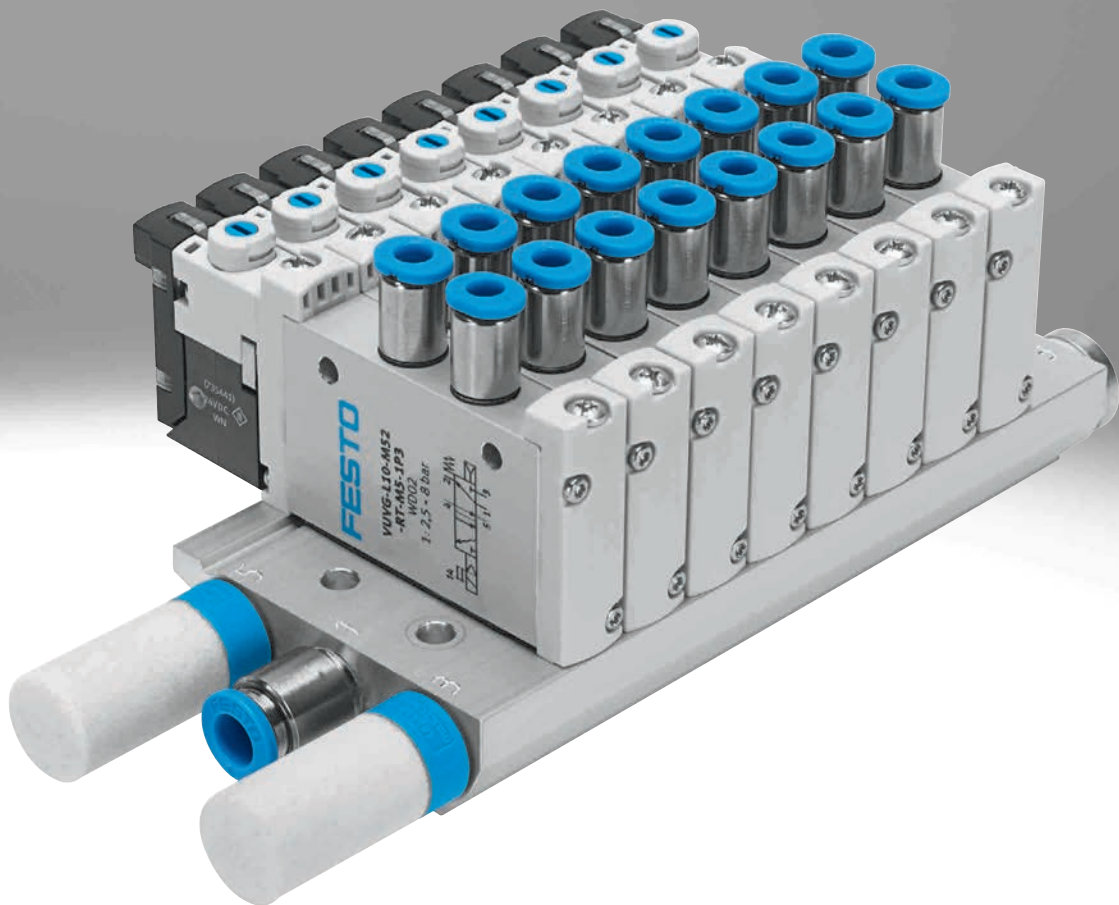


## Solenoid valves VUVG/valve terminals VTUG

**FESTO**



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Easy:

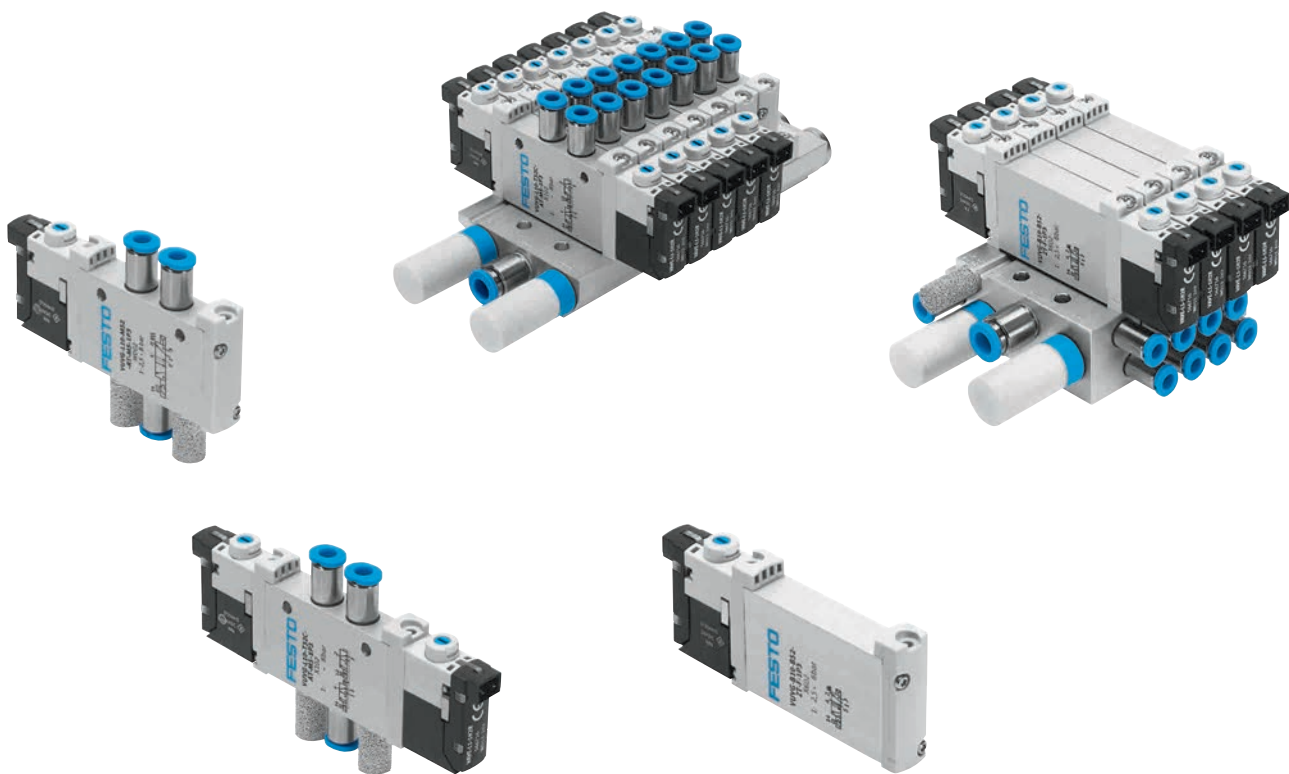
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for the  
star!

## Key features



### Innovative

- Can be set to internal or external pilot air supply for manifold assemblies with sub-base valves
- Maximum pressure 10 bar
- Design principle:
  - Piston spool with sealing ring (VUVG-LK, VUVG-BK)
  - Piston spool with sealing cartridge (VUVG-L, VUVG-B)

### Flexible

- Wide range of valve functions
- Choice of quick push-in connectors
- In-line valves
- Semi in-line valves for manifold assembly
- M5 and M7 in-line valves can be combined on one manifold rail
- Valve manifold assembly with pressure zones
- IP40, IP65
- Connection technology via:
  - E-box

### Reliable

- Sturdy and durable metal components
  - Valves
  - Manifold rails
- Fast troubleshooting thanks to 360° LED display
- Reliable servicing thanks to valves that can be replaced quickly and easily
- Choice of manual override: non-detenting, covered, non-detenting/detenting (without accessories)

### Easy to install

- Secure mounting on wall or H-rail
- Easy mounting, captive screws and seal
- Connection technology easy to change via the E-box
- Identification holder for labelling the valves

### Valve terminal configurator

A valve terminal configurator is available to help you select a suitable valve terminal VTUG. This makes it much easier to order the right product.

Valve terminals VTUG are ordered via an ident. code. All valve terminals are supplied fully assembled and individually tested.

This reduces assembly and installation time to a minimum.

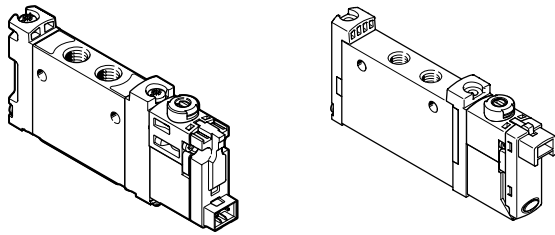
Download CAD data → [www.festo.com](http://www.festo.com)

Ordering system for valve terminal VTUG  
→ Internet: vtug

## Key features – Pneumatic components

## Individual valves and valve manifold assemblies

## In-line valves as individual valve

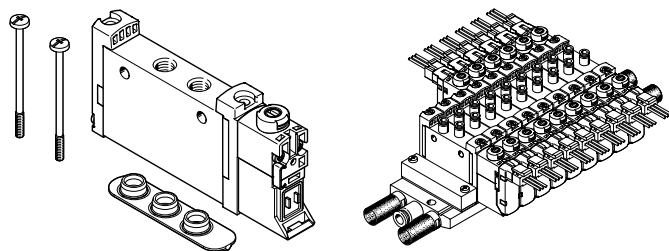


In-line valves are designed to be used without pneumatic links, as all connections to the fittings/tubing are on the valve. The electrical connection is provided by different E-boxes.

If a special seal set is used, in-line valves VUVG can also be mounted on a manifold rail (pneumatic linking) as semi in-line valves.

## In-line valve VUVG-LK/VUVG-L

## Semi in-line valves for manifold assembly



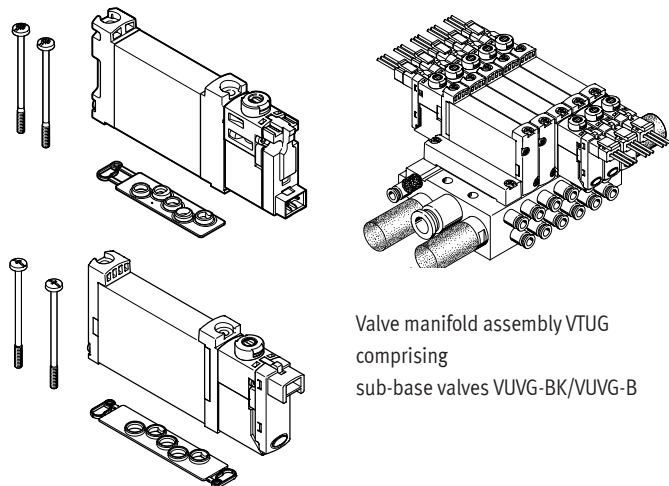
The supply ports (1, 3 and 5) for semi in-line valves are connected to the valve by common pneumatic links (e.g. sub-base).

The working ports (2, 4) are on the valve. The electrical connection is provided by different E-boxes.

## Semi in-line valve VUVG-S

## Valve manifold assembly VTUG comprising semi in-line valves VUVG-S

## Sub-base valves for manifold assembly



The supply ports (1, 3 and 5) and the working ports (2, 4) of sub-base valves are connected through the sub-base or manifold

to the valve. The electrical connection is provided by different E-boxes.

## Sub-base valve VUVG-BK/VUVG-B

## Valve manifold assembly VTUG comprising sub-base valves VUVG-BK/VUVG-B

## Key features – Pneumatic components

### Pilot air supply

#### Internal pilot air supply

Internal pilot air supply can be chosen with an operating pressure between 1.5 ... 8 bar, 2.5 ... 8 bar, or 3 ... 8 bar (depending on the valve used).

The pilot air supply is branched from duct 1 (compressed air supply) using an internal connection.

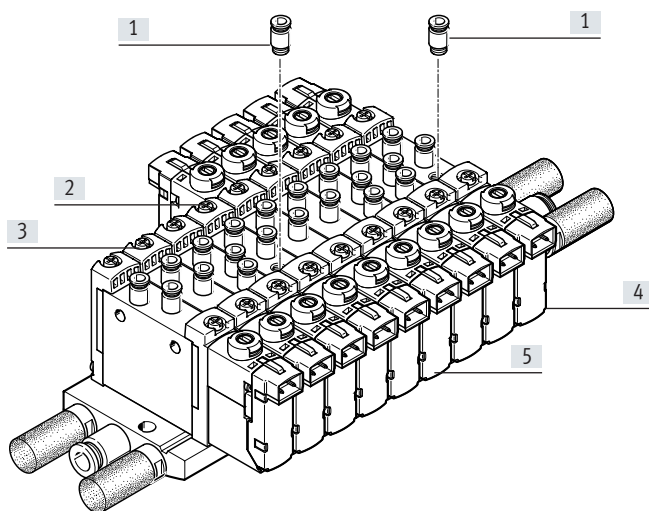
#### External pilot air supply

External pilot air supply is required for vacuum operation. The port for external pilot air supply (port 12/14) is located on the valve in the case of in-line valves and on the manifold rail in the case of sub-base valves.

#### Pilot exhaust air

With in-line valves, the pilot exhaust air escapes via exhaust holes. With sub-base valves, the pilot exhaust air is discharged via duct 82/84 of the manifold rail.

### Pilot air supply with in-line and semi in-line valves



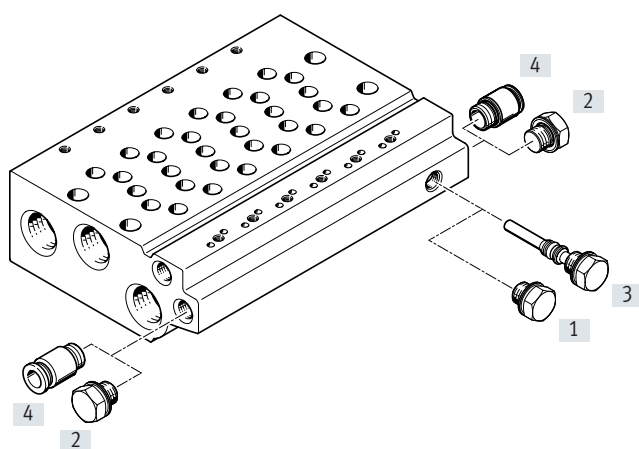
- [1] Push-in fitting for external pilot air supply at port 12/14
- [2] Single solenoid valve with external pilot air supply
- [3] Single solenoid valve with internal pilot air supply
- [4] Double solenoid valve with external pilot air supply
- [5] Double solenoid valve with internal pilot air supply

The internal pilot air is branched from port 1 in the valve body. The external pilot air (port 12/14) is supplied individually at each valve housing.

#### Note

Semi in-line valves cannot be supplied centrally with pilot air via the manifold rail.

### Pilot air supply with sub-base valves



- [1] Blanking plug, short, with internal pilot air
- [2] Blanking plug for duct 12/14 with internal pilot air
- [3] Blanking plug, long, with external pilot air
- [4] Push-in fitting in duct 12/14 with external pilot air

The manifold rails for sub-base valves have an internal connection between duct 12/14 and duct 1. By inserting a blanking plug into this connection, it is possible to switch between internal and external pilot air.

## Key features – Pneumatic components

### Operation with different pressures

#### Vacuum operation

#### Points to note with 3/2-way valves

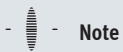
The 3/2-way valves are available in a design with two valves in one valve body and with pneumatic spring return. With these valves, the force for the return movement is obtained from port 1.

Vacuum operation is therefore only possible at port 3 and 5, not at port 1.

With external pilot air supply, vacuum can be connected at port 1, 3, 5 of the 5/2-way and 5/3-way valves.

#### Reverse operation

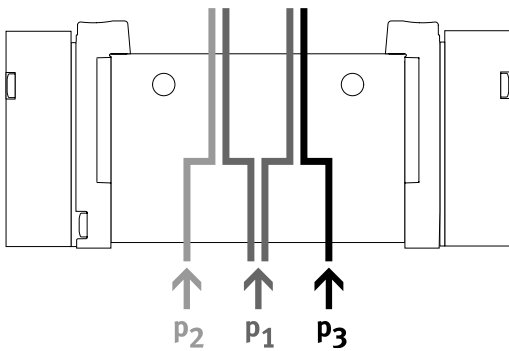
The 3/2-way valves with pneumatic spring are not suitable for reverse operation, since at least the minimum pilot pressure must be present in duct 1.



#### Note

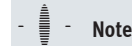
Pressure must be present at port 1.

#### Pressure deflector (internal pilot air)



- If two different pressures are required.

- Different pressures can be supplied at duct 1, 3 and 5.



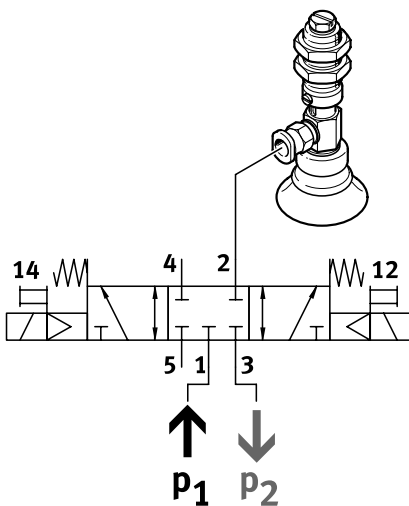
#### Note

- With internal pilot air supply, the minimum pilot pressure must be adhered to in duct 1
- With 2x 3/2-way valves without spring return, the minimum pilot pressure must always be adhered to in duct 1

#### Advantages

Any pressure or vacuum can be connected at ducts 3 and 5 both with external and internal pilot air.

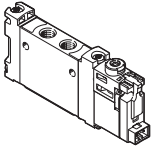
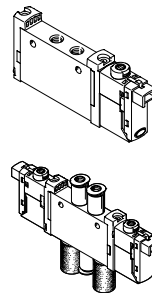
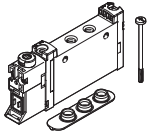
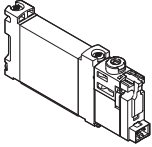
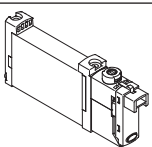
#### Vacuum, ejector pulse and normal position



Vacuum, ejector pulse and normal position can be achieved as follows:

- Internal pilot air supply
- Vacuum in duct 3
- Pressure for the ejector pulse in duct 1

Product range overview

Design	Working port	Size	Functions and flow rate [l/min]												→ Page/ Internet	
			T32C	T32U	T32H	T32C/M	T32U/M	T32H/M	M52	M52/M	B52	P53C	P53U	P53E		
<b>In-line valve as individual valve, solenoid valve VUVG-LK</b>																
	M5	10	■	-	-	-	-	-	■	-	■	-	-	-	27	
			180						195		195					
	M7	10	■	-	-	-	-	-	■	-	■	-	-	-		31
			280					340		340						
	G1/8	14	■	-	-	-	-	-	■	-	■	-	-	-	46	
			570					660		660						
<b>In-line valve as individual valve, solenoid valve VUVG-L</b>																
	M3	10A	-	-	-	-	-	-	■	■	■	■	■	■	21	
									100	80	100	90	90	90		
	M5	10	■	■	■	■	■	■	■	■	■	■	■	■		35
				150	150	150	135	125	125	220	190	220	210	210		
	M7	10	■	■	■	■	■	■	■	■	■	■	■	■		39
			190	190	190	150	140	140	380	320	380	320	320	320		
	G1/8	14	■	■	■	■	■	■	■	■	■	■	■	■	50	
			650	600	650	550	500	500	780	780	780	650	600	600		
	G1/4	18	■	■	■	■	■	■	■	■	■	■	■	■	58	
			1000	1000	1000	1000	1000	1000	1300	1300	1380	1200	1000	1000		
<b>Semi in-line valve for manifold assembly, solenoid valve VUVG-S</b>																
	M3	10A	-	-	-	-	-	-	■	■	■	■	■	■	21	
									100	80	100	90	90	90		
	M5	10	■	■	■	■	■	■	■	■	■	■	■	■		35
				150	150	150	135	125	125	220	190	220	210	210		
	M7	10	■	■	■	■	■	■	■	■	■	■	■	■		39
			170	170	170	140	130	130	340	290	340	300	300	300		
	G1/8	14	■	■	■	■	■	■	■	■	■	■	■	■	50	
			620	580	580	520	480	480	730	730	730	620	580	580		
	G1/4	18	■	■	■	■	■	■	■	■	■	■	■	■	58	
			1000	1000	1000	1000	1000	1000	1300	1300	1380	1200	1000	1000		
<b>Sub-base valve, solenoid valve VUVG-BK</b>																
	M5	10	■	-	-	-	-	-	■	-	■	-	-	-	72	
				160					160		160					
	M7	10	■	-	-	-	-	-	■	-	■	-	-	-		72
			160					160		160						
	G1/8	14	■	-	-	-	-	-	■	-	■	-	-	-	82	
			350					380		380						
<b>Sub-base valve, solenoid valve VUVG-B</b>																
	M3	10A	-	-	-	-	-	-	■	■	■	■	■	■	66	
									100	80	100	90	90	90		
	M5	10	■	■	■	■	■	■	■	■	■	■	■	■		75
				150	150	150	130	120	120	210	180	210	200	200		
	M7	10	■	■	■	■	■	■	■	■	■	■	■	■		75
			160	160	160	140	130	130	270	230	270	250	250	250		
	G1/8	14	■	■	■	■	■	■	■	■	■	■	■	■	82	
			540	510	540	430	410	410	580	580	580	540	510	510		
	G1/4	18	■	■	■	■	■	■	■	■	■	■	■	■	91	
			800	800	800	800	800	800	1000	1000	1000	950	950	950		

### Overview of valve functions




Valve	Valve code	Description	VUVG-LK, VUVG-BK		VUVG-L, VUVG-B			
			Size		Size			
			M5/M7	G1/8	M3	M5/M7	G1/8	G1/4
<b>5/2-way double solenoid valve</b>								
	B52	In-line valve, pilot air supply Internal	■	■	■	■	■	■
		In-line valve, pilot air supply External	-	-	■	■	■	■
		Sub-base valve, external pilot air supply	-	-	■	■	■	■
<b>5/2-way valve, single solenoid, pneumatic spring</b>								
	M52-A	In-line valve, pilot air supply Internal	■	■	-	-	■	-
		In-line valve, pilot air supply External	-	-	-	-	■	-
		Sub-base valve, external pilot air supply	-	-	-	-	■	-
<b>5/2-way single solenoid valve, mechanical spring</b>								
	M52-M	In-line valve, pilot air supply Internal	-	-	■	■	■	■
		In-line valve, pilot air supply External	-	-	■	■	■	■
		Sub-base valve, external pilot air supply	-	-	■	■	■	■
<b>5/2-way valve, single solenoid, pneumatic/mechanical spring</b>								
	M52-R	In-line valve, pilot air supply Internal	-	-	■	■	-	■
		In-line valve, pilot air supply External	-	-	■	■	-	■
		Sub-base valve, external pilot air supply	-	-	■	■	-	■

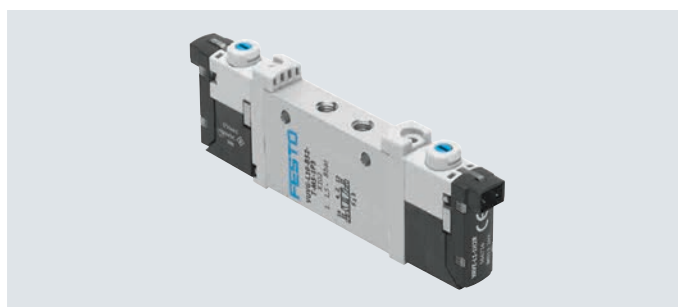
## Data sheet

## Function

2x 3/2C, 2x 3/2U, 2x 3/2H  
 5/2-way, single solenoid  
 5/2-way, double solenoid valve  
 5/3C, 5/3U, 5/3E

Circuit symbols → page 13

-  - Size 10 mm
-  - Flow rate  
125 ... 220 l/min
-  - Voltage  
5, 12 and 24 V DC



General technical data VUVG-L M5												
Valve function	T32-A			T32-M			M52-R	B52	M52-M	P53		
Normal position	C <sup>1)</sup>	U <sup>2)</sup>	H <sup>4)</sup>	C <sup>1)</sup>	U <sup>2)</sup>	H <sup>4)</sup>	–	–	–	C <sup>1)</sup>	U <sup>2)</sup>	E <sup>3)</sup>
Stable position	Monostable							Bistable	Monostable	Monostable		
Pneumatic spring reset	Yes			No			Yes <sup>5)</sup>	–	No	–		
Mechanical spring reset	No			Yes			Yes <sup>5)</sup>	–	Yes	Yes		
Vacuum operation at port 1	No			Only with external pilot air supply								
Design	Piston spool											
Sealing principle	Soft											
Type of actuation	Electrical											
Type of control	Piloted											
Pilot air supply	Internal or external											
Exhaust function	Can be throttled											
Manual override	Choice of non-detenting, covered, non-detenting/detenting or detenting											
Type of mounting	Optionally via through-holes <sup>6)</sup> or on manifold rail											
Mounting position	Any											
Nominal width	[mm]	2.7	1.9	1.8			3.2		2.2		3.2	
Standard nominal flow rate	[l/min]	150	135	125	125		220		190		210	
Flow rate on manifold rail	[l/min]	150	135	125	125		220		190		210	
Switching time on/off	[ms]	6/16		8/11			7/19	–	8/24	10/30		
Switching time changeover	[ms]	–						7	–	15		
Size	[mm]	10										
Connection	1, 2, 3, 4, 5	M5										
	12/14	M3										
Product weight	[g]	55			54			45	55	44	55	
Certification	c UL us - Recognized (OL)											
	c CSA us (OL)											
	RCM compliance mark											
CE marking (see declaration of conformity) <sup>7)</sup>	To EU EMC Directive											
Corrosion resistance class CRC <sup>8)</sup>	2											

1) C=Normally closed/mid-position closed

2) U=Normally open/mid-position pressurised

3) E=Mid-position exhausted

4) H=2x 3/2-way valve in one housing with 1x normally closed and 1x normally open

5) Combined reset method

6) If several valves are to be screwed together via the through-holes to form a block, a minimum distance of 0.3 mm must be ensured by placing spacer discs between them.

7) For information about the area of use, see the EC declaration of conformity at: [www.festo.com/sp](http://www.festo.com/sp) → Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

8) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.



## Data sheet

Operating and environmental conditions			T32-A <sup>1)</sup>	T32-M <sup>3)</sup>	M52-R <sup>2)</sup>	B52	M52-M <sup>3)</sup>	P53
Valve function			Compressed air to ISO 8573-2010 [7:4:4]					
Operating pressure	Internal	[bar]	1.5 ... 8	2.5 ... 8	2.5 ... 8	1.5 ... 8	3 ... 8	3 ... 8
	External	[bar]	1.5 ... 10	-0.9 ... 10			-0.9 ... 8	-0.9 ... 10
Pilot pressure		[bar]	1.5 ... 8	2 ... 8	2.5 ... 8	1.5 ... 8	3 ... 8	
Ambient temperature		[°C]	-5 ... +50, with holding current reduction -5 ... +60					
Temperature of medium		[°C]	-5 ... +50, with holding current reduction -5 ... +60					

- 1) Pneumatic spring
- 2) Mixed, pneumatic/mechanical spring
- 3) Mechanical spring

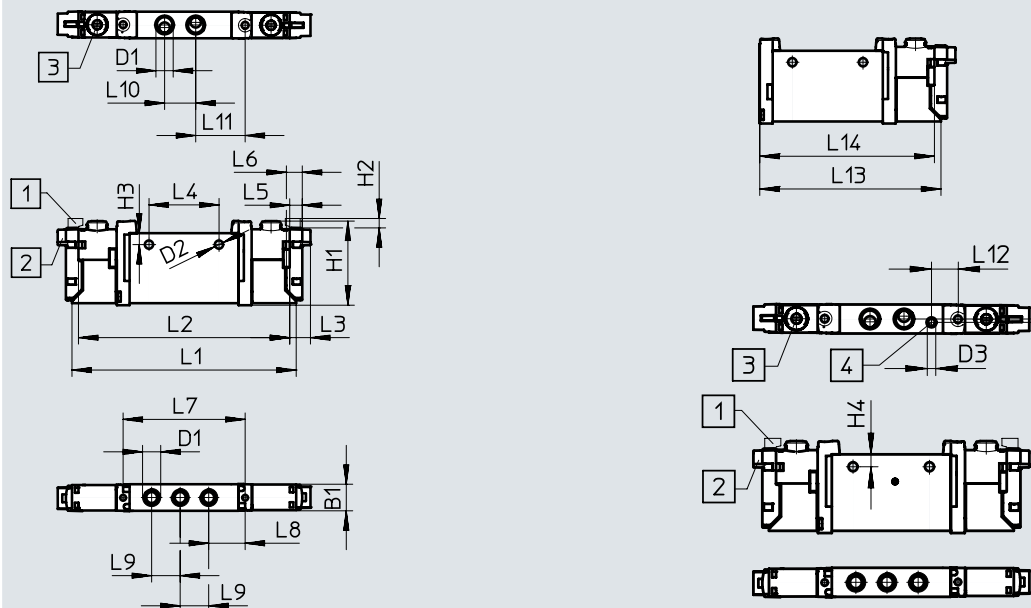
Electrical data	
Electrical connection	Via E-box → page 98
Operating voltage	[V DC] 5, 12 and 24 ±10%
Power	[W] 1, reduced to 0.35 with holding current reduction
Duty cycle	[%] 100
Degree of protection to EN 60529	IP40 (with plug socket), IP65 (with M8)

Information on materials	
Housing	Wrought aluminium alloy
Seals	HNBR, NBR
Note on materials	RoHS-compliant

### Dimensions

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

2x 3/2-way, 5/2-way and 5/3-way valve



**Note**  
Additional dimensions  
E-boxes  
→ Page 100

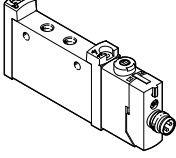
[1] Vertical electrical connection    [2] Horizontal electrical connection    [3] Manual override    [4] Port for external pilot air supply

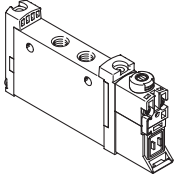
Type	B1	B2	D1	D2	D3	H1	H2	H3	L1	L2	L3	L4
VUVG-L-10 ...-M5...	10.2	-	M5	3.2	M3	32.5	3.6	4.4	86.5	81.5	8	27
VUVG-S-10 ...-M5...												

Type	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14
VUVG-L-10 ...-M5...	4.85	6.15	47	14	11	12	19	-	69.2	66.7
VUVG-S-10 ...-M5...										

## Ordering data

## ★ Core product range

Ordering data		Description	Part no.	Type
<b>In-line valve M5, with E-box R8</b>				
	<b>5/3-way valve</b>			
	Internal pilot air supply	Mid-position closed, mechanical spring reset	★ 577346	VUVG-L10-P53C-T-M5-1R8L

Ordering data		Description	Part no.	Type
<b>In-line valve M5, without E-box</b>				
	<b>2x 3/2-way valve</b>			
	Internal pilot air supply	Normally closed, pneumatic spring reset	566454	VUVG-L10-T32C-AT-M5-1P3
		Normally open, pneumatic spring reset	566455	VUVG-L10-T32U-AT-M5-1P3
		1x normally open, 1x normally closed, pneumatic spring reset	566456	VUVG-L10-T32H-AT-M5-1P3
		Normally closed, mechanical spring reset	574348	VUVG-L10-T32C-MT-M5-1P3
		Normally open, mechanical spring reset	574349	VUVG-L10-T32U-MT-M5-1P3
		1x normally open, 1x normally closed, mechanical spring reset	574350	VUVG-L10-T32H-MT-M5-1P3
	External pilot air supply	Normally closed, pneumatic spring reset	566463	VUVG-L10-T32C-AZT-M5-1P3
		Normally open, pneumatic spring reset	566464	VUVG-L10-T32U-AZT-M5-1P3
		1x normally open, 1x normally closed, pneumatic spring reset	566465	VUVG-L10-T32H-AZT-M5-1P3
		Normally closed, mechanical spring reset	574352	VUVG-L10-T32C-MZT-M5-1P3
		Normally open, mechanical spring reset	574353	VUVG-L10-T32U-MZT-M5-1P3
		1x normally open, 1x normally closed, mechanical spring reset	574354	VUVG-L10-T32H-MZT-M5-1P3
	<b>5/2-way single solenoid valve</b>			
	Internal pilot air supply	Pneumatic/mechanical spring reset	566457	VUVG-L10-M52-RT-M5-1P3
Mechanical spring reset		574351	VUVG-L10-M52-MT-M5-1P3	
External pilot air supply	Pneumatic/mechanical spring reset	566466	VUVG-L10-M52-RZT-M5-1P3	
	Mechanical spring reset	574355	VUVG-L10-M52-MZT-M5-1P3	

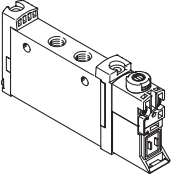
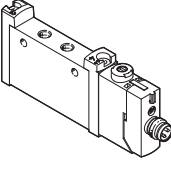
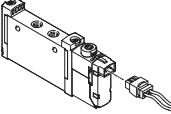
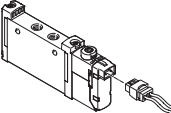
Festo core product range



Generally ready for dispatch from the factory within 24 hours

Generally ready for dispatch from the factory within 5 days

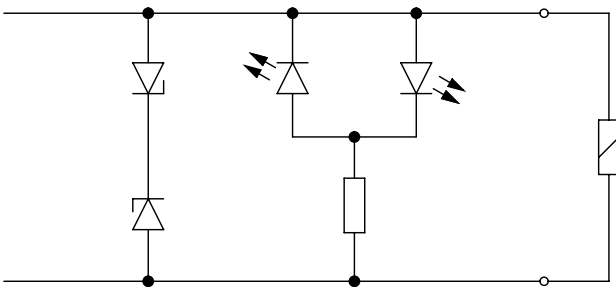
## Ordering data

Ordering data		Description	Part no.	Type
<b>In-line valve M5, without E-box</b>				
	<b>5/2-way double solenoid valve</b>			
	Internal pilot air supply		566458	VUVG-L10-B52-T-M5-1P3
	External pilot air supply		566467	VUVG-L10-B52-ZT-M5-1P3
	<b>5/3-way valve</b>			
	Internal pilot air supply	Mid-position closed, mechanical spring reset	566459	VUVG-L10-P53C-T-M5-1P3
		Mid-position exhausted, mechanical spring reset	566460	VUVG-L10-P53E-T-M5-1P3
		Mid-position pressurised, mechanical spring reset	566461	VUVG-L10-P53U-T-M5-1P3
	External pilot air supply	Mid-position closed, mechanical spring reset	566468	VUVG-L10-P53C-ZT-M5-1P3
		Mid-position exhausted, mechanical spring reset	566469	VUVG-L10-P53E-ZT-M5-1P3
Mid-position pressurised, mechanical spring reset		566470	VUVG-L10-P53U-ZT-M5-1P3	
<b>In-line valve M5, with E-box R8</b>				
	<b>2x 3/2-way valve</b>			
	Internal pilot air supply	Normally closed, pneumatic spring reset	577347	VUVG-L10-T32C-AT-M5-1R8L
		Normally open, pneumatic spring reset	8031466	VUVG-L10-T32U-AT-M5-1R8L
		1x normally open, 1x normally closed, pneumatic spring reset	8031467	VUVG-L10-T32H-AT-M5-1R8L
		Normally closed, mechanical spring reset	8031468	VUVG-L10-T32C-MT-M5-1R8L
		Normally open, mechanical spring reset	8031469	VUVG-L10-T32U-MT-M5-1R8L
		1x normally open, 1x normally closed, mechanical spring reset	8031470	VUVG-L10-T32H-MT-M5-1R8L
	<b>5/2-way single solenoid valve</b>			
	Internal pilot air supply	Pneumatic/mechanical spring reset	572634	VUVG-L10-M52-RT-M5-1R8L
		Mechanical spring reset	8031472	VUVG-L10-M52-MT-M5-1R8L
	<b>5/2-way double solenoid valve</b>			
	Internal pilot air supply		576664	VUVG-L10-B52-T-M5-1R8L
<b>5/3-way valve</b>				
Internal pilot air supply	Mid-position exhausted, mechanical spring reset	8031475	VUVG-L10-P53E-T-M5-1R8L	
	Mid-position pressurised, mechanical spring reset	8031476	VUVG-L10-P53U-T-M5-1R8L	
<b>In-line valve M5, with E-box H2</b>				
	<b>5/2-way single solenoid valve</b>			
	Internal pilot air supply	Pneumatic/mechanical spring reset	577316	VUVG-L10-M52-RT-M5-1H2L-W1
		Mechanical spring reset	578162	VUVG-L10-M52-MT-M5-1H2L-W1
	<b>5/2-way double solenoid valve</b>			
Internal pilot air supply		577317	VUVG-L10-B52-T-M5-1H2L-W1	
<b>Semi in-line valve M5, with E-box H2</b>				
	<b>5/2-way single solenoid valve</b>			
	Internal pilot air supply	Pneumatic/mechanical spring reset	577324	VUVG-S10-M52-RT-M5-1H2L-W1

E-boxes

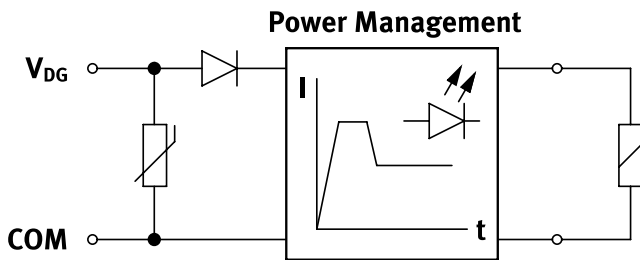
General technical data							
Variants	H2	H3	S2	S3	L-	R1	R8
Mounting position	Any						
Electrical connection	2-pin, socket				Flying leads	Individual plug M8, 4-pin	Individual plug M8, 3-pin
Degree of protection	IP40				IP65		
Signal status display	LED						
Type of mounting	Clip				Self-tapping screw		
Note on materials	RoHS-compliant						
Housing colour	Black						
Information on housing materials	PA						
Certification	RCM compliance mark						

Protective circuit without holding current reduction



The solenoid coils (P type) of the 5, 12 and 24 V designs have a protective circuit to arrest sparks and protect against polarity reversal.

Protective circuit with holding current reduction

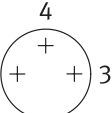
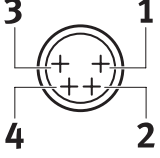



The 24 V DC design (R type) additionally features holding current reduction. This reduces the power from 1 W to 0.35 W.

Pin allocation for E-box

	Pin	Description	
<b>Rectangular plug, connection pattern H</b>			
	VAVE-L1-1VH2-LP, VAVE-L1-1VH3-LP		
	1	+ or -	Without holding current reduction
	2	+ or -	
	VAVE-L1-1H2-LR, VAVE-L1-1H3-LR		With holding current reduction
1	+		
2	-		
<b>Rectangular plug, connection pattern S</b>			
	VAVE-L1-1VS2-LP, VAVE-L1-1VS3-LP		
	1	+ or -	Without holding current reduction
	2	+ or -	
	VAVE-L1-1S2-LR, VAVE-L1-1S3-LR		With holding current reduction
1	-		
2	+		
<b>Flying leads, 2-pin</b>			
	VAVE-L1-1VL1...4-LP		
	1	+ or -	Without holding current reduction
	2	+ or -	
	VAVE-L1-1L1...4-LR		With holding current reduction
1	-		
2	+		

## E-boxes

Pin allocation for E-box		Pin	Description
<b>Round plug, M8, 3-pin</b>			
	<b>VAVE-L1-1VR8-LP</b>		
	1	Not used	Without holding current reduction
	3	+ or -	
	4	+ or -	
	<b>VAVE-L1-1R8-LR</b>		
	1	Not used	With holding current reduction
3	+ or -		
4	+ or -		
<b>Round plug, M8, 4-pin</b>			
	<b>VAVE-L1-1VR1-LP</b>		
	1	Not used	Without holding current reduction
	2	Not used	
	3	+ or -	
	4	+ or -	
	<b>VAVE-L1-1R1-LR</b>		
	1	Not used	With holding current reduction
	2	Not used	
3	+ or -		
4	+ or -		
<b>Open cable end</b>			
	<b>VAVE-L1-1VK...</b>		
	BK	+ or -	Without holding current reduction
	BK	+ or -	
	<b>VAVE-L1-1K...</b>		
BK	+ or -	With holding current reduction	
BK	+ or -		