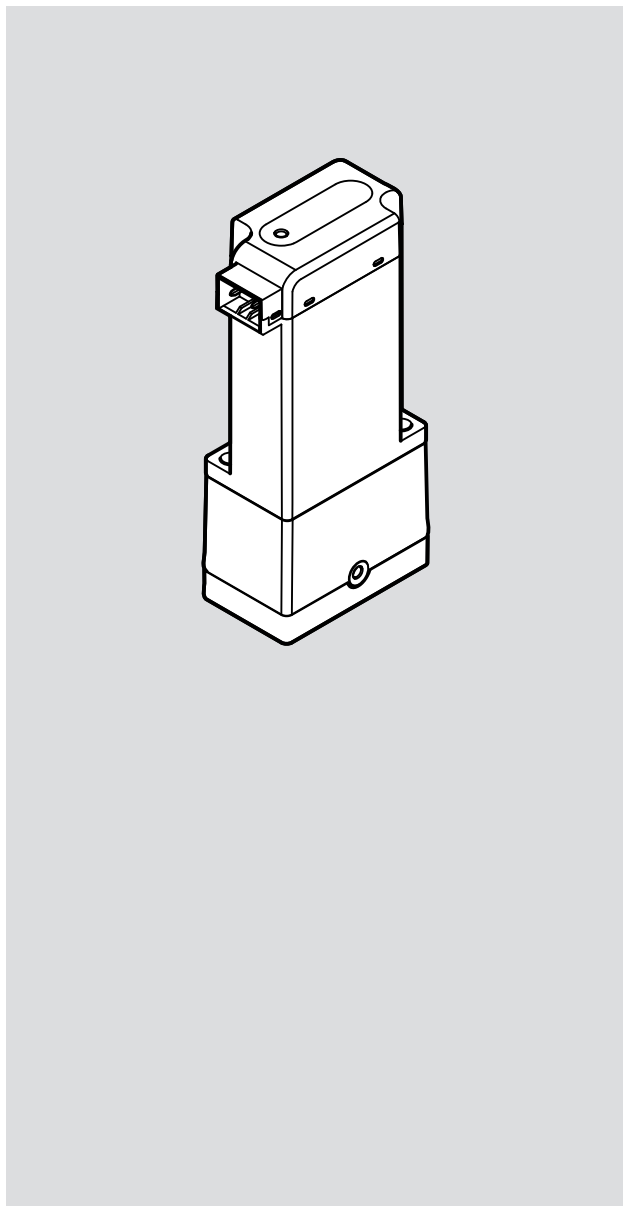


VYKC

Media separated solenoid valve



FESTO

Operating instruc-
tion



8222833

8222833
2024-09b
[8222835]

Original instructions

Table of contents

1	Applicable documents	4
2	Safety	4
2.1	Safety instructions.....	4
2.1.1	General safety instructions.....	4
2.1.2	Media.....	5
2.1.3	Return to Festo.....	5
2.2	Intended use.....	5
2.3	Foreseeable misuse.....	5
2.4	Training of qualified personnel.....	5
3	Additional information	5
4	Product overview	6
4.1	Design.....	6
4.1.1	Product design.....	6
4.1.2	Display components.....	6
4.2	Function.....	7
5	Mounting	7
6	Installation	8
6.1	Fluid installation.....	8
6.2	Installation, electrical.....	9
7	Commissioning	9
8	Maintenance	9
9	Malfunctions	9
10	Removal	10
11	Technical data	10
11.1	Technical data, general.....	10
11.2	Technical data, electrical.....	11
11.3	Technical data, fluidic.....	12

1 Applicable documents



All available documents for the product → www.festo.com/sp.

Document	Product	Contents
Application note	–	Constraints for liquid handling, media resistance

Tab. 1: Applicable documents

2 Safety

2.1 Safety instructions

2.1.1 General safety instructions

- Only use the product in its original condition without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Do not subject the product to mechanical loads.
- Before working on the product: Switch off the power supply, ensure that it is off and secure it against being switched on again.
- Before carrying out any work on the product: switch off the medium supply and secure it against being switched back on.
- Always grasp the plug by the housing. Do not pull on the cable.
- The product can become hot during continuous operation, during operation in block assembly and in the event of specific faults. Take suitable protective measures when using and handling the product.
- Do not operate the product in the vicinity of highly flammable media and substances.
- Use the product indoors only.
- Use the product in a dry environment only.
- Do not exceed the maximum permissible pressure of the medium. Potential pressure peaks in the system must also be taken into account.
- Store the product in a cool, dry environment protected from UV and corrosion. Keep storage times short.

2.1.2 Media

- Media may escape in the event of leakage. Take suitable protective measures for use and handling of the product.
- When using crystallising media, plan appropriate rinsing routines for the product.
- Use only media that will not cause dangerous reactions if mixed.
- Test the chemical resistance of the materials of the product in contact with the media for every application.
- Use only media to which the materials used for the product are resistant. Materials in contact with the medium → 11 Technical data.
- For evaluation of the media resistance → 1 Applicable documents.

2.1.3 Return to Festo

Hazardous substances can endanger the health and safety of personnel and cause damage to the environment. To prevent hazards, the product should only be returned if explicitly requested by Festo.

- Consult your regional Festo contact.
- Complete the declaration of contamination and attach it to the outside of the packaging.
- Comply with all legal requirements for the handling of hazardous substances and the transport of dangerous goods.

2.2 Intended use

The solenoid valve controls gaseous and liquid media. The product is intended for mounting in laboratory devices.

2.3 Foreseeable misuse

- The solenoid valve is not a food materials and articles item as defined by EC 1935/2004.
- Do not use the solenoid valve in medical devices that are intended to maintain or monitor human life.
- Do not operate the solenoid valve without holding current reduction.
- Do not operate the solenoid valve without a sub-base.

2.4 Training of qualified personnel

Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers. The qualified personnel have skills and experience in dealing with electrical (open-loop) control technology.

3 Additional information

- Contact the regional Festo contact if you have technical problems → www.festo.com.
- Accessories → www.festo.com/catalogue.

4 Product overview

4.1 Design

4.1.1 Product design

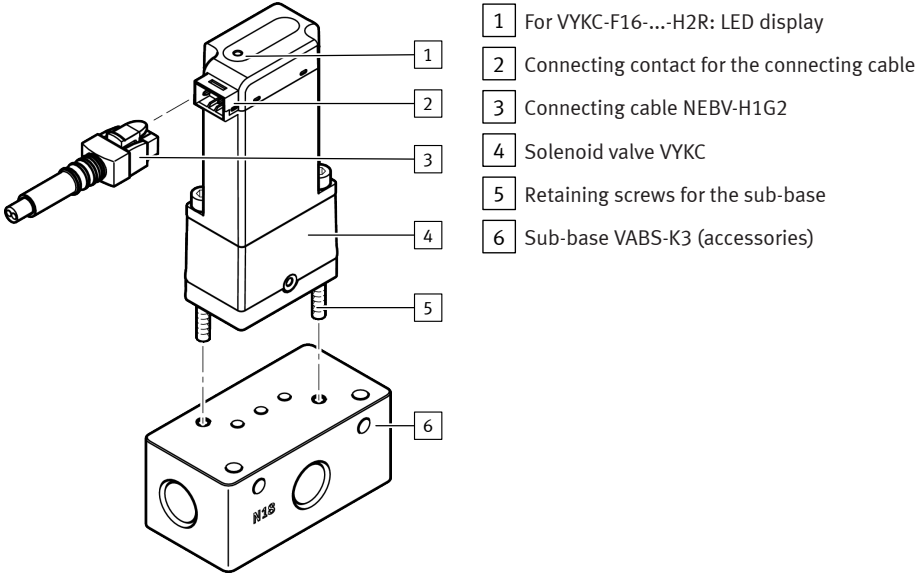







Fig. 1: Product design VYKC

4.1.2 Display components

LED display for solenoid valve VYKC-F16-...-H2R:

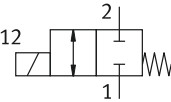
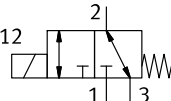
LED operating status	Meaning
 Blue light	<ul style="list-style-type: none"> - The power supply and media supply are switched on. - The solenoid valve is switched on.
 Off	<ul style="list-style-type: none"> - The power supply is switched off. - The solenoid valve is switched off.

Tab. 2: LED operating status

LED fault	Meaning
 Flashing red	<ul style="list-style-type: none"> - The voltage is less than 10 V or more than 26.4 V. - The solenoid valve does not switch or switches off.
 Red light	<ul style="list-style-type: none"> - The surface temperature is above 100 °C. - Short circuit or open circuit in the solenoid valve. - The solenoid valve does not switch or switches off.
 Off	<ul style="list-style-type: none"> - There is no fault with the solenoid valve.

Tab. 3: LED fault

4.2 Function

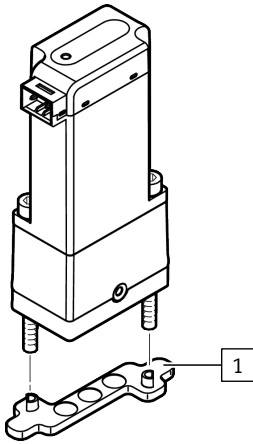
Solenoid valve	Circuit symbol	Function
VYKC-F16-M22C		Directly controlled 2/2-way valve, normally closed
VYKC-F16-M32		Directly controlled 3/2-way valve, normally closed or open

Tab. 4: Function

5 Mounting

Requirements:

- The media lines are unpressurised and do not carry any medium.
- The media lines are free of particles and fibres.
- Particle filters are installed in the medium line upstream from the product. Maximum particle size 5 µm.
- The ducts and sealing surfaces of the sub-base are free of particles and fibres.



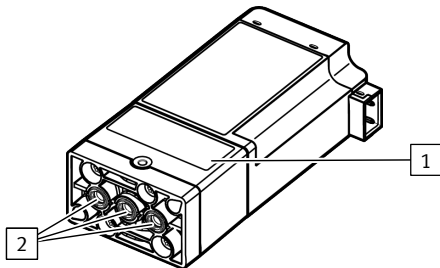
1 Transportation protection

Fig. 2: Transportation protection VYKC

1. Provide a suitable sub-base.
2. Remove the transport protection [1].
3. Mount the solenoid valve on the sub-base with the included screws. Tightening torque: 0.3 Nm \pm 15%.
4. Fasten the sub-base to the substrate by individual assembly or block assembly. Maximum tightening torque: 0.6 Nm.

6 Installation

6.1 Fluid installation



1 Identification of the connections
2 Media ports

Fig. 3: Installation example VYKC-F16-M32

1. Note the allocation of the ports on the valve and on the sub-base.
2. Connect all media lines [2] to the installed sub-base.

6.2 Installation, electrical

WARNING

Risk of Injury due to Electric Shock.

- For the electric power supply, use only PELV circuits that ensure a reliable electric disconnection from the mains network.
- Observe IEC 60204-1/EN 60204-1.
- The unit must be powered by a power source that fulfils the requirements of an energy-limited circuit in accordance with IEC 61010-1/EN 61010-1.

1. Note the polarity. The red cable marks the positive terminal.
2. Note the maximum cable length is 10 m.
3. Insert the plug until the locking lug clicks into place.
4. With metal sub-bases: connect the sub-base to functional earth.

7 Commissioning

Requirement:

- The solenoid valve is fully mounted and connected.
1. Switch on the media supply.
 2. Switch on the power supply.
 3. Check the solenoid valve for leakage.

8 Maintenance

- Inspect the product regularly from the outside for leakage and function.
- Clean the outside of the product with a soft dry cloth as required.

9 Malfunctions

Malfunction	Cause	Remedy
Solenoid valve does not close completely.	Operating voltage is still applied.	– Check the electrical connection. The red cable marks the positive terminal.
Solenoid valve does not open completely.	Pressure of medium is too high.	– Reduce the pressure of the medium.
	Operating voltage is interrupted or not sufficient.	– Check the power supply.
Medium is leaking.	Leakage at the connection between solenoid valve and sub-base.	– Check the integrated seal. – Check the surface of the sub-base.
	Diaphragm leaks.	– Replace the solenoid valve.

Tab. 5: Fault clearance

10 Removal

1. Switch off the power supply.
2. Depressurise the media line and the solenoid valve and allow them to cool.
3. Drain the media line and the solenoid valve completely. Collect the discharged media in a suitable container.
4. Demount the solenoid valve. Unlock the locking lug when removing the plug.

11 Technical data

11.1 Technical data, general

VYKC-F16	
Certificates, declaration of conformity	➔ www.festo.com/sp
Design	Rocker valve with diaphragm seal
Mounting position	Any
Flow direction	Reversible
Degree of protection	IP40
Min. grid dimension with block mounting [mm]	17
Relative humidity, non-condensing	80% at ≤ 30 °C
	50% at > 30 °C
Temperature	
Temperature of medium [°C]	0 ... +50
Ambient temperature [°C]	0 ... +50
Storage temperature [°C]	-20 ... +70
Loads	
Vibration resistance in accordance with IEC 60068-2-6	Severity level 2
Shock resistance in accordance with IEC 60068-2-27	Severity level 2
Connections	
Fluid	Sub-base VABS: 1/4-28 UNF, G 1/8, 1/8 NPT, M5
Electrical	Plug pattern H

Tab. 6: Technical data, general

Type of severity level (SL)		
Vibration load		
Frequency range [Hz]	Acceleration [m/s^2]	Deflection [mm]
SG2	SG2	SG2
2 ... 8	–	± 3.5
8 ... 27	10	–
27 ... 60	–	± 0.35
60 ... 160	50	–
160 ... 200	10	–
Shock load		
Acceleration [m/s^2]	Duration [ms]	Shocks per direction
SG2	SG2	SG2
± 300	11	5
Continuous shock load		
Acceleration [m/s^2]	Duration [ms]	Shocks per direction
± 150	6	1000

Tab. 7: Type of severity level (SL)

11.2 Technical data, electrical

VYKC-F16-...	-H2	-H2R
Duty cycle	100%	
Overvoltage category	II	
Contamination level	2	
Operating voltage [V DC]	$24 \pm 10 \%$	
Operating voltage range [V DC]	10.8 ... 26.4	
Permissible residual ripple	–	$\pm 8\%$
Inrush current [mA]	630 for 100 ms	
Holding current [mA]	260	
Permissible current fluctuations	$\pm 2\%$	–
Nominal power at inrush current		
At 24 V [W]	5.5	
At 12 V [W]	4.2	

Technical data

VYKC-F16-...		-H2	-H2R
Nominal power at holding current			
At 24 V	[W]	1.4	
At 12 V	[W]	1.1	
Max. power ¹⁾			
At 24 V	[W]	–	10
At 12 V	[W]	–	6.7

1) short-term

Tab. 8: Technical data, electrical

Max. switching frequency for single mounting				
Duty cycle		100 %	99 %	50 %
Max. switching frequency at ambient temperature				
< 20 °C	[Hz]	0	4	30
20 ... 30 °C	[Hz]	0	3.3	30
30 ... 40 °C	[Hz]	0	2.6	3.5
40 ... 50 °C	[Hz]	0	2	2.7

Tab. 9: Maximum switching frequency for single mounting

Max. switching frequency with block mounting				
Duty cycle		100 %	99 %	50 %
Max. switching frequency at ambient temperature				
< 20 °C	[Hz]	0	2	2.7
20 ... 30 °C	[Hz]	0	1.5	2.5
30 ... 40 °C	[Hz]	0	1.1	2
40 ... 50 °C	[Hz]	0	0.7	1.7

Tab. 10: Maximum switching frequency with block mounting

11.3 Technical data, fluidic

VYKC-F16		-M22C	-M32
Medium		Liquid media	
		Gaseous media	
Max. particle size of the medium	[µm]	5	

Technical data

VYKC-F16	-M22C	-M32
Materials in contact with the medium	PEEK	
	EPDM	
Pressure of medium [MPa]	-0.075 ... +0.2	
Flow rate Kv [m ³ /h]	0.048	0.043
Internal volume [μl]	89.2	59.1

Tab. 11: Technical data, fluidic

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

Phone:
+49 711 347-0

Internet:
www.festo.com