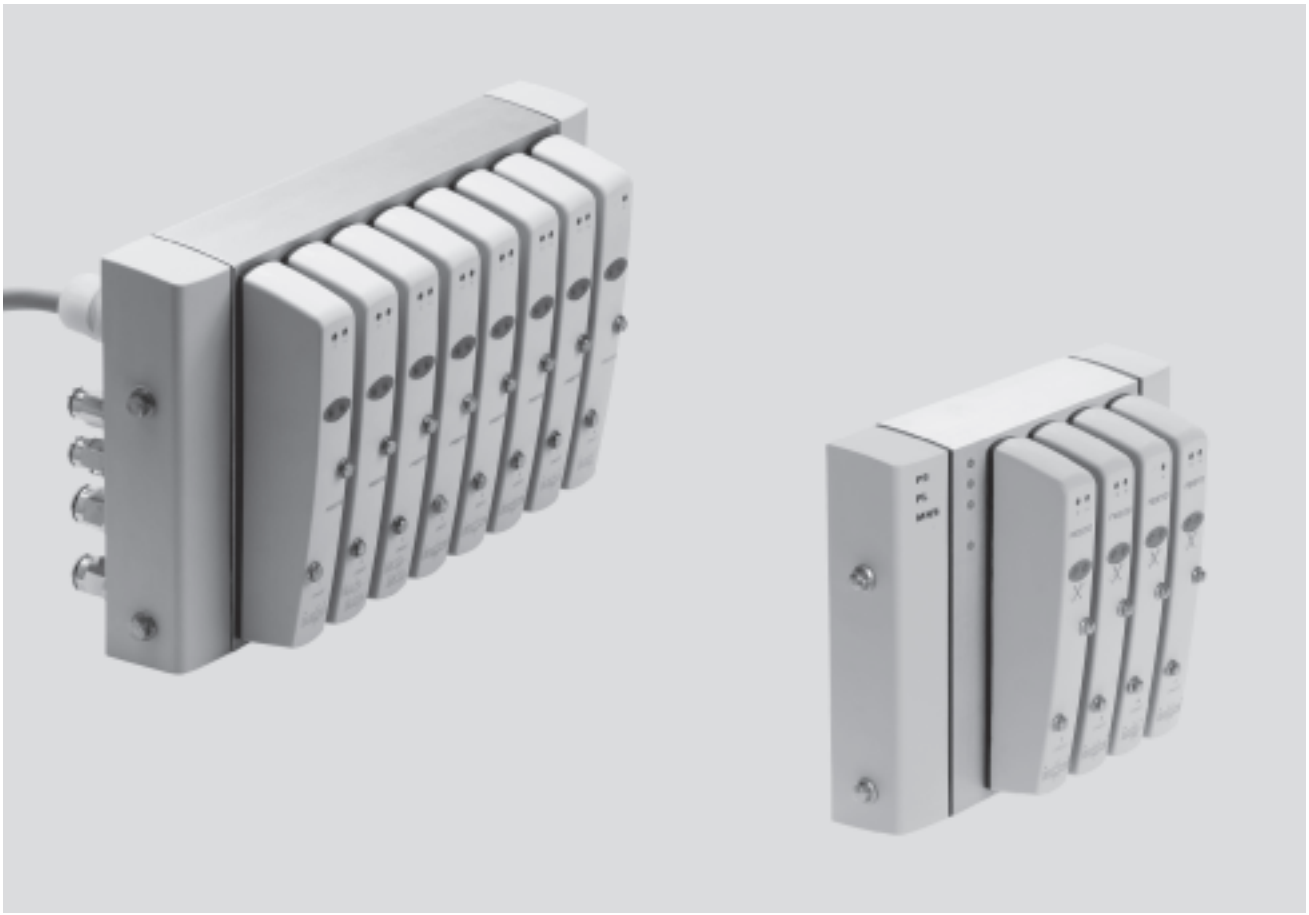
Valve terminal type 15 CDVI, Clean Design

FESTO

Valve terminal type 15 CDVI, Clean Design

Key features



The Clean Design valve terminal CDVI

The CDVI combines proven valve technology with a highly resistant polymer material.
The 5/2-way valve, 5/2-way valve, double solenoid, 5/3-way valve, 2 x 3/2-way valves, 3/2-way valves and the modular construction of the 1-valve, 4-valve and 8-valve basic block as well as the 2-valve expansion blocks, together with the multi-pin plug and fieldbus connection, ensure that the needs of the food industry are met.

Modularity
- 1, 4 ... 12 valve positions
- 2, 8 ... 24 solenoid coils
- Standardised from the individual valve up to multi-pin plug and fieldbus connections

Developed with practical considerations in mind
- Hygienic
- Resistant to corrosion
- Easy to clean

Multi-functional, variable, modular:
- Flow rates from 300 ... 650 l/min
- Valve width 18 mm
- 1 ...3 pressure zones

Easy to mount
As is the case with all Festo products, the 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 function
- tested for pneumatic function

Electrical connection options

Multi-pin plug
- 4 ... 12 valve positions/ max. 24 solenoid coils
- Detergent-resistant PVC cable already assembled
- Cable length 5 m or 10 m

Fieldbus
- 4 ... 12 valve positions/ max. 24 solenoid coils
- Easy-to-clean electrical connections at the rear

CP string extension
- Further valve terminals from the CPV/CPA range
- Or electrical I/O modules

Valve terminal type 15 CDVI, Clean Design

Key features

CDVI – The requirements

The food industry has stricter hygiene requirements than any other sector. There can therefore be no compromise when it comes to easy cleaning and corrosion resistance.

The end product: the CDVI.
Developed in close consultation with leading names from the food and packaging industry, the CDVI represents a totally new valve terminal solution for splash zones. The Clean Design valve terminal CDVI has a revolutionary corrosion resistant and easy to clean design that makes it stand out from its competitors.

CDVI – The solution

The new Clean Design valve terminal CDVI – Simply a clean solution

Apart from reduced cleaning times, the CDVI also takes less time to install and assemble. Stainless steel control cabinets have become a thing of the past and the electrical connection is now set up using the pre-fitted, ready to connect cable. The valve terminal is, of course, supplied ex works fully assembled and tested to IP65 and IP67.
This results in minimal installation time.
The valve terminal includes common supply ports and exhausts for all valves. The common lines are connected to the end plates.
The CDVI is available with four or eight valve positions in the basic design and can be expanded by up to four valve positions using groups of two valves.
Expansion blocks must be used in this case.

Individual sub-base

An individual sub-base for Clean Design valves (Clean Design Single Valve – CDSV) rounds off the lower end of the product range so that even upstream machines and system components can be incorporated into the Clean Design concept.

Clean in theory and practice – The CDVI

The requirements for the hygienic design of machine components to DIN EN 1672-2 and DIN ISO 14 159 have been implemented in the CDVI. They are 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 CDVI can be cleaned using special cleaning agents from the following manufacturers:

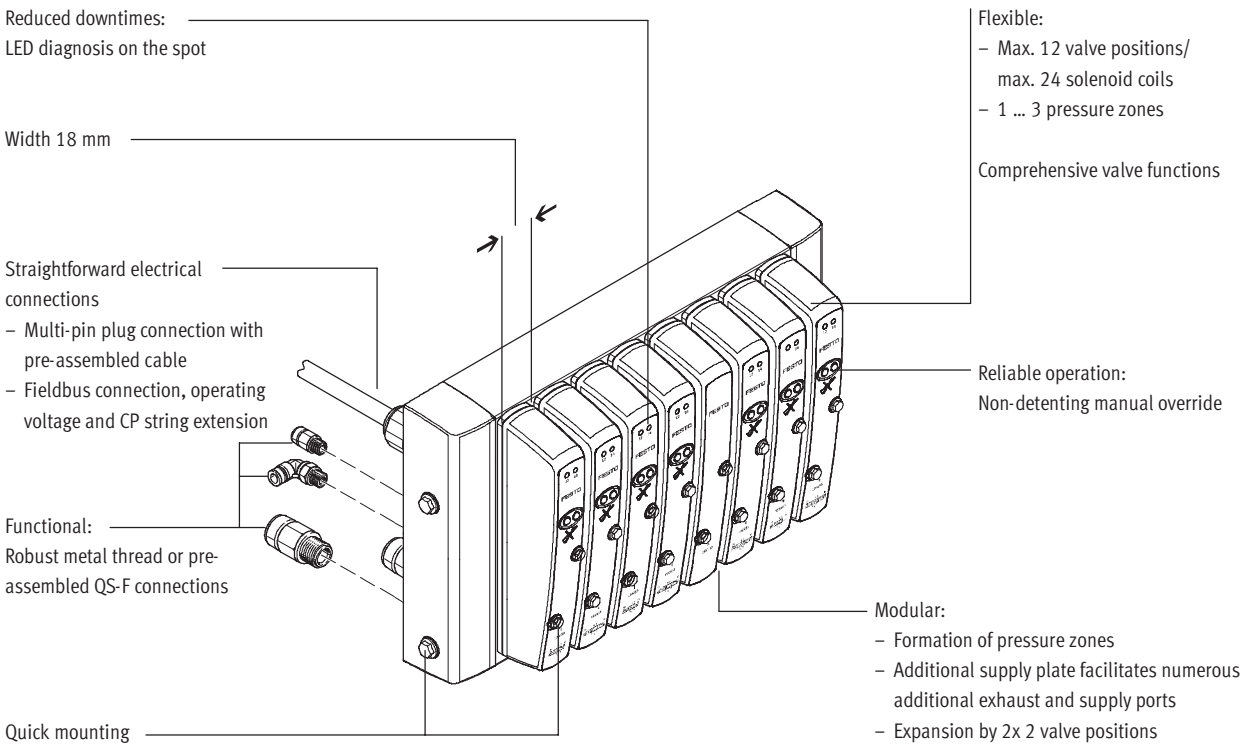
- Henkel
- Ecolab
- Johnson Diversy
- Kärcher

Certified cleanliness

The CDVI has certification to HACCP.

Valve terminal type 15 CDVI, Clean Design

Key features



Equipment options

Valve functions

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

Special features

Individual valve
- Electrical connection via multi-pin cable

Fieldbus terminal
- Max. 12 valve positions/ max. 24 solenoid coils
- Compressed air supply via both end plates as well as additional compressed air supply possible
- 1...3 pressure zones

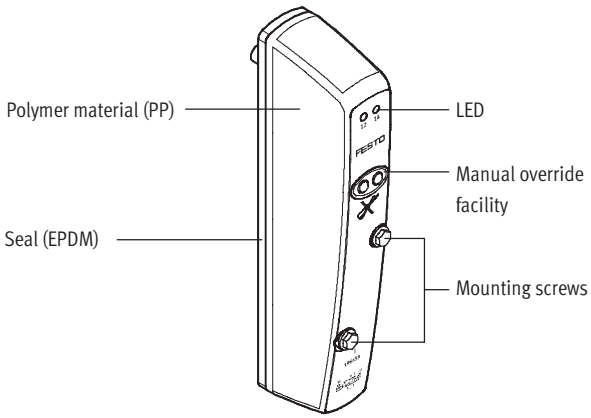
Multi-pin terminal
- Max. 12 valve positions/ max. 24 solenoid coils
- Compressed air supply via both end plates as well as additional compressed air supply possible
- 1.....3 pressure zones

CP string extension
- Further valve terminals from the CPV/CPA range
- Or electrical I/O modules

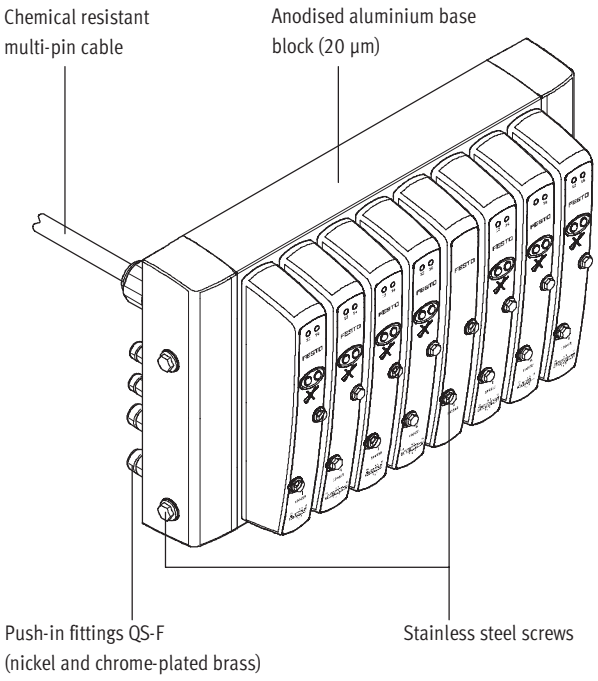
Valve terminal type 15 CDVI, Clean Design

Key features – Pneumatic components

The features



The ideal range for the food industry



Choose from

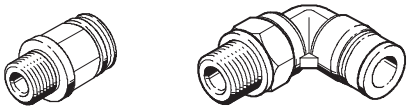
- a wide range comprising actuators to accessories in corrosion resistant designs that are easy to clean,
- as well as valves,
- stainless steel fittings and flow control valves and
- tubing approved for use in the food industry.

All have been tested using cleaning agents from leading manufacturers.

The accessories

Tubing PLN

Push-in fitting QS-F/QSL-F-...



You should only use accessories that have been approved by Festo. This is the only way of ensuring optimum performance from the CDVI in the following areas:

- Resilience
- Corrosion resistance
- Easy cleaning

Valve terminal type 15 CDVI, Clean Design

Key features

Valve terminal configurator **Online via:** ➔ www.festo.com

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

The valve terminals are fully assembled according to your order specifications and individually tested. This reduces the amount of assembly and installation required to a minimum.
You order a valve terminal type 15 using the order code.

Ordering system for type 15
➔ Internet: type 15

The illustration above provides an example of a valve terminal configuration.
The following describes how you arrive at the order code:

Once you have called up ➔ www.festo.com, select the online version of the digital product catalogue from the “Products” submenu. Activate the “Direct Search” menu.

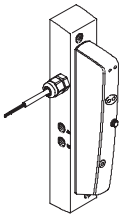
Here you can specify a “Part no.” (e.g. 197648), “Type” (e.g. CDVI) or “Article designation” (e.g. valve terminal) to find your “Search result”. Click on the blue shopping basket to complete the selected product according to your specifications (this does not initiate an order).

You will then be prompted to configure the product.
Select “Configurator”.
You can then configure the valve terminal step by step (from the top down) according to your requirements.
Select the “Finish” menu to go to your shopping basket.

Valve terminal type 15 CDVI, Clean Design

Key features

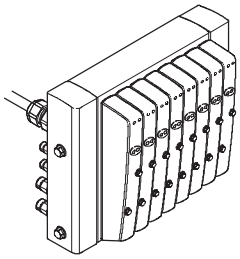
Individual connection



Valves can also be used on individual sub-bases for actuators further away from the valve terminal.

The electrical connection is established via a multi-pin cable.

Multi-pin plug connection



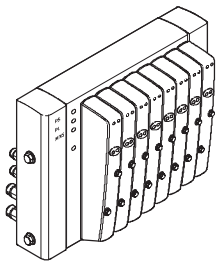
Control signals from the controller to the valve terminal are transmitted via a pre-assembled multi-core cable or a self-assembly multi-pin plug connection, which substantially reduces installation time.

This valve terminal can be equipped with 4 to 12 valve positions and 4 to 24 solenoid coils.

Variants

- Pre-assembled multi-pin cable with open wire ends

Fieldbus connection



An integrated fieldbus node manages the communication connection to a higher-order PLC. This enables a space-saving pneumatic and electronic solution.

Valve terminals with fieldbus interfaces can be configured with up to 12 valve positions. This means that up to 24 solenoid coils can be equipped.

Variants

- DeviceNet connection 2x M12
- Ethernet Powerlink on request

Valve terminal type 15 CDVI, Clean Design

Key features

CP string extension

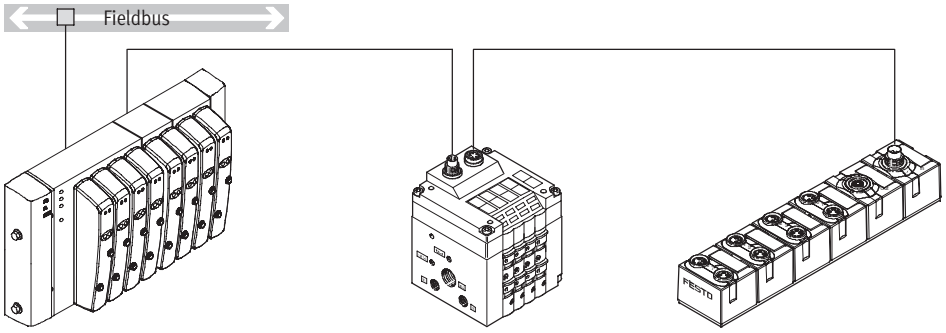
The optional string extension allows an additional valve terminal and I/O modules to be connected to Fieldbus Direct. A CP string of the CPI installation system is integrated in the fieldbus node as an extension. Different input and output modules as well as CPV and CPA valve terminals can be connected.

The maximum length of the CP string extension is 10 metres, which means that the expansion blocks can be mounted directly on-site. All of the required electrical signals are transmitted via the CP cable, which in turn means that no further installation is needed on the expansion block.

The CP string interface offers:

- 16 input signals
- 16 output signals for output modules 24 V DC or solenoid coils
- Logic and sensor supply for the input modules
- Load voltage supply for the valve terminals
- Logic supply for the output module

→ Internet: cpi



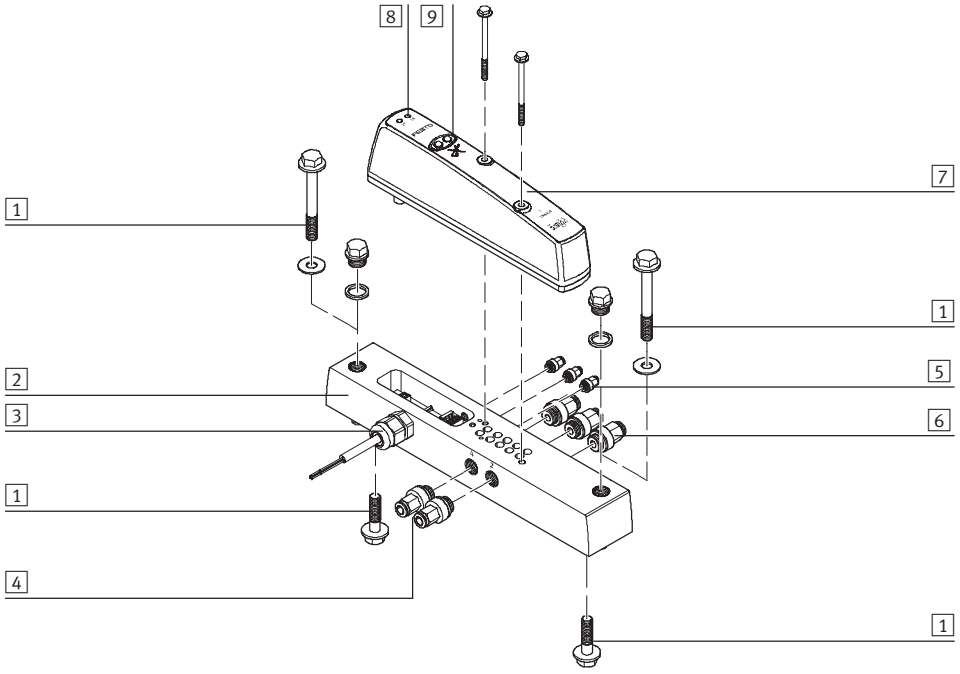
CDVI-DN valve terminals with fieldbus interfaces can be equipped with 4, 6, 8 or 12 valve positions and 4 to 24 solenoid coils.

Valve terminal type 15 CDVI, Clean Design

Peripherals overview

Overview – Clean Design valve terminal

Individual sub-base



	Brief description	➔ Page/Internet
1 Mounting kit	Mounting from above or below	36
2 Sub-base for individual valve	–	34
3 Individual electrical connection	–	–
4 Push-in fitting	For working ports	36
5 Push-in fitting	For pilot air supply and venting, venting hole	quick star
6 Push-in fitting	For compressed air supply and venting	36
7 Valve	–	34
8 LED display	–	–
9 Manual override	For each solenoid coil, operated by pushing	–

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

A Clean Design mounting set 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 relieving 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 relieving hole (venting hole) on the rear side.

- - Note

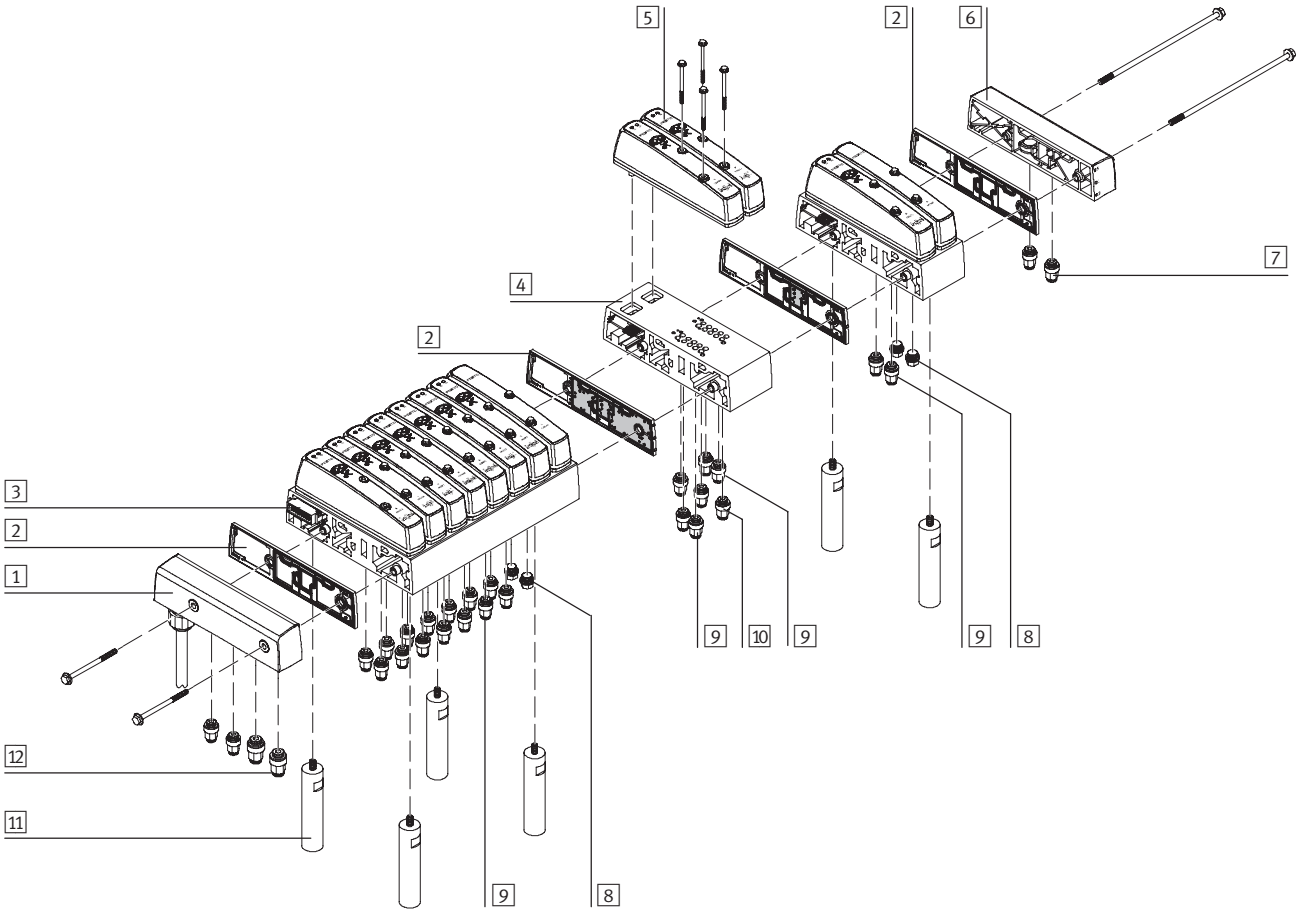
All ports and mounting holes that are not required must be sealed with a blanking plug.
Exception: venting hole

Valve terminal type 15 CDVI, Clean Design

Peripherals overview

Overview – Clean Design valve terminal

Valve terminal with multi-pin plug connection



	Brief description	➔ Page/Internet
1 Left-hand end plate	With multi-pin plug connection	35
2 Seal/separator plate	–	35
3 4/8-valve basic block	–	35
4 Extension module/energy supply module	–	35
5 Valves	–	34
6 Right-hand end plate	–	35
7 Push-in fittings	For right-hand end plate	36
8 Blanking plug	–	36
9 Push-in fittings	For working ports	36
10 Push-in fittings	For energy supply module	36
11 Spacer bolt	–	36
12 Push-in fittings	For left-hand end plate	36

The collected exhaust air from the pilot solenoid coils of the valves is drawn off via the pressure relieving hole (venting hole) on the rear side.

If you have included fittings with your order, the pressure relieving hole is also equipped with a QS fitting.

Note

All ports and mounting holes that are not required must be sealed with a blanking plug.
Exception: venting hole

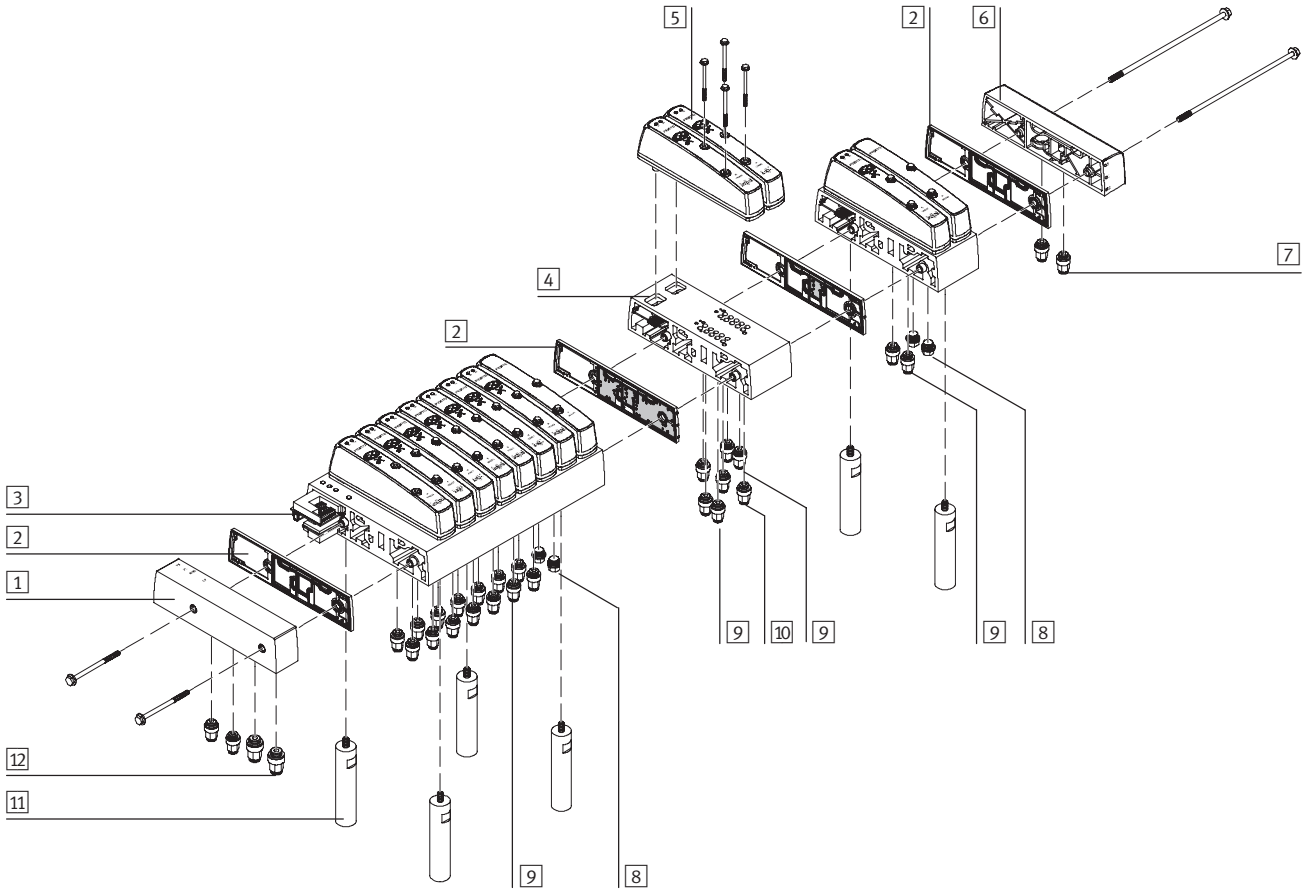
Valve terminal type 15 CDVI, Clean Design

Peripherals overview

FESTO

Overview – Clean Design valve terminal

Valve terminal with fieldbus connection



		Brief description	➔ Page/Internet
1	Left-hand end plate	For basic block with fieldbus connection	35
2	Seal/separator plate	–	35
3	4/8-valve basic block	With fieldbus connection	35
4	Extension module/energy supply module	–	35
5	Valves	–	34
6	Right-hand end plate	–	35
7	Push-in fittings	For right-hand end plate	36
8	Blanking plug	–	36
9	Push-in fittings	For working ports	36
10	Push-in fittings	For energy supply module	36
11	Spacer bolt	–	36
12	Push-in fittings	For left-hand end plate	36

The collected exhaust air from the pilot solenoid coils of the valves is drawn off via the pressure relieving hole (venting hole) on the rear side.

If you have included fittings with your order, the pressure relieving hole is also equipped with a QS fitting.

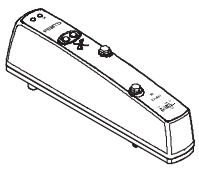
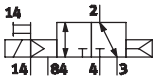
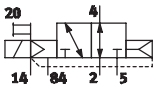
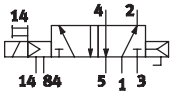
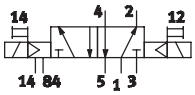
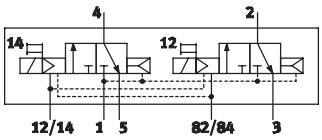
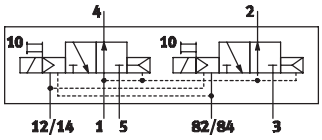
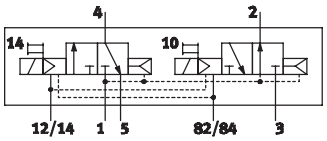
Note

All ports and mounting holes that are not required must be sealed with a blanking plug.
Exception: venting hole

Valve terminal type 15 CDVI, Clean Design

Key features – Pneumatic components

Valves

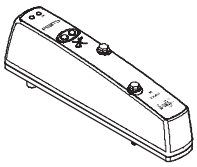
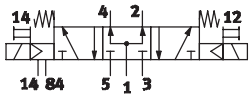
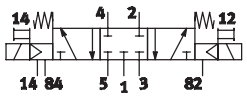
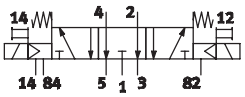
	Code	Circuit symbol	Description
	X		3/2-way valve, single solenoid • Normally closed • Pneumatic spring return • Suitable for vacuum • Supplied externally via working air
	W		3/2-way valve, single solenoid • Normally open • Pneumatic spring return • Suitable for vacuum • Supplied externally via working air
	M		5/2-way valve, single solenoid • Pneumatic spring return • Suitable for vacuum
	J		5/2-way valve, double solenoid • Suitable for vacuum
	K		2x 3/2-way valve, single solenoid • Normally closed • Pneumatic spring return • Not suitable for vacuum
	N		2x 3/2-way valve, single solenoid • Normally open • Pneumatic spring return • Not suitable for vacuum
	H		2x 3/2-way valve, single solenoid • 1x normally open, 1x normally closed • Pneumatic spring return • Not suitable for vacuum

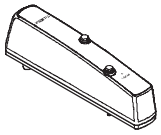
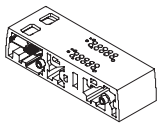
- Note

For vacuum operation valves require a filter. This is to avoid that foreign matter is drawn into the valve (e.g. when using a suction cup).

Valve terminal type 15 CDVI, Clean Design

Key features – Pneumatic components

Valves			
	Code	Circuit symbol	Description
	B		5/3-way valve • 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 differential piston areas. • Suitable for vacuum
	G		5/3-way valve • Mid-position closed • Mechanical spring return • The piston rod side of a cylinder remains held under pressure in the normal valve position. • Suitable for vacuum
	E		5/3-way valve • Mid-position exhausted • Mechanical spring return • In the normal valve position, the piston rod can be moved freely. • Suitable for vacuum

Covers/expansion blocks			
	Code	Designation	Description
	A	Cover for valve positions	For valve terminal only Blanking plate for vacant position
	B, D, F, H	Expansion block for 2 valve positions, multi-pin plug	For valve terminal only
	B, D, F, H	Expansion block for 2 valve positions, fieldbus	For valve terminal only
	K, I	Energy supply module for 3rd pressure zone for multi-pin plug	For valve terminal only
	K, I	Energy supply module for 3rd pressure zone for fieldbus	For valve terminal only

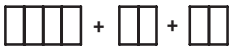
Valve terminal type 15 CDVI, Clean Design

Key features – Pneumatic components

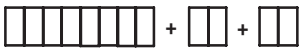
Modularity

Consistent modularity in the grid:
- The CDVI valve terminal with 4 ... 12 valve positions/8 ... 24 solenoid coils

Clean and modular:
- The valve technology



4 + 2 + 2 valve positions



8 + 2 + 2 valve positions

Pilot air supply

The valves used are piloted solenoid valves. The ports differ for the following pilot supply air types:
- Internal pilot supply air
- External pilot supply air

The pilot air supply duct 12/14 is taken from the main supply channel 1 (internal pilot air supply) or via a separate pilot air supply in the left-hand end plate (external pilot air supply).

A separate pilot air supply is required in any event if supply pressure is less than 3 bar or greater than 6 bar.
In this case it is advisable to restrict pilot air supply to max. 6 bar with a suitable regulator.

The pilot air supply is selected by including a corresponding code letter in the order code (end plates/pressure supply code U, V, Y, Z).

Pressure zones

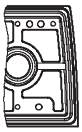
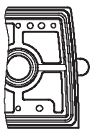
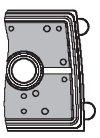
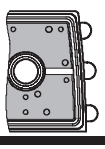
CDVI offers a number of options for creating pressure zones if different working pressures are required. Pressure zones are created by isolating the internal supply channels between basic and expansion blocks using an appropriate separating seal.

A maximum of two different pressure zones can be created on valve terminals with one expansion block. The pressure is supplied at both ends through the end plates.

A maximum of three different pressure zones can be created on valve terminals with two expansion blocks. With three pressure zones the pressure is supplied via the two end plates as well as the first expansion block.

Separating seals are integrated ex-works as per your order. Separating seals can be distinguished through their coding, even when the valve terminal is assembled.
A label on the right-hand end plate makes it easier to allocate the separating seals when the valve terminal is assembled.

Separating seals

Code	Pictorial examples	Coding	Notes
B			No duct separated
D			Duct 1 closed, 3/5 open
F			Duct 3 and 5 closed
H			Duct 1, 3 and 5 closed

- Note

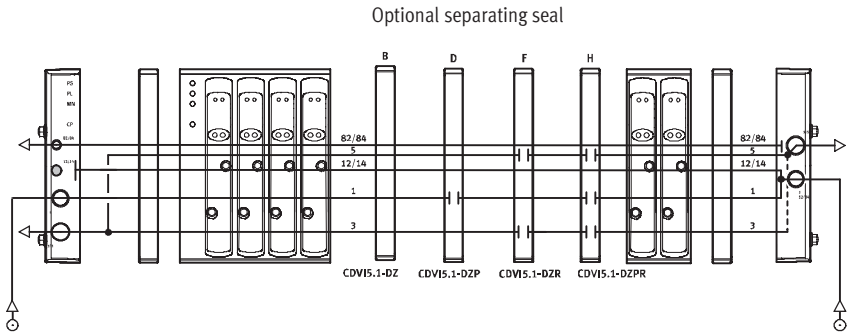
Normally only duct 1 is separated. Ducts 3 and 5 or 1, 3 and 5 can also be separated for special applications.

Examples: Compressed air supply and pilot air supply

Internal pilot supply air

Code U, Y

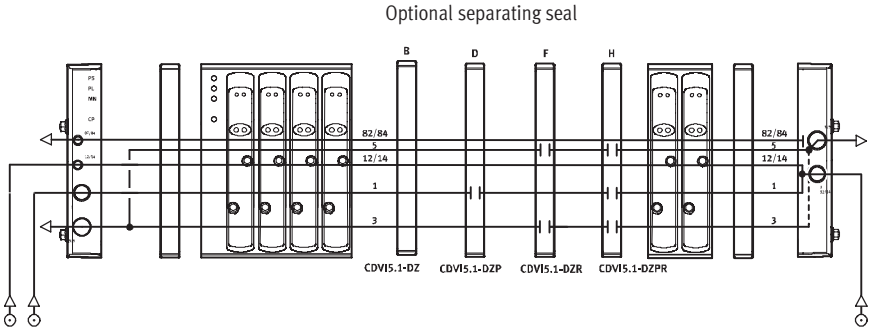
The diagram opposite shows an example for the configuration and connection of the compressed air supply with an internal pilot air supply. Port 12/14 on the left-hand end plate is tightly sealed. The pilot air is supplied via the right-hand end plate. Separating seals can be used optionally to create pressure zones.



External pilot supply air

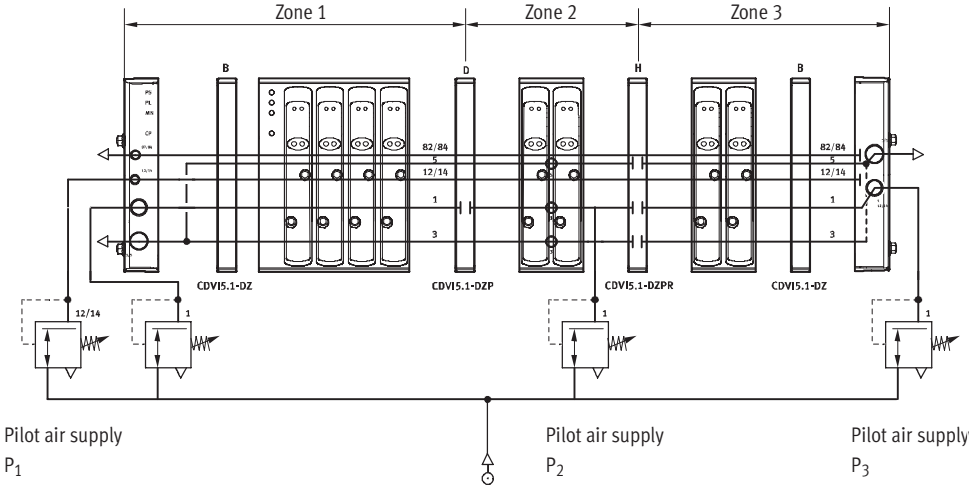
Code V, Z

The diagram opposite shows an example for the configuration and connection of the compressed air supply with an external pilot air supply. Port 12/14 on the left-hand end plate is equipped with a fitting for this purpose.
Separating seals can be used optionally to create pressure zones. In this case it is advisable to restrict pilot air supply to max. 6 bar with a suitable regulator.



Examples: Creating pressure zones

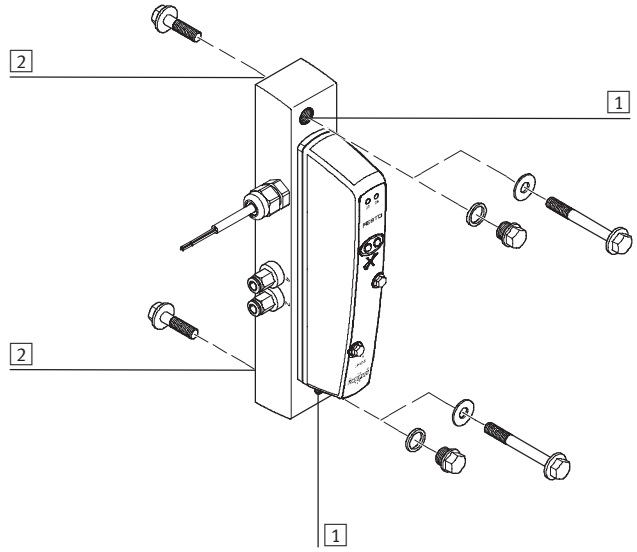
CDVI facilitates the creation of up to 3 pressure zones. The diagram opposite shows an example for the configuration and connection of three pressure zones using separating seals – with an external pilot air supply of 3 ... 6 bar.



Note

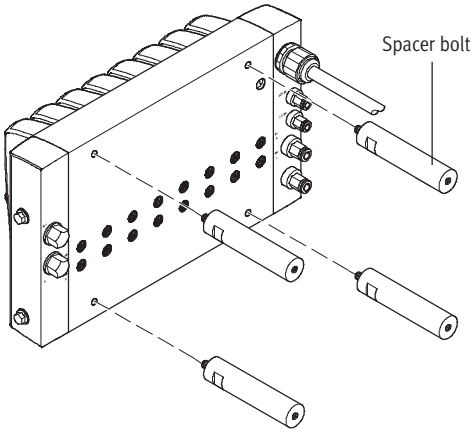
Particular attention must be paid to the assembly of the respective right-hand end plate when converting a valve terminal from internal to external pilot air supply.

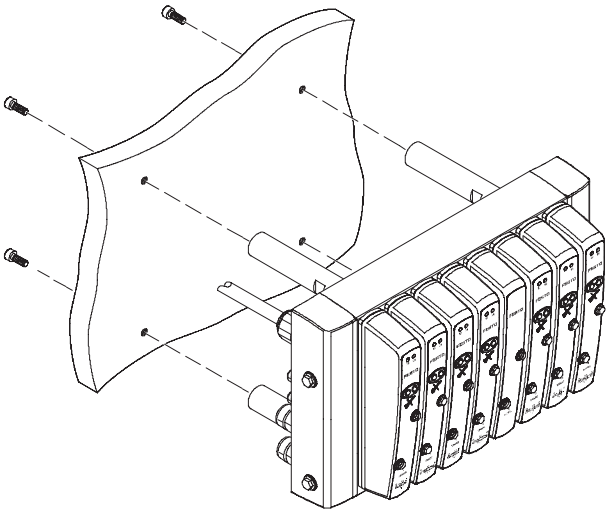
Individual sub-base assembly



1 Hole for front mounting (CDSV) using M6 screws; the hole can be covered with blanking plug G1⁄8 if not required
2 Hole for rear mounting (CDSV) using M6 screws

Valve terminal assembly





The CDVI can be mounted directly on earthed mounting surfaces using the four threaded holes in the basic block and the spacer bolts ordered via the order code (accessories order code Y).

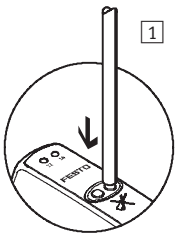
The CDVI can be mounted in any position. However, the selected mounting position should allow for the cleaning off of dirt and the draining of cleaning agent.

- Note

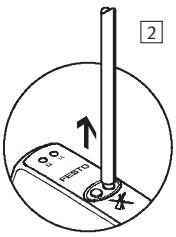
A further two spacer bolts are required as from the second expansion block.

Manual override (MO)

Manual override with automatic return (pushing)

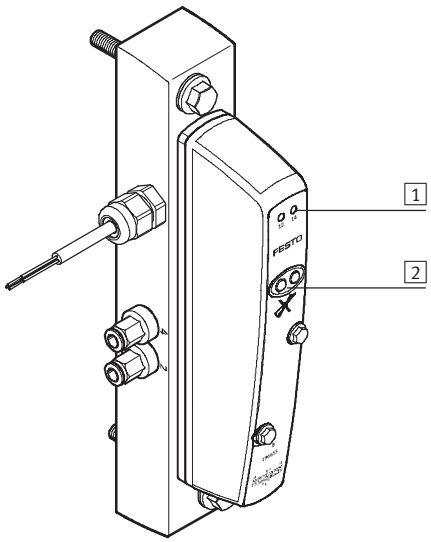


1 Press in the stem of the manual override with a pointed object. Valve is then actuated.



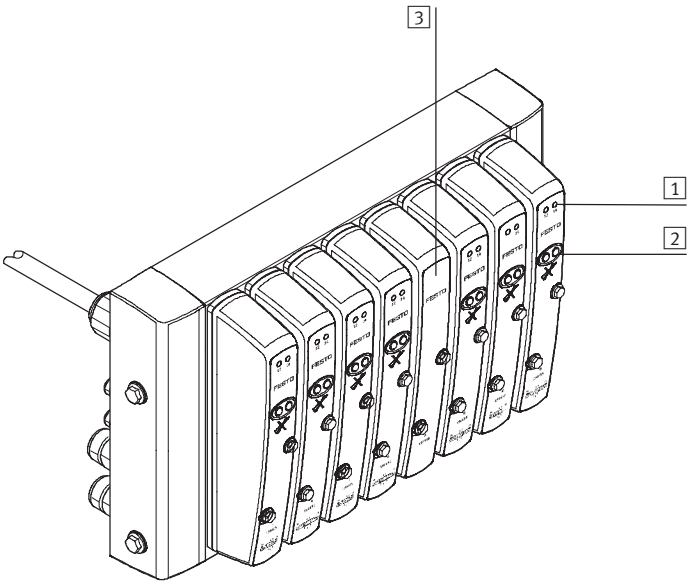
2 Remove the pointed object. Spring force pushes the stem of the manual override back. Valve returns to initial position (not with 5/2-double solenoid valve code J).

Display and control elements – Individual sub-base



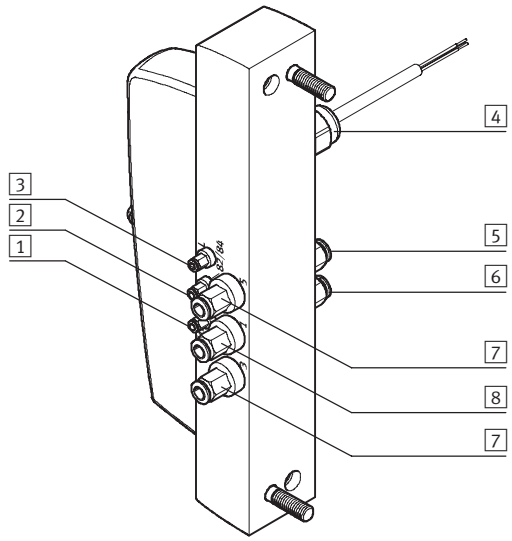
1 Yellow LEDs (solenoid coil)
2 Manual override (per solenoid coil)

Display and control elements – Valve terminal



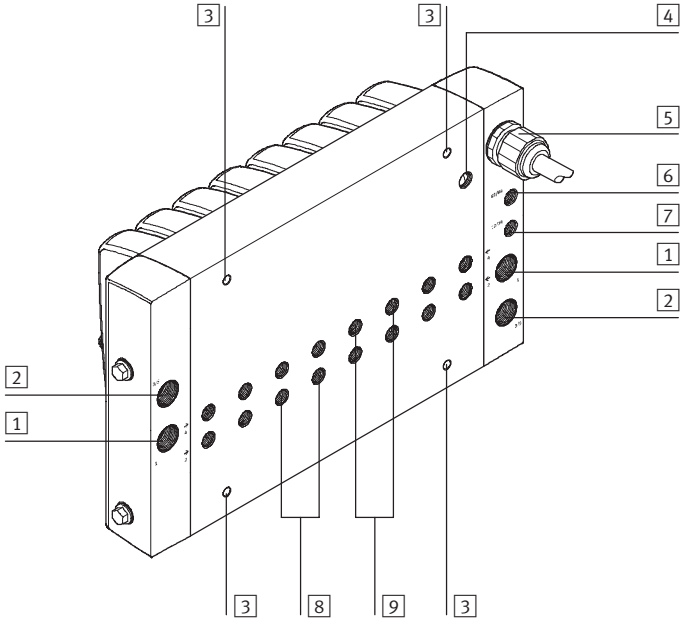
1 Yellow LEDs (per solenoid coil)
2 Non-detenting manual override (per solenoid coil)
3 Vacant valve position with blanking plate

Connections – Individual sub-base



1 Pilot exhaust port (82/84)
2 Pilot air supply port (12/14)
3 Pressure relieving port/venting hole
4 Electrical connection
5 Working line (4) per valve
6 Working line (2) per valve
7 Exhaust port (3/5)
8 Supply port (1)

Connections – Valve terminal



1 working air port (1)
2 Exhaust port (3/5)
3 4 threaded holes for spacer bolts
4 Pressure relieving port/venting hole
5 Electrical multi-pin plug connection
6 Pilot exhaust port (82/84)
7 Pilot air supply port (12/14)
8 Working line (2) per valve
9 Working line (4) per valve

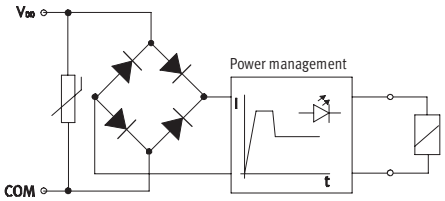
Line		Port code (ISO 5599)	Connection size (ISO 228)	Connector fitting[1]
Working air/vacuum	1	1	G3/8 G1/8	– in left-hand/right-hand end plate – in the expansion block with auxiliary energy supply
Exhaust	2	3/5 3, 5	G3/8 G1/8	– in left-hand/right-hand end plate – in the expansion block with auxiliary energy supply
Pressure relieving port	4	–	G1/8	– in the base block
Pilot exhaust	6	82/84	G1/8	– in left-hand end plate
Pilot air supply	7	12/14	G1/8	– in left-hand end plate
Air/vacuum	8, 9	2, 4	G1/8	– in the manifold block – in the expansion block with auxiliary energy supply

1) The CDVI valve terminal can be pre-equipped with QS-F push-in fittings depending on the order.

Valve terminal type 15 CDVI, Clean Design

Key features – Electrical components

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 additionally equipped with integrated current reduction.

Advantages:

- Lower power consumption
- Lower temperature rise

Terminal allocation – Multi-pin cable for valve terminal CDVI[1)]

Valve	Coil	Address	Pin	Core colour[2)]
1	14	0	A01	WH
	12	1	A02	GN
2	14	2	B01	YE
	12	3	B02	GY
3	14	4	C01	PK
	12	5	C02	BU
4	14	6	A03	RD
	12	7	A04	VT
5	14	8	B03	GY PK
	12	9	B04	RD BU
6	14	10	C03	WH GN
	12	11	C04	BN GN
7	14	12	A05	WH YE
	12	13	A06	YE BN
8	14	14	B05	WH GY
	12	15	B06	GY BN
9	14	16	C05	WH PK
	12	17	C06	PK BN
10	14	18	A07	WH BU
	12	19	A08	BN BU
11	14	20	B07	WH RD
	12	21	B08	BN RD
12	14	22	C07	WH BK
	12	23	C08	BN BK
com			B10	BN
			C10	BK

1) Max. 24 solenoid coils
2) To IEC 757

Terminal allocation – Cable for individual sub-base CDSV

Core colour	Allocation
Brown	Coil 14
Black	Coil 12 (not on 5/2-way valve, single solenoid)
Blue	com[1)]

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

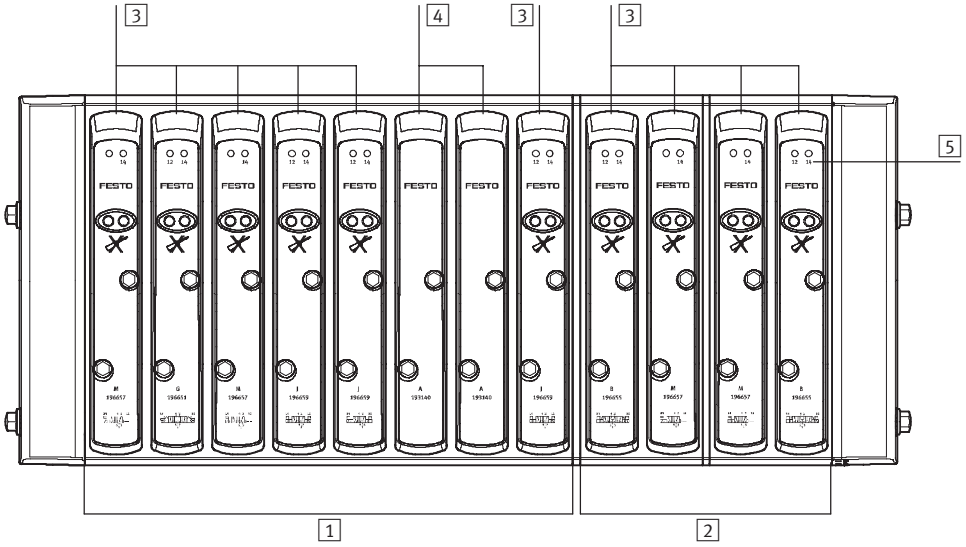
Address allocation – Valves with multi-pin plug

A valve position on the CDVI valve terminal always occupies 2 addresses, even if one of these is equipped with a blanking plate.

Addresses should be assigned in ascending consecutive order.
The numbering system goes from left to right.

A basic block expansion always occupies 8 addresses, regardless of whether one or two expansion blocks are used.

Example: Address allocation for a CDVI valve terminal with one basic block containing 8 valves and 1 expansion block

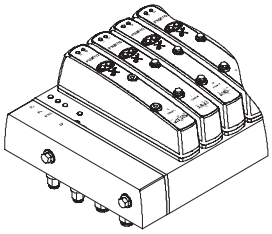


1 Basic block: 8 or 16 addresses
2 Expansion block: 8 addresses
3 Valves
4 Vacant positions
5 Number of solenoid coils

Valve terminal type 15 CDVI, Clean Design

Key features – Electrical components

Fieldbus Direct



Fieldbus Direct is a system for the compact connection of a valve terminal of various sizes to different fieldbus standards.

The CP string extension option allows the functions and components of the CPI installation system to be used.

The I/O modules and cables for the CP string extension are ordered using the order code for the CPI installation system.

➔ Internet: cpi

Addressing order for valves with fieldbus

The CDVI valve terminal occupies 8, 16 or 24 addresses, regardless of the number of solenoid coils.
This means that the terminal can be expanded later without shifting addresses.
A basic block occupies 8 or 16 addresses, an expansion block always occupies 8 addresses.

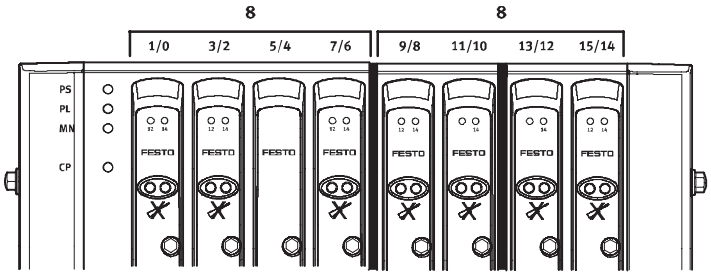
If a valve position is equipped with a valve with 2 pilot solenoid coils, the following allocation applies:

- Pilot solenoid coil 14 occupies the less significant address
- Pilot solenoid coil 12 occupies the more significant address

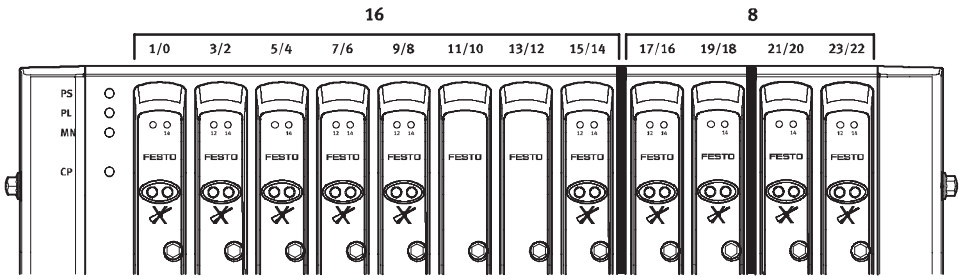
The more significant address is not used in valves with only one pilot solenoid coil.

The addresses of the CDVI valve terminal are allocated from left to right, while the addresses of the individual valve positions are allocated from right (pilot solenoid coil 14) to left (pilot solenoid coil 12).

Example: Addressing order for a basic block with 4 valve positions



Example: Addressing order for a basic block with 8 valve positions



Equipment

Operate your equipment with unlubricated compressed air if possible. Festo valves and cylinders are designed for operation under normal use without any additional lubrication, yet still have a long service life. The quality of compressed air downstream from the compressor must correspond to that of unlubricated compressed air. If possible, do not operate all of your equipment with lubricated compressed air. The lubricators should, where possible, always be installed directly upstream of the actuator used.

Incorrect additional oil and too high an oil content in the compressed air reduces the service life of a valve terminal.
Use Festo special oil OFSW-32 or the alternatives listed in the Festo catalogue (as specified in DIN 51524 HLP32; basic oil viscosity 32 CST at 40 °C).

Bio-oils
When using bio-oils (oils which are based upon synthetic or native ester, e.g. rapeseed oil methyl ester), the maximum residual oil content of 0.1 mg/m^3 must not be exceeded (see ISO 8573-1 Class 2).

Mineral oils
When using mineral oils (e.g. HLP oils to DIN 51524, parts 1 through 3) or similar oils based on poly-alpha-olefins (PAO), the maximum residual oil content of 5 mg/m^3 must not be exceeded (see ISO 8573-1 Class 4).
A higher residual oil content irrespective of the compressor oil cannot be permitted, as the basic lubricant would be flushed out over time.

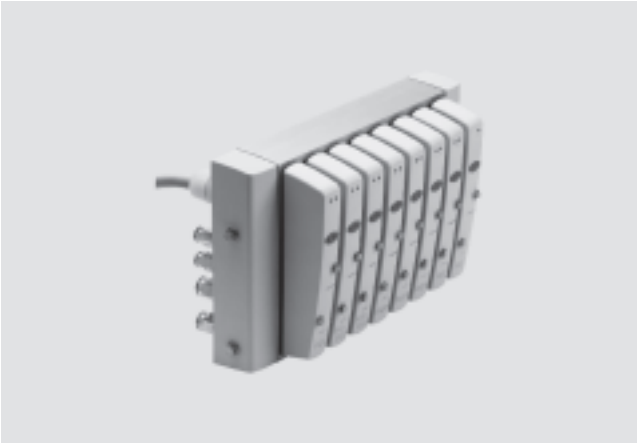
Valve terminal type 15 CDVI, Clean Design

Technical data

FESTO

Flow rate
300 ... 650 l/min

Valve width
24 mm



General technical data											
Valve function	3/2-way valve Normally		5/2-way valve		2x 3/2-way valve Normally			5/3-way valve Mid-position		
	open	closed	Single solenoid	Double solenoid	open	closed	1x open 1x closed	pressur-ised	exhausted	closed
Valve function ordering code	W	X	M	J	N	K	H	B	E	G

Constructional design		Piston spool valve
Actuation type		Electrical
Width	[mm]	24
Nominal size	[mm]	5
Lubrication		Lubricated for life, PWIS-free (free of paint-wetting impairment substances)
Type of mounting • Valves and end plate • Valve terminal		 Via 2 screws (DIN 6921) Via spacer bolt
Tightening torque valve/ blaning plate	[Nm]	Flow control
Assembly position		Any
Manual override		Pushing
Pneumatic connections		
Supply port	1	G3/8 (G1/8 on expansion block CDVI5.0-EBX and CDSV)
Exhaust port	3/5	G3/8 (G1/8 on expansion block CDVI5.0-EBX and CDSV)
Working ports	2/4	G1/8
Pilot air port	12/14	G1/8 (M5 on CDSV)
Pilot exhaust air port	82/84	G1/8 (M5 on CDSV)
Pressure compensation port		G1/8 (M5 on CDSV)

Valve response times [ms]											
Valve function ordering code		W	X	M	J	N	K	H	B	E	G
Response times	on	10.3	10.3	12	–	10	10	10	12	12	12
	off	14.1	14.1	22	–	22	22	22	25	25	25
	reversing	–	–	–	10	–	–	–	17	17	17

Valve terminal type 15 CDVI, Clean Design

Technical data

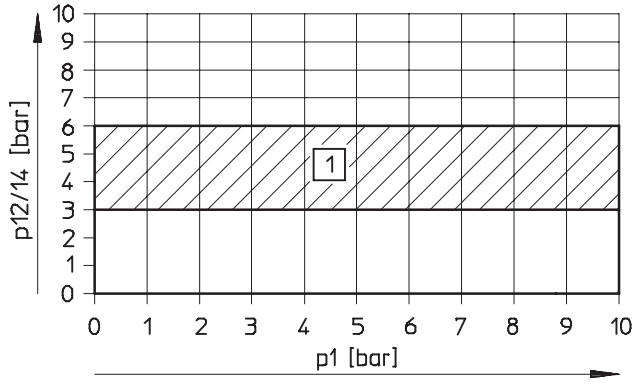
Operating and environmental conditions											
Valve function ordering code		W	X	M	J	N	K	H	B	E	G
Operating medium		Filtered compressed air, lubricated or unlubricated									
Grade of filtration	[µm]	40									
Operating pressure	[bar]	–0.9 ... +10				3 ... 10[2]			–0.9 ... +10		
Operating pressure for valve terminal with internal pilot air supply	[bar]	3 ... 6 (not on CDSV available)									
Pilot pressure	[bar]	3 ... 6									
Storage temperature	[°C]	–20 ... +40									
Operating temperature	[°C]	–5 ... +50									
Temperature of medium	[°C]	–5 ... +50									
CE mark (see declaration of conformity)		To EU EMC directive									
Food industry approval		DIN EN ISO 14159									
Corrosion resistance class CRC[1]		3									

1) Corrosion resistance class 3 according to Festo standard 940 070
Components requiring higher corrosion resistance. 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.

2) 3/2-way valves not suitable for vacuum.

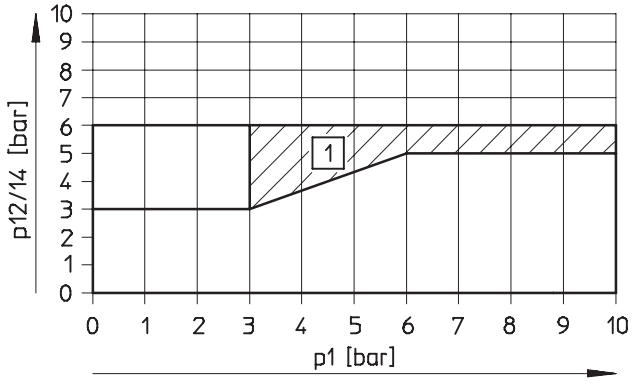
Pilot pressure with external pilot air supply

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



1 Permissible pressure range

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



1 Permissible pressure range

Valve terminal type 15 CDVI, Clean Design

Technical data

Electrical data											
Valve function ordering code		W	X	M	J	N	K	H	B	E	G
Electromagnetic compatibility		Interference immunity tested to EN 61 000-6-2									
Operating voltage	[V]	24 DC (±10%)									
Minimum power supply requirement	[V/ms]	0.4 minimum voltage increase time to reach the high-current phase									
Residual ripple	[Vss]	4									
Switch-on current consumption											
• per solenoid coil at 24 V (with LEDs)	[mA]	Typ. 120									
• total at 24 V and max. number of solenoid coils (with LEDs)	[A]	Typ. 2.88									
Current consumption during operation											
• per solenoid coil at 24 V (with LEDs)	[mA]	Min. 26									
• total at 24 V and max. number of solenoid coils (with LEDs)	[A]	Typ. 0.62									
Electrical power consumption per solenoid coil (with LED)	[W]	2.88									
Duty cycle		100%									
Protection class to EN 60 529		IP65/67 (fully assembled)									
Vibration resistance		To DIN/IEC 68/EN 60 068, Parts 2-6 and IEC 721/EN 60 068, Parts 2-3									
Shock resistance		To DIN/IEC 68/EN 60 068, Parts 2-27 and IEC 721									
Continuous shock resistance		To DIN/IEC 68/EN 60 068, Parts 2-29: +/–15 g at 6 ms, 1000 cycles									

Multi-pin cable		
Constructional design	[mm^2]	25x0.34
Bending radius during flexible use		Min. 15x cable ∅
Outer ∅	[mm]	Approx. 11.4

Materials											
Valve function ordering code		W	X	M	J	N	K	H	B	E	G
Cover		Polypropylene (PP), thermoplastic rubber (TPE), polyamide (PA)									
Connection block		Aluminium (anodised min. 20 µm)									
Blanking plug		Polybutylene terephthalate (material no.: 1.4303 or 1.4301)									
End plate		Polypropylene									
Screws		Polybutylene terephthalate (material no.: 1.4303 or 1.4301)									
Spacer bolt		Aluminium (anodised min. 20 µm)									
Valve		Aluminium, polyacetate (POM), polyphenylene sulphide (PPS), polyamide (PA), nitrile rubber (NBR), brass (Ms), steel (St), polycarbonate (PC), polypropylene (PP)									

Valve terminal type 15 CDVI, Clean Design

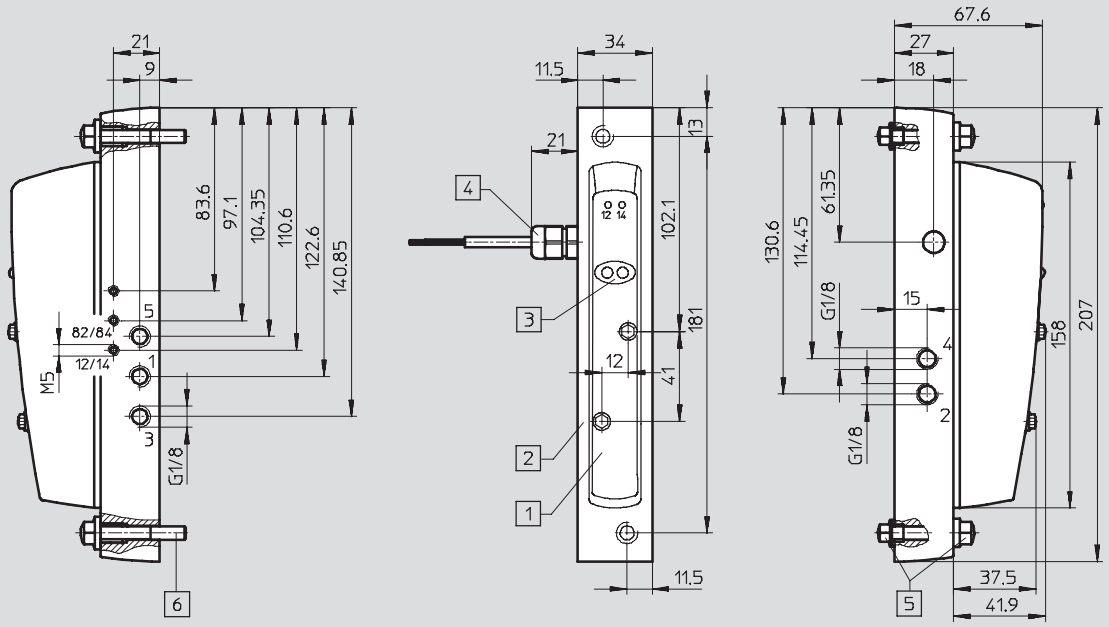
Technical data

Product weight [g]	**Approx. weights**									
Valve function ordering code	W	X	M	J	N	K	H	B	E	G
Basic block with 4 valve positions MP	1 050									
Basic block with 8 valve positions MP	2 090									
Basic block with 4 valve positions FB	1 320									
Basic block with 8 valve positions FB	2 360									
CDVI with 4 valve positions MP with fittings, 10 m cable and valves	4 170									
CDVI with 8 valve positions MP with fittings, 10 m cable and valves	6 170									
CDVI with 4 valve positions FB with fittings and valves	2 760									
CDVI with 8 valve positions FB with fittings and valves	4 760									
Expansion block (2 valve positions)	510									
Expansion block (2 valve positions) with fitting and valves	1 030									
Valve	185		195	205	210					
Blanking plate	85									
Left-hand end plate DeviceNet	120									
Left-hand end plate MP, cable length 5 m	960									
Left-hand end plate MP, cable length 10 m	1 800									
Right-hand end plate	120									
Separator plate DZ, DZP	30									
Separator plate DZR, DZPR	40									
CDSV individual sub-base	690									
CDSV individual sub-base with fittings and valve	1 070									
Spacer bolt (2 pieces)	160									

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

Dimensions Download CAD data ➔ **www.festo.com**

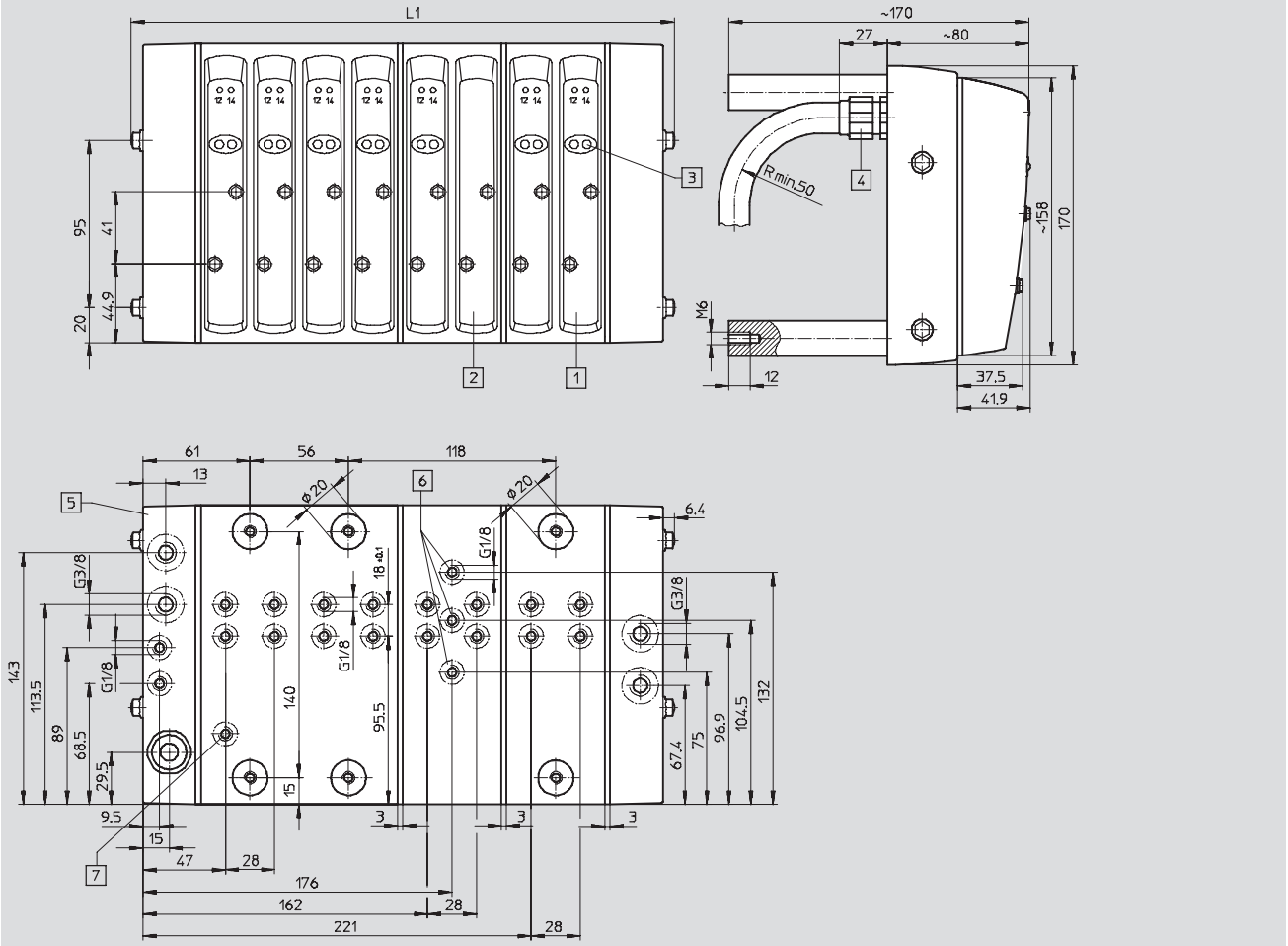
Individual sub-base



1 Choice of single solenoid or double solenoid valve
2 Sub-base
3 Manual override facility
4 Cable conduit fitting M20x1.5
5 For mounting from below:
2x screw M6x18-A2-80
2x sealing ring CRO-M6
2x blanking plug G1⁄8
2x sealing ring G1⁄8
6 For mounting from above:
2x screw M6x40-A2-80
2x sealing ring CRO-M6

Dimensions Download CAD data ➔ **www.festo.com**

Four-valve block with two expansions, variant with multi-pin plug connection

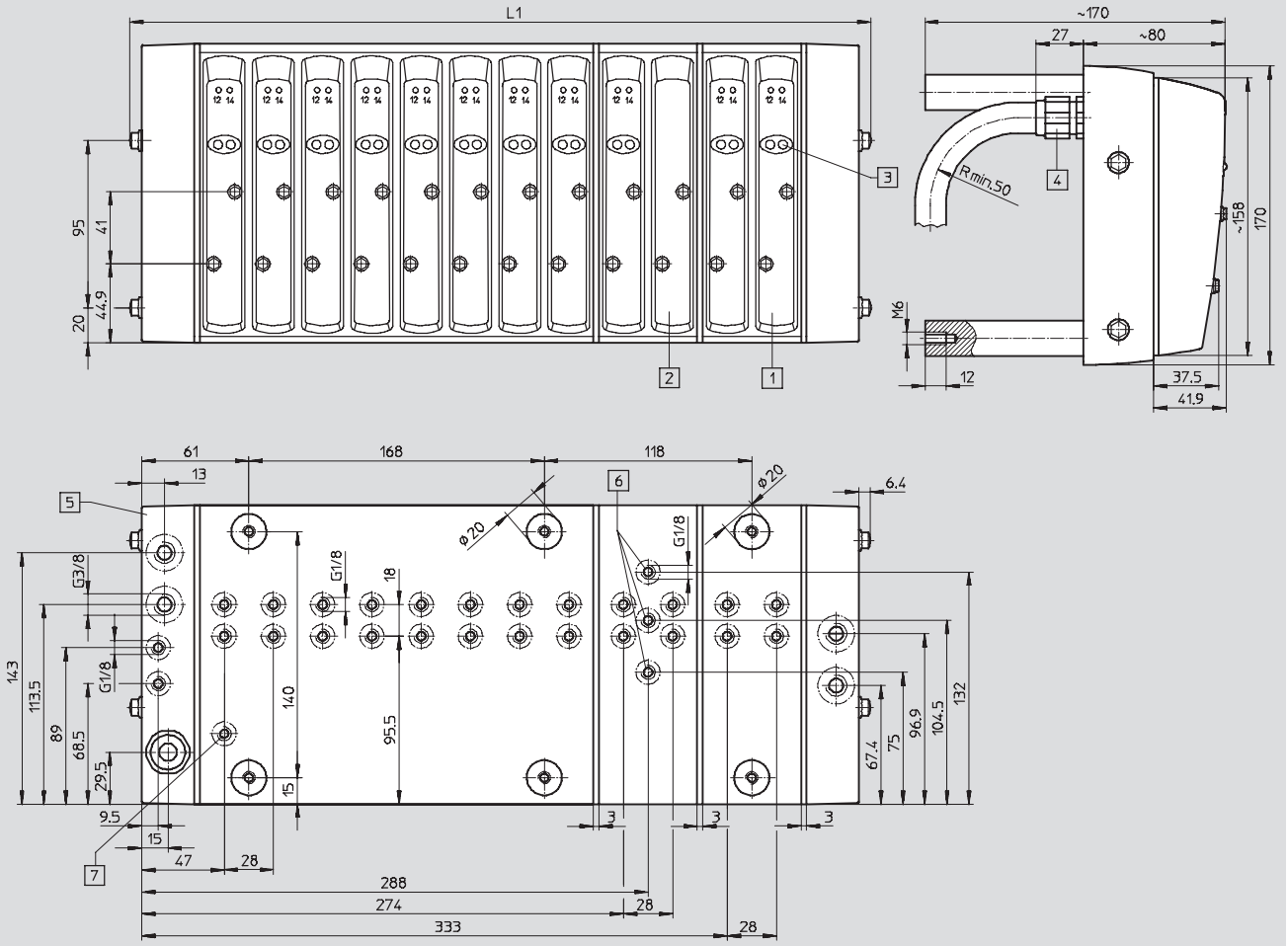


1 Choice of single solenoid or double solenoid valve
2 Blanking plate
3 Manual override facility
4 Cable conduit fitting M20x1.5
5 Right-hand end plate: optional external pilot air supply or internal pilot air supply
6 Port for further pressure zone
7 Venting hole

	4-valve block	4-valve block + 1 expansion block	4-valve block +2 expansion blocks
L1	190.8	249.8	308.8

Dimensions Download CAD data ➔ **www.festo.com**

Eight-valve block with two expansion blocks, variant with multi-pin plug connection

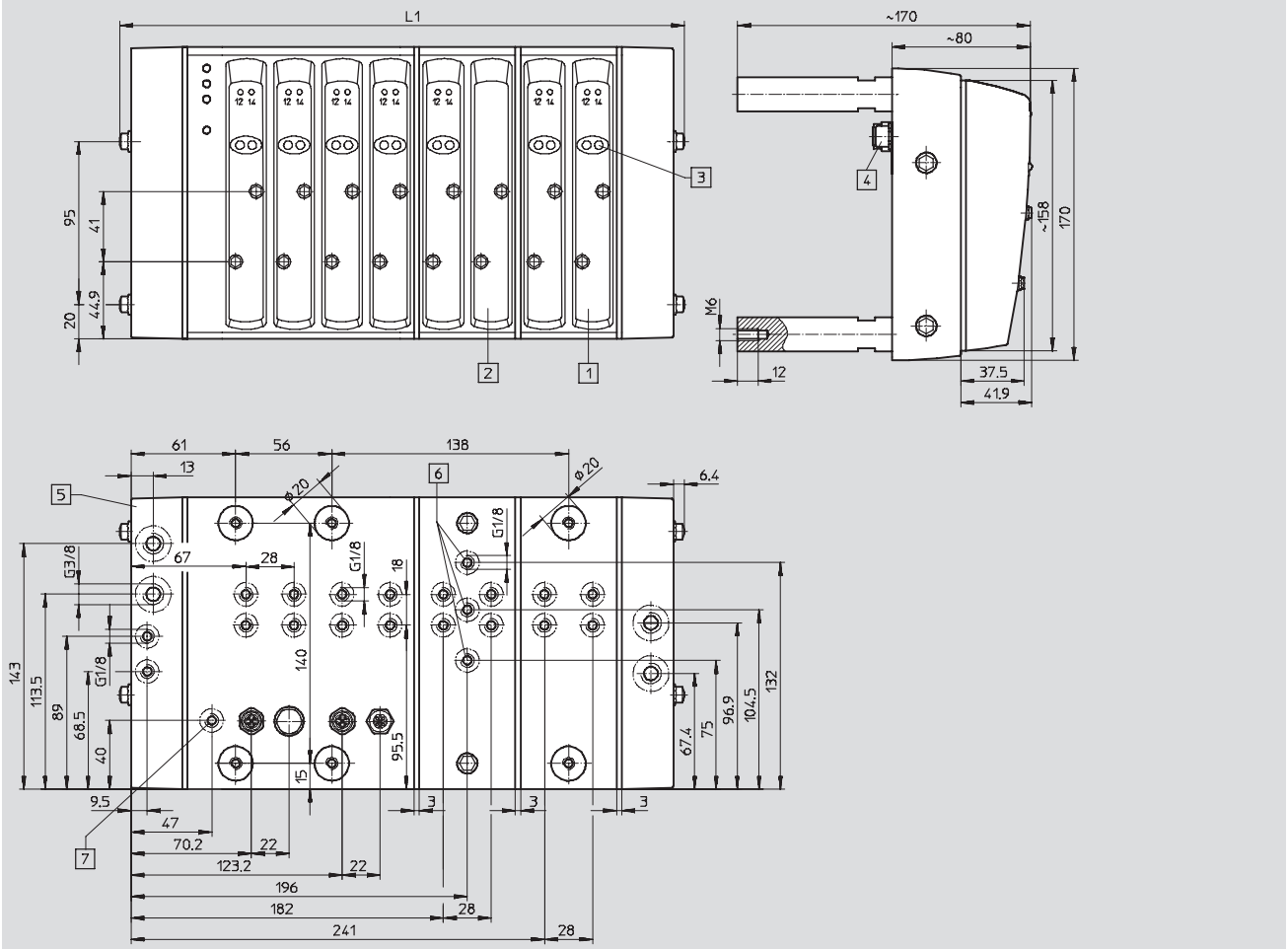


1 Choice of single solenoid or double solenoid valve
2 Blanking plate
3 Manual override facility
4 Cable conduit fitting M20x1.5
5 Right-hand end plate: optional external pilot air supply or internal pilot air supply
6 Port for further pressure zone
7 Venting hole

	8-valve block	8-valve block + 1 expansion block	8-valve block +2 expansion blocks
L1	302.8	361.8	420.8

Dimensions Download CAD data ➔ **www.festo.com**

Four-valve block with two expansions, variant with fieldbus connection

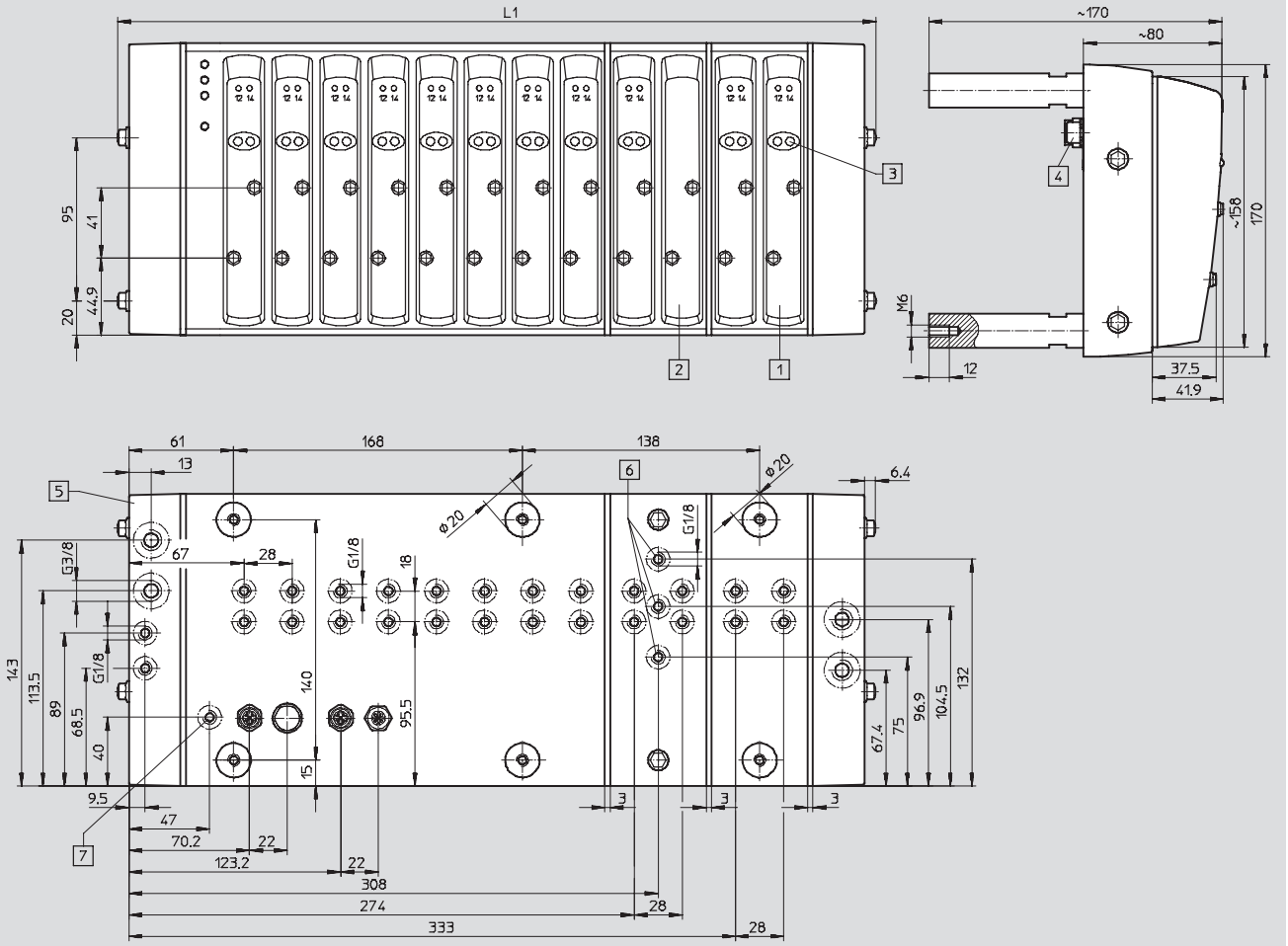


1 Choice of single solenoid or double solenoid valve
2 Blanking plate
3 Manual override facility
4 Bus connection/power supply
5 Right-hand end plate: optional external pilot air supply or internal pilot air supply
6 Port for further pressure zone
7 Venting hole

	4-valve block	4-valve block + 1 expansion block	4-valve block +2 expansion blocks
L1	190.8	249.8	308.8

Dimensions Download CAD data ➔ **www.festo.com**

Eight-valve block with two expansion blocks, variant with fieldbus connection



1 Choice of single solenoid or double solenoid valve
2 Blanking plate
3 Manual override facility
4 Bus connection/power supply
5 Right-hand end plate: optional external pilot air supply or internal pilot air supply
6 Port for further pressure zone
7 Venting hole

	8-valve block	8-valve block + 1 expansion block	8-valve block +2 expansion blocks
L1	302.8	361.8	420.8

Valve terminal type 15 CDVI, Clean Design

Ordering system

Ordering system information

Like all valve terminals, the CDVI is ordered using an ident. code. This ident. code specifies the valve functions, the number of valves and vacant positions 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 in the working ports and end plates on request
- tested for electrical function
- tested for pneumatic function
- packed securely together with full instructions (user documentation) and delivered

Notes on the ident. code and ordering procedure

15P-K10-8A-UR-8M-E+Y

Terminal with 10 m multi-pin cable, 8-valve basic block with straight QS8-F fittings in the working ports and QS12-F fittings in the supply and exhaust ports, compressed air supply at left side only with internal pilot air supply, fitted with eight 5/2-way single solenoid valves, English manual and spacer bolts for mounting.

Individual sub-base

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

Ordering example:

15P-K10-1B-**XR**-M-**B+**Z

Ident. codes in bold print do not permit alternative selections.

15P-F11-4A-ZR-4M-K-2K-H-2M-D+Y

Terminal with DeviceNet fieldbus connection, 4-valve basic block and two expansion blocks, straight QS8-F fitting in the working ports, external pilot air supply via straight QS8-F connection in the left-hand end plate

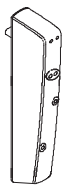
- fitted with four 5/2-way single solenoid valves, basic block compressed air supply and exhaust via straight QS12-F fitting in the left-hand end plate
- first expansion with separate compressed air supply, fitted with two 2x3/2-way valves, normally closed, compressed air supply via straight QS8-F fitting in the expansion block, exhaust air drawn off via the basic block in the left-hand end plate
- second expansion fitted with two 5/2-way single solenoid valves, compressed air supply and exhaust via straight QS12-F fitting in the right-hand end plate
- German manual and spacer bolts

Fittings

The basic valve terminal price includes the following:

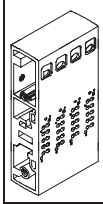
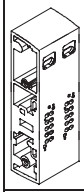
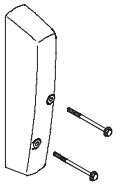
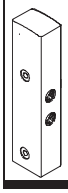
- The straight QS-F-G1⁄8 fittings in the working ports for optimum flow
- Suitable straight QS-F-G3⁄8 fittings for compressed air supply and main exhaust air in the end plates

These sets of fittings for the end plates are always correctly assembled before leaving the factory. Vacant ports are sealed with easy to clean blanking plugs (with supply at one side or internal pilot air supply).

Ordering data				
	Code	Description	Type	Part No.
Individual sub-base valve				
	W	3/2-way valve, normally open, external supply air	**CDVI5.0-MT2H-1X3OLS-EXT**	**547 014**
	X	3/2-way valve, normally closed, external supply air	**CDVI5.0-MT2H-1X3GLS-EXT**	**547 013**
	M	5/2-way valve, single solenoid	**CDVI5.0-MT2H-5LS**	**196 657**
	J	5/2-way valve, double solenoid	**CDVI5.0-MT2H-5JS**	**196 659**
	N	2x 3/2-way valve, normally open	**CDVI5.0-MT2H-2x3OLS**	**196 663**
	K	2x 3/2-way valve, normally closed	**CDVI5.0-MT2H-2x3GLS**	**196 661**
	H	2x 3/2-way valve, 1x normally open 1x normally closed	**CDVI5.0-MT2H-3OLS-3GLS**	**196 665**
	B	5/3-way valve, mid-position pressurised	**CDVI5.0-MT2H-5/3BS**	**196 655**
	E	5/3-way valve, mid-position exhausted	**CDVI5.0-MT2H-5/3ES**	**196 653**
	G	5/3-way valve, mid-position closed	**CDVI5.0-MT2H-5/3GS**	**196 651**
Individual sub-bases				
	1	Individual sub-base	**CDSV5.0-AS-1/8**	**534 434**

Valve terminal type 15 CDVI, Clean Design

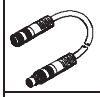
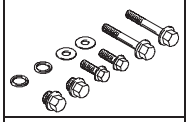
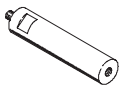
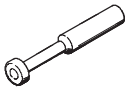
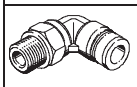
Accessories

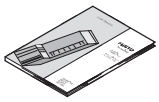
Ordering data				
	Code	Description	Type	Part No.
Basic block				
	4	Basic block with 4 valve positions for multi-pin plug	**CDVI5.0-GB4-MP**	**196 714**
		Basic block with 4 valve positions for fieldbus	**CDVI5.0-GB4-DN**	**535 840**
	8	Basic block with 8 valve positions for multi-pin plug	**CDVI5.0-GB8-MP**	**196 690**
		Basic block with 8 valve positions for fieldbus	**CDVI5.0-GB8-DN**	**535 839**
Expansion block and power supply module				
	B, D, F, H	Expansion block for multi-pin plug	**CDVI5.0-EB**	**196 710**
	B, D, F, H	Expansion block for fieldbus	**CDVI5.0-EB-DN**	**536 813**
	K, I	Power supply module for 3rd pressure zone (multi-pin plug)	**CDVI5.0-EBX**	**528 609**
	K, I	Power supply module for 3rd pressure zone (fieldbus)	**CDVI5.0-EBX-DN**	**536 815**
Blanking plate				
	A	Blanking plate for vacant valve position	**CDVI5.0-A-P-2**	**193 140**
Separator plate				
	B	No duct separated	**CDVI5.0-DZ**	**196 700**
	D	Duct 1 separated	**CDVI5.0-DZP**	**196 702**
	F	Duct 3/5 separated	**CDVI5.0-DZR**	**196 704**
	H	Duct 1/3/5 separated	**CDVI5.0-DZPR**	**196 706**
Left-hand end plate				
	K05	Electrical multi-pin connection, cable length 5 m	**CDVI5.0-EPL-MP-K05**	**196 692**
	K10	Electrical multi-pin connection, cable length 10 m	**CDVI5.0-EPL-MP-K10**	**196 694**
	F11	Fieldbus node DeviceNet	**CDVI5.0-EPL-DN:LI**	**535 838**
Right-hand end plate				
	–	Internal pilot air supply	**CDVI5.0-EPR**	**196 696**
	–	External pilot air supply	**CDVI5.0-EPR-S**	**196 698**

Valve terminal type 15 CDVI, Clean Design

Accessories

FESTO

Ordering data					
	Code	Description		Type	Part No.
Bus connection					
	–	DeviceNet plug socket/Micro Style connection , M12, 5-pin, straight socket (A-coded), IP65, Pg9		**FBSD-GD-9-5PIN**	**18 324**
	–	DeviceNet plug/power supply/Micro Style connection, M12, 5-pin, straight plug (A-coded), IP65, Pg9		**FBS-M12-5GS-PG9**	**175 380**
Valve terminal connection					
	–	Connecting cable WS-WD, angled plug-angled socket	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
			0.5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
			2 m	**KVI-CP-3-WS-WD-2**	**540 329**
			5 m	**KVI-CP-3-WS-WD-5**	**540 330**
			8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	–	Connecting cable GS-GD, straight plug-straight socket	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
			5 m	**KVI-CP-3-GS-GD-5**	**540 333**
			8 m	**KVI-CP-3-GS-GD-8**	**540 334**
Input and output modules					
	–	Input and output modules, CP system ➔ Internet: cpi			
Mounting components					
	–	Adapter kit		**CDSV5.0**	**534 436**
	Y	Spacer bolt (2 pieces)		**CDVI5.0-STB**	**196 718**
Blanking plugs					
	–	Blanking plug	G⅜ for end plates	**CDVI-5.0-B-G⅜**	**196 712**
	–		G⅛ for end plates	**CDVI-5.0-B-G⅛**	**196 720**
	–		for spacer bolt thread	**CDVI5.0-B-M6**	**532 476**
Plugs					
	–	Blanking plug	for tubing O.D. ∅ 6 mm	**QSC-6H**	**153 268**
	–		for tubing O.D. ∅ 8 mm	**QSC-8H**	**153 269**
	–		for tubing O.D. ∅ 10 mm	**QSC-10H**	**153 270**
	–		for tubing O.D. ∅ 12 mm	**QSC-12H**	**153 271**
Push-in fittings					
	B	Push-in fitting	for tubing O.D. ∅ 6 mm	**QS-F-G⅛-6**	**193 409**
	A		for tubing O.D. ∅ 8 mm	**QS-F-G⅛-8**	**193 410**
	–		for tubing O.D. ∅ 12 mm	**QS-F-G⅜-12**	**197 487**
	D	Push-in L-fitting	for tubing O.D. ∅ 6 mm	**QSL-F-G⅛-6**	**193 419**
	C		for tubing O.D. ∅ 8 mm	**QSL-F-G⅛-8**	**193 420**
	–		for tubing O.D. ∅ 12 mm	**QSL-F-G⅜-12**	**197 486**

Ordering data					
	Code	Description		Type	Part No.
User documentation					
	D	Pneumatic components – CDVI	German	**P.BE-CDVI-DE**	**197 361**
	E		English	**P.BE-CDVI-EN**	**197 363**
	S		Italian	**P.BE-CDVI-IT**	**197 369**
	I		Spanish	**P.BE-CDVI-ES**	**197 367**
	V		Swedish	**P.BE-CDVI-SV**	**197 371**
	D	Electrical components – CDVI-DN	German	**P.BE-CDVI-DN-DE**	**539 044**
	E		English	**P.BE-CDVI-DN-EN**	**539 045**
	I		Italian	**P.BE-CDVI-DN-IT**	**539 048**
	S		Spanish	**P.BE-CDVI-DN-ES**	**539 046**
	V		Swedish	**P.BE-CDVI-DN-SV**	**539 049**