

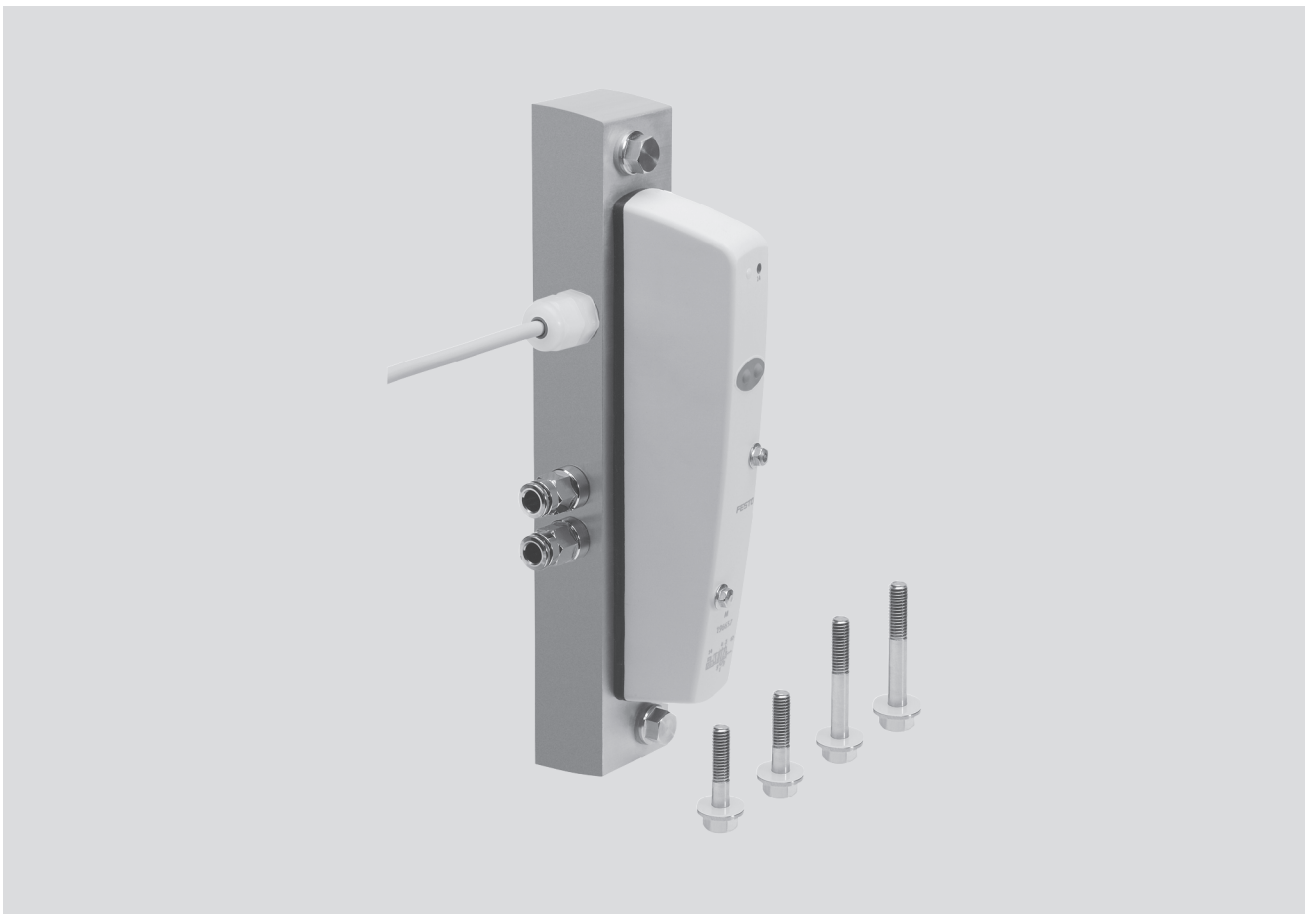
Solenoid valves CDSV, Clean Design



Solenoid valves CDSV, Clean Design

Key features

FESTO



Innovative

- Proven valve technology combined with a highly resistant polymer material
- The valves are identical with the valves in the valve terminal CDVI. This simplifies planning, ordering and warehousing

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

Easy to mount

- As is the case with all Festo products, all CDVI and CDSV are fully pre-assembled and equipped according to customer requirements
- With QS...-F fittings on the working lines and end plates
 - Tested for electrical and pneumatic function

Solenoid valves CDSV, Clean Design

Key features

FESTO

CDSV and CDVI – The requirements



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

Festo's answer is the CDSV and CDVI. Developed in close consultation with leading names from the food and packaging industry, the CDSV and CDVI represent a totally new valve and valve terminal solution for splash zones. 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 CDVI – The solution

The new Clean Design valves – a clean solution

Apart from reduced cleaning times, the CDSV and CDVI 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-fitted, ready-to-connect cable. The CDSV is, of course, supplied ex works fully assembled and tested to IP65 and IP67.

This results in minimal installation time. The various equipment options

can be found in the tables in the ordering system section on page → 15. The individual sub-base includes all supply ports and common exhausts.

Valve terminal CDVI

The valve terminal CDVI is available with four or eight valve positions in the basic design and can be expanded by up to four valve positions.

Expansion blocks must be used for this.

More information

→ Internet: cdvi

Clean in theory and practice – the CDSV

The requirements for the hygienic design of machine components to DIN EN 1672-2 and DIN ISO 14159 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 CDSV Clean Design valve can be cleaned using special cleaning agents that are compatible with aluminium, available from the following manufacturers:

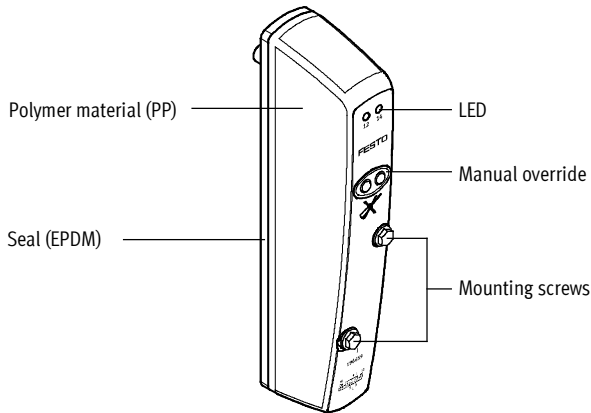
- Henkel
- Ecolab
- Johnson Diversey
- Kärcher

Solenoid valves CDSV, Clean Design

Key features – Pneumatic components



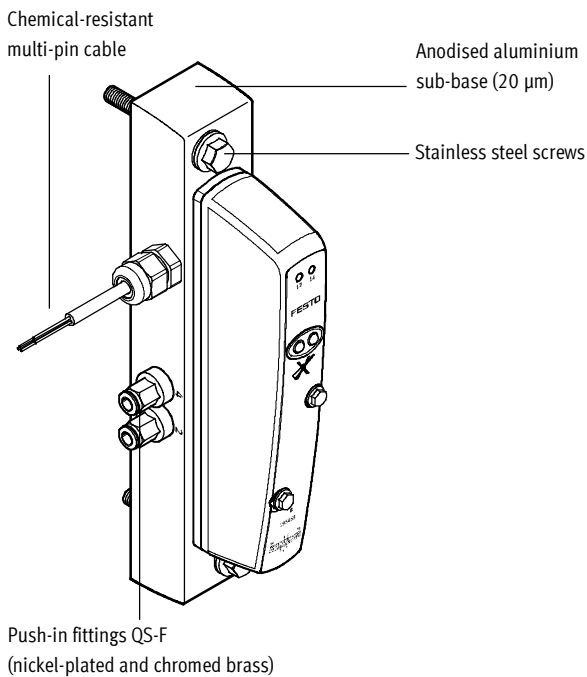
The features



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



All CDSV valves can be assembled on an individual sub-base CDSV. The CDSV has a connection for external pilot air supply, is pre-assembled with a valve and a 10 m PVC cable and is fully inspected before shipment. Pre-assembled push-in fittings will be included on request.

Mounting

A Clean Design mounting set comprising two screws and blanking plugs (blanking plugs already fitted in the drawing) permits mounting from the front or from the rear.

The CDSV can be mounted in any position. However, the selected mounting position should allow for the cleaning off of dirt and the draining of cleaning agent.

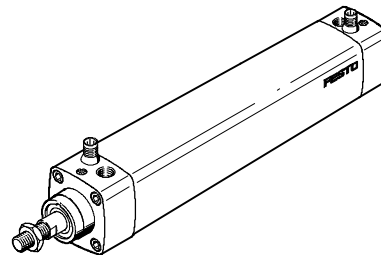
Pressure compensation

The collected exhaust air from the pilot solenoid coils of the valves is drawn off via the pressure compensation hole on the right-hand side. If you have included fittings with your order, the pressure compensation hole is also equipped with a QS fitting.

The ideal range for the food industry

Choose from

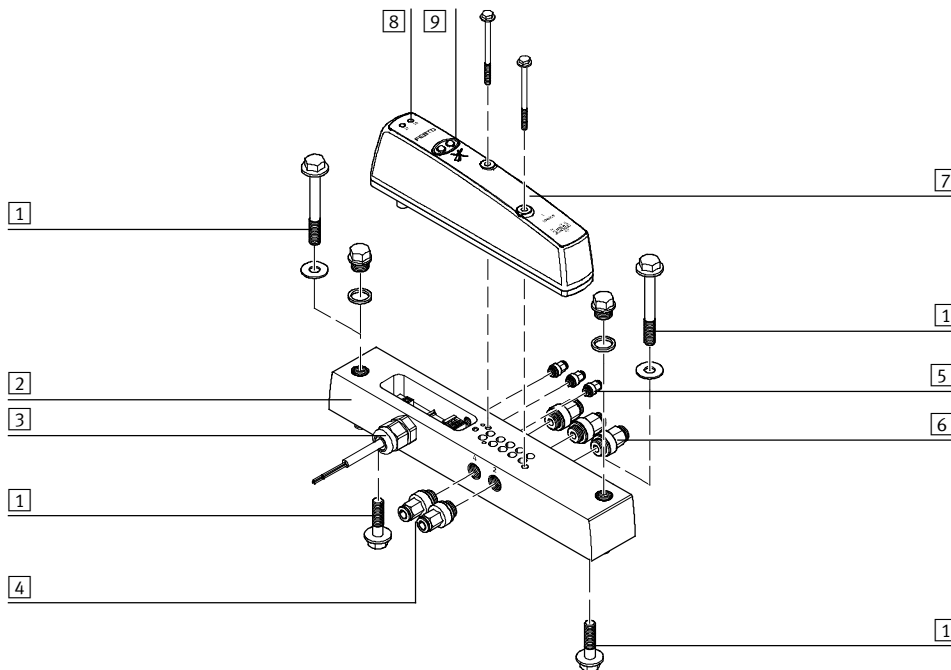
- a wide range of actuators in corrosion-resistant designs that are easy to clean,
 - as well as valves,
 - stainless steel fittings and flow control valves and
 - tubing approved for use in the food industry.
- All have been tested using cleaning agents from leading manufacturers.



Solenoid valves CDSV, Clean Design

Peripherals overview

Overview – Individual clean design valve




	Brief description	→ Page/Internet	
1	Mounting kit	Mounting from above or below	17
2	Sub-base for individual valve	–	16
3	Individual electrical connection	–	–
4	Push-in fitting	For working lines	17
5	Push-in fitting	For pilot air supply and venting, venting hole	17
6	Push-in fitting	For compressed air supply and venting	17
7	Valve	–	16
8	LED display	–	–
9	Manual override	For each solenoid coil, non-detenting	–

All valves on the valve terminal CDVI can be mounted on the individual sub-base CDSV. The individual sub-base CDSV has a connection for external pilot air supply, is pre-assembled with a valve and a 10 m PVC cable and is fully inspected

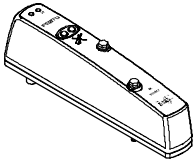
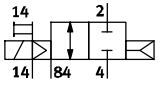
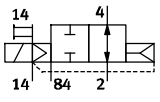
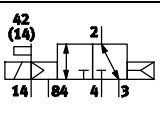
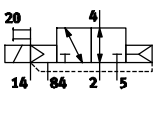
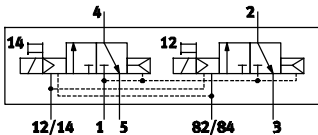
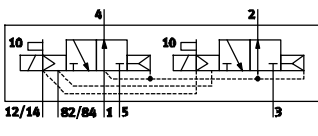
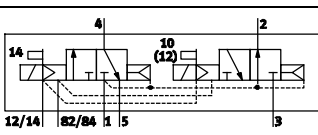
before shipment. Assembled push-in fittings included on request. A Clean Design mounting kit comprising two screws (18 mm and 40 mm) and two stainless steel blanking plugs permits mounting from above or below. If you have included fittings with your order,

the pressure compensation hole is also equipped with a QS fitting. The collected exhaust air from the pilot solenoid coils of the valves is 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 a blanking plug. Exception: venting hole

Solenoid valves CDSV, Clean Design

Key features – Pneumatic components

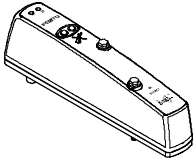
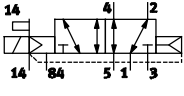
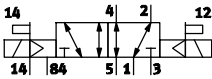
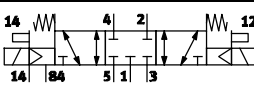
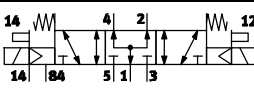
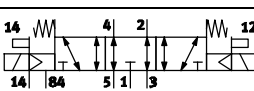
Valves			
	Code	Circuit symbol	Description
	R		2/2-way valve, single solenoid <ul style="list-style-type: none"> • Normally closed • Pneumatic spring return • Suitable for vacuum • External supply air
	S		2/2-way valve, single solenoid <ul style="list-style-type: none"> • Normally open • Pneumatic spring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

 - 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

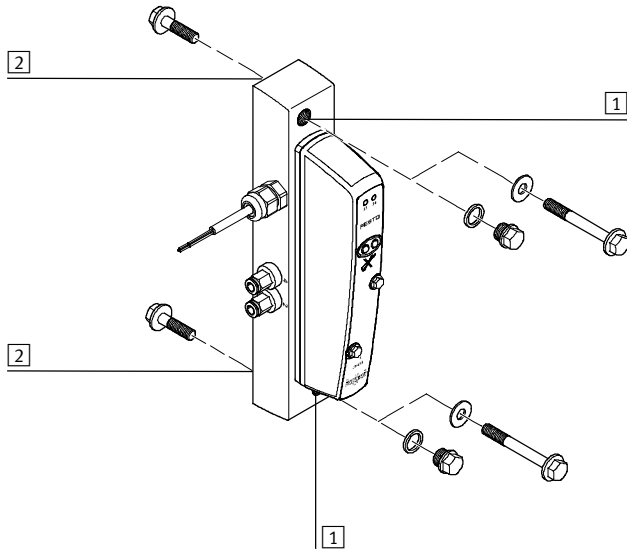
Valves and cover			
	Code	Circuit symbol	Description
	M		5/2-way valve, single solenoid <ul style="list-style-type: none"> • Pneumatic spring return • Suitable for vacuum
	J		5/2-way valve, double solenoid <ul style="list-style-type: none"> • Suitable for vacuum
	G		5/3-way valve <ul style="list-style-type: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

Solenoid valves CDSV, Clean Design

Key features – Pneumatic components

Mounting

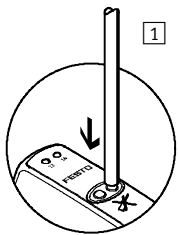
Individual sub-base



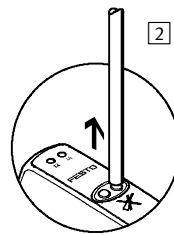
- 1 Hole for front mounting (CDSV) using M6 screws; if not required, the hole can be covered with blanking plug G $\frac{1}{8}$
- 2 Hole for rear mounting (CDSV) using M6 screws

Manual override (MO)

MO with automatic reset (non-detenting)



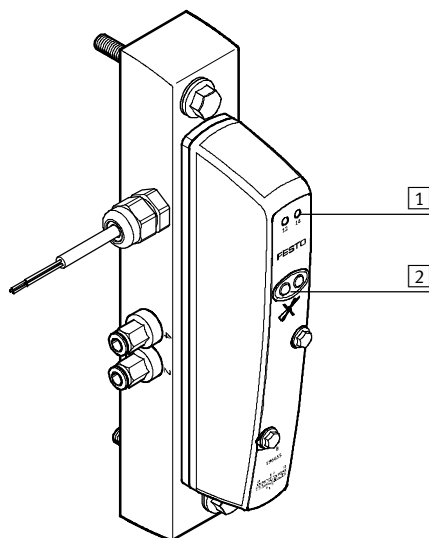
- 1 Press in the stem of the manual override with a pointed object. The valve is then actuated.



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

Display and control elements

Individual sub-base



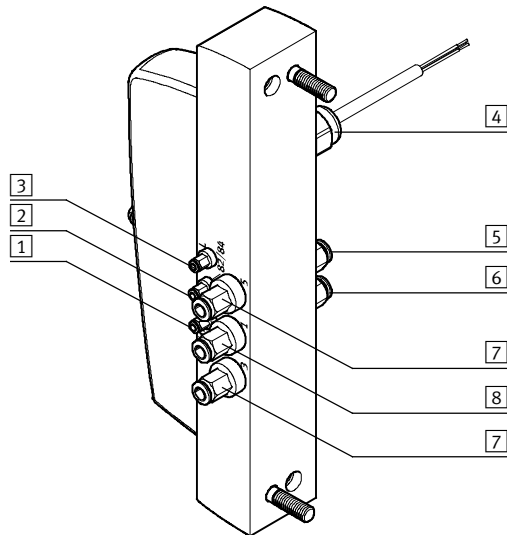
- 1 Yellow LEDs (one per solenoid coil)
- 2 Non-detenting manual override (per solenoid coil)

Solenoid valves CDSV, Clean Design

Key features – Pneumatic components

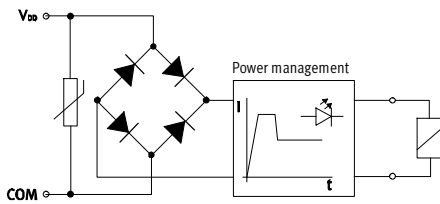
Connecting components

Individual sub-base



- 1 Pilot air supply port 12/14
- 2 Pilot exhaust port 82/84
- 3 Pressure compensation port/venting hole
- 4 Electrical connection
- 5 Working line 4
- 6 Working line 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. Benefits:

- Lower power consumption.
- Lower temperature rise.


Terminal allocation – Cable for individual sub-base CDSV

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

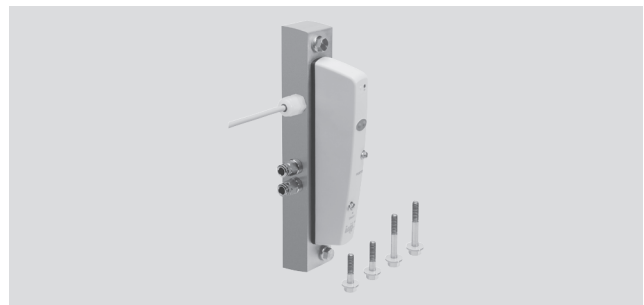
1) 0 V for positive switching valves; 24 V can be connected for negative switching control signals

Solenoid valves CDSV, Clean Design

Technical data

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

-  - Valve width
24 mm



General technical data														
Valve function order 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		400	
Design	Piston spool valve													
Actuation type	Electric													
Sealing principle	Soft													
Width [mm]	24													
Nominal size [mm]	5													
Tightening torque of valve/blanking plate [Nm]	0.8													
Mounting position	Any													
Manual override	Non-detenting													
Max. no of valve positions	16 (max. 24 solenoid coils)													
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	1		G $\frac{3}{8}$											
Exhaust	3/5		G $\frac{3}{8}$											
Working lines	2/4		G $\frac{3}{8}$											
Pilot air supply	12/14		M5											
Pilot exhaust air	82/84		M5											
Pressure compensation	M5													

Valve switching times [ms]													
Valve function order 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

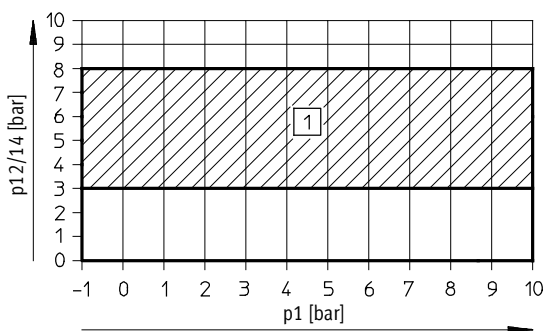
Technical data

Operating and environmental conditions												
Valve function order 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 about the operating/pilot medium	Lubricated operation possible (required during subsequent operation)											
Operating pressure [bar]	-0.9 ... +10				3 ... 10 ¹⁾				-0.9 ... +10			
Operating pressure for valve terminal with internal pilot air supply [bar]	3 ... 8 (not available on the CDSV)											
Pilot pressure [bar]	3 ... 8											
Ambient temperature [°C]	-5 ... +50											
Temperature of medium [°C]	-5 ... +50											
Corrosion resistance class CRC ²⁾	3											
CE marking (see declaration of conformity)	To EU EMC Directive ³⁾											
Based on standard	EN 1672-2 (food processing machines, general design principles)											
	ISO 14159 (machine safety – hygiene requirements for machinery design)											
Certification	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. External visible parts in direct contact with industrial atmospheres or media such as solvents and cleaning agents, with a predominantly functional requirement for the surface.
- 3) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com → Support → 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.

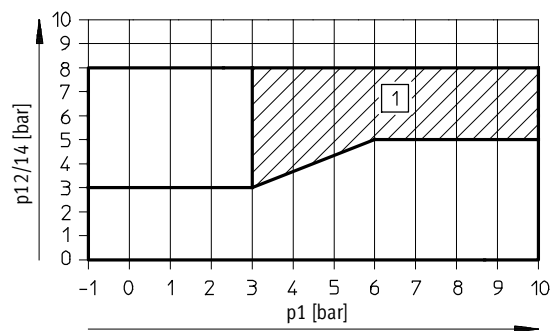
Pilot pressure with external pilot air supply

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



1 Permissible pressure range

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



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
Switch-on 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	100%
Protection class 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 order 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 ¹⁾	690											

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

Nominal flow rate [l/min]												
Valve function order 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

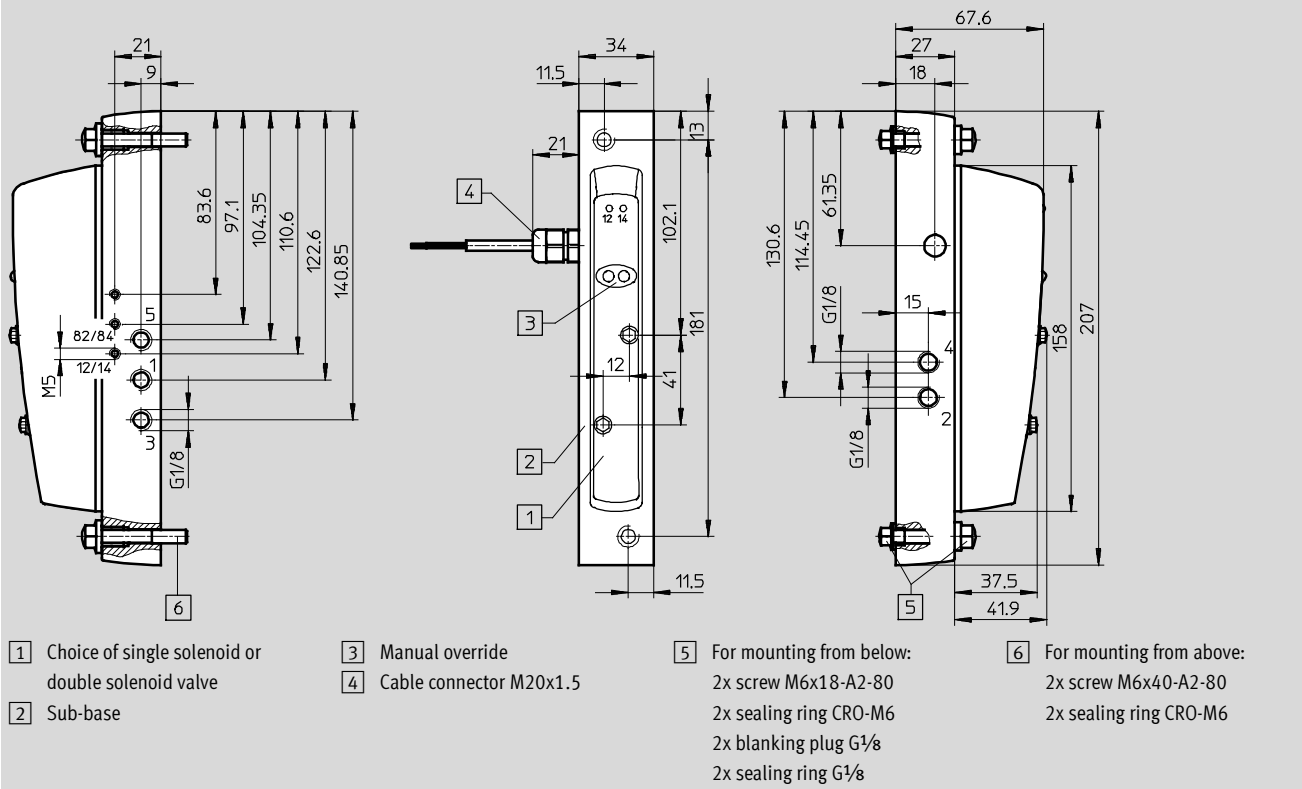
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

Individual sub-base



Solenoid valves CDSV, Clean Design

Ordering system

Ordering system information

The solenoid valves CDSV can be processed via an ident. code. This ident. code specifies the valve functions and the type of compressed air supply.

As is the case with all Festo products, the CDVI and CDSV are:

- fully pre-assembled
- fitted with QS...-F fittings on the working lines and end plates on request

- tested for electrical function
- tested for pneumatic function and
- supplied safely packaged

Notes on the order code and ordering procedure

Individual sub-base

The individual sub-base can be ordered either via the ident. code or via individual part numbers.

Order example:
15P-K10-1B-XR-M-B+Z
Ident. codes in bold print do not permit alternative selections.

Fittings

The basic CDSV price includes the following:

- The straight QS-F-G $\frac{1}{8}$ fittings on the working lines for the best possible flow rate

- The matching straight QS-F-G $\frac{1}{8}$ fittings for air supply and main exhaust.

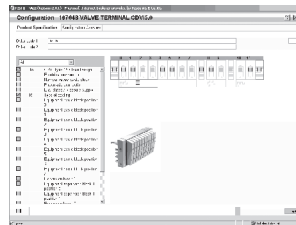
These sets of fittings are assembled before the CDSV leaves the factory.

Valve terminal configurator

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

The valves and valve terminals are equipped and assembled according to customer requirements. This results in minimal installation time. They are also fully inspected before shipment.

Online via: → www.festo.com



Solenoid valves CDSV, Clean Design

Ordering data – Modular products

M Mandatory data →

Module No.	Valve terminal, pneumatic part	Electrical connection	No. of valves on the basic block	Pneumatic connection	End plates/pneumatic supply	Type of seal
197648	15P	K10	1	B, G	X	R
Ordering example						
197648	15P	- K10	- 1	B	- X	R
1	2	3	4	5	6	7

→ **M Mandatory data**

Basic block equipment

M, J, G, E, B, K, N, H, A

Valve position
0

- **M**

8

O Options

Accessories

Z

+ _____

9

Ordering table

		Condi- tions	Code	Enter code
M 1	Module No.		197648	
2	Valve terminal, pneumatic part	Valve terminal type 15, CDVI, Clean Design	15P	15P
3	Electrical connection	Multi-pin plug, 10 m cable	-K10	-K10
4	No. of valves on the basic block	1	-1	-1
5	Pneumatic connection	Straight push-in connectors, QS-6 Thread Gx, without fitting	B G	
6	End plates/pneumatic supply	Supply at right, external pilot air	-X	-X
7	Type of seal	Resistant to cleaning agents	R	R
8	Basic block equipment	Valve position 0	-	-
	Valve functions	5/2-way valve, single solenoid	M	
		5/2-way valve, double solenoid	J	
		5/3-way valve, mid-position closed	G	
		5/3-way valve, mid-position exhausted	E	
		5/3-way valve, mid-position pressurised	B	
		3/2-way valve, normally closed, external supply air	X	
		3/2-way valve, normally open, external supply air	W	
		2/2-way valve, normally closed, external supply air	R	
		2/2-way valve, normally open, external supply air	S	
		2x 3/2-way valve, normally closed	K	
		2x 3/2-way valve, normally open	N	
		2x 3/2-way valve, 1x normally open, 1x closed	H	
		Vacant position for two solenoid coils	A	
O 9	Accessories		+	+
	Pneumatic accessories	Mounting set for individual valve CDSV	Z	

Transfer order code

197648	15P	- K10	- 1		- X	R
1	2	3	4	5	6	7

Valve position 0

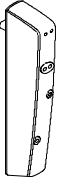
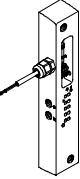
- _____ + _____

8 9

Solenoid valves CDSV, Clean Design

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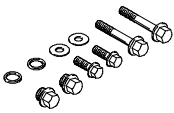

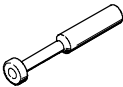

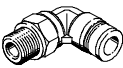
Accessories

Ordering data				
	Code	Description	Part No.	Type
Individual sub-base valve				
	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
	K	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, 1x 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
Sub-base				
	1	Sub-base, individual connection	534434	CDSV5.0-AS-1/8

Solenoid valves CDSV, Clean Design

Accessories

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Ordering data				
	Code	Description	Part No.	Type
Mounting attachments				
	-	Mounting kit	534436	CDSV5.0
Blanking plug				
	-	Blanking plug	Gx for end plates	196720 CDVI-5.0-B-G $\frac{1}{8}$
Plug				
	-	Blanking plug for tubing O.D.	6 mm	153268 QSC-6H
Push-in fittings (10 pieces)				
	-	Straight, connecting thread M5 for tubing O.D. 4 mm	533844	QS-F-M5-4
	B	Straight, connecting thread G $\frac{1}{8}$ for tubing O.D. 6 mm	193409	QS-F-G $\frac{1}{8}$ -6
	A	Straight, connecting thread G $\frac{1}{8}$ for tubing O.D. 8 mm	193410	QS-F-G $\frac{1}{8}$ -8
	-	Angled, connecting thread M5 for tubing O.D. 4 mm	533849	QSL-F-M5-4
	D	Angled, connecting thread Gx for tubing O.D. 6 mm	193419	QSL-F-G $\frac{1}{8}$ -6
	C	Angled, connecting thread Gx for tubing O.D. 8 mm	193420	QSL-F-G $\frac{1}{8}$ -8