

# Solenoid valves CDSV, Clean Design



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Key features

FESTO



## Innovative

Proven valve technology combined with a highly resistant polymer material.

## Versatile

- 1 valve position
- 2 solenoid coils
- Flow rate 300 ... 650 l/min
- Valve width 24 mm
- Connected via 10 m PVC cable

## Reliable

Developed with practical considerations in mind

- Hygienic
- Corrosion resistant
- Easy to clean
- External pilot air
- Ducted venting hole

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## CDSV and CDVI – The requirements



The food industry has higher hygiene requirements than any other sector, which means there is no room for compromises when it comes to ease of cleaning and resistance to corrosion.

The result: CDSV and MPA-C. Developed in close consultation with trendsetters from the food and packaging industry, the CDSV and CDVI represent a totally new valve and valve terminal solution for splash zones. The Clean Design valves have a revolutionary corrosion-resistant design that sets them apart from their competitors and scores them top marks for ease of cleaning.

## CDSV and MPA-C – The solution

### The new Clean Design valves - a clean solution

As well as reduced cleaning times, the CDSV and MPA-C also take less time to install and assemble. Stainless steel control cabinets have become a thing of the past and the electrical connection is now established using the pre-assembled, ready-to-connect cable.

The individual sub-base includes all supply ports and common exhausts.

### Valve terminal MPA-C

The valve terminal MPA-C provides up to 32 valve positions with a maximum of 32 solenoid coils.

Further information  
→ Internet: [mpac](#)

### Clean in theory and practice – CDSV

The requirements for the hygienic design of machine components to DIN EN 1672-2 and DIN ISO 14 159 have been implemented.

Easy to clean thanks to:

- no sharp edges
- no small radii
- no crevices where dirt can gather
- space between the valves for easy cleaning
- corrosion-resistant materials

The Clean Design valve CDSV can be cleaned using sector-specific cleaning agents that are compatible with aluminium, available from the following manufacturers:

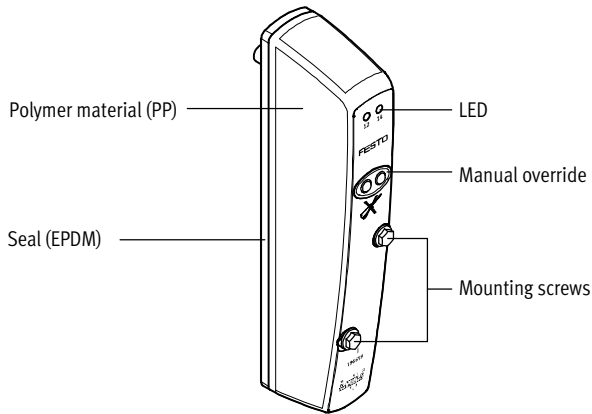
- Henkel
- Ecolab
- Johnson Diversey
- Kärcher

# Solenoid valves CDSV, Clean Design

Key features – Pneumatic components



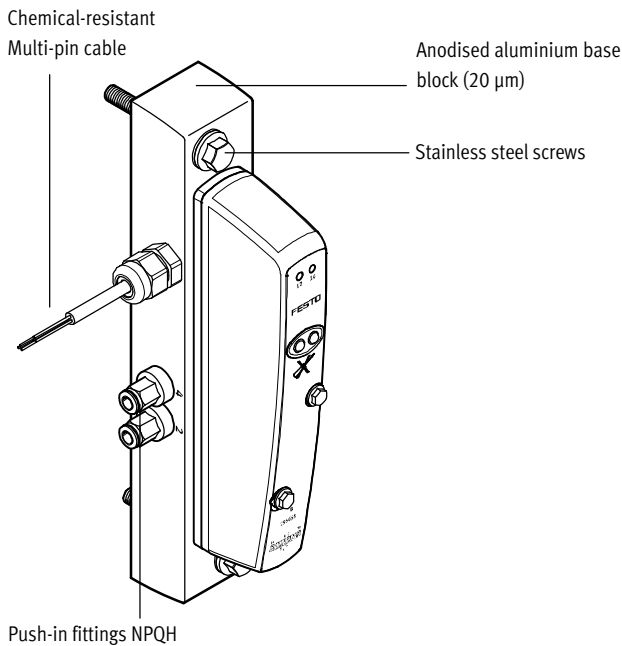
## Range of services



The CDSV supports the following valve types:

- 5/2-way valve, single solenoid
- 5/2-way valve, double solenoid
- 5/3-way valve, mid-position pressurised
- 5/3-way valve, mid-position exhausted
- 5/3-way valve, mid-position closed
- 3/2-way valve, single solenoid, normally closed
- 3/2-way valve, single solenoid, normally open
- 2x 3/2-way valve, single solenoid, normally closed
- 2x 3/2-way valve, single solenoid, normally open
- 2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed
- 2/2-way valve, single solenoid, normally closed
- 2/2-way valve, single solenoid, normally open

## Individual sub-base



The CDSV has a connection for external pilot air supply, is pre-assembled with a 10 m PVC cable and is fully inspected before shipment.

### Mounting

The CDSV can be mounted in any position. However, it should be mounted in such a way that dirt can be cleaned off and cleaning agent can drain off.

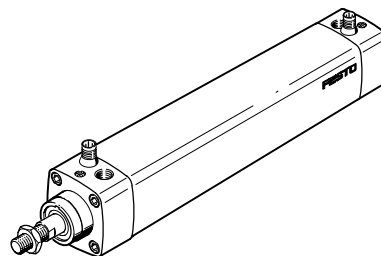
### Pressure compensation

The exhaust air from the pilot solenoid coils of the valves is collected and drawn off via the pressure compensation hole on the right-hand side.

## The ideal range for the food industry

Choose from

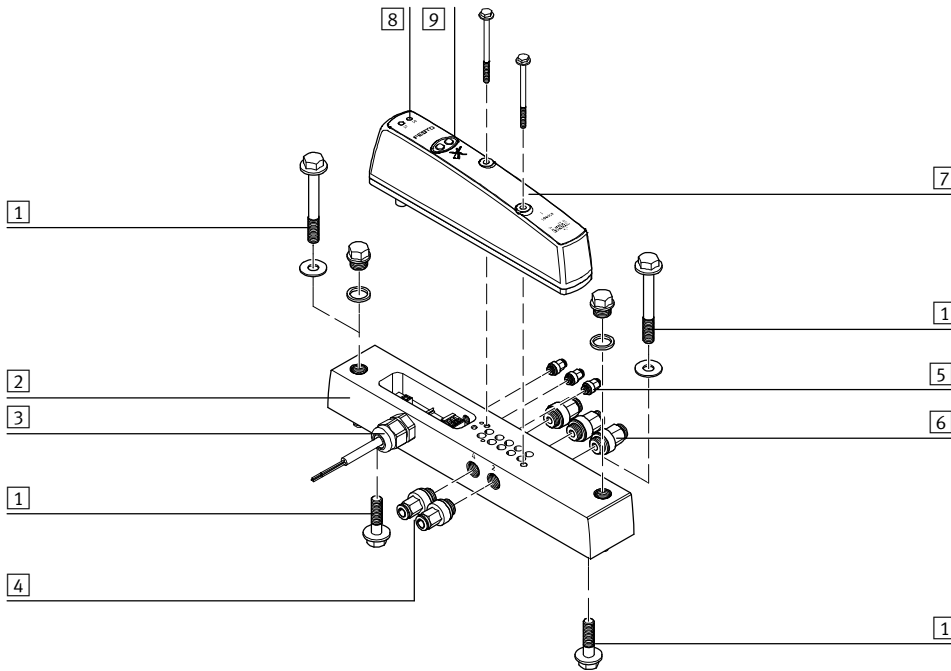
- a wide range of actuators in corrosion-resistant designs that are easy to clean,
  - as well as valves,
  - stainless steel fittings and flow control valves and
  - tubing approved for use in the food industry.
- All have been tested using cleaning agents from leading manufacturers.



# Solenoid valves CDSV, Clean Design

Peripherals overview

## Overview – Individual Clean Design valve




	Brief description	→ Page/Internet	
1	Mounting screw	Mounting from above or below	–
2	Sub-base for individual valve	–	14
3	Individual electrical connection	–	–
4	Push-in fitting	For working ports	15
5	Push-in fitting	For pilot air supply and exhaust, venting hole	15
6	Push-in fitting	For compressed air supply and exhaust	15
7	Valve	–	14
8	LED display	–	–
9	Manual override	For each solenoid coil, non-detenting	–

The individual sub-base CDSV has a connection for external pilot air supply, is pre-assembled with a 10 m PVC cable and is fully inspected

before shipment. The exhaust air from the pilot solenoid coils of the valves is collected and drawn off via the pressure

compensation hole (venting hole) on the rear side.

-  - Note  
All ports and mounting holes that are not required must be sealed with blanking plugs.  
Exception: venting hole

# Solenoid valves CDSV, Clean Design

Key features – Pneumatic components



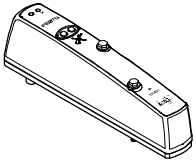
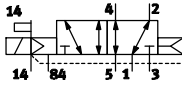
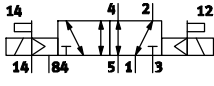
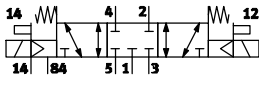
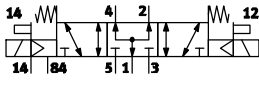
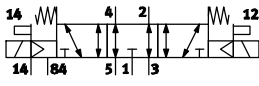
Valves	Code	Circuit symbol	Description
	R		2/2-way valve, single solenoid <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Pneumatic spring return</li> <li>• Suitable for vacuum</li> <li>• External supply air</li> </ul>
	S		2/2-way valve, single solenoid <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Pneumatic spring return</li> <li>• Suitable for vacuum</li> <li>• External supply air</li> </ul>
	X		3/2-way valve, single solenoid <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Pneumatic spring return</li> <li>• Suitable for vacuum</li> <li>• External supply air</li> </ul>
	W		3/2-way valve, single solenoid <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Pneumatic spring return</li> <li>• Suitable for vacuum</li> <li>• External supply air</li> </ul>
	K		2x 3/2-way valve, single solenoid <ul style="list-style-type: none"> <li>• Normally closed</li> <li>• Pneumatic spring return</li> <li>• Not suitable for vacuum</li> </ul>
	N		2x 3/2-way valve, single solenoid <ul style="list-style-type: none"> <li>• Normally open</li> <li>• Pneumatic spring return</li> <li>• Not suitable for vacuum</li> </ul>
	H		2x 3/2-way valve, single solenoid <ul style="list-style-type: none"> <li>• 1x normally closed, 1x normally open</li> <li>• Pneumatic spring return</li> <li>• Not suitable for vacuum</li> </ul>

- Note

A filter must be installed upstream of valves operated in vacuum mode. This prevents any foreign matter in the intake air getting into the valve (e.g. when operating a suction cup).

# Solenoid valves CDSV, Clean Design

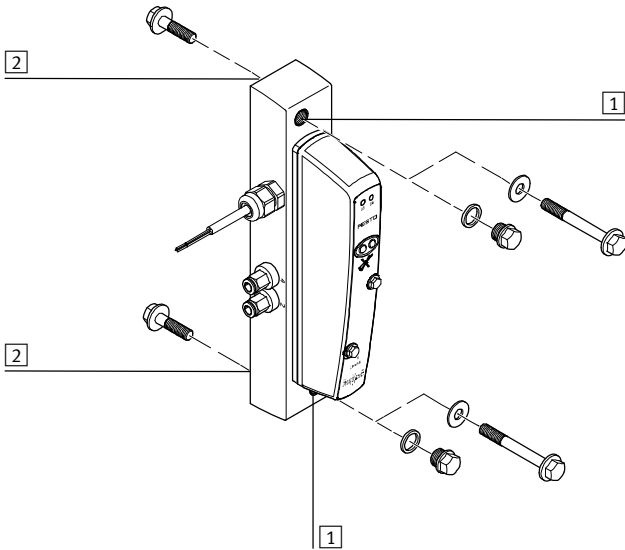
Key features – Pneumatic components

Valves and cover		Code	Circuit symbol	Description
	M		5/2-way valve, single solenoid <ul style="list-style-type: none"> <li>• Pneumatic spring return</li> <li>• Suitable for vacuum</li> </ul>	
	J		5/2-way valve, double solenoid <ul style="list-style-type: none"> <li>• Suitable for vacuum</li> </ul>	
	G		5/3-way valve <ul style="list-style-type: none"> <li>• Mid-position closed</li> <li>• Mechanical spring return</li> <li>• The piston-rod side of a cylinder remains held under pressure when the valve is in the normal position</li> <li>• Suitable for vacuum</li> </ul>	
	B		5/3-way valve <ul style="list-style-type: none"> <li>• Mid-position pressurised</li> <li>• Mechanical spring return</li> <li>• The piston rod of a connected cylinder advances when the valve is in the normal position due to the different surface areas of the piston</li> <li>• Suitable for vacuum</li> </ul>	
	E		5/3-way valve <ul style="list-style-type: none"> <li>• Mid-position exhausted</li> <li>• Mechanical spring return</li> <li>• The piston rod can be moved freely in the normal valve position</li> <li>• Suitable for vacuum</li> </ul>	

# Solenoid valves CDSV, Clean Design

Key features – Pneumatic components

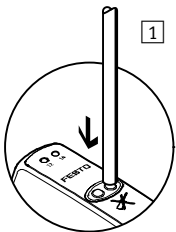
## Assembly



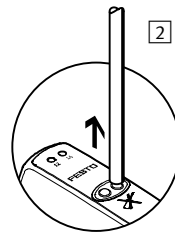
- 1 Hole for front mounting using M6 screws; if not required, the hole can be covered with blanking plug G $\frac{1}{8}$
- 2 Hole for rear mounting using M6 screws

## Manual override (MO)

MO with automatic return (non-detenting)

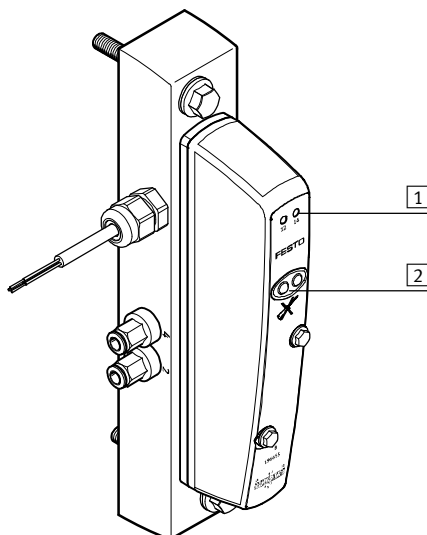


- 1 Press in the stem of the manual override with a pointed object. Valve is in switching position.



- 2 Remove the pointed object. The mechanical force pushes the stem of the manual override back. The valve returns to its normal position (not in the case of 5/2-way double solenoid valve, code J).

## Display and control elements



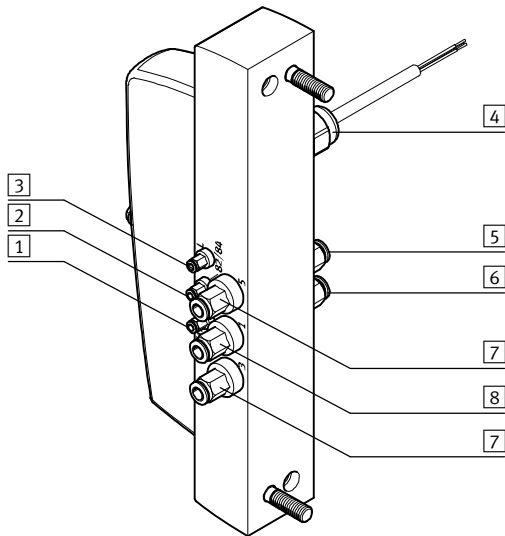
- 1 Yellow LEDs (one per solenoid coil)
- 2 Non-detenting manual override (per solenoid coil)



# Solenoid valves CDSV, Clean Design

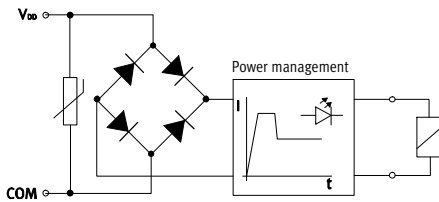
Key features – Pneumatic components

## Connecting components



- 1 Pilot air supply port 12/14
- 2 Pilot exhaust port 82/84
- 3 Pressure compensation port/  
venting hole
- 4 Electrical connection
- 5 Working port 4
- 6 Working port 2
- 7 Exhaust port 3/5
- 8 Supply port 1

## Electrical power as a result of current reduction



Each solenoid coil is protected with a spark arresting protective circuit as well as against polarity reversal. All valve types are also equipped with

integrated current reduction. Advantages:

- Lower power consumption
- Lower temperature rise


## Terminal allocation – Cable for individual sub-base


Wire colour	Allocation
Brown	Solenoid coil 14
Black	Solenoid coil 12 (not on 5/2-way single solenoid valve)
Blue	com <sup>1)</sup>

1) 0 V for positive switching valves; 24 V can be connected for negative switching control signals

# Solenoid valves CDSV, Clean Design

Technical data

-  - Flow rate  
300 ... 650 l/min

-  - Valve width  
24 mm



General technical data														
Valve function code	R	S	X	W	K	N	H	M	J	G	B	E		
Valve function	2/2-way solenoid valve		3/2-way solenoid valve		2x 3/2-way solenoid valve			5/2-way solenoid valve		5/3-way solenoid valve				
Reset method	Pneumatic spring		Pneumatic spring		Pneumatic spring			Pneumatic spring		Mechanical spring				
Direction of flow	Reversible		Reversible		Non-reversible			Reversible		Reversible				
Exhaust function	With flow control		With flow control		No flow control			With flow control		With flow control				
b value	0.34		0.34		0.14			0.38		0.5		0.37		0.5
C value [l/sbar]	2.05		2.05		1.4			2.75		2.55		3.2		1.54
Standard nominal flow rate [l/min]	500	300	500		300			650		650	650		400	
Note on forced checking procedure	Switching frequency at least 1/month													
Design	Piston spool valve													
Type of actuation	Electrical													
Sealing principle	Soft													
Width [mm]	24													
Nominal width [mm]	5													
Tightening torque of valve/ blanking plate [Nm]	0.8													
Mounting position	Any													
Manual override	Non-detenting													
Type of mounting														
Valves	With 2 screws (DIN 6921)													
Individual sub-base	With 2 screws M6x40 (mounting from the front)													
	With 2 screws M6x18 (mounting from the rear)													
Pneumatic connections														
Supply port	1	G $\frac{1}{8}$												
Exhaust port	3/5	G $\frac{1}{8}$												
Working ports	2/4	G $\frac{1}{8}$												
Pilot air supply port	12/14	M5												
Pilot exhaust air port	82/84	M5												
Pressure compensation port	M5													

Valve switching times [ms]													
Valve function code	R	S	X	W	K	N	H	M	J	G	B	E	
Switching times	On	10	10	10	10	10	10	10	12	-	12	12	12
	Off	14	14	14	14	22	22	22	22	-	25	25	25
	Change-over	-	-	-	-	-	-	-	-	10	17	17	17

# Solenoid valves CDSV, Clean Design

Technical data

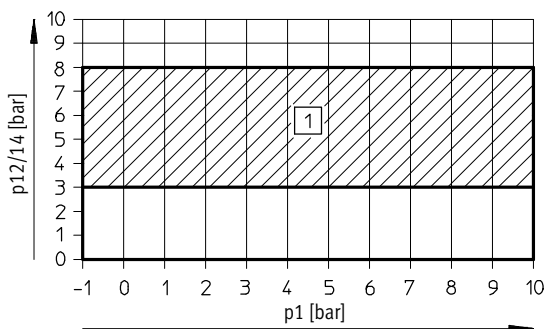
Operating and environmental conditions												
Valve function code	R	S	X	W	K	N	H	M	J	G	B	E
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]											
Note on operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)											
Operating pressure [bar]	-0.9 ... +10				3 ... 10 <sup>1)</sup>				-0.9 ... +10			
Pilot pressure [bar]	3 ... 8											
Ambient temperature [°C]	-5 ... +50											
Temperature of medium [°C]	-5 ... +50											
Corrosion resistance class CRC <sup>2)</sup>	3											
CE marking (see declaration of conformity)	To EU EMC Directive <sup>3)</sup>											
Based on standard	EN 1672-2 (food processing machines, general design principles)											
	ISO 14159 (machine safety – hygiene requirements for machinery design)											
Approval certificate	C-Tick											

- 1) 2x 3/2-way valves are not suitable for vacuum
- 2) Corrosion resistance class 3 according to Festo standard 940 070  
Components subject to high corrosion stress. Externally visible parts with primarily functional surface requirements which are in direct contact with a normal industrial environment or media such as solvents and cleaning agents.
- 3) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com/sp](http://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.

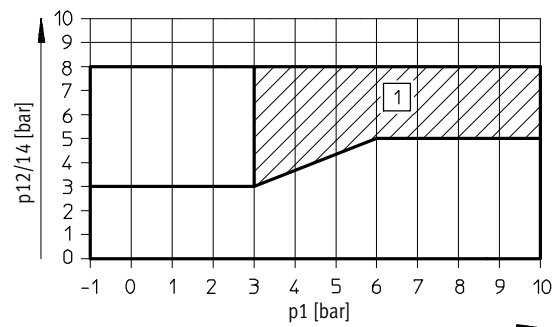
## Pilot pressure with external pilot air supply

Switch-on pilot pressure of 5/2-way and 5/3-way valves and 3/2-way valves with external air supply (EXT)

Switch-on pilot pressure of 3/2-way valves



1 Permissible pressure range



1 Permissible pressure range

# Solenoid valves CDSV, Clean Design

Technical data

Electrical data	
Electromagnetic compatibility	Interference immunity tested to EN 61000-6-2
Nominal operating voltage [V DC]	24, reverse polarity protected
Permissible voltage fluctuations [%]	±10
Residual ripple [Vss]	4
Starting current consumption • Per solenoid coil at 24 V [mA] (with LEDs)	Typ. 120
Current consumption during operation • Per solenoid coil at 24 V [mA] (with LEDs)	Min. 26
Electrical power consumption [W] per solenoid coil (with LED)	3.1
Duty cycle ED	100%
Degree of protection to EN 60529	IP65, IP66, IP67, NEMA 4 (fully assembled)

Materials	
Connection block	Aluminium (anodised, at least 20 µm)
Blanking plug	Polybutylene terephthalate (material no.: 1.4303 or 1.4301)
Screws	Polybutylene terephthalate (material no.: 1.4303 or 1.4301)
Valve	Aluminium, polyacetal (POM), polyphenylene sulphide (PPS), polyamide (PA), nitrile rubber (NBR), brass (Ms), steel (St), polycarbonate (PC), polypropylene (PP)
Note on materials	RoHS compliant

Product weight [g]												
Valve function code	R	S	X	W	K	N	H	M	J	G	B	E
Valve	185	185	185	185	210	210	210	195	205	210	210	210
CDSV individual sub-base <sup>1)</sup>	690											

1) Individual sub-base, without pneumatic fittings and valve.

Nominal flow rate [l/min.]												
Valve function code	R	S	X	W	K	N	H	M	J	G	B	E
Pressurised	500	300	500	500	300	300	300	650	650	650	650	400
Exhausted	500	300	500	500	300	300	300	650	650	650	400	650
Mid-position	–	–	–	–	–	–	–	–	–	–	150	150

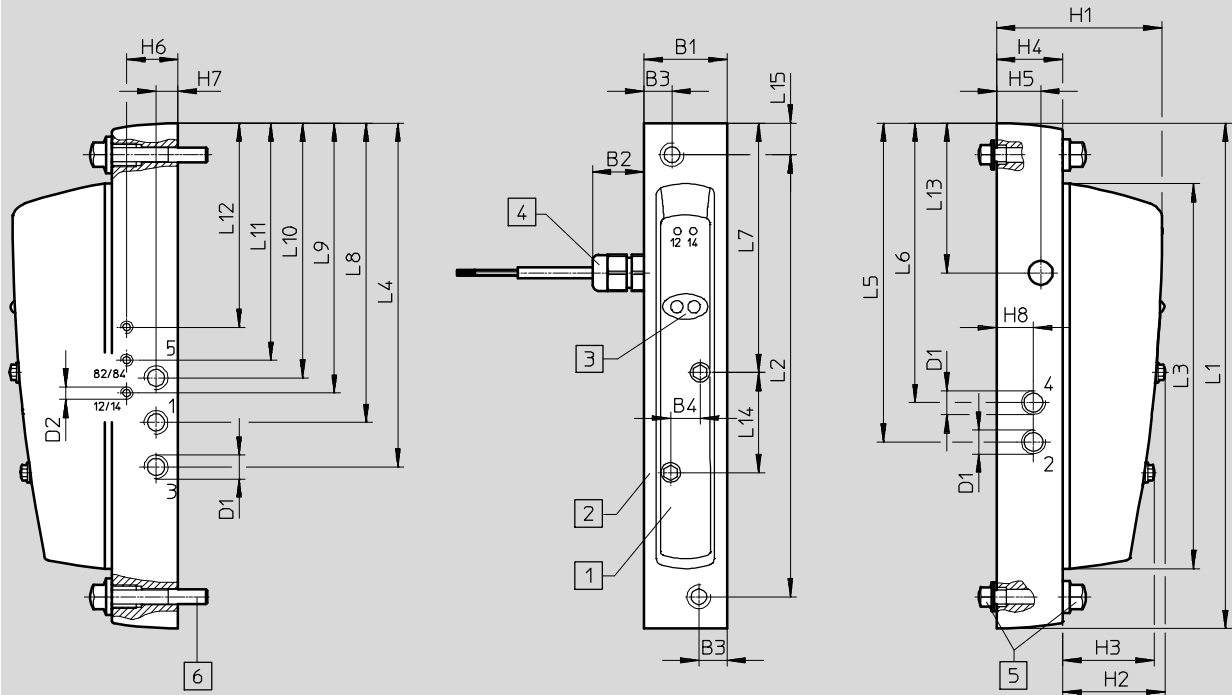
# Solenoid valves CDSV, Clean Design

Technical data

FESTO

## Dimensions

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



- 1 Choice of single solenoid or double solenoid valve
- 2 Sub-base

- 3 Manual override
- 4 Cable connector M20x1.5

- 5 For mounting from below:  
2x screw M6x18  
2x sealing ring M6  
2x blanking plug G $\frac{1}{8}$   
2x sealing ring G $\frac{1}{8}$



- 6 For mounting from above:  
2x screw M6x40  
2x sealing ring M6

Type	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	H6	H7	H8
CDSV	34	21	11.5	12	G $\frac{1}{8}$	M5	67.6	41.9	37.5	27	18	21	9	15

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15
CDSV	207	181	158	140.9	130.6	114.5	102.1	122.6	110.6	104.4	97.1	83.6	61.4	41	13


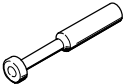


# Solenoid valves CDSV, Clean Design

Accessories

Ordering data				
	Code	Description	Part No.	Type
<b>Individual sub-base valve</b>				
	R	2/2-way valve, single solenoid, normally closed, external supply air	556379	CDVI5.0-MT2H-1X2GLS-EXT
	S	2/2-way valve, single solenoid, normally open, external supply air	556380	CDVI5.0-MT2H-1X2OLS-EXT
	X	3/2-way valve, single solenoid, normally closed, external supply air	547013	CDVI5.0-MT2H-1X3GLS-EXT
	W	3/2-way valve, single solenoid, normally open, external supply air	547014	CDVI5.0-MT2H-1X3OLS-EXT
	C	2x 3/2-way valve, single solenoid, normally closed	196661	CDVI5.0-MT2H-2x3GLS
	N	2x 3/2-way valve, single solenoid, normally open	196663	CDVI5.0-MT2H-2x3OLS
	H	2x 3/2-way valve, single solenoid, 1x normally open, 1 x normally closed	196665	CDVI5.0-MT2H-3OLS-3GLS
	M	5/2-way valve, single solenoid	196657	CDVI5.0-MT2H-5LS
	J	5/2-way valve, double solenoid	196659	CDVI5.0-MT2H-5JS
	G	5/3-way valve, mid-position closed	196651	CDVI5.0-MT2H-5/3GS
	B	5/3-way valve, mid-position pressurised	196655	CDVI5.0-MT2H-5/3BS
	E	5/3-way valve, mid-position exhausted	196653	CDVI5.0-MT2H-5/3ES
<b>Sub-base</b>				
	1	Sub-base, individual connection	534434	CDSV5.0-AS-1/8

# Solenoid valves CDSV, Clean Design

Accessories

Ordering data					
	Code	Description		Part No.	Type
<b>Blanking plug</b>					
	-	Blanking plug	Connecting thread G $\frac{1}{8}$	<b>196720</b>	<b>CDVI-5.0-B-G<math>\frac{1}{8}</math></b>
<b>Plug</b>					
	-	Blanking plug for tubing O.D.	6 mm	<b>153268</b>	<b>QSC-6H</b>
<b>Push-in fittings (10 pieces)</b>					
	-	Straight, connecting thread M5 for tubing O.D. 4 mm		<b>578334</b>	<b>NPQH-D-M5-Q4-P10</b>
	B	Straight, connecting thread G $\frac{1}{8}$ for tubing O.D. 6 mm		<b>578339</b>	<b>NPQH-D-G18-Q6-P10</b>
	A	Straight, connecting thread G $\frac{1}{8}$ for tubing O.D. 8 mm		<b>578340</b>	<b>NPQH-D-G18-Q8-P10</b>
	-	Angled, connecting thread M5 for tubing O.D. 4 mm		<b>578276</b>	<b>NPQH-L-M5-Q4-P10</b>
	D	Angled, connecting thread G $\frac{1}{8}$ for tubing O.D. 6 mm		<b>578281</b>	<b>NPQH-L-G18-Q6-P10</b>
	C	Angled, connecting thread G $\frac{1}{8}$ for tubing O.D. 8 mm		<b>578282</b>	<b>NPQH-L-G18-Q8-P10</b>