M5 Compact System

Key features

- Flow rate
  100 l/min

- Forms the basis for compact pneumatic control systems
- M5 elements with 2n sub-bases
- Control cabinet installation
- Easy mounting
- Fast replacement of components
- Barbed fitting connection for 3 mm plastic tubing

The M5 Compact System is a complete system offering control components with all the functions required for pneumatic sequence controls. These all feature 2n sub-bases and barbed fitting connections for 3 mm plastic tubing.

For basic valves and actuators for panel mounting for use as signal components for basic functions such as START, STOP, etc.
➔ Volume 2

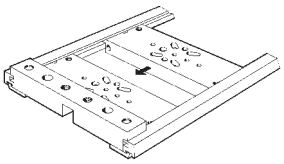
M5 Compact System

Key features

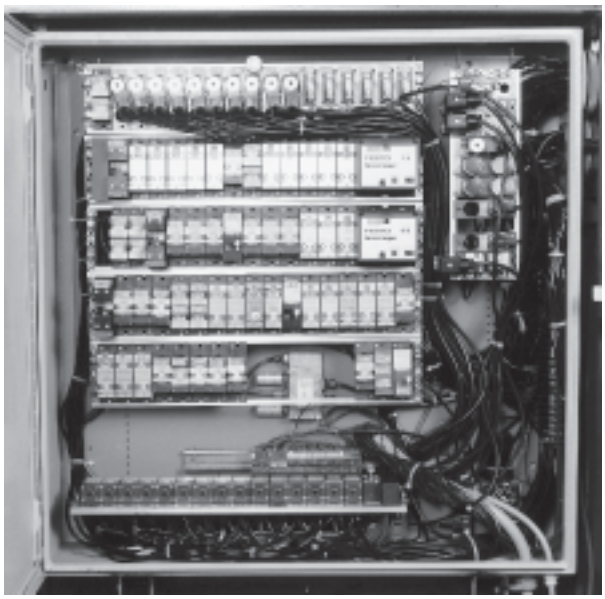
Mounting the components

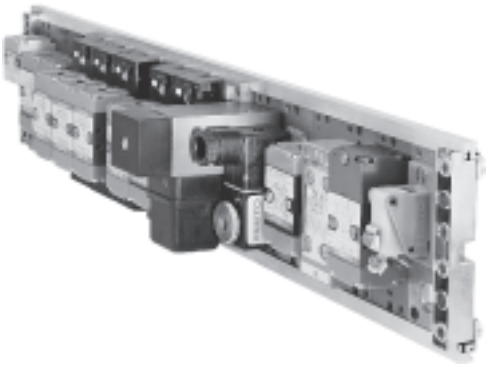
Each mounting frame can be used to mount up to 16 components of the M5 Compact System using 2N sub-bases. The frames are 480 mm long and have been designed for use with 19" housings to DIN 41 488. The rails can be shortened to allow for other types of installation.

Components are attached by sliding their sub-bases or mounting plates into the guide slot of the profile rails. The sub-bases or plates are then clamped between the cross bars.



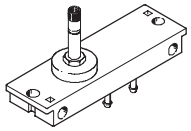
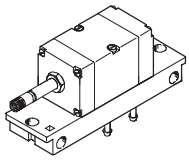
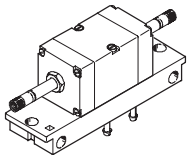
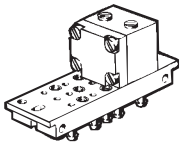
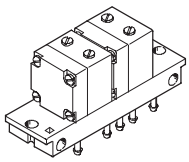
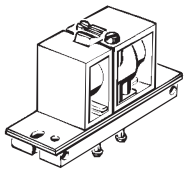
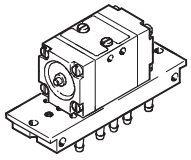
They can also be placed onto the frame and screwed down individually.





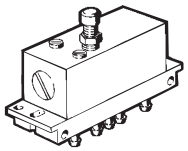
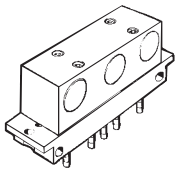
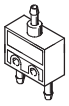
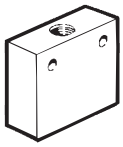
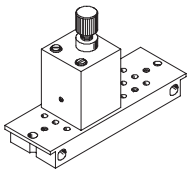
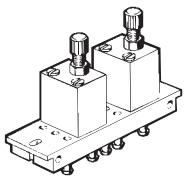
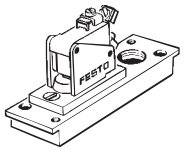
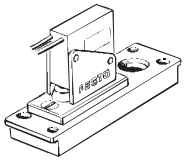
M5 Compact System

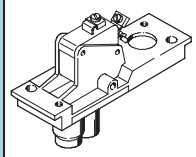
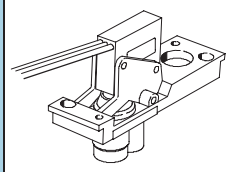
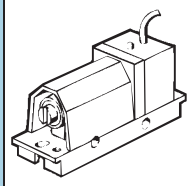
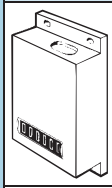
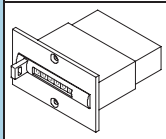
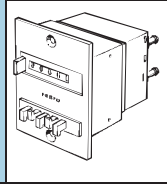
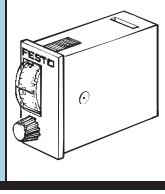
Product range overview

Function	Version	Type	Brief description	Operating pressure [bar]	➔ Page
Solenoid valves	**3/2-way valves**				
		MUFH-3-PK-3	Mechanical spring return for mounting frame 2N	0 ... 8	4 / 6.2-6
	5/2-way valves				
		MFH-5-PK-3	Mechanical spring return for mounting frame 2N	3 ... 8	4 / 6.2-6
		MFH-5-PK-3-L	Pneumatic spring return for mounting frame 2N	1.5 ... 8	4 / 6.2-6
		JMFH-5-PK-3	Double solenoid valve for mounting frame 2N	2 ... 8	4 / 6.2-6
Pneumatic valves	**3/2-way valves**				
		VL/O-3-PK-3	Mechanical spring return for mounting frame 2N	0 ... 8	4 / 6.2-9
		VL/O-3-PK-3x2	2 pneumatic valves on one sub-base Mechanical spring return for mounting frame 2N	0 ... 8	4 / 6.2-9
		J-3-PK-3	Double pilot valve for mounting frame 2N	–0.9 ... 8	4 / 6.2-9
	5/2-way valves				
		VL-5-PK-3	Mechanical spring return for mounting frame 2N	0 ... 8	4 / 6.2-9
		J-5-PK-3	Double pilot valve for mounting frame 2N	1 ... 8	4 / 6.2-9
		JD-5-PK-3	Double pilot valve with dominating signal at 14 for mounting frame 2N	1 ... 8	4 / 6.2-9

M5 Compact System

Product range overview

Function	Version	Type	Brief description	Operating pressure [bar]	→ Page
Time delay valves	**Time delay valves**				
		VZ-3-PK-3	With switch-on delay for mounting frame 2N	0 ... 8	4 / 6.2-12
		VZO-3-PK-3	With switch-off delay for mounting frame 2N	0 ... 8	4 / 6.2-12
Logic components	**AND/OR blocks**				
		OS-PK-3-6/3	3 OR gates for mounting frame 2N	1.6 ... 8	4 / 6.2-14
		ZK-PK-3-6/3	3 AND gates for mounting frame 2N	1.6 ... 8	4 / 6.2-14
		OS-PK-3	OR gate	1.6 ... 8	4 / 6.2-22
		ZK-PK-3	AND gate	1.6 ... 8	4 / 6.2-22
		OS-⅛-B	OR gate	1 ... 10	4 / 6.2-22
		ZK-⅛-B	AND gate	1 ... 10	4 / 6.2-22
		OS-¼-B	OR gate	1 ... 10	4 / 6.2-22
One-way flow control valves	**One-way flow control valves**				
		GRF-PK-3	For mounting frame 2N	0.5 ... 8	4 / 6.2-15
		GRF-PK-3x2	2 one-way flow control valves on one sub-base for mounting frame 2N	0.5 ... 8	4 / 6.2-15
Pressure switches	**Pneumatic/electrical pressure transducers**				
		PE-⅛-2N	For mounting frame 2N	0 ... 8	4 / 6.2-16
		PE-⅛-2N-SW	Splash proof design for mounting frame 2N	0 ... 8	4 / 6.2-16

Function	Version	Type	Brief description	Operating pressure [bar]	➔ Page
Pressure switches	**Pneumatic/electrical pressure transducers**				
		VPE-1/8-2N	Vacuum switch for mounting frame 2N	–0.95 ... 0	4 / 6.2-16
		VPE-1/8-2N-SW	Vacuum switch splash proof design for mounting frame 2N	–0.95 ... 0	4 / 6.2-16
	Pneumatic/electrical differential pressure switch				
		PEN-M5	Vacuum switch for mounting frame 2N	–0.95 ... 8	4 / 6.2-19
Pneumatic counters	**Adding counters**				
		PZA-A-B	Base mounting	2 ... 8	4 / 6.2-24
		PZA-E-C	Panel mounting	2 ... 8	4 / 6.2-24
	Predetermining counter				
		PZV-E-C	Panel mounting	2 ... 8	4 / 6.2-24
Pneumatic timer	**Pneumatic timer**				
		PZVT-3-C PZVT-30-C PZVT-12-C PZVT-300-C	Clamping frame	2 ... 6	4 / 6.2-30
		PZVT-AUT	Automatic reset module	2 ... 6	4 / 6.2-30

Solenoid valves MUFH/MFH/JMFH, for mounting frame 2N

Technical data

General technical data						
			3/2-way valves	5/2-way valves		
			MUFH-3-PK-3	MFH-5-PK-3	MFH-5-PK-3-L	JMFH-5-PK-3
Constructional design			Poppet valve			
Type of mounting			Through-holes in sub-base or on mounting frame			
Operating medium			Filtered compressed air, lubricated or unlubricated			
Pneumatic connection			1, 2: 3 mm; 3: M5	Barbed fitting for 3 mm tubing		
Nominal size		[mm]	1.3	2.5		
Standard nominal flow rate 1 > 4		[l/min]	50	105		
Response time at 6 bar	On	[ms]	15	10	14	–
	Off	[ms]	22	22	22	–
	Change-over	[ms]	–	–	–	13
Materials			Housing: Anodised aluminium			
			Sub-base: Blue anodised aluminium			
			Seals: Perbunan			
Weight		[g]	120	270	270	380

Operating and environmental conditions					
		3/2-way valves	5/2-way valves		
		MUFH-3-PK-3	MFH-5-PK-3	MFH-5-PK-3-L	JMFH-5-PK-3
Operating pressure	[bar]	0 ... 8	3 ... 8	1.5 ... 8	2 ... 8
Ambient temperature	[°C]	–5 ... +40	–5 ... +40	–5 ... +40	0 ... +40
Temperature of medium	[°C]	–10 ... +60	–10 ... +60	–10 ... +60	0 ... +60

Electrical data					
		3/2-way valves	5/2-way valves		
		MUFH-3-PK-3	MFH-5-PK-3	MFH-5-PK-3-L	JMFH-5-PK-3
D.C. voltage					
Standard voltages	[V]	12, 24			Solenoid coils
Special voltage	[V]	12 ... 220			➔ Volume 2
A.C. voltage					
Standard voltages	[V]	24, 42, 110, 220 at 50 Hz or 50 and 60 Hz			Solenoid coils
Special voltage	[V]	12 ... 240 at 50 or 60 Hz			➔ Volume 2
Power consumption					
D.C. voltage	[W]	4.5			
A.C. voltage	[VA]	Hold: 6			
		Pull: 7.5			
Duty cycle		100%			
Protection class to EN 60 529		IP65 with plug socket			

Solenoid valves MUFH/MFH/JMFH, for mounting frame 2N

Technical data

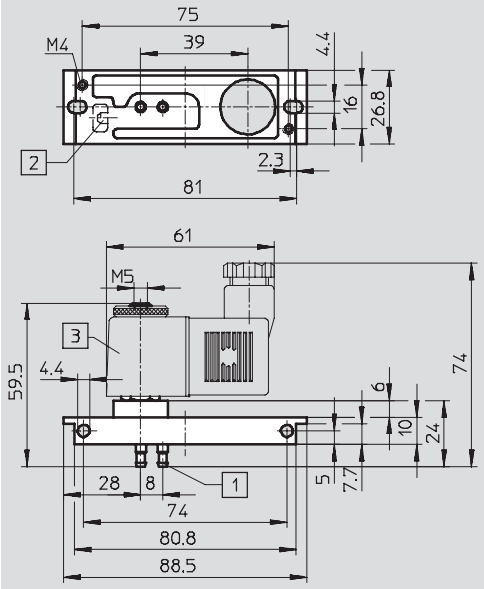
FESTO

Dimensions

Download CAD data ➔ **www.festo.com/en/engineering**

3/2-way valves

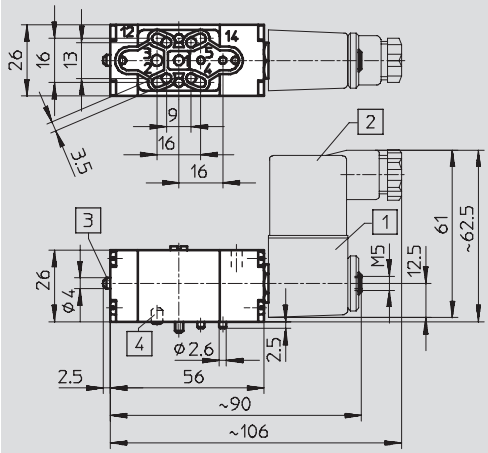
MUFH-3-PK-3



1 Barbed fitting for 3 mm plastic tubing
2 Manual override
3 Solenoid coil can be turned 360°

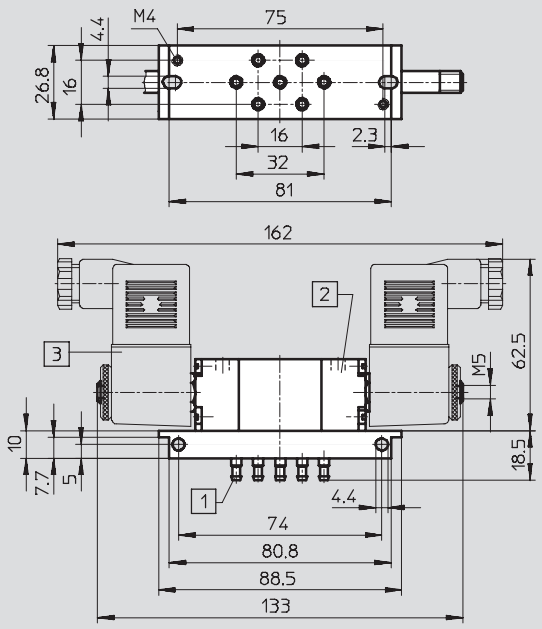
5/2-way valves

MFH-5-PK-3
MFH-5-PK-3-L



1 Rotatable solenoid coil
2 Plug can be repositioned by 180°
3 Manual override
4 Dowel pin

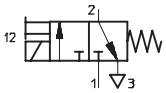
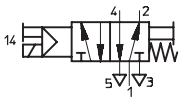
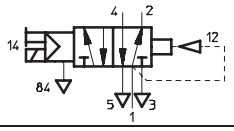
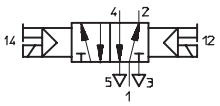
JMFH-5-PK-3



1 Barbed fitting for 3 mm plastic tubing
2 Manual override
3 Solenoid coil can be turned 360°

Solenoid valves MUFH/MFH/JMFH, for mounting frame 2N

Technical data

Ordering data			
		Part No.	Type
3/2-way valves			
Solenoid valve mechanical spring return		**6 705**	**MUFH-3-PK-3**
5/2-way valves			
Solenoid valve mechanical spring return		**4 448**	**MFH-5-PK-3**
Solenoid valve pneumatic spring return		**11 546**	**MFH-5-PK-3-L**
Double solenoid valve		**4 447**	**JMFH-5-PK-3**
Accessories			
Solenoid coils and plug sockets		➔ Volume 2	

Pneumatic valves VL/J, for mounting frame 2N

Technical data

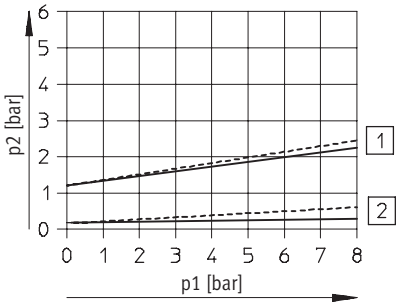
General technical data							
			3/2-way valves		5/2-way valves		
			VL/O-3-PK-3 VL/O-3-PK-3x2	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3
Constructional design			Poppet valve	Piston spool valve	Poppet valve		
Type of mounting			2 through-holes in sub-base or on mounting frame				
Operating medium			Filtered compressed air, lubricated or unlubricated				
Pneumatic connection			Barbed fitting for 3 mm plastic tubing				
Nominal size		[mm]	2.5				
Standard nominal flow rate 1 › 2		[l/min]	100		105		
Response time at 6 bar	On	[ms]	VL 10 VLO 13	–	15	–	–
	Off	[ms]	50	–	22	–	–
	Change-over	[ms]	–	with 10: 6 with 12: 8	–	9	with 14: 9 with 12: 25
Materials			Housing: Die-cast zinc, plastic				
			Sub-base: Plastic, brass				
			Seals: Perbunan				
Weights		[g]					
1 valve on sub-base			110	75	130	130	130
2 valves on sub-base			180	–	–		

Operating and environmental conditions						
		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	–0.9 ... +8	0 ... 8	1 ... 8	
Pilot pressure	[bar]	See graph		See graph		
Ambient temperature	[°C]	–10 ... +60		–10 ... +60	0 ... +60	

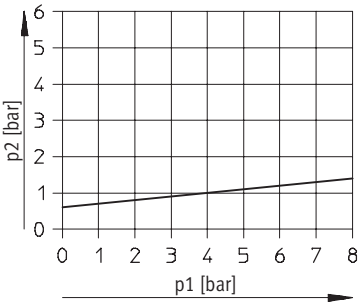
Minimum pilot pressure p2 as a function of the operating pressure p1

3/2-way valves

VL/O-3-PK-3
VL/O-3-PK-3x2



J-3-PK-3



1 No flow when not actuated VL
2 Flow when not actuated VLO

Pneumatic valves VL/J, for mounting frame 2N

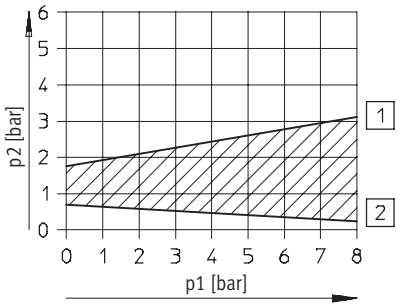
Technical data

FESTO

Minimum pilot pressure p2 as a function of the operating pressure p1

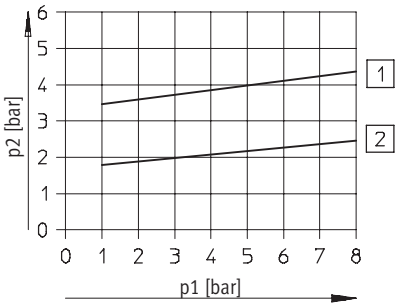
5/2-way valves

VL-5-PK-3



1 Switch-on pressure
2 Switch-off pressure

J-5-PK-3
JD-5-PK-3



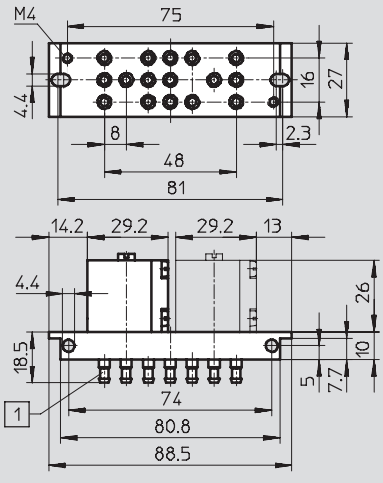
1 JD-5-PK-3
2 J-5-PK-3

Dimensions

Download CAD data ➔ **www.festo.com/en/engineering**

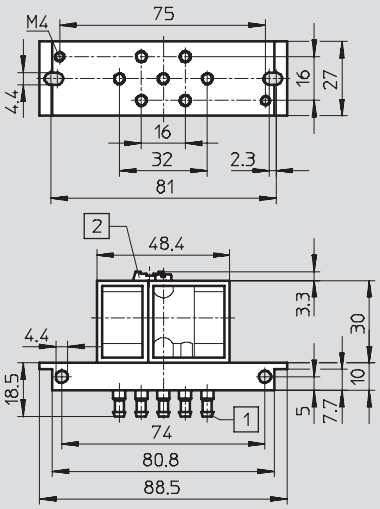
3/2-way valves

VL/O-3-PK-3
VL/O-3-PK-3x2



1 Barbed fitting for 3 mm plastic tubing

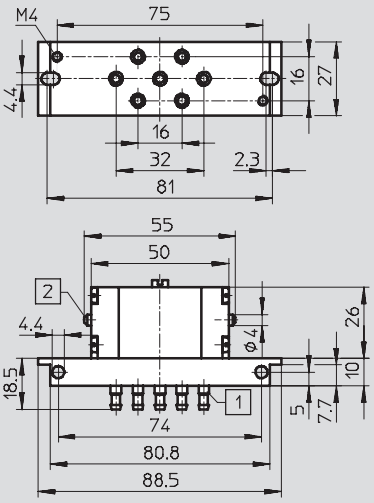
J-3-PK-3



1 Barbed fitting for 3 mm plastic tubing
2 Manual override

5/2-way valves

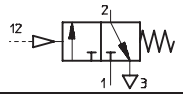
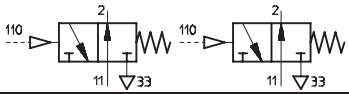
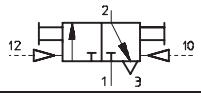
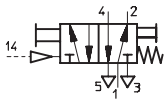
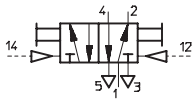
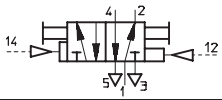
VL-5-PK-3
J-5-PK-3
JD-5-PK-3



1 Barbed fitting for 3 mm plastic tubing
2 Manual override

Pneumatic valves VL/J, for mounting frame 2N

Technical data

Ordering data			
		Part No.	Type
3/2-way valves			
Pneumatic valve mechanical spring return		**4 233**	**VL/O-3-PK-3**
2 pneumatic valves on one sub-base mechanical spring return		**4 245**	**VL/O-3-PK-3x2**
Double pilot valve		**10 772**	**J-3-PK-3**
5/2-way valves			
Pneumatic valve mechanical spring return		**4 504**	**VL-5-PK-3**
Double pilot valve		**4 503**	**J-5-PK-3**
Double pilot valve with dominating signal at 14		**4 901**	**JD-5-PK-3**

Time delay valves VZ/VZO, for mounting frame 2N

Technical data

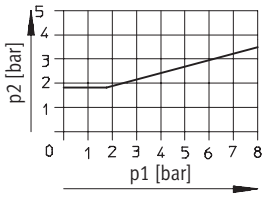
General technical data			
		With switch-on delay VZ-3-PK-3	With switch-off delay VZO-3-PK-3
Constructional design		Poppet valve with spring return	
Type of mounting		2 through-holes in sub-base or on mounting frame	
Operating medium		Filtered compressed air, lubricated or unlubricated	
Pneumatic connection		Barbed fitting for 3 mm plastic tubing	
Nominal size	[mm]	2.5	
Standard nominal flow rate 1 > 2	[l/min]	90	65
Adjustable time delay[1)]	[s]	0.25 ... 5	
Reset time	[ms]	50	55
Materials		Housing: Aluminium	
		Sub-base: Plastic, brass	
		Seals: Perbunan	
Weight	[g]	150	

1) In order to achieve delay times longer than 5 s, remove the protective cover from barbed fitting 6 and connect an additional reservoir to this. An increase in reservoir size of 10 cm³ will increase the delay time by approx. 5 s. For reservoir type VZS ➔ Volume 3.

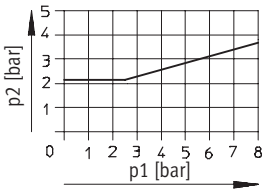
Operating and environmental conditions		
Operating pressure	[bar]	0 ... 8
Pilot pressure	[bar]	See graph
Ambient temperature	[°C]	–10 ... +60

Minimum pilot pressure p2 as a function of the operating pressure p1

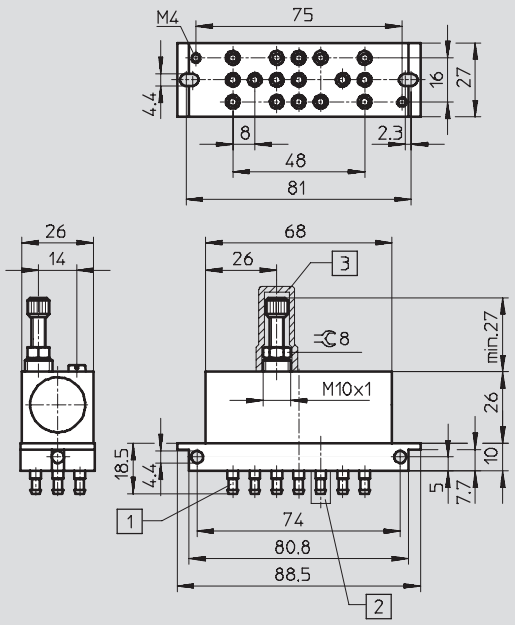
VZ-3-PK-3



VZO-3-PK-3



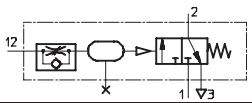
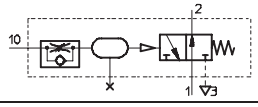
Dimensions Download CAD data ➔ **www.festo.com/en/engineering**



1 Barbed fitting for 3 mm plastic tubing
2 Port 6 with protective cap, for additional reservoir
3 Protective cover

Time delay valves VZ/VZO, for mounting frame 2N

Technical data

Ordering data			
		Part No.	Type
Time delay valve with switch-on delay		5 755	VZ-3-PK-3
Time delay valve with switch-off delay		5 754	VZO-3-PK-3
Accessories			
Protective cover		6 436	GRK-M5

AND/OR blocks OS/ZK, for mounting frame 2N

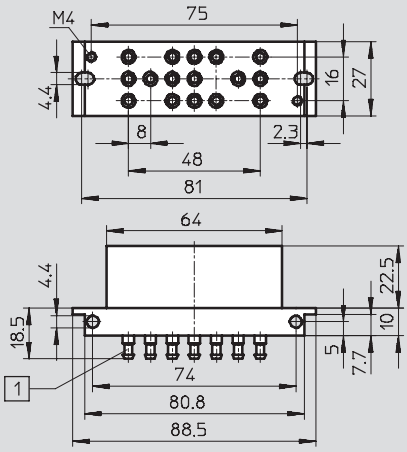
Technical data

FESTO

General technical data			
		OR block OS-PK-3-6/3	AND block ZK-PK-3-6/3
Type of mounting		2 through-holes in sub-base or on mounting frame	
Operating medium		Filtered compressed air, lubricated or unlubricated	
Pneumatic connection	[mm]	Barbed fitting for 3 mm plastic tubing	
Nominal size	[mm]	2.5	
Standard nominal flow rate	[l/min]	100	
Materials		Housing: Plastic	
		Sub-base: Plastic	
		Seals: Perbunan	
Weight	[g]	90	85

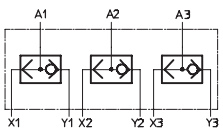
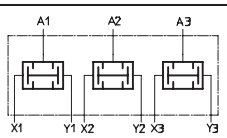
Operating and environmental conditions		
Operating pressure	[bar]	1.6 ... 8
Ambient temperature	[°C]	–10 ... +60

Dimensions Download CAD data ➔ **www.festo.com/en/engineering**



1 Barbed fitting for 3 mm plastic tubing

Ordering data

		Part No.	Type
OR block (3 OR gates)		**4 232**	**OS-PK-3-6/3**
AND block (3 AND gates)		**4 204**	**ZK-PK-3-6/3**

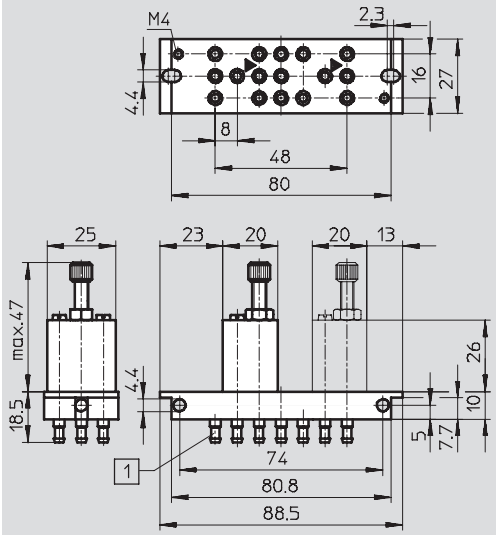
One-way flow control valves GRF, for mounting frame 2N

Technical data

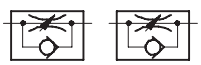
General technical data			
		GRF-PK-3	GRF-PK-3x2
Type of mounting		Through-holes in sub-base or on mounting frame	
Operating medium		Filtered compressed air, lubricated or unlubricated	
Pneumatic connection	[mm]	Barbed fitting for 3 mm plastic tubing	
Nominal size	[mm]		
in direction of flow control		1.5	
against the direction of flow control		2	
Standard nominal flow rate	[l/min]		
in direction of flow control		0 ... 45	
against the direction of flow control		45	
Materials		Housing: Aluminium	
		Sub-base: Plastic	
		Seals: Perbunan	
Weight	[g]	90	145

Operating and environmental conditions		
Operating pressure	[bar]	0.5 ... 8
Ambient temperature	[°C]	–10 ... +60

Dimensions Download CAD data ➔ **www.festo.com/en/engineering**



1 Barbed fitting for 3 mm plastic tubing

Ordering data			
		Part No.	Type
One-way flow control valve		**4 565**	**GRF-PK-3**
2 one-way flow control valves on one sub-base		**4 566**	**GRF-PK-3x2**

PE converters PE/VPE, for mounting frame 2N

Technical data

FESTO

General technical data					
		PE converter		Vacuum switch	
		PE-1/8-2N	PE-1/8-2N-SW	VPE-1/8-2N	VPE-1/8-2N-SW
Constructional design		Pneumatically actuated electrical micro switch to EN 60 947-5-1			
Type of mounting		On mounting frame 2N			
		Via through-holes			
Operating medium		Compressed air, filtered (lubricated or unlubricated) or vacuum			
Pneumatic connection		G1/8			
Electrical connection		Screw connector	3 separate sheathed connector wires, moulded, 0.5 m long	Screw connector	3 separate sheathed connector wires, moulded, 0.5 m long
Materials		Housing: Die-cast aluminium, polyamide			
		Diaphragm: Polyurethane			
Weight	[g]	55	65	32	45

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Operating and environmental conditions					
		PE converter		Vacuum switch	
		PE-1/8-2N	PE-1/8-2N-SW	VPE-1/8-2N	VPE-1/8-2N-SW
Operating pressure	[bar]	0 ... 8		0 ... –0.95	
Switch-on pressure	[bar]	2		–0.25 ... ±0.05	
Switch-off pressure	[bar]	0.5		≤ 0.1	
Ambient temperature	[°C]	–10 ... +60			0 ... +40

Electrical data					
		PE converter		Vacuum switch	
		PE-1/8-2N	PE-1/8-2N-SW	VPE-1/8-2N	VPE-1/8-2N-SW
Rated operating voltage	[V AC]	250			
Rated operating voltage	[V DC]	250			
Switching capacity		See separate table			
Utilisation category		AC 12/DC 12 (ohmic load)			
		AC 14/DC 13 (inductive load)			
CE marking symbol (see conformity declaration)		As per EU low voltage directive			
Certification		CCC			
Protection class to EN 60 529		IP00	IP67	IP00	IP67

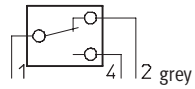
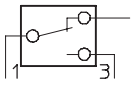
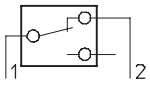
Test symbols for PE, VPE-1/8-2N: VDE, SEMKO, ÖVE, SEV, UL, CSA, (CEE).

Max. permissible electrical load					
D.C. voltage			A.C. voltage		
Voltage [V DC]	Resistive load [A]	Inductive load [A]	Voltage [V AC]	Resistive load [A]	Inductive load [A]
PE/VPE-1/8-2N					
12	6	6	250	6	2
24	6	6	250	6	2
60	1	0.5			
110	0.5	0.2			
220	0.25	0.1			
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			

PE converters PE/VPE, for mounting frame 2N

Technical data

Terminal allocation

Changeover switch	Normally open contact	Normally closed contact
		
black blue	black blue	black grey

Dimensions

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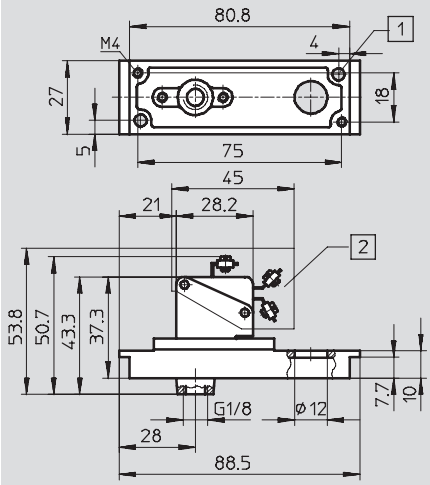
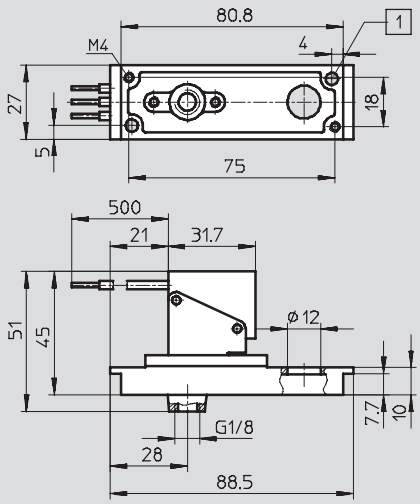
PE converter
PE-1/8-2N



1 For M4 thread
2 Protective cap SPE-B

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

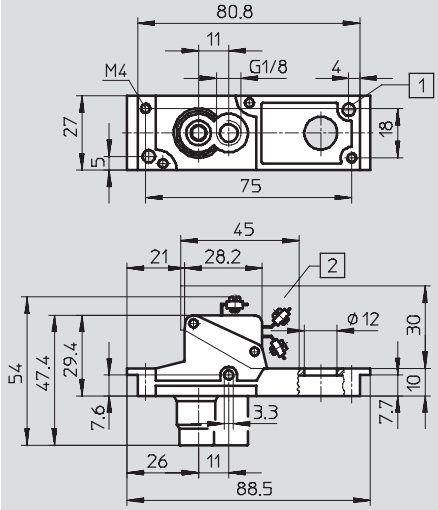
PE-1/8-2N-SW
splash proof design



1 For M4 thread

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

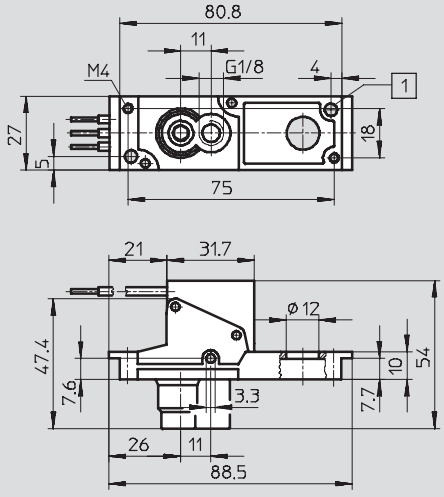
Vacuum switch
VPE-1/8-2N



1 For M4 thread
2 Protective cap SPE-B

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

VPE-1/8-2N-SW
splash proof design



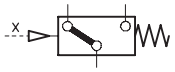
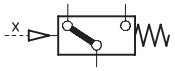
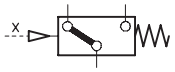
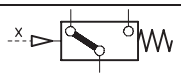
1 For M4 thread

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

PE converters PE/VPE, for mounting frame 2N

Technical data

FESTO

Ordering data			
		Part No.	Type
PE converter		**7 860**	**PE-1/8-2N**
PE converter splash proof design		**7 862**	**PE-1/8-2N-SW**
Vacuum switch		**12 594**	**VPE-1/8-2N**
Vacuum switch splash proof design		**12 595**	**VPE-1/8-2N-SW**
Accessories			
Protective cap for protection against accidental contact		**165 614**	**SPE-B**

PE converters PEN-M5, for mounting frame 2N

Technical data

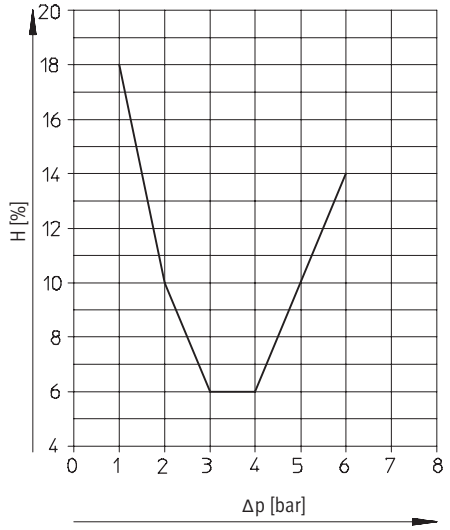
FESTO

General technical data		
Constructional design		Pneumatic/electrical differential pressure switch
Type of mounting		On mounting frame 2N
		Via through-holes
Operating medium		Compressed air, filtered (lubricated or unlubricated) or vacuum
Pneumatic connection		M5
Electrical connection		2.5 m cable 3x0.14 mm^2
Switch output		Contactless switching output (normally open function)
Max. switching frequency	[Hz]	70
Materials		Housing: Die-cast zinc
Note on material		Free of copper, PTFE and silicone
Weight	[g]	240

Operating and environmental conditions		
Operating pressure	[bar]	–0.95 ... +8 bar
Threshold value setting range	[bar]	–0.8 ... +8 bar
Ambient temperature	[bar]	–20 ... +60 °C

Electrical data		
Operating voltage range	[V DC]	12 ... 30
Switching status display		Yes
Adjustable hysteresis		➔ Graph 4 / 6.2-19
Max. output current	[mA]	350
Protection against short circuit		Yes
Protection against polarity reversal		Yes
CE symbol		In accordance with EU Directive 89/336/EU
Protection class to EN 60 529		IP67

Hysteresis H as a function of the differential pressure Δp



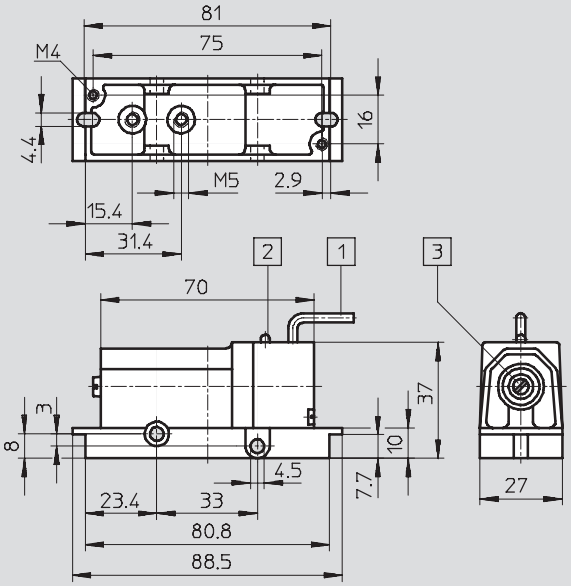
PE converters PEN-M5, for mounting frame 2N

Technical data

FESTO

Dimensions

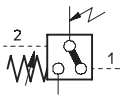
Download CAD data ➔ **www.festo.com/en/engineering**



1 Connecting cable 3x0.14 mm², 2.5 m long
2 Light emitting diode (LED)
3 Pressure adjustment screw

Colour coding:
BN = Positive terminal
BU = Negative terminal
BK = Load output
The switch is polarity-safe

Ordering data

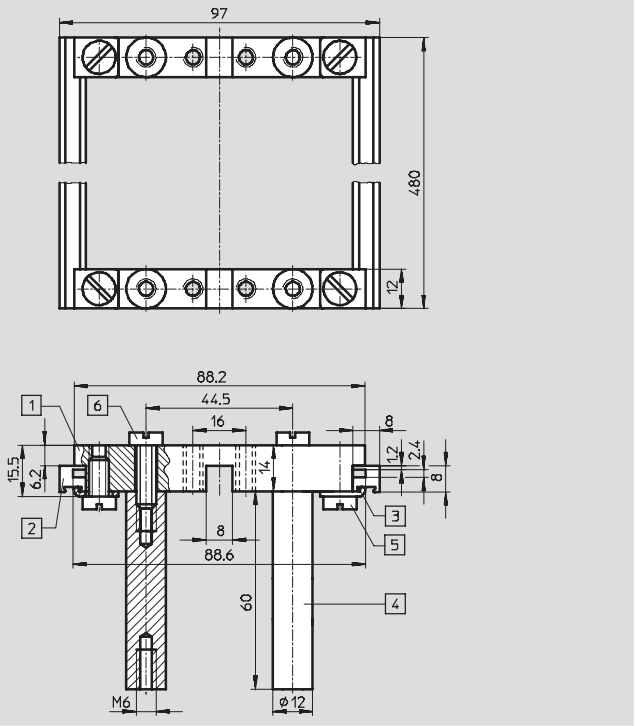
	Part No.	Type
PE converter 	**8625**	**PEN-M5**
Accessories		
Mounting bracket for mounting sub-bases on the frame	**11 571**	**NRW-9/1,5-B**
Socket head screw (2 included in scope of delivery)	**204 021**	**DIN 84-M4X12-4.8**

Mounting frames 2N

Accessories

Mounting frame NRRQ-2N

Scope of delivery
2 x connecting piece NRV-2N
2 x mounting rail NRQ-8-480
4 x mounting bracket NRW-12/3
4 x threaded spacer NRB-12/60
4 x slotted head screw
DIN 84-M6X18-4.8
4 x slotted head screw
DIN 84-M6X12-4.8
4 x mounting bracket NRW-9/1,5-B
4 x slotted head screw
DIN 84-M4X10-4.8



1 Connecting piece NRV-2N
2 Mounting rail NRQ-8-480
3 Mounting bracket NRW-12/3
4 Threaded spacer NRB-12/60
5 Slotted head screw
DIN 84-M6X18-4.8
6 Slotted head screw
DIN 84-M6X12-4.8

Mounting frame	Part No.	Type
Mounting frame 2N complete for 16 components	**9 365**	**NRRQ-2N**
Accessories		
Mounting bracket for mounting sub-bases on the frame	**11 571**	**NRW-9/1,5-B**
Slotted head screw (2 included in scope of delivery)	**204 021**	**DIN 84-M4X12-4.8**

AND/OR blocks OS/ZK

Key features

OS-PK-3
ZK-PK-3

OS-⅛-B
ZK-⅛-B

OS-¼-B

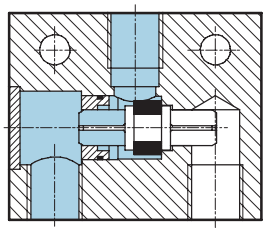
- Flow rate
  120 ... 1170 l/min

- Barbed fitting for 3 mm tubing
- G⅛, G¼
- OR function
- AND function

OR function

The OR gate has two inputs (X and Y) and one output (A). The valve automatically blocks the input which is not pressurised. If both inputs are pressurised simultaneously at different levels, the higher pressure is fed to the output A.
An OR valve (or shuttle valve) is used to allow a function to be executed from either of 2 different places.
An output signal is present whenever at least one of 2 signal inputs is activated.

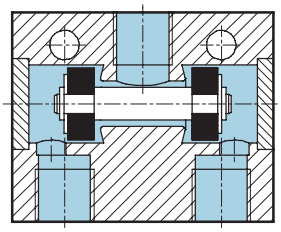
OS-¼-B



AND function

The AND gate has two inputs (X and Y) and one output (A), which is pressurised only as long as pressure is present at both inputs. If different pressures are present at the inputs, the lower pressure is fed to output A.
An AND valve (or dual-pressure valve) is used in cases where at least 2 signals are required to be present before a function is executed. A signal is present at output A only when both signal inputs are activated.

ZK-⅛-B



AND/OR blocks OS/ZK

Technical data

FESTO

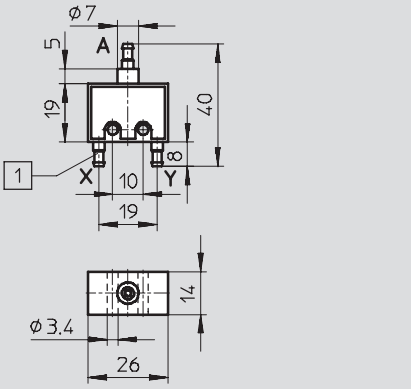
General technical data						
Type		OR gate			AND gate	
		OS-PK-3	OS-⅛-B	OS-¼-B	ZK-PK-3	ZK-⅛-B
Type of mounting		2 through-holes in housing				
Operating medium		Filtered compressed air, lubricated or unlubricated				
Pneumatic connection		Barbed fitting for 3 mm tubing	G⅛	G¼	Barbed fitting for 3 mm tubing	G⅛
Nominal size	[mm]	2.4	4	6.5	2.4	4.5
Standard nominal flow rate	[l/min]	120	500	1170	120	500
Weight	[g]	10	45	110	10	45
Materials	Housing	Plastic, brass	Blue anodised aluminium	Blue anodised aluminium	Plastic, brass	Blue anodised aluminium
	Seals	Nitrile rubber			Nitrile rubber	
Note on material		Free of copper, PTFE and silicone ➔ Ordering data			–	

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Operating and environmental conditions						
Type		OR gate			AND gate	
		OS-PK-3	OS-⅛-B	OS-¼-B	ZK-PK-3	ZK-⅛-B
Operating pressure	[bar]	1.6 ... 8	1 ... 10		1.6 ... 8	1 ... 10
Ambient temperature	[°C]	–10 ... +60			0 ... +60	

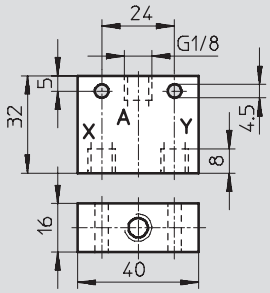
Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

OS-PK-3
ZK-PK-3



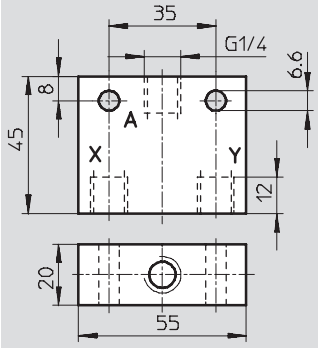
1 Barbed fitting for 3 mm plastic tubing

OS-⅛-B
ZK-⅛-B

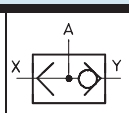
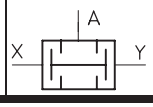


Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

OS-¼-B



Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Ordering data				
		Connection	Part No.	Type
OR gate		Barbed fitting for 3 mm tubing	**6 684**	**OS-PK-3**
		G⅛	**6 681**	**OS-⅛-B**
			165 694	**OS-⅛-B-CT**[1)]
		G¼	**6 682**	**OS-¼-B**
			165 693	**OS-¼-B-CT**[1)]
AND gate		Barbed fitting for 3 mm tubing	**6 685**	**ZK-PK-3**
		G⅛	**6 680**	**ZK-⅛-B**

1) Free of copper, PTFE and silicone

Counters PZA/PZV

Key features

Adding counter

- Surface mounting
- Panel mounting

Adding counters have 6-digit displays and count upwards, i.e. incoming signals are added. When the counter is reset, 000 000 appears.
A pneumatic signal increments the counter by a half step, and the first half of the digit appears. After completion of the signal, the second half-step increment occurs and the digit becomes fully visible.
The counter can be reset manually by means of a button. It can also be reset by means of a pneumatic signal. A counting signal may not arrive or be present during the resetting procedure.

Predetermining counter

- Subtracting counting mode
- Manual and pneumatic reset
- Protective cover

Predetermining counters count pneumatic signals backwards from a preset number. When zero is reached, the counter generates a pneumatic output signal. This output signal persists until the counter is reset.
The counter is preset by pressing the reset button and simultaneously keying in the preset value. This value is retained when the counter is reset.

Counters PZA/PZV

Technical data

FESTO

General technical data				
Type		Adding counter		Predetermining counter
		PZA-A-B	PZA-E-C	PZV-E-C
Constructional design		Mechanical counter with pneumatic drive		
Type of mounting		3 through-holes in housing	Panel mounting	
Operating medium		Compressed air, filtered, unlubricated		
Pneumatic connection		M5		
Display[1)]		6-digit	6-digit	5-digit
Reset		Pushbutton or pneumatic signal		
Response pressure				
Drive	[bar]	0.6 ±0.2	> 0.8	0.6 ±0.2
Reset	[bar]	0.6 ±0.2	2	–
Drop-off pressure				
Drive	[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				
Drive	[ms]	10	8	10
Reset	[ms]	180	150	180
Min. pause period				
Drive	[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

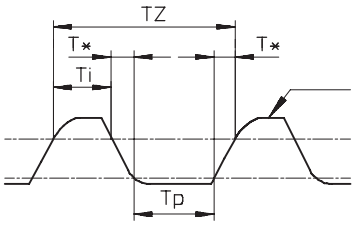
Operating and environmental conditions				
Type		Adding counter		Predetermining counter
		PZA-A-B	PZA-E-C	PZV-E-C
Operating pressure	[bar]	2 ... 8		
Min. reset pressure	[bar]	2	–	–
Ambient temperature	[°C]	–10 ... +60	0 ... +60	

Counters PZA/PZV

Technical data

Counting rate

Adding counter PZA-E-C



Max. pulse rate = $\frac{1}{TZ}$

TZ = $T_i + T_p + T^*$

TZ = $T_i + T^*$

T_i = Min. pulse length

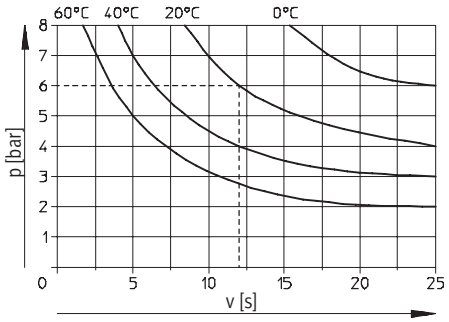
T_p = Min. pulse duration

TZ = Time for counting pulse

T* = Depends on pressure and tubing length (values must be determined empirically)

Counting speed v as a function of the operating pressure p

Predetermining counter PZV-E-C



Intermittent operation
The counter operates non-continuously. The counting rate is constant right down to zero contact (high rate possible). A reset then follows.

Continuous operation
The counter operates continuously at a constant rate. The interval between 2 counting signals is longer than the required reset time.

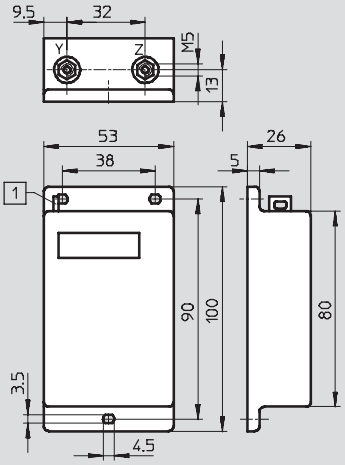
Counters PZA/PZV

Technical data

Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

Adding counter

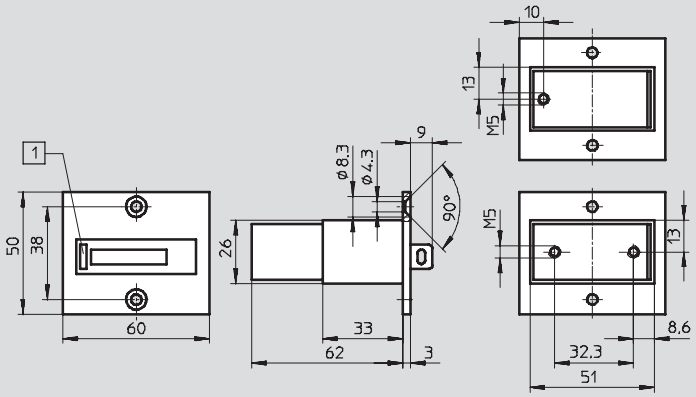
Surface mounting PZA-A-B



1 Reset button

Z = Counting signal
Y = Reset signal

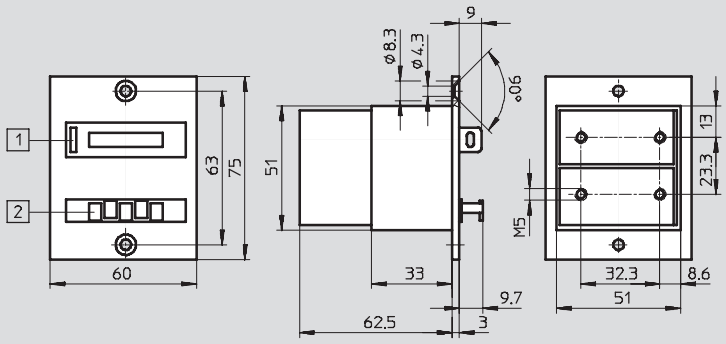
Panel mounting PZA-E-C



1 Reset button

Predetermining counter

Surface mounting PZV-E-C



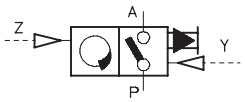
1 Reset button
2 Preselect buttons

The preset number is restored using the reset button or by a pneumatic signal to the reset port.

Note

The output signal must not be used to reset the counter. No counting signal may arrive or be present during the resetting procedure.

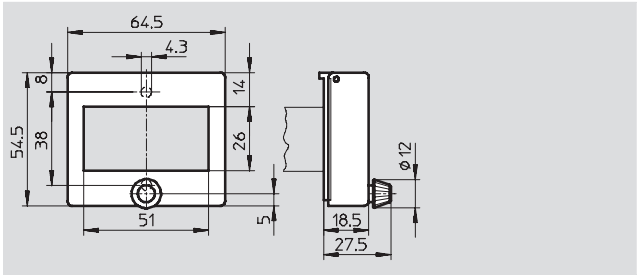
Ordering data

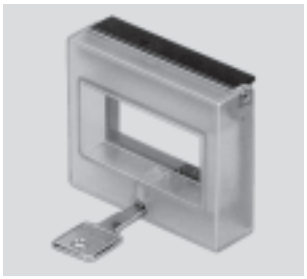
			Part No.	Type
Adding counter	Surface mounting		**14 992**	**PZA-A-B**
	Panel mounting		**8 606**	**PZA-E-C**
Predetermining counter	Surface mounting		**15 608**	**PZV-E-C**

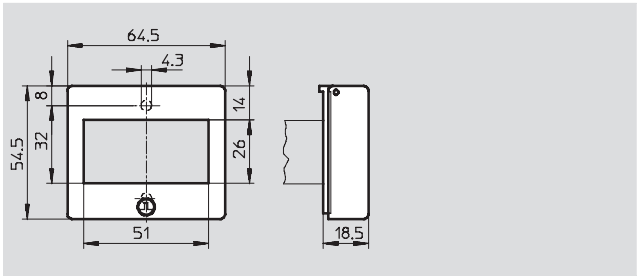
Counters PZA/PZV

Accessories

Protective cover
with rotary knob PZ-SK-1
with lock PZ-SS-1
Protective cover for adding counter to protect against entry of dirt and water on the front panel



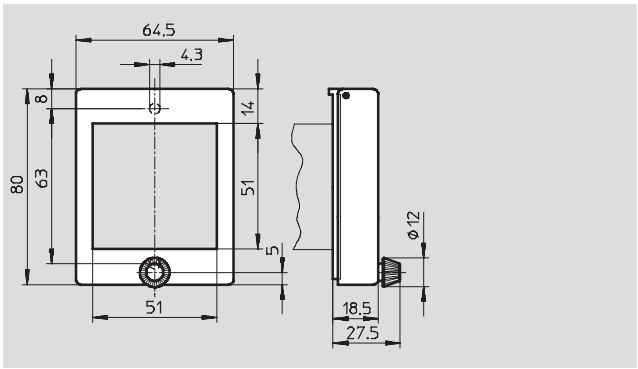


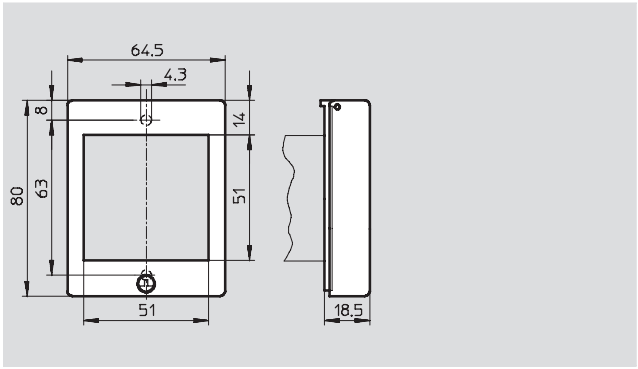


Ordering data

	Part No.	Type
Protective cover with rotary knob	**14 662**	**PZ-SK-1**
Protective cover with lock	**13 965**	**PZ-SS-1**

Protective cover
with rotary knob PZ-SK-2
with lock PZ-SS-2
Protective cover for predetermining counter to protect against entry of dirt and water on the front panel



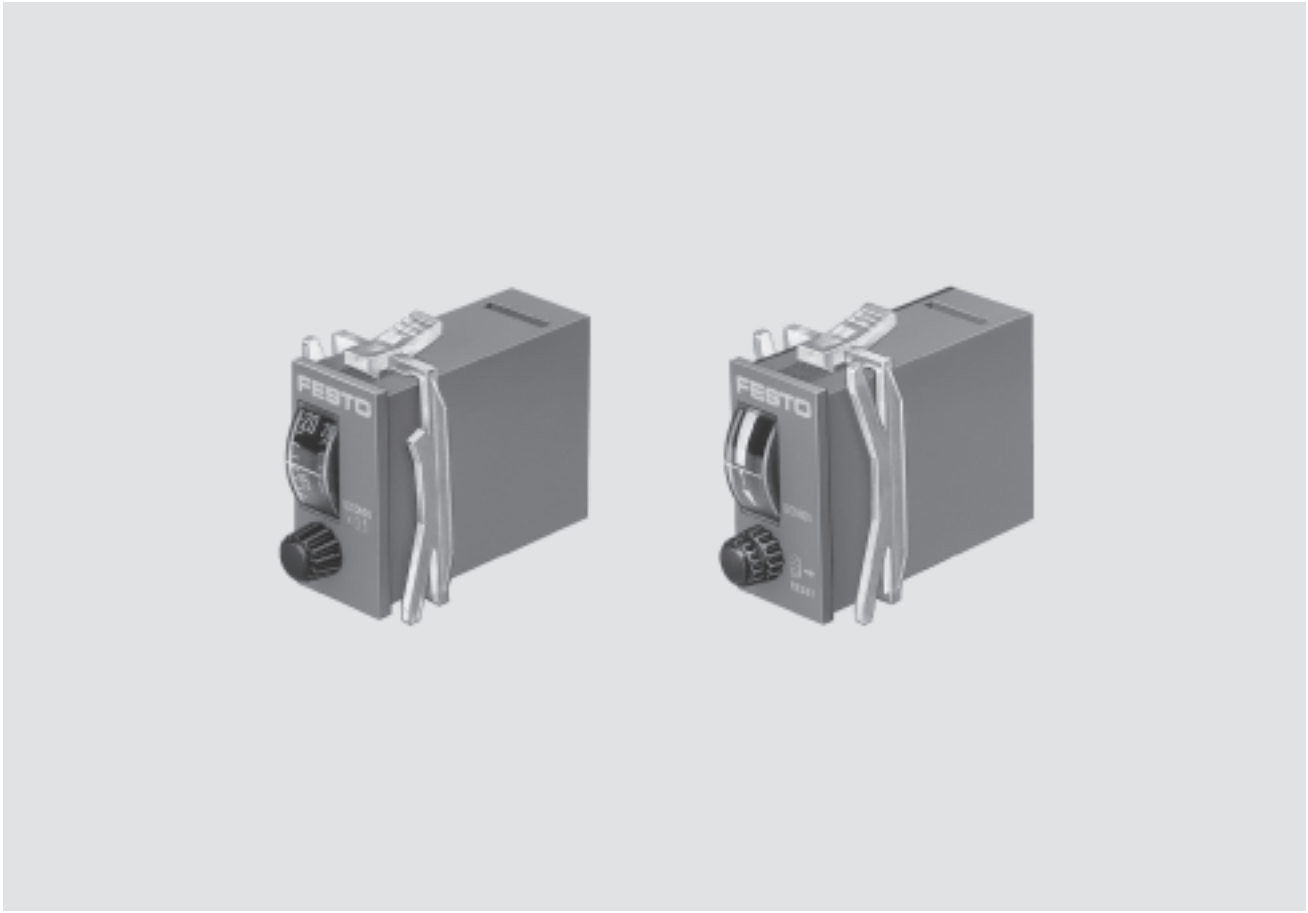


Ordering data

	Part No.	Type
Protective cover with rotary knob	**14 663**	**PZ-SK-2**
Protective cover with lock	**13 966**	**PZ-SS-2**

Timers PZVT

Key features



	Pneumatic timer PZVT	Automatic reset module PZVT-AUT
• Adjustable delay times – 0.2 ... 3 s – 2 ... 30 s – 8 ... 120 s – 20 ... 300 s • Panel mounting • Mounting on – G-rail to EN 50 035 – H-rail to EN 60715 • Protective cover	The timer switches input pressure applied to port 1 through to port 2 after the preset delay time has expired.	The reset module is used to automatically reset timers of type PZVT-...-SEC at the end of a preset time and to generate an output signal of defined duration for control system purposes. The timer can be reset manually by pulling the setting knob on the reset module. This allows the simple creation of pneumatic timer controls with automatically repeating time intervals.

Timers PZVT

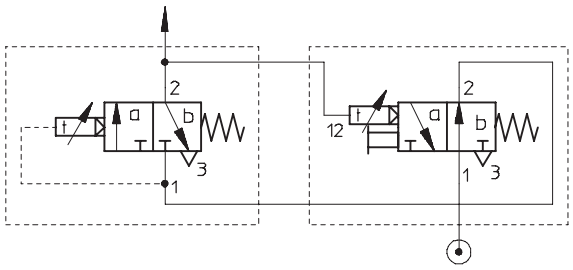
Technical data

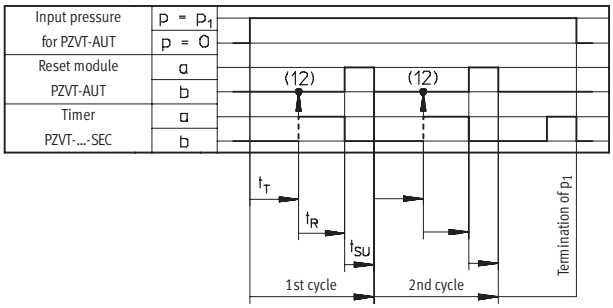
General technical data						
Type		Timer				Reset module
		PZVT-3-SEC	PZVT-30-SEC	PZVT-120-SEC	PZVT-300-SEC	PZVT-AUT
Constructional design		Mechanical sequence counter with pneumatic drive				
Type of mounting		Panel mounting				
Operating medium		Filtered compressed air (unlubricated) (≤ 40 µm)				
Pneumatic connection		M5				
Standard nominal flow rate	[l/min]	50				
Adjustable delay times	[s]	0.2 ... 3	2 ... 30	8 ... 120	20 ... 300	0.2 ... 2
Repetition accuracy	[ms]	±0.1	±0.3	±1.2	±3	±0.3
Setting accuracy	[ms]	±0.3	±0.6	±3	±6	–
Pause period for reset	[ms]	≥ 200				
Protection class to EN 60 529		IP40 with protective cover and panel frame				
Weight	[g]	45				50
Materials		Housing: Polymer				

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				

Example of application

PZVT-...-SEC PZVT-AUT



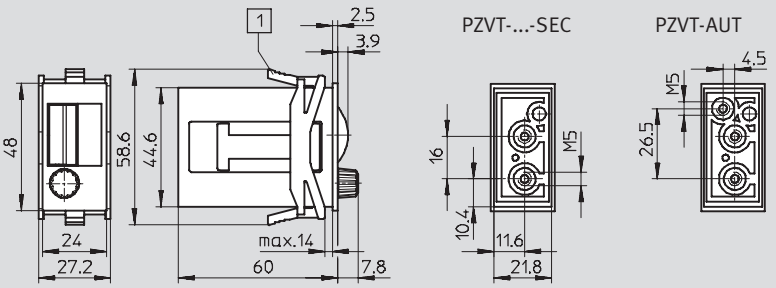


1 = Supply port
2 = Working or outlet line
3 = Exhausts
12 = Pilot line

t_T = Time preset range for timer type PZVT-...-SEC
t_R = Switching delay time for reset module PZVT-AUT (0.2 ... 2 s)
t_{SU} = Signal interruption period for reset module PZVT-AUT (≥ 300 ms)

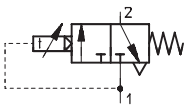
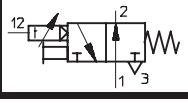
Dimensions

Download CAD data ➔ **www.festo.com/en/engineering**

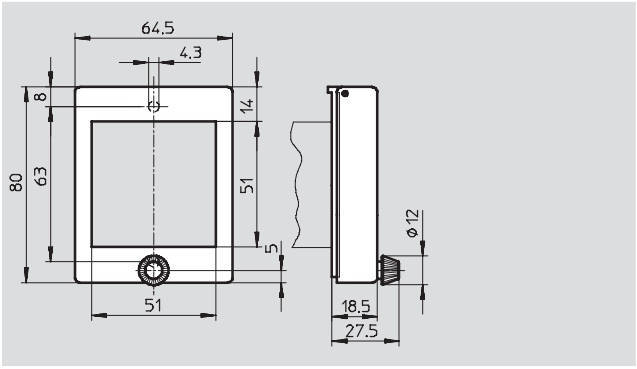


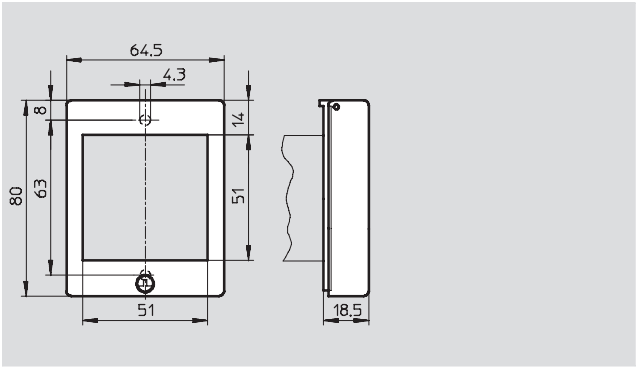
1 Clamping frame included in scope of delivery

Ordering data

			Part No.	Type
Timer	0.2 ... 3 s		**158 495**	**PZVT-3-SEC**
	2 ... 30 s		**150 238**	**PZVT-30-SEC**
	8 ... 120 s		**177 616**	**PZVT-120-SEC**
	20 ... 300 s		**150 239**	**PZVT-300-SEC**
Reset module	0.2 ... 2 s		**158 496**	**PZVT-AUT**

Protective cover
with rotary knob PZ-SK-2
with lock PZ-SS-2
Protective cover for timers to protect against entry of dirt and water on the front panel

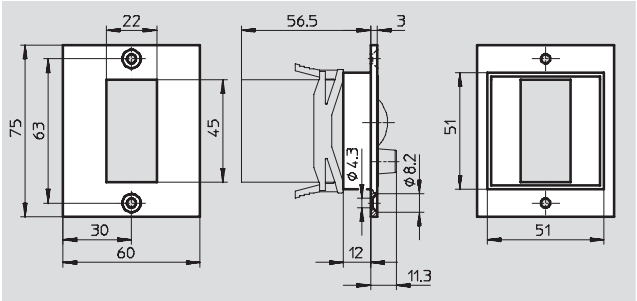




Ordering data

	Part No.	Type
Protective cover with rotary knob	**14 663**	**PZ-SK-2**
Protective cover with lock	**13 966**	**PZ-SS-2**

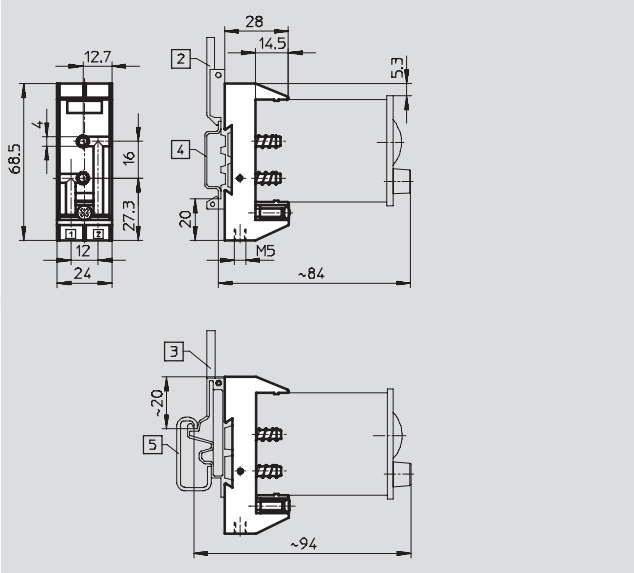
Panel frame PZVT-FR
for panel mounting



Ordering data

	Part No.	Type
Panel frame	**150 241**	**PZVT-FR**

Base PZVT-S-DIN
for mounting on G-rail to EN 50 035
or H-rail on EN 60715



2 Mounting plate MPL-MUS/PZ-H
3 Mounting plate MPL-MUS/PZ-G
4 H-rail to EN 60715
5 G-rail to EN 50 035

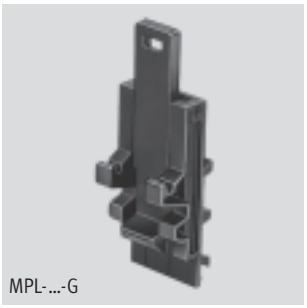
- Note

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

Ordering data		
	Part No.	Type
Base	**150 240**	**PZVT-S-DIN**

Mounting plate MPL-MUS/PZ-G
for G-rail to EN 50 035

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


MPL-...-G


MPL-...-H

Ordering data		
	Part No.	Type
Mounting plate for G-rail	**19 134**	**MPL-MUS/PZ-G**
Mounting plate for H-rail	**19 135**	**MPL-MUS/PZ-H**