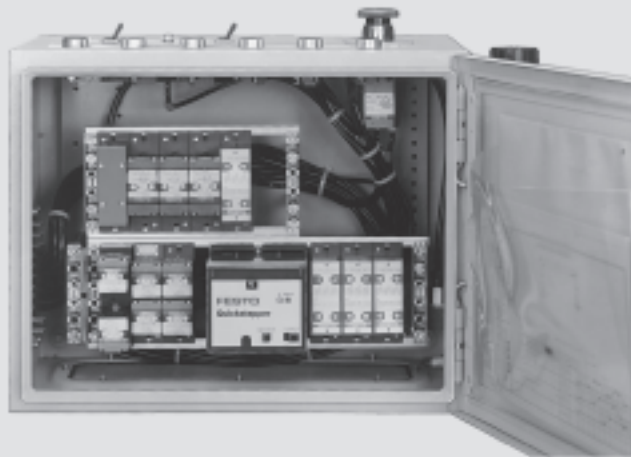



# M5 Compact System

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

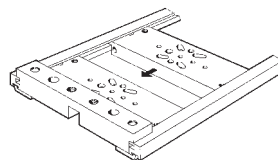
# M5 Compact System

Key features

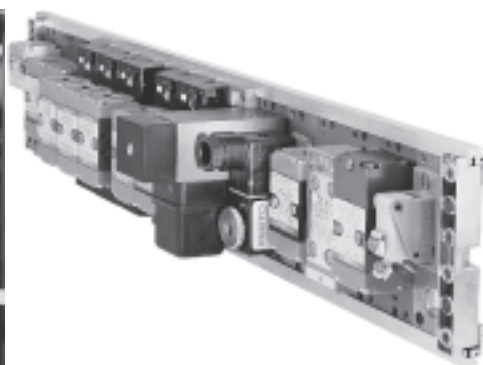
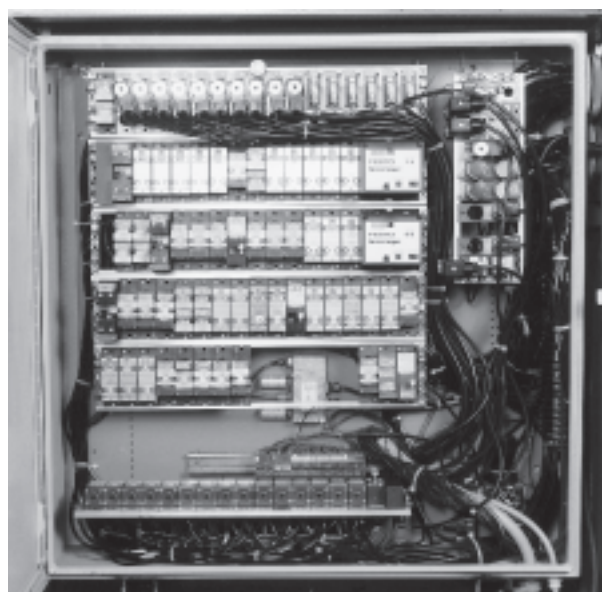
## Mounting the components

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.



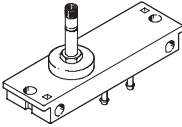
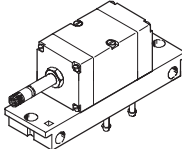
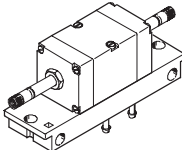
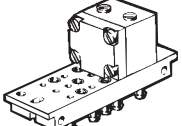
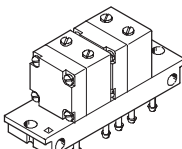
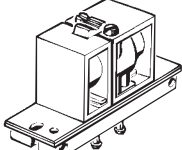
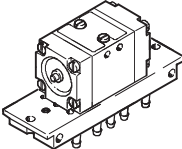
They can also be placed onto the frame and screwed down individually.



# M5 Compact System

Product range overview

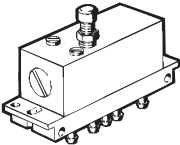
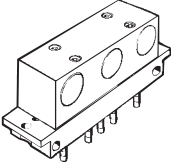
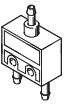
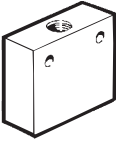
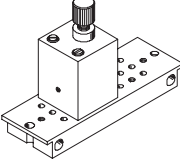
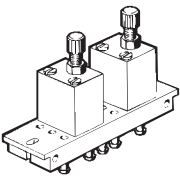
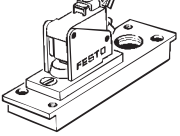
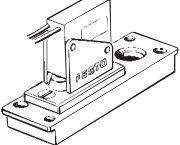
**FESTO**

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

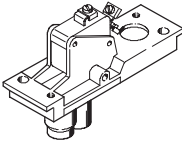
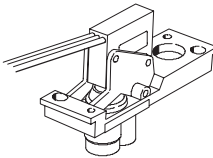
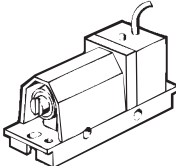
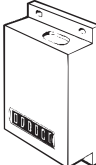
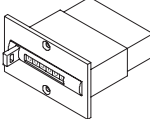
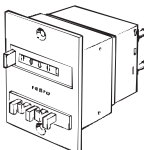
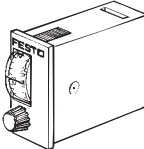
**FESTO**

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-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	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-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

# M5 Compact System

Product range overview

**FESTO**

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

FESTO

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]	–	–	–
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

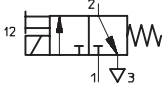
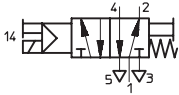
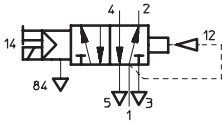
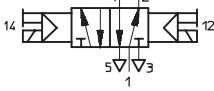
Electrical data					
		3/2-way valves	5/2-way valves		
		MUFH-3-PK-3	MFH-5-PK-3	MFH-5-PK-3-L	JMFH-5-PK-3
D.C. voltage					
Standard voltages	[V]	12, 24			Solenoid coils ➔ Volume 2
Special voltage	[V]	12 ... 220			
A.C. voltage					
Standard voltages	[V]	24, 42, 110, 220 at 50 Hz or 50 and 60 Hz			Solenoid 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			

**FESTO**

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

Technical data

**FESTO**

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

FESTO

Pneumatic control systems  
M5-Compact system

6.2

General technical data							
		3/2-way valves		5/2-way valves			
		VL/O-3-PK-3	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3	
		VL/O-3-PK-3x2					
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	–	15	–	–
			VLO 13				
	Off	[ms]	50	–	22	–	–
		Change-over	[ms]	–	with 10: 6	–	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	

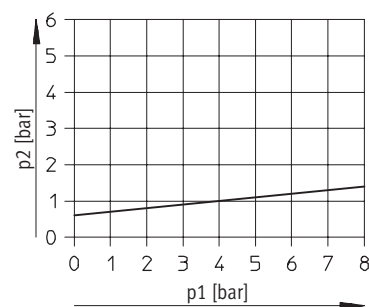
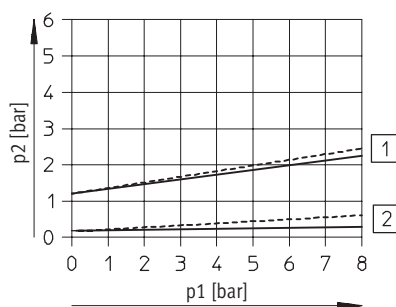
## Minimum pilot pressure p2 as a function of the operating pressure p1

### 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

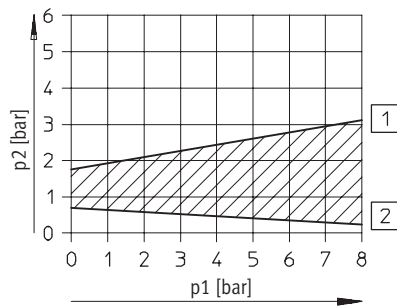
Technical data

FESTO

## Minimum pilot pressure $p_2$ as a function of the operating pressure $p_1$

### 5/2-way valves

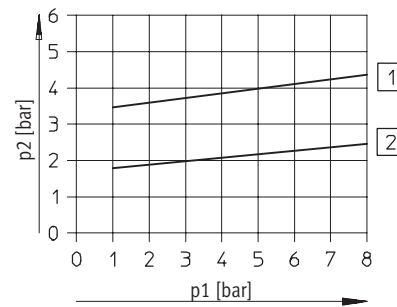
VL-5-PK-3



- 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

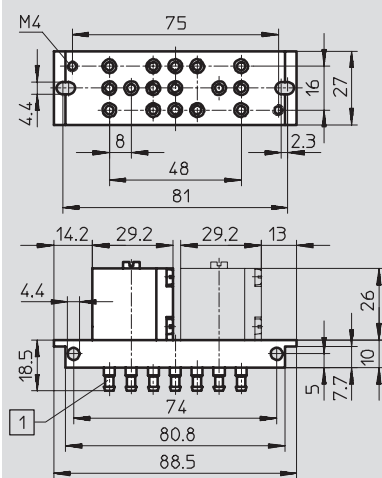
## Dimensions

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

### 3/2-way valves

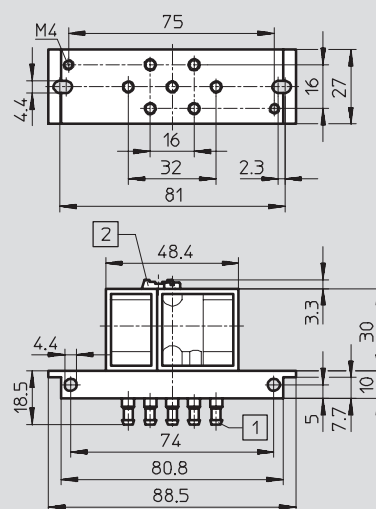
VL/O-3-PK-3

VL/O-3-PK-3x2



- 1 Barbed fitting for 3 mm plastic tubing

J-3-PK-3



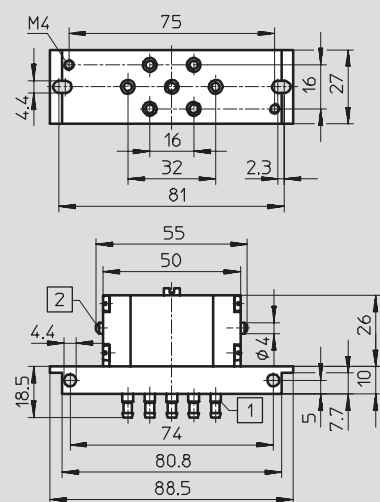
- 1 Barbed fitting for 3 mm plastic tubing
- 2 Manual override

### 5/2-way valves

VL-5-PK-3

J-5-PK-3

JD-5-PK-3

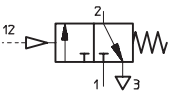
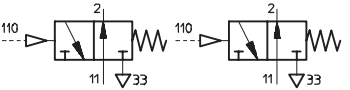
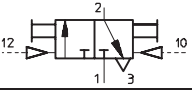
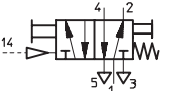
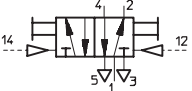
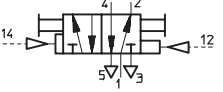


- 1 Barbed fitting for 3 mm plastic tubing
- 2 Manual override

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

Technical data

**FESTO**

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

FESTO

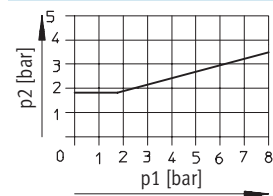
General technical data		
	With switch-on delay VZ-3-PK-3	With switch-off delay VZO-3-PK-3
Constructional design	Poppet valve with spring return	
Type of mounting	2 through-holes in sub-base or on mounting frame	
Operating medium	Filtered compressed air, lubricated or unlubricated	
Pneumatic connection	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.

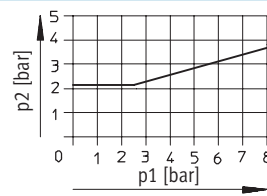
Operating and environmental conditions		
Operating pressure [bar]	0 ... 8	
Pilot pressure [bar]	See graph	
Ambient temperature [°C]	-10 ... +60	

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

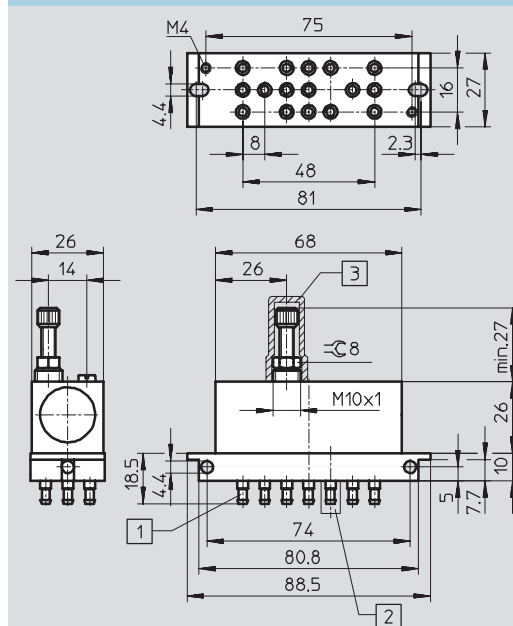
VZ-3-PK-3



VZO-3-PK-3



## 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

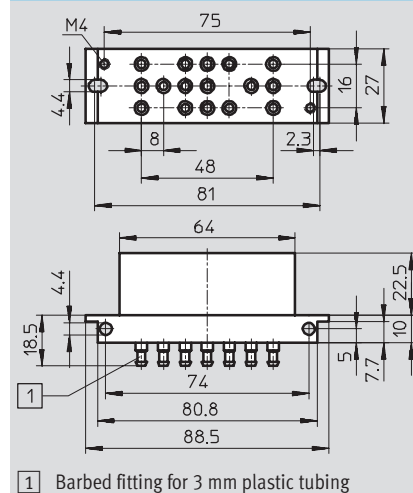
Technical data

**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](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

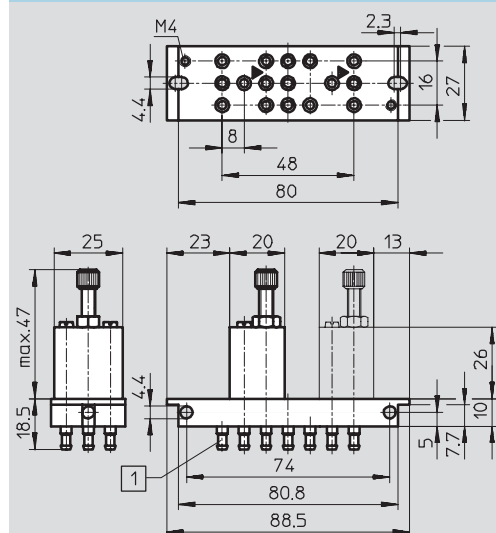
FESTO

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		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

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

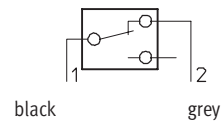
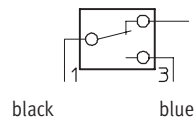
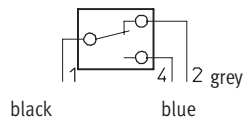
**FESTO**

## Terminal allocation

Changeover switch

Normally open contact

Normally closed contact



## Dimensions

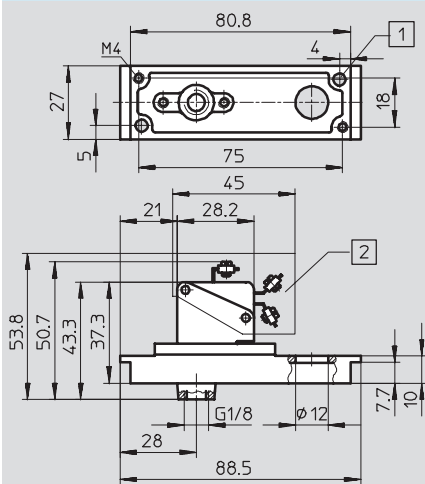
Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)

PE converter

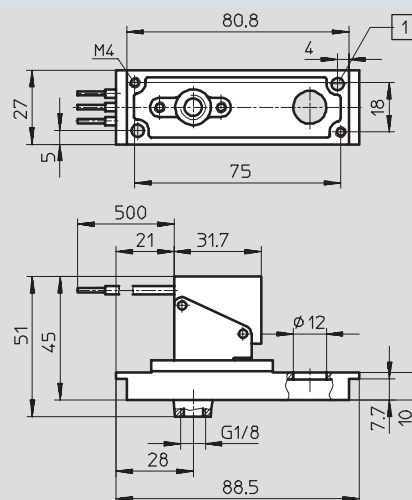
PE-1/8-2N

PE-1/8-2N-SW

splash proof design



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



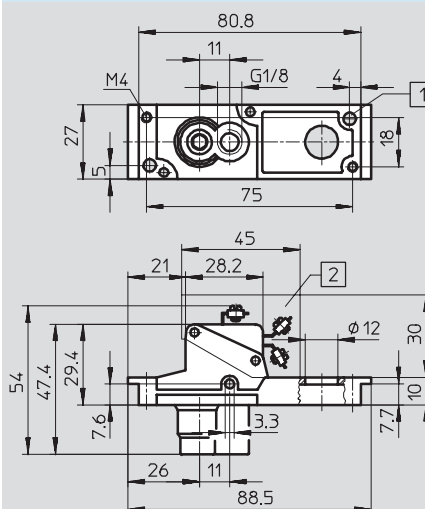
- 1 For M4 thread

Vacuum switch

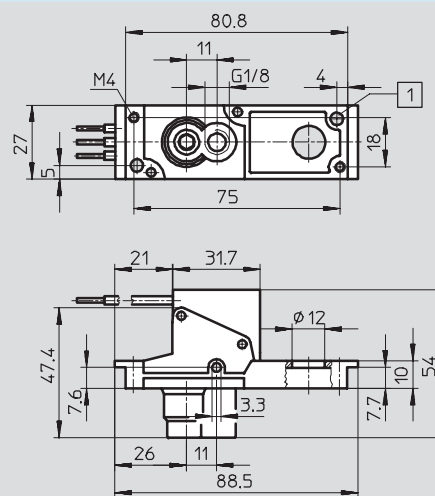
VPE-1/8-2N

VPE-1/8-2N-SW

splash proof design



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

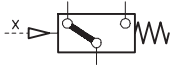
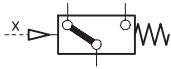
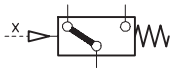
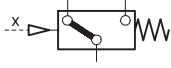


- 1 For M4 thread

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

Technical data

**FESTO**

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

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

Technical data

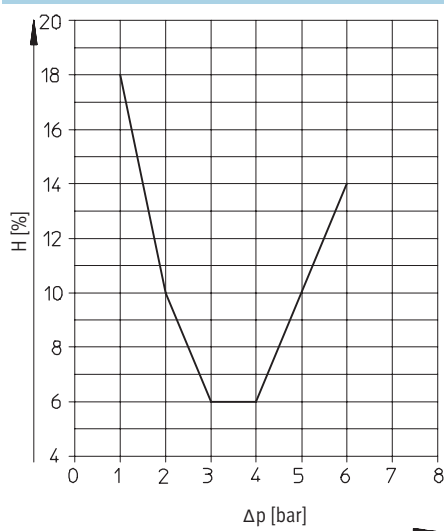
**FESTO**

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 <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

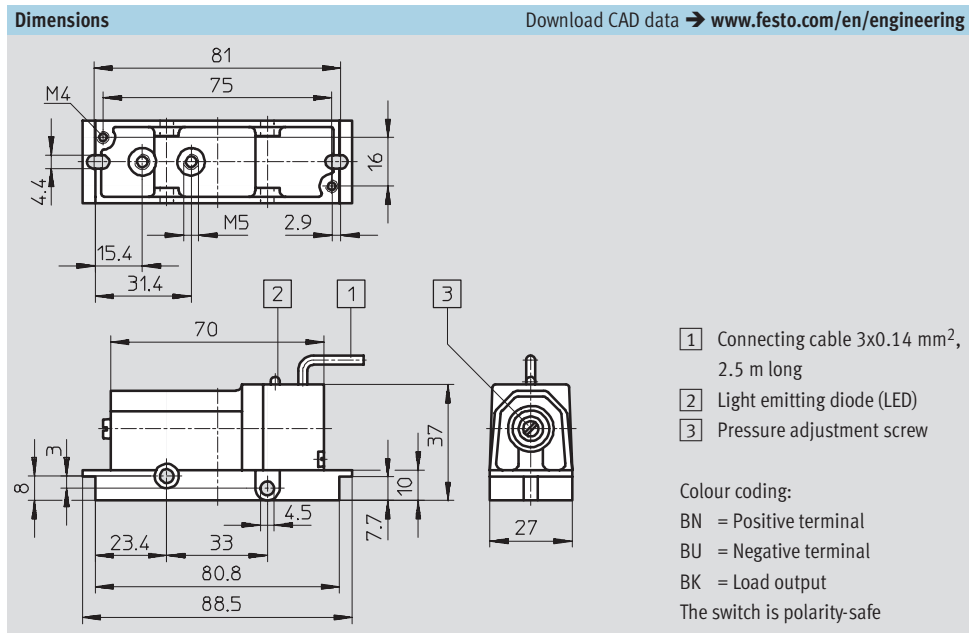
Hysteresis H as a function of the differential pressure  $\Delta p$

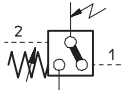


## PE converters PEN-M5, for mounting frame 2N

Technical data

**FESTO**



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

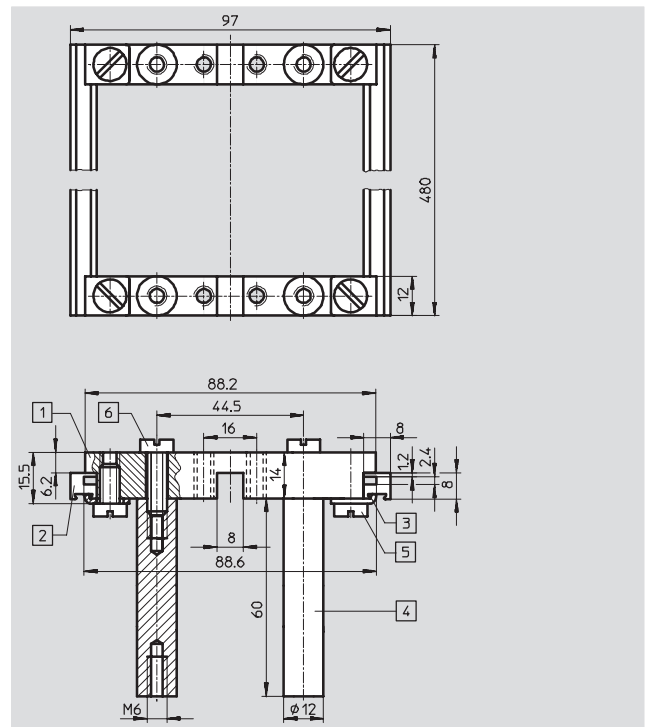
Accessories

FESTO

## 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

Pneumatic control systems  
M5-Compact system

6.2

# AND/OR blocks OS/ZK

Key features

FESTO




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
- G $\frac{1}{8}$ , G $\frac{1}{4}$
- OR function
- AND function

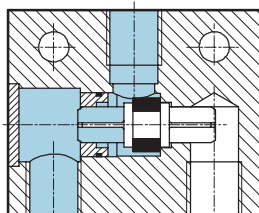
## OR function

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.

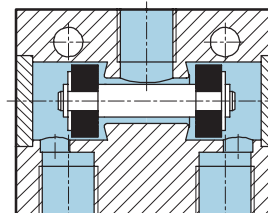
OS-1/4-B



## 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

**FESTO**

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	G1/8	G1/4	Barbed fitting for 3 mm tubing	G1/8
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 → <a href="http://www.festo.com/en/engineering">www.festo.com/en/engineering</a>
OS-PK-3	OS-1/8-B	OS-1/4-B	
ZK-PK-3	ZK-1/8-B		
1) Barbed fitting for 3 mm plastic tubing			

Ordering data			
OR gate		Connection	Part No. Type
		Barbed fitting for 3 mm tubing	6 684 OS-PK-3
		G1/8	6 681 OS-1/8-B
			165 694 OS-1/8-B-CT <sup>1)</sup>
		G1/4	6 682 OS-1/4-B
			165 693 OS-1/4-B-CT <sup>1)</sup>
AND gate		Connection	Part No. Type
		Barbed fitting for 3 mm tubing	6 685 ZK-PK-3
		G1/8	6 680 ZK-1/8-B

1) Free of copper, PTFE and silicone

# Counters PZA/PZV

Key features

FESTO



## 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	PZA-E-C	PZV-E-C
Operating pressure	[bar]	2 ... 8		
Min. reset pressure	[bar]	2	–	–
Ambient temperature	[°C]	–10 ... +60	0 ... +60	

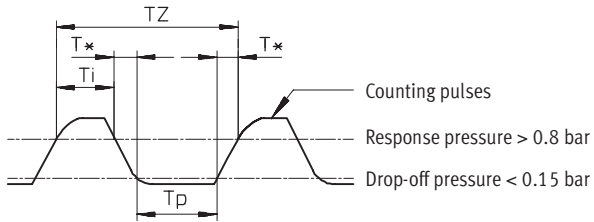
# Counters PZA/PZV

Technical data

FESTO

## 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

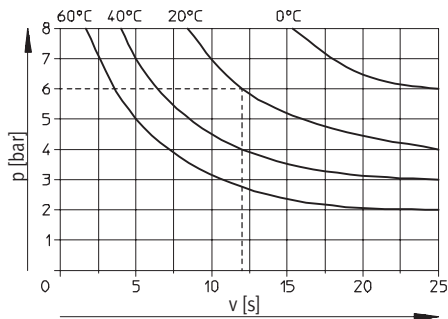
$T_p$  = Min. pulse duration

$T_Z$  = 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

FESTO

Pneumatic control systems  
M5-Compact system

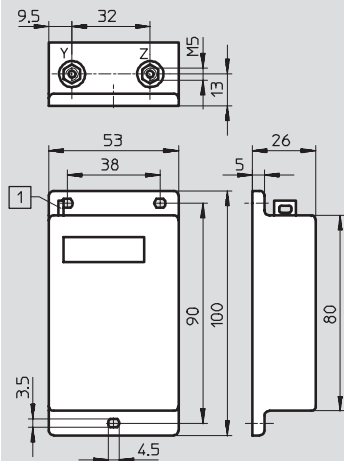
6.2

## Dimensions

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

Adding counter

Surface mounting PZA-A-B

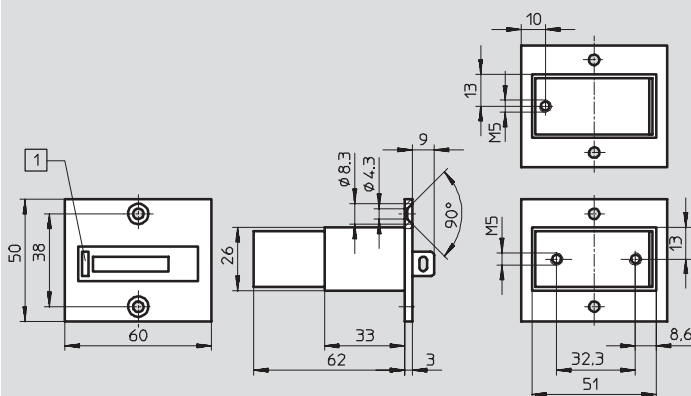


1 Reset button

Z = Counting signal

Y = Reset signal

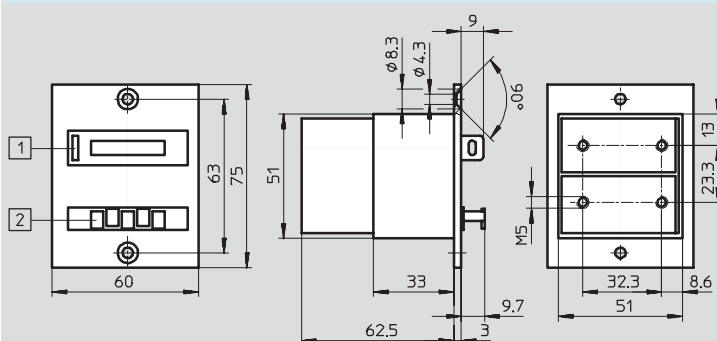
Panel mounting PZA-E-C



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.



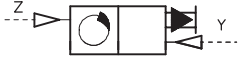
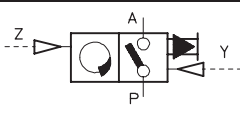
Note  
The output signal must not be used to reset the counter. No counting

signal may arrive or be present during the resetting procedure.

# Counters PZA/PZV

Technical data

FESTO

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

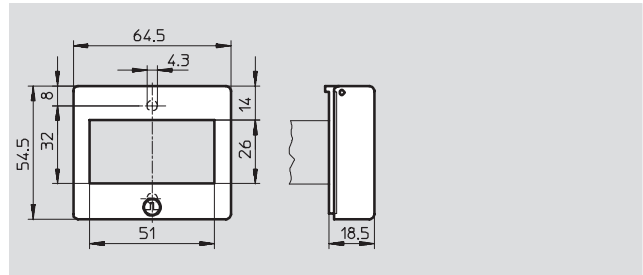
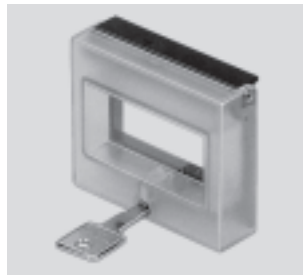
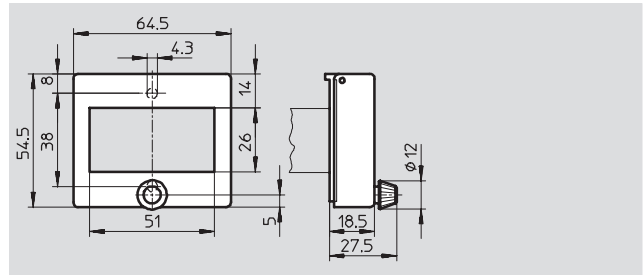
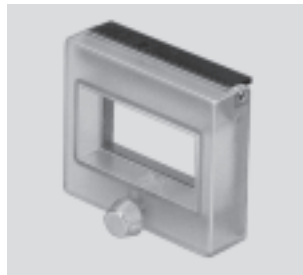
## Counters PZA/PZV

Accessories

FESTO

### 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

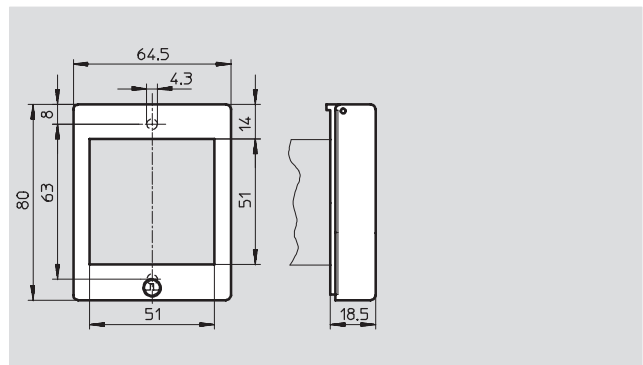
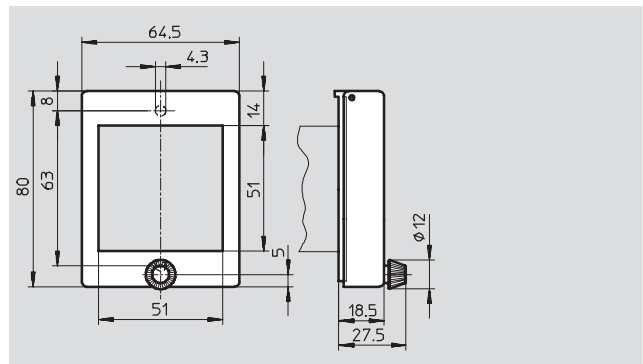


#### Ordering data

	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



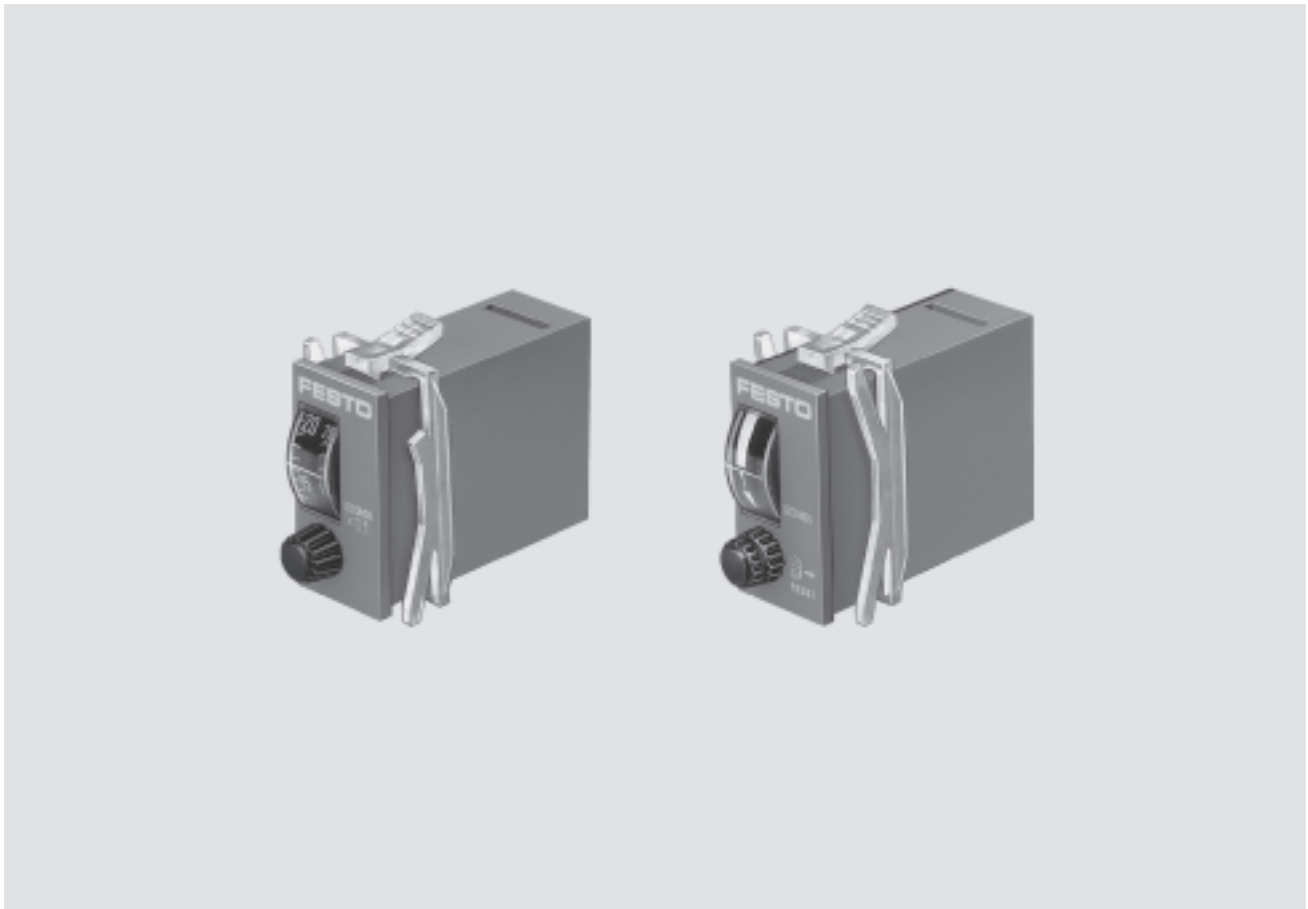
#### Ordering data

	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

FESTO



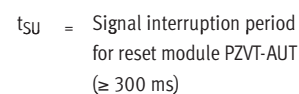
		Pneumatic timer PZVT	Automatic reset module PZVT-AUT
<ul style="list-style-type: none"> <li>Adjustable delay times                             <ul style="list-style-type: none"> <li>– 0.2 ... 3 s</li> <li>– 2 ... 30 s</li> <li>– 8 ... 120 s</li> <li>– 20 ... 300 s</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Panel mounting</li> </ul>	<p>The timer switches input pressure applied to port 1 through to port 2 after the preset delay time has expired.</p>	<p>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.</p>
	<ul style="list-style-type: none"> <li>Mounting on                             <ul style="list-style-type: none"> <li>– G-rail to EN 50 035</li> <li>– H-rail to EN 60715</li> </ul> </li> <li>Protective cover</li> </ul>		

### Technical data

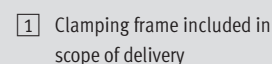
### General technical data

### Operating and environmental conditions

### Example of application



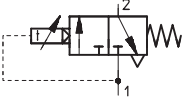
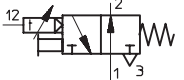
Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)



# Timers PZVT

Technical data

FESTO

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



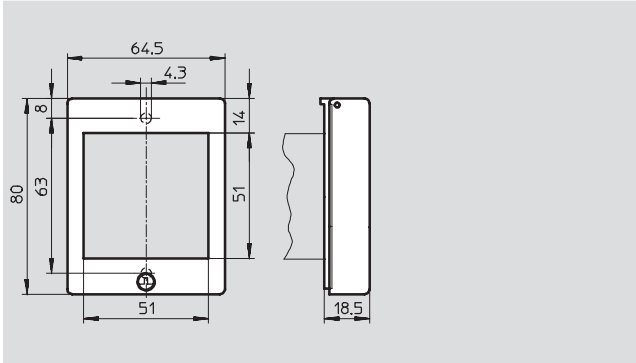
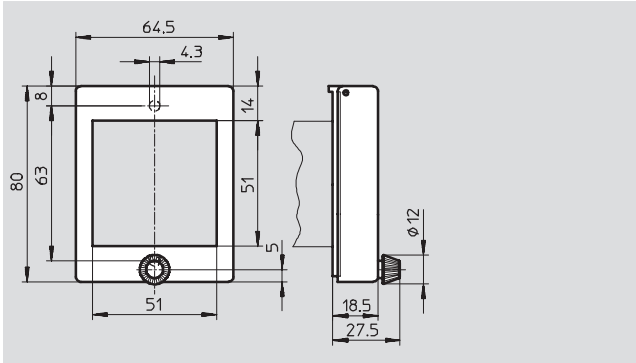
# Timers PZVT

Accessories



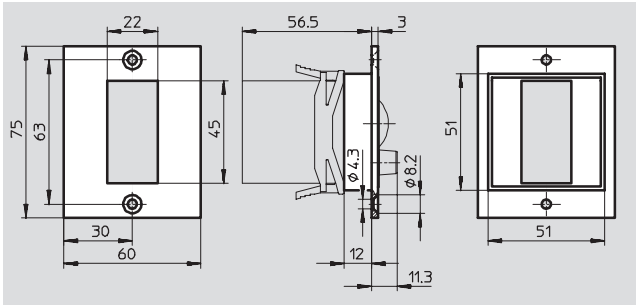
## Protective cover with rotary knob PZ-SK-2 with lock PZ-SS-2

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

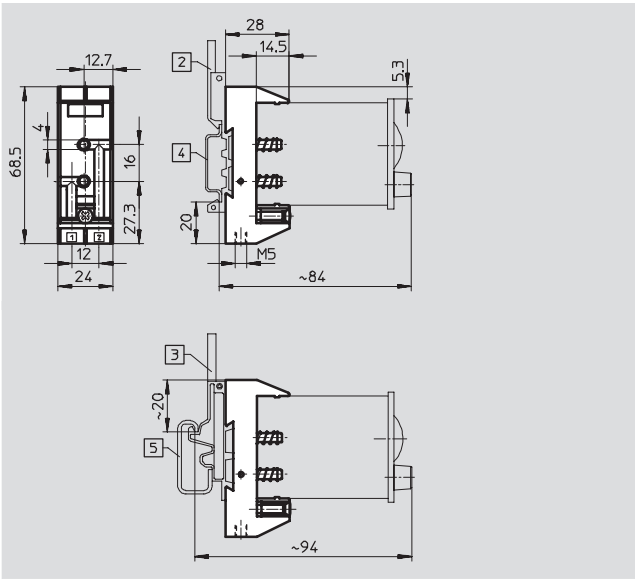
# Timers PZVT

Accessories

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



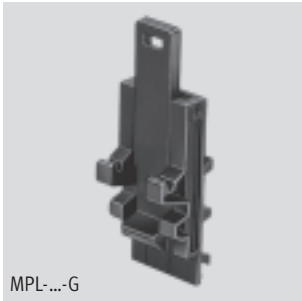
- 2 Mounting plate  
MPL-MUS/PZ-H
- 3 Mounting plate  
MPL-MUS/PZ-G
- 4 H-rail to EN 60715
- 5 G-rail to EN 50 035



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