Proportional directional control valves MPYE

FESTO

- High dynamics
- Final control element for closed control loops
- 5/3 –way function

Proportional directional control valves MPYE

Key features

General information

- The directly actuated proportional directional control valve has a position-controlled spool. This transforms an analogue input signal into a corresponding opening cross-section at the valve outputs.
- In combination with an external position controller and displacement encoder, a precise pneumatic positioning system can be created.
- Flow control function for varying cylinder speed
- 5/3-way function for varying the direction of movement

Wide choice of variants

- Setpoint value input
  - Analogue voltage signal
  - Analogue current signal
- Flow rates from 100 ... 2000 l/min

Proportional directional control valves MPYE

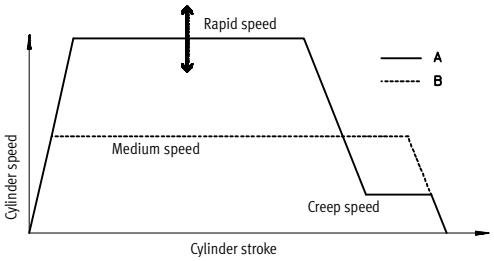
Key features and type codes

Short machine cycle times – fast switching of programmed flow rates

- Reduce machine cycle times by optimising cylinder speeds
  - Assembly technology
  - Handling technology
  - Furniture industry

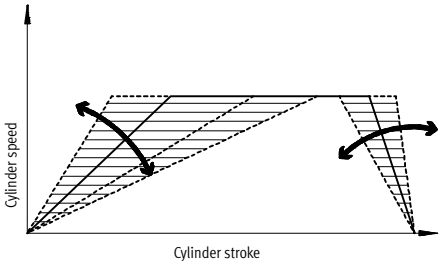
A: Proportional valves allow different speed levels and speed ramps to be set.

B: Speed regulation with directional control valves is more difficult and is performed by means of exhaust air flow control.



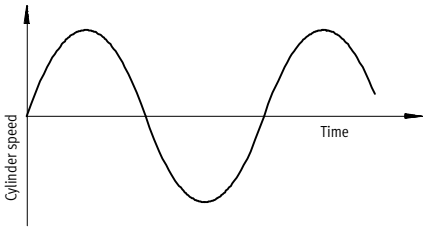
Flexible cylinder speeds – Achieving variable flow rates

- Flexibly adapting cylinder speeds to the process. Traversing individual acceleration ramps (gentle approach with delicate goods)
  - Automobile suppliers
  - Production technology
  - Conveyor technology
  - Test engineering



Proportionaldirectional control valve as final control element – Dynamic and fast changing of flow rates

- Fatigue tests
- SoftStop with end-position controller SPC11



Type codes

MPYE	–	5	–	⅛ LF	–	010	–	B

Type	
MPYE	Proportional directional control valve

Valve function	
5	5/3-way valve

Pneumatic connection	
M5	M5
⅛ LF	G⅛ Low Flow
⅛ HF	G⅛ High Flow
¼	G¼
⅜	G⅜

Setpoint value input	
010	Analogue voltage signal
420	Analogue current signal

Generation	
B	B series

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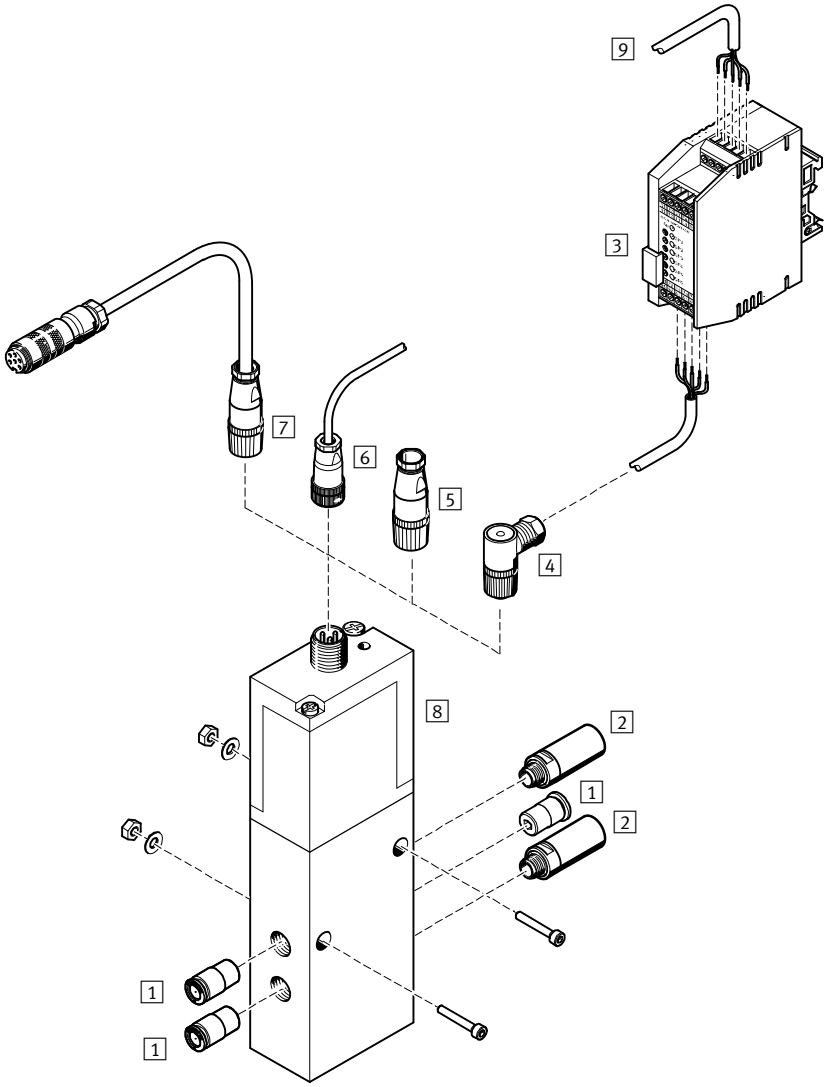
Peripherals overview



Accessories		
	Description	**➔ Page/Internet**
1 Push-in fitting QS	For connecting compressed air tubing with standard external diameters	quick star
2 Silencer	For fitting in exhaust ports	u
3 Setpoint module MPZ	For generating 6+1 analogue voltage signals	–
4 Sensor socket SIE-WD-TR	Angled, 4-pin, M12x1	8
5 Sensor socket SIE-GD	Straight, 4-pin, M12x1	8
6 Connecting cable KMPYE	–	8
7 Connecting cable KVIA-MPYE	Connecting cable to the analogue module of valve terminal type 03	8
8 Proportional directional control valve MPYE	–	5
9 Digital input/output	For controlling the setpoint module	–

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Technical data

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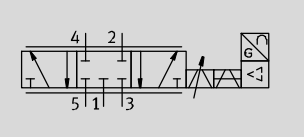
Function



Variants

- Setpoint value input as analogue voltage signal 0 ... 10 V
- Setpoint value input as analogue current signal 4 ... 20 mA

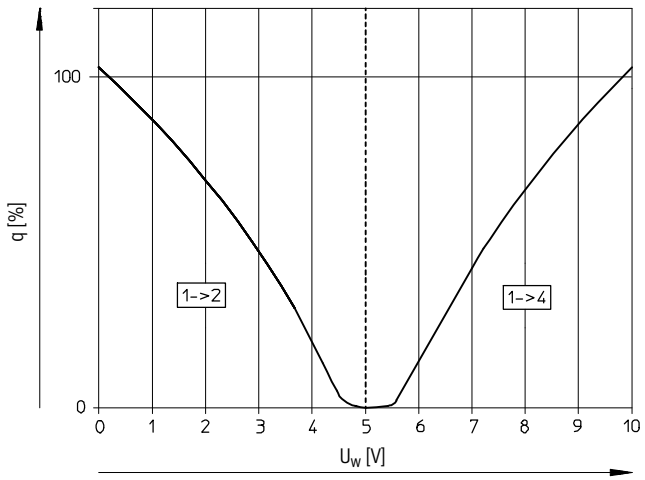
- Voltage
  17 ... 30 V DC
- Flow rate
  100 ... 2000 l/min
- Pressure
  0 ... 10 bar

General technical data						
Pneumatic connection		M5	G1⁄8		G1⁄4	G3⁄8
			Low flow	High flow		
Valve function		5/3-way, normally closed				
Constructional design		Piston spool, directly actuated, controlled piston spool position				
Sealing principle		Hard				
Actuation type		Electrical				
Type of reset		Mechanical spring				
Type of pilot control		Direct				
Direction of flow		Non-reversible				
Type of mounting		Via through-holes				
Mounting position[1)]		Any				
Nominal size	[mm]	2	4	6	8	10
Standard nominal flow rate	[l/min]	100	350	700	1400	2000
Product weight	[g]	290	330	330	530	740

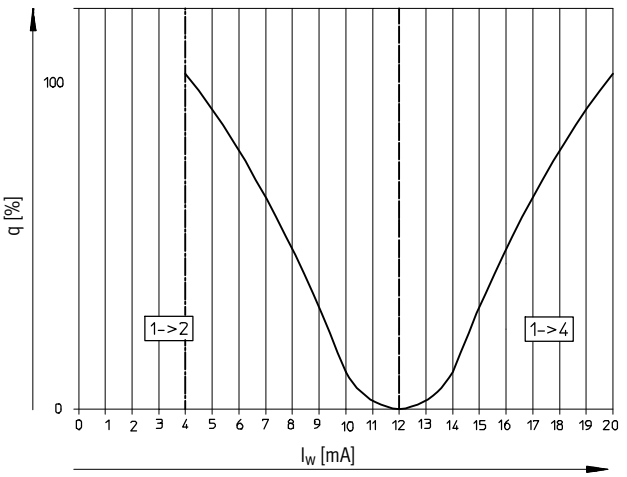
1) If the proportional directional control valve is in motion during operation, it must be mounted at right angles to the direction of movement.

Flow rate q at 6 ⇢ 5 bar as a function of the setpoint voltage U

Voltage type MPYE-5-...-010-B



Current type MPYE-5-...-420-B



Proportional directional control valves MPYE

Technical data

Electrical data							
Pneumatic connection			M5	G⅛ Low flow	G⅛ High flow	G¼	G⅜
Power supply		[V DC]	17 … 30				
Max. current consumption	in mid-position	[mA]	100				
	at full stroke	[mA]	1 100				
Setpoint value	Voltage type	[V DC]	0 … 10				
	Current type	[mA]	4 … 20				
Max. hysteresis[1)]		[%]	0.4				
Valve mid-position	Voltage type	[V DC]	5 (±0.1)				
	Current type	[mA]	12 (±0.16)				
Duty cycle[2)]		[%]	100				
Critical frequency[3)]		[Hz]	125	100	100	90	65
Safety setting			Active mid-position in the event of setpoint value cable break				
Protection against polarity reversal	Voltage type		For all electrical connections				
	Current type		For setpoint value				
Protection class			IP65				
Electrical connection			4-pin plug socket, round design, M12x1				

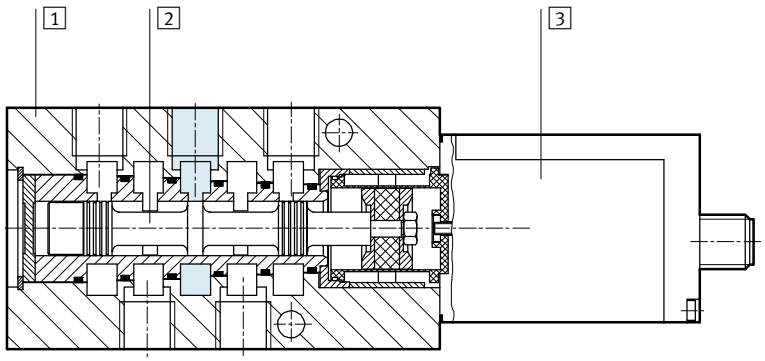
1) Referred to the maximum stroke of the piston spool.
2) The proportional direction control valve automatically switches off if it overheats (goes to mid-position) and switches back on once it cools down.
3) Corresponds to the 3dB frequency at the maximum movement stroke of the piston spool.

Operating and environmental conditions		
Operating pressure	[bar]	0 … 10
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [6:4:4]
Note on operating/pilot medium		Operation with lubricated medium not possible
Ambient temperature	[°C]	0 … 50
Vibration resistance[1)]		To DIN/IEC 68 Parts 2 -6, severity level 2
Continuous shock resistance[1)]		To DIN/IEC 68 Parts 2 -27, severity level 2
CE symbol		To 89/336/EEC (EMC regulation)
Temperature of medium	[°C]	5 … 40, condensation not permitted

1) If the proportional directional control valve is in motion during operation, it must be mounted at right angles to the direction of movement.

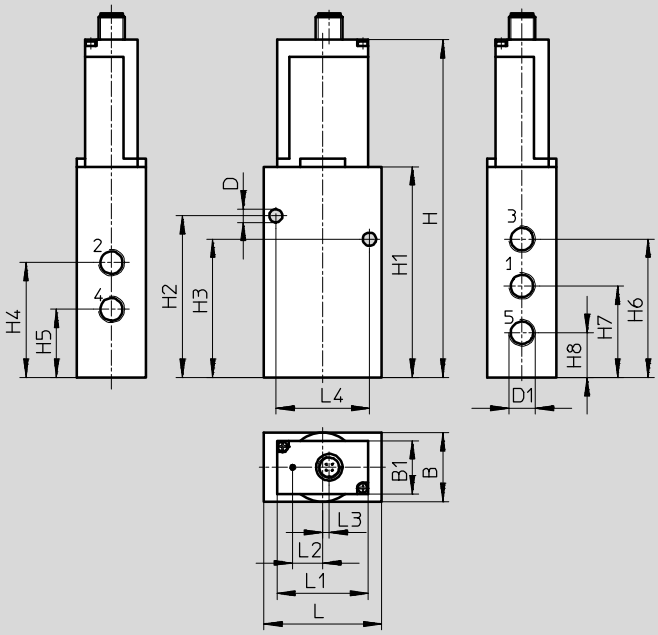
Materials

Sectional view



1	Housing	Anodised aluminium
2	Valve spool	Tempered aluminium
3	Housing for electronics	Galvanised acrylic butadiene styrene
–	Seals	Nitrile rubber

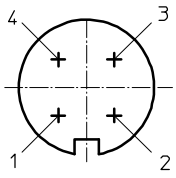
Dimensions Download CAD data ➔ **www.festo.com**



Pneumatic connection D1	B	B1	D ∅	H	H1	H2	H3	H4
M5	26	–	5.5	129.9	69	56.1	38.1	32.1
G1/8	26	–	5.5	149.3	88.4	71.3	55.1	45.8
G1/4	35	26	6.5	164.6	103.7	79.6	68.1	56.6
G3/8	40	26	6.5	176.6	115.7	98.4	79.4	65.4

Pneumatic connection D1	H5	H6	H7	H8	L	L1	L2	L3	L4
M5	20.1	38.1	26.1	14.1	45	–	14.8	3.2	32
G1/8	26.8	55.3	36.3	17.3	45	–	14.8	3.2	35
G1/4	33.6	68.1	45.1	22.1	58	45	14.8	3.2	46
G3/8	37.4	82.4	51.4	20.4	67	45	14.8	3.2	54

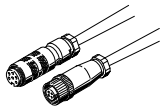
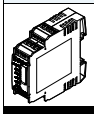
Terminal allocation



1 24 V DC, supply voltage
2 GND
3 Uw/I_W, setpoint input
4 GND

Ordering data

Pneumatic connection	Voltage type 0 ... 10 mV		Current type 4 ... 20 mA	
	Part No.	Type	Part No.	Type
M5	**154200**	**MPYE-5-M5-010-B**	**162959**	**MPYE-5-M5-420-B**
G1/8	**151692**	**MPYE-5-1/8LF-010-B**	**161978**	**MPYE-5-1/8LF-420-B**
	151693	**MPYE-5-1/8HF-010-B**	**161979**	**MPYE-5-1/8HF-420-B**
G1/4	**151694**	**MPYE-5-1/4-010-B**	**161980**	**MPYE-5-1/4-420-B**
G3/8	**151695**	**MPYE-5-3/8-010-B**	**161981**	**MPYE-5-3/8-420-B**

Ordering data				
	Description	Cable length [m]	Part No.	Type
Connecting cable				Technical data ➔ Internet: kmpye, kvia
	Screened	5	**151909**	**KMPYE-5**
	–	5	**161984**	**KVIA-MPYE-5**
		10	**161985**	**KVIA-MPYE-10**
Sensor socket				Technical data ➔ Internet: sie-gd
	Straight, 4-pin, M12x1	–	**18494**	**SIE-GD**
Sensor socket				Technical data ➔ Internet: sie-wd
	Angled, 4-pin, M12x1	–	**12956**	**SIE-WD-TR**
Setpoint module				Technical data ➔ Internet: mpz
	Generation of 6+1 analogue setpoint values	–	**546224**	**MPZ-1-24DC-SGH-6-SW5**