

3-Way Proportional Pressure Control Valves



Nominal sizes 2, 4, 8, 12, 20

Poppet valves, Flanged design

Manifold and stacking system in nom. size 2

Pressure setting p_V : 0 to 6, 10 and 16 bar

Catalog Register
P16

Publication 7503040.06.12.96

**OBSOLETE
DOCUMENT**
Technical
Reference
Only

Description

General

The proportional pressure control valves allow infinite adjustment and regulation of a pneumatic pressure.

Function

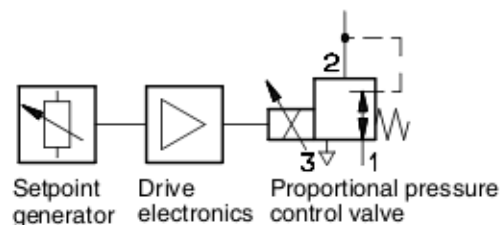
Setting of the pneumatic output pressure is achieved via a piston which, in its regulating position, is influenced by the variable force of a proportional solenoid. The magnitude of the output pressure is proportional to the solenoid force/solenoid current.

If the output pressure exceeds the set value, the valve releases pressure via a secondary exhaust.

If an electronic amplifier is switched in series, the output pressure of the valve is adjustable via a specified level signal. Potentiometers, controllers, etc. can be used for setpoint adjustment.



Example of a control for pressure adjustment



Features

- Minimal hysteresis
- Excellent repeatability
- Choice of mounting position
- High flow capacity even at cross-sectional area of vent duct

Applications

Remote adjustment of pressures

Program-controlled pressure adjustment

Open and closed loop control of number of revolutions, position, flow rate and force by pressure

Control of pneumatically actuated positioning and metering valves

Braking of masses

Further versions

- Other nominal sizes (up to nominal size 40)
- Subplates with NPT-thread
- Units with integrated electronic pressure control (see Publication No. 7502952)

Equipment list (standard units)

Standard voltage 12 VDC

Nominal size	Pressure setting p_v [bar]	Operating pressure max. p_e [bar]	Rated current [mA]	Dimensional drawing	Subplate Connection	Cat. No.	Cat. No. Valve Solenoid
2	0 ... 6 0 ... 10 0 ... 16	7 12 16	525 750 1200	01	G 1/8	0601740	4090021. 7093 4090020. 7093 4090022. 7093
4	0 ... 6 0 ... 10 0 ... 16	7 12 16	525 750 1200	02	G 1/8 NPT 1/8	0542848 0544480	4090100. 7093 4090110. 7093 4090126. 7093
8	0 ... 6 0 ... 10 0 ... 16	7 12 16	525 750 1200	02	G 1/4 G 3/8 NPT 1/4 NPT 3/8	0542636 0543705 0798930 0544478	4090300. 7093 4090310. 7093 4090326. 7093
12 / 20	0 ... 6 0 ... 10 0 ... 16	7 12 16	525 750 1200	02	G 1/2 G 3/4 G 1 NPT 1/2 NPT 3/4	0542814 0542840 5993638 0543152 0544476	4090400. 7093 4090410. 7093 4090426. 7093

Subplates and plug connectors to be ordered separately.

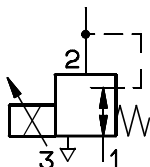
For order numbers, see Equipment survey (standard units) or Accessories, Page 14

For further subplates and stacking systems in nominal size 2, see Pages 5 to 8

For dimensional drawings, see Page 4

Characteristic data

General parameters

Description	3-way proportional pressure control valve			
Switching symbol				
Design	Poppet valve			
Connection	Flange, subplate			
Mounting position	Optional			
Flow direction	Fixed			
Actuator	Proportional solenoid			
Ambient temperature [°C]	-10 ... +60			
Nominal size	2	4	8	12 20
Weight [kg]	0.28	0.58	0.71	1.4
Material: Body Seals	Aluminium alloy NBR			
Degree of protection	IP 65 with connector			

Pneumatic parameters

Fluid	Filtered air, lubricated or unlubricated
Filter [μm]	50
Fluid temperature [°C]	-10 ... +40
Operating pressure range p_e for units with p_v 0 ... 6 bar 0 ... 10 bar 0 ... 16 bar	max. 7 max. 12 max. 16
Pressure setting [bar] range p_v	0 ... 6 0 ... 10 0 ... 16
Hysteresis [% p_v max.]	< 3
Repeatability [% p_v max.]	< 1
Linearity ¹⁾ [% p_v max.]	< 1
Sensitivity of response [% p_v max.]	≤ 1

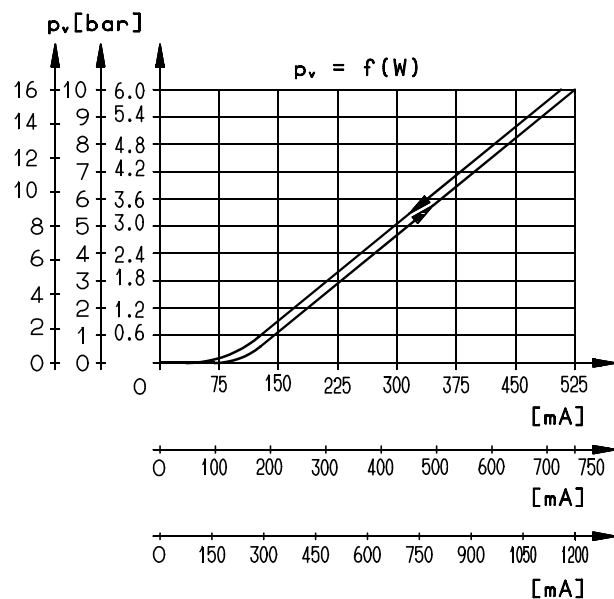
¹⁾ Values for 20°C

Electrical parameters of proportional solenoid

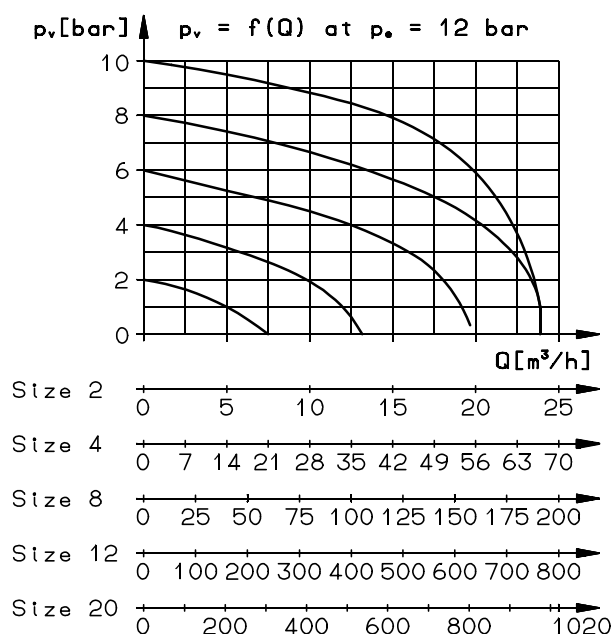
Limiting current I_N [mA]	1930
Rated power P_N [W]	25
Resistance R_{20} [Ω]	6.3 + 3%
Duty cycle [%]	100
Drive electronics pQ 03, pQ 04, pQ 11 or pQ 12	(see Pages 12 and 13)

Characteristic curves

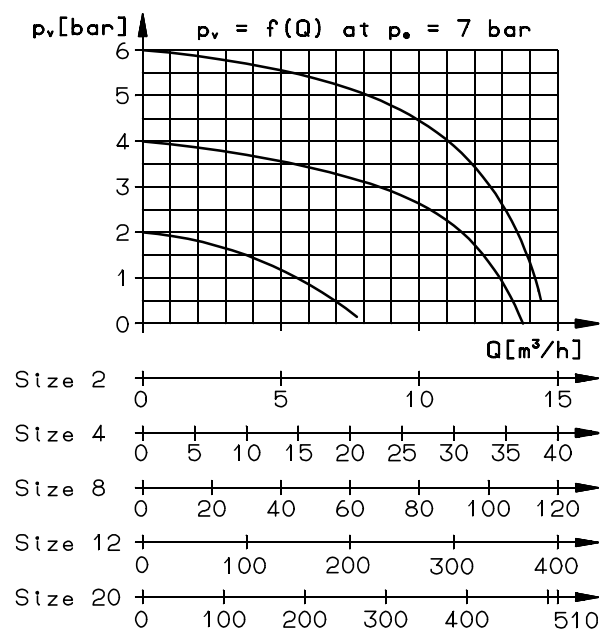
Static curve



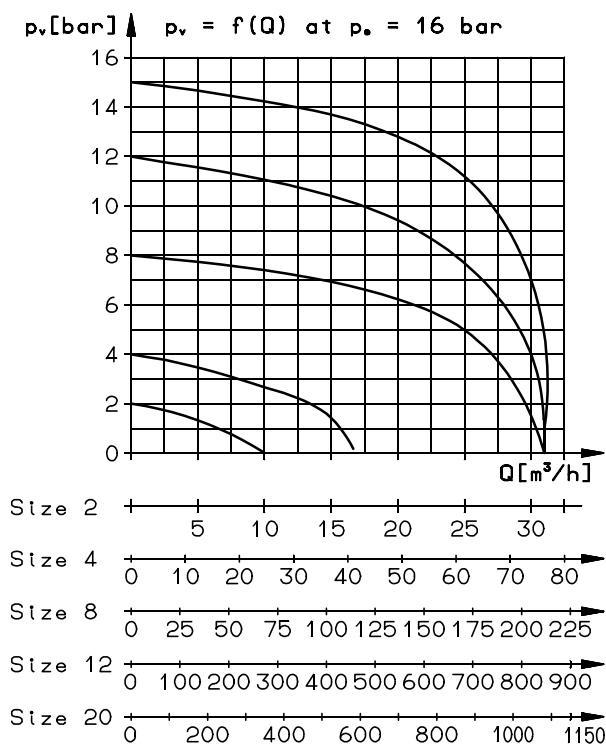
Flow characteristic for 12 bar operating pressure



Flow characteristic for 7 bar operating pressure

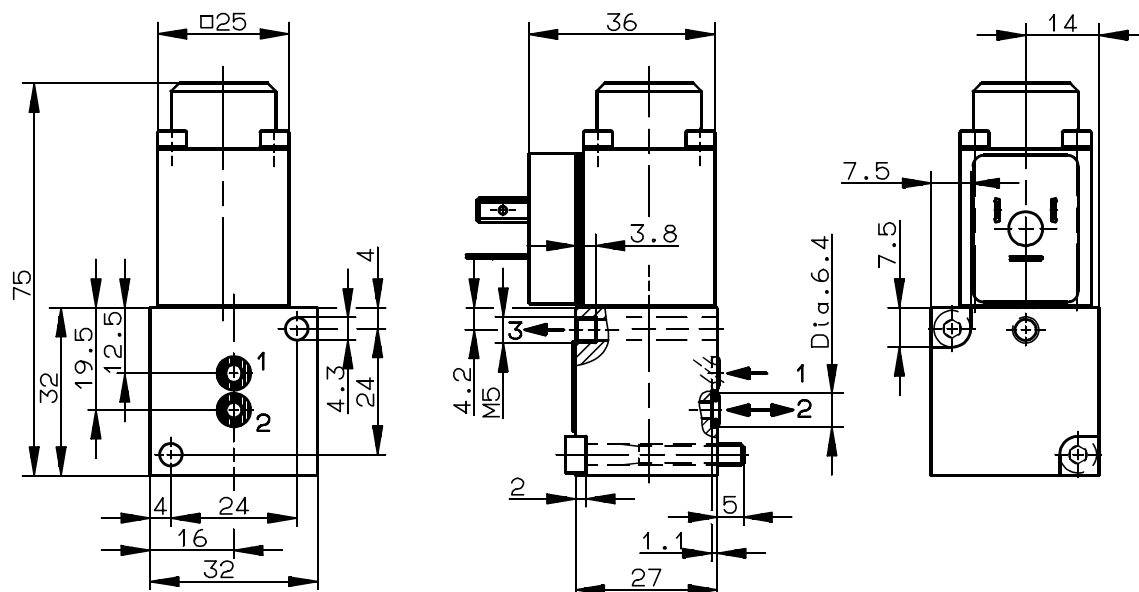


Flow characteristic for 16 bar operating pressure

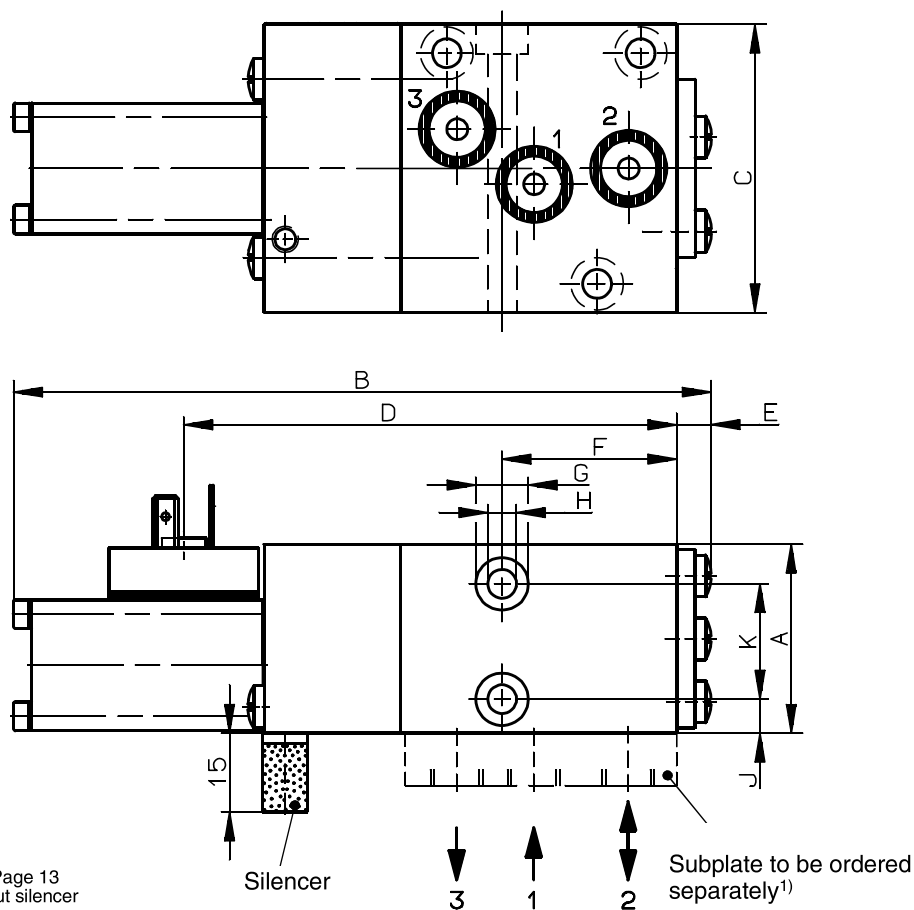


Dimensional drawings [mm]

01



02



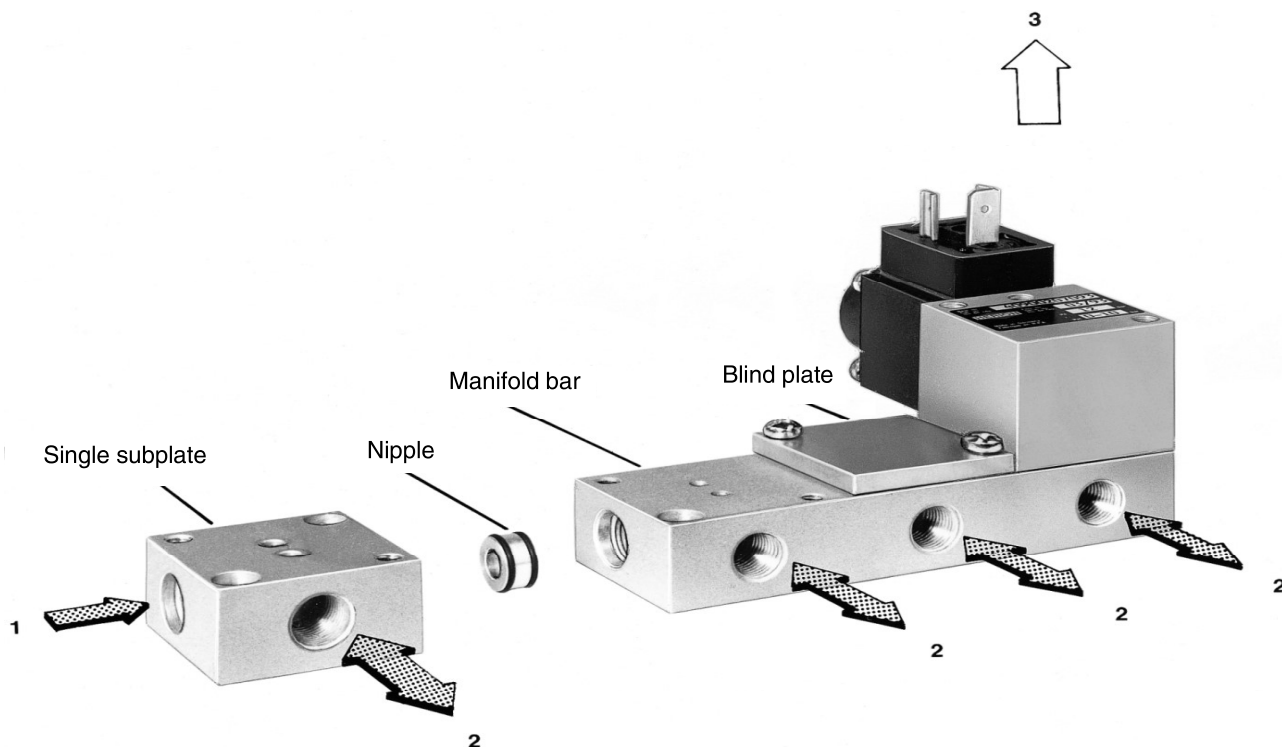
¹⁾ see Accessories on Page 13
²⁾ Nominal size 2 without silencer

Dimensional table [mm]

Size	A	B	C	D	E	F	G	H	J	K
4	36	133.1	55	94.0	6.6	33.3	10	5.5	6.5	22.0
8	50	137.0	55	97.5	6.6	35.6	10	5.5	7.5	30.0
12	70	167.1	70	127.3	7.3	59.0	11	6.6	8.5	49.8
20	70	167.1	70	127.3	7.3	59.0	11	6.6	8.5	49.8

Manifold system

For nominal size 2 to be ordered separately



Component parts

Description	Weight [kg]	Cat. No.
Single subplate assly.	0.04	0601740
Manifold bar		
for 2 valves	0.08	0601741
for 3 valves	0.13	0601742
for 4 valves	0.17	0601743
for 5 valves	0.21	0601744
for 6 valves	0.24	0601745
Nipple	—	0559301
Blind plate assly.	0.22	0602005
Screw plug G 1/8	—	0568384

Manifold bars and single subplate without valves

Subplate G 1/8 for size 2 to be ordered separately
Cat. No. **0601740**

Cat. No. **0601740**

For nominal size 2 to be ordered separately

6

Stacking system

For nominal size 2 to be ordered separately

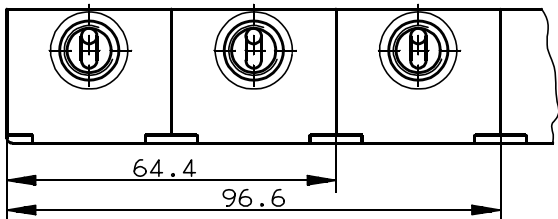
Stacking plate O-ring Mounting bracket

Component parts

Description	Weight [kg]	Cat. No.
Stacking plate (without valve) with 2 brackets and 1 O-ring	0.04	0541070
Screw plug G 1/4	—	0657380
Sealing ring for screw plug G 1/4	—	0660835
O-ring	—	0663083
Bracket for stacking of plates	—	0541281

Dimensional drawing [mm]

Stacking of plates

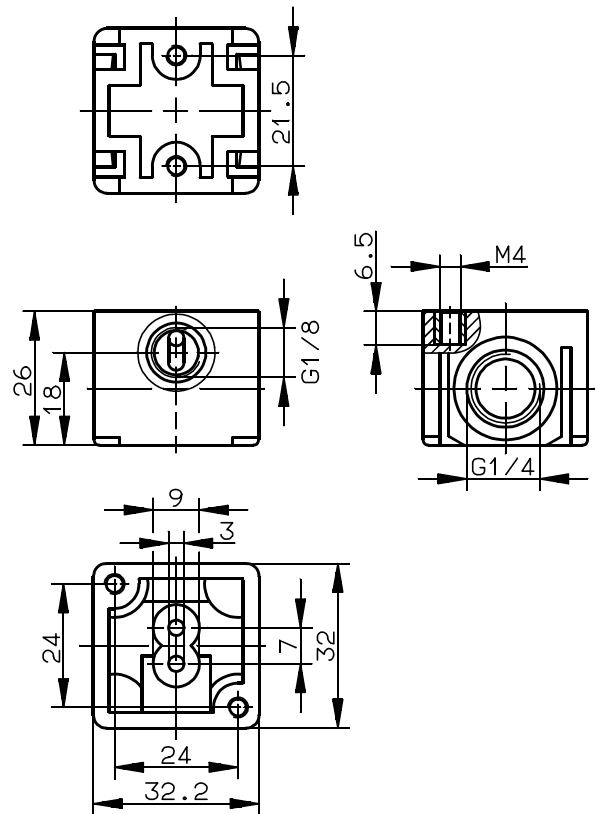


Mounting instructions

Bores of mounting bracket must not be used for fastening of stacking system

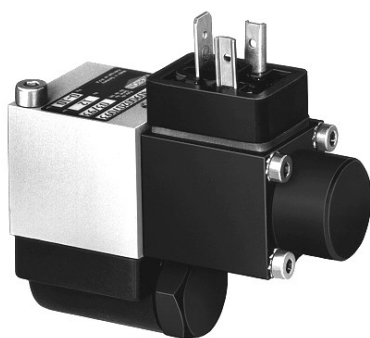
Dimensional drawing [mm]

Single plate



Flanged system

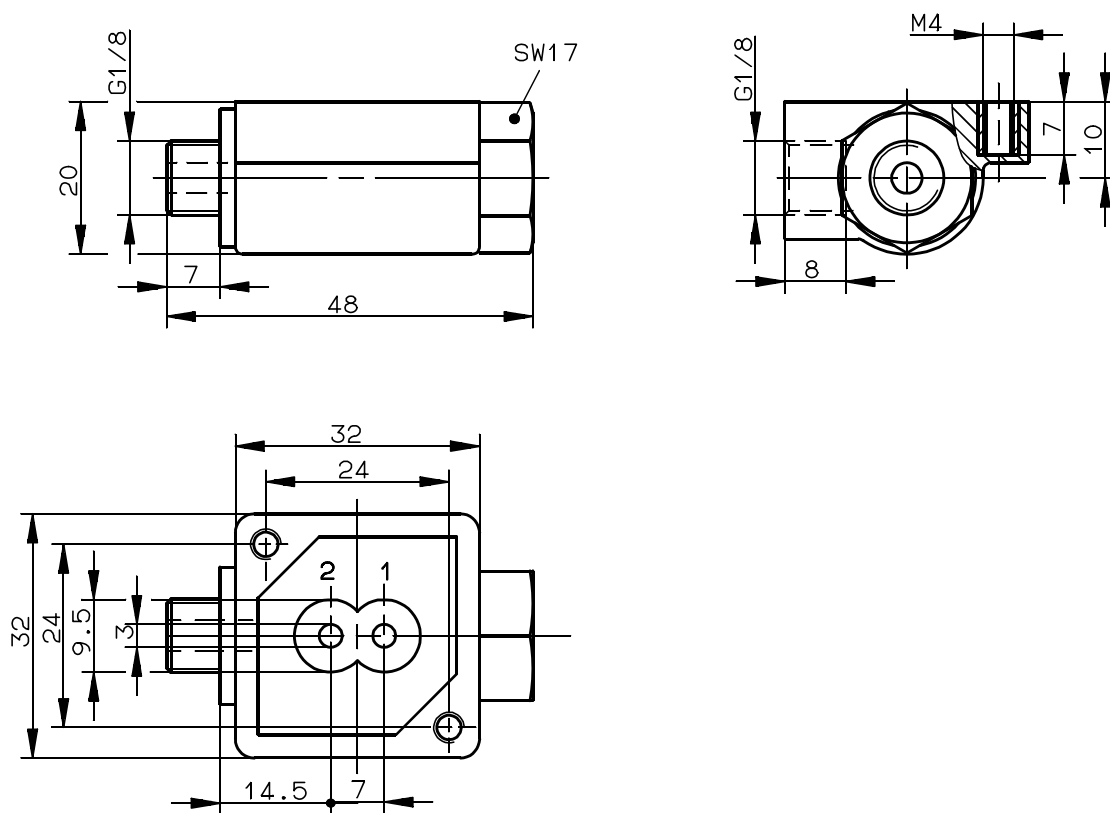
For nominal size 2 to be ordered separately



Component parts

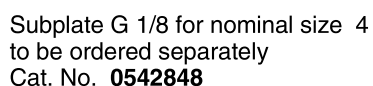
Description	Weight [kg]	Cat. No.
Flange assly., with screw G 1/8	0.1	0543862

Dimensional drawing [mm]

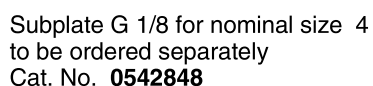


Subplate G 1/8 for nominal size 4
to be ordered separately
Cat. No. **0542848**

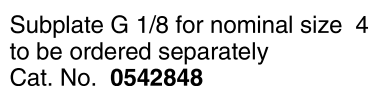
Subplate G 1/8 for nominal size 4
to be ordered separately
Cat. No. **0542848**



Subplate G 1/8 for nominal size 4
to be ordered separately
Cat. No. **0542848**

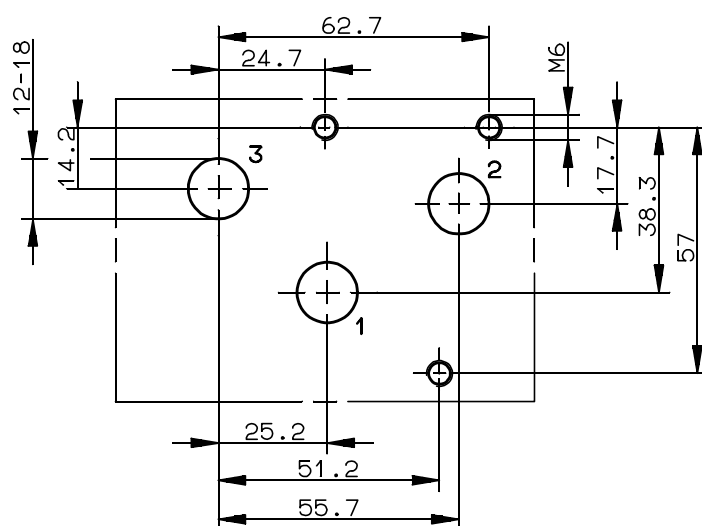


Subplate G 1/8 for nominal size 4
to be ordered separately
Cat. No. **0542848**



Subplate G 1/8 for nominal size 4
to be ordered separately
Cat. No. **0542848**

Subplate G 1/2 for nominal size 12
to be ordered separately
Cat. No. **0542814**

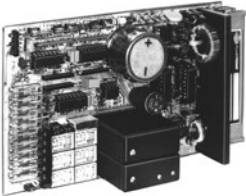


Surface finish within
sealing range R_z 16

Subplate G 3/4 for nominal size 20
to be ordered separately
Cat. No. **0542840**



Drive electronics

Drive electronics pQ 03 Amplifier with constant current regulator PDM Power supply: 24 ± 4 VDC Residual ripple: ≤10 % Ambient temperature ϑ_U : 0 ... +45 °C Weight: 0.4 kg Mounting position: Upright Free air circulation must be ensured Space requirement for installation in 19" card rack: 50 mm European format: 100 x 160 mm 	Setpoint input	Internal setpoints	Ramps	Front panel 3 HE	Terminal strip Form F DIN 41612	Additional function	Current draw amplifier	Cat. No.	For further information, see Publication
		Pcs.	Pcs.		Number of pins	PID controller with threshold value switch	[mA]		
	For proportional valves with 1 solenoid Rated current I_N: 0 ... 1600 mA, permissible solenoid resistance R_{20}: 2,5 ... 7 Ω								HERION 7501722
	0 ... 10 V	○	○	○	48	○	1400	5998614	
	0 ... 20 mA	○	○	○	48	○	1400	5998615	
	digital, 7 bit	○	○	○	48	○	1400	5998616	
	0 ... 10 V	4	2	○	48	○	1400	5998617	
	0 ... 10 V	○	○	○	48	●	1400	5980030	
	0 ... 10 V	4	2	○	48	●	1400	5980029	

Drive electronics pQ 04 Digital amplifier with constant current regulator PDM 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 in 19" card rack: 50 mm European format: 100 x 160 mm 	Setpoint input	Internal setpoints	Ramps	Front panel	Terminal strip Form F DIN 41612	PID controller for external Control loops	Cat. No.	For further information, see Publication
		Pcs.	Pcs.		Number of pins			
	For proportional valves with 1 solenoid Rated current I_N: 0 ... 800 mA or 0 ... 1600 mA							HERION 7503188
	2x 0 ... ± 10 V	4	4	○	48	○	5988019	
	2x 0 ... ± 10 V	4	4	●	48	○	5988020	
	2x 0 ... ± 10 V	4	4	○	48	●	5988021	
	2x 0 ... ± 10 V	4	4	●	48	●	5988022	
Description	Specification						Cat. No.	
Programming unit PM 04	Mounts on amplifier, without keyboard For programming and measuring						5988018	
Operator program pQ04SOFT	Display, documentation, change, storing and loading of parameters with a PC						5988030	

Drive electronics pQ 11 Plug-in amplifier with constant current regulator PDM Degree of protection: IP 65 Power supply: 18 ... 32 VDC Residual ripple: ≤10 % Ambient temperature ϑ_U : -20 ... +50 °C Mounting position: Optional 	Output currents	Solenoid connection Interface acc. to DIN 43650	Type of connection		Cat. No.	For further information, see Publication
	[mA]	Form B (narrow)	Cable 2 m long	Connector acc. to DIN 43651		
	0 ... 400 / 800 / 1000	●	○	●	5980083	HERION 7502961
		●	●	○	5980087	
	0 ... 1600 / 2400	●	○	●	5980118	
		●	●	○	5980119	

Mark in table: ○ without, ● with

Drive electronics

Drive electronics pQ 12 Amplifier module with constant current regulator PDM Degree of protection: IP 65 Power supply: 18 ... 32 VDC Residual ripple: $\leq 10\%$ Ambient temperature ϑ_{U} : $-20 \dots +50\text{ }^{\circ}\text{C}$ Mounting position: Optional For attachment on mounting rail acc. to EN 50022 	Output currents	Cat. No.	For further information, see Publication HERION 7503109
	[mA]		
	0 ... 400 / 800 / 1000	5980126	
	0 ... 1600 / 2400	5980127	

Accessories for valves

Description	Specification	Publication No.	Cat. No.
Manifold system, nominal size 2	Manifold bar for 2 valves	–	0601741
	Manifold bar for 3 valves		0601742
	Manifold bar for 4 valves		0601743
	Manifold bar for 5 valves		0601744
	Manifold bar for 6 valves		0601745
	Nipple		0559301
	Blind plate assly.		0602005
	Screw plug G 1/8		0568384
Stacking system, nominal size 2	Plate with 2 brackets and 1 O-ring	–	0541070
	Screw plug G 1/4		0657380
	Sealing ring for screw plug G 1/4		0660835
	O-ring		0663083
	Bracket for stacking of plates		0541281
Flange, nominal size 2	Complete, with screw G 1/8	–	0543862
Subplates for nominal sizes 2 to 20	Size 2 G 1/8	–	0601740
	Size 4 G 1/8		0542848
	Size 8 G 1/4		0542636
	Size 8 G 3/8		0543705
	Size 12 G 1/2		0542814
	Size 20 G 3/4		0542840
Silencer for nominal size 2	M 5	7501079	0014400
Silencer for exhaust port at subplate for nominal sizes 4 to 20	Size 4 G 1/4		0014610
	Size 8 G 3/8		0014710
	Size 12 G 1/2		0014810
	Size 20 G 3/4		0014910
Plug connector for proportional valve	DIN 43650 Form B / narrow	–	0680003

Accessories for electronics

Description	Specification	Publication No.	Cat. No.
Setpoint adjuster SE 01 1-turn potentiometer Angle of rotation 270°	0 ... 10 V	7501675	5998534
Setpoint adjuster SE 02 10-turn potentiometer Angle of rotation 360°	0 ... 10 V	7501782	5998536
Setpoint adjuster SE 03 digital	0 ... 10 V	7501783	5998647
Setpoint adjuster SE 13 digital	0 ... 20 mA	7502504	5998774
Setpoint adjuster SE 13 digital	4 ... 20 mA	7502504	5998775
Transformer TR 21	110/220 VAC/50-60 Hz 24 VDC 3,0 A	7501789	5998609
Transformer TR 22	380 VAC/50-60 Hz 24 VDC 6,0 A	7501789	5998611
Plug connector for electronic amplifier	6-pin + PE acc. to DIN 43651	–	0660689