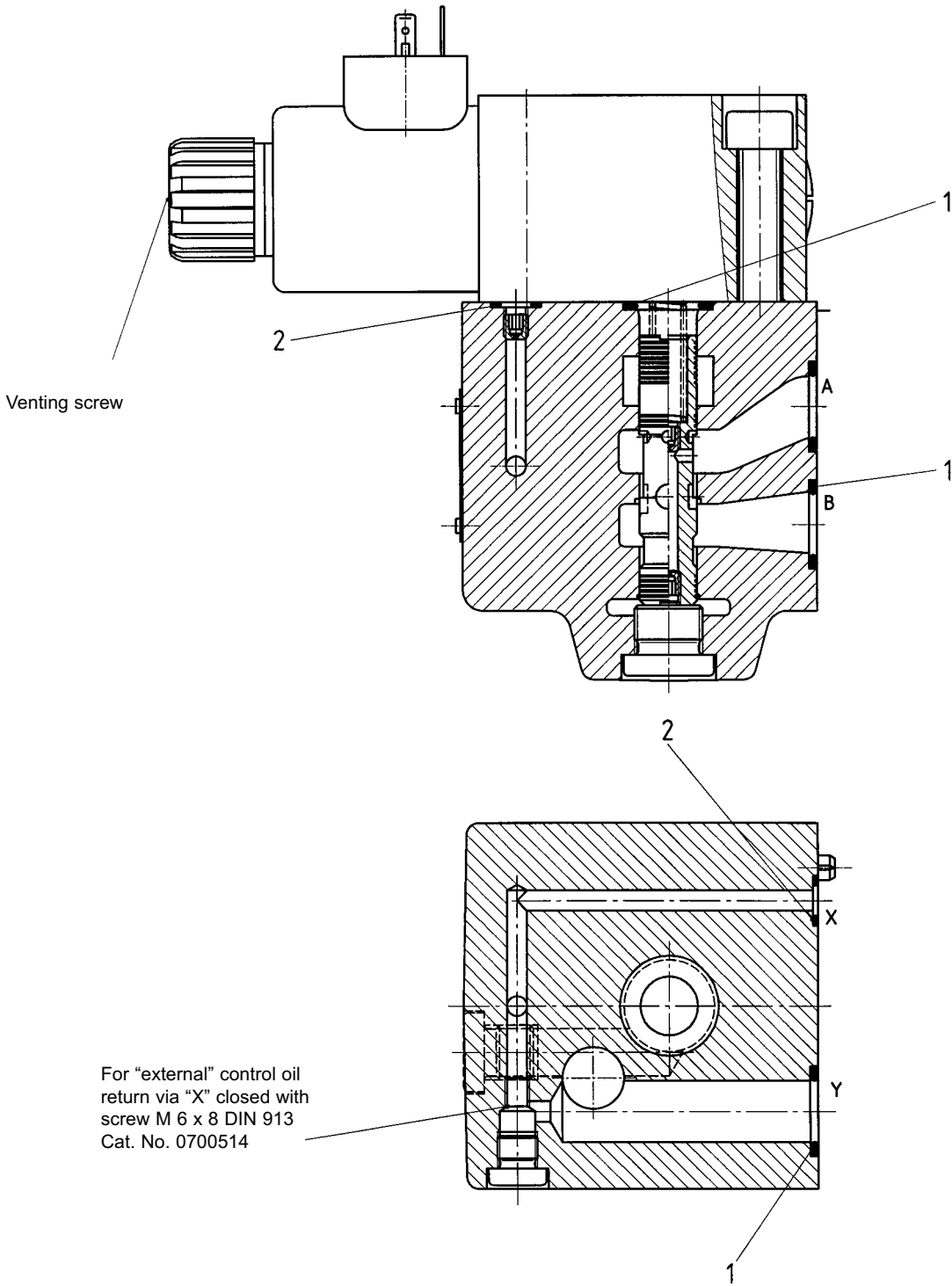
Dimensional drawings [mm]



**Subplate with HERION hole pattern
(acc. to DIN 24 340-D 10-1)**



Spare parts drawing



Spare parts

Part	Qty.	Description	Cat. No.
1	3	O-ring (17.1 x 2.6)	0701290
2	1	O-ring (9.2 x 1.8)	0701252

Mountings screws

-	4	Socket-head screw (M10 x 90 DIN 912-10.9)	0700462
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1 set of spare parts consists of parts 1 and 2.