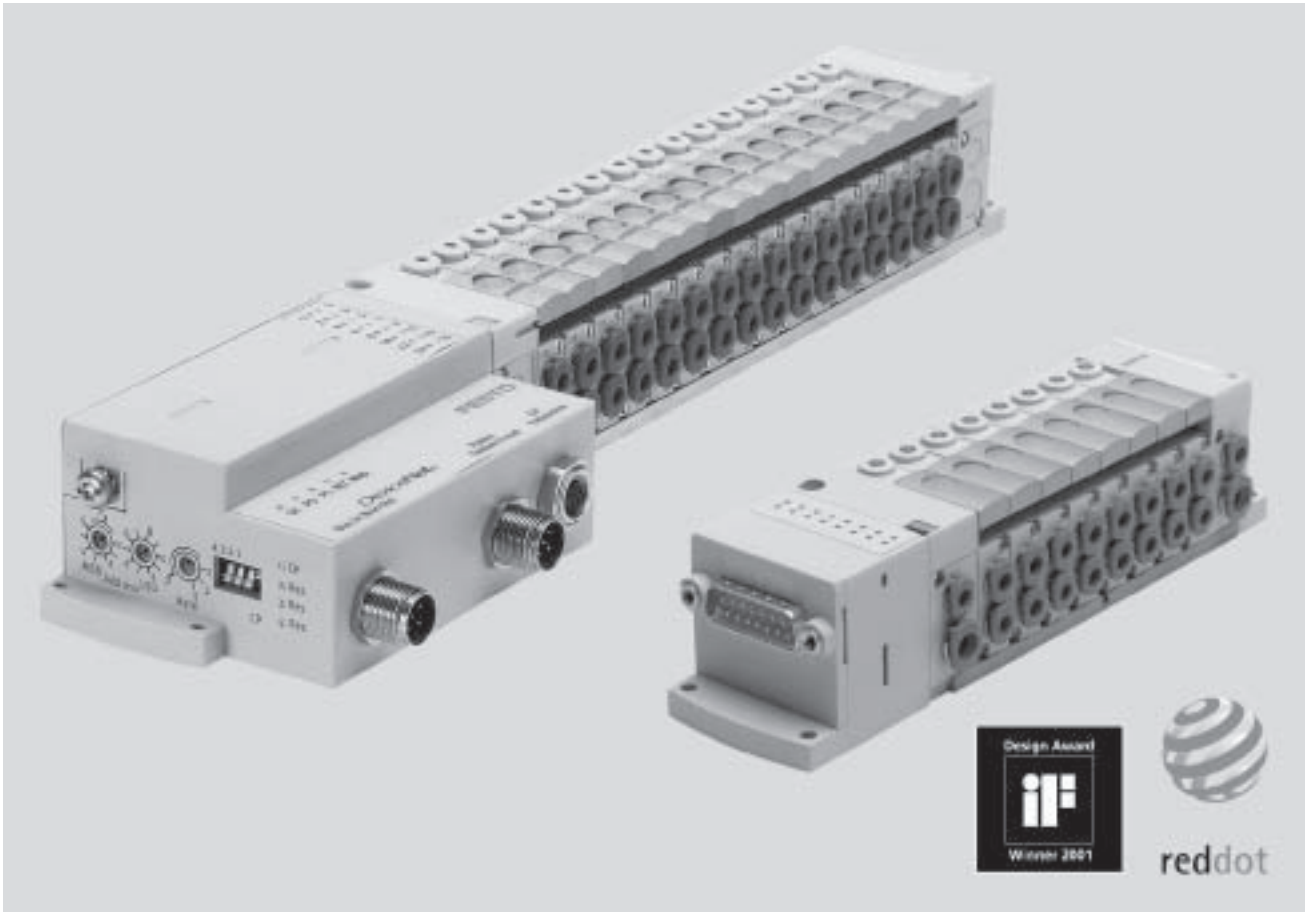
Valve terminal type 80 CPVSC1, Smart Cubic

FESTO

- Modular valve terminal for a wide range of applications
- Space-saving thanks to smaller valve dimensions
- Manual override and LED switching status display
- Up to 170 l/min flow rate
- Variety of pneumatic and electrical connection options

Valve terminal type 80 CPVSC1, Smart Cubic

Key features



Innovative

- Small, compact valve terminal for a wide range of pneumatic applications
- Highly versatile during the planning and assembly stages as well as in operational use
- Multi-pin and fieldbus interface
- Numerous selectable valve functions; 5/2-way, 3/2-way and 2/2-way functions
- With a flow rate of 170 l/min, CPV-SC offers outstanding pneumatic performance for a wide range of applications
- Low weight

Versatile

- Provides 4 ... 16 valve positions on one terminal
- Ideally suited for operating small pneumatic drives in tight spaces
- The flexibility of the pneumatic working connections facilitates a practical solution to different requirements
- Built-in silencer or ducted exhaust air
- Suitable for vacuum
- Permits multiple pressure zones on a single valve terminal

Reliable

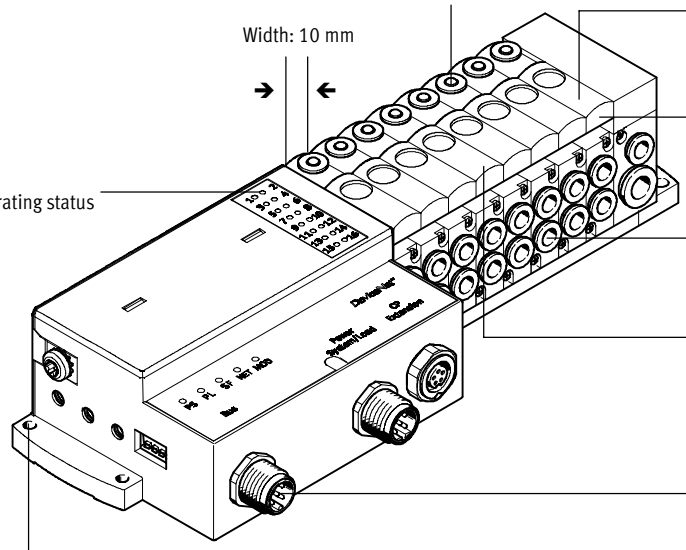
- Manual override facility
- Durable thanks to the use of tried-and-tested piston spool valves
- Sturdy thanks to metal housing and connecting thread
- Fast troubleshooting thanks to LEDs on the valves and diagnosis via fieldbus

Easy-to-mount

- Fully assembled and tested valve terminal
- Minimised expenditure with regard to ordering, installation and commissioning
- Direct mounting even on moving system components
- Reliable servicing

Valve terminal type 80 CPVSC1, Smart Cubic

Key features



Equipment options

A CPVSC valve terminal can be equipped with the following valve functions and electrical connections:

Valve functions

- 5/2-way valve, single solenoid
- 5/2-way valve, double solenoid
- 3/2-way valve, normally open
- 3/2-way valve, normally closed
- 2/2-way valve, normally closed

Separator plate with additional compressed air supply

- Compressed air duct (1) closed
- Compressed air duct (1) and exhaust line (3/5) closed

Blanking plate

- Plate without valve function for reserving a valve position

Dimensions

All valves have the same compact dimensions with an overall length of 42 mm, a height of 40 mm and a width of 10 mm.

Electrical connection options

Multi-pin

- 4 ... 16 valve positions/max. 16 solenoid coils
- Sub-D
- Flat cable

Fieldbus

- 4 ... 16 valve positions/max. 16 solenoid coils

CP string extension

- Further valve terminals from the CPV/CPA range
- or electrical I/O modules

Valve terminal type 80 CPVSC1, Smart Cubic

Key features

Valve terminal configurator

Online via: ➔ www.festo.com/en/engineering

A valve terminal configurator is available to help you select a suitable CPVSC 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 80 using the modular order code.

Ordering system for type 80
➔ 4 / 3.1-28

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

Once you have called up the Festo home page, select the online version of the digital product catalogue from the "Products" submenu: this will bring you directly to the home page for the Pneumatic Catalogue. Activate the "Product Search" menu.

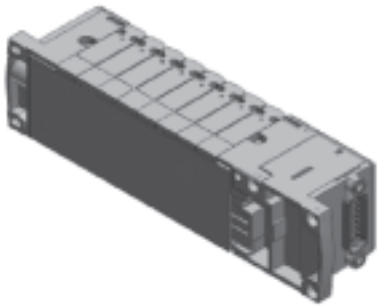
Here you can specify a "Part No." (e.g. 525675), "Type" (e.g. CPVSC1) or "Article designation" (e.g. valve terminal) to find your "Search result". Click on the blue shopping basket to complete the selected product according to your specifications (this does not initiate an order). You will then be prompted 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 continue on with the ordering process.

2D/3D CAD data

Online via: ➔ www.festo.com/en/engineering

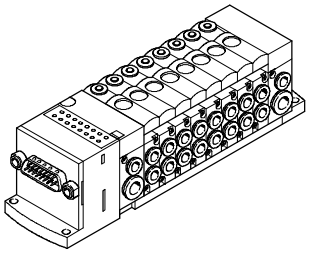
You can request the CAD data for a valve terminal you have configured. To do so, perform a product search for Part No. 525675 as described above. Click on this number to the right of the blue shopping basket. This brings you to the detailed view. In the menu bar on the right-hand edge of the screen, click on "2D/3D CAD" and then on "Configurator". Proceed with your configuration and then click on "Finish". On the next page you can generate a 3D preview or request another data format of your choice by e-mail.



Valve terminal type 80 CPVSC1, Smart Cubic

Key features

Multi-pin plug connection

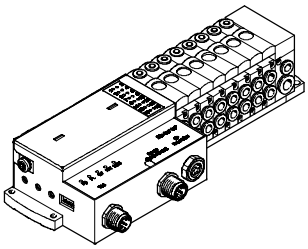


Control signals from the controller to the valve terminal are transmitted via a pre-assembled multi-core cable, which substantially reduces installation time.

These valve terminals can be fitted with 4 to 16 solenoid coils.

Variants
- Sub-D connection
- Flat cable connection

Fieldbus Direct



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

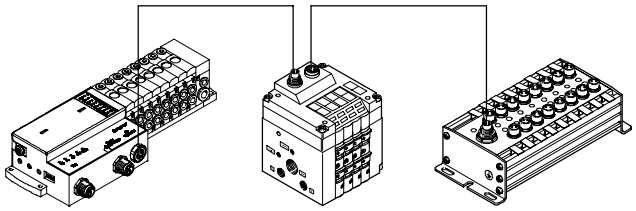
Valve terminals with fieldbus interfaces can be equipped with 4 to 16 valve positions and 4 to 16 solenoid coils.

Variants
- DeviceNet connection
- 4 to 16 solenoid coils

Valve terminal type 80 CPVSC1, Smart Cubic

Key features

CP string extension



The optional string extension allows an additional valve terminal and I/O modules to be connected to the CPV Direct fieldbus node. 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 max. length of the CP string extends to 10 metres, which means that the extension modules 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 extension module.

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 / 4.7-2

Valve terminal type 80 CPVSC1, Smart Cubic

Peripherals overview

Valve terminal with electrical multi-pin plug connection

- 15- and 26-pin Sub-D multi-pin plug connection
  Code: MS, MH

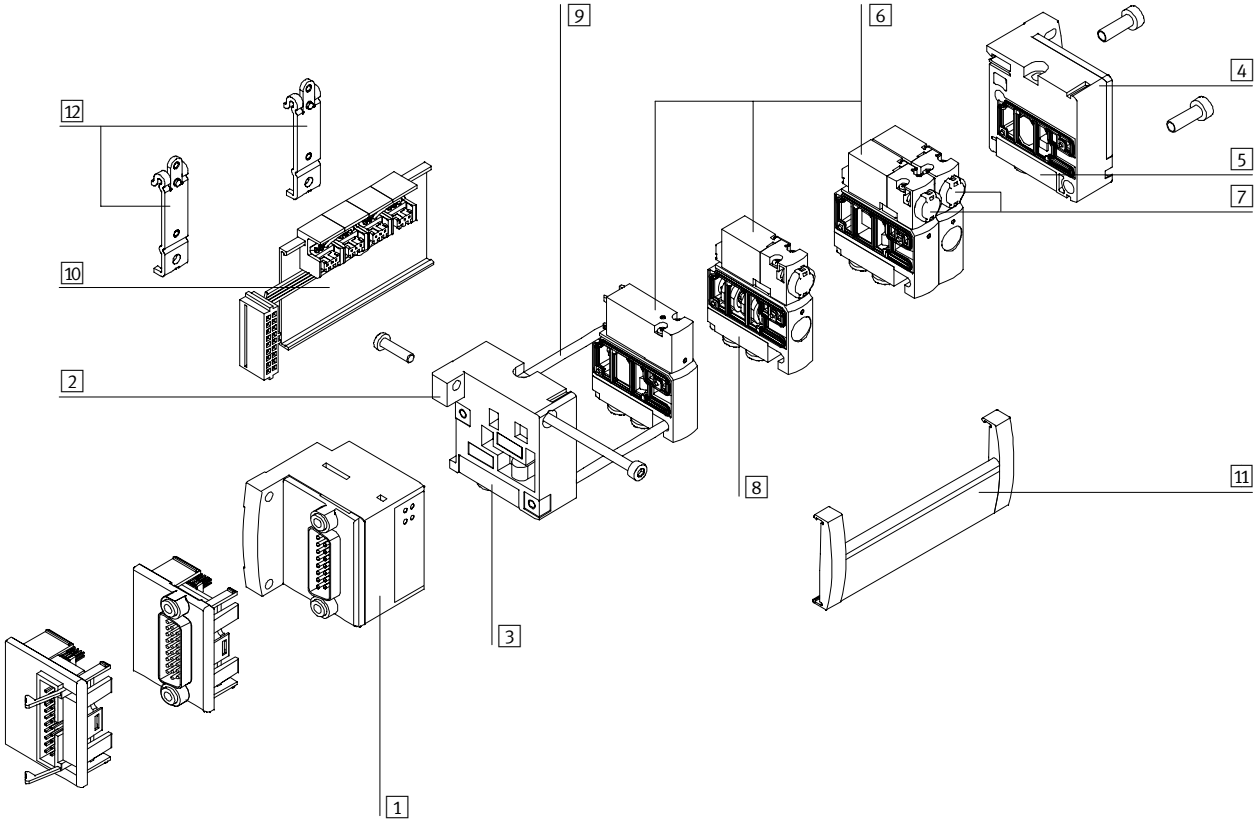
or

- 20-pin multi-pin plug connection with connector for flat cable
  Code: MF

Valves and end plates are the basic pneumatic components of the valve terminal.
The valve terminals are connected to the end plates using tie rods.

Valve terminals with electrical multi-pin plug connection can be equipped with 4 to max. 16 valve positions. Each valve position can either be equipped with a valve or a blanking plate.

The electrical connection is located on the left-hand side, thereby allowing flush mounting of the system.



1 Electrical triggering unit for Sub-D or flat cable connection and LED switching status display
2 Left-hand end plate for compressed air supply 1 or 12/14
3 Connections (2, 4) underneath
4 Right-hand end plate for ducted exhaust air or silencer (3/5 or 82/84)
5 Sub-base for ducted exhaust air (push-in fitting or thread)
6 Valve
7 Cover for manual override (optional)
8 Sub-base for compressed air supply (push-in fitting or thread)
9 Tie rod
10 Valve electrical linking module
11 Inscription label holder
12 H-rail mounting

Valve terminal type 80 CPVSC1, Smart Cubic

Peripherals overview

FESTO

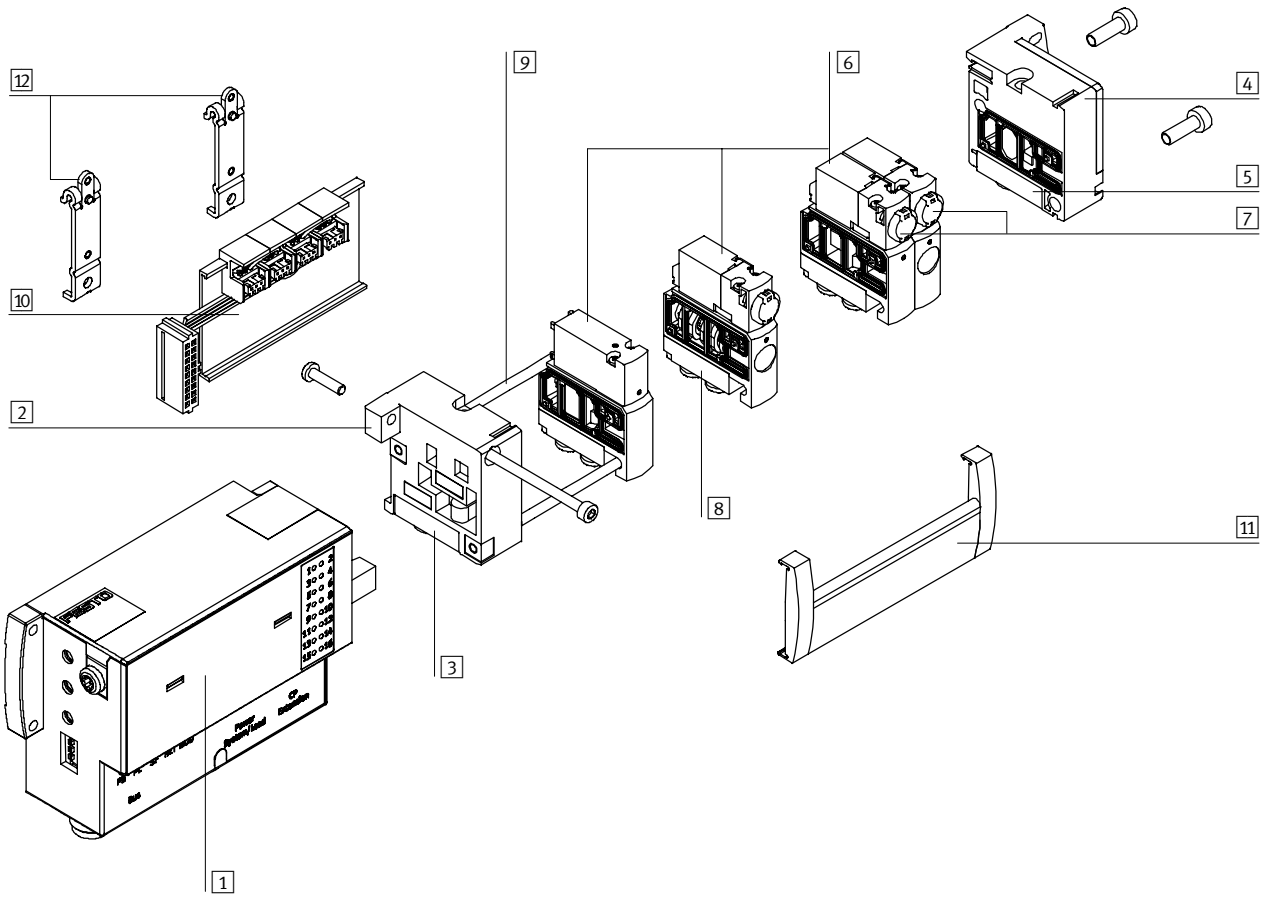
Valve terminal with Fieldbus Direct

■ M12 A-coded DeviceNet connection
Code: DN

Valves and end plates are the basic pneumatic components of the valve terminal.
The valve terminals are connected to the end plates using tie rods.

Valve terminals with Fieldbus Direct DeviceNet can be equipped with 4 to max. 16 valve positions. Each valve position can either be equipped with a valve or a blanking plate.

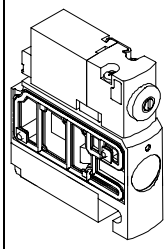
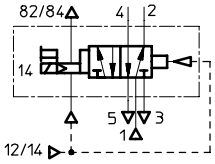
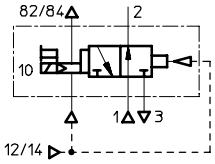
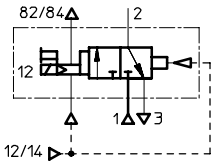
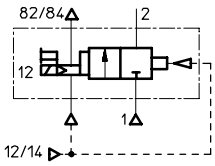
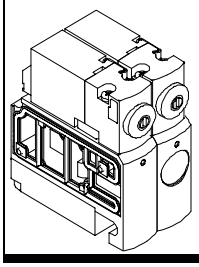
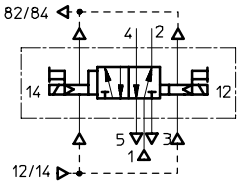
The space-saving electrical connection is optimised for minimum tubing.



1 Fieldbus Direct
2 Left-hand end plate for compressed air supply 1 or 12/14
3 Connections (2, 4) underneath
4 Right-hand end plate for ducted exhaust air or silencer (3/5 or 82/84)
5 Sub-base for ducted exhaust air (push-in fitting or thread)
6 Valve
7 Cover for manual override (optional)
8 Sub-base for compressed air supply (push-in fitting or thread)
9 Tie rod
10 Valve electrical linking module
11 Inscription label holder
12 H-rail mounting

Valves

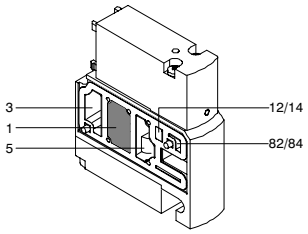
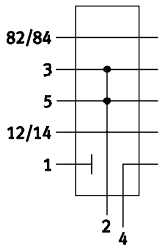
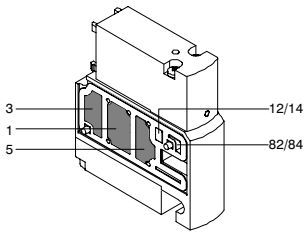
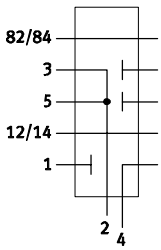
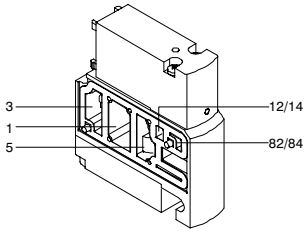
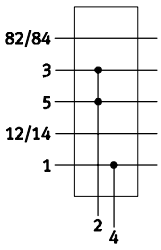
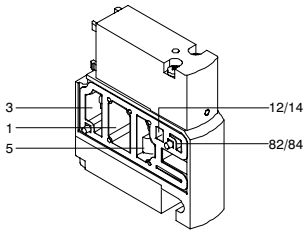
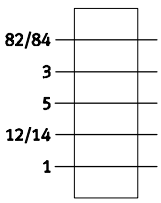
CPVSC valves are series manifold valves, i.e. in addition to the valve function they contain all of the ducts for supply, exhaust and the working ports. The supply ducts are a central part of the valve slices and allow a direct flow of air through them. This helps achieve maximum flow rates. All valves have a pneumatic pilot control for optimising performance. The valve function is based on a piston spool system with a patented sealing principle that guarantees its suitability for a wide range of applications as well as a long service life.

Valve functions	Code	Circuit symbol	Size 10	Description
	M		■	5/2-way valve, single solenoid Pneumatic spring return
	N		■	3/2-way valve, single solenoid Normally open Pneumatic spring return
	K		■	3/2-way valve, single solenoid Normally closed Pneumatic spring return
	D		■	2/2-way valve, single solenoid Normally closed Pneumatic spring return
	J		■	5/2-way valve, double solenoid This valve consists of two valve housing units and therefore occupies two valve positions. The pilot control with coil 12 is located on the left and labelled “J12”. If both coils are actuated, the signal at port “14” dominates in switching position.

Valve terminal type 80 CPVSC1, Smart Cubic

Key features – Pneumatic components

FESTO

Valves				
Valve functions	Code	Circuit symbol	Size 10	Description
Pneumatic supply plate with duct separation				
	T		■	Compressed air duct (1) closed For separating pressure zones with a common exhaust. (Using pressure zones ➔ 4 / 3.1-14) Pneumatic connection: QS-4, M5
	S		■	Compressed air duct (1) and exhaust line (3/5) closed For separating pressure zones with a separate exhaust. (Using pressure zones ➔ 4 / 3.1-14) Pneumatic connection: QS-4, M5
Pneumatic supply plate without duct separation				
	U		■	Additional compressed air supply (1) and additional exhaust (3/5). Pneumatic connection: QS-4, M5
Blanking plate				
	L		■	Plate without valve function for reserving a valve position No pneumatic connection

In the case of compressed air supply configuration code S or T (exhaust via large surface area silencer), a plug-in silencer UC-QS-4H is included with supply plates.

Valve terminal type 80 CPVSC1, Smart Cubic

Key features – Pneumatic components

Design

Valve replacement

Valves can be replaced quickly and easily in just a few movements. Separating seals between the valves are based on a metal support and are secured in place.

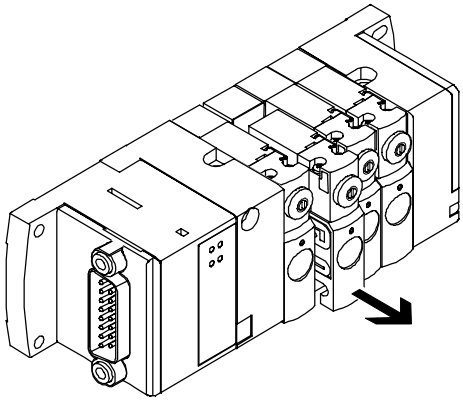
Materials

The valve housing and thread in the sub-bases are made of metal, while other housing sections are made from robust plastic materials.

Extension

Valves can be ordered as accessories and are available with fully assembled sub-bases with QS or threaded connections. The functionality of the valve terminal can therefore be extended by replacing vacant positions.

For ordering purposes, valves have the valve code printed on the front and the product type on the rear.



- Note

The valve with the working line plate has been tested by Festo for leak tightness.

Valve terminal type 80 CPVSC1, Smart Cubic

Key features – Pneumatic components

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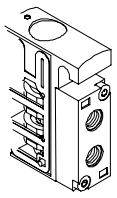
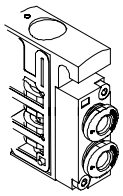
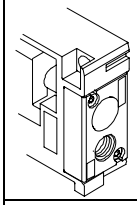
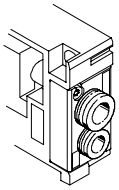
Pneumatic working lines		
	Code	Description
Working port		
	B	M5 threaded connection
	E	QS-3 push-in fitting
	F	QS-4 push-in fitting
Supply port		
	C	Threaded connection ■ M7 ■ M5 and M7
	G	Push-in fitting ■ QS-6 ■ QS-4 and QS-6

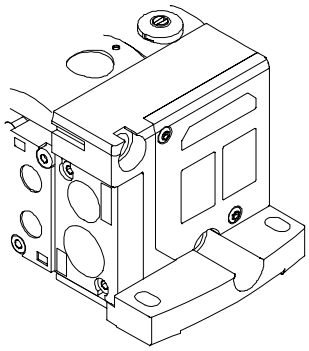
Pneumatic working lines

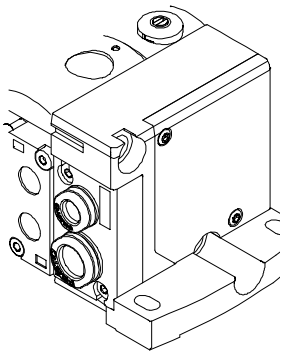
Supply and exhaust

A basic feature of a CPVSC valve terminal are the two end plates.

The left-hand end plate is used for the supply of compressed air, while the right-hand end plate is used to exhaust the valve terminal.

Exhaust air escapes either via an integrated large surface area silencer or via a push-in or threaded connection.

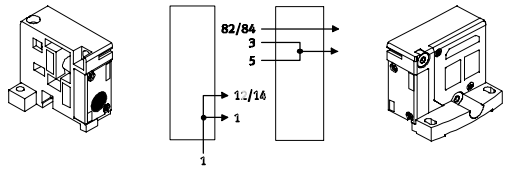
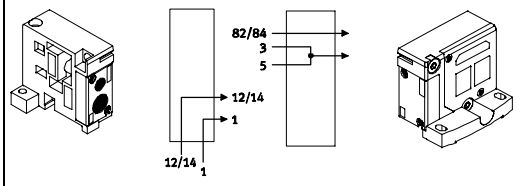
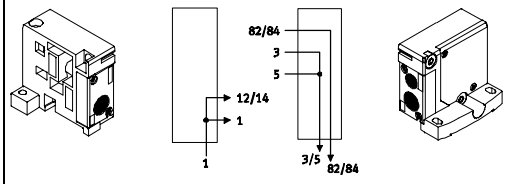
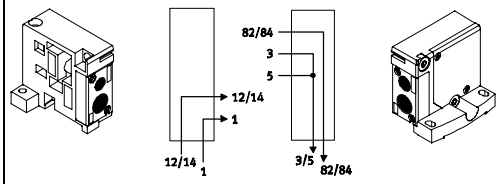




Exhaust from duct 3/5 as well as 82/84 via large surface area silencer
Ducted exhaust air from duct 3/5 or 82/84
Replacement part (insert) for large surface area silencer type CPVSC1-UA

Valve terminal type 80 CPVSC1, Smart Cubic

Key features – Pneumatic components

Pneumatic supply		
End plate combination	Code	Description
	S	Internal pilot air supply, large surface area silencer For operating pressure in the range 3 ... 7 bar
	T	Internal pilot air supply, large surface area silencer For operating pressure in the range –0.9 ... +7 bar
	V	Internal pilot air supply, ducted exhaust air For operating pressure in the range 3 ... 7 bar
	X	External pilot air supply, ducted exhaust air For operating pressure in the range –0.9 ... +7 bar

1) 8 bar upon request

Pilot supply air

The CPVSC valve terminal is suitable for internal or external pilot supply air, depending on the mounted end plates

Internal pilot supply air

If the supply pressure for your CPVSC valve terminal is between 3 and 7[1)] bar, it can be operated with internally distributed pilot air supply. Pilot air supply is branched at the left-hand end plate of port 1 for this purpose.

External pilot supply air

If the supply pressure for your CPVSC valve is between -0.9 and 3 bar, it must be operated with external pilot air. The pilot air supply is supplied externally via port 12/14 in this case.

Valve terminal type 80 CPVSC1, Smart Cubic

Key features – Pneumatic components

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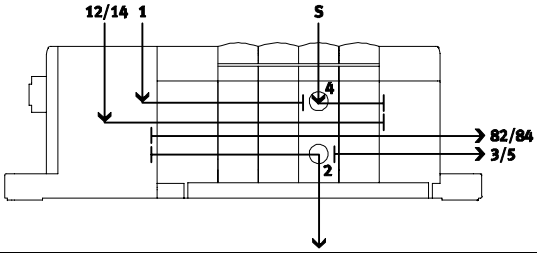
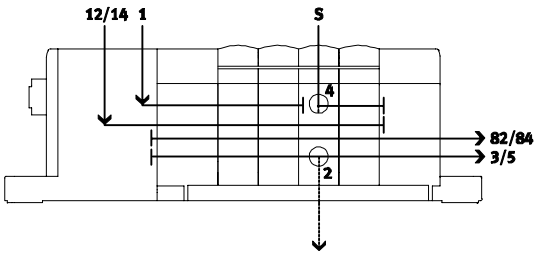
Using pressure zones

The CPVSC valve terminal can be operated with multiple pressure zones. After two zones, a supply with duct separation is required for each subsequent pressure zone. It always occupies one valve position. An isolating disc T separates the compressed air supply of a valve group on the left from the compressed air supply of a valve group on the right. The right-hand pressure zone is supplied at port 4 of the supply plate. Port 2 also allows the left-hand pressure zone to be exhausted. All of the exhaust ducts of the valve are interconnected and are exhausted through the right-hand end plate. An isolating disc S also separates exhaust lines 3 and 5 in addition to pressure duct 1.

Note

Larger or simultaneously operating cylinders generate a back pressure in the exhaust duct of the valve terminal, the size of which depends on the exhaust capacity of the silencer. In order to prevent interaction with adjacent valves, valves can be separated by means of duct separation using isolating disc S. The pressure zone located to the left of an isolating disc S is exhausted using the supplied plug-in silencer. Where there are more than two valves in such a pressure zone, an additional supply with additional exhaust may be required. It is therefore useful to meet the increased exhaust requirements in the pressure zone that is exhausted by the right-hand end plate.

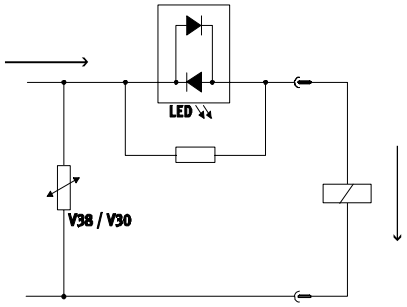
Pneumatic supply plate

	Code	Description
	S	Duct 1/3/5 closed
	T	Duct 1 closed

Valve terminal type 80 CPVSC1, Smart Cubic

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.

Electrical multi-pin plug connection

The following multi-pin plug connection types are offered for the valve terminal CPVSC:

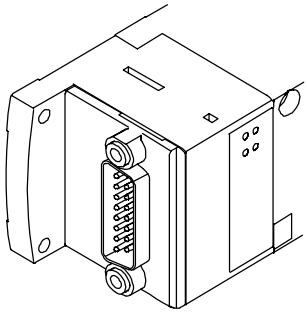
- Sub-D multi-pin plug connection (15- and 26-pin) or
- Multi-pin plug connection with connector for flat cable (20-pin)

CPVSC is connected via a multi-pin plug connection with Sub-D or flat cable. A maximum of one valve position – and therefore one coil or one address – is assigned to each pin of the multi-pin plug.

Double solenoid valves "J" occupy two valve positions. The left-hand valve position with pilot control 12 is actuated by the less significant address of the two addresses.

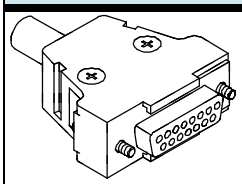
Electrical multi-pin plug connection – Sub-D

Code MS, MH

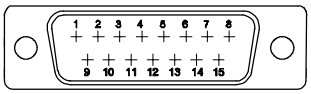


With this electrical connection variant, all valves are centrally actuated via the 15- and 26-pin connector plug.
The electrical connection is located on the left-hand side.

Ordering data – Connecting cable Sub-D

	Code	Description		Type	Part No.
	CP	15-pin for 12 coils (code MS)	2.5 m long	**KMP6-15P-12-2,5**	**527 543**
	CQ	Material: PVC	5 m long	**KMP6-15P-12-5**	**527 544**
	CR	Suitable for chain link trunking	10 m long	**KMP6-15P-12-10**	**527 545**
	CP	26-pin for 16 coils (code MH)	2.5 m long	**KMP6-26P-16-2,5**	**527 546**
	CQ	Material: PVC	5 m long	**KMP6-26P-16-5**	**527 547**
	CR	Suitable for chain link trunking	10 m long	**KMP6-26P-16-10**	**527 548**

Pin allocation for 15-pin Sub-D (code MS)

KMP6-15P-12-...	Description	Pin	Core colour	Allocation
	CPVSC valve terminal with up to 12 valve positions and multi-pin cable with 15-pin Sub-D plug	1	white	Coil 0
		2	brown	Coil 1
		3	green	Coil 2
		4	yellow	Coil 3
		5	grey	Coil 4
		6	pink	Coil 5
		7	blue	Coil 6
		8	red	Coil 7
		9	black	Coil 8
		10	purple	Coil 9
		11	grey-pink	Coil 10
		12	red-blue	Coil 11
		13	white-green	n.c.
		14	brown-green	0 V[1)]
		15	white-yellow	0 V[1)]

1) Pin 14 to Pin 15 are bridged in the valve terminal.
0 V for positive switching control signals; 24 V can be connected for negative switching control signals

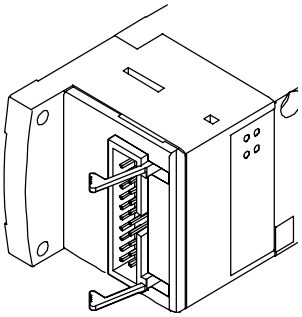
Pin allocation for 26-pin Sub-D (code MH)

KMP6-26P-16-...	Description	Pin	Core colour	Allocation
	CPVSC valve terminal with 16valve positions and multi-pin cable with 26-pin Sub-D plug	1	white	Coil 0
		2	brown	Coil 1
		3	green	Coil 2
		4	yellow	Coil 3
		5	grey	Coil 4
		6	pink	Coil 5
		7	blue	Coil 6
		8	red	Coil 7
		9	black	Coil 8
		10	purple	Coil 9
		11	grey-pink	Coil 10
		12	red-blue	Coil 11
		13	white-green	Coil 12
		14	brown-green	Coil 13
		15	white-yellow	Coil 14
		16		Coil 15
		17		Coil 16
		18		n.c.
		19		n.c.
		20		0 V[1)]
		21		0 V[1)]
		22		0 V[1)]
		23	white-grey	0 V[1)]
		24	grey-brown	0 V[1)]
		25	white-pink	0 V[1)]
		26	pink-brown	0 V[1)]

1) Pin 17 to Pin 22 are bridged in the valve terminal.
0 V for positive switching control signals; 24 V can be connected for negative switching control signals

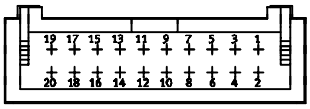
Electrical multi-pin plug connection – Connector for flat ribbon cable

Code MF



With this electrical connection variant, all valves are centrally actuated via the 20-pin connector plug.
The electrical connection is located on the left-hand side.

Pin allocation – Connector for flat ribbon cable (code MF)



CPVSC valve terminal with up to 16 valve positions and 20-pin multi-pin socket for flat ribbon cables to DIN 41 561-1, -2 or IEC 60603-13-C020FD-7C1E-2G

Contact surface gold
Flat ribbon cable grid 1.27 mm
Conductor cross section 0.13 mm^2

Pin	Allocation
1	Coil 0
2	Coil 1
3	Coil 2
4	Coil 3
5	Coil 4
6	Coil 5
7	Coil 6
8	Coil 7
9	Coil 8
10	Coil 9
11	Coil 10
12	Coil 11
13	Coil 12
14	Coil 13
15	Coil 14
16	Coil 15
17	0 V[1)]
18	0 V[1)]
19	0 V[1)]
20	0 V[1)]

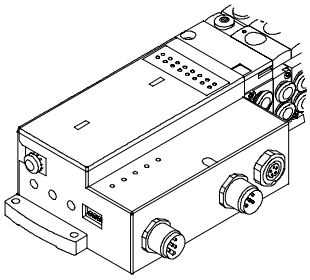
1) Pin 17 to Pin 20 are bridged in the valve terminal.

Valve terminal type 80 CPVSC1, Smart Cubic

Key features – Electrical components

FESTO

Fieldbus Direct



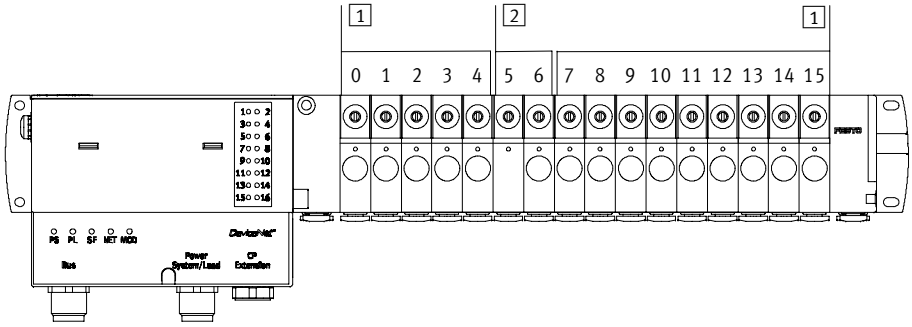
Fieldbus Direct is a system for the compact connection of a valve terminal of various sizes to different fieldbus standards.

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.

➔ 4 / 4.6-2

Address allocation – Solenoid coils



1 Single solenoid valves occupy one valve position

2 Double solenoid valves occupy two valve positions

Example:
Valve terminal where valve positions 5 and 6 are prepared for 2 solenoids.

The addresses of the valve positions on the CPV-SC-DN are assigned from left to right. Each valve position has an address, regardless of whether or not a valve is mounted there.

Double solenoid valves "J" occupy two valve positions. The left-hand valve position with pilot control 12 is actuated by the less significant address of the two addresses.

Display and operation

The switching status of every solenoid coil is displayed on the triggering unit LED. Inscription labels (type MH-BZ-80x) can be applied to each valve for labelling purposes.

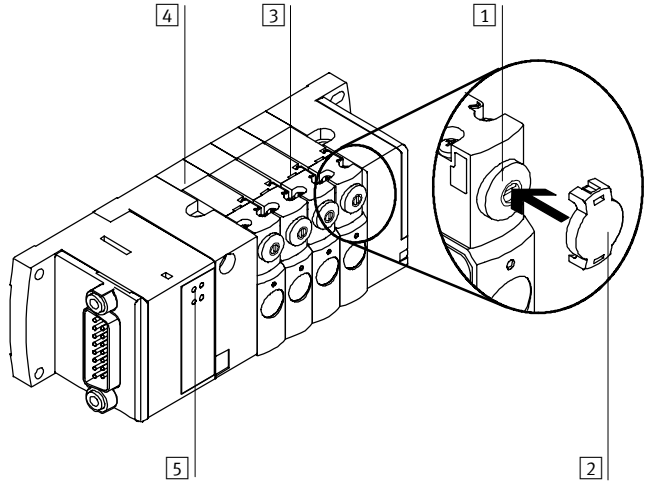
The manual override (MO) allows the valve to be switched when in the electrically non-activated or de-energised status. The valve is switched by pushing the manual override. The set switching status can also be secured by rotating the manual override.

A cover can be fitted over the manual override to prevent it from being actuated accidentally (code V).

- Note

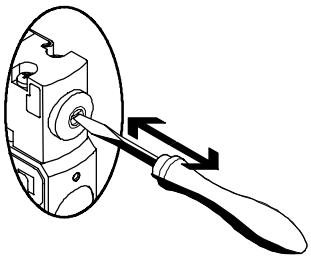
A manually actuated valve (manual override) cannot be reset electrically. Conversely, an electrically actuated valve cannot be reset using the mechanical manual override.

Manual override



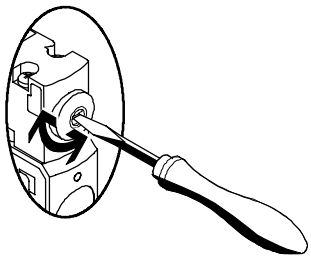
1 Manual override (pushing and detenting via turning using a screwdriver)
2 Cover for manual override (code V or accessory CPVSC1-HV)
3 Location for valve position inscription label (type MH-BZ-80x)
4 Numbering of valve positions
5 LED signal status display per valve position

Manual override with automatic return (push-in)



MO is actuated by pushing it with a pin or screwdriver and reset by spring force.

Manual override with lock (detenting)



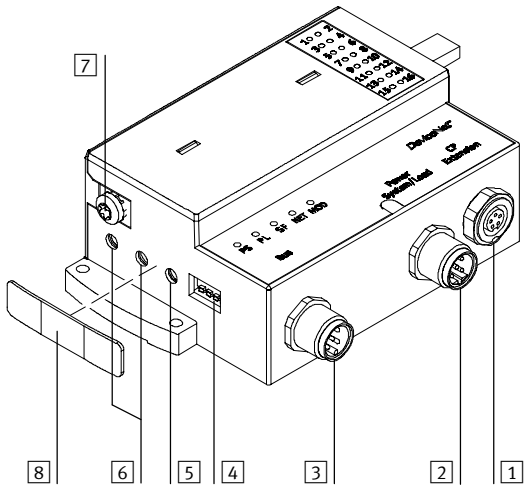
MO remains active until it is reset with a screwdriver.

Valve terminal type 80 CPVSC1, Smart Cubic

Key features – Display and operation

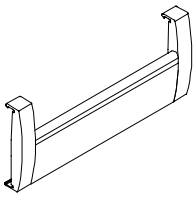
Display and operation

Fieldbus Direct



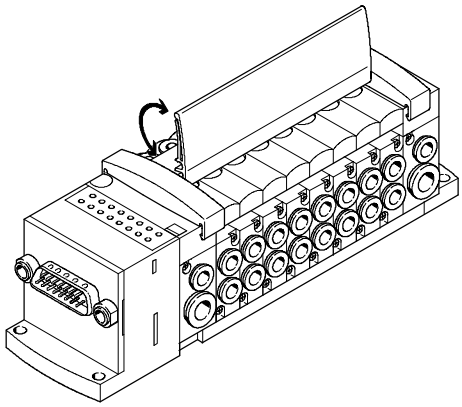
1 Connection for CP extension
2 Connection for voltage supply
3 Connection for fieldbus
4 DIL switch for CP extension
5 Rotary switch for baud rate
6 Rotary switch for station number
7 Earth terminal
8 Cover (for IP40)

Inscription label holder



The transparent inscription label holder provides sufficient space for individually created labels on paper or foil.

Labelling templates:
www.festo.com/Services & Support/ Download Area under the search term "Inscription label holders".



Valve terminal type 80 CPVSC1, Smart Cubic

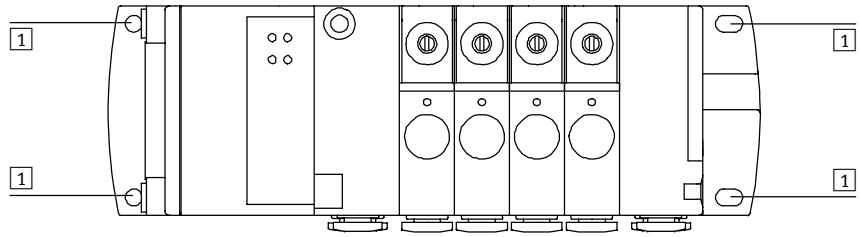
Key features – Mounting types

Mounting – Valve terminal

Sturdy terminal attachment thanks to:

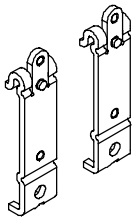
- Four through-holes for wall mounting
- H-rail mounting

Wall mounting

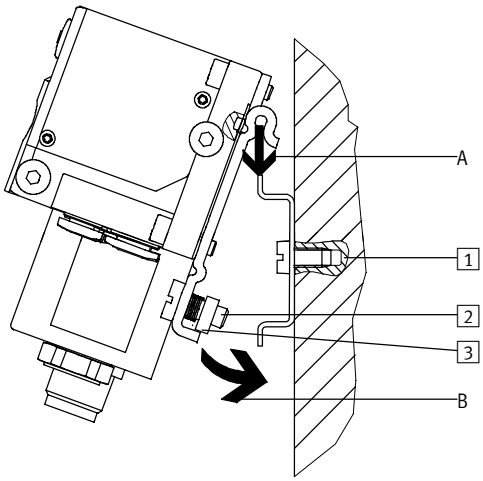


1 Mounting holes for screws M3

H-rail mounting



The mounting CPVSC1-HS35 facilitates mounting on the H-rail to DIN EN 50 022.



The CPVSC valve terminal is attached to the H-rail (see arrow A).
It is then hinged on the H-rail and secured in place with the clamping component (see arrow B).

1 Holes for wall mounting
2 Self-tapping M4x10 screw of the H-rail clamping unit
3 Clamping component of the H-rail clamping unit

Valve terminal type 80 CPVSC1, Smart Cubic

Technical data

FESTO

- Flow rate
  170 l/min
- Valve width
  10 mm
- Voltage
  24 V DC

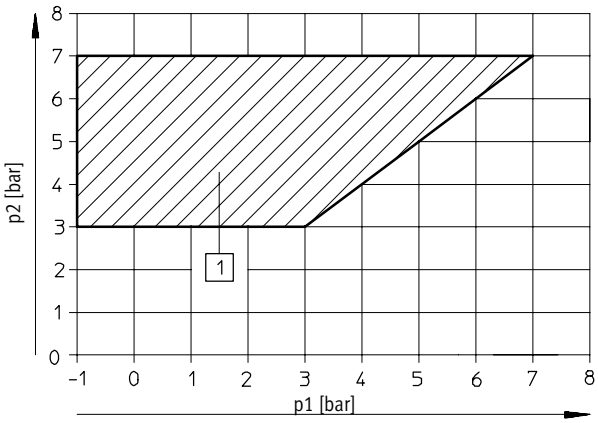
General technical data						
Valve		5/2-way valve		3/2-way valve		2/2-way valve
		Single solenoid	Double solenoid	Normally open	Normally closed	Normally closed
Valve function ordering code		M	J	N	K	D
Design		Electromagnetically actuated piston spool valve				
Width	[mm]	10		10		10
Nominal size	[mm]	2.5		2.5		2.5
Standard nominal flow rate	[l/min]	170		170		150
Lubrication		Lubricated for life				
Type of mounting		Wall mounting				
Assembly position		Any				
Manual override		Push-in/detenting/covered				
Pneumatic connections						
Supply	1	M7, QS-6				
Exhaust port	3/5	M7, QS-6 or integrated large surface area silencer				
Working ports	2/4	Depending on the connection type selected ■ M5 ■ QS-3 ■ QS-4				
Pilot air port	12/14	M5, QS-4				
Pilot exhaust air port	82/84	M5, QS-4 or integrated large surface area silencer				

Valve terminal type 80 CPVSC1, Smart Cubic

Technical data

Operating pressure [bar]						
Valve function ordering code		M	J	N	K	D
Without pilot air supply		3 ... 7				
With pilot air supply		–0.9 ... +7				
Pilot pressure		3 ... 7				

Pilot pressure p2 as a function of operating pressure p1



1 Operating range for valves with external auxiliary pilot air

Valve response times [ms]						
Valve function ordering code		M	J	N	K	D
Response times	on	10	10	10	10	10
	off	10	–	10	10	10
	change-over	–	6	–	–	–

Operating and environmental conditions						
Valve function ordering code		M	J	N	K	D
Operating medium		Filtered compressed air, lubricated or unlubricated, inert gases permissible ➔ 4 / 3.1-25				
Grade of filtration	[µm]	40 (average pore size)				
PWIS-free		Yes (free of paint wetting impairment substances)				
CE symbol		Yes, with control unit to EMC regulations				
Ambient temperature	[°C]	–5 ... +40				
Temperature of medium	[°C]	0 ... +40				
Storage temperature	[°C]	–20 ... +40				
Corrosion resistance class CRC[1)]		1				

1) Corrosion resistance class 1 according to Festo standard 940 070
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Valve terminal type 80 CPVSC1, Smart Cubic

Technical data

FESTO

Electrical data						
Valve function ordering code		M	J	N	K	D
Electromagnetic compatibility of the CPVSC valve terminal (Sub-D or flat cable connection)		Interference emission tested to EN 50 081-2, industry				
		Interference immunity[1] tested to EN 61 000-6-2, industry				
Protection against electric shock (protection against direct and indirect contact to EN 60204-1/IEC 204)		By means of PELV power supply unit				
Nominal operating voltage	[V]	24 DC				
Operating voltage range	[V]	20.4 ... 26.4 DC				
Electrical power consumption	[W]	1.0				
Duty cycle		100% at 40°C ambient temperature				
Protection class to EN 60 529		IP40 (in assembled state and with detenting plug)				
Relative air humidity		90% at 40°C, non-condensing				
Vibration resistance		To DIN/IEC 68/EN 60 068, Parts 2-6				
Continuous shock resistance		To DIN/IEC 68/EN 60 068, Parts 2-27				

1) The maximum signal line length is 10 m

Materials					
Valve function ordering code	M	J	N	K	D
Electrical interface	Polymer				
End plate, electrical sub-base	Polymer				
Seals	Elastomer				
Valve sub-base	Die-cast aluminium				
Working connection plates	Polyamide				

Product weight [g]					
Valve function ordering code	M	J	N	K	D
5/2-way, 3/2-way valve	30.5				
5/2-way double solenoid valve	56.5				
Vacant position	22.5				
Right-hand end plate	42.5				
Left-hand end plate	28				
Controller housing	43				
Tie rod, 16-fold	29.6				
Electrical linking module, 16-fold	64				

Pneumatic 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 cylinders 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 to 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.

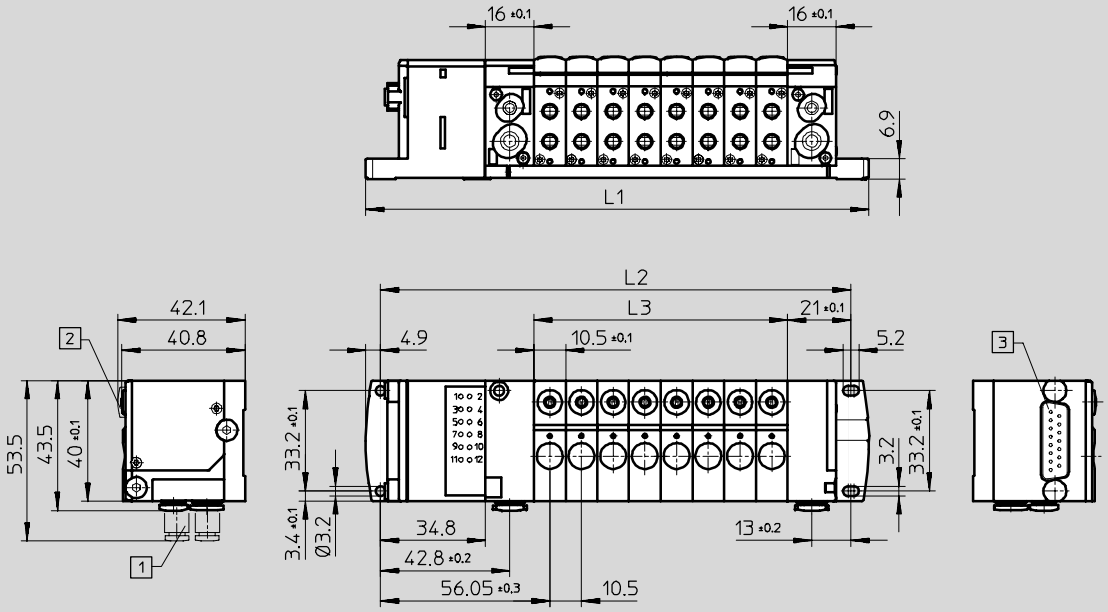
Valve terminal type 80 CPVSC1, Smart Cubic

Technical data

FESTO

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

With multi-pin plug connection



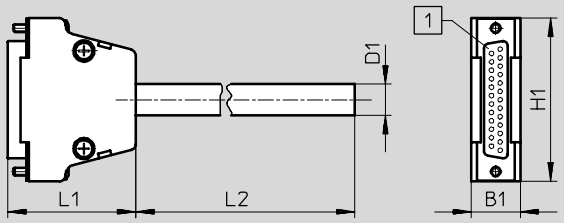
1 QS push-in fitting

2 Cover cap

3 Multi-pin plug connection with 20-pin flat cable or 15/26-pin SUB-D multi-pin plug connection

Valve positions n	L1	L2	L3
4	125 +0.8/–.4	114 +0.5/–0.5	42 +0.4
8	167 +1.2/–1.4	156 +0.9/–0.5	84 +0.8
12	209 +1.6/–1.4	198 +1.3/–0.5	126 +1.2
16	251 +2.0/–1.4	240 +1.7/–0.5	168 +1.6

Dimensions – Sub-D plug with cable Download CAD data ➔ **www.festo.com/en/engineering**

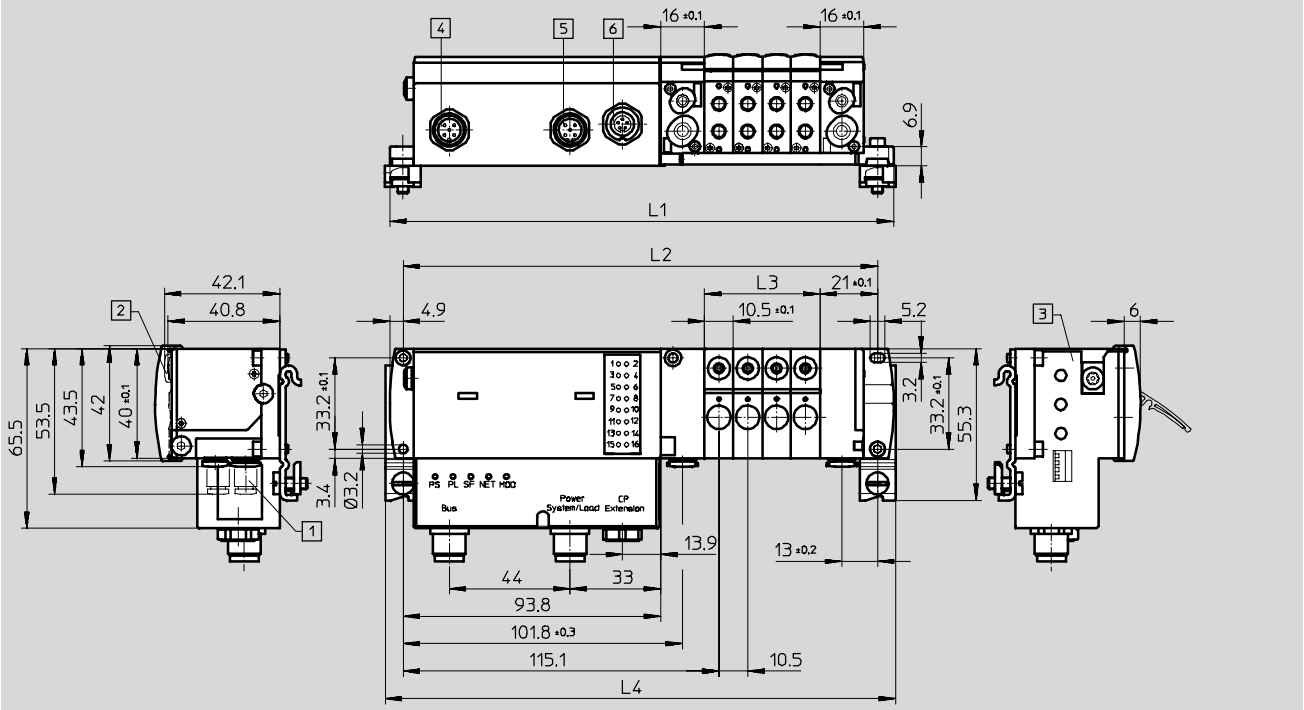


1 15-/26-pin plug

Type	B1	D1	H1	L1	L2			Number of pins
KMP6-15P-12-...	16	8.5	40	34.5	2500	5000	10000	15
KMP6-26P-16-...	16	8.6	40	34.5	2500	5000	10000	26

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

With fieldbus connection



1 QS push-in fitting
2 Cover cap
3 Fieldbus connection DN
4 Bus connection M12
5 Voltage supply M12
6 CP connection M9

Valve positions n	L1	L2	L3	L4
4	183.6 +0.8/–1.4	172.8 +0.5/–0.5	42 +0.4	185.4
8	225.8 +1.2/–1.4	214.8 +0.9/–0.5	84 +0.8	227.4
12	267.6 +1.6/–1.4	256.8 +1.3/–0.5	126 +1.2	269.4
16	309.6 +2.0/–1.4	298.8 +1.7/–0.5	168 +1.6	311.4

Valve terminal type 80 CPVSC1, Smart Cubic – Multi-pin

Ordering data – Modular products

FESTO

M **Mandatory data** →

Module No.	Valve terminal	Size	Power supply	Electrical connection	Position of working ports	Pneumatic working ports	Manual override	Pneumatic supply	Pneumatic supply connection	Type of connections
525 675	80P	10	1 5	MS MF MH	P	B E F	N V	S T V X	L	C G
Ordering example										
529 675	**80P**	**10**			**P**				**L**	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**

Ordering table

Size			10	Conditions	Code	Enter code
M	**1**	Module No.	**525 675**			
	2	Valve terminal	Valve terminal type 80, Smart Cubic, CPV-SC		**80P**	80P
	3	Size [mm]	10		**-10**	-10
	4	Power supply [V]	Power supply 24 DC		**-1**	
			Power supply 12 DC		**-5**	
	5	Electrical connection	Connection for multi-pin cable Sub-D, 15-pin	1	**MS**	
			Connection for flat cable, 20-pin	2	**MF**	
			Connection for multi-pin cable Sub-D, 26-pin	2	**MH**	
	6	Position of working ports	On valve sub-base		**-P**	-P
	7	Pneumatic working ports, per valve position	Threaded connection M5	2	**B**	
			Push-in fittings QS-3	2	**E**	
			Push-in fittings QS-4		**F**	
	8	Manual override	Manual override, push-in/detenting		**-N**	
			Manual override blocked		**-V**	
	9	Pneumatic supply	Internal pilot air supply, silencer		**-S**	
			External pilot air supply, silencer		**-T**	
			Internal pilot air supply, ducted exhaust air		**-V**	
			External pilot air supply, ducted exhaust air		**-X**	
	10	Pneumatic supply connection	Supply at left		**L**	L
	11	Type of connections	Threaded connection M7		**C**	
↓			Push-in fittings QS-6		**G**	

1 **MS** Max. 12 valve positions possible.

2 **MF, MH, B, E, N, K, J, D, L, T, S, U**
Not possible with power supply 5.

Transfer order code

529 675	80P	–	10	–			–	P		–		–		L	
1	**2**		**3**		**4**	**5**		**6**	**7**		**8**		**9**	**10**	**11**

Valve terminal type 80 CPVSC1, Smart Cubic – Multi-pin

Ordering data – Modular products

FESTO

M Mandatory data		O Options
Equipment at valve position 0 ... 15	**User documentation**	**Accessories**
12 Valves: M, N, K, J, D, L, T, S, U	B, D, E, F, I, S, V	CP, CQ, CR, H, T

Valve position

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

– [12] – [13] + [14]

Ordering table

Size			10	Conditions	Code		Enter code
↓	**12**	Equipment at valve position 0 ... 15		3	-		-
M		Valves	5/2-way valve, single solenoid		**M**		Enter equipment selection for valve positions in order code
			3/2-way valve, normally open	2	**N**		
			3/2-way valve, normally closed	2	**K**		
			5/2-way valve, double solenoid	2 4	**J**		
			2/2-way valve, normally closed	2	**D**		
			Vacant position	2	**L**		
			Pneumatic supply plate, duct 1 separate	2 5	**T**		
			Pneumatic supply plate, duct 1/3/5 separate	2 5	**S**		
			Pneumatic supply plate	2	**U**		
	13	User documentation	Express waiver - no manual to be included (already available)		**-B**		
			Manuals, German		**-D**		
			Manuals, English		**-E**		
			Manuals, French		**-F**		
			Manuals, Italian		**-I**		
			Manuals, Spanish		**-S**		
			Manuals, Swedish		**-V**		
O	**14**	Accessories			**+**		+
		Connecting cables	Connecting cable 2.5 m, Sub-D	6	**CP**		
			Connecting cable 5 m, Sub-D	6	**CQ**		
			Connecting cable 10 m, Sub-D	6	**CR**		
		H-rail mounting	1		**H**		
		Inscription label holder	1		**T**		

2 **MF, MH, B, E, N, K, J, D, L, T, S, U**
Not possible with power supply 5.

3 **Equipment at valve position 0 ... 15**
Valve terminal must be equipped with exactly 4, 8, 12 or 16 valve positions. Exception: Electrical connection MS: max. 12 valve positions.
Valve positions must always be configured from the left.

4 **J** Double solenoid valve occupies 2 valve positions.
Cannot be mounted at the last valve position.

5 **T, S** Can be mounted anywhere, however ensure adequate compressed air supply and exhausting (for more than 2 successive valves).

6 **CP, CQ, CR**
Not with electrical connection MF.

Transfer order code

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

– [12] – [13] + [14]

Valve terminal type 80 CPVSC1, Smart Cubic – Fieldbus Direct

Ordering data – Modular products

FESTO

M Mandatory data →

Module No.	Valve terminal		Size		Electrical connection		Position of working ports	Pneumatic working ports		Manual override		Pneumatic supply	Pneumatic supply connection	Type of connections
538 510	81P		10		DN		P	B E F		N V		S T V X	L	C G
Ordering example														
538 510	**81P**	–	**10**	–	**DN**	–	**P**		–		–		**L**	
1	**2**		**3**		**4**		**5**	**6**		**7**		**8**	**9**	**10**

Ordering table

Size			10	Conditions	Code		Enter code
M	**1**	Module No.	**538 510**				
	2	Valve terminal	Valve terminal type 80, Smart Cubic, CPV-SC		**81P**		81P
	3	Size [mm]	10		**-10**		-10
	4	Electrical connection	DeviceNet		**-DN**		-DN
	5	Position of working ports	On valve		**-P**		-P
	6	Pneumatic working ports, per valve position	Threaded connection M5		**B**		
			Push-in fittings QS-3		**E**		
			Push-in fittings QS-4		**F**		
	7	Manual override	Manual override, push-in/detenting		**-N**		
			Manual override blocked		**-V**		
	8	Pneumatic supply	Internal pilot air supply, silencer		**-S**		
			External pilot air supply, silencer		**-T**		
			Internal pilot air supply, ducted exhaust air		**-V**		
			External pilot air supply, ducted exhaust air		**-X**		
	9	Pneumatic supply connection	Supply at left		**L**		L
↓	**10**	Type of connections	Threaded connection M7		**C**		
			Push-in fittings QS-6		**G**		

Transfer order code

538 510	**81P**	–	**10**	–	**DN**	–	**P**		–		–		**L**	
1	**2**		**3**		**4**		**5**	**6**		**7**		**8**	**9**	**10**

Valve terminal type 80 CPVSC1, Smart Cubic – Fieldbus Direct

FESTO

Ordering data – Modular products

M Mandatory data																O Options	
Equipment at valve position 0 ... 15																User documentation	Accessories
11 Valves: M, N, K, J, D, L, T, S, U																D, E, F, I, S, V	...D, H, T
Valve position	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
–	M	N	M	K	M	K	J	J								– D	+ H T
	11															12	13

Ordering table

Size			10	Conditions	Code		Enter code
↓	11	Equipment at valve position 0 ... 15		1	-		-
M		Valves	5/2-way valve, single solenoid		M		Enter equipment selection for valve positions in order code
			3/2-way valve, normally open		N		
			3/2-way valve, normally closed		K		
			5/2-way valve, double solenoid	2	J		
			2/2-way valve, normally closed		D		
			Vacant position		L		
			Pneumatic supply plate, duct 1 separate	3	T		
			Pneumatic supply plate, duct 1/3/5 separate	3	S		
			Pneumatic supply plate		U		
O	12	User documentation	Manuals, German		-D		
			Manuals, English		-E		
			Manuals, French		-F		
			Manuals, Italian		-I		
			Manuals, Spanish		-S		
			Manuals, Swedish		-V		
	13	Accessories			+		+
		Connector plug straight DeviceNet	1 ... 99		...D		
		H-rail mounting	1		H		
		Inscription label holder	1		T		

1 **Equipment at valve position 0 ... 15**
Number of valve positions: 4, 8, 12, 16.
Valve positions must always be configured from the left.

2 **J** Double solenoid valve occupies 2 valve positions.
Cannot be mounted at the last valve position.

3 **T, S** Can be mounted anywhere, however ensure adequate compressed air supply and exhausting (for more than 2 successive valves).

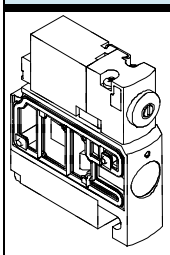
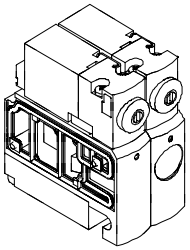
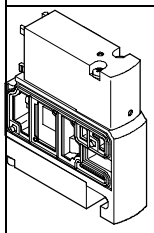
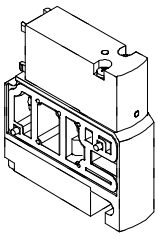
Transfer order code

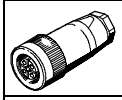
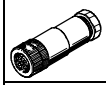
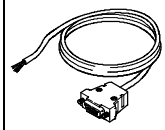
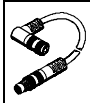
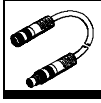
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
–																	–	+
	11																12	13

Valve terminal type 80 CPVSC1, Smart Cubic

Accessories

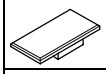
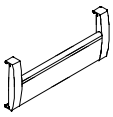
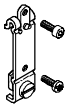
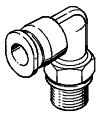
FESTO

Ordering data – Valves			
	Designation	Type	Part No.
	**Solenoid valve with connections M5**		
	5/2-way valve, single solenoid	**CPVSC1-M1H-M-P-M5C**	**527 550**
	5/2-way valve, double solenoid	**CPVSC1-M1H-J-P-M5C**	**527 553**
	3/2-way valve, normally open	**CPVSC1-M1H-N-P-M5C**	**527 551**
	3/2-way valve, normally closed	**CPVSC1-M1H-K-P-M5C**	**527 552**
	2/2-way valve, normally closed	**CPVSC1-M1H-D-P-M5C**	**527 554**
	**Solenoid valve with QS-3 push-in fittings**		
	5/2-way valve, single solenoid	**CPVSC1-M1H-M-P-Q3C**	**527 555**
	5/2-way valve, double solenoid	**CPVSC1-M1H-J-P-Q3C**	**527 558**
	3/2-way valve, normally open	**CPVSC1-M1H-N-P-Q3C**	**527 556**
	3/2-way valve, normally closed	**CPVSC1-M1H-K-P-Q3C**	**527 557**
	2/2-way valve, normally closed	**CPVSC1-M1H-D-P-Q3C**	**527 559**
	Solenoid valve with QS-4 push-in fittings		
	5/2-way valve, single solenoid	**CPVSC1-M1H-M-P-Q4C**	**527 560**
	5/2-way valve, double solenoid	**CPVSC1-M1H-J-P-Q4C**	**527 563**
	3/2-way valve, normally open	**CPVSC1-M1H-N-P-Q4C**	**527 561**
	3/2-way valve, normally closed	**CPVSC1-M1H-K-P-Q4C**	**527 562**
	2/2-way valve, normally closed	**CPVSC1-M1H-D-P-Q4C**	**527 564**
	**Plates with integrated connections**		
	Vacant position, with blanking plate	**CPVSC1-RP-B**	**527 527**
	**Supply plate M5**		
	Duct 1 separate	**CPVSC1-SP-P-M5**	**527 528**
	Duct 1/3/5 separate	**CPVSC1-SP-PRS-M5**	**527 530**
	Without duct separation	**CPVSC1-SP-M5**	**527 532**
	Supply plate, QS-4 push-in fitting		
	Duct 1 separate	**CPVSC1-SP-P-Q4**	**527 529**
	Duct 1/3/5 separate	**CPVSC1-SP-PRS-Q4**	**527 531**
	Without duct separation	**CPVSC1-SP-Q4**	**527 533**
	**Cover for manual override**		
	10 pieces	**CPVSC1-MO-V**	**527 393**
	Cover for manual override	**CPVSC1-HV**	**527 642**

Ordering data – Accessories				
Designation			Type	Part No.
Power supply				
	MicroStyle M12, 5-pin socket (B-coded)	for 0.75 mm^2	**NTSD-GD-9-M12-5POL-RK**	**538 999**
Fieldbus connection				
	Fieldbus socket for MicroStyle connection, M12, socket (A-coded)		**FBSD-GD-9-5POL**	**18 324**
Connecting cable, IP20 for multi-pin plug connection				
	Sub-D, 15-pin, up to 12 valve positions for code MS Material: PVC Suitable for chain link trunking	2.5 m	**KMP6-15P-12-2,5**	**527 543**
		5 m	**KMP6-15P-12-5**	**527 544**
		10 m	**KMP6-15P-12-10**	**527 545**
	Sub-D, 26-pin, up to 16 valve positions for code MH Material: PVC Suitable for chain link trunking	2.5 m	**KMP6-26P-16-2,5**	**527 546**
		5 m	**KMP6-26P-16-5**	**527 547**
		10 m	**KMP6-26P-16-10**	**527 548**
Valve terminal connection				
	Angled plug – angled socket WS-WD	0.5 m	**KVI-CP-1-WS-WD-0,5**	**178 564**
		2 m	**KVI-CP-1-WS-WD-2**	**163 139**
		5 m	**KVI-CP-1-WS-WD-5**	**163 138**
	Plug straight GS-WD	5 m	**KVI-CP-1-GS-WD-5**	**163 137**
		8 m	**KVI-CP-1-GS-WD-8**	**163 136**
	Plug straight GS-GD	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**

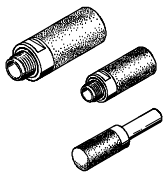
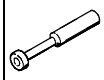
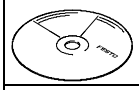
Valve terminal type 80 CPVSC1, Smart Cubic

Accessories

Ordering data – Accessories				
Designation			Type	Part No.
Inscription labels for valve identification				
	80 pieces, 9x4.5 mm		**MH-BZ-80x**	**197 259**
Inscription label holder				
	1 piece	for 4 valves	**CPVSC1-ST-4**	**527 631**
		for 8 valves	**CPVSC1-ST-8**	**527 633**
		for 12 valves	**CPVSC1-ST-12**	**527 635**
		for 16 valves	**CPVSC1-ST-16**	**527 637**
Mounting				
	Screw for additional terminal mounting		**M3x45**	**527 643**
	Mounting		**CPVSC-HS35**	**527 639**
Push-in fitting for working ports				
	Connecting thread M5 for tubing O.D.	3 mm	**QSM-M5-3**	**153 302**
		4 mm	**QSM-M5-4**	**153 304**
		3 mm	**QSM-M5-3-I**	**153 313**
		4 mm	**QSM-M5-4-I**	**153 315**
		6 mm	**QSM-M5-6-I**	**153 317**
	Connecting thread M7 for tubing O.D.	4 mm	**QSM-M7-4-I**	**153 319**
		6 mm	**QSM-M7-6-I**	**153 321**
Push-in L-fitting for working ports				
	Connecting thread M5 for tubing O.D.	3 mm	**QSML-M5-3**	**153 331**
		4 mm	**QSML-M5-4**	**153 333**
		6 mm	**QSML-M5-6**	**153 335**
		4 mm	**QSMLL-M5-4**	**153 339**
		6 mm	**QSMLL-M5-6**	**153 341**
	Connecting thread M7 for tubing O.D.	4 mm	**QSML-M7-4**	**186 352**
		6 mm	**QSML-M7-6**	**186 353**
		4 mm	**QSMLL-M7-4**	**186 354**
		6 mm	**QSMLL-M7-6**	**186 355**

Valve terminal type 80 CPVSC1, Smart Cubic

Accessories

Ordering data – Accessories				
Designation			Type	Part No.
Silencers				
	Connecting thread M5		**U-M5**	**4 645**
	Connecting thread M5		**UC-M5**	**165 003**
	Connecting thread M7		**UC-M7**	**161 418**
	Connection type, push-in sleeve		**UC-QS-3H**	**165 005**
	Connection type, push-in sleeve		**UC-QS-4H**	**165 006**
	Connection type, push-in sleeve		**UC-QS-6H**	**165 007**
Blanking plugs				
	Thread M5		**B-M5-B**	**174 308**
	Thread M7		**B-M7**	**174 309**
Plugs				
	Blanking plug for tubing O.D. 4 mm		**QSC-4H**	**153 267**
	Blanking plug for tubing O.D. 6 mm		**QSC-6H**	**153 268**
	Blanking plug for tubing O.D. 3 mm		**QSMC-3H**	**153 382**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**
User documentation				
	User documentation – Pneumatics, Valve terminal CPVSC	German	**P.BE-CPVSC-DE**	**530 925**
		English	**P.BE-CPVSC-EN**	**530 926**
		French	**P.BE-CPVSC-FR**	**530 927**
		Spanish	**P.BE-CPVSC-ES**	**530 928**
		Italian	**P.BE-CPVSC-IT**	**530 929**
		Swedish	**P.BE-CPVSC-SV**	**530 930**
	User documentation – Fieldbus DeviceNet	German	**P.BE-CPASC-CPVSC-DN-DE**	**539 008**
		English	**P.BE-CPASC-CPVSC-DN-EN**	**539 009**
		French	**P.BE-CPASC-CPVSC-DN-FR**	**539 010**
		Spanish	**P.BE-CPASC-CPVSC-DN-ES**	**539 011**
		Italian	**P.BE-CPASC-CPVSC-DN-IT**	**539 012**
		Swedish	**P.BE-CPASC-CPVSC-DN-SV**	**539 013**