Proportional directional control valves MPYE

Key features

General

The directly actuated proportional directional control valve has a position-controlled spool. This converts an analogue input signal into a corresponding opening cross-section at the valve outputs.

In combination with an external position controller and displacement encoder, this can be used to create a precise pneumatic positioning system.

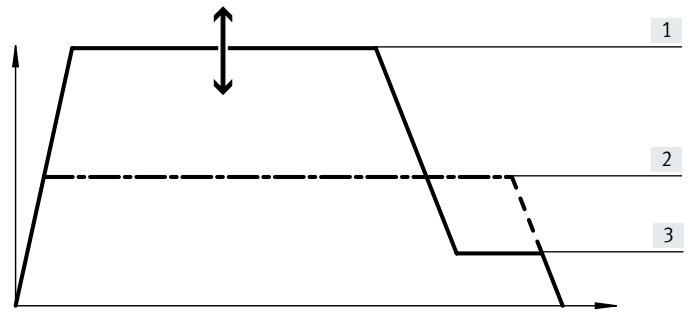
- Flow control function for varying the cylinder speed
- 5/3-way function for varying the direction of movement

Wide choice of variants

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

Key features

Short machine cycle times – fast switching of programmed flow rates



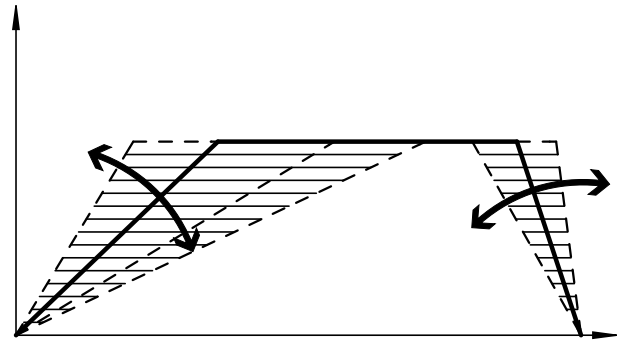
Y-axis: Cylinder speed
X-axis: Cylinder stroke
A – Proportional valve
B – Switching valve

Optimising the cylinder speeds reduces machine cycle times
- Assembly technology
- Handling technology
- Furniture industry

A: Proportional valves allow different speed levels ([1] Fast, [3] Creep) and speed ramps to be set.

B: Speed regulation using switching valves requires exhaust air flow control and is very inflexible (only [2] Medium speed).

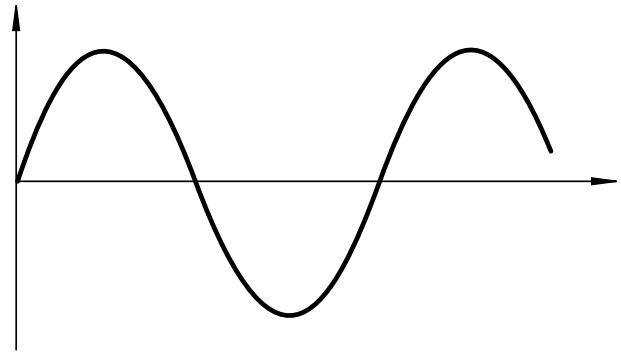
Flexible cylinder speeds – achieving variable flow rates



Y-axis: Cylinder speed
X-axis: Cylinder stroke

Adapt cylinder speeds flexibly to the process.
Make use of custom acceleration ramps (gentle start for sensitive items)
- Automotive suppliers
- Production engineering
- Conveyor technology
- Inspection

Proportional directional control valve as final control element – dynamic and fast changing of flow rates



Y-axis: Cylinder speed
X-axis: Time

- Fatigue testing
- SoftStop with end-position controller SPC11

Type codes

001	Series	
MPYE	Proportional directional control valve	

002	Valve function	
5	5/3-way valve	

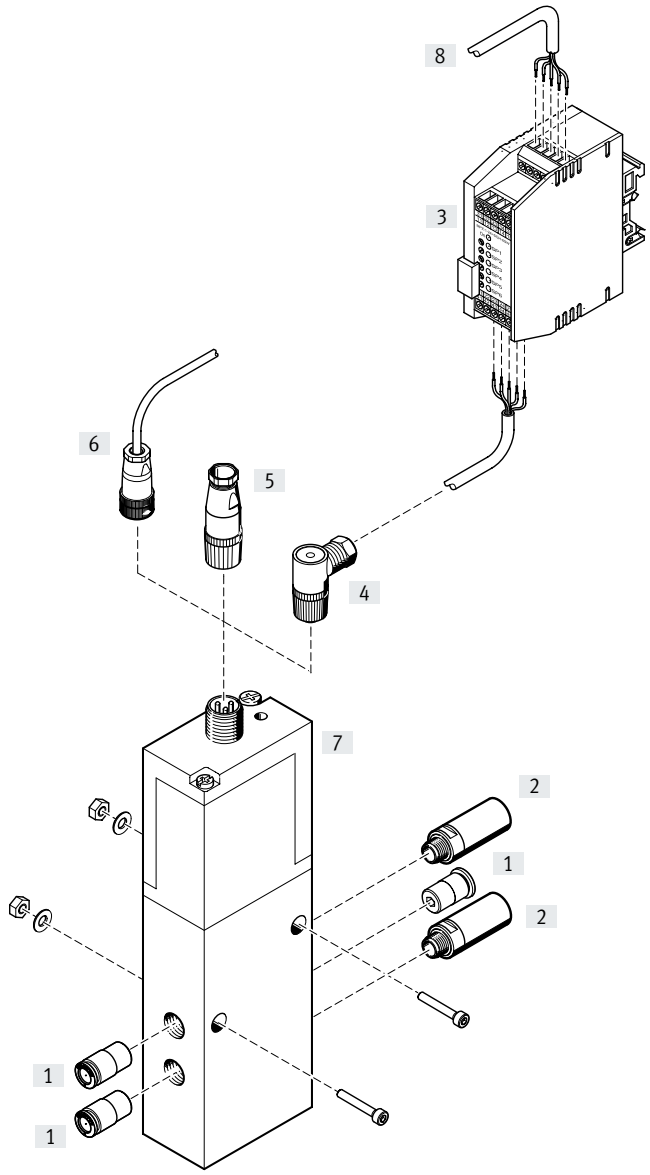
003	Pneumatic connection	
M5	M5	
1/8	G1/8	
1/4	G1/4	
3/8	G3/8	

004	Flow rate	
	Standard	
HF	High flow rate	
LF	Low flow rate	

005	Setpoint input for individual valves	
010	0 ... 10 V	
420	4 ... 20 mA	

006	Generation	
B	Series B	

Peripherals overview

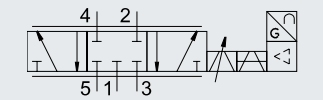


Accessories

		Description	→ Page/Internet
[1]	Push-in fitting	For connecting compressed air tubing with standard O.D.	npqh
[2]	Silencer U	For mounting in exhaust ports	u
[3]	Setpoint module MPZ	For generating 6+1 analogue voltage signals	10
[4]	Sensor socket SIE-WD-TR	Angled, 4-pin, M12x1	10
[5]	Sensor socket SIE-GD	Straight, 4-pin, M12x1	10
[6]	Connecting cable KMPYE	–	10
[7]	Proportional directional control valve MPYE	–	6
[8]	Digital input/output	For actuating the setpoint module	–

Data sheet

Function



- Voltage
  17 ... 30 V DC
- Flow rate
  100 ... 2000 l/min
- Pressure
  0 ... 1 MPa
  0 ... 10 bar

Variants

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

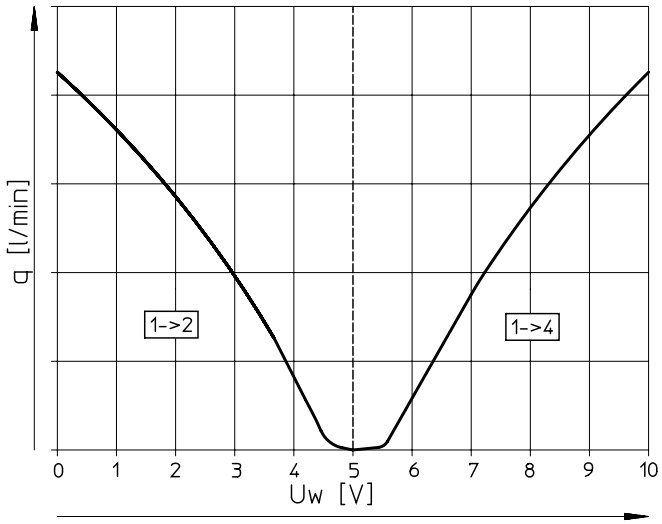
General technical data

Pneumatic connection		M5	G1/8		G1/4	G3/8
			Low flow rate	High flow rate		
Valve function		5/3-way, normally closed				
Design		Piston spool, directly actuated, controlled piston spool position				
Sealing principle		Hard				
Actuation type		Electrical				
Reset method		Magnetic				
Type of control		Direct				
Direction of flow		Not reversible				
Type of mounting		Via through-hole				
Mounting position[1]		Any				
Nominal width	[mm]	2	4	6	8	10
Standard nominal flow rate	[l/min]	100	350	700	1400	2000
Product weight	[g]	255	285	285	510	685

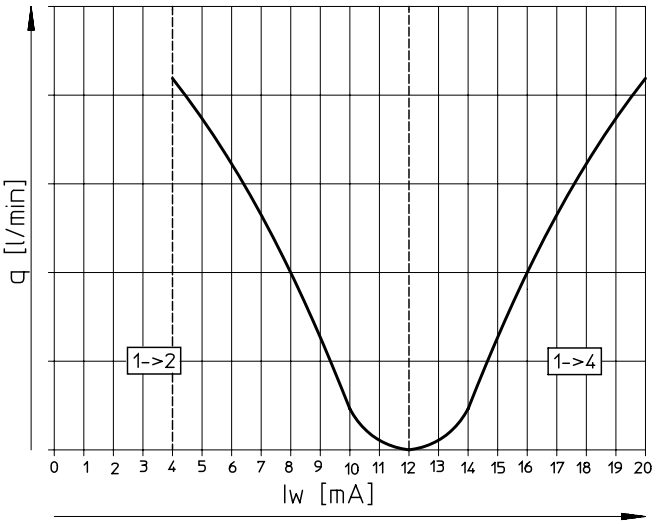
1) If the proportional directional control valve moves during operation, it must be mounted at right angles to the direction of movement.

Flow rate q at 6 → 5 bar as a function of setpoint voltage or current

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



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



Data sheet

Electrical data							
Pneumatic connection			M5	G1/8		G1/4	G3/8
				Low flow rate	High flow rate		
Power supply		[V DC]	17 ... 30				
Switching times		[ms]	4.1	4.8		5.0	5.5
Reference 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				
Residual ripple		[%]	5				
Critical frequency[3]		[Hz]	115	95	95	80	70
Reverse-polarity protection	Voltage type		For all electrical connections				
	Current type		For setpoint value				
Degree of protection			IP65				
Electrical connection			4-pin plug, round design, M12x1				

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

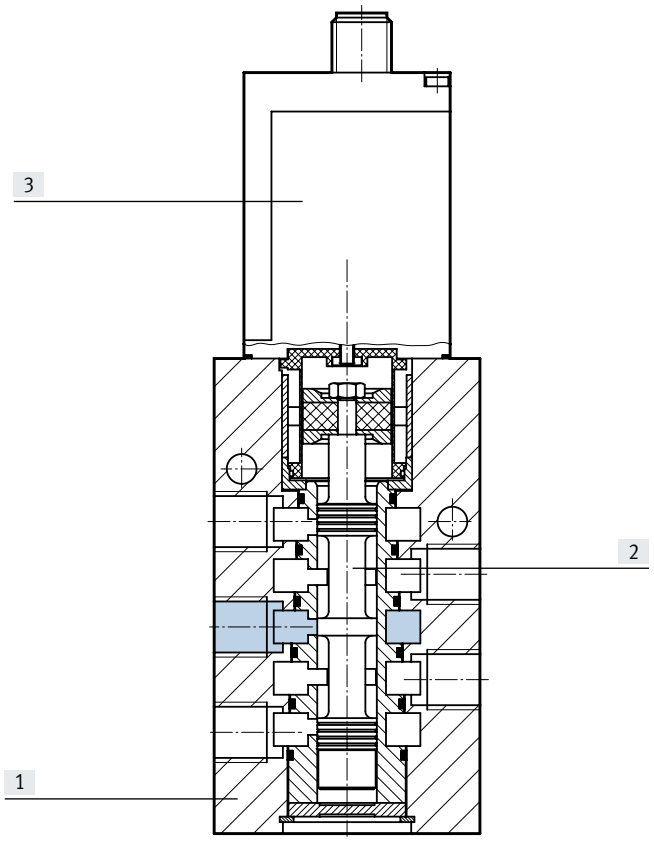
Operating and environmental conditions		
Operating pressure	[MPa]	0 ... 1
	[bar]	0 ... 10
Operating medium		Compressed air to ISO 8573-1:2010 [6:4:4]
Note on the operating/pilot medium		Lubricated operation not possible
Ambient temperature	[°C]	0 ... 50
Temperature of medium	[°C]	5 ... 40, condensation not permitted
Certification		RCM
Shock and vibration resistance[1]		To DIN/IEC 68 Parts 2 – 27, severity level 2 to FN 942017 Parts 4 and 5
CE marking (see declaration of conformity)[2]		To EU EMC Directive[3]
		To EU RoHS Directive
UKCA marking (see declaration of conformity)[2]		To UK instructions for EMC[3]
		To UK RoHS instructions
KC mark		KC EMC
Corrosion resistance CRC[4]		2
Note on materials		RoHS-compliant
PWIS conformity		VDMA24364-B2-L

1) If the proportional directional control valve moves during operation, it must be mounted at right angles to the direction of movement.
2) Additional information www.festo.com/catalogue/... → Support/Downloads.
3) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.
4) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Data sheet

Materials

Sectional view



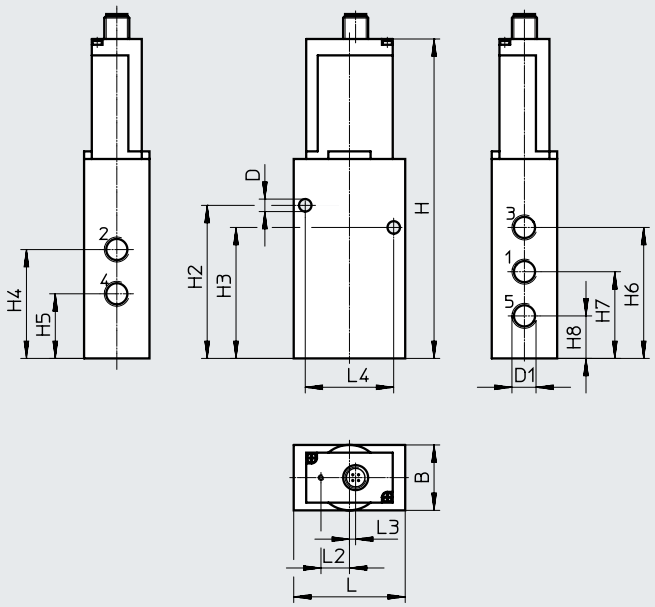
Note

If the power supply cable breaks, the valve assumes the closed mid-position.

Proportional directional control valve		
[1]	Housing	Anodised aluminium
[2]	Valve spool	Tempered aluminium
[3]	Housing for electronics	Coated ABS
–	Seals	NBR

Data sheet

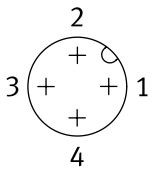
Dimensions Download CAD data ➔ www.festo.com



Type	Pneum. connection D1	B	D ø	H	H2	H3	H4
MPYE-5-M5-...-B	M5	26	5.5	130	57	39	32.3
MPYE-5-1/8-...-B	G1/8	26	5.5	149.3	71.3	55.3	45.8
MPYE-5-1/4-...-B	G1/4	35	6.5	162.5	77.5	66	54.5
MPYE-5-3/8-...-B	G3/8	40	6.5	174.5	96.3	77.3	63.3

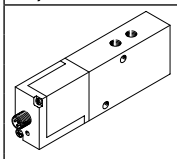
Type	Pneum. connection D1	H5	H6	H7	H8	L	L2	L3	L4
MPYE-5-M5-...-B	M5	20.3	38.3	26.3	14.3	45	14.8	3.2	32
MPYE-5-1/8-...-B	G1/8	26.8	55.3	36.3	17.3	45	14.8	3.2	35
MPYE-5-1/4-...-B	G1/4	31.5	66	43	20	58	14.8	3.2	46
MPYE-5-3/8-...-B	G3/8	35.3	80.3	49.3	18.3	67	14.8	3.2	54

Terminal allocation

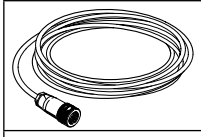
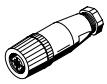
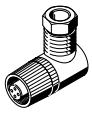
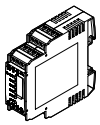


1 24 V DC, supply voltage
2 GND
3 U_W/I_W, setpoint input
4 GND

Ordering data

	Description			Part no.	Type
Proportional directional control valves MPYE					Data sheets ➔ Internet: mpye
	Voltage type 0 ... 10 V	Pneumatic connection M5	Standard flow rate	**154200**	**MPYE-5-M5-010-B**
		Pneumatic connection G1/8	Low flow rate	**151692**	**MPYE-5-1/8-LF-010-B**
			High flow rate	**151693**	**MPYE-5-1/8-HF-010-B**
		Pneumatic connection G1/4	Standard flow rate	**151694**	**MPYE-5-1/4-010-B**
		Pneumatic connection G3/8	Standard flow rate	**151695**	**MPYE-5-3/8-010-B**
	Current type 4 ... 20 mA	Pneumatic connection M5	Standard flow rate	**162959**	**MPYE-5-M5-420-B**
		Pneumatic connection G1/8	Low flow rate	**161978**	**MPYE-5-1/8-LF-420-B**
			High flow rate	**161979**	**MPYE-5-1/8-HF-420-B**
		Pneumatic connection G1/4	Standard flow rate	**161980**	**MPYE-5-1/4-420-B**
		Pneumatic connection G3/8	Standard flow rate	**161981**	**MPYE-5-3/8-420-B**

Accessories

Ordering data	Description		Part no.	Type
Connecting cable				Data sheets ➔ Internet: connecting cable
	Straight socket, M12x1, 4-pin, open cable end	Cable length 5 m	**151909**	**KMPYE-5**
Sensor socket				Data sheets ➔ Internet: sie
	Straight, 4-pin, M12x1		**18494**	**SIE-GD**
	Angled, 4-pin, M12x1		**12956**	**SIE-WD-TR**
Setpoint module				Data sheets ➔ Internet: mpz
	Setpoint module for generating 6 + 1 analogue voltage signals		**546224**	**MPZ-1-24DC-SGH-6-SW**