


# M5 Compact System

Key features

FESTO



-  - 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

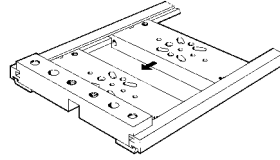
Key features



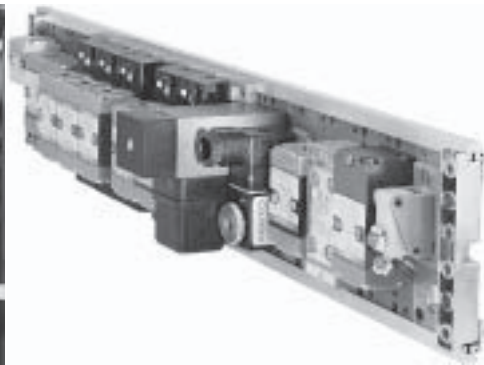
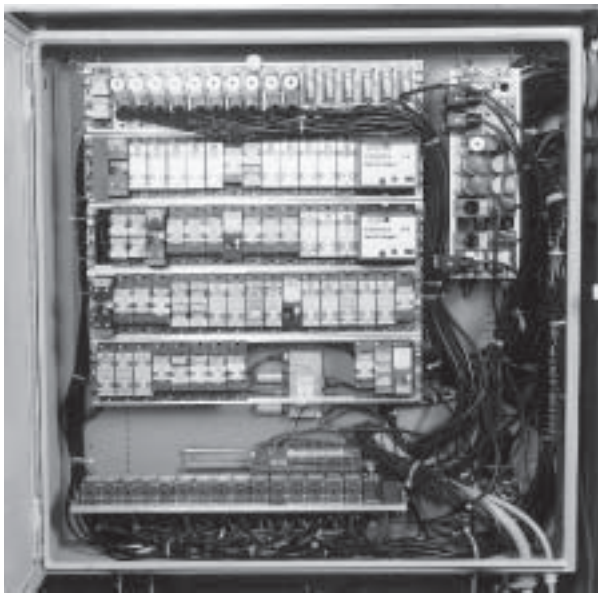
## Mounting the components

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.



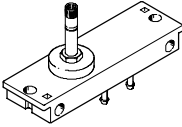
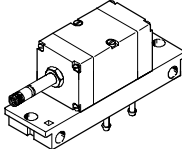
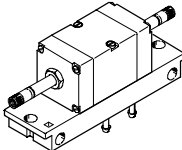
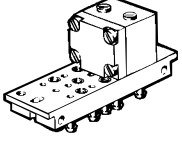
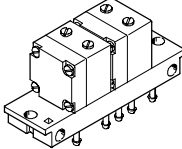
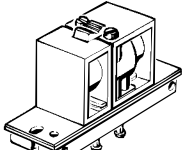
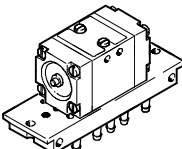
They can also be placed onto the frame and screwed down individually.



# M5 Compact System

Product range overview

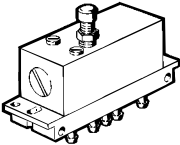
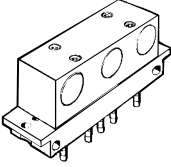
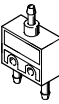
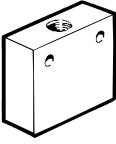
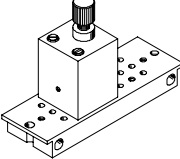
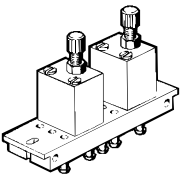
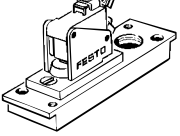
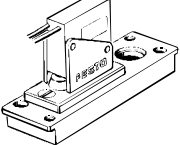


Function	Version	Type	Brief description	Operating pressure [bar]	→ Page
Solenoid valves	<b>3/2-way valves</b>				
		MUFH-3-PK-3	Mechanical spring return for mounting frame 2N	0 ... 8	4 / 6.2-6
	<b>5/2-way valves</b>				
		MFH-5-PK-3	Mechanical spring return for mounting frame 2N	3 ... 8	4 / 6.2-6
		MFH-5-PK-3-L	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	<b>3/2-way valves</b>				
		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
	<b>5/2-way valves</b>				
		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

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Product range overview

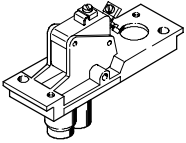
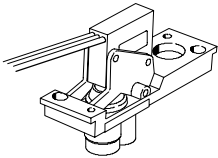
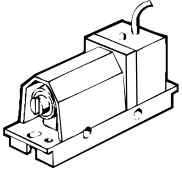
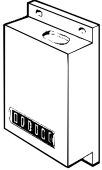
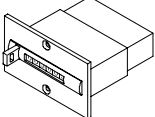
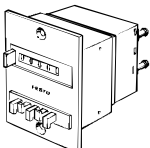
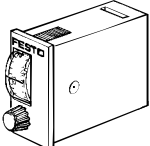


Function	Version	Type	Brief description	Operating pressure [bar]	→ Page
Time delay valves	<b>Time delay valves</b>				
		VZ-3-PK-3	With switch-on delay for mounting frame 2N	0 ... 8	4 / 6.2-12
		VZO-3-PK-3	With switch-off delay for mounting frame 2N	0 ... 8	4 / 6.2-12
Logic components	<b>AND/OR blocks</b>				
		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-1/8-B	OR gate	1 ... 10	4 / 6.2-22
		ZK-1/8-B	AND gate	1 ... 10	4 / 6.2-22
		OS-1/4-B	OR gate	1 ... 10	4 / 6.2-22
One-way flow control valves	<b>One-way flow control valves</b>				
		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	<b>Pneumatic/electrical pressure transducers</b>				
		PE-1/8-2N	For mounting frame 2N	0 ... 8	4 / 6.2-16
		PE-1/8-2N-SW	Splash proof design for mounting frame 2N	0 ... 8	4 / 6.2-16

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Product range overview



Function	Version	Type	Brief description	Operating pressure [bar]	→ Page
Pressure switches	<b>Pneumatic/electrical pressure transducers</b>				
		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
	<b>Pneumatic/electrical differential pressure switch</b>				
		PEN-M5	Vacuum switch for mounting frame 2N	-0.95 ... 8	4 / 6.2-19
Pneumatic counters	<b>Adding counters</b>				
		PZA-A-B	Base mounting	2 ... 8	4 / 6.2-24
		PZA-E-C	Panel mounting	2 ... 8	4 / 6.2-24
	<b>Predetermining counter</b>				
		PZV-E-C	Panel mounting	2 ... 8	4 / 6.2-24
Pneumatic timer	<b>Pneumatic timer</b>				
		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 → Volume 2
Special voltage [V]		12 ... 220			
A.C. voltage					
Standard voltages [V]		24, 42, 110, 220 at 50 Hz or 50 and 60 Hz			Solenoid coils → Volume 2
Special voltage [V]		12 ... 240 at 50 or 60 Hz			
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

Dimensions Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

3/2-way valves

MUFH-3-PK-3

Technical drawing of the MUFH-3-PK-3 3/2-way valve. The front view shows a valve body with a total width of 81 mm and a height of 26.8 mm. Key dimensions include 75 mm for the main body length, 39 mm for the internal passage, and 4.4 mm for the mounting hole offset. A manual override (2) is located on the side. The side view shows the valve mounted on a frame with a total height of 74 mm and a width of 88.5 mm. A solenoid coil (3) is mounted on top, and a barbed fitting (1) is on the side. Callouts 1, 2, and 3 indicate specific features.

- 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

Technical drawing of the MFH-5-PK-3 and MFH-5-PK-3-L 5/2-way valves. The front view shows a valve body with a total width of 81 mm and a height of 26.8 mm. Key dimensions include 75 mm for the main body length, 32 mm for the internal passage, and 4.4 mm for the mounting hole offset. A manual override (2) is located on the side. The side view shows the valve mounted on a frame with a total height of 62.5 mm and a width of 106 mm. A rotatable solenoid coil (1) is mounted on top, and a dowel pin (4) is on the side. Callouts 1, 2, 3, and 4 indicate specific features.

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

JMFH-5-PK-3

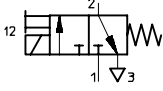
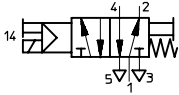
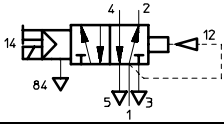
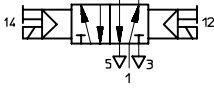
Technical drawing of the JMFH-5-PK-3 5/2-way valve. The front view shows a valve body with a total width of 81 mm and a height of 26.8 mm. Key dimensions include 75 mm for the main body length, 32 mm for the internal passage, and 4.4 mm for the mounting hole offset. A manual override (2) is located on the side. The side view shows the valve mounted on a frame with a total height of 62.5 mm and a width of 133 mm. A barbed fitting (1) is on the side, and a solenoid coil (3) is mounted on top. Callouts 1, 2, and 3 indicate specific features.

- 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
<b>3/2-way valves</b>			
Solenoid valve mechanical spring return		6 705	MUFH-3-PK-3
<b>5/2-way valves</b>			
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
<b>Accessories</b>			
Solenoid coils and plug sockets		→ Volume 2	



# Pneumatic valves VL/J, for mounting frame 2N

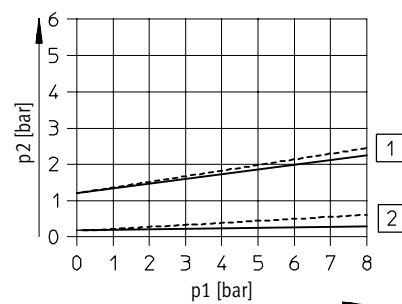
Technical data

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	VL 10	–	15	–	–
		VLO 13				
	Off	50	–	22	–	–
Change-over		–	with 10: 6	–	9	with 14: 9
			with 12: 8			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	–	–		

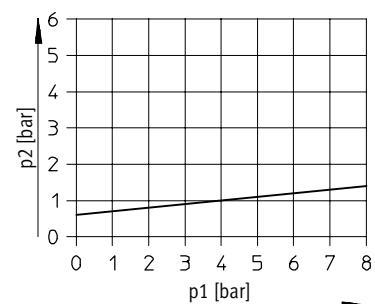
Operating and environmental conditions						
		3/2-way valves		5/2-way valves		
		VL/O-3-PK-3 VL/O-3-PK-3x2	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3
Operating pressure	[bar]	0 ... 8	–0.9 ... +8	0 ... 8	1 ... 8	
Pilot pressure	[bar]	See graph		See graph		
Ambient temperature	[°C]	–10 ... +60		–10 ... +60	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

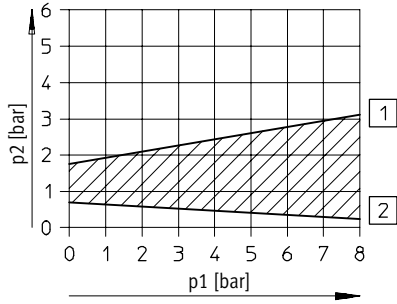
Technical data



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

5/2-way valves

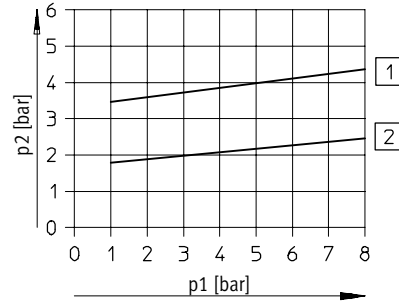
VL-5-PK-3



- 1 Switch-on pressure
- 2 Switch-off pressure

J-5-PK-3

JD-5-PK-3



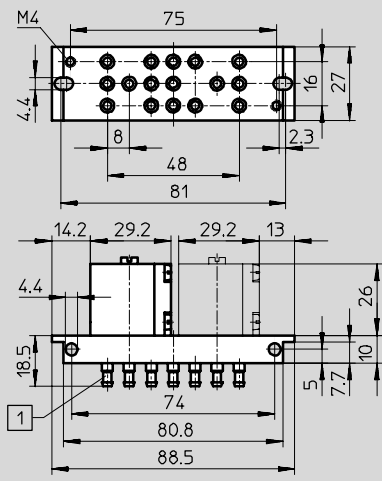
- 1 JD-5-PK-3
- 2 J-5-PK-3

## Dimensions

3/2-way valves

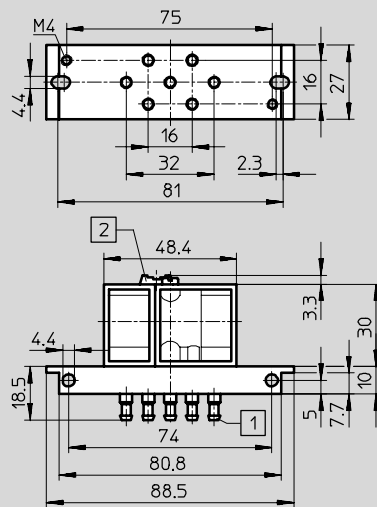
VL/O-3-PK-3

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

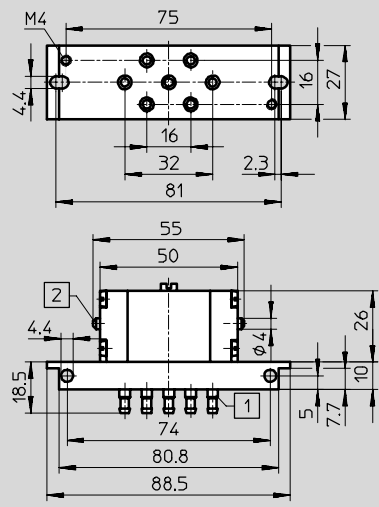
Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

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
<b>3/2-way valves</b>			
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
<b>5/2-way valves</b>			
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

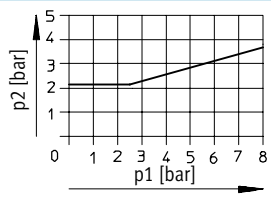
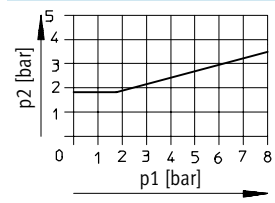


General technical data		With switch-on delay VZ-3-PK-3	With switch-off delay VZO-3-PK-3
Constructional design	Poppet valve with spring return		
Type of mounting	2 through-holes in sub-base or on mounting frame		
Operating medium	Filtered compressed air, lubricated or unlubricated		
Pneumatic connection	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 <sup>1)</sup> [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 cm<sup>3</sup> will increase the delay time by approx. 5 s. For reservoir type VZS → Volume 3.

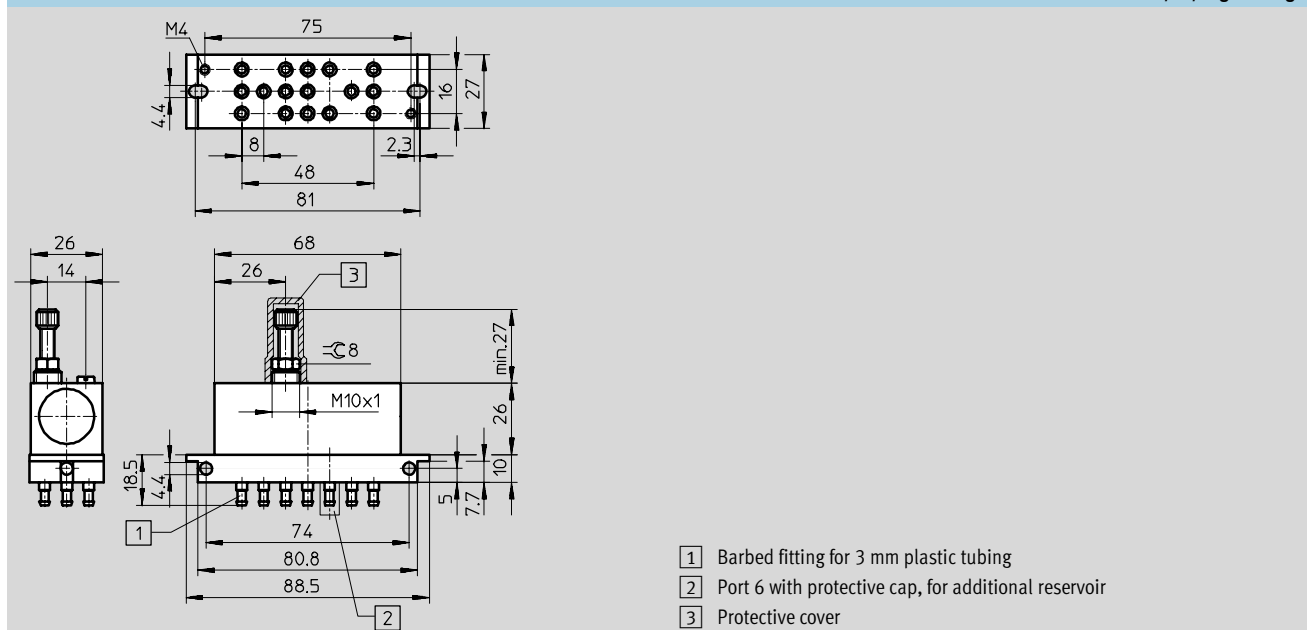
Operating and environmental conditions		
Operating pressure [bar]		0 ... 8
Pilot pressure [bar]		See graph
Ambient temperature [°C]		-10 ... +60

## Minimum pilot pressure p<sub>2</sub> as a function of the operating pressure p<sub>1</sub>



## Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

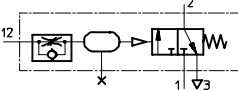
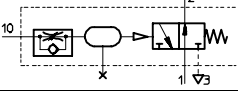


- 1 Barbed fitting for 3 mm plastic tubing
- 2 Port 6 with protective cap, for additional reservoir
- 3 Protective cover

# 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

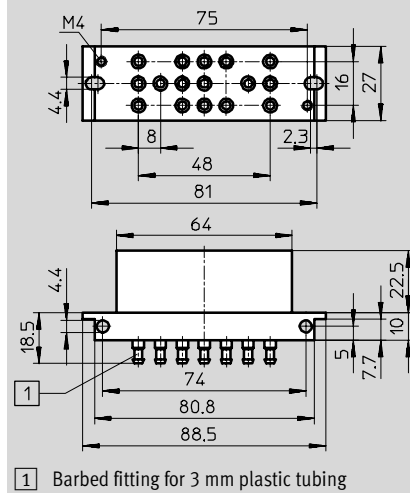
Technical data



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](http://www.festo.com/en/engineering)



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](http://www.festo.com/en/engineering)

1 Barbed fitting for 3 mm plastic tubing

Ordering data		
One-way flow control valve		Part No. Type 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



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

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 symbol	In accordance with EU Directive 73/23/EU			
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			
60	1	0.5			
110	0.5	0.2			
220	0.25	0.1			
PE/VPE-1/8-2N-SW					
15	10	10	250	5	2
30	5	3			
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

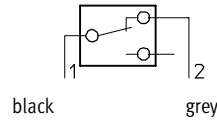
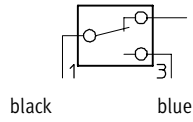
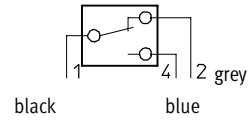


## Terminal allocation

Changeover switch

Normally open contact

Normally closed contact



## Dimensions

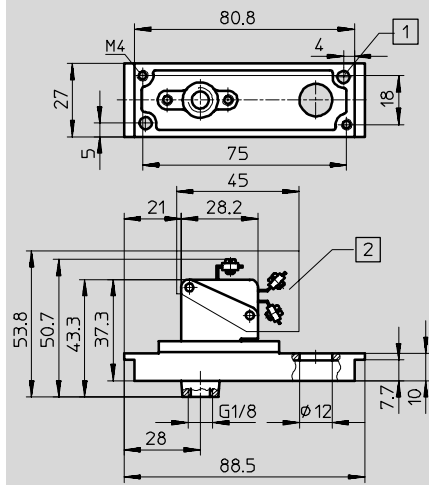
Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

PE converter

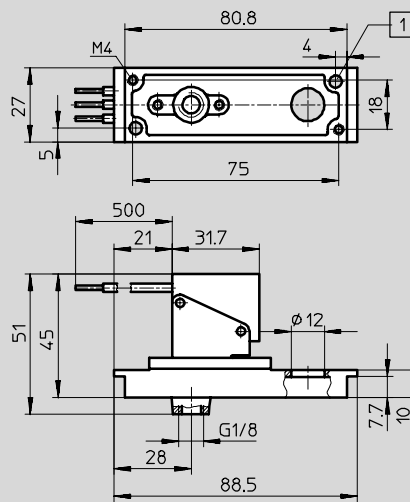
PE-1/8-2N

PE-1/8-2N-SW

splash proof design



- 1 For M4 thread
- 2 Protective cap SPE-B



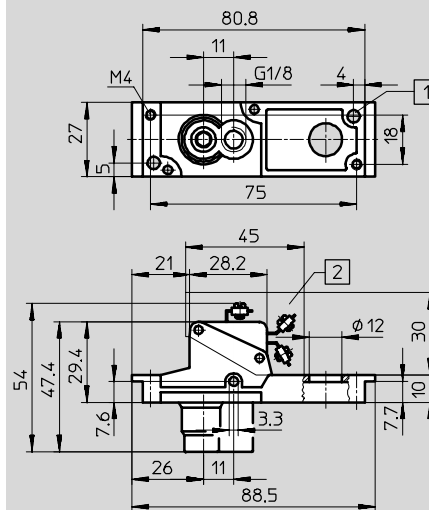
- 1 For M4 thread

Vacuum switch

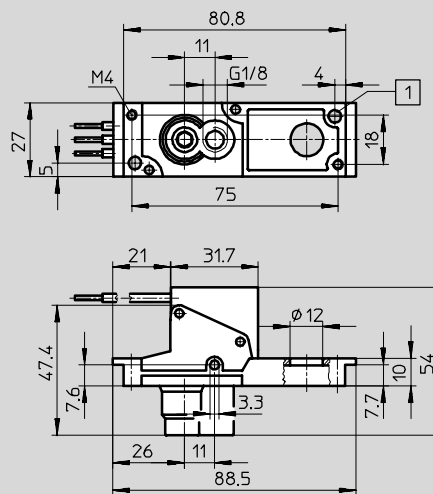
VPE-1/8-2N

VPE-1/8-2N-SW

splash proof design



- 1 For M4 thread
- 2 Protective cap SPE-B

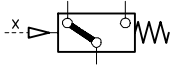
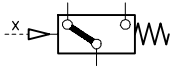
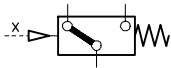
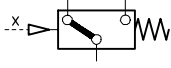


- 1 For M4 thread

# PE converters PE/VPE, for mounting frame 2N

Technical data



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

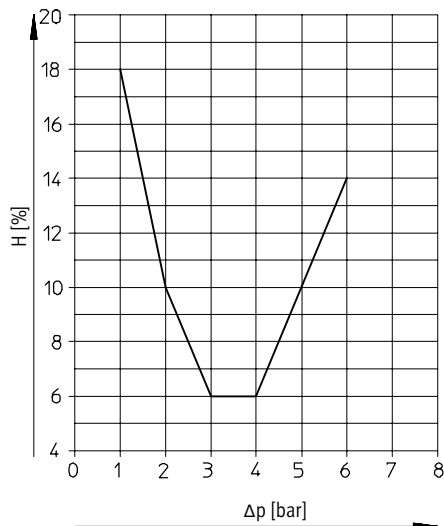
Technical data

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 <sup>2</sup>
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 $\Delta p$



# PE converters PEN-M5, for mounting frame 2N

Technical data



Pneumatic control systems  
M5-Compact system

6.2

**Dimensions** Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

1 Connecting cable 3x0.14 mm<sup>2</sup>, 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		<b>8625</b>	<b>PEN-M5</b>
<b>Accessories</b>			
Mounting bracket for mounting sub-bases on the frame		<b>11 571</b>	<b>NRW-9/1,5-B</b>
Socket head screw (2 included in scope of delivery)		<b>204 021</b>	<b>DIN 84-M4X12-4.8</b>

# Mounting frames 2N

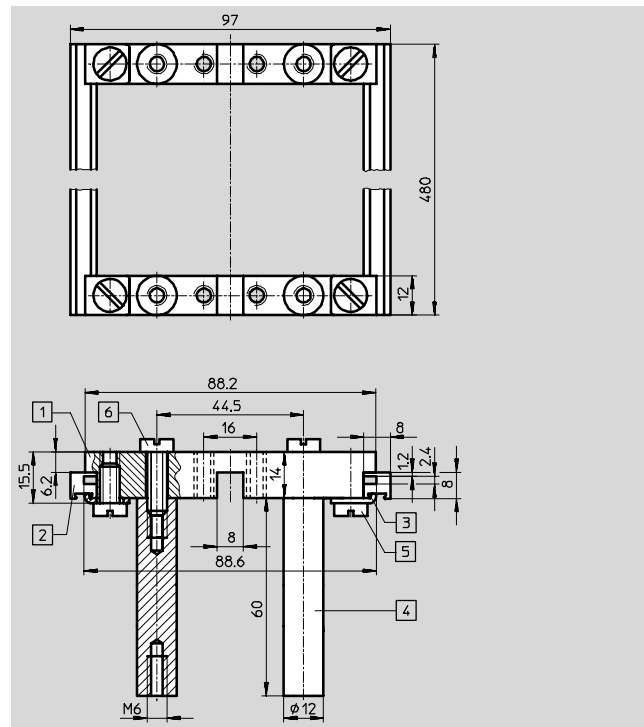
Accessories



## 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

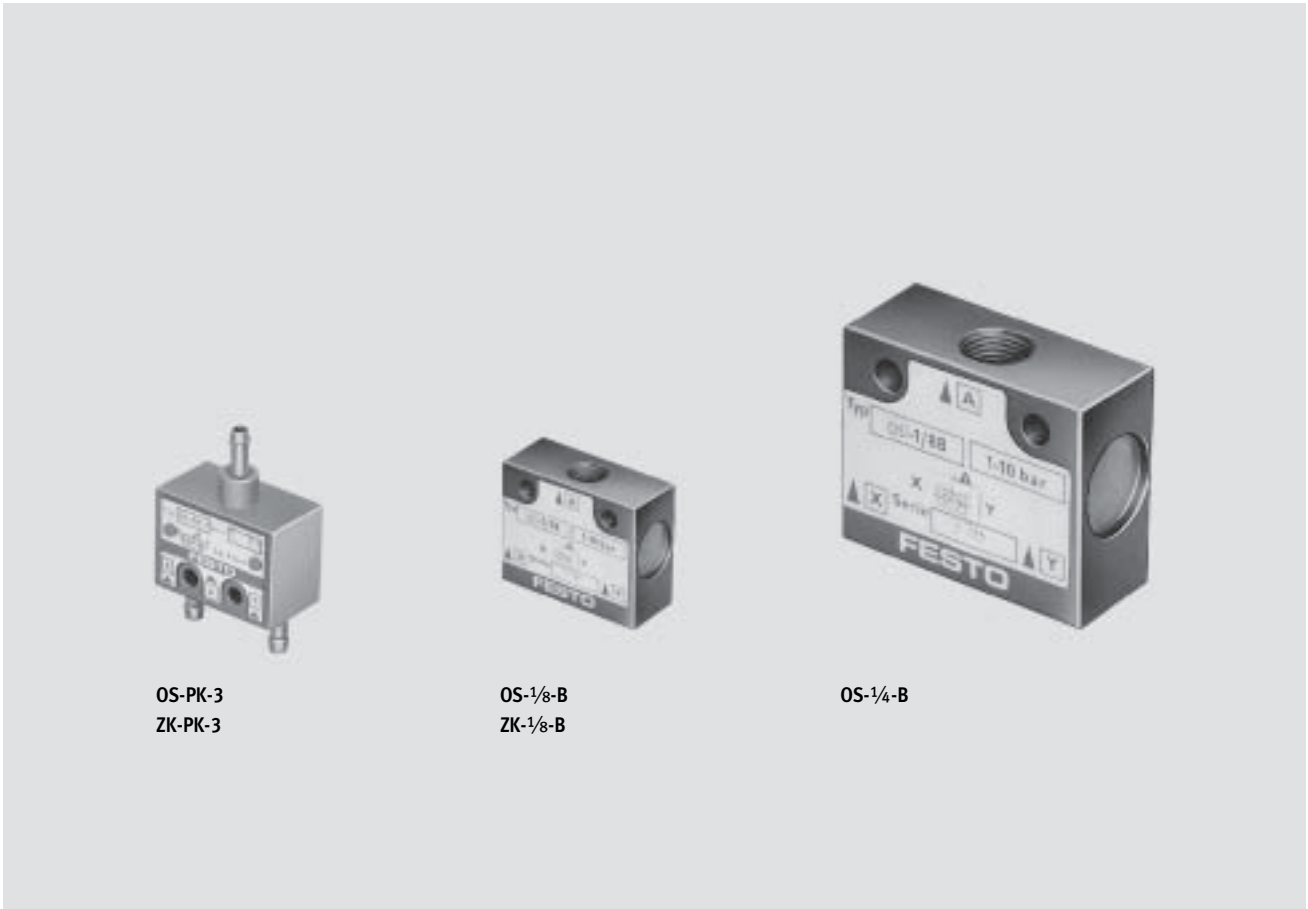


- 1 Connecting piece NRV-2N
- 2 Mounting rail NRQ-8-480
- 3 Mounting bracket NRW-12/3
- 4 Threaded spacer NRB-12/60
- 5 Slotted head screw  
DIN 84-M6X18-4.8
- 6 Slotted head screw  
DIN 84-M6X12-4.8

Mounting frame	Part No.	Type
Mounting frame 2N complete for 16 components	9 365	NRRQ-2N
<b>Accessories</b>		
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-1/8-B  
ZK-1/8-B

OS-1/4-B

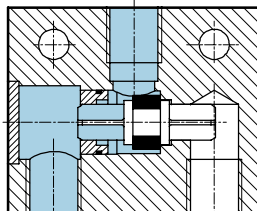
- Flow rate  
120 ... 1170 l/min

- Barbed fitting for 3 mm tubing
- G1/8, G1/4
- 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.

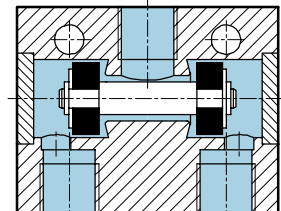
OS-1/4-B



### 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-1/8-B



# AND/OR blocks OS/ZK

Technical data



General technical data						
Type	OR gate			AND gate		
	OS-PK-3	OS-1/8-B	OS-1/4-B	ZK-PK-3	ZK-1/8-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	G $\frac{1}{8}$	G $\frac{1}{4}$	Barbed fitting for 3 mm tubing	G $\frac{1}{8}$	
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			-		

Operating and environmental conditions					
Type	OR gate			AND gate	
	OS-PK-3	OS-1/8-B	OS-1/4-B	ZK-PK-3	ZK-1/8-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](http://www.festo.com/en/engineering)

OS-PK-3 ZK-PK-3	OS-1/8-B ZK-1/8-B	OS-1/4-B
--------------------	----------------------	----------

1) Barbed fitting for 3 mm plastic tubing

Ordering data		Connection	Part No.	Type
OR gate		Barbed fitting for 3 mm tubing	6 684	OS-PK-3
		G $\frac{1}{8}$	6 681	OS-1/8-B
			165 694	OS-1/8-B-CT <sup>1)</sup>
		G $\frac{1}{4}$	6 682	OS-1/4-B
			165 693	OS-1/4-B-CT <sup>1)</sup>
AND gate		Barbed fitting for 3 mm tubing	6 685	ZK-PK-3
		G $\frac{1}{8}$	6 680	ZK-1/8-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 <sup>1)</sup>	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	

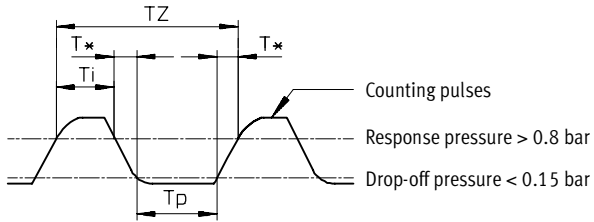
# Counters PZA/PZV

Technical data



## Counting rate

Adding counter PZA-E-C



$$\text{Max. pulse rate} = \frac{1}{T_Z}$$

$$T_Z = T_i + T_p + T^*$$

$$T_Z = T_i + T^*$$

$T_i$  = Min. pulse length

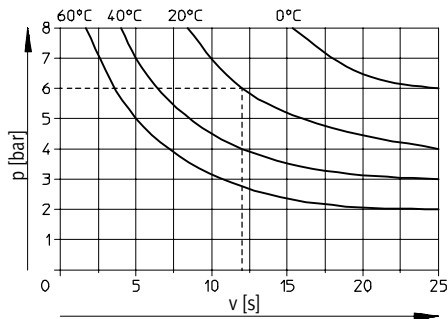
$T_p$  = Min. pulse duration

$T_Z$  = 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](http://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 PZA-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.

# Counters PZA/PZV

Technical data



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

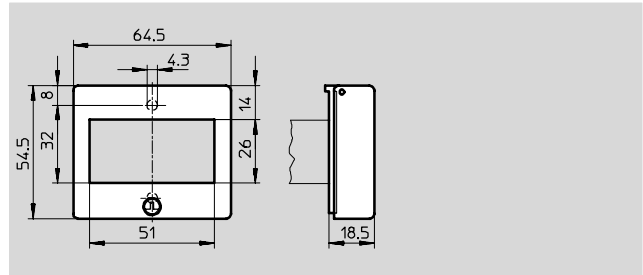
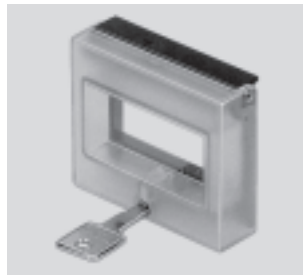
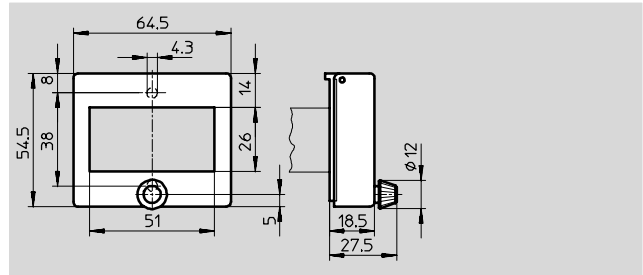
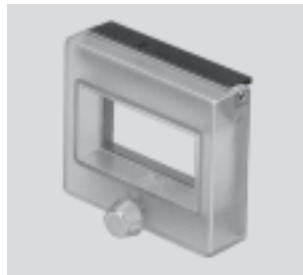
# Counters PZA/PZV

Accessories



## Protective cover with rotary knob PZ-SK-1 with lock PZ-SS-1

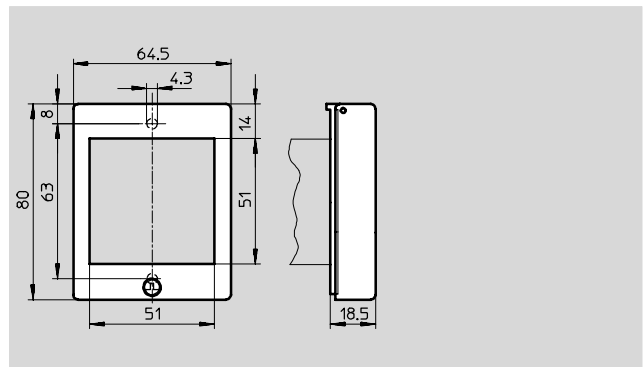
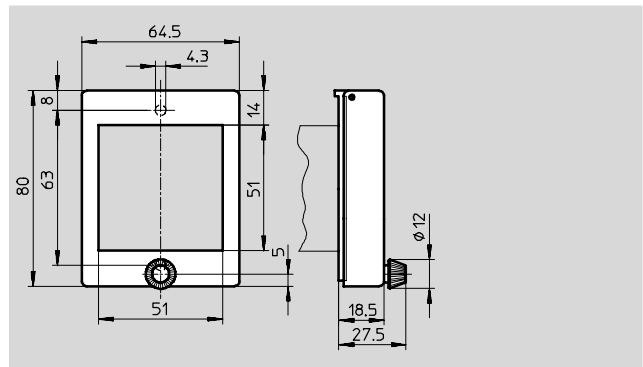
Protective cover for adding counter to protect against entry of dirt and water on the front panel



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

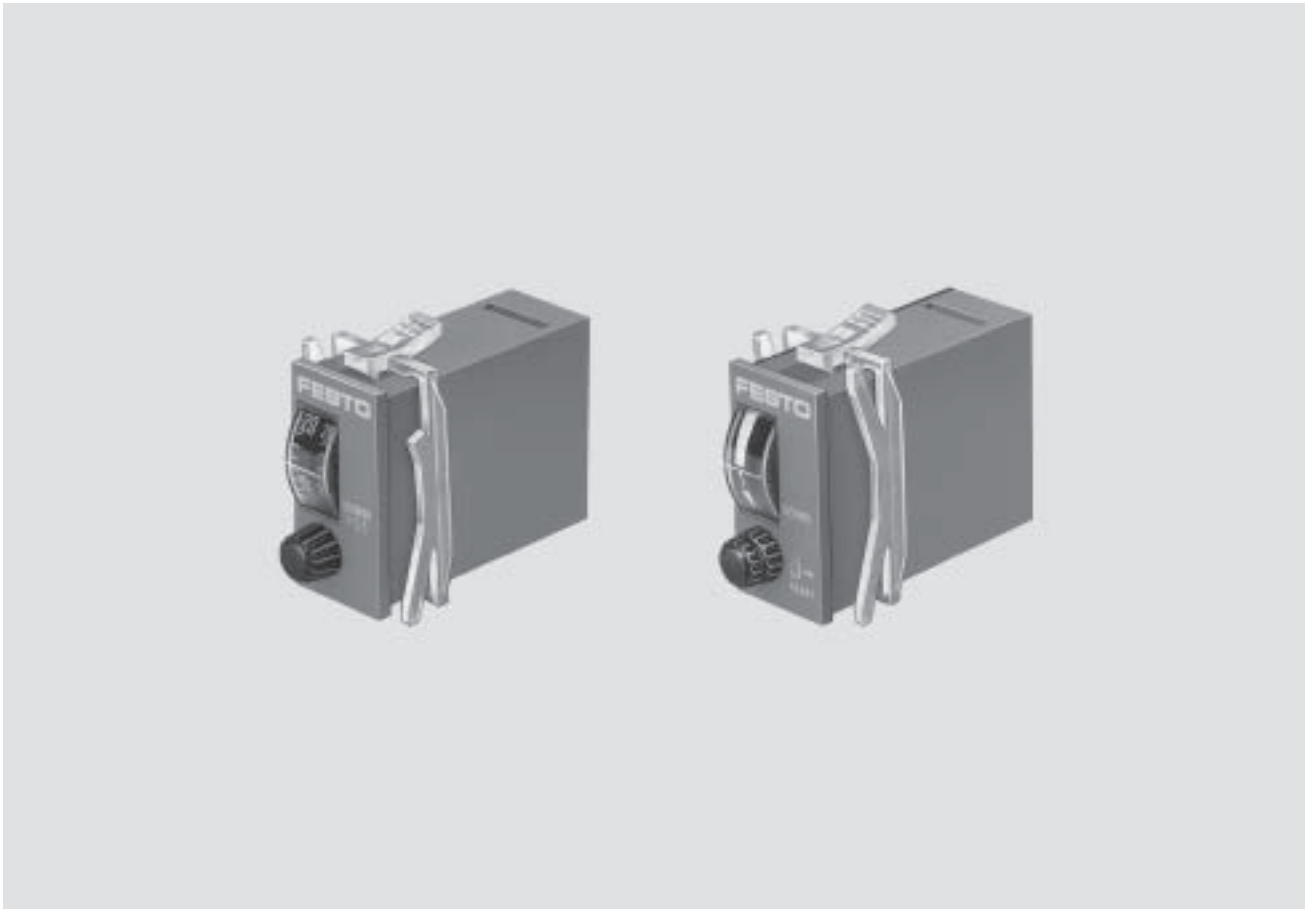
Pneumatic control systems  
M5-Compact system

## 6.2

# Timers PZVT

Key features

FESTO



- Adjustable delay times
  - 0.2 ... 3 s
  - 2 ... 30 s
  - 8 ... 120 s
  - 20 ... 300 s

- Panel mounting
  - G-rail to EN 50 035
  - H-rail to EN 50 022
- Protective cover

### Pneumatic timer PZVT

The timer switches input pressure applied to port 1 through to port 2 after the preset delay time has expired.

### Automatic reset module PZVT-AUT

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.

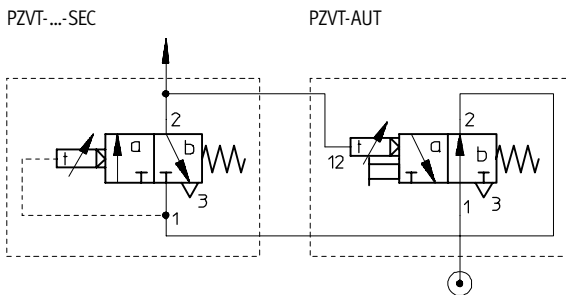
# Timers PZVT

Technical data

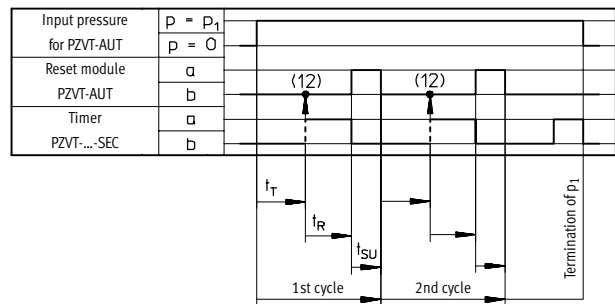
General technical data						
Type	Timer					Reset module
	PZVT-3-SEC	PZVT-30-SEC	PZVT-120-SEC	PZVT-300-SEC	PZVT-AUT	
Constructional design	Mechanical sequence counter with pneumatic drive					
Type of mounting	Panel mounting					
Operating medium	Filtered compressed air (unlubricated) ( $\leq 40 \mu\text{m}$ )					
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]	$\pm 0.1$	$\pm 0.3$	$\pm 1.2$	$\pm 3$	$\pm 0.3$
Setting accuracy	[ms]	$\pm 0.3$	$\pm 0.6$	$\pm 3$	$\pm 6$	-
Pause period for reset	[ms]	$\geq 200$				
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]	$\geq 1.6$				
Switch-off pressure	[bar]	$\leq 0.1$				$\leq 0.3$
Ambient temperature	[°C]	-10 ... +60				

## Example of application



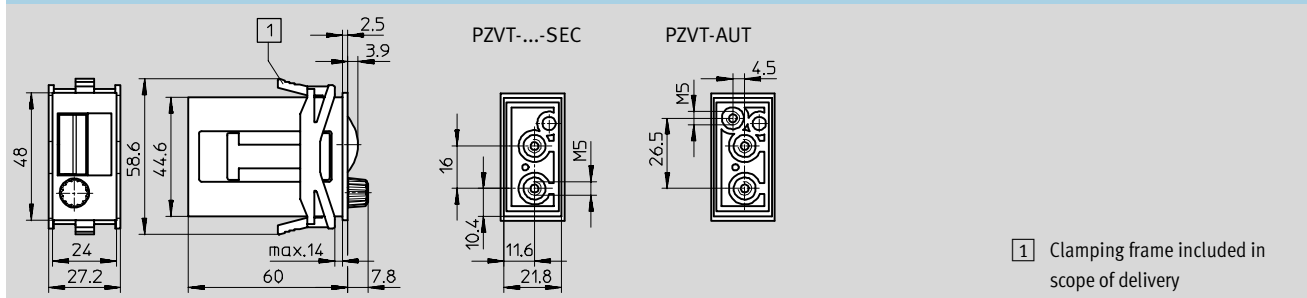
- 1 = Supply port
- 2 = Working or outlet line
- 3 = Exhausts
- 12 = Pilot line



- $t_T$  = 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 ( $\geq 300$  ms)

## Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)



- 1 Clamping frame included in scope of delivery

# Timers PZVT

Technical data



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



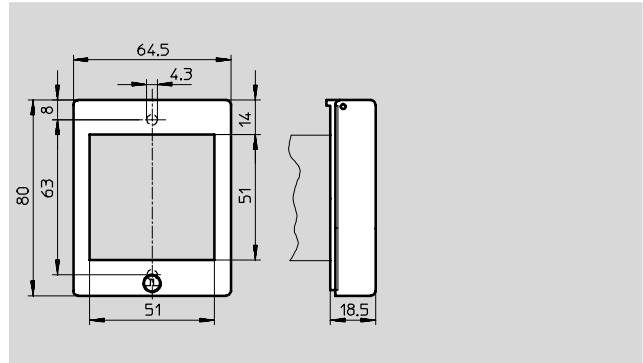
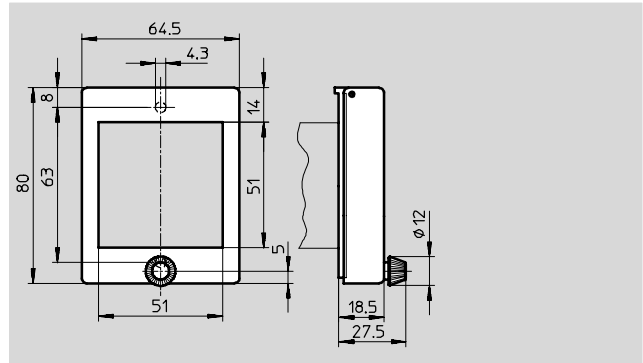
# Timers PZVT

Accessories



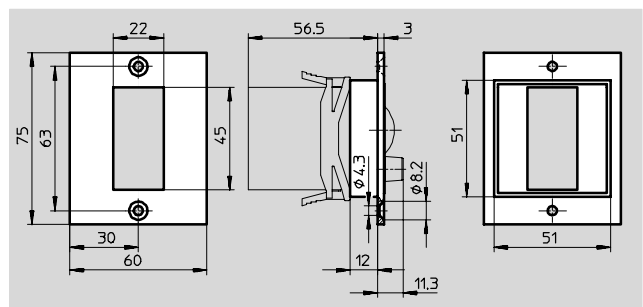
## Protective cover with rotary knob PZ-SK-2 with lock PZ-SS-2

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

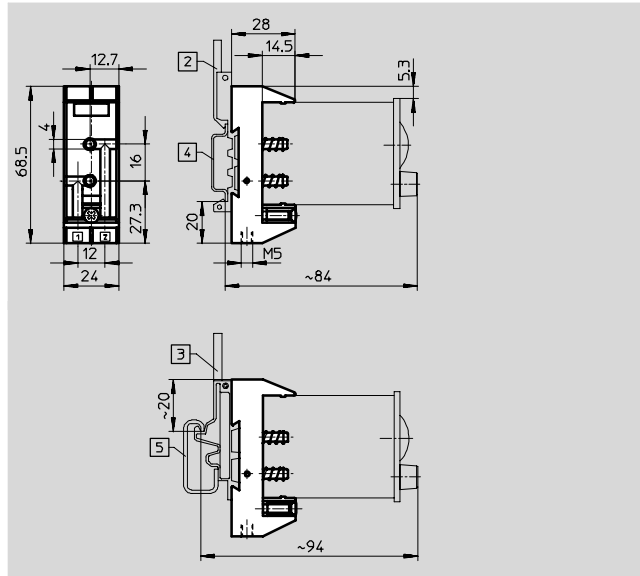
# Timers PZVT

Accessories



## Base PZVT-S-DIN

for mounting on G-rail to EN 50 035  
or H-rail on EN 50 022

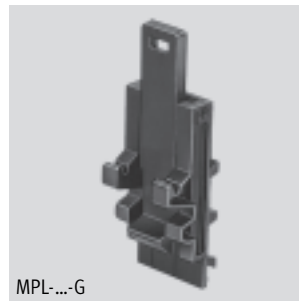


- 2 Mounting plate MPL-MUS/PZ-H
- 3 Mounting plate MPL-MUS/PZ-G
- 4 H-rail to EN 50 022
- 5 G-rail to EN 50 035

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 50 022



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