


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.
→ Internet: sv

M5 Compact System

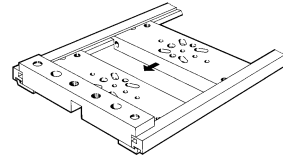
Key features

FESTO

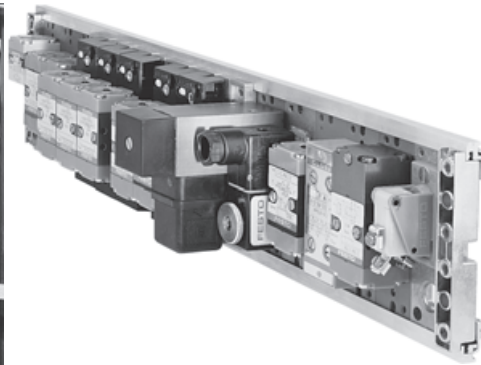
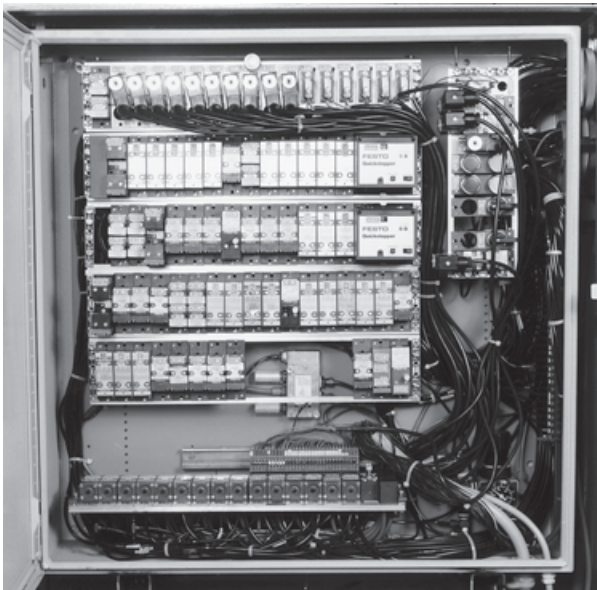
Mounting the components

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.



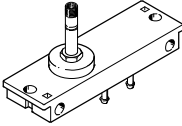
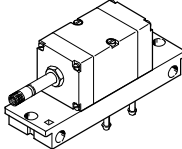
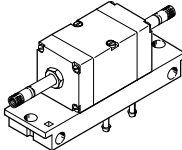
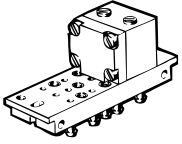
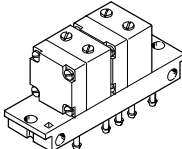
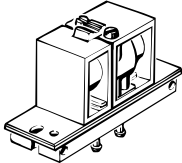
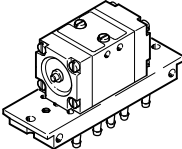
They can also be placed onto the frame and screwed down individually.



M5 Compact System

Product range overview

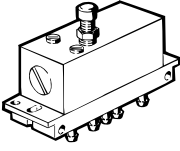
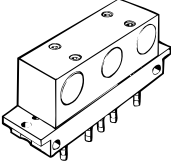
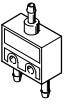
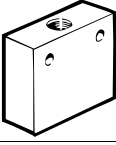
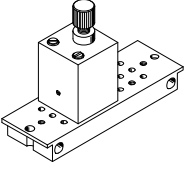
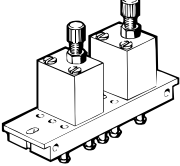
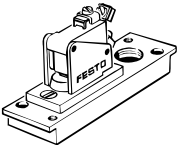
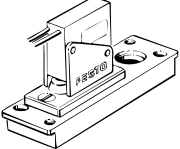
FESTO

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

M5 Compact System

Product range overview

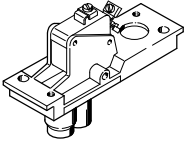
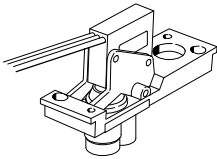
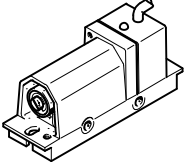
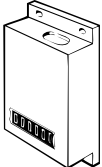
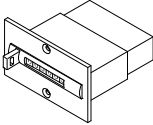
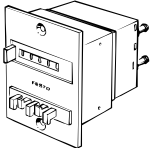
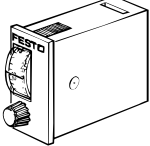
FESTO

Function	Version	Type	Brief description	Operating pressure [bar]	→ Page/Internet
Time delay valves	Time delay valves				
		VZ-3-PK-3	With switch-on delay for mounting frame 2N	2.5 ... 8	12
		VZO-3-PK-3	With switch-off delay for mounting frame 2N	2.5 ... 8	12
Logic components	AND/OR blocks				
		OS-PK-3-6/3	3 OR gates for mounting frame 2N	1.6 ... 8	14
		ZK-PK-3-6/3	3 AND gates for mounting frame 2N	1.6 ... 8	14
		OS-PK-3	OR gate	1.6 ... 8	24
		ZK-PK-3	AND gate	1.6 ... 8	24
		OS-1/8-B	OR gate	1 ... 10	24
		ZK-1/8-B	AND gate	1 ... 10	24
		OS-1/4-B	OR gate	1 ... 10	24
		OS-1/2	OR gate	1 ... 10	24
	One-way flow control valves	One-way flow control valves			
		GRF-PK-3	For mounting frame 2N	0.5 ... 8	15
		GRF-PK-3x2	2 one-way flow control valves on one sub-base for mounting frame 2N	0.5 ... 8	15
PE converters	Pneumatic/electrical pressure transducers				
		PE-1/8-2N	For mounting frame 2N	0 ... 8	17
		PE-1/8-2N-SW	Splash proof design for mounting frame 2N	0 ... 8	17

M5 Compact System

Product range overview



Function	Version	Type	Brief description	Operating pressure [bar]	→ Page/Internet
PE converters	Pneumatic/electrical pressure transducers				
		VPE-1/8-2N	Vacuum switch for mounting frame 2N	-0.95 ... 0	17
		VPE-1/8-2N-SW	Vacuum switch splash proof design for mounting frame 2N	-0.95 ... 0	17
	Pneumatic/electrical differential pressure switch				
	PEN-M5	For mounting frame 2N	-1 ... 8	21	
Pneumatic counters	Adding counters				
		PZA-A-B	Base mounting	2 ... 8	26
		PZA-E-C	Panel mounting	2 ... 8	26
	Predetermining counter				
	PZV-E-C	Panel mounting	2 ... 8	26	
Pneumatic timer	Pneumatic timer				
		PZVT-3-C PZVT-30-C PZVT-12-C PZVT-300-C	Clamping frame	2 ... 6	32
		PZVT-AUT	Automatic reset module	2 ... 6	32

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	Compressed air in accordance with ISO 8573-1:2010 [7:--:-]			
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: NBR			
Note on materials	-		RoHS-compliant	
Weight [g]	120	270	270	380

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

Electrical data				
	3/2-way valves		5/2-way valves	
	MUFH-3-PK-3		MFH-5-PK-3	MFH-5-PK-3-L JMFH-5-PK-3
D.C. voltage				
Standard voltages [V]	12, 24			Solenoid coils
Special voltage [V]	12 ... 220			➔ Internet: msf
A.C. voltage				
Standard voltages [V]	24, 42, 110, 220 at 50 Hz or 50 and 60 Hz			Solenoid coils
Special voltage [V]	12 ... 240 at 50 or 60 Hz			➔ Internet: msf
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

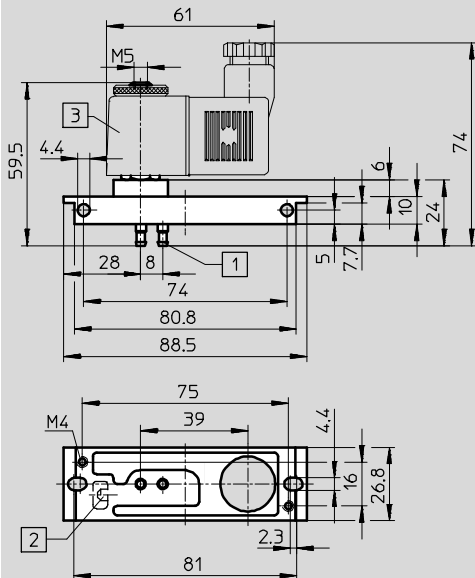
Technical data

Dimensions

Download CAD data → www.festo.com

3/2-way valves

MUFH-3-PK-3

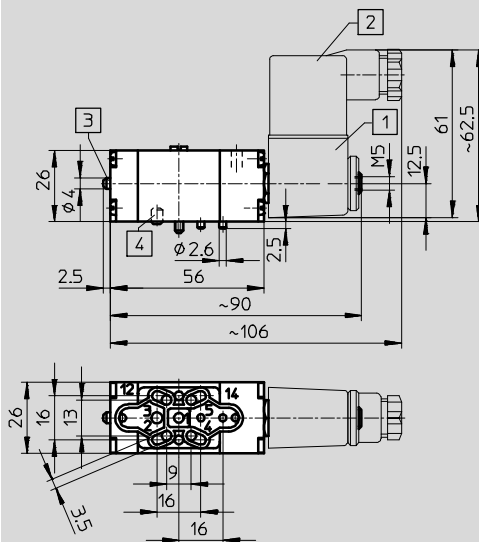


- 1 Barbed fitting for 3 mm plastic tubing
- 2 Manual override
- 3 Solenoid coil can be turned 360°

5/2-way valves

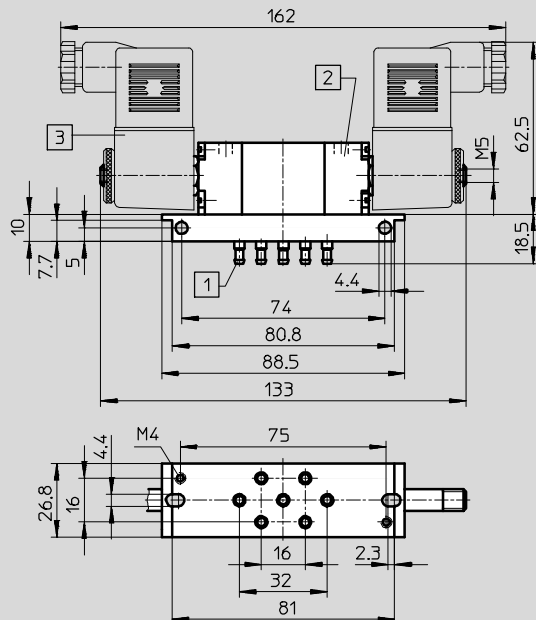
MFH-5-PK-3

MFH-5-PK-3-L



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

JMFH-5-PK-3

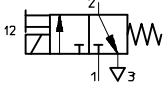
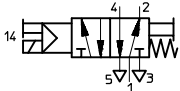
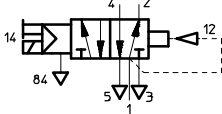
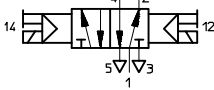


- 1 Barbed fitting for 3 mm plastic tubing
- 2 Manual override
- 3 Solenoid coil can be turned 360°

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

FESTO

Technical data

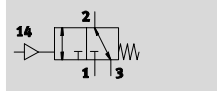
Ordering data		Part No.	Type
3/2-way valves			
Solenoid valve mechanical spring return		6705	MUFH-3-PK-3
5/2-way valves			
Solenoid valve mechanical spring return		4448	MFH-5-PK-3
Solenoid valve pneumatic spring return		11546	MFH-5-PK-3-L
Double solenoid valve		4447	JMFH-5-PK-3
Accessories			
Solenoid coils		→ Internet: msf	

Pneumatic valves VL/J, for mounting frame 2N

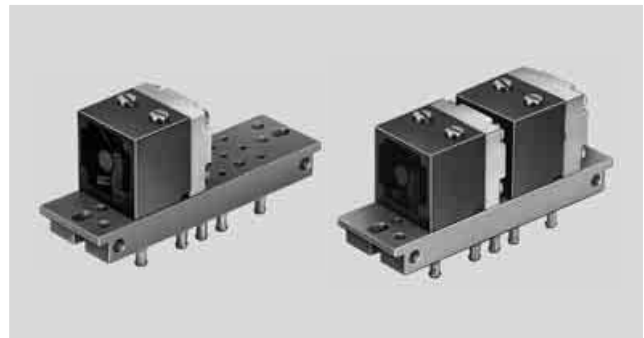
Technical data

3/2-way valves

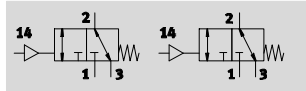
VL/O-3-PK-3



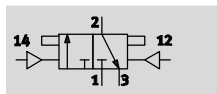
- - Flow rate
100 l/min
- - Temperature range
-10 ... +6 °C
- - Operating pressure
0 ... 8 bar



VL/O-3-PK-3x2



J-3-PK-3

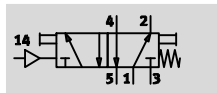


- - Flow rate
100 l/min
- - Temperature range
-10 ... +60 °C
- - Operating pressure
-0.9 ... 8 bar

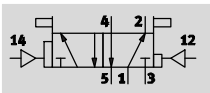


5/2-way valves

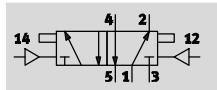
VL-5-PK-3



JD-5-PK-3



J-5-PK-3



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



General technical data						
Type	3/2-way valves			5/2-way valves		
	VL/O-3-PK-3	VL/O-3-PK-3x2	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3
Pneumatic connection 1 ... 5	PK-3					
Auxiliary pilot air port 12	-	-	PK-3	-	PK-3	PK-3
Auxiliary pilot air port 14	PK-3					
Nominal width [mm]	2.5					
Design	Poppet seat	Poppet seat	Piston spool valve	Poppet seat	Poppet seat	Poppet seat
Type of mounting	On sub-base On mounting frame With through-hole					
Mounting position	Any					
Valve function	3/2-way valve, open, monostable	3/2-way valve, open, monostable	3/2-way valve, bistable	5/2-way valve, monostable	5/2-way valve, bistable	5/2-way valve, bistable, dominant ¹⁾
Switching time	Off [ms]	50	50	-	22	-
	On [ms]	12	12	-	15	-
	Changeover [ms]	-	-	7	-	9
	Changeover (dominant) [ms]	-	-	-	-	-

1) Dominant signal at 14.

Pneumatic valves VL/J, for mounting frame 2N

Technical data

FESTO

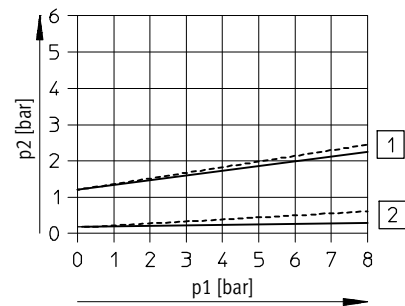
Operating and environmental conditions						
Type	3/2-way valves			5/2-way valves		
	VL/O-3-PK-3	VL/O-3-PK-3x2	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3
Operating pressure [bar]	0 ... 8	0 ... 8	-0.9 ... 8	0 ... 8	1 ... 8	1 ... 8
Pilot pressure [bar]	See diagram					
Operating/pilot medium	Compressed air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

Materials						
Type	3/2-way valves			5/2-way valves		
	VL/O-3-PK-3	VL/O-3-PK-3x2	J-3-PK-3	VL-5-PK-3	J-5-PK-3	JD-5-PK-3
Housing	Plastic, die-cast zinc					
Sub-base	Brass, PPS-reinforced					
Seals	NBR					
Note on materials	-	-	Contains PWIS (paint-wetting impairment substances)	RoHS-compliant	RoHS-compliant	RoHS-compliant

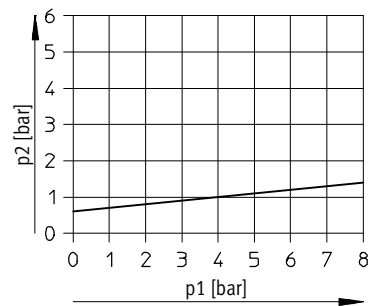
Minimum pilot pressure p2 as a function of operating pressure p1

3/2-way valves

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



J-3-PK-3

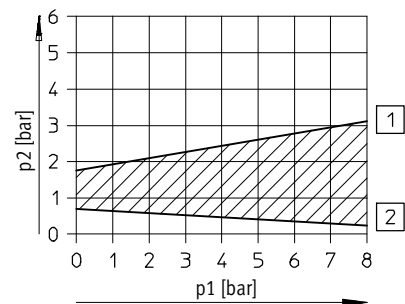


———— Exhaust throttled
 - - - - - Exhaust unthrottled

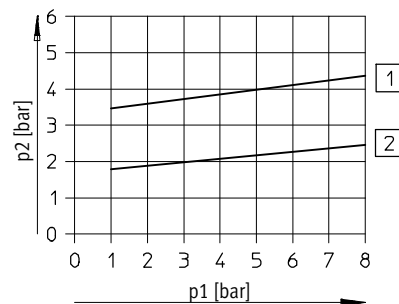
- 1 Switch-on pressure
- 2 Switch-off pressure

5/2-way valves

VL-5-PK-3



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



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

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

Pneumatic valves VL/J, for mounting frame 2N

Technical data

Dimensions Download CAD data → www.festo.com

3/2-way valves
 VL/O-3-PK-3, VL/O-3-PK-3x2 J-3-PK-3 5/2-way valves
 VL-5-PK-3, J-5-PK-3, JD-5-PK-3

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

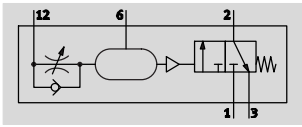
Ordering data					
Function	Pneumatic connection	Standard nominal flow rate q _{nN} [l/min.]	Weight [g]	Part No.	Type
3/2-way valves					
Open, monostable (1 valve)	PK-3	100	110	4233	VL/O-3-PK-3
Open, monostable (2 valves)			180	4245	VL/O-3-PK-3x2
Bistable			75	10772	J-3-PK-3
5/2-way valves					
Monostable	PK-3	105	130	4504	VL-5-PK-3
Bistable			130	4503	J-5-PK-3
Bistable, dominant ¹⁾			130	4901	JD-5-PK-3

1) Dominant signal at 14.

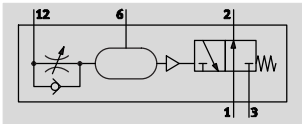
Time delay valves VZ/VZO, for mounting frame 2N

Technical data

VZ, with switch-on delay



VZO, with switch-off delay



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



The time delay valve consists of a pneumatically actuated 3-way valve and an upstream throttle with

additional volume. The directional control valve is activated with a delay depending on the setting of the

throttle. It is reset via a mechanical spring.

General technical data		
Type	VZ	VZO
Pneumatic port	PK-3	
Nominal width [mm]	2	
Design	Poppet valve with spring return	
Type of actuation	Pneumatic	
Type of mounting	Front panel mounting On mounting frame	
Mounting position	Any	
Valve function	3/2-way valve, closed, monostable	3/2-way valve, open, monostable
Non-overlapping	No	
Manual override	None	
Exhaust-air function	With flow control	
Type of control	Direct	
Pilot air supply	External	
Direction of flow	Non-reversible	
Sealing principle	Soft	
Adjustable delay time ¹⁾ [s]	0.25 ... 5	
Pause period for reset [ms]	≥ 55	≥ 50
Repetition accuracy of time setting [s]	±0.5	

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

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

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

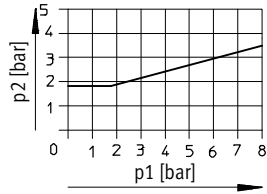
Time delay valves VZ/VZO, for mounting frame 2N

Technical data

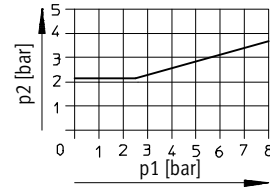
FESTO

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

VZ

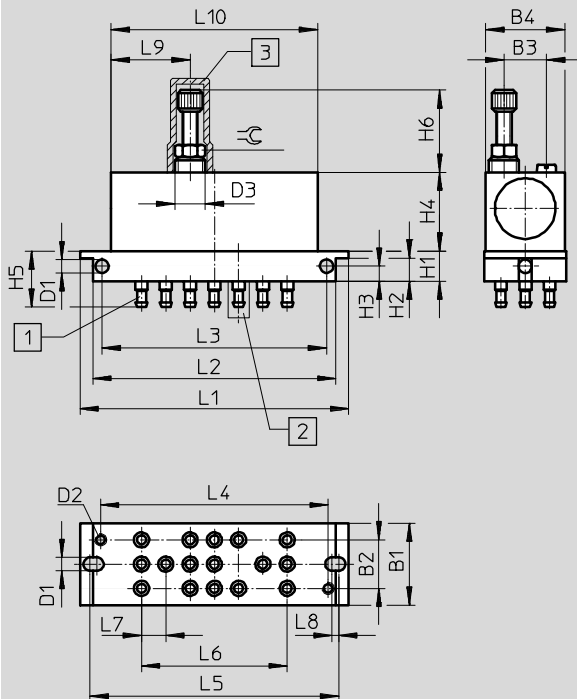


VZO



Dimensions

Download CAD data → www.festo.com



- 1 Barbed fitting for plastic tubing PK-3
- 2 Port 6 with end cap, for additional volume
- 3 Protective cap

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

H6 Min.	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	≅
27	88.5	80.8	74	75	81	48	8	2.3	26	68	8

Ordering data

Function	Pneumatic port	Standard nominal flow rate qnN [l/min.]	Weight [g]	Part No.	Type
With switch-on delay	PK-3	90	150	5755	VZ-3-PK-3
With switch-off delay		60	150	5754	VZO-3-PK-3

Ordering data for accessories

Description	Part No.	Type
Cover cap	6436	GRK-M5

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

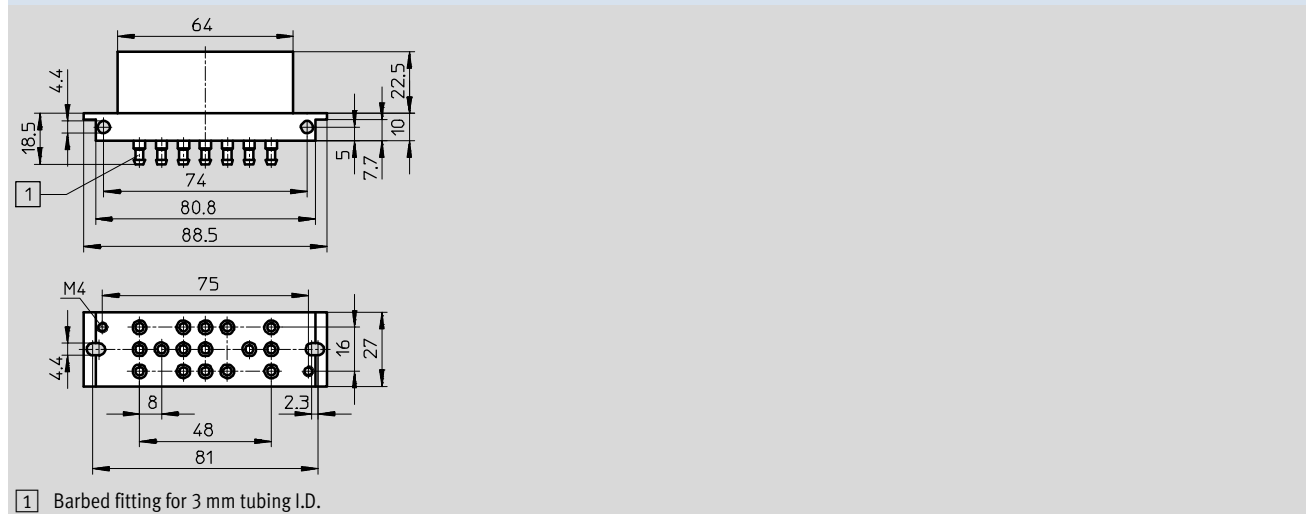


Technical data

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

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

Dimensions Download CAD data → www.festo.com

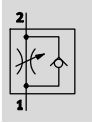





Ordering data		Part No.	Type
OR block (3 OR gates)		4232	OS-PK-3-6/3
AND block (3 AND gates)		4204	ZK-PK-3-6/3

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

Technical data

One-way flow control function



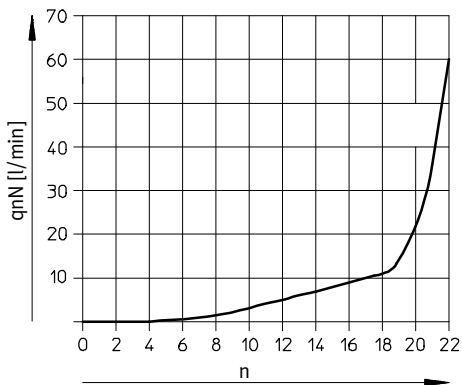
-  - Flow rate
45 l/min
-  - Temperature range
-10 ... +60 °C
-  - Operating pressure
0.5 ... 8 bar



General technical data	
Valve function	One-way flow control function
Pneumatic connection 2	PK-3
Pneumatic connection 1	PK-3
Adjusting element	Knurled screw
Type of mounting	With through-hole
Mounting position	Any

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

Standard nominal flow rate q_{nN} at 6 > 5 bar as a function of turns of the adjusting screw n

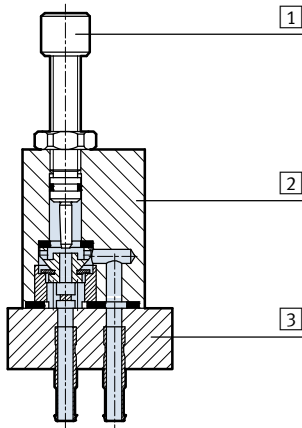


One-way flow control valves GRF, for mounting frame 2N

Technical data

Materials

Sectional view

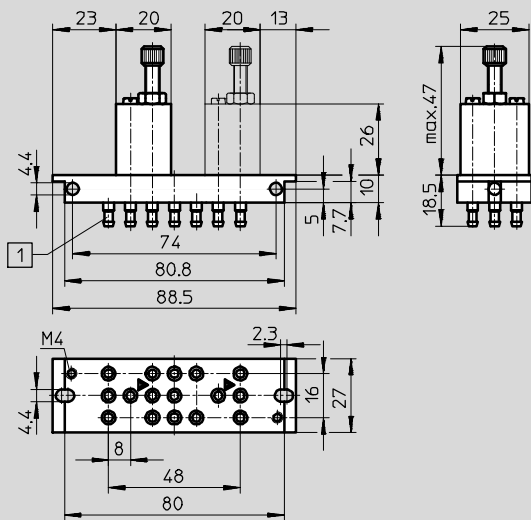


One-way flow control valve

1	Regulating screw	Brass
2	Housing	Wrought aluminium alloy
3	Connecting plate	PA
-	Seals	NBR

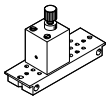
Dimensions

Download CAD data → www.festo.com



1 Barbed connector PK-3

Ordering data – One-way flow control function

Pneumatic connection	Standard nominal flow rate q _{nN} [l/min]		Number of one-way flow control valves	Weight [g]	Part No.	Type	
	at 6 bar → 5 bar						
2	1	In direction of flow control	In non-return direction				
Knurled screw							
	PK-3	PK-3	45	45	1	95	4565 GRF-PK-3
					2	145	4566 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
Method of measurement	Pneumatic/electric pressure transducer			
Measured variable	Relative pressure			
Type of mounting	On mounting frame 2N With through-hole			
Mounting position	Any			
Pneumatic connection	G1/8			
Electrical connection	Screw terminal	3 connector leads	Screw terminal	3 connector leads
Materials				
Housing	Die-cast aluminium, PA, steel		POM, steel, PET	PA, POM, steel, VMQ
Diaphragm	TPE-U(PU)		CR	
Switch contact	Silver		Silver	
Electrical connection	Brass	Tin-plated	Brass	Tin-plated
Cable sheath	–		PVC	
Weight [g]	55	65	32	45

· † - Note: This product conforms to ISO 1179-1 and to ISO 228-1

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 medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]			
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)			
Operating pressure [bar]	0 ... 8		0 ... -0,95	
Switch-on pressure [bar]	2		-0,25	
Switch-off pressure [bar]	0,5		≤ 0,1	
Ambient temperature [°C]	0 ... +60			
Temperature of medium [°C]	0 ... +60			

Electrical data				
	PE converter		Vacuum switch	
	PE-1/8-2N	PE-1/8-2N-SW	VPE-1/8-2N	VPE-1/8-2N-SW
Operating voltage range AC [V AC]	12 ... 250			
Operating voltage range DC [V DC]	12 ... 250			
Switching element function	Changeover contact			
Switching output	Contacting		–	
Switching function	Threshold value with fixed hysteresis		–	
Minimum load current [mA]	100			
Max. switching frequency [Hz]	1			
CE marking (see declaration of conformity)	To EU Low Voltage Directive			
Approval certificate	CCC			
Degree of protection	IP00 (IP20) ¹⁾	IP67	IP00 (IP20) ¹⁾	IP67

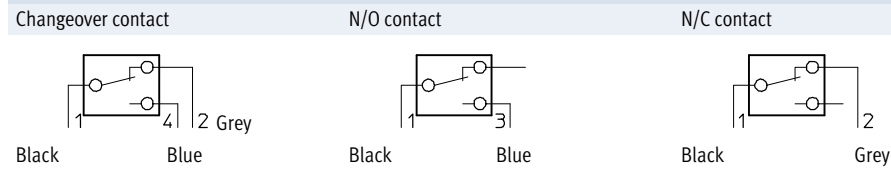
1) With protective cap SPE-B

PE converters PE/VPE, for mounting frame 2N

Technical data

Max. permissible electrical load					
DC voltage			AC voltage		
Voltage [V DC]	Resistance load [A]	Inductive load [A]	Voltage [V AC]	Resistance 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			

Pin allocation



PE converters PE/VPE, for mounting frame 2N

Technical data

FESTO

Dimensions

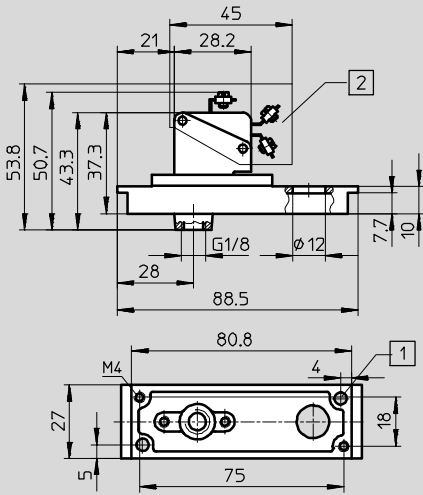
Download CAD data → www.festo.com

PE converter

PE-1/8-2N

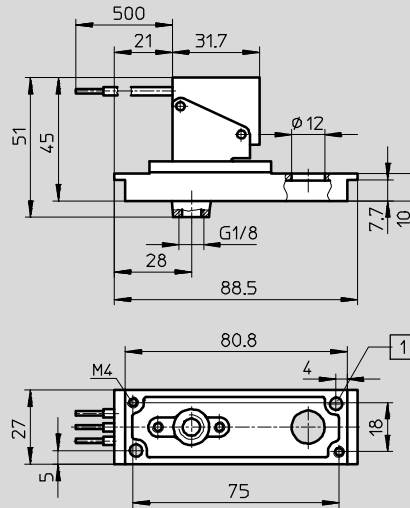
PE-1/8-2N-SW

Splash-proof design



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

Note: This product conforms to ISO 1179-1 and to ISO 228-1



- 1 For M4 thread

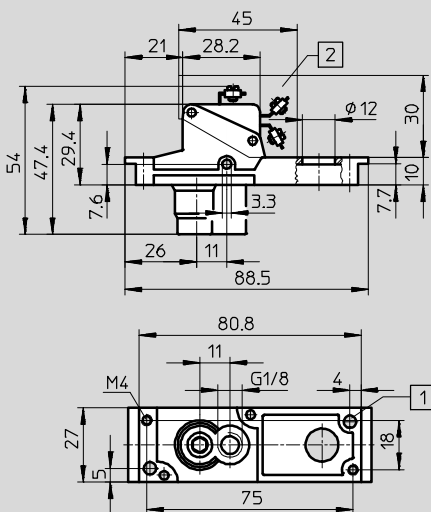
Note: This product conforms to ISO 1179-1 and to ISO 228-1

Vacuum switch

VPE-1/8-2N

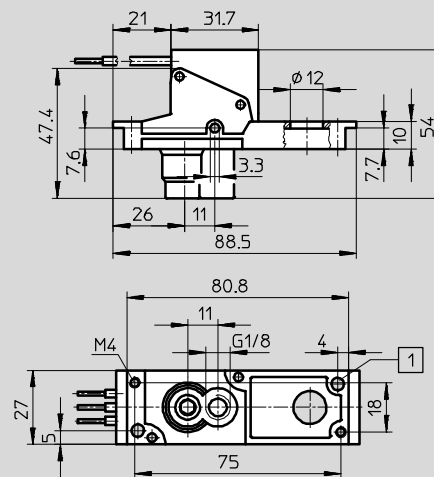
VPE-1/8-2N-SW

Splash-proof design



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

Note: This product conforms to ISO 1179-1 and to ISO 228-1



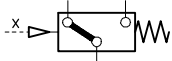
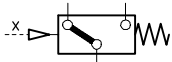
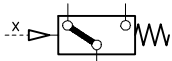
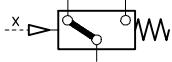
- 1 For M4 thread

Note: This product conforms to ISO 1179-1 and to ISO 228-1

PE converters PE/VPE, for mounting frame 2N

FESTO

Technical data



Ordering data		Part No.	Type
PE converter		7860	PE-1/8-2N
PE converter Splash-proof design		7862	PE-1/8-2N-SW
Vacuum switch		12594	VPE-1/8-2N
Vacuum switch Splash-proof design		12595	VPE-1/8-2N-SW
Accessories			
Protective cap for protection against accidental contact		165614	SPE-B

PE converters PEN-M5, for mounting frame 2N

Technical data

Function



-  - Temperature range
-20 ... +60 °C
-  - Operating pressure
-1 ... +8 bar



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

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Input signal/measuring element	
Measured variable	Relative pressure (overpressure: connection to P1/vacuum: connection to P2) Differential pressure (connection P1 and P2, condition: P1 ≥ P2)
Method of measurement	Pneumatic/electrical differential pressure switch
Operating pressure [bar]	-1 ... +8
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)
Temperature of medium [°C]	-20 ... +60
Ambient temperature [°C]	-20 ... +60

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

Output, additional data	
Protection against short circuit	Yes

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

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

Mechanical system	
Type of mounting	On mounting frame 2N With through-hole
Mounting position	Any
Pneumatic connection	M5
Information on housing materials	Die-cast zinc

PE converters PEN-M5, for mounting frame 2N

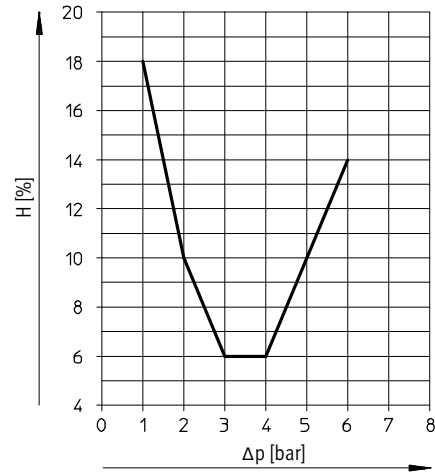
Technical data

FESTO

Display/operation	
Switching status indication	Yellow LED

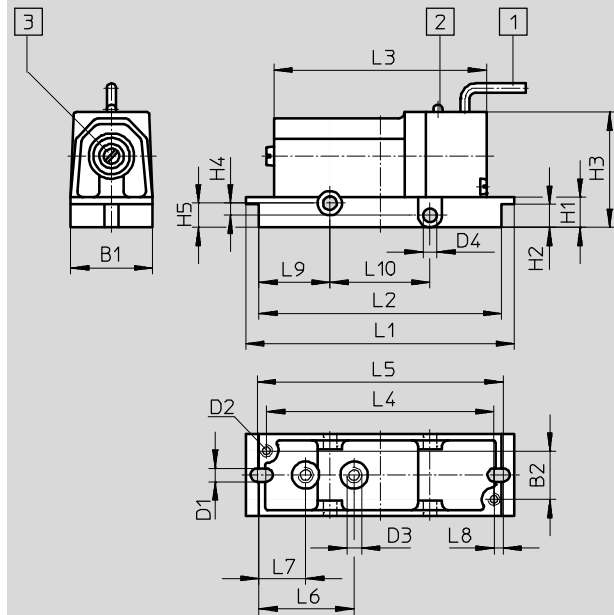
Immission/emission	
Degree of protection	IP67

Hysteresis H as a function of the differential pressure Δp



Dimensions

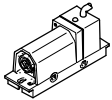
Download CAD data → www.festo.com



- 1 Cable: 3 x 0.14 mm², 2.5 m long
- 2 Yellow LED
- 3 Pressure threshold setting

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

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

Ordering data													
	<table border="1"> <thead> <tr> <th>Pneumatic connection</th> <th>Electrical connection</th> <th>Cable length [m]</th> <th>Weight [g]</th> <th>Part No.</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>M5</td> <td>Cable, 3-wire, open end</td> <td>2.5</td> <td>240</td> <td>8625</td> <td>PEN-M5</td> </tr> </tbody> </table>	Pneumatic connection	Electrical connection	Cable length [m]	Weight [g]	Part No.	Type	M5	Cable, 3-wire, open end	2.5	240	8625	PEN-M5
Pneumatic connection	Electrical connection	Cable length [m]	Weight [g]	Part No.	Type								
M5	Cable, 3-wire, open end	2.5	240	8625	PEN-M5								

Mounting frames 2N

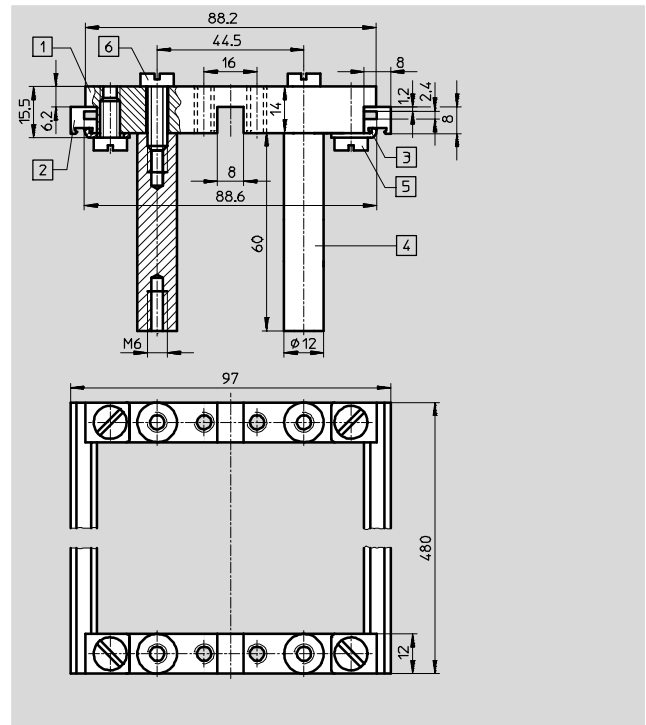
Accessories

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

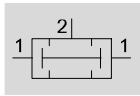
Mounting frame	Part No.	Type
Mounting frame 2N complete for 16 components	9365	NRRQ-2N
Accessories		
Mounting bracket for mounting sub-bases on the frame	11571	NRW-9/1,5-B
Slotted head screw (2 included in scope of delivery)	204021	DIN 84-M4X12-4.8

AND/OR gates OS/ZK

Technical data



AND gate ZK

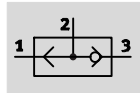
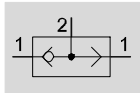


OR gate OS

OS-PK-3

OS-1/8/1/4-B

OS-1/2



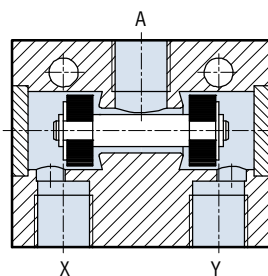
- - Flow rate
120 ... 5000 l/min
- - Temperature range
-10 ... +60 °C
- - Operating pressure
1 ... 10 bar



Valve function

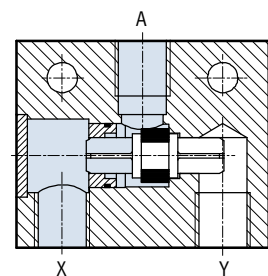
AND function

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



OR function

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



General technical data						
Valve function	AND function		OR function			
Type	ZK-PK-3	ZK-1/8-B	OS-PK-3	OS-1/8-B	OS-1/4-B	OS-1/2
Pneumatic connection	PK-3	G1/8	PK-3	G1/8	G1/4	G1/2
Nominal size [mm]	2.4	4.5	2.4	4	6.5	12
Type of mounting	With through-hole					
Mounting position	Any					

- - Note: This product conforms to ISO 1179-1 and to ISO 228-1

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

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

AND/OR gates OS/ZK

Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

ZK-PK-3

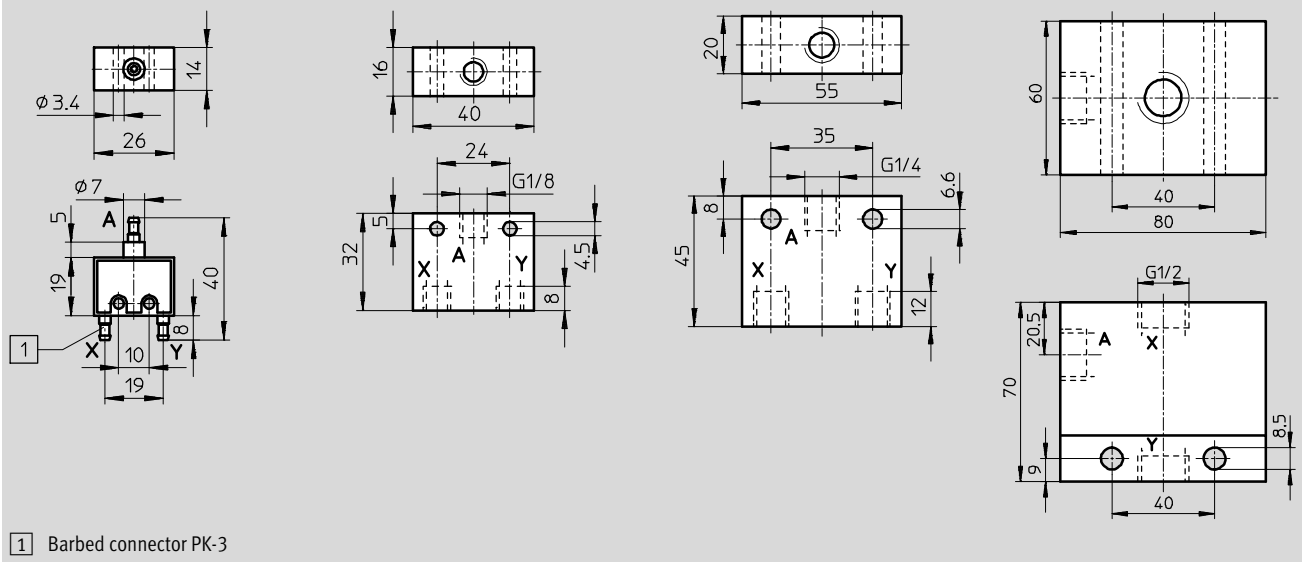
ZK-1/8-B

OS-1/4-B

OS-1/2

OS-PK-3

OS-1/8-B



Note: This product conforms to ISO 1179-1 and to ISO 228-1

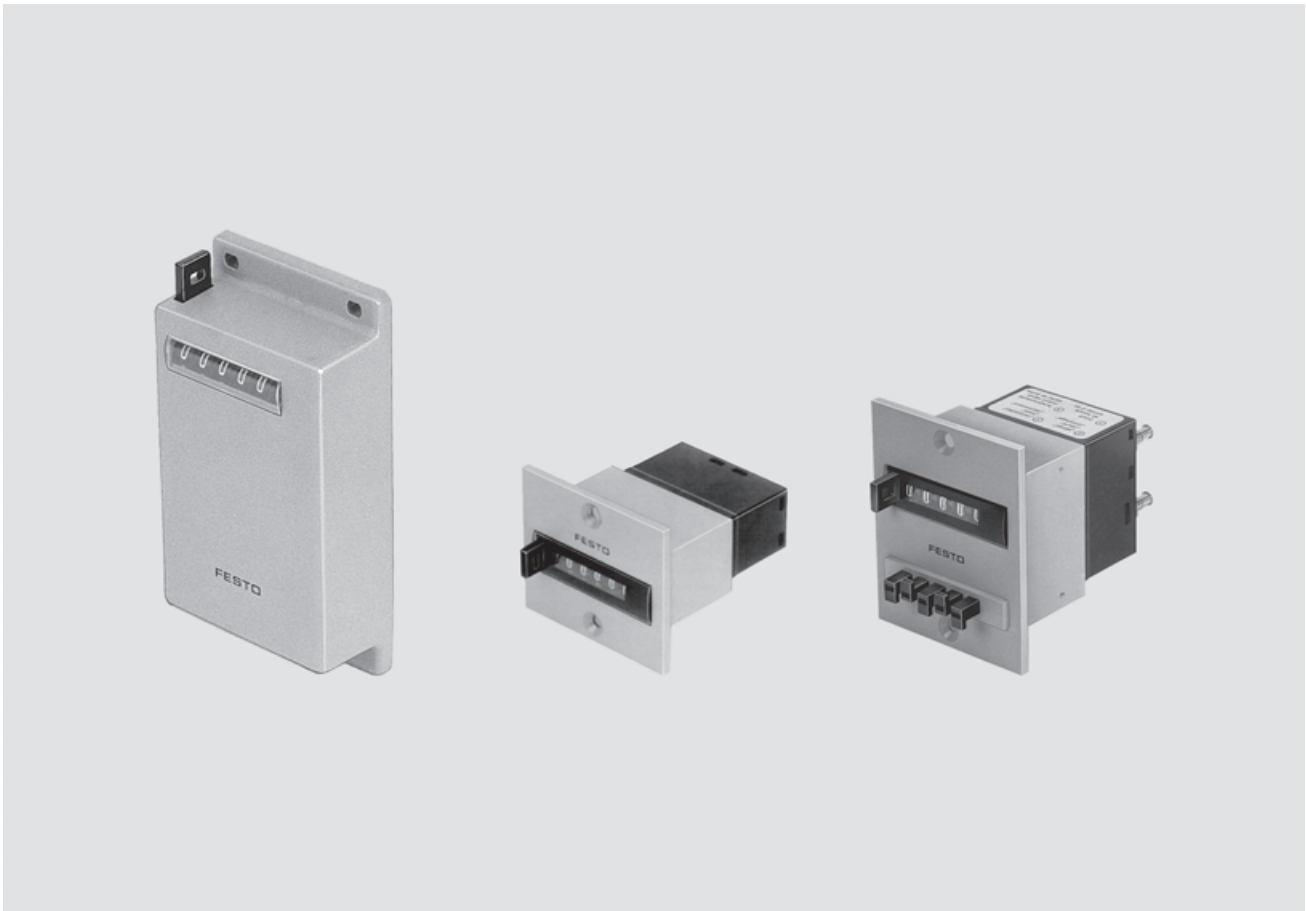
Ordering data

Valve function	Pneumatic connection 1, 2, 3	Standard nominal flow rate qnN [l/min]	Weight [g]	Part No.	Type
AND function	PK-3	120	10	6685	ZK-PK-3
	G1/8	550	45	6680	ZK-1/8-B
OR function	PK-3	120	9	6684	OS-PK-3
	G1/8	500	45	6681	OS-1/8-B
	G1/4	1170	110	6682	OS-1/4-B
	G1/2	5000	814	3427	OS-1/2

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 in accordance with ISO 8573-1:2010 [7:4:4]			
Note on operating/pilot medium	Operation with lubricated medium not possible			
Pneumatic connection				
Display ¹⁾	6-digit	6-digit	5-digit	
Reset	Pushbutton or pneumatic signal			
Response pressure				
Drive	[bar]	0.6 ±0.2	> 0.8	0.6 ±0.2
Reset	[bar]	0.6 ±0.2	2	–
Drop-off pressure				
Drive	[bar]	0.2 ±0.1	< 0.15	0.2 ±0.1
Reset	[bar]	0.15 ±0.1	< 0.15	0.15 ±0.1
Min. pulse length				
Drive	[ms]	10	8	10
Reset	[ms]	180	150	180
Min. pause period				
Drive	[ms]	15	10	15
Reset	[ms]	50	50	50
Materials				
	Housing: Plastic			
	Seals: Chloroprene			
Weight	[g]	155	70	150

1) Digit size 4.5 mm

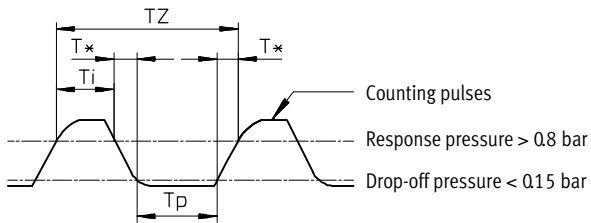
Operating and environmental conditions				
Type	Adding counter		Predetermining counter	
	PZA-A-B	PZA-E-C	PZV-E-C	
Operating pressure	[bar]	2 ... 8		
Min. reset pressure	[bar]	2	–	–
Ambient temperature	[°C]	–10 ... +60	0 ... +60	

Counters PZA/PZV

Technical data

Counting rate

Adding counter PZA-E-C



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

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

$$TZ = T_i + T^*$$

T_i = Min. pulse length

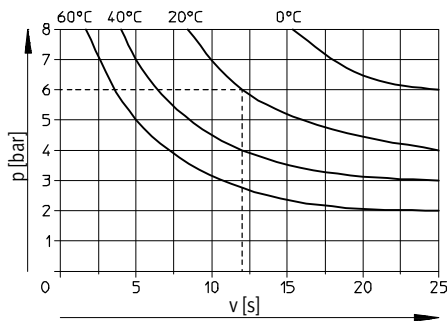
T_p = Min. pause period

TZ = Time for counting pulse

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

Counting speed v as a function of the operating pressure p

Predetermining counter PZV-E-C



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

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

Counters PZA/PZV

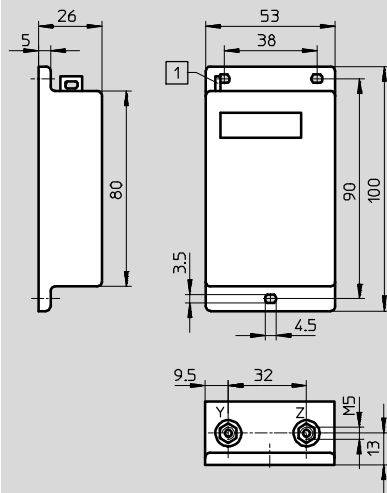
Technical data

Dimensions

Download CAD data → www.festo.com

Adding counter

Surface mounting PZA-A-B

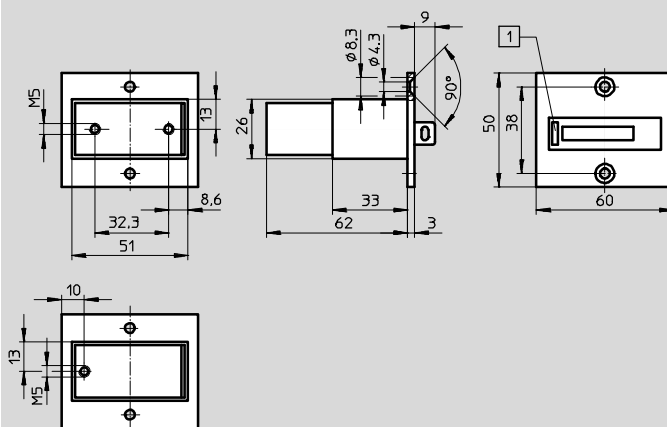


1 Reset button

Z = Counting signal

Y = Reset signal

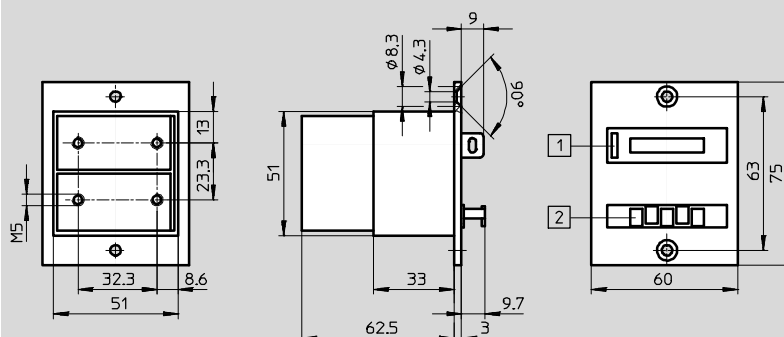
Panel mounting PZA-E-C



1 Reset button

Predetermining counter

Surface mounting PZV-E-C



1 Reset button

2 Preselect buttons

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

-H- Note

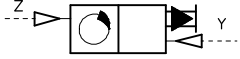
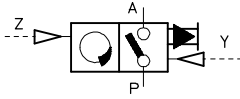
The output signal must not be used to reset the counter. No counting

signal may arrive or be present during the resetting procedure.

Counters PZA/PZV

Technical data

FESTO

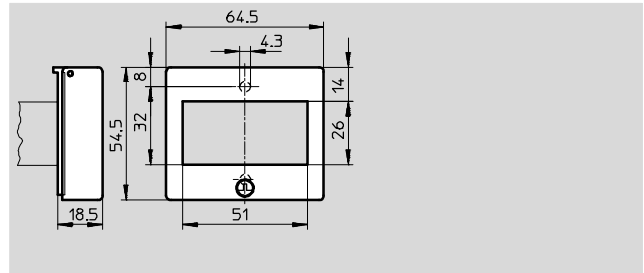
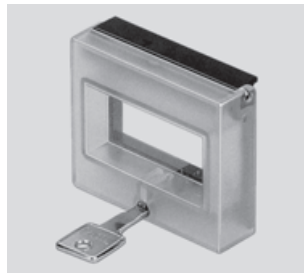
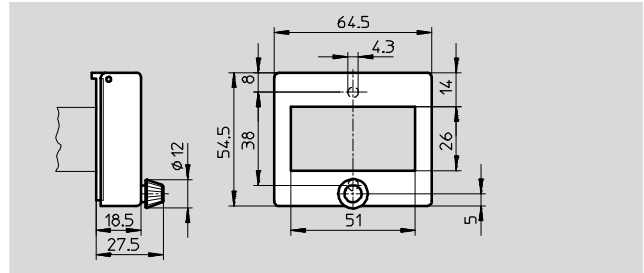
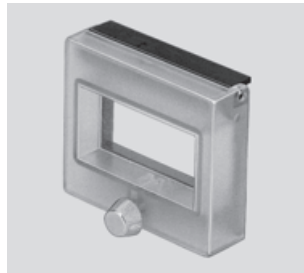
Ordering data			Part No.	Type
Adding counter	Surface mounting		14992	PZA-A-B
	Panel mounting		8606	PZA-E-C
Predetermining counter	Surface mounting		15608	PZV-E-C

Counters PZA/PZV

Accessories

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

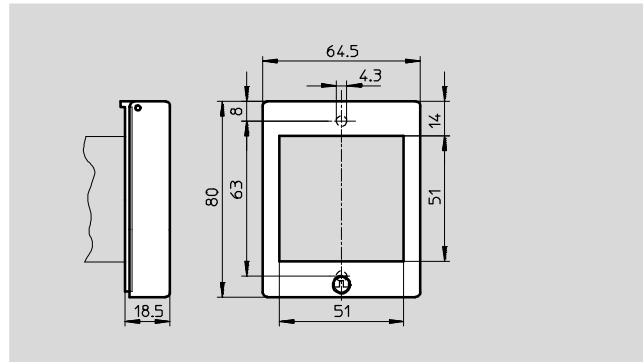
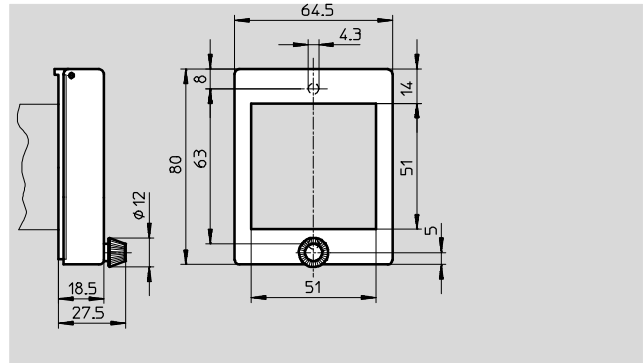
Protective cover for adding counter to protect against entry of dirt and water on the front panel



Ordering data		
	Part No.	Type
Protective cover with rotary knob	14662	PZ-SK-1
Protective cover with lock	13965	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

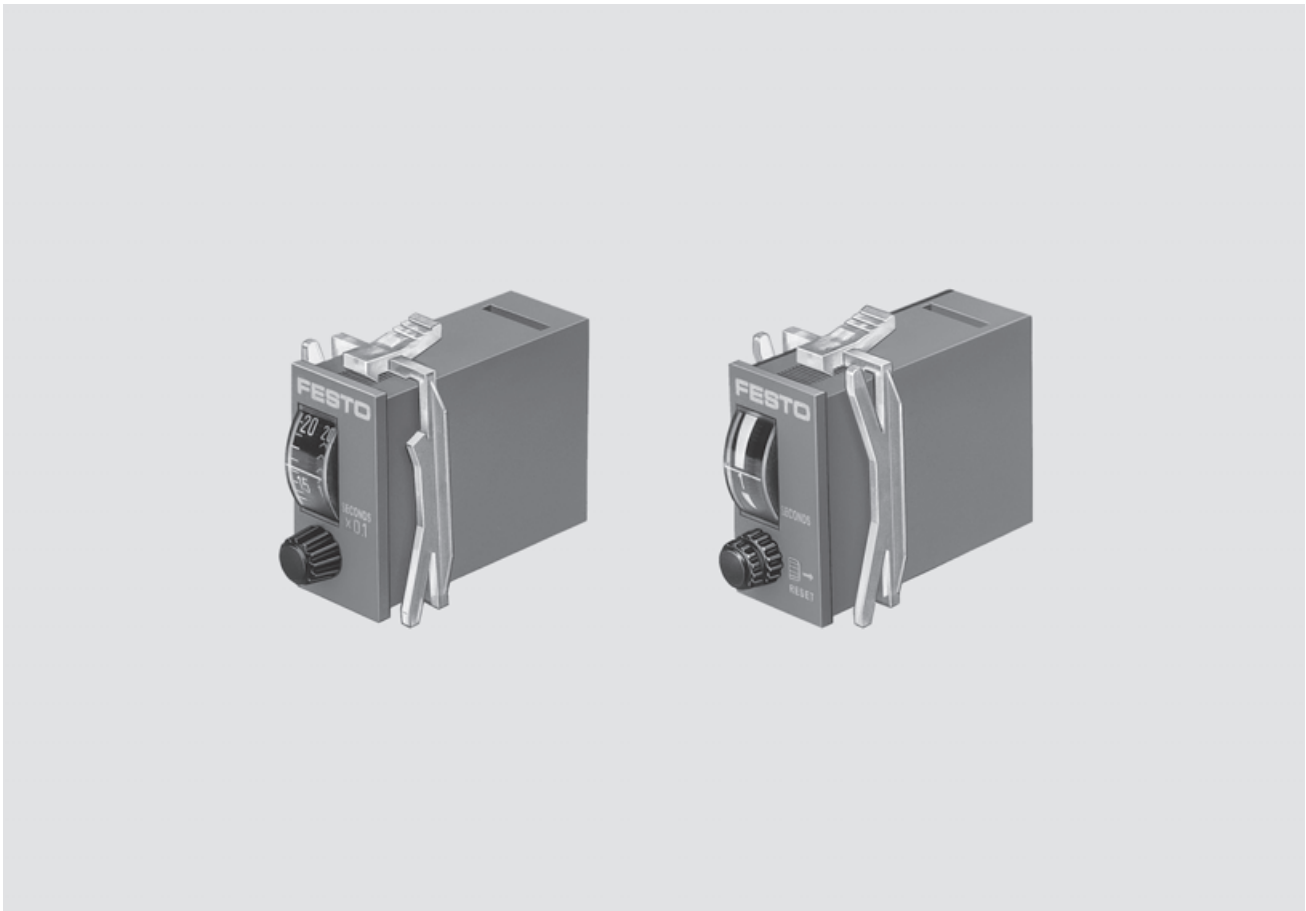


Ordering data		
	Part No.	Type
Protective cover with rotary knob	14663	PZ-SK-2
Protective cover with lock	13966	PZ-SS-2

Timers PZVT

Key features

FESTO



		Pneumatic timer PZVT	Automatic reset module PZVT-AUT
<ul style="list-style-type: none">Adjustable delay times<ul style="list-style-type: none">– 0.2 ... 3 s– 2 ... 30 s– 8 ... 120 s– 20 ... 300 s	<ul style="list-style-type: none">Panel mountingMounting on H-rail to EN 60715Protective cover	<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>

Timers PZVT

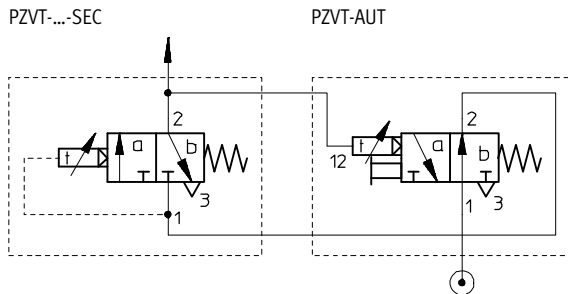
Technical data

FESTO

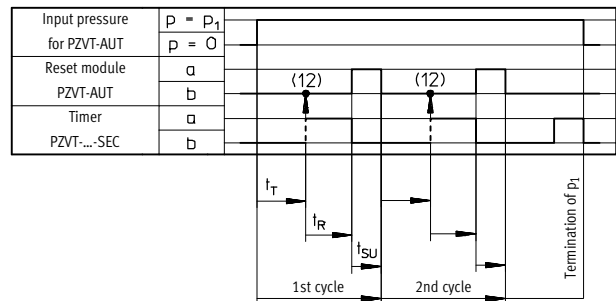
General technical data						
Type	Timer					Reset module
	PZVT-3-SEC	PZVT-30-SEC	PZVT-120-SEC	PZVT-300-SEC	PZVT-AUT	
Constructional design	Mechanical sequence counter with pneumatic drive					
Type of mounting	Panel mounting					
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]					
Note on operating/pilot medium	Operation with lubricated medium not possible					
Pneumatic connection	Female thread 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 [s]	±0.1	±0.3	±1.2	±3	±0.3	
Setting accuracy [s]	±0.3	±0.6	±3	±6	–	
Pause period for reset [ms]	≥ 200					
Protection class	IP54 to IEC 60529 with protective cover and panel frame					
Weight [g]	45				50	
Material of housing	ABS					
Note on materials	RoHS-compliant					

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

Example of application



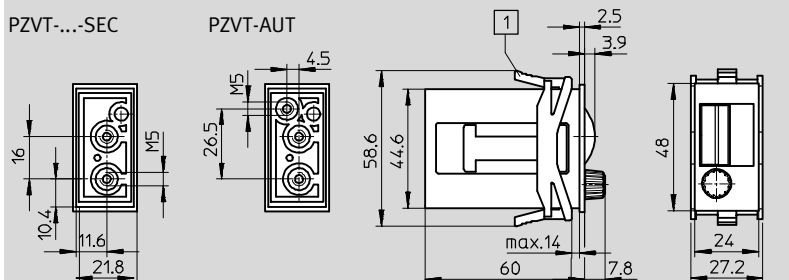
- 1 = Supply port
- 2 = Working or outlet line
- 3 = Exhausts
- 12 = Pilot line



- 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 (≥ 300 ms)

Dimensions

Download CAD data → www.festo.com

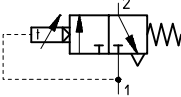
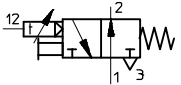


- 1 Clamping frame included in scope of delivery

Timers PZVT

Technical data

FESTO

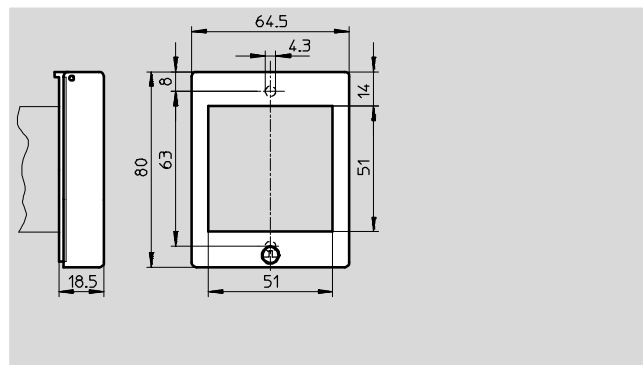
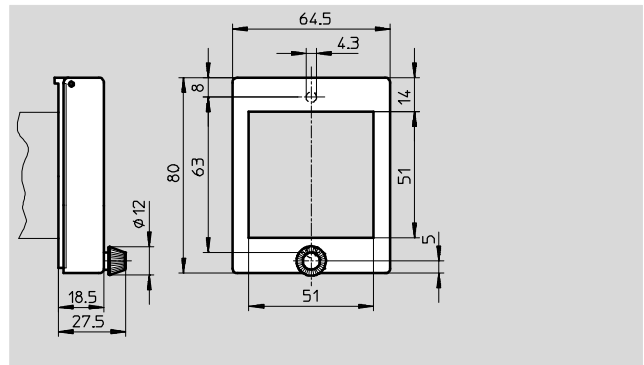
Ordering data			Part No.	Type
Timer	0.2 ... 3 s		158495	PZVT-3-SEC
	2 ... 30 s		150238	PZVT-30-SEC
	8 ... 120 s		177616	PZVT-120-SEC
	20 ... 300 s		150239	PZVT-300-SEC
Reset module	0.2 ... 2 s		158496	PZVT-AUT

Timers PZVT

Accessories

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

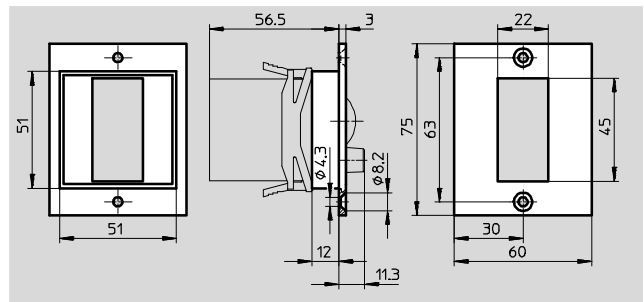
Protective cover for timers to protect against entry of dirt and water on the front panel



Ordering data		
	Part No.	Type
Protective cover with rotary knob	14663	PZ-SK-2
Protective cover with lock	13966	PZ-SS-2

Panel frame PZVT-FR for panel mounting

Note on materials: RoHS-compliant



Ordering data		
	Part No.	Type
Panel frame	150241	PZVT-FR

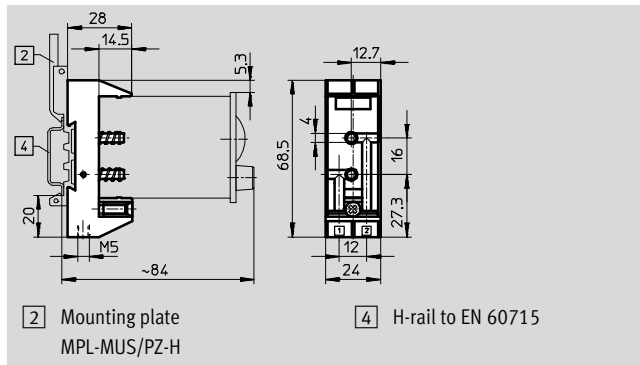
Timers PZVT


Accessories



Base PZVT-S-DIN

for mounting on H-rail to EN 60715



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

Ordering data		
	Part No.	Type
Base	150240	PZVT-S-DIN

Mounting plate MPL-MUS/PZ-H

for H-rail to EN 60715



Ordering data		
	Part No.	Type
Mounting plate for H-rail	19135	MPL-MUS/PZ-H

Product Range and Company Overview

A Complete Suite and Company Overview

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



Custom Automation Components
Complete custom engineered solutions



Custom Control Cabinets
Comprehensive engineering support and on-site services



Complete Systems
Shipment, stocking and storage services

The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.



Electromechanical
Electromechanical actuators, motors, controllers & drivers



Pneumatics
Pneumatic linear and rotary actuators, valves, and air supply



PLCs and I/O Devices
PLC's, operator interfaces, sensors and I/O devices

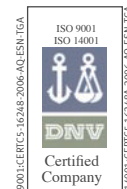
Supporting Advanced Automation... As No One Else Can!

Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 16,000 employees in 60 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

Quality Assurance, ISO 9001 and ISO 14001 Certifications

Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.

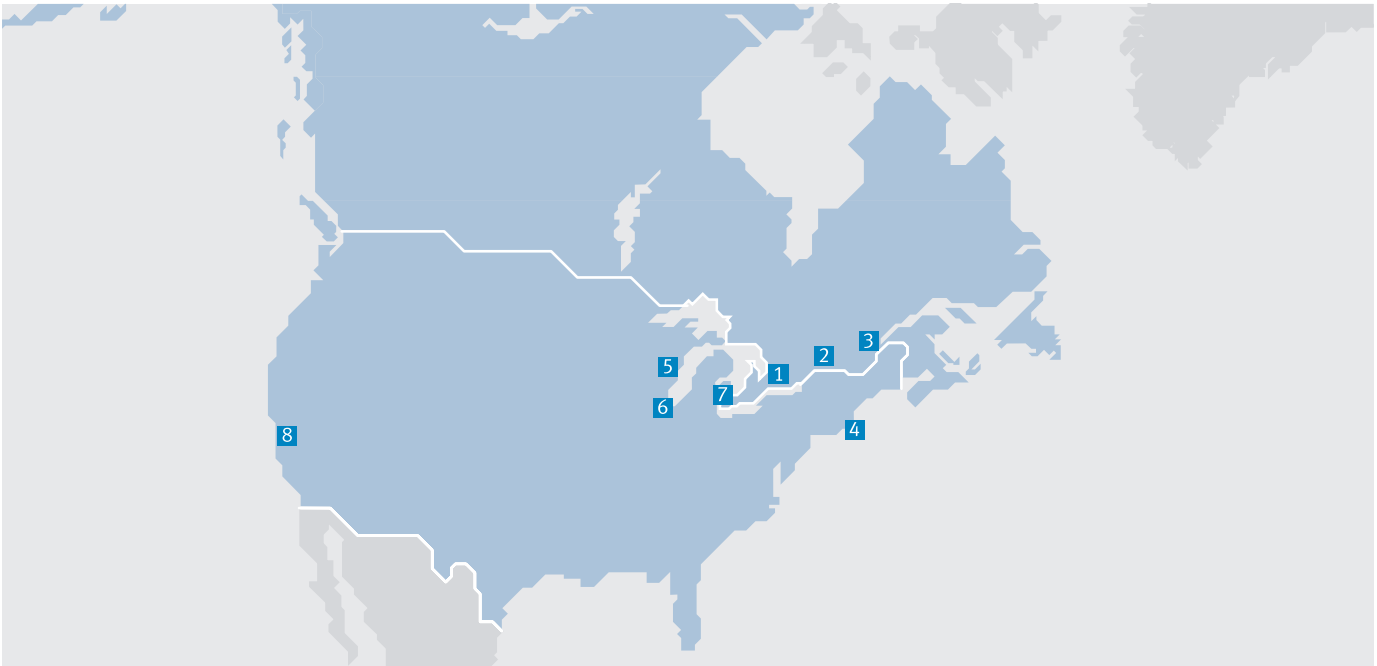


© Copyright 2013, Festo Corporation. While every effort is made to ensure that all dimensions and specifications are correct, Festo cannot guarantee that publications are completely free of any error, in particular typing or printing errors. Accordingly, Festo cannot be held responsible for the same. For Liability and Warranty conditions, refer to our "Terms and Conditions of Sale", available from your local Festo office. All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of Festo. All technical data subject to change according to technical update.



Printed on recycled paper at New Horizon Graphic, Inc., FSC certified as an environmental friendly printing plant.

Festo North America



**1 Festo Canada
Headquarters
Festo Inc.**
5300 Explorer Drive
Mississauga, ON
L4W 5G4

2 Montréal
5600, Trans-Canada
Pointe-Claire, QC
H9R 1B6

3 Québec City
2930, rue Watt#117
Québec, QC
G1X 4G3



**4 Festo United States
Headquarters
Festo Corporation**
395 Moreland Road
Hauppauge, NY
11788

5 Appleton
North 922 Tower View Drive, Suite N
Greenville, WI
54942

7 Detroit
1441 West Long Lake Road
Troy, MI
48098

6 Chicago
85 W Algonquin - Suite 340
Arlington Heights, IL
60005

8 Silicon Valley
4935 Southfront Road, Suite F
Livermore, CA
94550

Festo Regional Contact Center

Canadian Customers

Commercial Support:
Tel: 1 877 GO FESTO (1 877 463 3786)
Fax: 1 877 FX FESTO (1 877 393 3786)
Email: festo.canada@ca.festo.com

Technical Support:
Tel: 1 866 GO FESTO (1 866 463 3786)
Fax: 1 877 FX FESTO (1 877 393 3786)
Email: technical.support@ca.festo.com

USA Customers

Commercial Support:
Tel: 1 800 99 FESTO (1 800 993 3786)
Fax: 1 800 96 FESTO (1 800 963 3786)
Email: customer.service@us.festo.com

Technical Support:
Tel: 1 866 GO FESTO (1 866 463 3786)
Fax: 1 800 96 FESTO (1 800 963 3786)
Email: product.support@us.festo.com