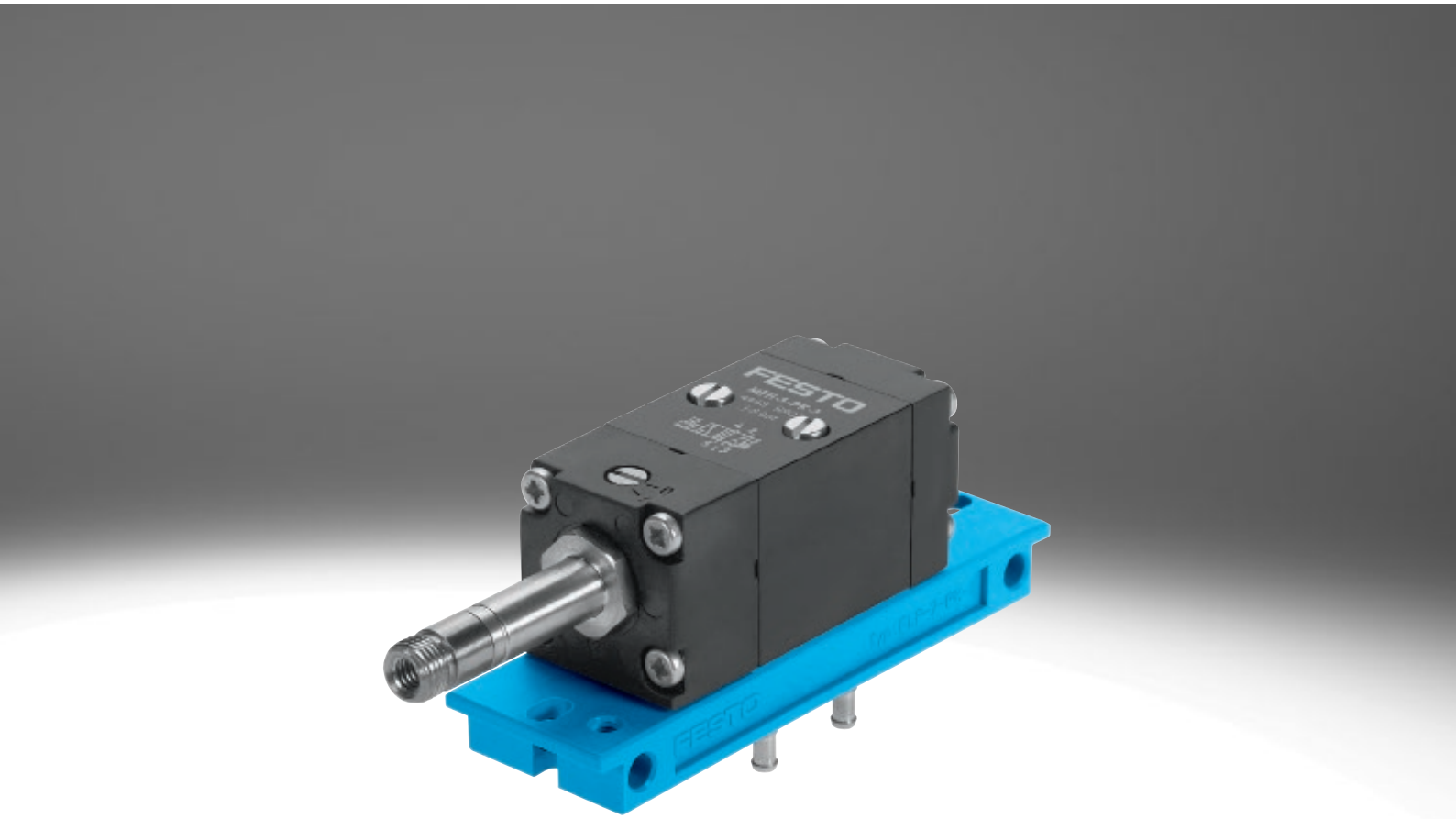
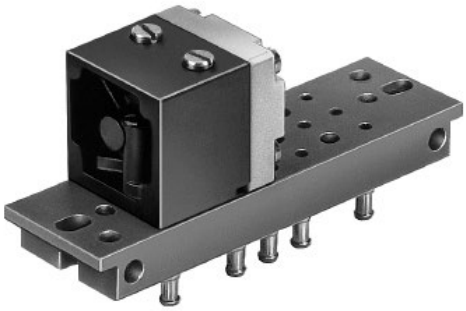
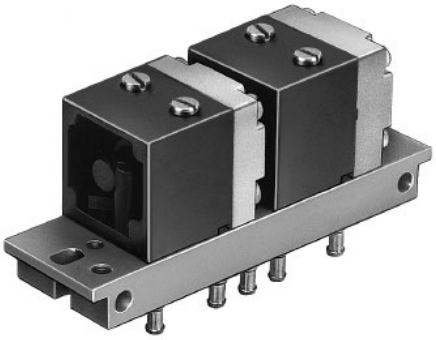
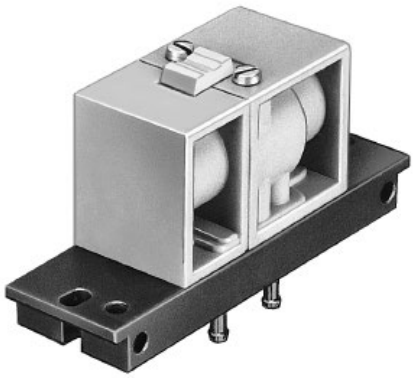
M5 compact system



Key features







- Flow rate
  100 l/min

- Basis for compact pneumatic control systems
- M5 components with 2n sub-bases
- Control cabinet installation
- Easy to mount
- Fast replacement of components
- Barbed connection for plastic tubing NW 3

The M5 compact system is a complete system offering control components with all the functions required for pneumatic sequence control. It is based on the sub-bases 2n and barbed connections for tubing NW 3.

Basic valves and actuator attachments for front-panel mounting as signal elements for basic functions START, STOP etc.

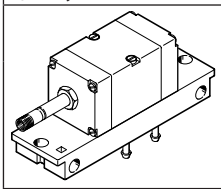
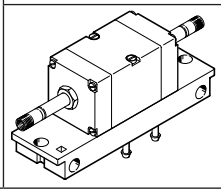
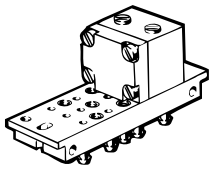
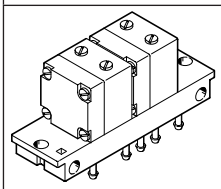
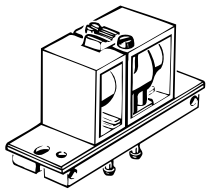
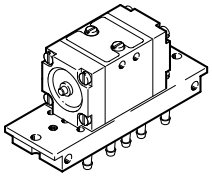
→ Internet: sv

Mounting the components

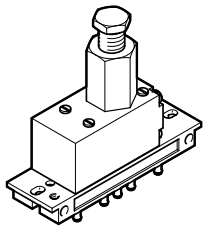
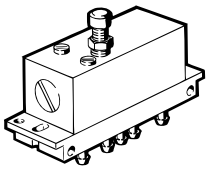
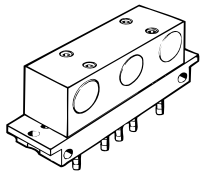
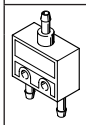
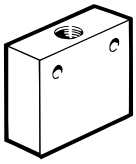
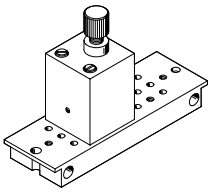
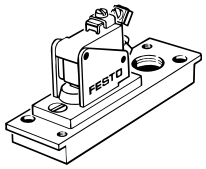
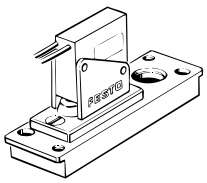
A maximum of 16 components of the M5 compact system with 2N sub-bases can be mounted on the mounting frame. At 480 mm, the length of the frame is designed for 19" housing to DIN 41 488. The strips can be shortened to adapt them to other installation conditions.

During mounting, the sub-bases or mounting plates of the components are slid into the guide slot of the profile strips. These are then firmly clamped between the connecting components.

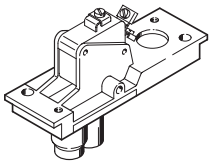
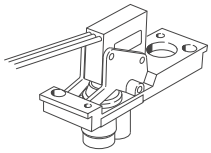
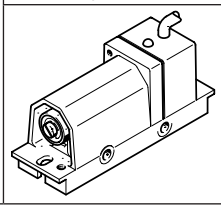
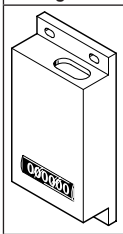
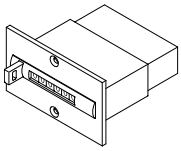
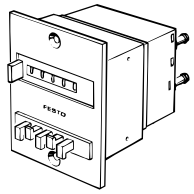
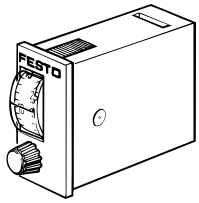
Product range overview

Function	Version	Type	Description	Operating pressure [bar]	→ Page/Internet
Solenoid valves	**5/2-way valves**				
		MFH-5-PK-3	Mechanical spring return For mounting frame 2N	3 ... 8	6
		MFH-5-PK-3-L	Pneumatic spring return For mounting frame 2N	1.5 ... 8	6
		JMFH-5-PK-3	Double solenoid valve For mounting frame 2N	2 ... 8	6
Pneumatic valves	**3/2-way valves**				
		VL/O-3-PK-3	Mechanical spring return For mounting frame 2N	0 ... 8	9
		VL/O-3-PK-3x2	2 pneumatic valves on one sub-base Mechanical spring return For mounting frame 2N	0 ... 8	9
		J-3-PK-3	Pneumatic double pilot valve For mounting frame 2N	–0.9 ... 8	9
	5/2-way valves				
		VL-5-PK-3	Mechanical spring return For mounting frame 2N	0 ... 8	9
		J-5-PK-3	Pneumatic double pilot valve For mounting frame 2N	1 ... 8	9
		JD-5-PK-3	Pneumatic double pilot valve With dominant signal at 14 For mounting frame 2N	1 ... 8	9

Product range overview

Function	Version	Type	Description	Operating pressure [bar]	→ Page/Internet
Pressure sequence valves	**Pressure sequence valves**				
		VD-3-PK-3	Opens and closes at set pressure For mounting frame 2N	1.8 ... 8	12
Time delay valves	**Time delay valves**				
		VZ-3-PK-3	With switch-on delay For mounting frame 2N	2.5 ... 8	14
		VZO-3-PK-3	With switch-off delay For mounting frame 2N	2.5 ... 8	14
Logic components	**AND/OR blocks**				
		OS-PK-3-6/3	3 OR gates For mounting frame 2N	1.6 ... 8	16
		ZK-PK-3-6/3	3 AND gates For mounting frame 2N	1.6 ... 8	16
		OS-PK-3	OR gate	1.6 ... 8	24
		ZK-PK-3	AND gate	1.6 ... 8	24
		OS-1/8-B	OR gate	1 ... 10	24
		ZK-1/8-B	AND gate	1 ... 10	24
		OS-1/4-B	OR gate	1 ... 10	24
		OS-1/2	OR gate	1 ... 10	24
One-way flow control valves	**One-way flow control valves**				
		GRF-PK-3	For mounting frame 2N	0.5 ... 8	17
		GRF-PK-3x2	2 one-way flow control valves on one sub-base For mounting frame 2N	0.5 ... 8	17
PE converter	**Pneumatic/electrical pressure transducer**				
		PE-1/8-2N	For mounting frame 2N	0 ... 8	19
		PE-1/8-2N-SW	Splash-proof design For mounting frame 2N	0 ... 8	19

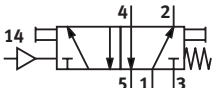
Product range overview

Function	Version	Type	Description	Operating pressure [bar]	→ Page/Internet
PE converter	**Pneumatic/electrical pressure transducer**				
		VPE-1/8-2N	Vacuum switch For mounting frame 2N	–0.95 ... 0	19
		VPE-1/8-2N-SW	Vacuum switch Splash-proof design For mounting frame 2N	–0.95 ... 0	19
	Pneumatic/electrical differential pressure switch				
		PEN-M5	For mounting frame 2N	–1 ... 8	21
Pneumatic counters	**Adding counter**				
		PZA-A-B	Base mounting	2 ... 8	26
		PZA-E-C	Front panel mounting	2 ... 8	26
	Preset counter				
		PZV-E-C	Front panel mounting	2 ... 8	26
Pneumatic timers	**Pneumatic timers**				
		PZVT-3-C PZVT-30-C PZVT-12-C PZVT-300-C	Clamping frame	2 ... 6	31
		PZVT-AUT	Automatic reset module	2 ... 6	31

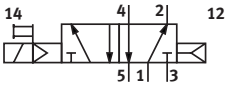
Datasheet

5/2-way valves

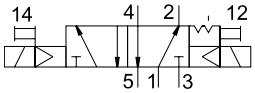
MFH-5-PK-3



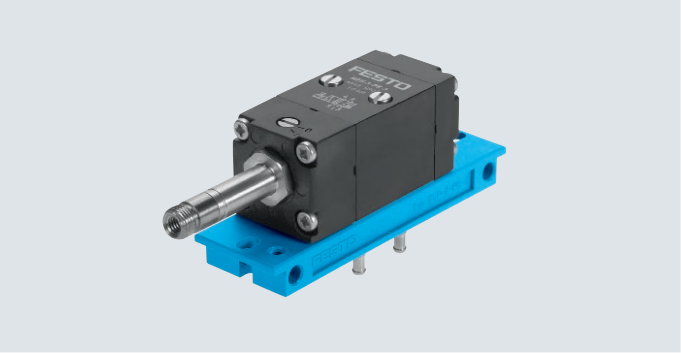
MFH-5-PK-3-L



JMFH-5-PK-3



- Flow rate
  105 l/min
- Operating pressure
  1.5 ... 8 bar



General technical data					
Type			MFH-5-PK-3	MFH-5-PK-3-L	JMFH-5-PK-3
Pneumatic connection 1, 2			PK-1		
Pneumatic connection 3			PK-3		
Pneumatic connection 4, 5			PK-3		
Nominal size		[mm]	2.5		
Standard nominal flow rate qnN		[l/min]	105		
Design			Poppet seat		
Type of mounting			On sub-base		
			On mounting frame		
			Via through-hole		
Mounting position			Any		
Valve function			5/2-way valve, monostable	5/2-way valve, monostable	5/2-way valve, bistable
Sealing principle			Soft		
Switching time	Off	[ms]	22	22	–
	On	[ms]	10	14	–
	Changeover	[ms]	–	–	13
Weight		[g]	270	270	380

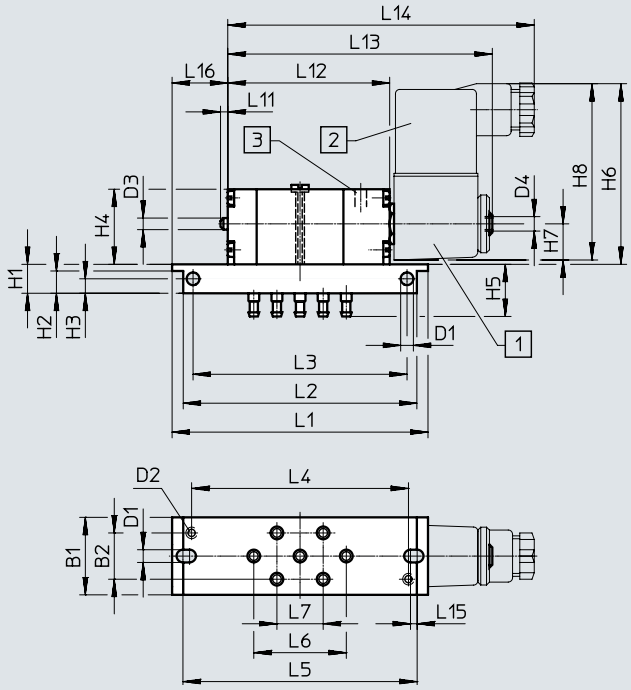
Operating and environmental conditions				
Type		MFH-5-PK-3	MFH-5-PK-3-L	JMFH-5-PK-3
Operating pressure	[bar]	3 ... 8	1.5 ... 8	2 ... 8
Operating/pilot medium		Compressed air to ISO 8573-1:2010 [7:-:-]		
Ambient temperature	[°C]	–5 ... +40	–5 ... +40	0 ... +40
Temperature of medium	[°C]	–10 ... +60	–10 ... +60	0 ... +60

Materials	
Housing	Anodised aluminium
Sub-base	Anodised aluminium
Seals	NBR
Note on materials	RoHS-compliant

Datasheet

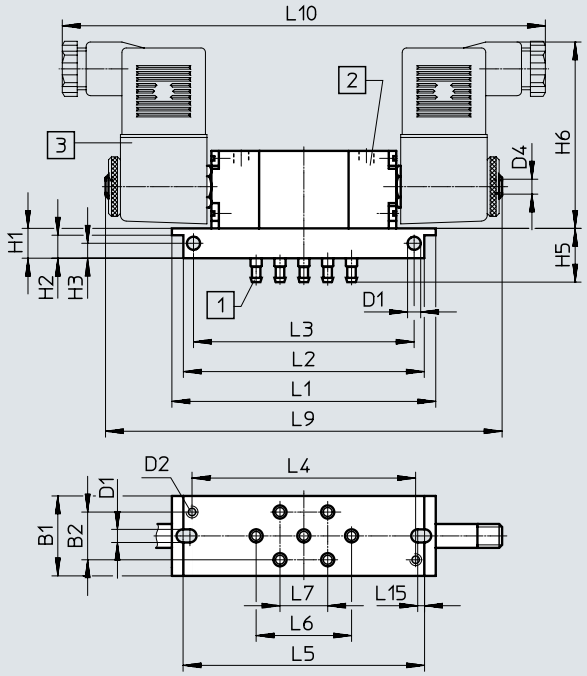
Dimensions – 5/2-way valves Download CAD data ➔ www.festo.com

MFH-5-PK-3(-L)



[1] Rotatable solenoid coil
[2] Plug can be repositioned by 180°
[3] Manual override

JMFH-5-PK-3



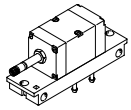
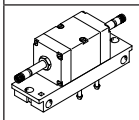
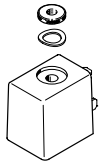
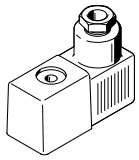
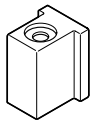
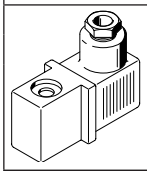
[1] Barbed connector PK-3 for plastic tubing
[2] Manual override
[3] Rotatable solenoid coil

Type	B1	B2	D1 ø	D2	D3 ø	D4	H1	H2	H3	H4	H5	H6	H7	H8
MFH	26.8	16	4.4	M4	4	M5	10	7.7	5	26	18.5	62.5	12.5	61
JMFH					–					–			–	–

Type	L1	L2	L3	L4	L5	L6	L7	L9	L10	L11	L12	L13	L14	L15	L16
MFH	88.5	80.8	74	75	81	32	16	–	–	2.5	56	~90	~106	2.3	19
JMFH								133	162	–	–	–	–		–

Datasheet

Ordering data

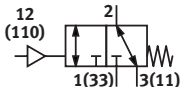
	Description		Part no.	Type
5/2-way valves				
	Monostable	Mechanical spring return	**4448**	**MFH-5-PK-3**
		Pneumatic spring return	**11546**	**MFH-5-PK-3-L**
	Bistable	–	**4447**	**JMFH-5-PK-3**
Solenoid coil, plug to industry standard, type B				
	Without plug socket	12 V DC	**34410**	**MSFG-12-OD**
		24 V DC, 42 V AC	**34411**	**MSFG-24/42-50/60-OD**
		42 V DC	**34413**	**MSFG-42-OD**
		24 V AC	**34415**	**MSFW-24-50/60-OD**
		48 V AC	**34418**	**MSFW-48-50/60-OD**
		110 V AC	**34420**	**MSFW-110-50/60-OD**
		230 V AC	**34422**	**MSFW-230-50/60-OD**
		240 V AC	**34424**	**MSFW-240-50/60-OD**
	With plug socket	12 V DC	**4526**	**MSFG-12**
		24 V DC, 42 V AC	**4527**	**MSFG-24/42-50/60**
		24 V AC	**4534**	**MSFW-24-50/60**
		110 V AC	**6720**	**MSFW-110-50/60**
		230 V AC	**4540**	**MSFW-230-50/60**
Solenoid coil, plug to EN 175301, type A				
	Without plug socket	24 V DC, 42 V AC	**34412**	**MSFG-24/42-50/60-DS-OD**
		230 V AC	**175118**	**MSFW-230-50/60-DS-OD**
	With plug socket, plug can be repositioned by 180°	24 V DC, 42 V AC	**13264**	**MSFG-24/42-50/60-DS**
		110 V AC	**13265**	**MSFW-110-50/60-DS**
	Maritime classification[1] see certificate	230 V AC	**13266**	**MSFW-230-50/60-DS**

1) Additional information: www.festo.com/catalogue/mfh → Support/Downloads.

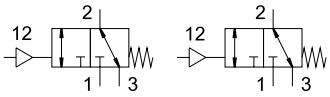
Datasheet

3/2-way valves

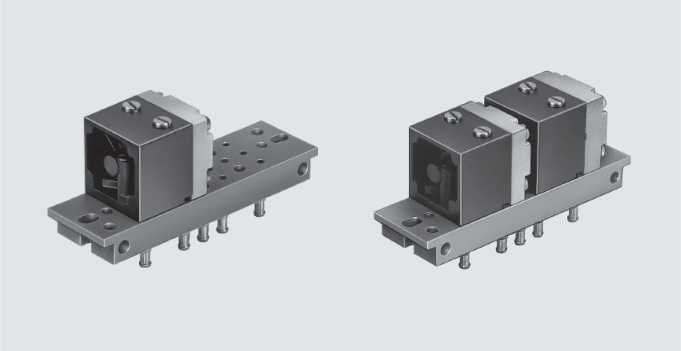
VL/O-3-PK-3



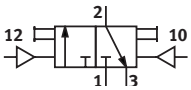
VL/O-3-PK-3x2



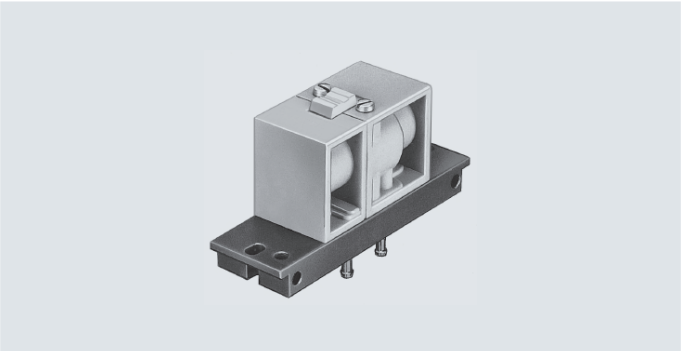
- Flow rate
  100 l/min
- Temperature range
  –10 ... +60 °C
- Operating pressure
  0 ... 8 bar



J-3-PK-3

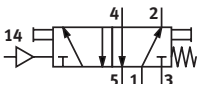


- Flow rate
  100 l/min
- Temperature range
  –10 ... +60 °C
- Operating pressure
  –0.9 ... 8 bar

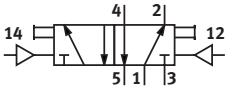


5/2-way valves

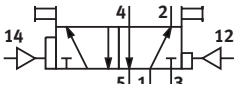
VL-5-PK-3



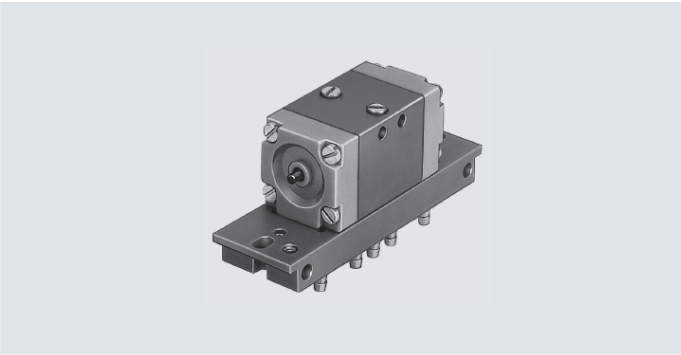
J-5-PK-3



JD-5-PK-3



- Flow rate
  105 l/min
- Operating pressure
  0 ... 8 bar



Datasheet

General technical data								
Type			3/2-way valves			5/2-way valves		
			VL/O-3-PK-3	VL/O-3-PK-3x2	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3
Pneumatic connection 1 ... 5			PK-3					
Auxiliary pilot air connection 10			–	–	PK-3	–	–	–
Auxiliary pilot air connection 12			PK-3	PK-3	PK-3	–	PK-3	PK-3
Auxiliary pilot air connection 14			–	–	–	PK-3	PK-3	PK-3
Nominal size		[mm]	2.5					
Standard nominal flow rate qnN		[l/min]	100	100	100	105	105	105
Design			Poppet seat	Poppet seat	Piston spool	Poppet seat	Poppet seat	Poppet seat
Type of mounting			On sub-base					
			On mounting frame					
			Via through-hole					
Mounting position			Any					
Valve function			3/2-way valve, open, monostable	3/2-way valve, open, monostable	3/2-way valve, bistable	5/2-way valve, monostable	5/2-way valve, bistable	5/2-way valve, bistable, dominant[1]
Switching time	Off	[ms]	50	50	–	22	–	
	On	[ms]	12	12	–	15	–	
	Changeover	[ms]	–	–	7	–	9	9
	Changeover (dominant)	[ms]	–	–	–	–	–	25
Weight		[g]	110	180	75	130	130	130

1) Dominant signal at 14

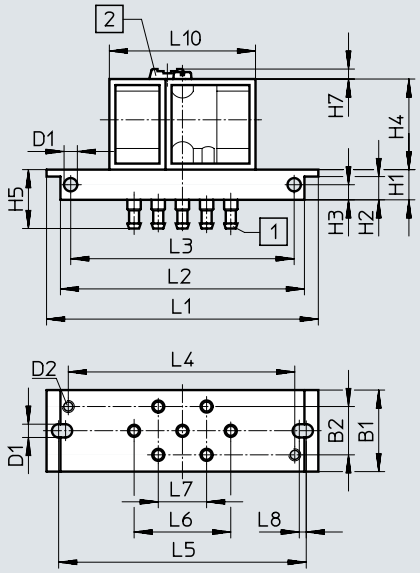
Operating and environmental conditions							
Type		3/2-way valves			5/2-way valves		
		VL/O-3-PK-3	VL/O-3-PK-3x2	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3
Operating pressure	[bar]	0 ... 8	0 ... 8	–0.9 ... 8	0 ... 8	1 ... 8	1 ... 8
Pilot pressure	[bar]	See graph					
Operating/pilot medium		Compressed air to ISO 8573-1:2010 [7:–:–]					
Note on the operating/ pilot medium		Lubricated operation possible (in which case lubrication will always be required)					
Ambient temperature	[°C]	–10 ... +60	–10 ... +60	–10 ... +60	–10 ... +60	0 ... +60	0 ... +60
Temperature of medium	[°C]	–10 ... +60	–10 ... +60	–10 ... +60	–10 ... +60	0 ... +60	0 ... +60

Materials						
Type	3/2-way valves			5/2-way valves		
	VL/O-3-PK-3	VL/O-3-PK-3x2	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3
Housing	Plastic, die-cast zinc					
Sub-base	Brass, reinforced PPS					
Seals	NBR					
Note on materials	–			RoHS-compliant		
LABS (PWIS) conformity	VDMA24364-B1/B2-L		VDMA24364 zone III	VDMA24364-B1/B2-L		

Datasheet

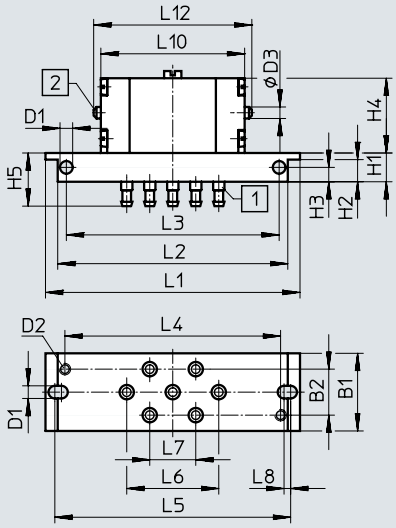
Dimensions Download CAD data ➔ www.festo.com

J-3-PK-3



[1] Barbed connector PK-3 for plastic tubing
[2] Manual override

VL-5-PK-3, J-5-PK-3, JD-5-PK-3



[1] Barbed connector PK-3 for plastic tubing
[2] Manual override

Type	B1	B2	D1 ø	D2	D3 ø	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	L8	L10	L12
J-3	27	16	4.4	M4	–	10	7.7	5	30	18.5	88.5	80.8	74	75	81	32	16	2.3	48.4	–
VL-5					4				26										50	55
J-5					4				26										50	55
JD-5					4				26										50	55

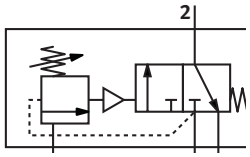
Ordering data

Description	Part no.	Type
3/2-way valves		
Open, monostable (1 valve)	**4233**	**VL/O-3-PK-3**
Open, monostable (2 valves)	**4245**	**VL/O-3-PK-3x2**
Bistable	**10772**	**J-3-PK-3**
5/2-way valves		
Monostable	**4504**	**VL-5-PK-3**
Bistable	**4503**	**J-5-PK-3**
Bistable, dominant[1)]	**4901**	**JD-5-PK-3**

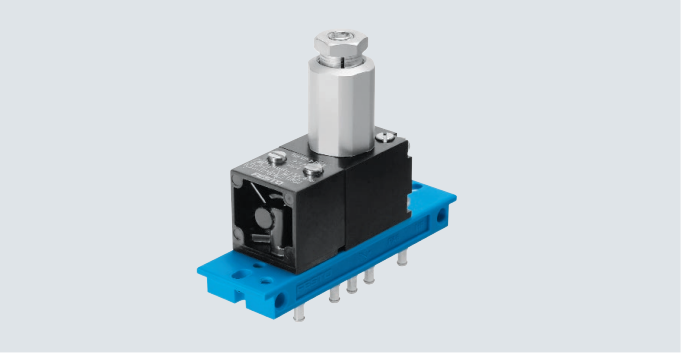
1) Dominant signal at 14

Datasheet

Pressure sequence valve



- Flow rate
  100 l/min
- Temperature range
  –10 ... +60 °C
- Operating pressure
  0.18 ... 0.8 MPa



The pressure sequence valve is used when a pressure-dependent signal is required to switch a control system to the next step, e.g. if a minimum control pressure for the cylinders is reached.

The pressure is set at the adjusting screw.
As soon as the control signal has reached the set pressure, the attached 3/2-way valve is actuated.

Conversely, the valve switches back when the control signal falls below the set pressure.

General technical data		
Type		VD
Pneumatic connection		PK-3
Nominal size	[mm]	2.5
Standard nominal flow rate qnN	[l/min]	100
Type of mounting		Via through-hole
Weight	[g]	220

Operating and environmental conditions		
Operating pressure	[MPa]	0.18 ... 0.8
	[bar]	1.8 ... 8
Operating/pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Corrosion resistance class CRC[1)]		0 - no corrosion stress
Temperature of medium	[°C]	–10 ... +60

1) For additional information www.festo.com/x/topic/crc

Materials	
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Note

To avoid neutral switching statuses, care must be taken to ensure that pressure is applied to the supply port upstream of the pilot port.

Datasheet

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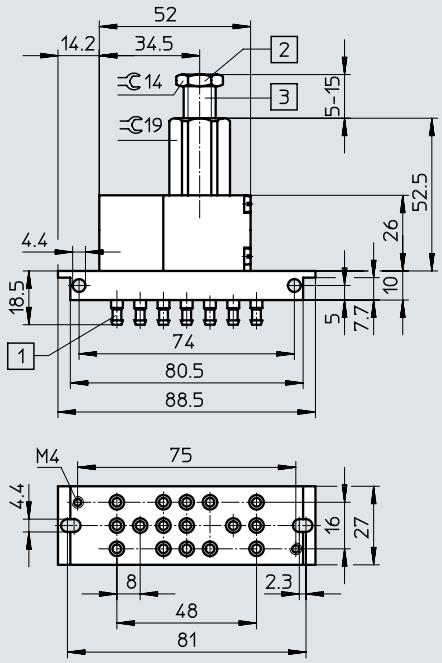


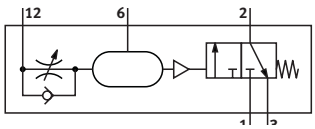
[1] Barbed connector PK-3 for plastic tubing
[2] Locking screw
[3] Pressure adjusting screw (1 graduation line ~ 1 bar)

Ordering data

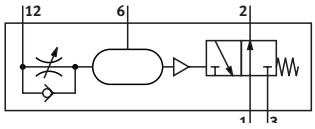
Type ID code	Part no.	Type
VD	**9270**	**VD-3-PK-3**

Datasheet

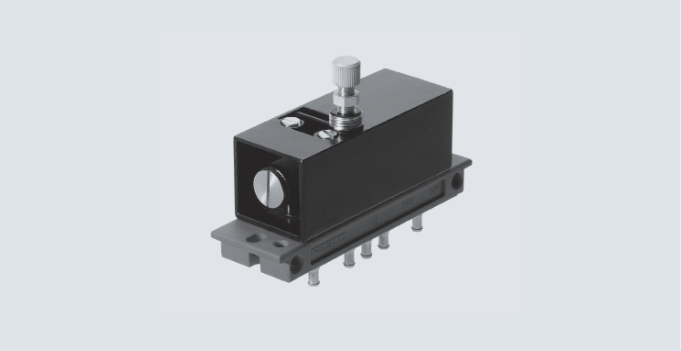
VZ, with switch-on delay



VZO, with switch-off delay



- Flow rate
  60 ... 90 l/min
- Temperature range
  –10 ... +60 °C
- Operating pressure
  2.5 ... 8 bar



The time delay valve consists of a pneumatically actuated 3-way valve and an upstream flow control valve with additional volume.

The delay in the valve actuation is dependent on the setting of the flow control valve.

It is reset via a mechanical spring.

General technical data			
Type		VZ	VZO
Pneumatic connection		PK-3	
Nominal size	[mm]	2	
Standard nominal flow rate qnN	[l/min]	90	60
Design		Poppet valve with spring return	
Actuation type		Pneumatic	
Type of mounting		Front panel mounting	
		On mounting frame	
Mounting position		Any	
Valve function		3/2-way valve, closed, monostable	3/2-way valve, open, monostable
Overlap		Negative overlap	
Manual override		None	
Exhaust function		Can be throttled	
Type of actuation		Direct	
Pilot air supply		External	
Direction of flow		Not reversible	
Sealing principle		Soft	
Adjustable delay time[1)]	[s]	0.25 ... 5	
Pause period for reset	[ms]	≥ 55	≥ 50
Repetition accuracy of time setting	[s]	±0.5	
Weight	[g]	150	

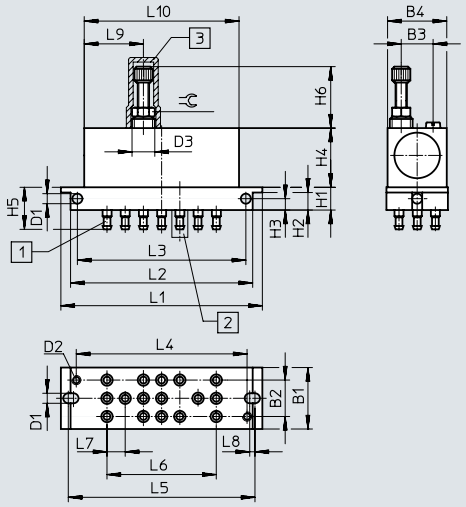
1) To achieve delay times that are longer than 5 s, an additional volume can be connected to the barbed connector 6 once the sealing cap has been removed. A 10 cm³ increase in volume will increase the time delay by approx. 5 s. Air reservoir VZS → Internet: vzs

Operating and environmental conditions		
Operating pressure	[bar]	2.5 ... 8
Operating/pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/ pilot medium		Lubricated operation not possible
Note on forced checking procedure		Switching frequency min. 1/week
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60

Materials	
Housing	Die-cast zinc
Seals	NBR
Note on materials	RoHS-compliant

Datasheet

Dimensions Download CAD data ➔ www.festo.com



[1] Barbed connector PK-3 for plastic tubing
[2] Connection 6 with end cap, for additional volume
[3] Protective cap

Type	B1	B2	B3	B4	D1 ⌀	D2	D3	H1	H2	H3	H4	H5
VZ VZO	27	16	14	26	4.4	M4	M10x1	10	7.7	5	26	18.5

Type	H6 min.	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	⌯
VZ VZO	27	88.5	80.8	74	75	81	48	8	2.3	26	68	8

Ordering data

Description	Part no.	Type
With switch-on delay	**5755**	**VZ-3-PK-3**
With switch-off delay	**5754**	**VZO-3-PK-3**

Ordering data – Accessories

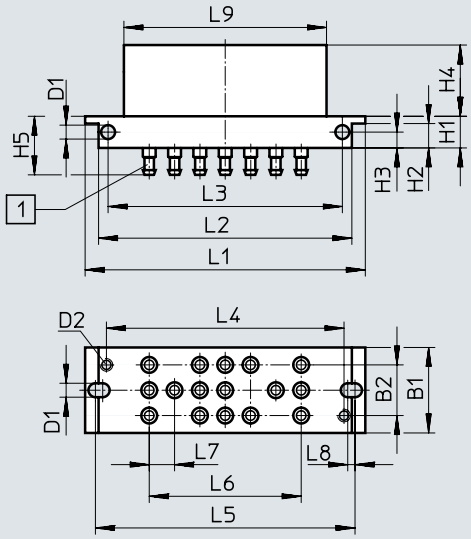
Description		Part no.	Type
Cover cap	Tamper-proof protective cap	**6436**	**GRK-M5**

Datasheet

General technical data			
		OS-PK-3-6/3	ZK-PK-3-6/3
Valve function		OR function	AND function
Nominal size	[mm]	2.5	2.5
Mounting position		Any	
Type of mounting		With through-hole, front panel mounting, on mounting frame	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium		Lubricated operation possible (in which case lubrication will always be required)	
Pneumatic connection	[mm]	PK-3 for tubing I.D. 3	
Standard nominal flow rate	[l/min]	100	
Information on materials: Housing		POM	POM
Information on materials: Seals		NBR	NBR
Weight	[g]	90	85

Operating and environmental conditions		
Operating pressure	[bar]	1.6 ... 8
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60

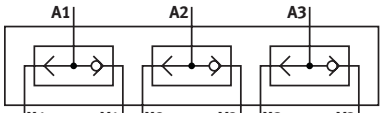
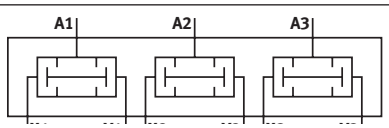
Dimensions Download CAD data ➔ www.festo.com



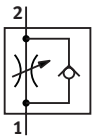
[1] Barbed connector for tubing I.D. 3

Type	B1	B2	D1 ø	D2	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	L8	L9
OS/ZK	27	16	4.4	M4	10	7.7	5	22.5	18.5	88.5	80.8	74	75	81	48	8	2.3	64

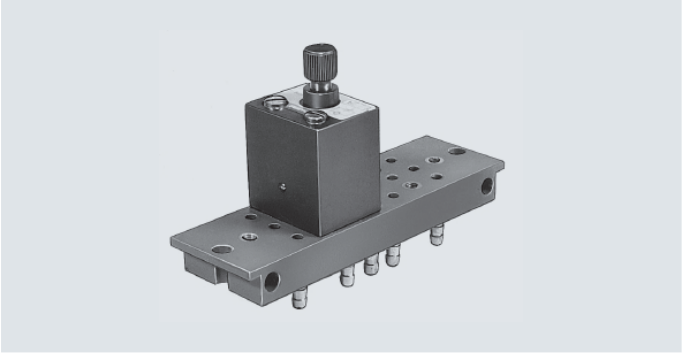
Ordering data

		Part no.	Type
OR block (3 OR gates)		**4232**	**OS-PK-3-6/3**
AND block (3 AND gates)		**4204**	**ZK-PK-3-6/3**

Datasheet



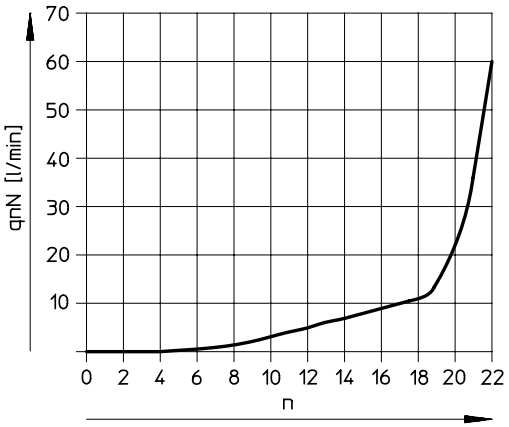
- Flow rate
  45 l/min
- Temperature range
  –10 ... +60 °C
- Operating pressure
  0.5 ... 8 bar



General technical data			
		GRF-PK-3	GRF-PK-3X2
Valve function		One-way flow control function	
Pneumatic connection 2		PK-3	
Pneumatic connection 1		PK-3	
Standard nominal flow rate qnN	[l/min]	45	
Adjusting element		Knurled screw	
Type of mounting		Via through-hole	
Mounting position		Any	
Weight	[g]	95	145

Operating and environmental conditions		
Operating pressure	[bar]	0.5 ... 8
Operating medium		Compressed air to ISO 8573-1:2010 [7:–:–]
Note on the operating/ pilot medium		Lubricated operation possible (in which case lubrication will always be required)
Ambient temperature	[°C]	–10 ... +60
Temperature of medium	[°C]	–10 ... +60

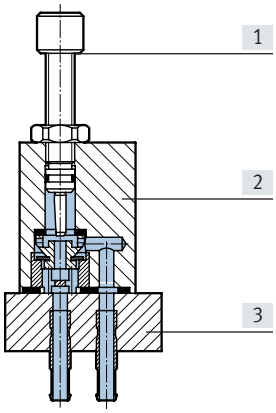
Standard nominal flow rate qnN at 6 bar > 5 bar as a function of spindle rotations n



Datasheet

Materials

Sectional view



One-way flow control valve		
[1]	Adjusting screw	Brass
[2]	Housing	Wrought aluminium alloy
[3]	Sub-base	PA
–	Seals	NBR

Dimensions

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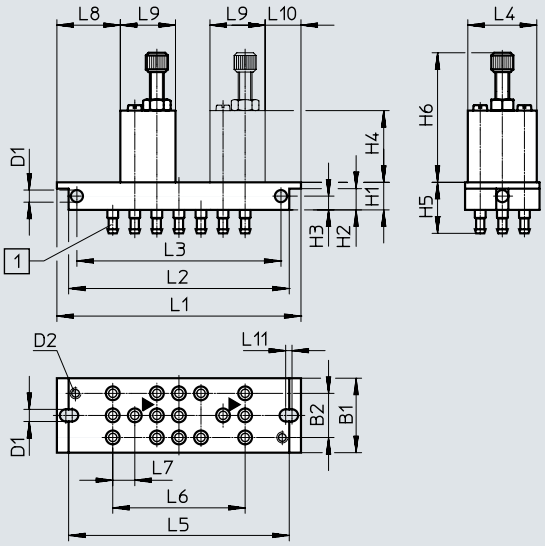
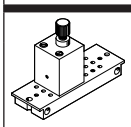


[1] Barbed connector PK-3

Type	B1	B2	D1 ø	D2	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
GRF	27	16	4.4	M4	10	7.7	5	26	18.5	≤ 47	88.5	80.8	74	25	80	48	8	23	20	13	2.3

Ordering data

	Number of one-way flow control valves	Part no.	Type
	1	**4565**	**GRF-PK-3**
	2	**4566**	**GRF-PK-3X2**

Datasheet

General technical data			
		PE converter	Vacuum switch
		PE-1/8-2N-SW	VPE-1/8-2N-SW
Measurement method		Pneumatic/electrical pressure transducer	
Measured variable		Relative pressure	
Type of mounting		On mounting frame 2N	
		Via through-hole	
Mounting position		Any	
Pneumatic connection		G1/8	
Electrical connection		3 connector leads	3 connector leads
Materials			
Housing		Die-cast aluminium, PA, steel	PA, POM, steel, VMQ
Diaphragm		TPE-U(PU)	CR
Switching contact		Silver	Silver
Electrical connection		Tin-plated	Tin-plated
Cable sheath		PVC	–
Weight	[g]	65	45

Note: this product conforms to ISO 1179-1 and ISO 228-1.

Operating and environmental conditions			
		PE converter	Vacuum switch
		PE-1/8-2N-SW	VPE-1/8-2N-SW
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]	
Note on the operating/pilot medium		Lubricated operation possible (in which case lubrication will always be required)	
Operating pressure	[MPa]	0 ... 0.8	–0.095 ... 0
	[bar]	0 ... 8	–0.95 ... 0
Switch-on point	[bar]	2	–0.25
Switch-off point	[bar]	0.5	≤ 0.1
Ambient temperature	[°C]	0 ... +60	
Temperature of medium	[°C]	0 ... +60	

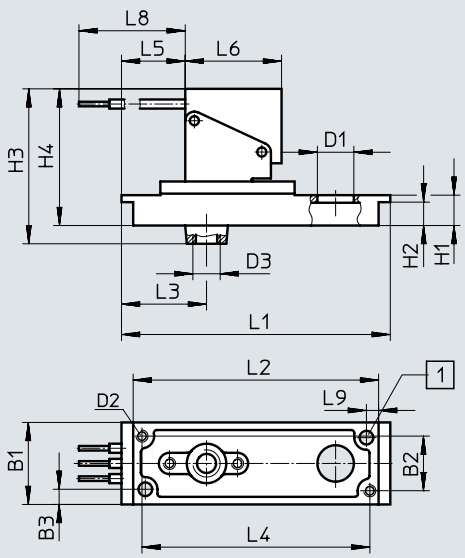
Electrical data			
		PE converter	Vacuum switch
		PE-1/8-2N-SW	VPE-1/8-2N-SW
Operating voltage range AC	[V AC]	12 ... 250	
Operating voltage range DC	[V DC]	12 ... 250	
Switching element function		Changeover switch	
Switching output		Contacting	–
Switching function		Threshold value with fixed hysteresis	–
Minimum load current	[mA]	100	
Max. switching frequency	[Hz]	1	
CE marking (see declaration of conformity)		To EU Low Voltage Directive	
Certification		CCC	
Degree of protection		IP67	IP67

Max. permissible electrical load					
DC voltage			Alternating voltage		
Voltage [V DC]	Resistance load [A]	Inductive load [A]	Voltage [V AC]	Resistance load [A]	Inductive load [A]
PE/VPE-1/8-2N-SW					
15	10	10	125	5	5
30	5	3	250	5	2
50	1	1			
75	0.75	0.25			
124	0.5	0.03			
250	0.25	0.02			

Datasheet

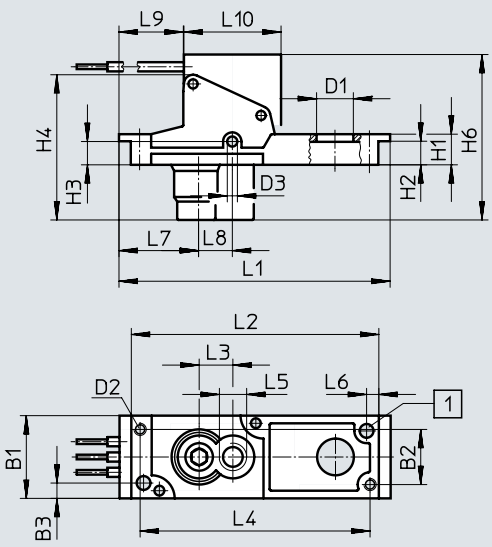
Dimensions Download CAD data ➔ www.festo.com

PE-1/8-2N-SW



[1] For thread M4

VPE-1/8-2N-SW



[1] For thread M4

Type	B1	B2	B3	D1 ø	D2	D3	H1	H2	H3	H4	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
PU	27	18	5	12	M4	3.3	10	7.7	51	45	–	88.5	80.8	28	75	21	31.7	–	500	4	–
VPE						G1/8			7.6	47.4	54			11		G1/8	4	26	11	21	31.7

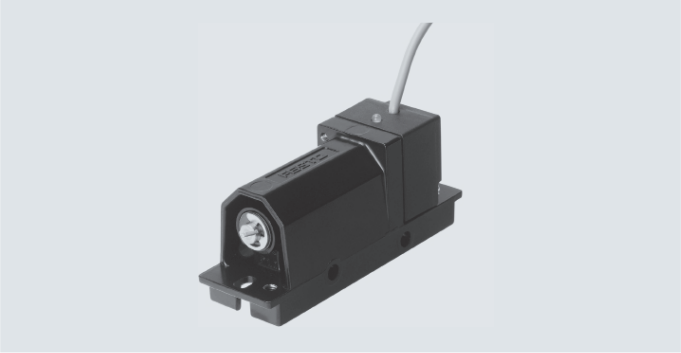
Note: this product conforms to ISO 1179-1 and ISO 228-1.

Ordering data	Part no.	Type
PE converter, splash-proof	**7862**	**PE-1/8-2N-SW**
Vacuum switch, splash-proof	**12595**	**VPE-1/8-2N-SW**
Accessories		
Protective cap for protection against accidental contact	**165614**	**SPE-B**

Datasheet

Temperature range
–20 ... +60 °C

Operating pressure
–0.1 ... +0.8 MPa



General technical data	
Certification	RCM
CE marking (see declaration of conformity)	To EU EMC Directive[1)]
Note on materials	RoHS-compliant
	Free of copper and PTFE
Degree of protection	IP67

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/pen-m5 → 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.

Input signal/measuring element	
Measured variable	Relative pressure (overpressure: connection to P1/vacuum: connection to P2)
	Differential pressure (connection P1 and P2, condition: P1 ≥ P2)
Measurement method	Pneumatic/electrical differential pressure switch

Switching output		
Switching output		PNP
Switching element function		N/O
Threshold-value setting range	[bar]	–0.8 ... +8
Max. switching frequency	[Hz]	70
Max. output current	[mA]	350

Output, additional data	
Short circuit current rating	Yes

Electronics		
Operating voltage range	[V DC]	12 ... 30

Electromechanics		
Electrical connection		Cable, 3-core, open end
Cable length	[m]	2.5

Mechanical systems		
Type of mounting		On mounting frame 2N
		Via through-hole
Mounting position		Any
Pneumatic connection		M5
Weight	[g]	240

Display/operation	
Switching status indication	Yellow LED

Datasheet

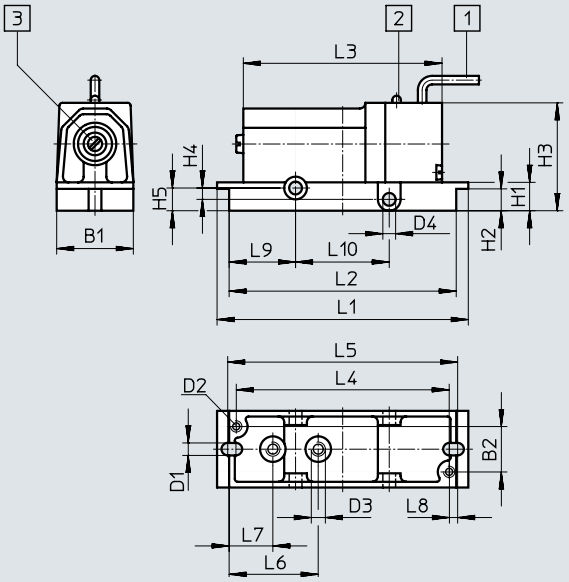
Operating and environmental conditions		
Operating pressure	[MPa]	–0.1 ... +0.8
	[bar]	–1 ... +8
	[psi]	–14.5 ... +116
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubrication will always be required)
Temperature of medium	[°C]	–20 ... +60
Ambient temperature	[°C]	–20 ... +60
CE marking (see declaration of conformity)[1)]		To EU EMC Directive To EU RoHS Directive
UKCA marking (see declaration of conformity)[1)]		To UK EMC regulations To UK RoHS regulations

1) Additional information: www.festo.com/catalogue/pen-m5 ➔ Support/Downloads.

Materials	
Housing	Die-cast zinc
Sealing ring	NBR
LABS (PWIS) conformity	VDMA24364-B2-L

Dimensions

Download CAD data ➔ www.festo.com

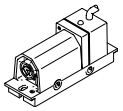


[1] Cable: 3x0.14 mm², 2.5 m long
[2] Yellow LED
[3] Pressure threshold setting

Colour coding:
BN = 24 V
BU = 0 V
BK = switching output
The switch is protected against polarity reversal

Type	B1	B2	D1 ø	D2	D3	D4 ø	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
PEN-M5	27	16	4.4	M4	M5	4.5	10	7.7	37	3	8	88.5	80.8	70	75	81	31.4	15.4	2.9	23.4	33

Ordering data

		Part no.	Type
	M5	**8625**	**PEN-M5**

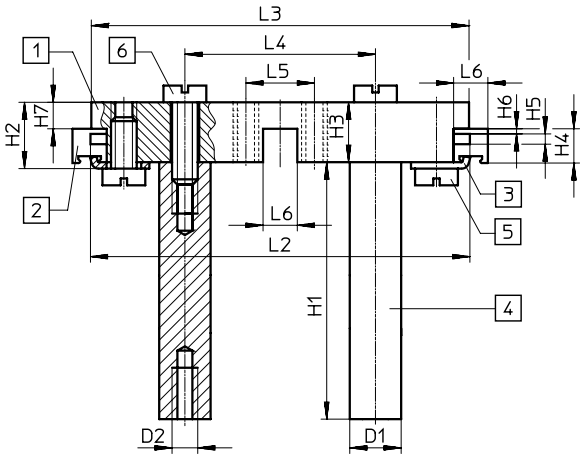
Accessories

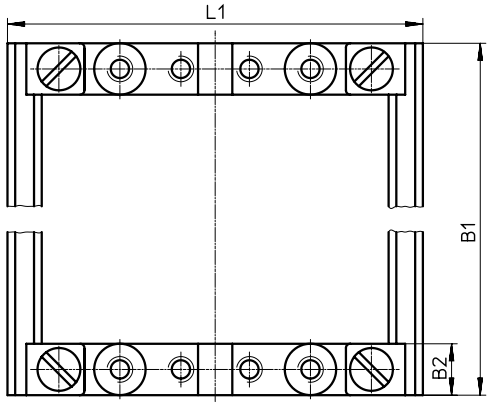
Mounting frame NRRQ-2N

Scope of delivery

2 x connecting component NRV-2N
2 x profile strip NRQ-8-480
4 x mounting bracket NRW-12/3
4 x bolt NRB-12/60
4 x socket head screw
DIN 84-M6X18-4.8
4 x socket head screw
DIN 84-M6X12-4.8
4 x mounting bracket NRW-9/1.5-B
4 x socket head screw
DIN 84-M4X10-4.8

[1] Connecting component NRV-2N
[2] Mounting rail NRQ-8-480
[3] Mounting bracket NRW-12/3
[4] Bolt NRB-12/60
[5] Socket head screw
DIN 84-M6X18-4.8
[6] Socket head screw
DIN 84-M6X12-4.8



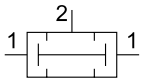


Type	B1	B2	D1 ⌀	D2	H1	H2	H3	H4	H5	H6	H7	L1	L2	L3	L4	L5	L6
NRRQ	480	12	12	M6	60	15.5	14	8	2.4	1.2	6.2	97	88.6	88.2	44.5	16	8

Mounting frame	Part no.	Type
Mounting frame 2N complete For 16 components	**9365**	**NRRQ-2N**
Accessories		
Mounting bracket For mounting sub-bases on the frame	**11571**	**NRW-9/1.5-B**
Socket head screw (2 included in the scope of delivery)	**204021**	**DIN 84-M4X12-4.8**

Datasheet

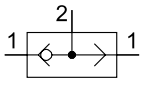
AND gate ZK



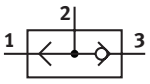
OR gate OS

OS-PK-3

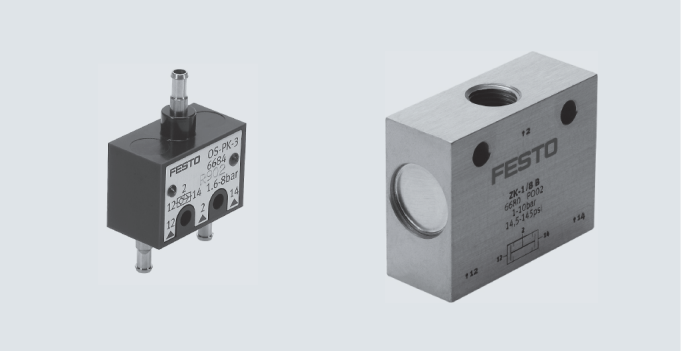
OS-1/8 / 1/4-B



OS-1/2



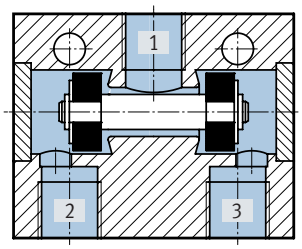
- Flow rate
  120 ... 5000 l/min
- Temperature range
  –10 ... +60 °C
- Operating pressure
  1 ... 10 bar



Valve function

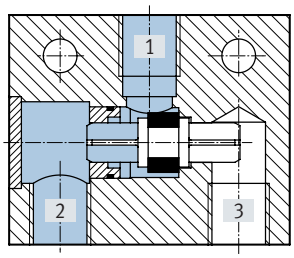
AND function

For an AND gate, all input signals must be active at the same time in order to execute a function.
The AND gate ZK has two inputs [2], [3] and one output [1]. Output [1] is only pressurised if pressure is supplied to both inputs at the same time. If different pressures are present at the inputs, the lower pressure is fed to the output [1].



OR function

For an OR gate, at least one of all the input signals must be active in order to execute a function.
The OR gate OS has two inputs [2], [3] and one output [1]. Output [1] is pressurised if pressure is supplied to at least one of the two inputs. The valve automatically blocks the input which is not pressurised. If both inputs are simultaneously supplied with different pressures, the higher pressure is fed to the output [1].



General technical data

Valve function		AND function		OR function			
Type		ZK-PK-3	ZK-1/8-B	OS-PK-3	OS-1/8-B	OS-1/4-B	OS-1/4-B
Pneumatic connection		PK-3	G1/8	PK-3	G1/8	G1/4	G1/2
Nominal size	[mm]	2.4	4.5	2.4	4	6.5	12
Standard nominal flow rate qnN	[l/min]	120	550	120	500	1170	5000
Weight	[g]	10	45	9	45	110	814
Type of mounting		Via through-hole					
Mounting position		Any					

Note: this product conforms to ISO 1179-1 and ISO 228-1.

Operating and environmental conditions

Type		ZK-PK-3	ZK-1/8-B	OS-PK-3	OS-1/8-B	OS-1/4-B	OS-1/2
Operating pressure	[bar]	1.6 ... 8	1 ... 10	1.6 ... 8	1 ... 10	1 ... 10	1 ... 10
Operating/pilot medium		Compressed air to ISO 8573-1:2010 [7:–:–]					
Note on the operating/ pilot medium		Lubricated operation possible (in which case lubrication will always be required)					
Ambient temperature	[°C]	–10 ... +60					
Temperature of medium	[°C]	–10 ... +60					

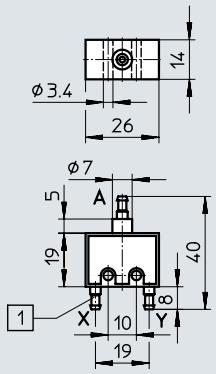
Materials

Type	ZK-PK-3	ZK-1/8-B	OS-PK-3	OS-1/8-B	OS-1/4-B	OS-1/2
Housing	Brass, POM	Anodised wrought aluminium alloy	POM	Wrought aluminium alloy		
Seals	NBR					
Note on materials	RoHS-compliant					

Datasheet

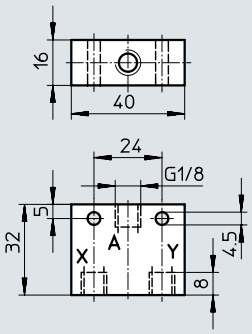
Dimensions Download CAD data ➔ www.festo.com

ZK-PK-3
OS-PK-3

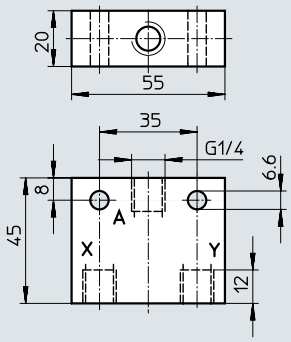


[1] Barbed connector PK-3

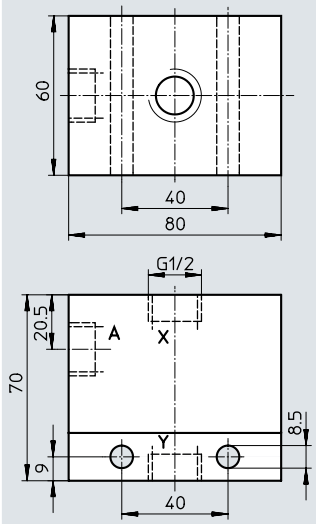
ZK-1/8-B
OS-1/8-B



OS-1/4-B



OS-1/2

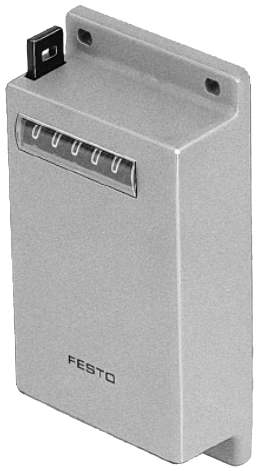


Note: this product conforms to ISO 1179-1 and ISO 228-1.

Ordering data

Valve function	Pneumatic connection	Part no.	Type
AND function	PK-3	**6685**	**ZK-PK-3**
	G1/8	**6680**	**ZK-1/8-B**
OR function	PK-3	**6684**	**OS-PK-3**
	G1/8	**6681**	**OS-1/8-B**
	G1/4	**6682**	**OS-1/4-B**
	G1/2	**3427**	**OS-1/2**

Key features



Adding counter

- Base mounting
- Front panel mounting

Adding counters have 6 digits and count upwards, i.e. the relevant signals are added. If it is reset, the number 000 000 appears.
A pneumatic signal switches the counter by half a step, so the first half of the number is visible. At the end of the signal, with the 2nd half-step, the number is completely visible.
The counter can be reset manually by pressing a button. It can also be reset pneumatically using a compressed air signal. While it is being reset, no counting signal can be received or be present.

Preset counter

- Subtraction counting mode
- Manual and pneumatic reset
- Protective cap

The counter counts pneumatic signals backwards from a preset number. Once the zero position is reached, the counter gives a pneumatic output signal. This output signal remains until the counter is reset.
The counter is preset by pressing the reset button and entering the preset value at the same time. Once the number has been preset, it is retained for future resetting of the counter.

Datasheet

General technical data				
Type		Adding counter		Preset counter
		PZA-A-B	PZA-E-C	PZV-E-C
Design		Mechanical counter with pneumatic drive		
Type of mounting		3 through-holes in the housing	Front panel mounting	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on the operating/ pilot medium		Lubricated operation not possible		
Pneumatic connection		M5		
Display[1]		6-digit	6-digit	5-digit
Reset		Manual button or pneumatic signal		
Response pressure				
Actuator	[bar]	0.6 ±0.2	> 0.8	0.6 ±0.2
Reset	[bar]	0.6 ±0.2	2	–
Drop-off pressure				
Actuator	[bar]	0.2 ±0.1	< 0.15	0.2 ±0.1
Reset	[bar]	0.15 ±0.1	< 0.15	0.15 ±0.1
Min. pulse length				
Actuator	[ms]	10	8	10
Reset	[ms]	180	150	180
Min. pause period				
Actuator	[ms]	15	10	15
Reset	[ms]	50	50	50
Materials		Housing: Plastic		
		Seals: Chloroprene		
Weight	[g]	155	70	150

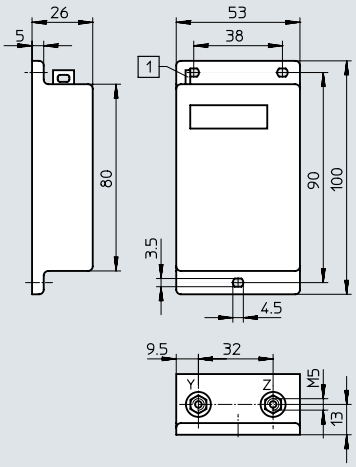
1) Digit size 4.5 mm

Operating and environmental conditions				
Type		Adding counter		Preset counter
		PZA-A-B	PZA-E-C	PZV-E-C
Operating pressure	[bar]	2 ... 8		
Min. reset pressure	[bar]	2	–	–
Ambient temperature	[°C]	–10 ... +60	0 ... +60	

Datasheet

Dimensions Download CAD data ➔ www.festo.com

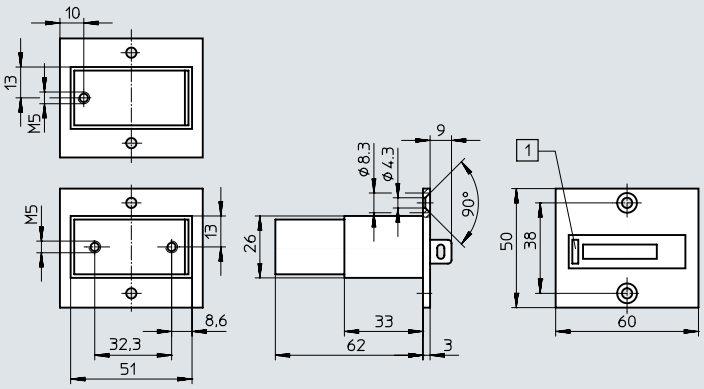
Adding counters – Base mounting PZA-A-B



[1] Reset button

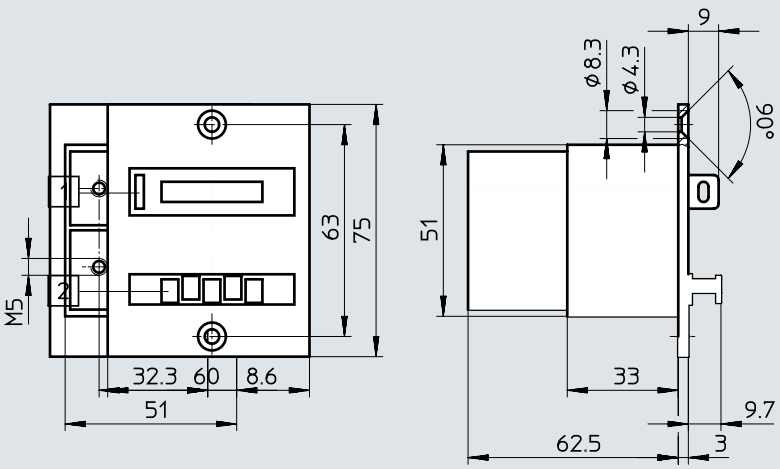
Z = Count signal
Y = Reset signal

Adding counters – Front panel mounting PZA-E-C



[1] Reset button

Preset counters – Base mounting PZV-E-C



[1] Reset button
[2] Presetting buttons

The preset number is reset once again using the reset button or via a pneumatic signal at the reset connection.

Note: The output signal must not be used to reset the counter. During the resetting process, no count pulses can be received or be present.

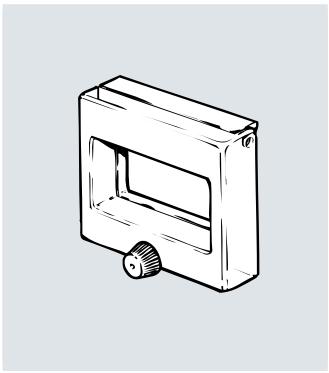
Datasheet

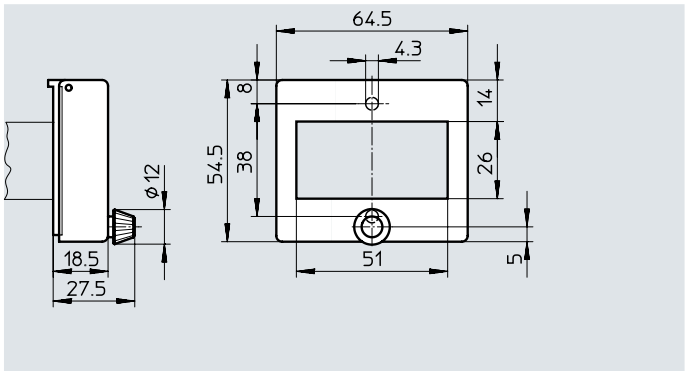
Ordering data

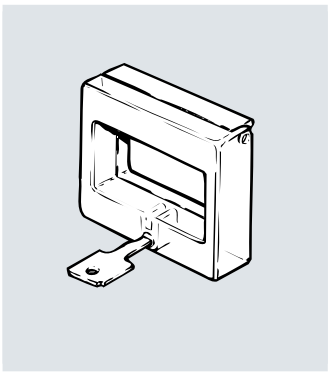
		Part no.	Type
Adding counter	Base mounting	**14992**	**PZA-A-B**
	Front panel mounting	**8606**	**PZA-E-C**
Preset counter	Base mounting	**15608**	**PZV-E-C**

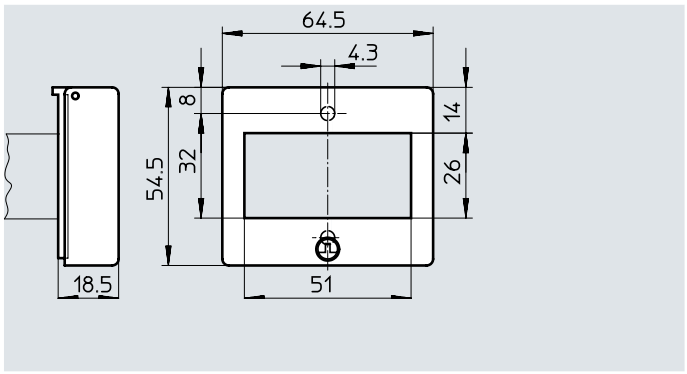
Accessories

Protective cap
With rotary knob PZ-SK-1
With lock PZ-SS-1
Protective cap for adding counters to prevent the ingress of dirt and spray at the front





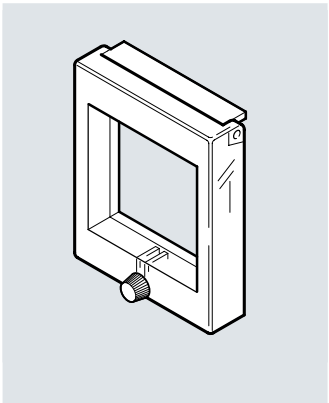


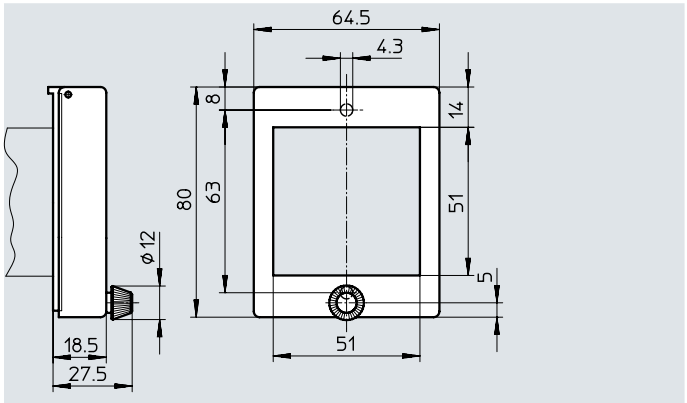


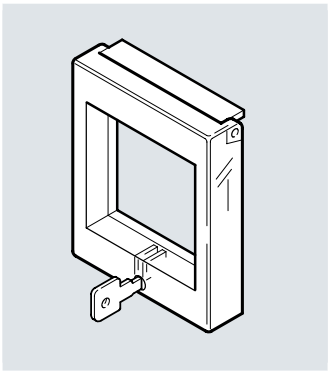
Ordering data

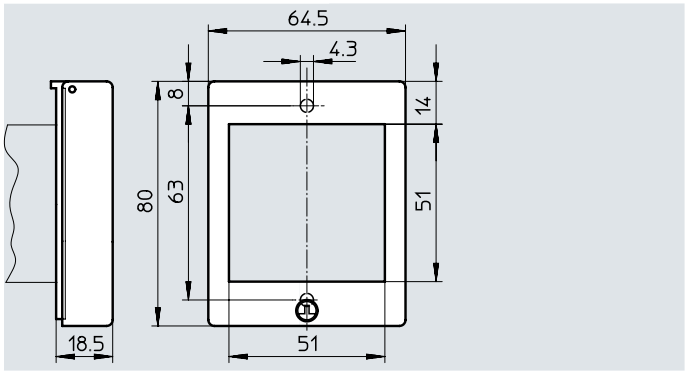
	Part no.	Type
Protective cap with rotary knob	**14662**	**PZ-SK-1**
Protective cap with lock	**13965**	**PZ-SS-1**

Protective cap
With rotary knob PZ-SK-2
With lock PZ-SS-2
Protective cap for preset counters to prevent the ingress of dirt and spray at the front





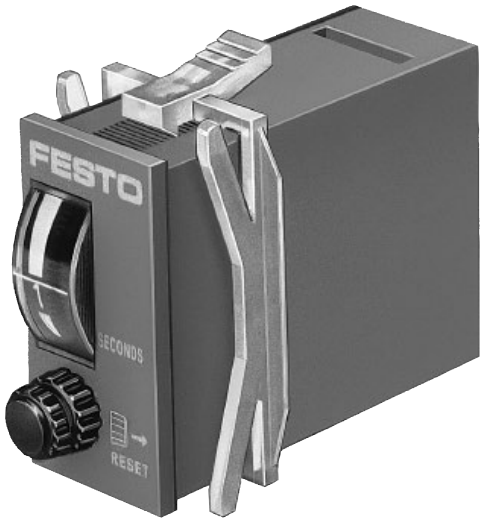




Ordering data

	Part no.	Type
Protective cap with rotary knob	**14663**	**PZ-SK-2**
Protective cap with lock	**13966**	**PZ-SS-2**

Key features



General

- Adjustable delay time
  - 0.2 ... 3 s
  - 2 ... 30 s
  - 8 ... 120 s
  - 20 ... 300 s
- Front panel mounting
- H rail mounting to EN 60715
- Protective cap

Pneumatic timer PZVT

The timer switches the input pressure applied to connection 1 to connection 2 after the set time delay has expired.

Automatic reset module PZVT-AUT

The reset module is used to automatically reset timers of type PZVT-...-SEC once the preset time has expired and to generate an output signal of a specific length for control purposes.

The timer can be reset manually by pulling the adjusting knob on the reset module. This makes it very easy to implement pneumatic time control processes with automatically repeating time intervals.

Datasheet

General technical data

Type		Timer				Reset module
		PZVT-3-SEC	PZVT-30-SEC	PZVT-120-SEC	PZVT-300-SEC	PZVT-AUT
Design		Mechanical sequence counter with pneumatic drive				
Type of mounting		Front panel mounting				
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]				
Note on the operating/ pilot medium		Lubricated operation not possible				
Pneumatic connection		Female thread M5				
Standard nominal flow rate	[l/min]	50				
Adjustable delay time	[s]	0.2 ... 3	2 ... 30	8 ... 120	20 ... 300	0.2 ... 2
Repetition accuracy	[s]	±0.1	±0.3	±1.2	±3	±0.3
Setting accuracy	[s]	±0.3	±0.6	±3	±6	–
Pause period for reset	[ms]	≥ 200				
Degree of protection		IP54 to IEC 60529 with protective cover and panel frame				
Weight	[g]	45				50
Housing material		ABS				
Note on materials		RoHS-compliant				

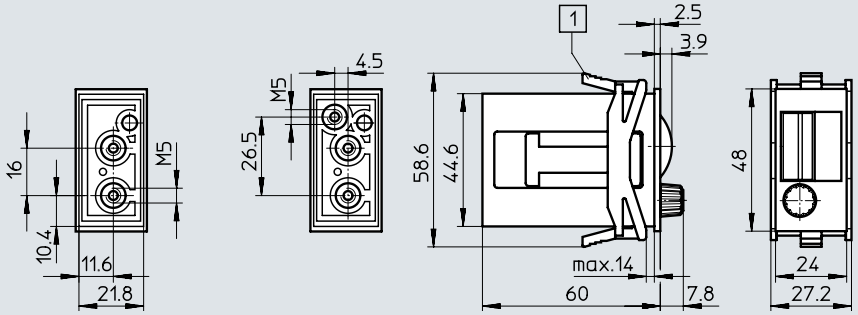
Operating and environmental conditions

Type		PZVT-3-SEC	PZVT-30-SEC	PZVT-120-SEC	PZVT-300-SEC	PZVT-AUT
Operating pressure	[bar]	2 ... 6				
Switch-on pressure	[bar]	≥ 1.6				
Switch-off pressure	[bar]	≤0.1				≤0.3
Ambient temperature	[°C]	–10 ... +60				–15 ... +60

Datasheet

Dimensions Download CAD data ➔ www.festo.com

PZVT-...-SEC PZVT-AUT



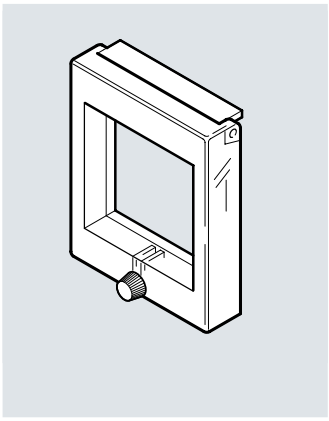
[1] Clamping frame included in the scope of delivery

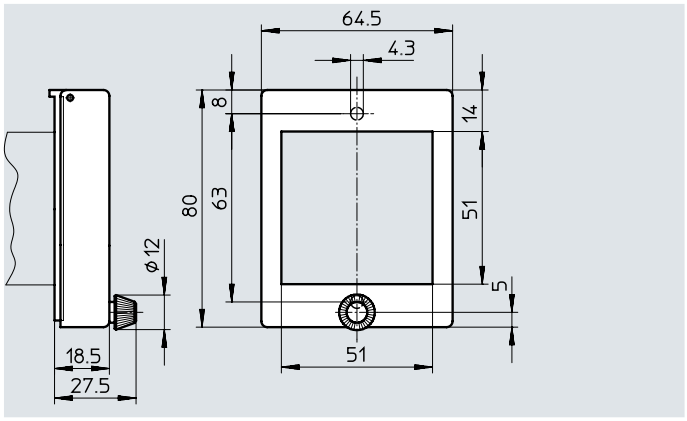
Ordering data

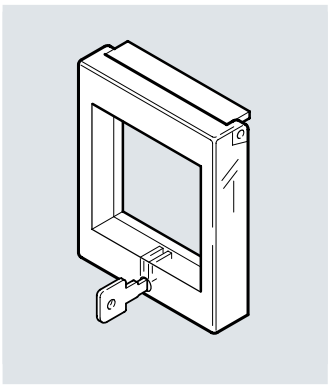
	Adjustable delay time [s]	Part no.	Type
Timer	0.2 ... 3	**158495**	**PZVT-3-SEC**
	2 ... 30	**150238**	**PZVT-30-SEC**
	8 ... 120	**177616**	**PZVT-120-SEC**
	20 ... 300	**150239**	**PZVT-300-SEC**
Reset module	0.2 ... 2	**158496**	**PZVT-AUT**

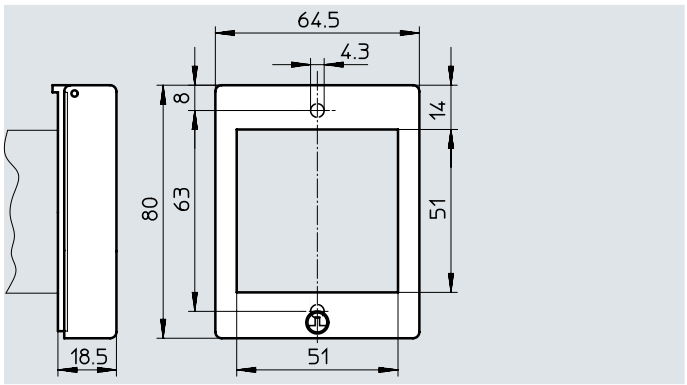
Accessories

Protective cap
With rotary knob PZ-SK-2
With lock PZ-SS-2
Protective cap for preset counters to prevent the ingress of dirt and spray at the front









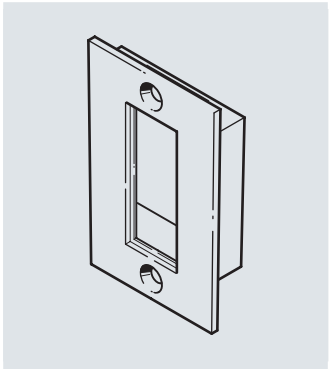
Ordering data

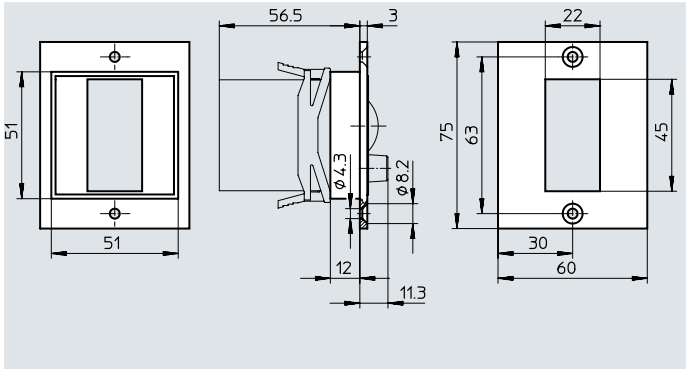
	Part no.	Type
Protective cap with rotary knob	**14663**	**PZ-SK-2**
Protective cap with lock	**13966**	**PZ-SS-2**

Accessories

Panel frame
for front panel mounting

Note on materials: RoHS-compliant

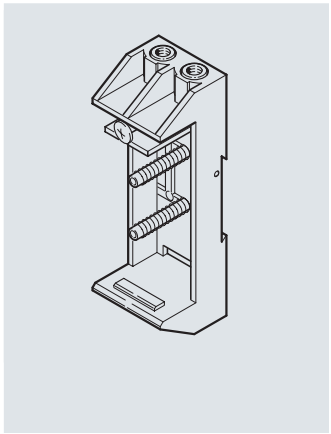


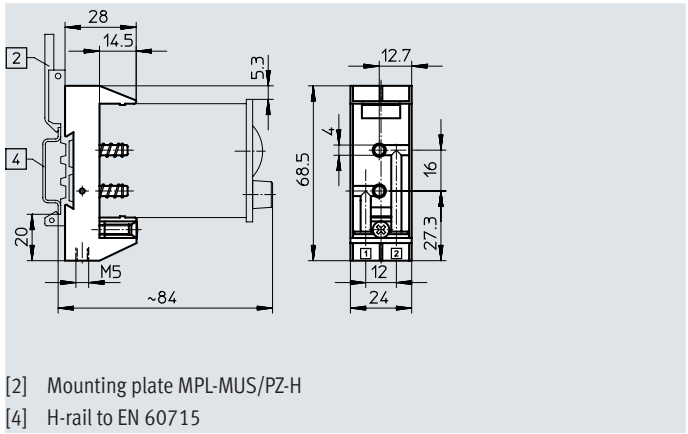


Ordering data

	Part no.	Type
Panel frame	**150241**	**PZVT-FR**

Base PZVT-S-DIN
For mounting on H-rail to EN 60715





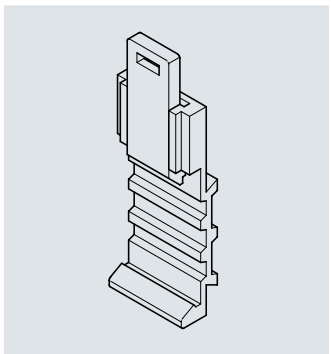
[2] Mounting plate MPL-MUS/PZ-H
[4] H-rail to EN 60715

Ordering data

	Part no.	Type
Base	**150240**	**PZVT-S-DIN**

Note: The base PZVT-S-DIN cannot be used for the reset module PZVT-AUT.

Mounting plate MPL-MUS/PZ-H
For H rail to EN 60715



Ordering data

	Part no.	Type
Mounting plate for H-rail	**19135**	**MPL-MUS/PZ-H**

Ordering data

	Part no.	Type
Base	**150240**	**PZVT-S-DIN**

Note: The base PZVT-S-DIN cannot be used for the reset module PZVT-AUT.