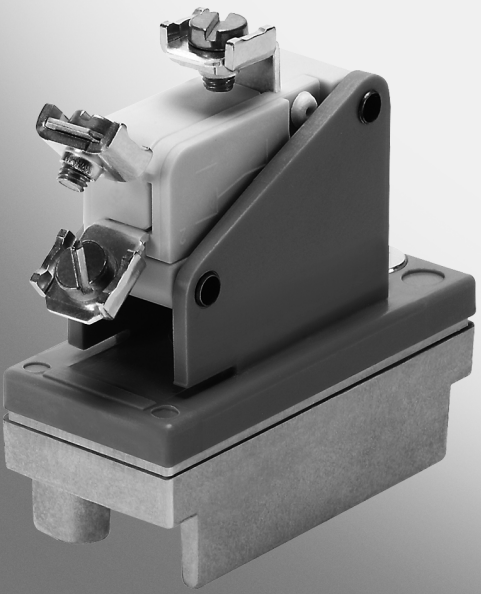
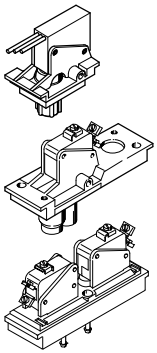
Pressure/vacuum switch
(V)PE-1/8-...(-SW)
PE-PK-...(-SW)

FESTO

(en) Operating instructions





8068554
2017-05c
[8068556]

Original instructions

Symbols:

Warning, Caution

Please note

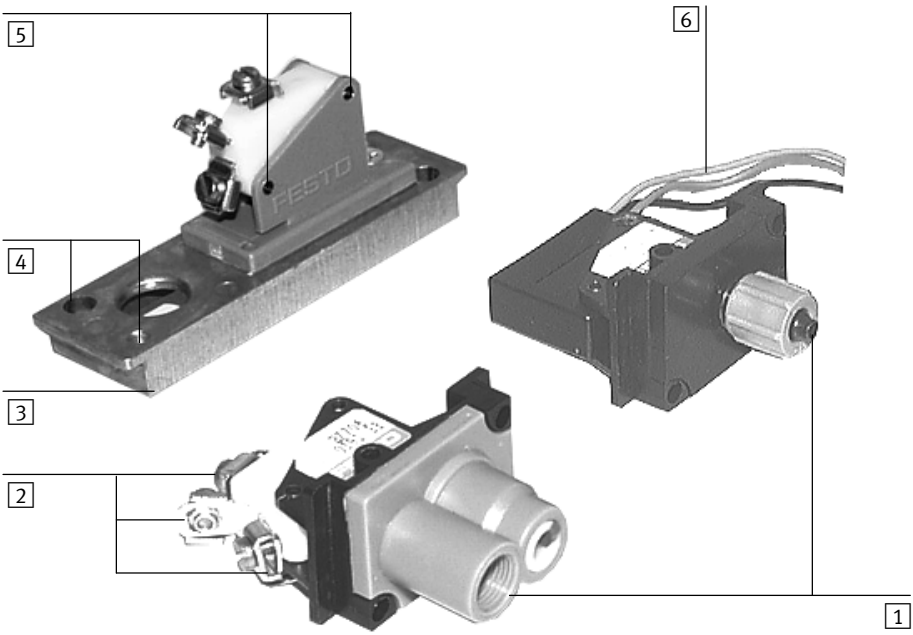
Antipollution

Accessories

Fitting and commissioning to be carried out by qualified personnel only in accordance with the operating instructions.

Pressure/vacuum switch
Type (V)PE-1/8-...(-SW), PE-PK-...(-SW)

1 Operating parts and connections



1 Compressed air or vacuum connection
- connecting thread G 1/8 with (V)PE-1/8-...
- tubing connection with PE-PK-...

2 Screw terminals for electrical connection

3 Sub-base for mounting frame

4 Through holes for fastening

5 Through holes for cover cap (type see section 9 “Accessories”)

6 Cable for electrical connection

Fig. 1

Documentation on the product

For all available product documentation ➔ www.festo.com/pk

2 Product overview

Vacuum types			
	Vacuum connection	**Standard length for fitting onto mounting fram**	**Electrical connection**
VPE-1/8	G1/8	1N	Screw terminals
VPE-1/8-SW	G1/8	1N	Cables
VPE-1/8-2N	G1/8	2N	Screw terminals
VPE-1/8-2N-SW	G1/8	2N	Cables

Fig. 2

Overpressure types			
	Compressed air connection	**Standard length for fitting onto mounting frame**	**Electrical connection**
PE-1/8-1N	G1/8	1N	Screw terminals
PE-1/8-2N	G1/8	2N	Screw terminals
PE-1/8-1N-SW	G1/8	1N	Cables
PE-1/8-2N-SW	G1/8	2N	Cables
PE-PK-3x2-2N	PK-3	2N	Screw terminals
PE-PK-4-SW	PK-4	1N	Cables
PE-PK-4	PK-4	1N	Screw terminals

Fig. 3

3 Function and application

The (V)PE-... contains a chamber with a diaphragm.
This diaphragm is subjected to pressure forces (with PE-...)/tensile forces (with VPE-...) on one side, and to the clamping force of the springs on the other side. If the pressure or vacuum forces are increased in excess of the clamping force, a piston connected to the diaphragm will move and actuate a changeover switch.

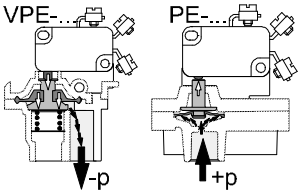


Fig. 4

The (V)PE-... can be used as a normally-closed, normally-open or changeover switch. It has been designed for converting pneumatic pressure values into electrical signals which are used for control or monitor functions.

4 Conditions of use

Please note
Incorrect handling can lead to malfunctioning.
- Observe the following instructions for the correct and safe use of the product.

- Compare the specified limits, e.g. pressures, forces and temperatures with your individual application.
- Make sure that there is a supply of correctly prepared compressed air.
- Take into account the prevailing ambient conditions.
- Observe the technical regulations as well as relevant national and local laws.

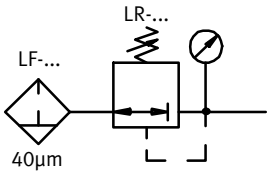


Fig. 5

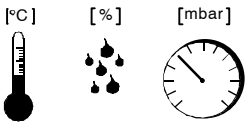


Fig. 6

- Remove all packing material such as protective wax, foils, caps and cartons.
  The individual materials can be disposed of in separate containers for recycling purposes.
- Use the product in its original state without undertaking any modifications.

5 Fitting

Mechanical components

- Select the suitable fastening method:
  a) by means of through holes 4 in the housing or
  b) by fitting into the following mounting frames:
  – NRRQ-1N for (V)PE-...-**1N**, PE-PK-4
  – NRRQ-2N for (V)PE-...-**2N**.
- Fasten the (V)PE-... in the intended position.

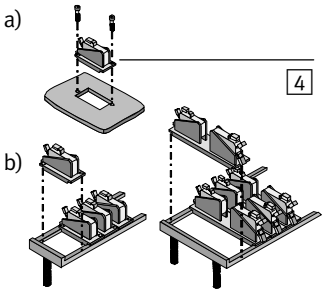


Fig. 7

Pneumatic components

- Connect the (V)PE-... to the compressed air tubing using the following components:

(V)PE-		
1/8	**PK-3-...**	**PK-4-...**
Screw connector size G1/8	tubing size 3	tubing size 4
Maximum tightening torque: 1 Nm	—	—

Fig. 9

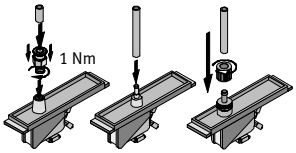


Fig. 8

Electrical components

Using the (V)PE-... with screw terminals [2] and an operating voltage of ≥ AC/DC 50 V:

Warning
You will receive an electric shock if you touch unprotected conductive components.

- Make sure that the electrical connections are protected in accordance with IP 20 (as per EN 60529). A protective cap as per Accessories (see section 9) is required here.

- Wire the (V)PE-... as follows:

Connection		Screw terminal (see Fig. 10)	Cable colours
PE-...	VPE-...		
Input (common)	Input (common)	1	black (BK)
Normally-closed contact	Normally-open contact	2	grey (GY)
Normally-open contact	Normally-closed contact	4	blue (BU)

Fig. 11

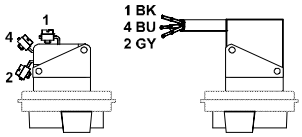


Fig. 10

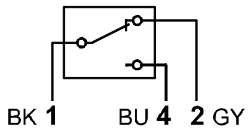
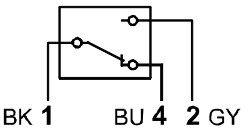
Basic position PE-...	Basic position VPE-...
	

Fig. 12

The wire surface area of the connecting cable must be between 0.34 mm^2 and 1 mm^2.

Fastening the protective cap (type see section 9 “Accessories”)

- Proceed as follows:
  1. Insert the fastening pins into the through holes 5.
  2. Carefully press the protective cap together until the hooks (A) and (B) snap into place (do not break the hooks off).

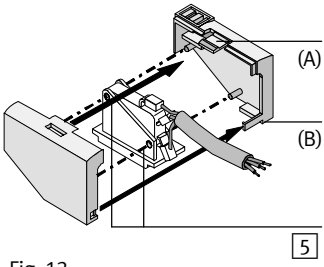


Fig. 13

6 Commissioning

- Switch on the operating voltage.
- Pressurize the compressed air connection with the pressure required as the switching pressure, or evacuate the vacuum required as the switching vacuum.
- Check the function by modifying the pressure or vacuum applied.

7 Care and maintenance

Cleaning

- Switch off the operating voltage.
- If necessary, clean the (V)PE-....
  Permitted cleaning agents are:
  – soap suds (max. +60 °C)
  – all non-abrasive agents.

8 Dismantling and repairs

Dismantling

- Switch off the following sources of power:
  - the operating voltage
  - the compressed air
  - the vacuum.

Dismantling the protective cap (Type see section 9 “Accessories”)

- Proceed as follows:
  1. Carefully press hook (A) outwards (do not break off).
  2. Press hook (B).
  3. Pull the protective cap apart.
- Disconnect the relevant connections from the (V)PE-... .

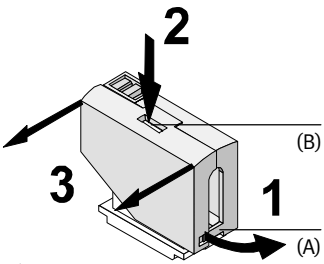


Fig. 14

9 Accessories

Designation	Type
Protective cap (not necessary for (V)PE-...-SW)	SPE-B
Fastening bracket	NRW-...
Barbed fitting	N-...; CK-...; QSM-...
Mounting frame	NRRQ-...

Fig. 15

10 Eliminating faults

Fault	Possible cause	Remedy
(V)PE-... does not function	Pressure failure	Switch on compressed air
	Connections not correct	Connect (V)PE-... correctly
	Short circuit at the switching outputs	Eliminate short circuit
	Damage due to excess pressure/ vacuum	Replace (V)PE-...
	Incorrect operating voltage	Apply correct operating voltage
	(V)PE-... operated with non-permitted medium	Replace (V)PE and operate only with compressed air/vacuum
Outputs no longer switch back	(V)PE-... defective	Return (V)PE-... to Festo

Fig. 16

11 Technical specifications

General specifications

Type		(V)PE-...
Design		Diaphragm actuator
Mounting position		As desired
Operating medium		– with PE: filtered, non-lubricated or lubricated compressed air, filter fineness 40 µm – with VPE: vacuum
Medium temperature Ambient temperature	[°C] [°C]	0 ... 60 0 ... 60
Operating voltage range AC/DC		12 ... 250
Minimum load current	[mA]	100

Type		(V)PE-...
Maximum switching frequency	[Hz]	1
CE marking symbol (see conformity declaration)		as per EU low voltage directive

Fig. 17

Product-specific specifications (V)PE-... without (V)PE-....-SW

Typ		PE-PK-4	PE-PK-3x2-2N	PE-1/8-1N	PE-1/8-2N	VPE-1/8	VPE-1/8-2N
Part no.		7470	13691	6217	7860	12592	12594
Operating pressure	[bar]	0 ... 0,25	0 ... 8			0 ... -0,95	
Switch-on point	[bar]	≤ 0,08	≤ 2			-0,25 ± 0,05	
Switch-off point	[bar]	≥ 0,01	≥ 0,5			≤ -0,1	
Overload pressure (brief, static)	[bar]	max. 8	max. 12	–		max. 1	
Rated operating voltage (V_b)	[V]	AC/DC 250					
Rated operating current (with V_b)				at AC 250 V		at DC 250 V	
	[A]	– ohmic load		6		0,25	
	[A]	– inductive load		2		0,1	
Use category		– ohmic load			AC 12/DC 12		
		– small electromagnetic load			AC 14/DC 13		
Switching output (DC voltage)		Voltage [V DC]:	12	24	60	110	220
	[A]	– resistor load	6	6	1	0,5	0,25
	[A]	– inductive load	6	6	0,5	0,2	0,1
	[A]	– bulb load	3	2	0,6	0,5	0,25
Protection class		(as per EN 60 529) IP00, IP20 with protective cap type SPE-B					
Materials							
– Housing		PET/POM/St	PA/GD-AL/St/PET			PET/POM/St	
– Connections		CuZn	CuZn			CuZn	
– Diaphragm		CR	TPE-U(PU)			CR	
– Switching contact		Ag	Ag			Ag	

Fig. 18

Product-specific specifications (V)PE-...-SW (cable types)

Typ		PE-PK-4-SW	PE-1/8-1N-SW	PE-1/8-2N-SW	VPE-1/8-SW	VPE-1/8-2N-SW
Part no.		7471	6484	7862	12593	12595
Operating pressure	[bar]	0 ... 0,25	0 ... 8		0 ... -0,95	
Switch-on point	[bar]	≤ 0,25	≤ 2		-0,25 ± 0,05	
Switch-off point	[bar]	≥ 0,07	≥ 0,5		≤ -0,1	
Overload pressure (brief, static)	[bar]	max. 8	–		max. 1	
Rated operating voltage (V_b)	[V]	AC/DC 250				
Rated operating current (with V_b)			bei AC 250 V		bei DC 250 V	
	[A]	– ohmic load	5		0,25	
	[A]	– induktive Last	2		0,03	
Use category		– ohmic load			AC 12/DC 12	
		– small electromagnetic load			AC 14/DC 13	
Switching output (DC voltage)		Voltage [V DC]:	15	30 / 50	75	125 / 250
	[A]	– resistor load	10	5 / 1	0,75	0,5 / 0,25
	[A]	– Induktive Last	10	3 / 1	0,25	0,03 / 0,02
	[A]	– bulb load	3	3 / 0,7	0,5	0,4 / 0,20
Protection class		(as per EN 60 529) IP67				
Materials						
– Housing		POM/PA/St/VMQ	PA/GD-AL/St/VMQ		POM/PA/VMQ/St	
– Connections		CR	TPE-U-(PU)		CR	
– Diaphragm		PVC	PVC		PVC	
– Switching contact		Ag	Ag		Ag	

Fig. 19

Copyright:
Festo SE & Co. KG
Ruiter Straße 82
73734 Esslingen
Germany

Phone:
+49 711 347-0

Fax:
+49 711 347-2144

E-mail:
service_international@festo.com

Internet:
www.festo.com