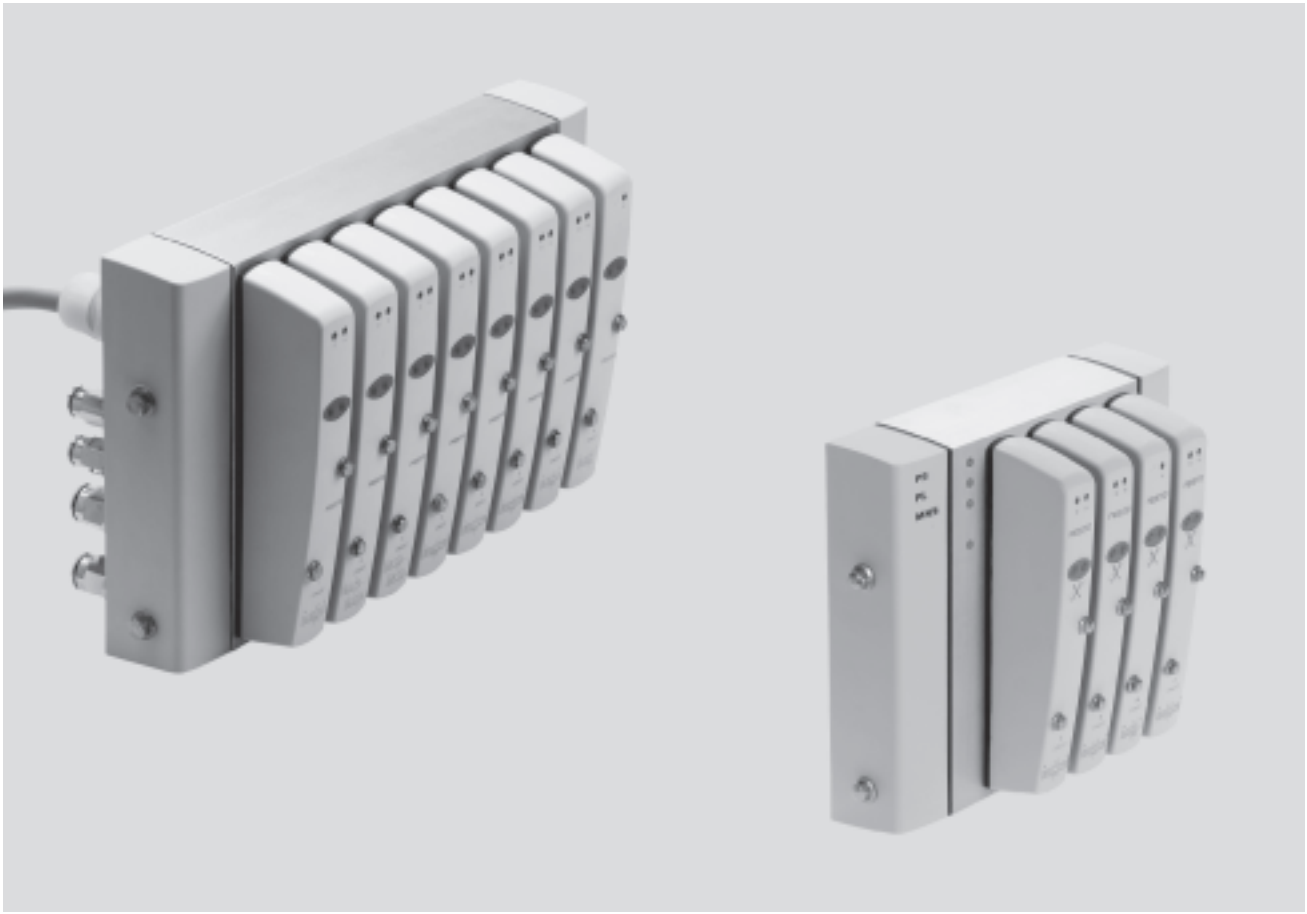
Valve terminal type 15 CDVI, Clean Design

FESTO

- Clean Design modular valve terminal
- Hygienic
- Resistant to corrosion
- Easy to clean
- Certification to HACCP

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, 5/2-way double solenoid, 5/3-way, 2 x 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

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 various equipment options for the valve terminal are included in the tables in the ordering system section on page ➔ 4 / 3.4-32.

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:

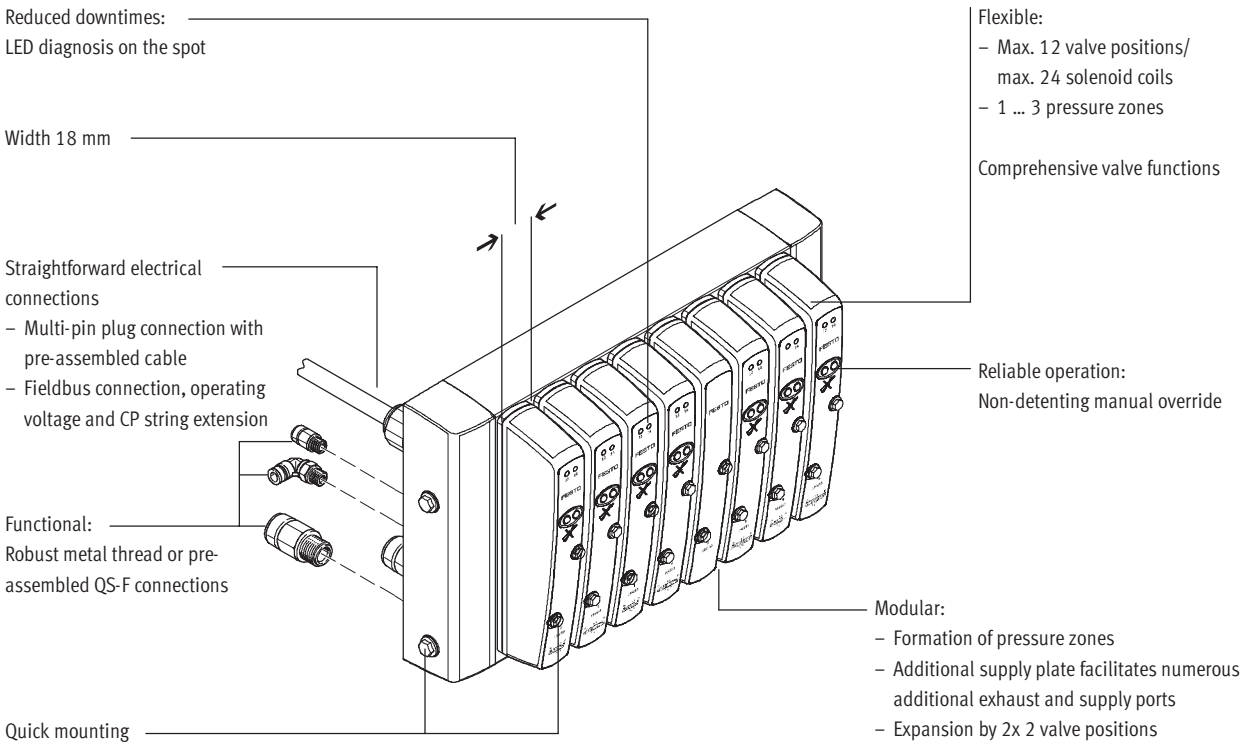
- Henkel
- Ecolab
- Johnson Diversy
- Kärcher

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
- 5/3-way valve, mid-position pressurised
- 5/3-way valve, mid-position closed
- 5/3-way valve, mid-position exhausted

Special features

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

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

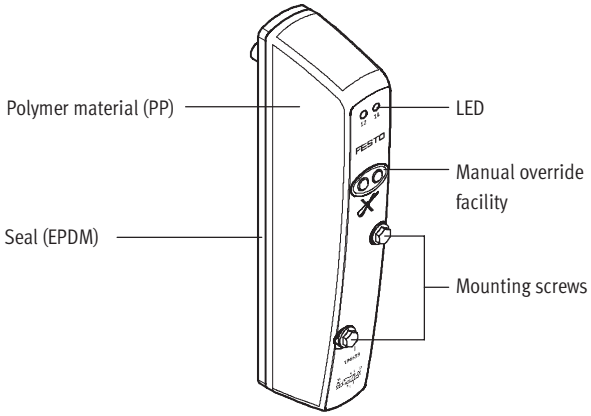
Individual valve
- Electrical connection via multi-pin cable

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

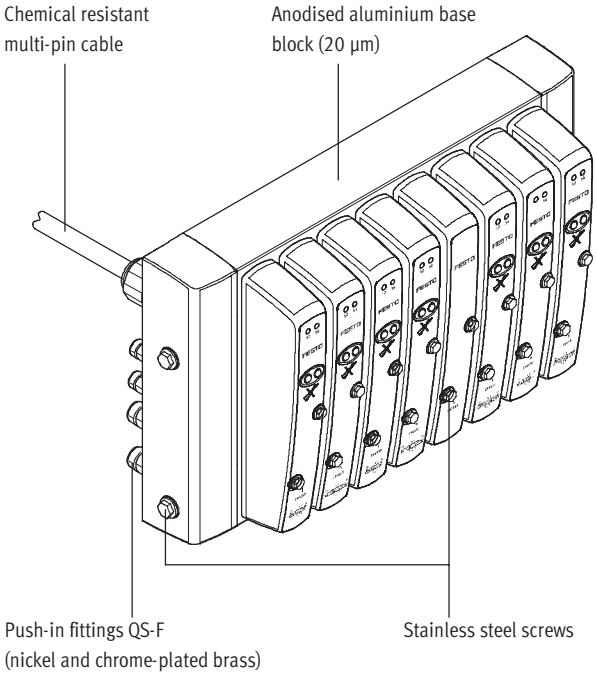
Valve terminal type 15 CDVI, Clean Design

Key features – Pneumatic components

The features



The ideal range for the food industry



Choose from

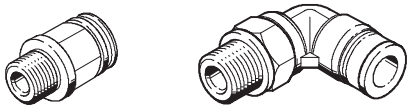
- a wide range comprising actuators to accessories in corrosion resistant designs that are easy to clean,
- as well as valves,
- stainless steel fittings and flow control valves and
- tubing approved for use in the food industry.

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

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

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
➔ 4 / 3.4-32

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 the Festo home page and selected the appropriate country, select “Industrial Automation” and “Catalogue” to go to the home page for the Pneumatic Catalogue. Activate the “Direct search” menu.

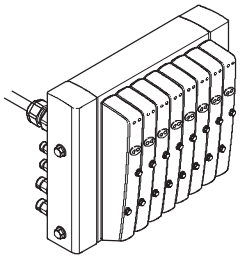
Here you can specify a “Part no.” (e.g. 197648), “Type” (e.g. CDVI) or “Article designation” (e.g. valve terminal) to find your “Search result”. Click on the blue shopping basket to complete the selected product according to your specifications (this does not initiate an order).

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

Multi-pin plug connection

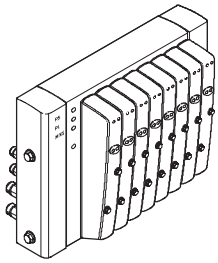


Control signals from the controller to the valve terminal are transmitted via a pre-assembled multi-core cable or a self-assembly multi-pin plug connection, which substantially reduces installation time.

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

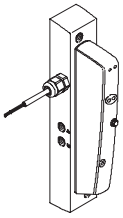


An integrated fieldbus node manages the communication connection to a higher-order PLC. This enables a space-saving pneumatic and electronic solution.

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

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.

Valve terminal type 15 CDVI, Clean Design

Key features

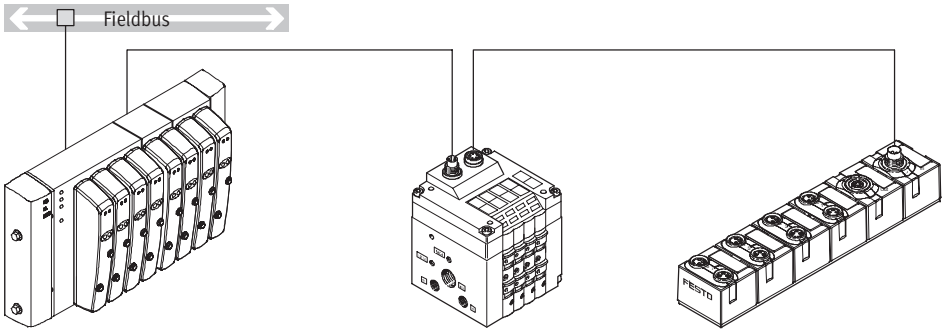
CP string extension

The optional string extension allows an additional valve terminal and I/O modules to be connected to Fieldbus Direct. A CP string of the CP 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

→ 4 / 4.6-1



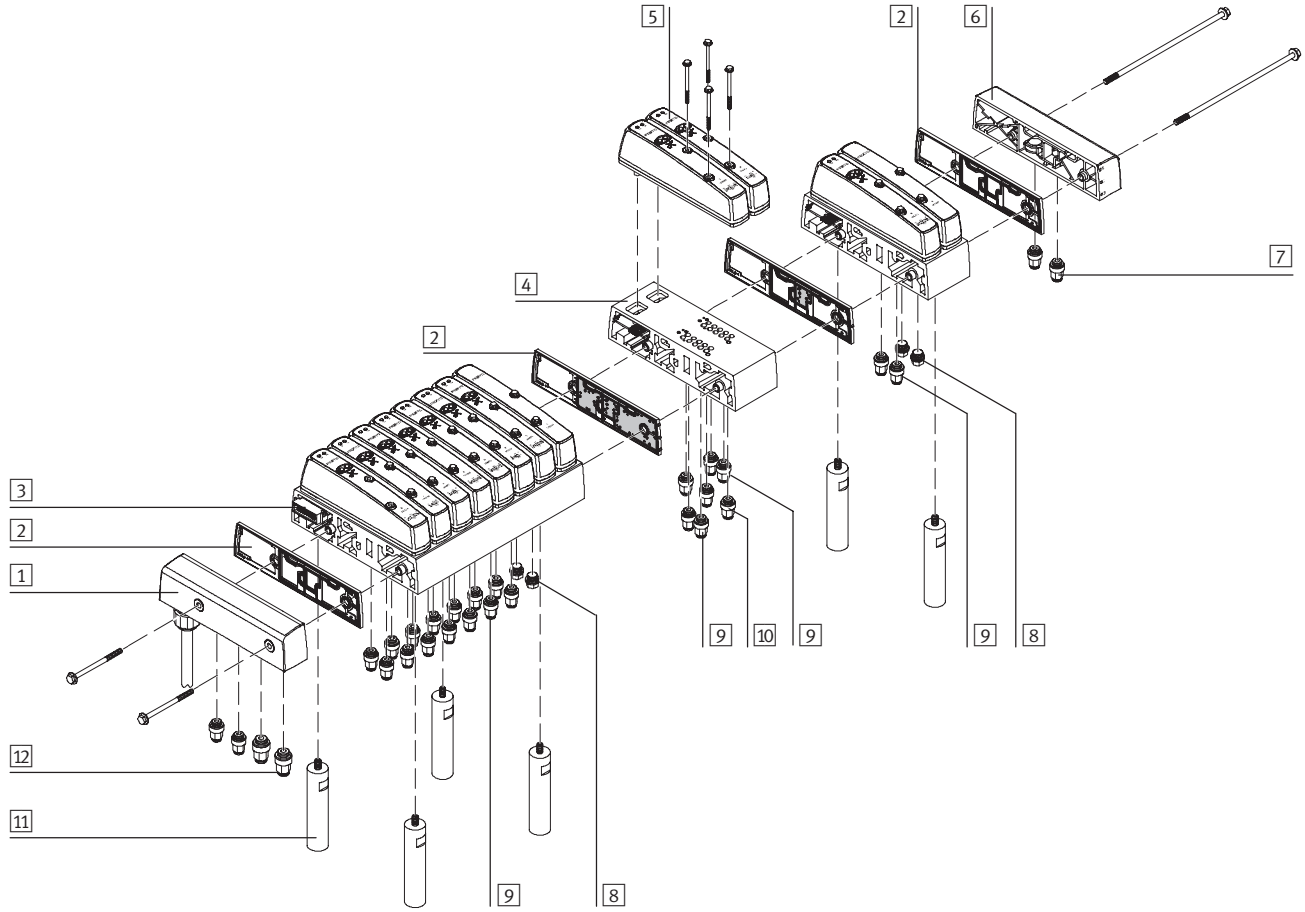
CDVI-DN valve terminals with fieldbus interfaces can be equipped with 4, 6, 8 or 12 valve positions and 4 to 24 solenoid coils.

Valve terminal type 15 CDVI, Clean Design

Peripherals overview

Overview – Clean Design valve terminal

Valve terminal with multi-pin plug connection Order via ident. code➔ 4 / 3.4-32



1 Left-hand end plate with multi-pin plug connection
2 Seal/separator plate
3 4/8-valve basic block
4 Expansion block/energy supply module
5 Valves
6 Right-hand end plate
7 Push-in fittings, right-hand end plate
8 Blanking plugs
9 Push-in fittings, working lines
10 Push-in fittings, energy supply module
11 Spacer bolt
12 Push-in fittings, left-hand end plate

- - Note

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

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.

Valve terminal type 15 CDVI, Clean Design

Peripherals overview

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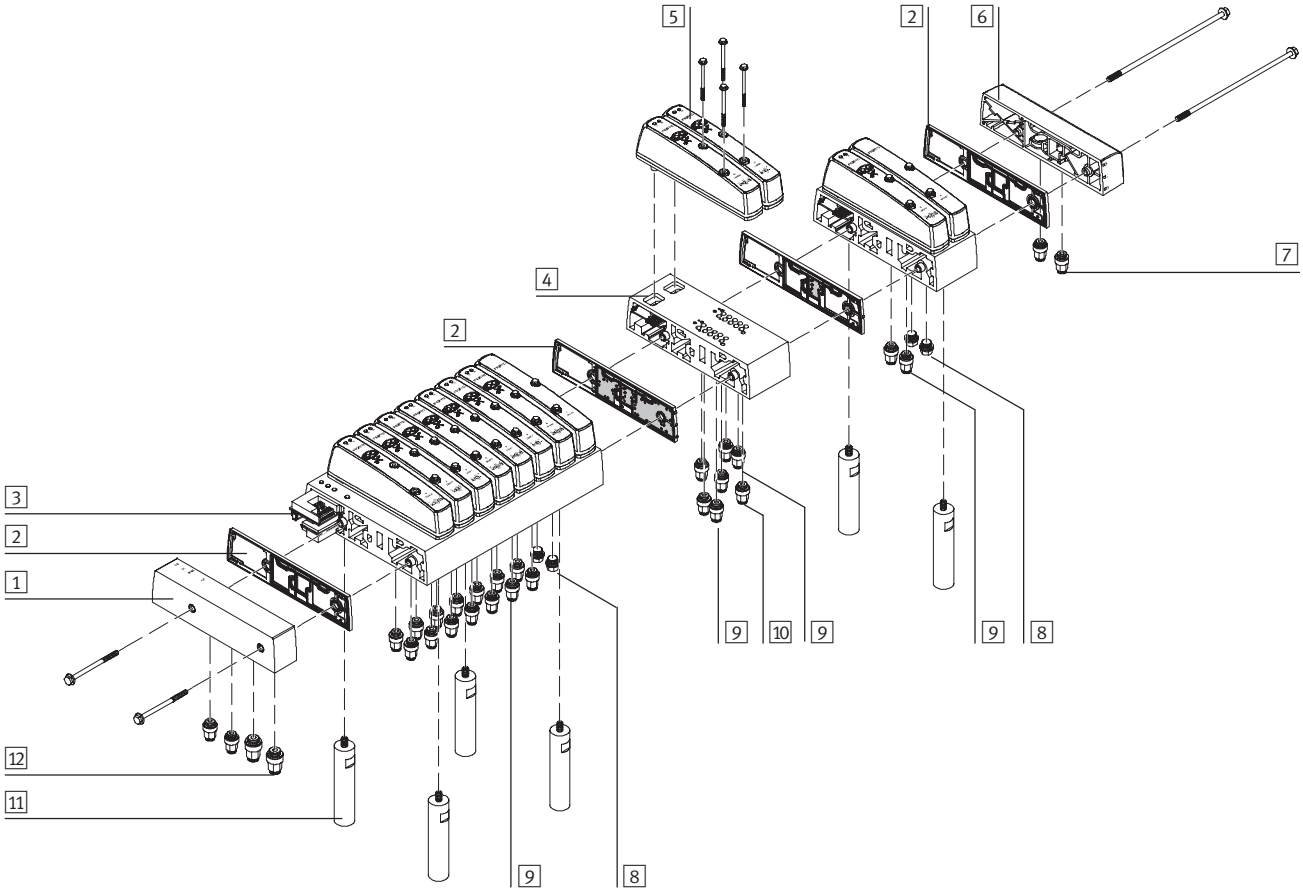
Overview – Clean Design valve terminal

Valve terminal with fieldbus connection

Order via ident. code➔ 4 / 3.4-32



1 Left-hand end plate for fieldbus connection
2 Seal/separator plate
3 4/8-valve basic block with setting options for fieldbus
4 Expansion block/energy supply module
5 Valves
6 Right-hand end plate
7 Push-in fittings, right-hand end plate
8 Blanking plugs
9 Push-in fittings, working lines
10 Push-in fittings, energy supply module
11 Spacer bolt
12 Push-in fittings, left-hand end plate

- Note

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

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.

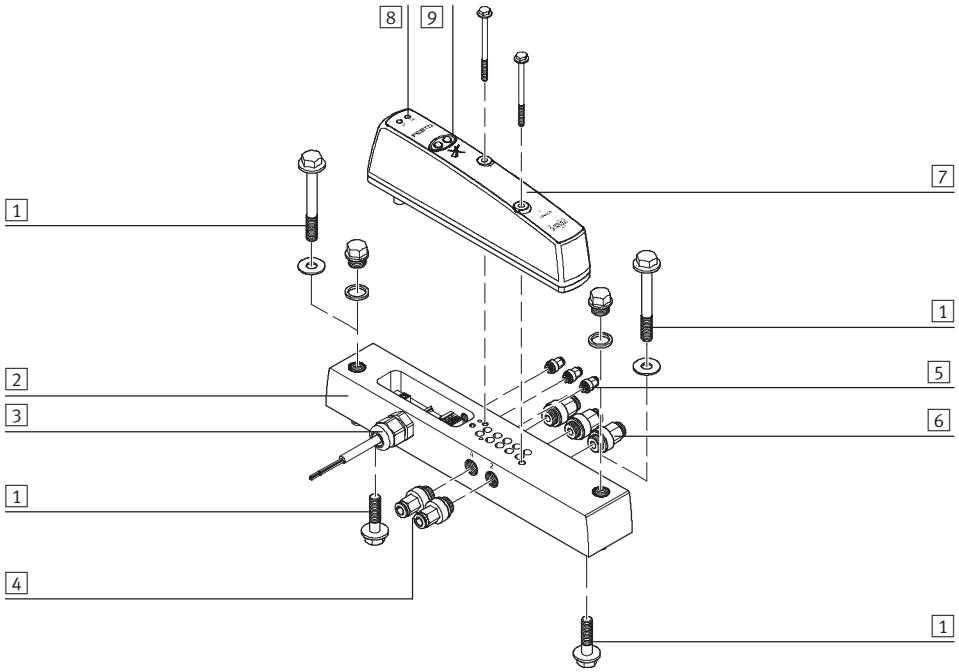
If you have included fittings with your order, the pressure relieving hole is also equipped with a QS fitting.

Valve terminal type 15 CDVI, Clean Design

Peripherals overview

Overview – Clean Design valve terminal

Individual sub-base Order via ident. code➔ 4 / 3.4-34



1 Mounting from above or below
2 Sub-base for individual valve
3 Individual electrical connection
4 Push-in fitting (working lines)
5 Push-in fitting for pilot air supply and exhaust, venting hole
6 Push-in fitting for compressed air supply and exhaust
7 Valve
8 LED display
9 Manual override (per solenoid coil, non-detenting)

Note

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

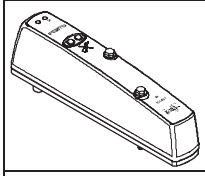
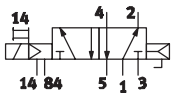
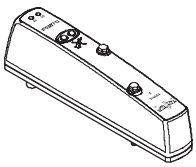
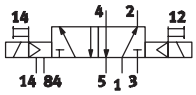
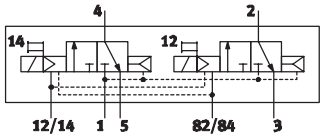
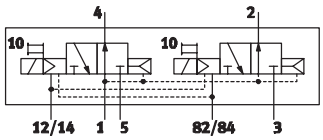
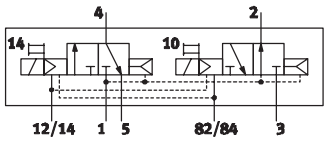
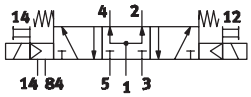
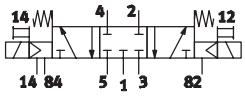
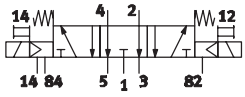
All valves on the CDVI valve terminal can be assembled on the individual sub-base CDSV. The individual sub-base CDSV has a connection for external pilot air supply, is pre-assembled with valve and 10 m PVC cable and is fully inspected before shipment. Assembled push-in fittings included on request.

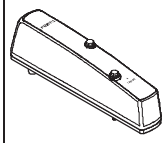
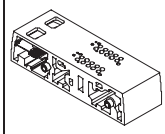
A Clean Design mounting set comprising two screws (18 mm and 40 mm) and two stainless steel blanking plugs permits mounting from above or below.

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.

Valves

	Code	Circuit symbol	Description
	M		5/2-way single solenoid valve Pneumatic spring return Suitable for vacuum
	J		5/2-way double solenoid valve Suitable for vacuum
	K		2x 3/2-way single solenoid valve Normally closed Pneumatic spring return Not suitable for vacuum
	N		2x 3/2-way single solenoid valve Normally open Pneumatic spring return Not suitable for vacuum
	H		2x 3/2-way single solenoid valve 1x normally closed, 1x open Pneumatic spring return Not suitable for vacuum
	B		5/3-way valve Mid-position pressurised Spring force 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 Spring force 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 Spring force 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

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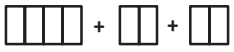
Modularity

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).
➔ 4 / 3.4-32

Pressure zones

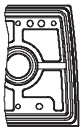
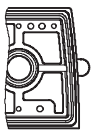
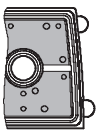
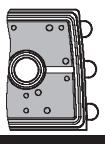
CDVI offers a number of options for creating pressure zones if different working pressures are required. Pressure zones are created by isolating the internal supply channels between basic and expansion blocks using an appropriate separating seal.

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

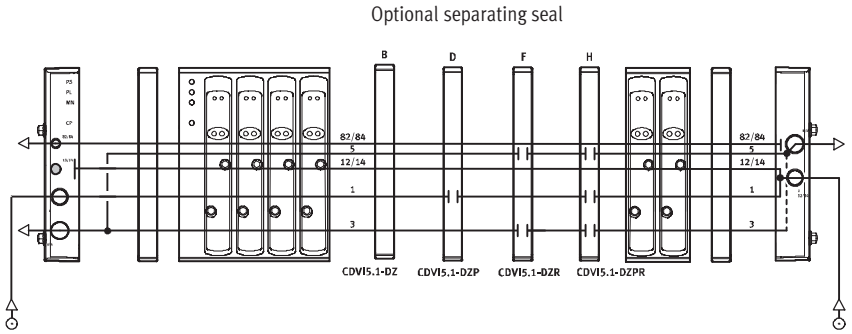
Normally only duct 1 is separated. Ducts 3 and 5 or 1, 3 and 5 can also be separated for special applications.

Examples: Compressed air supply and pilot air supply

Internal pilot supply air

Code U, Y

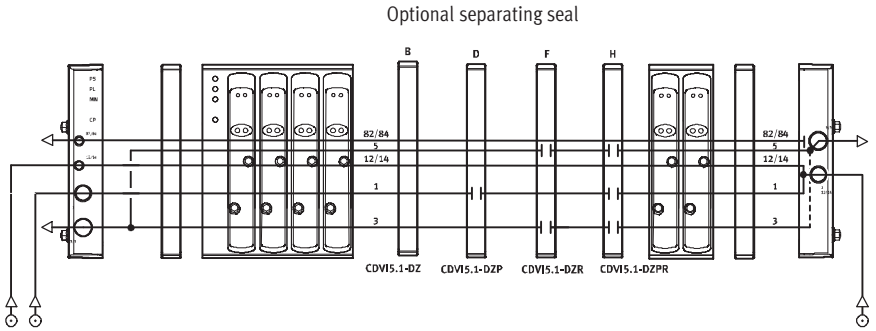
The diagram opposite shows an example for the configuration and connection of the compressed air supply with an internal pilot air supply. Port 12/14 on the left-hand end plate is tightly sealed. The pilot air is supplied via the right-hand end plate. Separating seals can be used optionally to create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



External pilot supply air

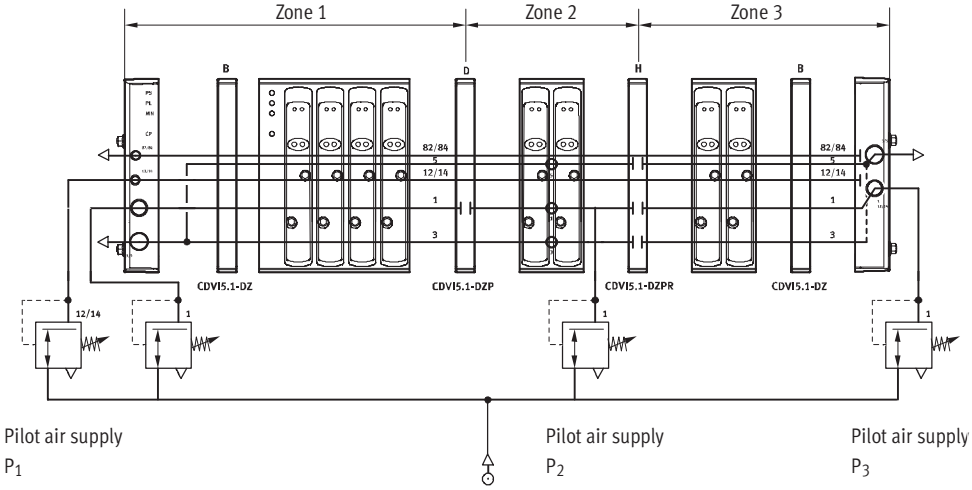
Code V, Z

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

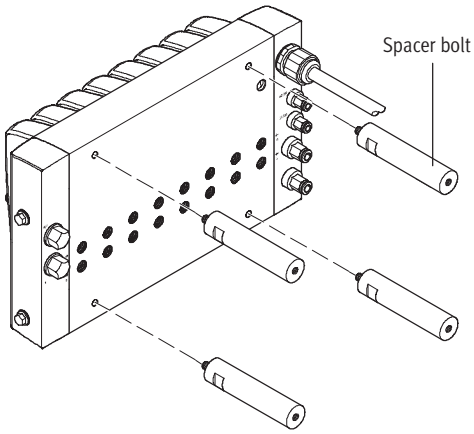
CDVI facilitates the creation of up to 3 pressure zones. The diagram opposite shows an example for the configuration and connection of three pressure zones using separating seals – with an external pilot air supply of 3 ... 6 bar.

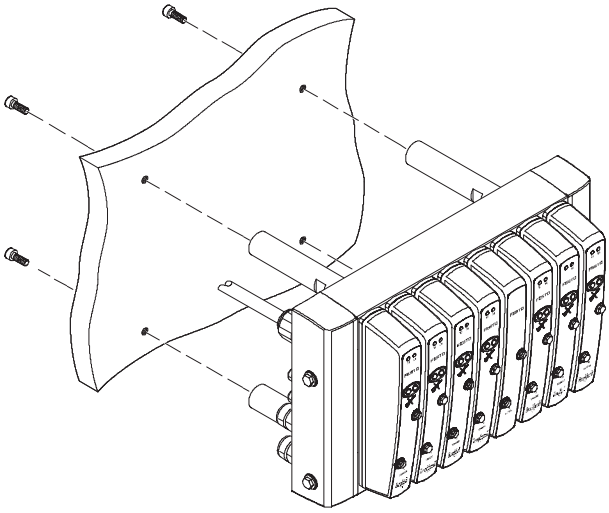


Note

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.

Valve terminal assembly





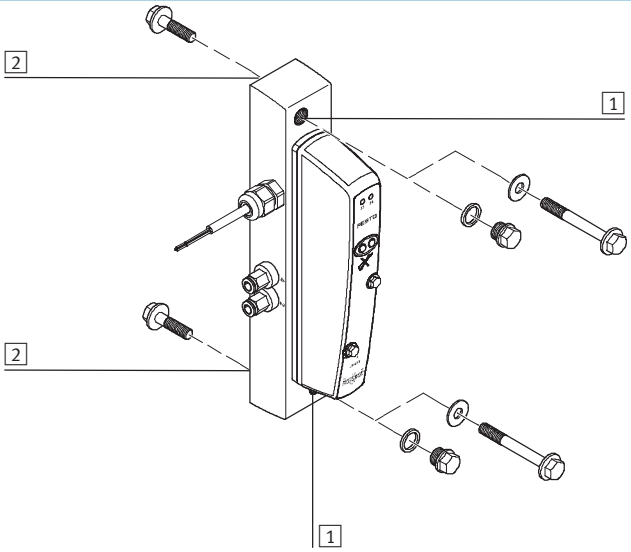
The CDVI can be mounted directly on earthed mounting surfaces using the four threaded holes in the basic block and the spacer bolts ordered via the order code (accessories order code Y).

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.

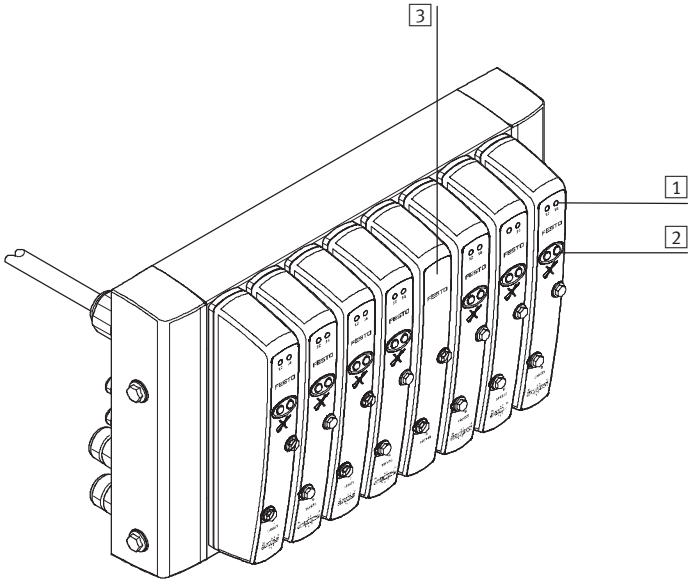
Individual sub-base assembly



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

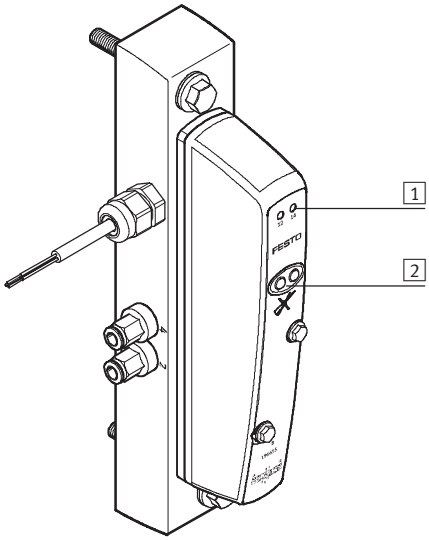
[2] Hole for rear mounting (CDSV) using M6 screws

Display and control elements – Valve terminal



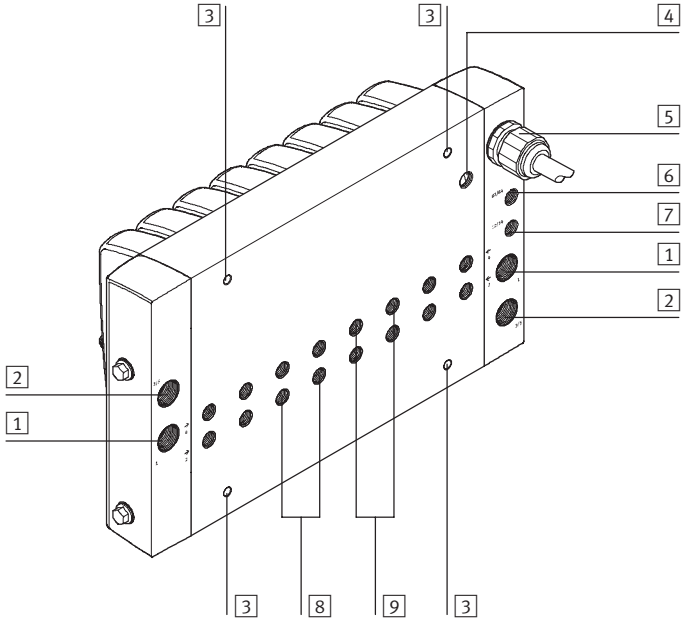
1 Yellow LEDs (one per valve solenoid)
2 Non-detenting manual override (one per solenoid valve coil)
3 Vacant valve position with blanking plate

Display and control elements – Individual sub-base



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

Connections – Valve terminal

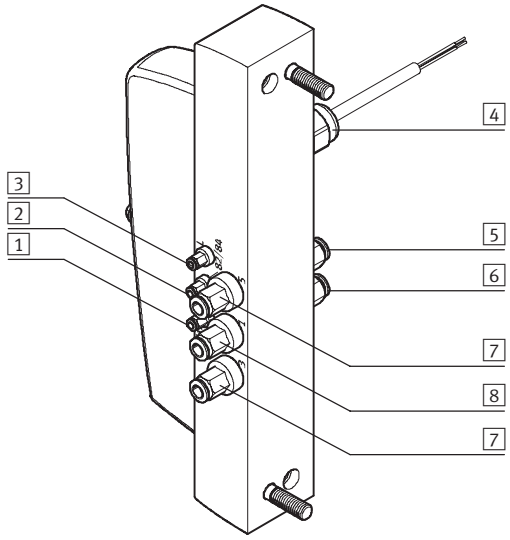


1 Supply port (1)
2 Exhaust port (3/5)
3 4 threaded holes for spacer bolts
4 Pressure relieving port/venting hole
5 Electrical multi-pin plug connection
6 Pilot exhaust port (82/84)
7 Pilot air supply port (12/14)
8 Working line (2) per valve
9 Working line (4) per valve

Line		Port code (ISO 5599)	Connection size (ISO 228)	Connector fitting[1)]
Compressed 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.

Connections – Individual sub-base

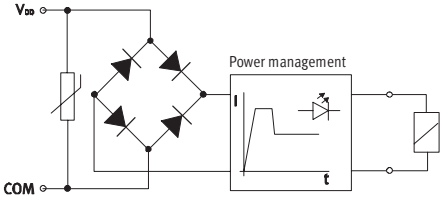


1 Pilot exhaust port (82/84)
2 Pilot air supply port (12/14)
3 Pressure relieving port/venting hole
4 Electrical connection
5 Working line (4) per valve
6 Working line (2) per valve
7 Exhaust port (3/5)
8 Supply port (1)

Valve terminal type 15 CDVI, Clean Design

Key features – Electrical components

Electrical power as a result of current reduction



Each valve 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

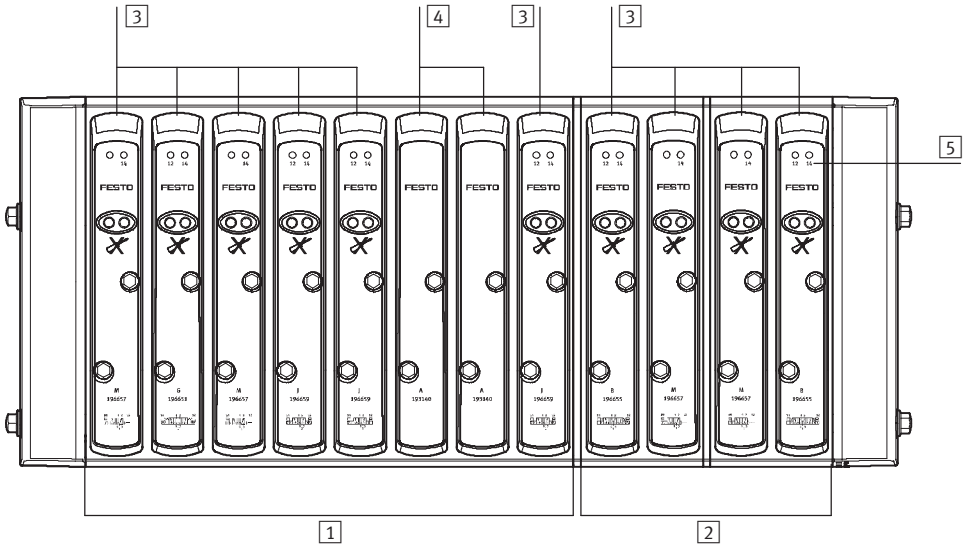
Address allocation – Valves with multi-pin plug

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

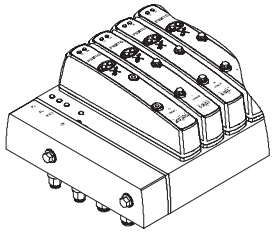


1 Basic block: 8 or 16 addresses
2 Expansion block: 8 addresses
3 Valves
4 Vacant positions
5 Number of solenoid coils

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 CP installation system to be used.

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

➔ Info 221 CP installation system

Addressing order for valves with fieldbus

The CDVI valve terminal occupies 8, 16 or 24 addresses, regardless of the number of valve 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.

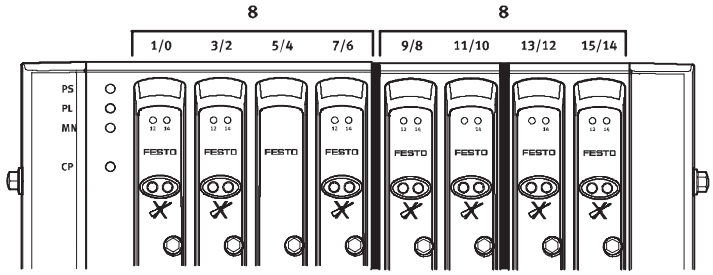
If a valve position is equipped with a valve with 2 pilot solenoid coils, the following allocation applies:

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

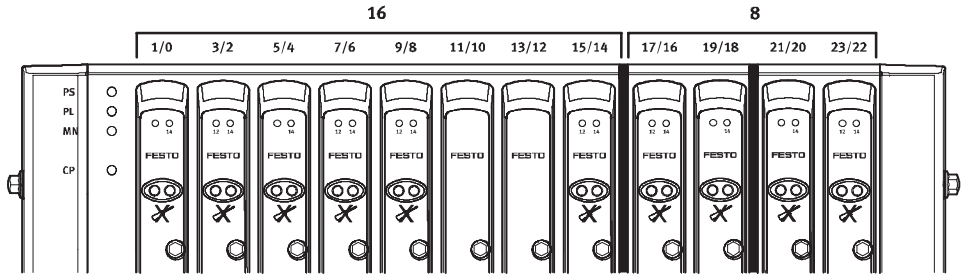
The more significant address is not used in valves with only one pilot solenoid coil.

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 51 524-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 51 524, 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.

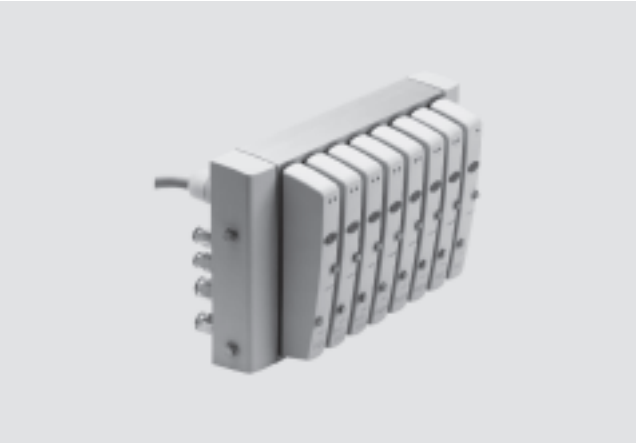
Valve terminal type 15 CDVI, Clean Design

Technical data

FESTO

Flow rate
300 ... 650 l/min

Valve width
18 mm



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

Constructional design		Piston spool valve
Width	[mm]	18
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
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)

Operating pressure [bar]									
Valve function ordering code		M	J	N	K	H	B	E	G
P1 with internal pilot air supply		3 ... 6 (not available on the CDSV)							
P1 with external pilot air supply		3 ... 6							
P1 External pilot supply air		–0.9 ... +10		3 ... 10[1)]			–0.9 ... +10		

1) 3/2-way valves not suitable for vacuum

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

Valve terminal type 15 CDVI, Clean Design

Technical data

FESTO

Operating and environmental conditions									
Valve function ordering code		M	J	N	K	H	B	E	G
Operating medium		Filtered compressed air, lubricated or unlubricated							
Grade of filtration	[µm]	40							
Storage temperature	[°C]	–20 ... +40							
Operating temperature	[°C]	–5 ... +50							
Temperature of medium	[°C]	–5 ... +50							
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.

Electrical data									
Valve function ordering code		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		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

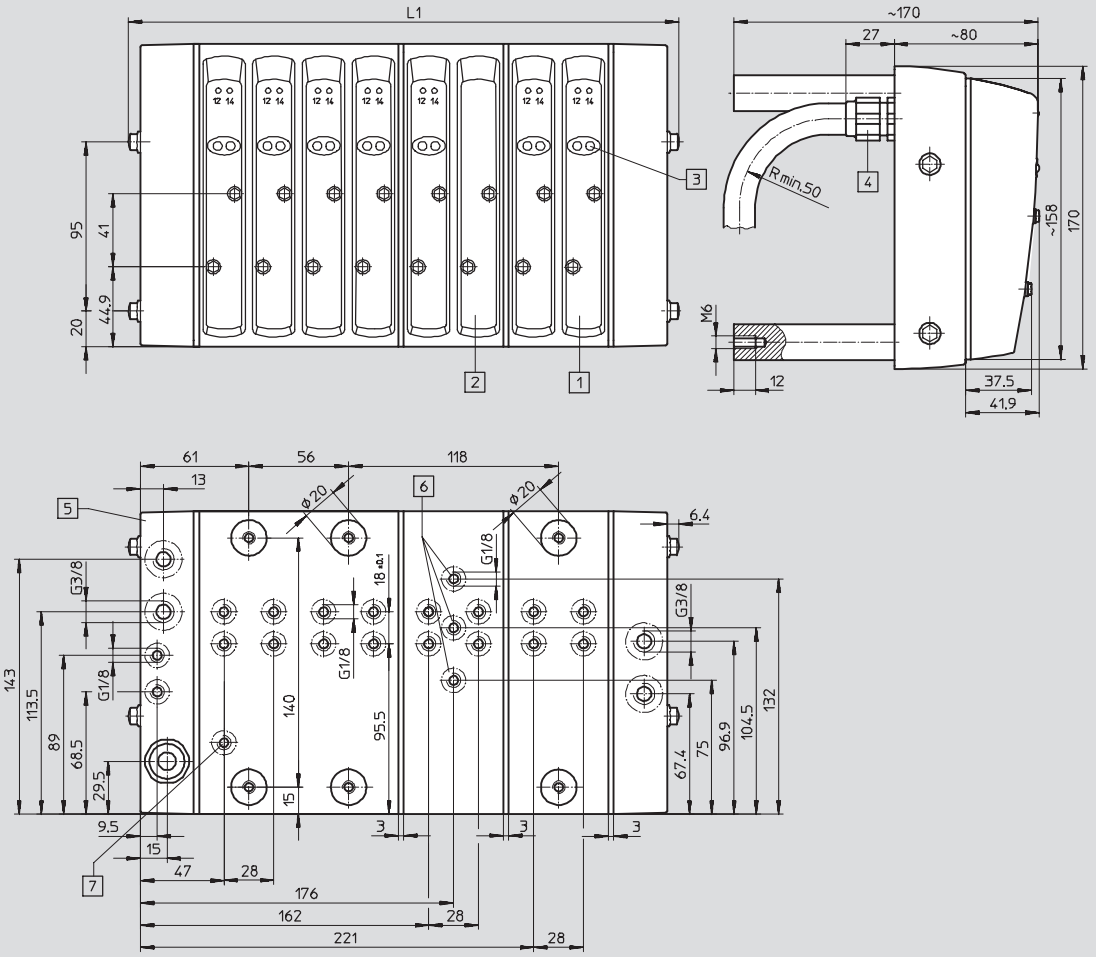
Technical data

Product weight [g]	Approx. weights							
Valve function ordering code	M	J	N	K	H	B	E	G
CDVI with 4 valve positions MP with fittings, 10 m cable and valves	4170							
CDVI with 8 valve positions MP with fittings, 10 m cable and valves	6170							
CDVI with 4 valve positions FB with fittings and valves	2760							
CDVI with 8 valve positions FB with fittings and valves	4760							
Expansion block (2 valve positions) with fitting and valves	1030							
Valve	210							
CDSV individual sub-base with fittings and valve	1070							
Spacer bolt (2 pieces)	160							

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

Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

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

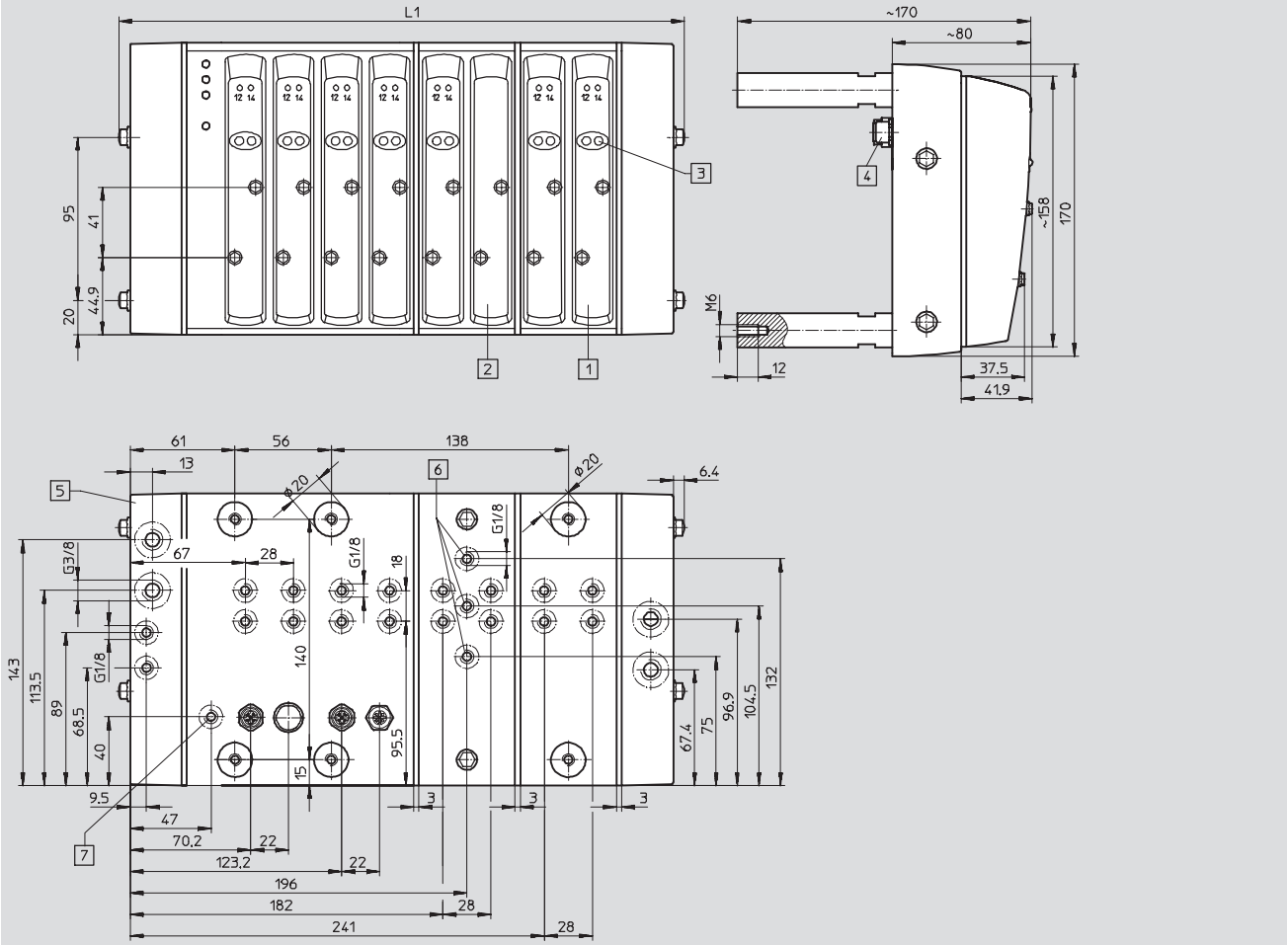


1 Choice of single solenoid or double solenoid valve
2 Blanking plate
3 Manual override facility
4 Cable conduit fitting M20x1.5
5 Right-hand end plate: optional external pilot air supply or internal pilot air supply
6 Port for further pressure zone
7 Venting hole

	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/en/engineering**

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

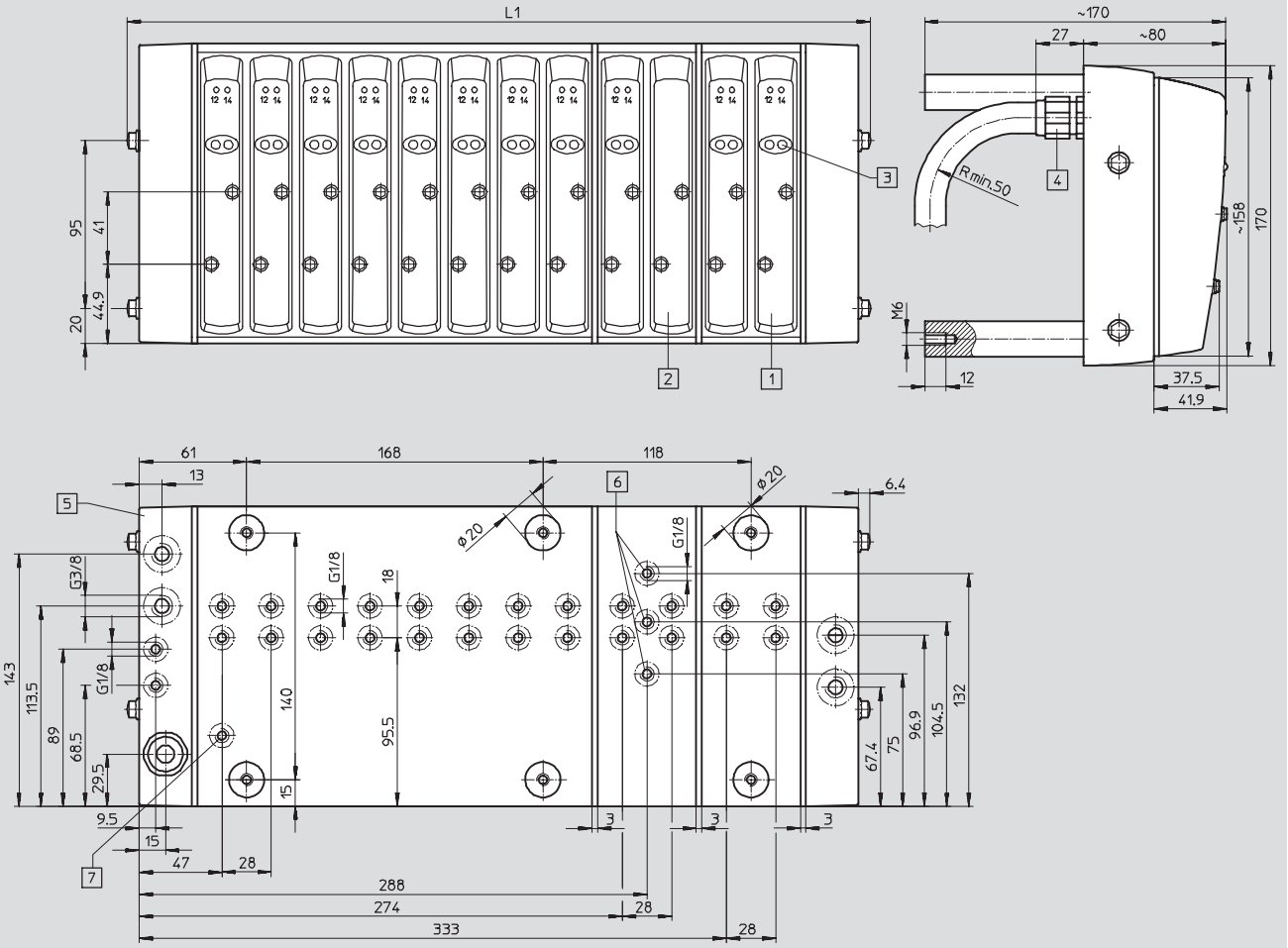


1 Choice of single solenoid or double solenoid valve
2 Blanking plate
3 Manual override facility
4 Bus connection/power supply
5 Right-hand end plate: optional external pilot air supply or internal pilot air supply
6 Port for further pressure zone
7 Venting hole

	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/en/engineering**

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

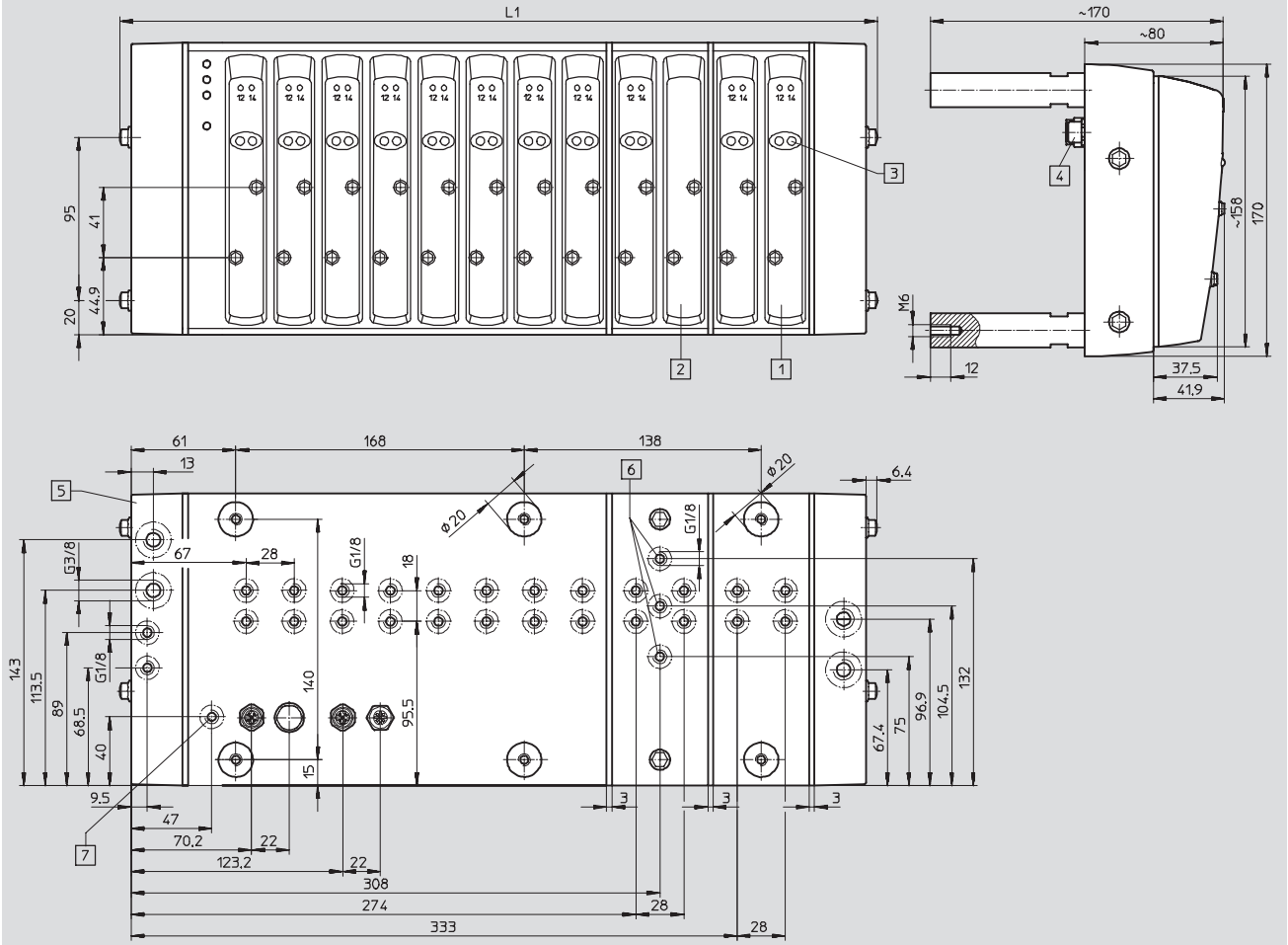


1 Choice of single solenoid or double solenoid valve
2 Blanking plate
3 Manual override facility
4 Cable conduit fitting M20x1.5
5 Right-hand end plate: optional external pilot air supply or internal pilot air supply
6 Port for further pressure zone
7 Venting hole

	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/en/engineering**

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

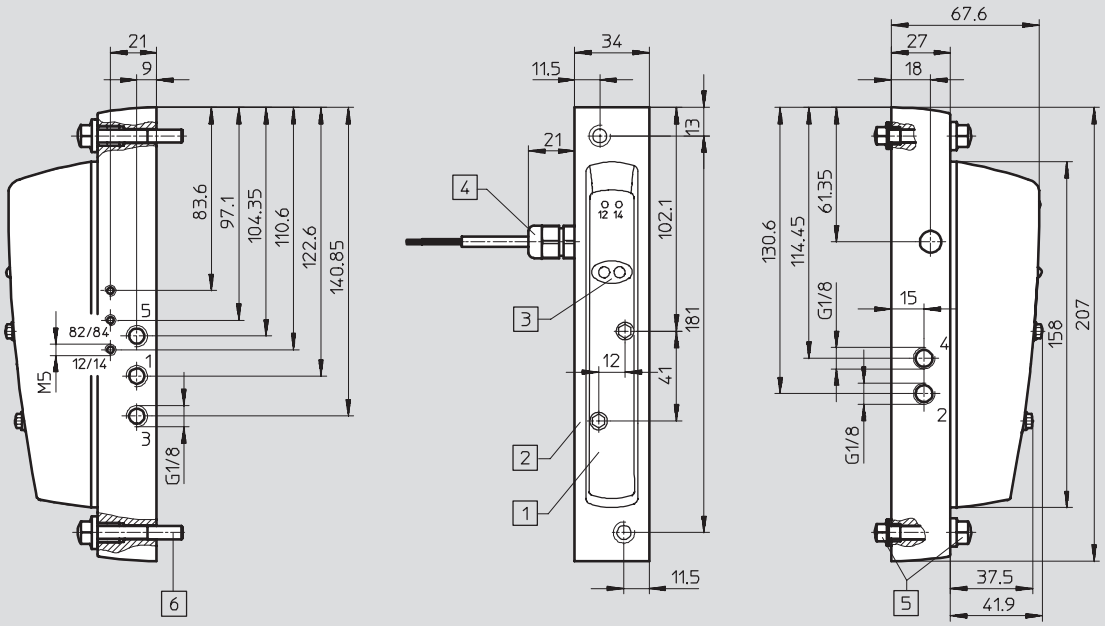


1 Choice of single solenoid or double solenoid valve
2 Blanking plate
3 Manual override facility
4 Bus connection/power supply
5 Right-hand end plate: optional external pilot air supply or internal pilot air supply
6 Port for further pressure zone
7 Venting hole

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

Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

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 G⅛
2x sealing ring G⅛
6 For mounting from above:
2x screw M6x40-A2-80
2x sealing ring CRO-M6

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-G⅛ fittings in the working ports for optimum flow
- Suitable straight QS-F-G⅜ 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).

Valve terminal type 15 CDVI, Clean Design

Ordering data – Modular products

FESTO

M **Mandatory data** →

Module No.	Valve terminal, pneumatic part		Electrical connection		No. of valves on the basic block	Pneumatic connection		End plates/ compressed air supply	Type of seal		Basic block equipment at valve position 0 ... 7 Valves
197 648	15P		K05, K10, F11		4, 8	A, B, C, D, G		U, V, Y, Z	R		M, J, G, E, B, K, N, H, A
Ordering example											Valve position 0 1 2 3 4 5 6 7
197 648	15P	–	K10	–	8	C	–	Y	R	–	E B H H M G M B
1	2		3		4	5		6	7		8

Ordering table

				Conditions	Code		Enter code
M	1	Module No.	197648				
	2	Valve terminal, pneumatic part	Clean Design CDVI type 15		15P		15P
	3	Electrical connection	Multi-pin, cable 5 m		-K05		
			Multi-pin, cable 10 m		-K10		
			Fieldbus node for DeviceNet		-F11		
	4	No. of valves on the basic block	4		-4		
			8		-8		
	5	Pneumatic connection	QS fittings, straight, tubing 8 mm		A		
			QS fittings, straight, tubing 6 mm		B		
			QS fittings, angled, tubing 8 mm	1	C		
			QS fittings, angled, tubing 6 mm	1	D		
			No fitting		G		
	6	End plates/compressed air supply	Supply at left, internal pilot air supply	2	-U		
			Supply at left, external pilot air supply	2	-V		
			Supply at both ends, internal pilot air supply		-Y		
			Supply at both ends, external pilot air supply		-Z		
	7	Type of seal	Resistant to cleaning agents		R		R
	8	Basic block equipment	Valve position 0 ... 7	3	-		-
		Valves	5/2-way valve, single solenoid		M		Enter equipment selection for valve positions in order code.
			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		
			2x3/2-way valve, normally closed		K		
			2x3/2-way valve, normally open		N		
			2x3/2-way valve, 1x normally open, 1x closed		H		
↓			Blanking plate for vacant valve position		A		

1 **C, D** Not with power supply modules K, I.

2 **U, V** Not with separator plates/power supply modules D, F, H, K, I.

3 **Basic block equipment**
Number of valve positions: Basic block: 4, 8.
Expansion block: 2

4 **B, D, F, H, K, I**
2 valve positions must be occupied after the separator plate/power supply module.
Depending on the separator plate/power supply module selection made for expansion block 1, only the following selections are available for expansion block 2 → 5 ... 10:

5 **B** Expansion block 1: B;
selection for expansion block 2: separator plate B, D, F or H.

6 **D** Expansion block 1: D;
selection for expansion block 2: separator plate B or F.

7 **F** Expansion block 1: F;
selection for expansion block 2: separator plate B or D.

8 **H** Expansion block 1: H;
selection for expansion block 2: separator plate B.

9 **K** Expansion block 1: K;
selection for expansion block 2: separator plate D or H.
K may only be attached directly after the basic block.

10 **I** Expansion block 1: I;
selection for expansion block 2: separator plate D or H.
I may only be attached directly after the basic block.

Transfer order code

197 648	15P	–		–			–		R	–	0	1	2	3	4	5	6	7
1	2		3		4	5		6	7		8							

Valve terminal type 15 CDVI, Clean Design

Ordering data – Modular products

FESTO

➔ O Options				M Mandatory data	O Options
Expansion block 1	Expansion block 1 equipment (valve position 0 … 1)	Expansion block 2	Expansion block 2 equipment (valve position 0 … 1)	User documentation	Accessories
B, D, F, H, K, I	M, J, G, E, B, K, N, H, A Valve position 0 1	B, D, F, H	M, J, G, E, B, K, N, H, A Valve position 0 1	D, E, I, S, V, B	Y
– [ ]	– [ ] [ ]	– [ ]	– [ ] [ ]	– B	+ [ ]
9	10	11	12	13	14

Ordering table

Module No.			197 648	Conditions	Code		Enter code
O	9	Expansion block 1	Separator plates	With single solenoid valves, no duct separated	4 5	-B		
				With single solenoid valves, duct 1 separated	4 6	-D		
				With single solenoid valves, duct 3/5 separated	4 7	-F		
				With single solenoid valves, duct 1+3/5 separated	4 8	-H		
			Power supply modules	With single solenoid valves with extra supply, duct 1 separated	4 9	-K		
				With single solenoid valves with extra supply, duct 1+3/5 separated	4 10	-I		
	10	Equipment		Expansion block 1 (valve position 0 … 1)		-		-
		Valves		5/2-way valve, single solenoid		M		Enter equipment selection for valve positions in order code.
				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		
				2x3/2-way valve, normally closed		K		
				2x3/2-way valve, normally open		N		
				2x3/2-way valve, 1x normally open, 1x closed		H		
				Blanking plate for vacant valve position		A		
	11	Expansion block 2	Separator plates	With single solenoid valves, no duct separated		-B		
				With single solenoid valves, duct 1 separated		-D		
				With single solenoid valves, duct 3/5 separated		-F		
				With single solenoid valves, duct 1+3/5 separated		-H		
	12	Equipment		Expansion block 2 (valve position 0 … 1)		-		-
		Valves		5/2-way valve, single solenoid		M		Enter equipment selection for valve positions in order code.
				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		
				2x3/2-way valve, normally closed		K		
				2x3/2-way valve, normally open		N		
				2x3/2-way valve, 1x normally open, 1x closed		H		
				Blanking plate for vacant valve position		A		
M	13	User documentation		German		-D		
				English		-E		
				Italian		-I		
				Spanish		-S		
				Swedish		-V		
				Express waiver - no manual to be included (already available)		-B		
O	14	Accessories				+		+
		Mounting		Spacer bolt, length 1		Y		

Transfer order code									
	0	1		0	1				
– [ ]	– [ ] [ ]	– [ ]	– [ ] [ ]	– [ ]	+ [ ]
9	10	11	12	13	14

Valve terminal type 15 CDVI, Clean Design – Individual valves

Ordering data – Modular products

FESTO

M Mandatory data →

Module No.	Valve terminal, pneumatic part		Electrical connection		No. of valves on the basic block	Pneumatic connection		End plates/ compressed air supply	Type of seal		Basic block equipment, valve position 0
											Valves
197 648	15P		K10		1	B, G		X	R		M, J, G, E, B, K, N, H, A
Ordering example											Valve position 0
197 648	15P	–	K10	–	1	B	–	X	R	–	M
1	2		3		4	5		6	7		8

→ **M Mandatory data**

User documentation	
B	
– B	+
9	10

O Options

Accessories
Z
10

Ordering table

				Condi-tions	Code		Enter code
M	1	Module No.	**197648**				
	2	Valve terminal, pneumatic part	Clean Design CDVI type 15		**15P**		15P
	3	Electrical connection	Multi-pin, cable 10 m		**-K10**		-K10
	4	No. of valves on the basic block	1		**-1**		-1
	5	Pneumatic connection	QS fittings, straight, tubing 6 mm		**B**		
			No fitting		**G**		
	6	End plates/compressed air supply	Supply at right, external pilot air supply		**-X**		-X
	7	Type of seal	Resistant to cleaning agents		**R**		R
	8	Basic block equipment	Valve position 0		**-**		-
		Valves	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**		
			2x3/2-way valve, normally closed		**K**		
			2x3/2-way valve, normally open		**N**		
			2x3/2-way valve, 1x normally open, 1x closed		**H**		
	9	User documentation	Express waiver - no manual to be included (already available)		**-B**		-B
O	10	Accessories			**+**		+
		Pneumatic accessories	Adapter kit for individual valve CDSV		**Z**		

Transfer order code

													Valve position 0	
197 648	15P	–	K10	–	1		–	X	R	–				→
1	2		3		4	5		6	7		8			

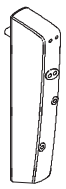
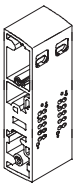
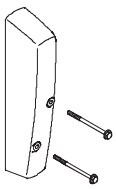
–	B	+	
	9		10

Valve terminal type 15 CDVI, Clean Design

Accessories

FESTO

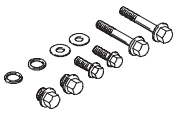
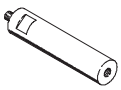
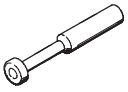
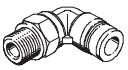
Ordering data

	Code	Description	Type	Part No.
Individual sub-base valve				
	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-2x3OLS-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				
	–	Individual sub-base	**CDSV5.0-AS-1/8**	**534 434**
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**

Valve terminal type 15 CDVI, Clean Design

Accessories

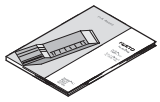
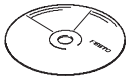
FESTO

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 between angled plug and angled socket	0.5 m	**KVI-CP-1-WS-WD-0,5**	**178 564**
			1 m	**KVI-CP-1-WS-WD-1,0**	**191 892**
			2 m	**KVI-CP-1-WS-WD-2**	**163 139**
			3 m	**KVI-CP-1-WS-WD-3,0**	**191 893**
			5 m	**KVI-CP-1-WS-WD-5**	**163 138**
	–	Connecting cable between straight plug and angled socket	5 m	**KVI-CP-1-GS-WD-5**	**163 137**
			8 m	**KVI-CP-1-GS-WD-8**	**163 136**
	–	Connecting cable between straight plug and straight socket	2 m, for chain link trunking	**KVI-CP-2-GS-GD-2**	**170 234**
			5 m, for chain link trunking	**KVI-CP-2-GS-GD-5**	**170 235**
			8 m, for chain link trunking	**KVI-CP-2-GS-GD-8**	**165 616**
Input and output modules					
	–	Input and output modules, CP system ➔ Electrical installation system CP-EL			
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-R-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**

Valve terminal type 15 CDVI, Clean Design

Accessories

FESTO

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**
	S		French	**P.BE-CDVI-DN-FR**	**539 047**
	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**
Software					
	–	CD-ROM	Valve terminal user documentation (PDF)	**P.CD-VALVE-T**	**183 350**
			Utilities	**P.CD-VI-UTILITIES-2**	**533 500**