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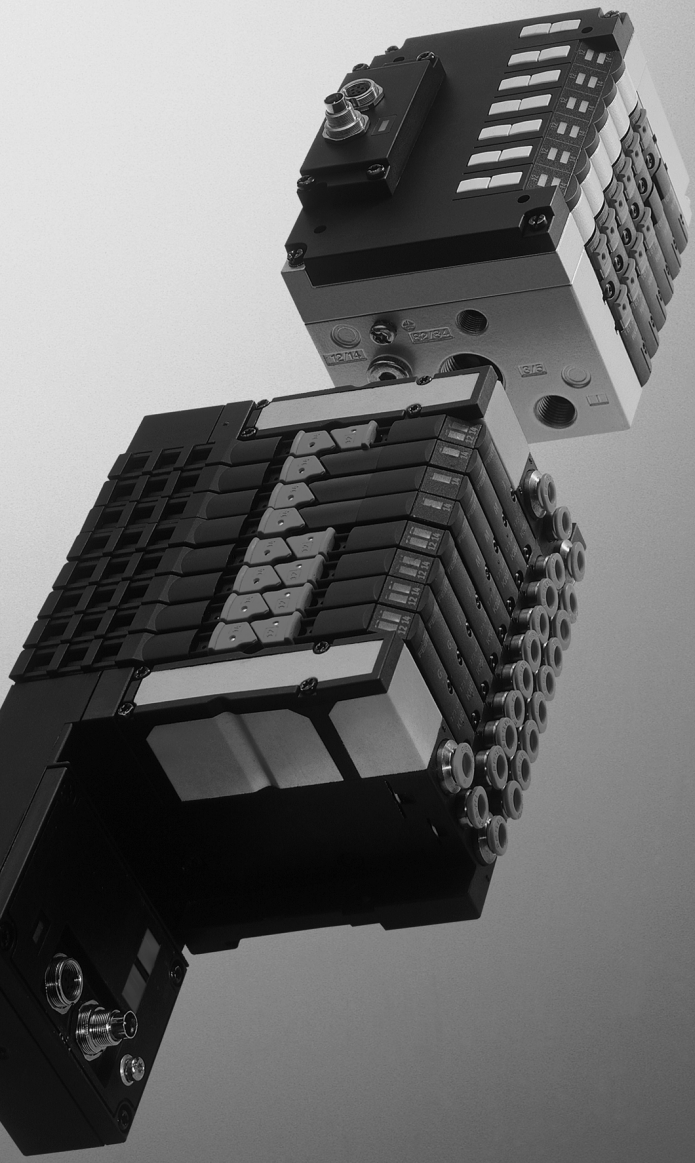
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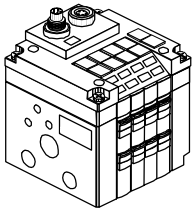
Compact performance



FESTO

CPV pneumatics manual

CPV valve terminal
Type CPV...-VI



Manual
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en 0503g

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Designated use

The CPV valve terminals described in this manual are intended for fitting into a machine or automated system. The user must at all times observe the safety regulations specified in this manual as well as the instructions concerning the designated use of the relevant CPV valve terminal. CPV valve terminals may only be used as follows:

– in accordance with designated use

– in their original state

– without any modifications by the user

– in faultless technical condition.

When used together with commercially available components, such as sensors and actuators, the specified limits for pressures, temperatures, electrical data, torques etc. must be observed. National and local safety regulations must also be observed.



Warning
If the terminal is to be used as an explosion-proof operating media, make sure that:

- the electrical connections are **not** disconnected when power is applied.
- the completely fitted product with all plugs, adapters and protective caps used complies at least with protection class IP64.

Target group

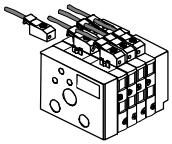
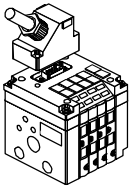
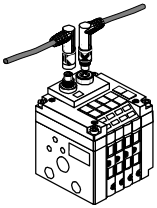
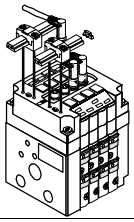
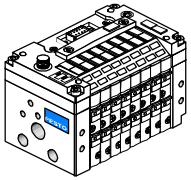
This manual is intended exclusively for technicians trained in control and automation technology, who have experience in fitting, installing, commissioning, servicing and converting pneumatic components.

Service

Please consult your local Festo service centre if you have any technical problems.

Notes on the use of this manual

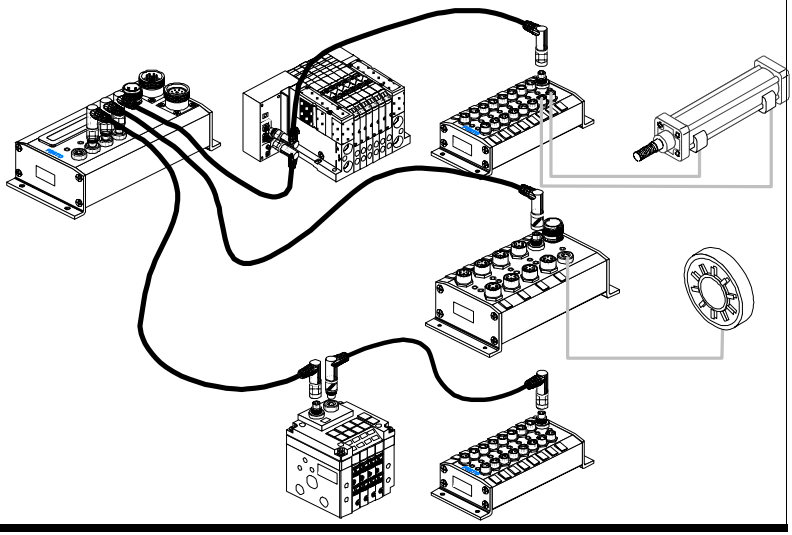
This manual contains specific information on fitting, installing, commissioning, servicing and converting the CPV valve terminal. This manual describes only the pneumatic components and refers to the CPV valve terminal variants listed in the table below.

Variants of the CPV valve terminal type CPV...-VI..	
With IC connection Information on the electric/electronic components: In this manual 	With MP connection Information on the electric/electronic components: See leaflet with product 
With CP connection Information on the electric/electronic components: See manual "CP system, installation and commissioning" 	With AS-Interface connection Information on the electric/electronic components: See leaflet with product 
With CP direct connection Information on the electric/electronic components: See manual "CPV valve terminal, with direct connection" for the relevant field bus 	

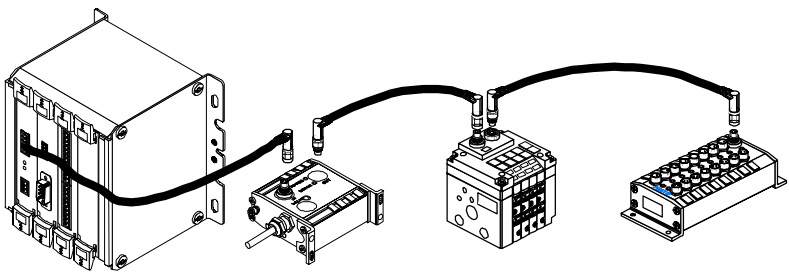
Tab. 0/1: Variants of the CPV valve terminal

Information on further CP modules, as well as basic information which must be observed in conjunction with the higher-order system, can be found in the manuals for the relevant modules/systems.

The table below gives an overview.

Manuals on the CP system				**Periph-erals**
Description	“CP system, installation and commissioning” Type P.BE-CPSYS-...			
Contents	General basic information on the method of operation, fitting, installation and commissioning of CP systems.			
Description	“CP field bus node, programming and diagnosis” Type P.BE-CP-FB... or P.BE-VIFB...-10...	“CPV valve terminal, pneumatics” or ”CPA valve terminal, pneumatics” Type P.BE-CPV-... or P.BE-CPA-...	“CP modules, electronics” Type P.BE-CPEA-...	
Contents	Special information on commissioning, programming and diagnosing related to the node used.	Information on fitting, installing and com-missioning CPA or CPV valve terminals	Information on fitting, installing and commissioning CP I/O modules	
				

Tab. 0/2: Manuals on the CP system

Manuals on the SPC200 Smart Positioning Controller			**Peripherals**
Manuals	SPC200 Smart Positioning Controller, User manual Type P.BE-SPC200-...	WinPISA manual Type P.SW-WIN-PISA-...	Manuals on: – Proportional directional control valves – Service unit – Measuring system – Cylinder or linear drives
Contents	Installation, commissioning and diagnosis with SPC200; standard components and modules	Functions of the WinPISA software package	
Description	CPV valve terminal, pneumatics Type P.BE-CPV-...	CP modules, electronics Type P.BE-CPEA-...	
Contents	Information on the CPV valve terminals	Information on the CP I/O modules	
			

Tab. 0/3: Manuals on the SPC200

Important user instructions

Danger categories

This manual contains instructions on the possible dangers which may occur if the product is not used correctly. These instructions are marked (Warning, Caution, etc.), printed on a shaded background and marked additionally with a pictogram. A distinction is made between the following danger warnings:



Warning
This means that failure to observe this instruction may result in serious personal injury or damage to property.



Caution
This means that failure to observe this instruction may result in personal injury or damage to property.



Please note
This means that failure to observe this instruction may result in damage to property.

The following pictogram marks passages in the text which describe activities with electrostatically sensitive components.



Electrostatically sensitive components may be damaged if they are not handled correctly.

Marking special information

The following pictograms mark passages in the text containing special information.

Pictograms



Information:
Recommendations, tips and references to other sources of information.



Accessories:
Information on necessary or sensible accessories for the Festo product.



Environment:
Information on environment-friendly use of Festo products.

Text markings

- The bullet indicates activities which may be carried out in any order.

1. Figures denote activities which must be carried out in the numerical order specified.

– Hyphens indicate general activities.

List of abbreviations

The following product-specific terms and abbreviations are used in this manual:

Term	Meaning
AS-Interface	**A**ctuator **S**ensor **I**nterface
AS-Interface connection	CPV valve terminal variant with serial connections which enables the CPV valve terminal to be connected to the AS-Interface bus.
Blanking plate	Plate without valve function in order to fill an unused location.
Components	Common term for sub-bases, end plates, relay plates, blanking plates, separator plates, valve sub-bases, valve extensions, vacuum generator plates and pneumatic multipin.
Connecting the tubing	Connecting the supply lines (tubing) to the CPV valve terminal
CP	**C**ompact **P**erformance
CP cable	Special cable for coupling the various CP modules
CP connection	CPV valve terminal variant with plug and socket which enables the CPV valve terminal to be connected to a field bus node and further CP modules.
CP modules	Common term for various modules which can be incorporated in a CP system.
CP system	Complete system consisting of CP field bus node and CP modules.
CPV valve terminal	Note the following on CPV valve terminals (type 10) with IC, MP, DI or AS-Interface connections.
CPV10 CPV14 CPV18	Size designations of the CPV valve terminals: – with micro valve sub-bases (CPV10), – with mini valve sub-bases (CPV14) – with midi valve sub-bases (CPV18)
DI connection	CPV valve terminal variant with plug and socket which can be connected directly with the field bus and with further CP modules, depending on type.
Electrical sub-base	Note the following with the MP, AS-Interface, DI and CP connections.

Term	Meaning
End plate	Cover plate at the left and right-hand ends of the CPV valve terminal with channels or connections for supplying the valves with compressed air and for conducting the exhaust air.
IC connection (individual connection)	CPV valve terminal variant on which every valve solenoid coil can be connected individually with a special CP cable.
I/O	Input/output modules
Manual override	Manual override
MP connection (multipin connection)	CPV valve terminal variant with sub-D plug via which all valve solenoid coils are connected centrally.
Pneumatic multipin	Plate for central tubing connections on the valve terminal (supply air, exhaust air and work air connections).
Relay plate	Plate with relay coils for actuating two electrically-isolated outputs.
Separator plate	Plate for dividing the valve terminal into two/four pressure zones.
Vacuum generator plate	Plate with vacuum generator (with or without reject pulse)
Valve block	Basic unit with valve sub-base, vacuum generator plate, separator, blanking, relay and end plates
Valve sub-base	Plate with single-solenoid or double-solenoid valves
5/3G valve extension	Module with two unlockable non-return valves. With the CPV10/14 valve terminals, the valve function “5/3-way in mid-position blocked” is implemented with this module and the valve sub-base Ident. code C.

Tab. 0/4: Product-specific terms and abbreviations

Sysytem summary

Chapter 1

Contents

1. Sysytem summary 1-1

1.1 Description of variants 1-3
1.2 Description of components 1-6

1.1 Description of variants

Festo assists you in solving your automation tasks at machine level with valve terminals. The modular structure of the CP system enables you to incorporate the CP valve terminals and I/O modules optimally in your machine or system.

Due to its compact structure the CP valve terminal can be mounted close to the actuators to be controlled. Short compressed air tubing can therefore be used. System losses can therefore be minimized and the times required for pressurizing and exhausting the tubing can be minimized. This is made possible by the use of very compact valves with high flow rate, therefore helping to reduce costs.

CPV valve terminal variants

The CPV valve terminals are available with the following types of electrical connections:

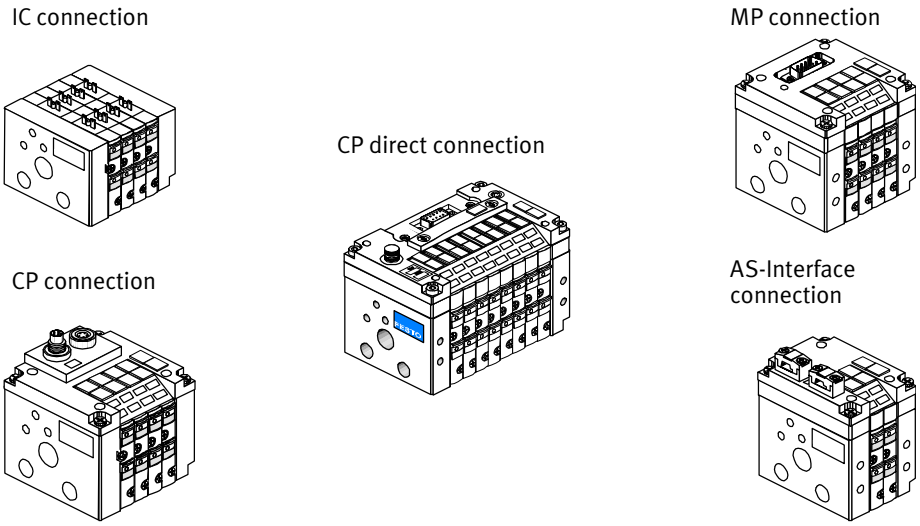


Fig. 1/1: Variants of the CPV valve terminal

CPV valve terminal with IC connection

The CPV valve terminal with IC connection is available with 2 to 8 valve sub-bases (also in odd gradation). The electrical connection is made individually on each valve solenoid coil.

CPV valve terminal with MP connection

This CPV valve terminal is available with 4, 6 or 8 valve sub-bases. The electrical connection of the valve solenoid coils is made centrally via the multipin connection.

CPV valve terminal with CP connection

The CPV valve terminal with CP connection is available with 4, 6 or 8 valve sub-bases. The connection to the higher-order field bus node is made via special ready-to-use CP cables.

CPV valve terminal with DI connection

The CPV valve terminals with direct connection are available for the following field bus systems in the sizes CPV10/14/18:

- CANopen
- DeviceNet
- Honeywell SDS
- Interbus Local bus (only in sizes CPV10/14)
- PROFIBUS DP, Festo field bus, ABB CS 31, Klöckner-Moeller SUCOnet K

These valve terminals can be connected directly to the relevant field bus. These CPV valve terminals are fitted with 4 or 8 valve sub-bases depending on the field bus system.

CPV valve terminal with AS-Interface connection

This CPV valve terminal is connected to the AS-Interface bus via special AS-Interface cables. It is available with 2, 4 or 8 valve sub-bases depending on the variant and with four different kinds of electrical connections:

- with additional supply connection for implementing an emergency stop function,
- with additional supply connection and 4 or 8 inputs (not CPV18),
- without additional supply connection,
- without additional supply connection with 4 or 8 inputs (not CPV18).

The CPV valve terminals with AS-Interface connection can be fitted with max. following valve sub-bases:

Valve sub-base with ...	ASI-2 (...-Z)	ASI-4 (...Z) ...ASI-4E4A (...-Z)	...ASI-8E8A-Z
... two 2/2-way valves (single-solenoid)	1	2	4
... two 3/2-way valves (single-solenoid)	1	2	4
... 5/2-way valve (single-solenoid)	2	4	8
... 5/2-way valve (double-solenoid)	1	2	4
... 5/3-way valve	1	2	-

Tab. 1/1: Maximum number of sub-bases on the CPV valve terminals with AS-Interface connection



The CPV valve terminals with AS-Interface connection and 4 or 8 inputs have 4 or 8 valve sub-bases. These CPV valve terminals also have blanking plates depending on the number of valve sub-bases.

1.2 Description of components

Sizes of the CPV valve terminals

The CPV valve terminals are available in the following sizes:

CPV10	10 mm	Micro valves
CPV14	14 mm	Mini valves
CPV18	18 mm	Midi valves

Tab. 1/2: Sizes of the CPV valve terminals

Identification code

With the identification code (I.C.) you can ascertain the equipment fitted on your CPV valve terminal. The code is printed on the front between manual overrides 12 and 14.

I.C.	Pneumatic components
Valve sub-bases with 2/2-way valves	
D	Two 2/2-way valves, single-solenoid, basic position closed
I	Two 2/2-way valves, basic position control side 14 open, control side 12 closed
Valve sub-bases with 3/2-way valves	
C	Two 3/2-way valves, single-solenoid, basic position closed
H	Two 3/2-way valves, basic position control side 14 open, control side 12 closed
N	Two 3/2-way valves, basic position open
Valve sub-bases with 5/2-way valves	
F	5/2-way valve, single-solenoid, fast-switching
J	5/2-way valve, double-solenoid
M	5/2-way valve, single-solenoid
Valve sub-bases with 5/3-way valves	
G	CPV10/14: Two 3/2-way valves, basic position closed + valve extension 5/3G CPV18: 5/3-way valve, mid-position blocked
Vacuum generator plates	
A	Without reject pulse
I	With 2/2-way valve for reject pulse
Separator plates	
S	Exhaust channel (3/5) and compressed air channels (1.11) blocked
T	Compressed air channels (1, 11) blocked
Blanking plate	
L	Plate without valve function for placing in an unused valve location

I.C.	Pneumatic components
Relay plate	
R	Plate with two electrically-isolated relays
Valve extensions	
P	One-way flow control valve for restricting the supply air
Q	One-way flow control valve for restricting the exhaust air
V	Flow control valve for setting the reject pulse

Tab. 1/3: Identification codes of the pneumatic components



Further information on the valve sub-bases and vacuum generator plates can be found in Appendix B.

Valve extension 5/3G (only CPV10/14)

The valve extension 5/3G contains the function of two unlockable non-return valves. A function “5/3-way in mid-position blocked” can be implemented in conjunction with the valve sub-base with Ident code C (two 2/3-way valves in basic position blocked).



Further information on valve extension 5/3G can be found under “Fitting the valve extensions” in chapter 2 and under “General instructions” in chapter 4.

Flow control valve or one-way flow control valve extension

With the following valve extensions you can adapt the CPV valve terminal to the requirements of your machine or system.

For restricting the supply or exhaust air of the valve sub-bases use valve extension:

– CPV-..-BS-2xGRZZ-... for restricting the supply air

– CPV-..-BS-2xGRZZ-... for restricting the exhaust air.

For restricting the reject pulse of the vacuum generator plate with Ident code E use valve extension:

– CPV-..-BS-GRZ-V-...

The valve extensions are flange-fitted directly onto the valve sub-bases. It is not intended that the above-mentioned valve extensions should be combined.



Further information on the valve extensions can be found under “Fitting the valve extensions” in chapter 2 and under “General instructions” in chapter 4.

Vacuum generator plates

CPV valve terminals can be fitted with vacuum generator plates for generating vacuum. Work items with a smooth and tight surface can then be sucked in.

Two types of vacuum generators are available:

– Plate with switchable vacuum generator.

– Plate with switchable vacuum generator and additional 2/2-way valve for generating the reject pulse.



Further information on the vacuum generator plates can be found under “Vacuum generator plates” in chapter 3.3.2.

Separator plate

By means of separator plates you can divide the CPV valve terminals into 2 to 4 pressure zones. Two types of separator plates are available:

– Separator plate with blocked compressed air channels (1 and 11).

– Only CPV10/14: Separator plate with blocked exhaust channel (3/5) and blocked compressed air channels (1 and 11).

Relay plate

CPV10/14 valve terminals which have holding current reduction can be fitted witht relay plates. This applies to CPV valve terminals with the following connection:

– CP connection

– CPV direct connection

– AS-Interface connection (only CPV10 valve terminals)

– IC connection (only in combination with connector socket KMYZ-7-24-...-LED (CPV10/14)

– MP connection

Each relay plate possesses two relays for actuating two electrically-isolated outputs.

Pneumatic multipin

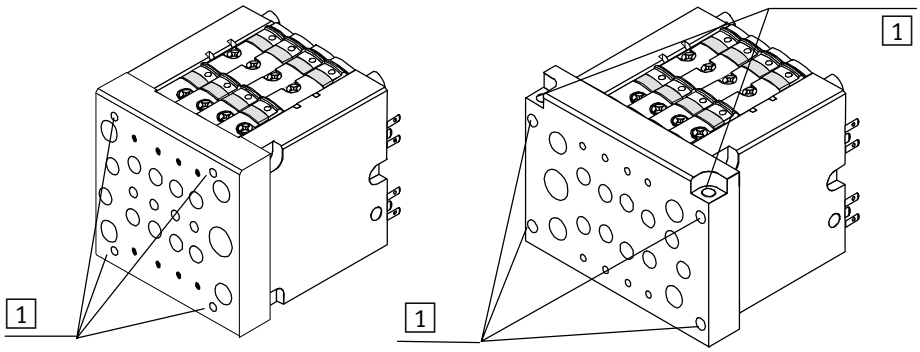
The pneumatic multipin serves as a common connection for power supply and work tubing. The CPV valve terminal is screwed together with the pneumatic multipin and sealed with it by means of sets of seals. The pneumatic multipin permits fast separation of the CPV valve terminal from the supply and work tubing. The pneumatic multipin is available in two forms:

– Without assembly step: This variant for mounting on a stand or wall opening fits flush with the end plates. The fastening holes are in the connection side of the pneumatic multipin.

– With assembly step: In this variant for fitting onto a wall or onto a stand the fastening holes are in the assembly step.

Pneumatic multipin (without step)

Pneumatic multipin (with step)

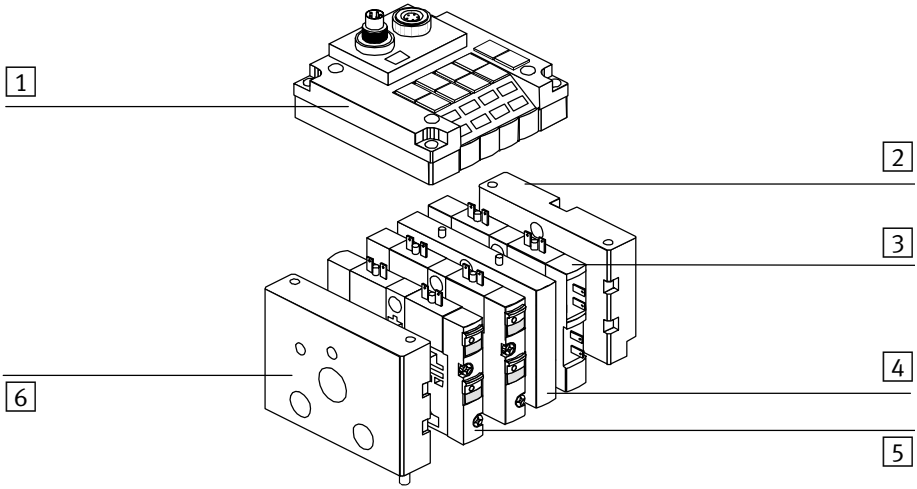


1 Mounting holes

Fig. 1/2: Variants of the pneumatic multipin

The CPV valve terminal can consist of the following components, depending on what has been ordered:

Overview of components



1 Electrical sub-base (only CPV valve terminals with MP, AS-Interface or CP connections)

2 Right-hand end plate (designs see Appendix B “Overview of end plates”)

3 Relay plate (see also compatibility list in chapter 5)

4 Blanking plate or separator plate (with blocked compressed air channels 1 and 11 and exhaust channel (3/5) or only blocked compressed air channels 1 and 11)

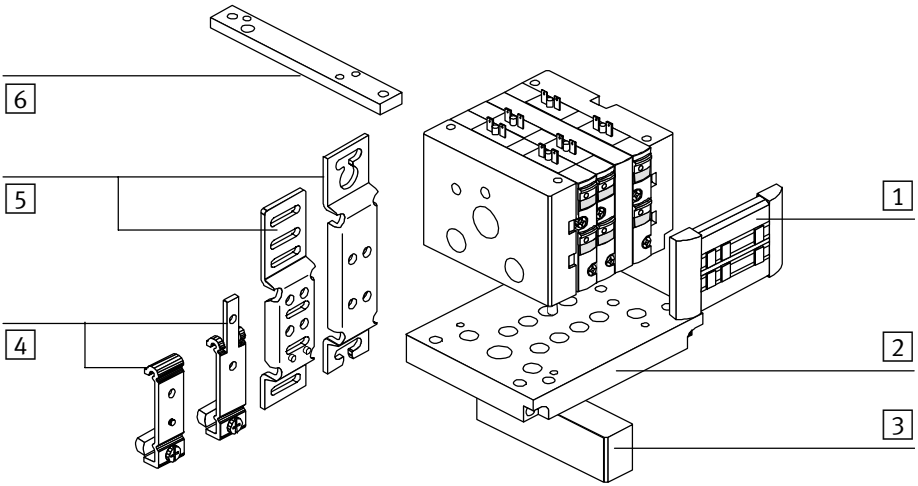
5 Valve sub-bases fitted with single-solenoid, double-solenoid or vacuum valves

6 Left-hand end plate (designs see Appendix B “Overview of end plates”)

Fig. 1/3: Components of the CPV valve terminal

Supplementary components of the CPV valve terminal

The CPV valve terminal can be supplemented optionally by the following components:



1 Manual override cover and support for identification signs, not in conjunction with relay plate

2 Pneumatic multipin

3 Valve extensions (5/3G function (only CPV10/14), vacuum restrictor valve or one-way flow control valve)

4 Support for hat rail fitting for CPV10/14 or CPV18

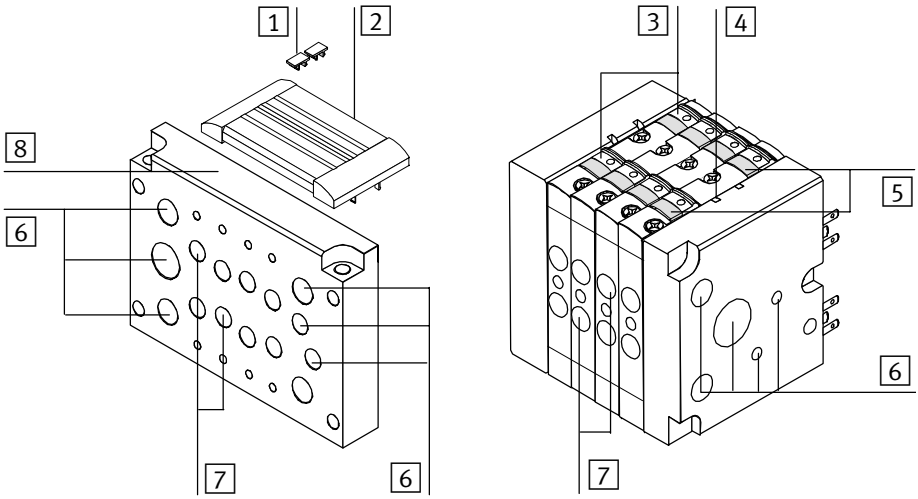
5 Support for wall fitting for CPV10/14 or CPV18

6 Support for wall fitting for CPV10/14 or CPV18

Fig. 1/4: Supplements to the CPV valve terminal

Connecting, display and operating elements

You will find the following connecting, display and operating elements on the CPV valve terminal:



1 Valve location for identification signs

2 Manual override cover and support for identification signs

3 Manual override (per pilot solenoid, locking or non-locking)

4 Removing the manual override cover

5 Clip of the non-locking manual override

6 Supply air connections (1, 11, 12/14), exhaust air connections (3/5, 82/84): with individual tubing on the left and/or right-hand end plate with central tubing on the pneumatic multipin

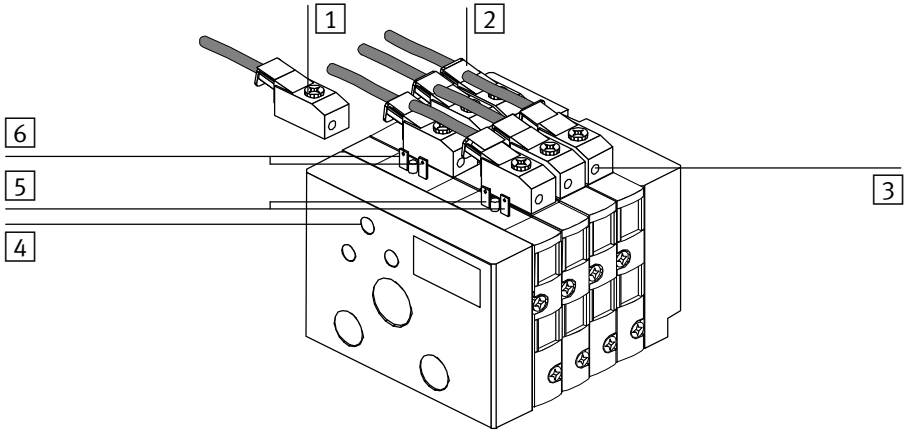
7 Work connections (2, 4) per valve

8 Pneumatic multipin

Fig. 1/5: Pneumatic connecting, display and operating elements of the CPV valve terminal

Instructions on the electrical connecting and display elements of the CPV valve terminals with direct connection can be found in the appropriate electronics manuals.

You will find the following electrical connecting and display elements on the CPV valve terminal with IC connection:



1 Ready-to-use connector socket (for each pilot solenoid), can be turned 180°

2 Identification sign (for each connector socket)

3 Yellow LED, signal status displays for pilot solenoid (for each connector socket)

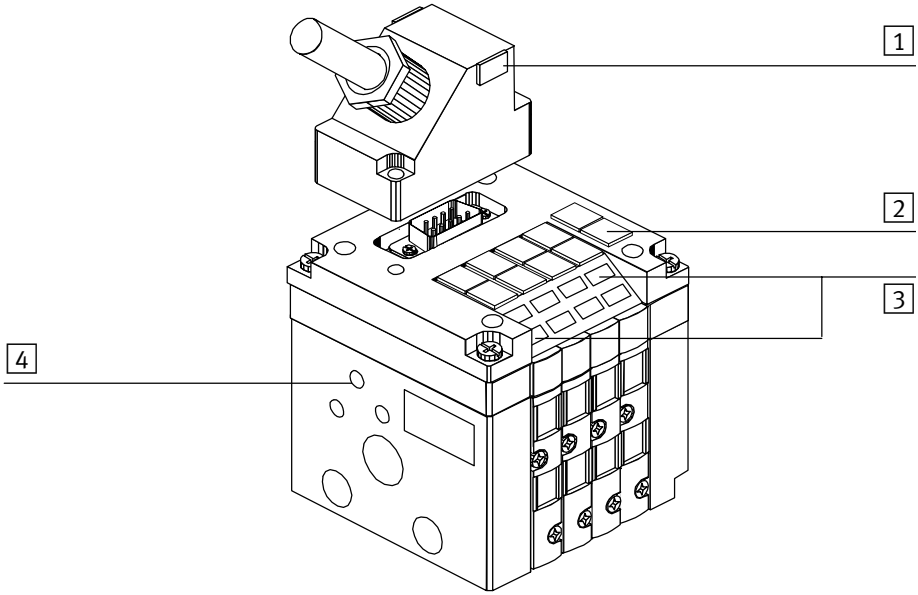
4 Earth/ground connection

5 Terminal lugs of pilot solenoid coil 14

6 Terminal lugs of pilot solenoid coil 12

Fig. 1/6: Electrical connecting and display elements of the CPV valve terminal with IC connection

You will find the following electrical connecting and display elements on the CPV valve terminal with MP connection:



1 Sub-D multipin plug (9-pin for terminals with 4 valves, 25-pin for terminals with 6 or 8 valves)

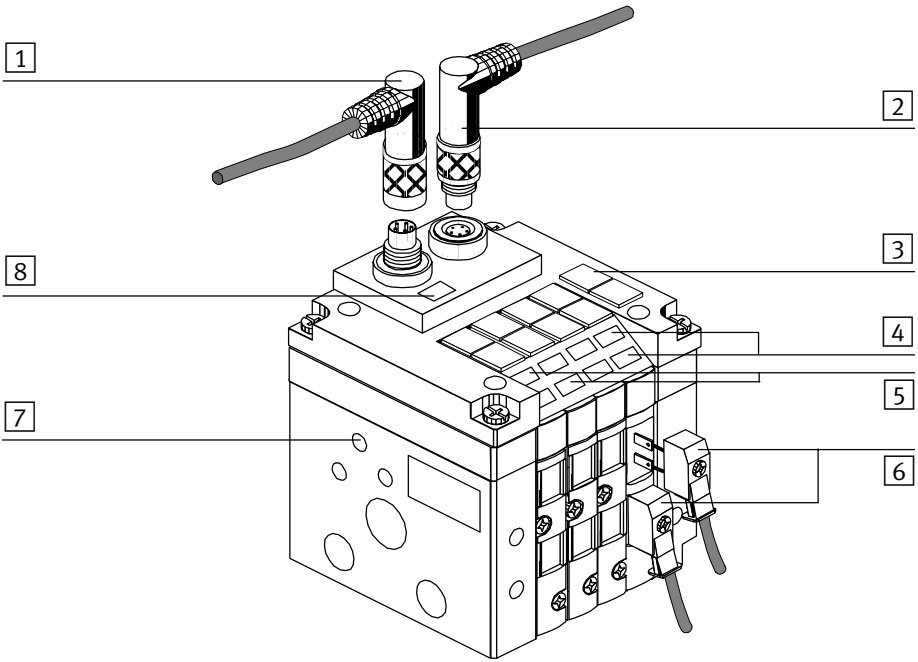
2 Identification labels

3 Yellow LED, signal status displays of the pilot solenoids

4 Earth/ground connection

Fig. 1/7: Electrical connecting and display elements of the CPV valve terminal with MP connection

You will find the following electrical connecting and display elements on the CPV valve terminal with MP connection:



1 Incoming CP cable

2 Continuing CP cable

3 Identification labels

4 Yellow LED, signal status display of the relays

5 Yellow LED, signal status display of the pilot solenoids

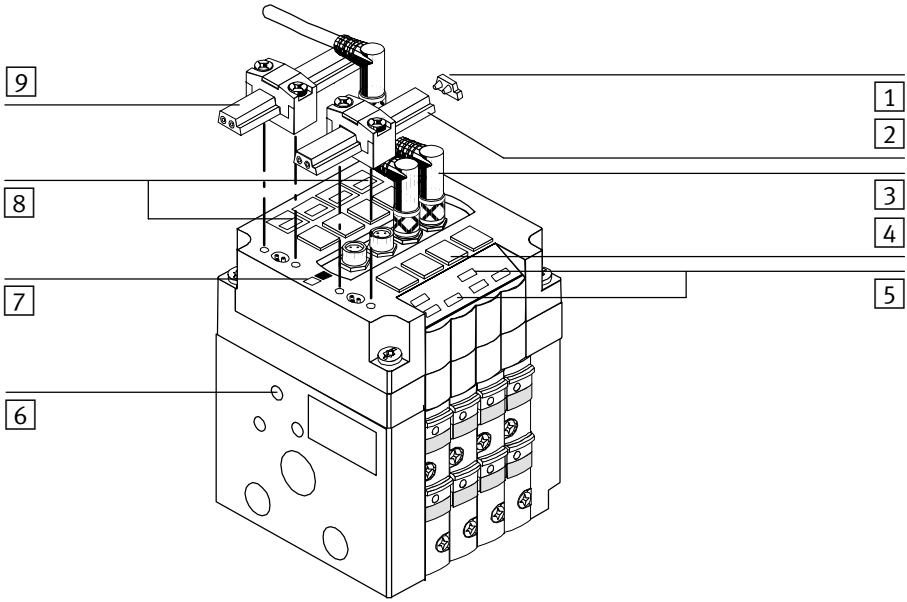
6 Relay connections with connecting cable

7 Earth/ground connection

8 Green LED, status display of the CP connection

Fig. 1/8: Electrical connecting and display elements of the CPV valve terminal with CP connection

You will find the following electrical connecting and display elements on the CPV valve terminal with AS-Interface connection:



1 AS-Interface cable cap, (only CPV..-GE-ASI-.-Z)

2 Cable socket of the additional supply with black cable, (only CPV..-GE-ASI-.-Z)

3 Sensor cable with plug (only CPV..-GE-ASI-..E..A-...)

4 Identification labels

5 Yellow LED, signal status displays of the pilot solenoids

6 Earth/ground connection

7 BUS LED 1 (green), BUS LED 2 (red), (only CPV..-GE-ASI-..E..A-...)

8 Green LED status displays of the inputs, (only CPV..-GE-ASI-..E..A-...)

9 AS-Interface bus socket with yellow bus cable

Fig. 1/9: Electrical connecting and display elements of the CPV valve terminal with AS-Interface connection

Fitting

Chapter 2

Contents

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Warning
Switch off the following power supplies before undertaking installation and/or maintenance work:

- the compressed air supply
- the power supply for the valve solenoid coils

You can thereby avoid:

– uncontrolled movements of loose tubing,

– unexpected movements of the connected actuators,

– non-defined switching states of the electronic components.

2.1 CPV valve terminal with individual tubing

Fitting variants

The CPV valve terminal with individual tubing has already been prepared for integration in a system or machine for the following fitting variants:

– Fitting onto a wall

– Fitting onto a hat rail

– Fitting onto a stand



Please note
If vibrations, which exceed the following values, occur on your application:

– 0.15 mm path at 10...58 Hz

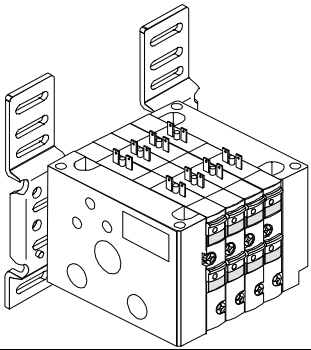
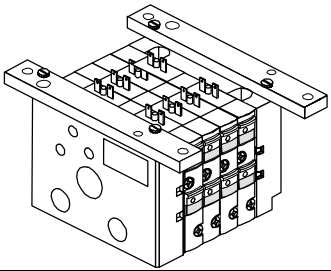
– 2 g acceleration at 58...150 Hz

You should mount the CPV14 or CPV18 valve terminal on a wall or on a stand.

2.1.1 Fitting onto a wall

In order to fit the CPV valve terminal onto a wall, you will require the appropriate mounting kit, depending on the type of mounting. The following table provides an overview.

For rear fitting of the CPV10/14 valve terminals with direct connection for Interbus Loop (type CPV..-GE-IL-..) or AS-Interface connection with inputs/outputs (type CPV..-GE-ASI..E/..A) there is a special mounting kit which is not listed here.

Type of mounting	
Rear 	On the top (only CPV10/14 with IC connection) 
Mounting kits (consisting of 2 profile sections and 4 self-threading screws)	
CPV10/14-VI-BG-RWL-B	CPV10-VI-BG-ET200X
CPV18-VI-BG-RW	CPV14-VI-BG-ET200X

Tab. 2/1: Fastening profile sections for fitting onto a wall

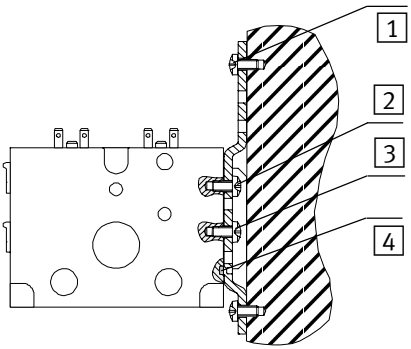
Proceed as follows:

- Make sure that the fastening surface can support the weight of the CPV valve terminal.
- Fit the fastening profile section to the left-hand and right-hand end plates (see Fig. 2/2). Use here the self-threading screws supplied (see table). When fitting the CPV10/14 valve terminals “from the rear,” make sure that the fixing bolts of the fastening profile sections grip into the recess in the end plates.

Valve terminal	**Type of mounting rear:**		**Type of mounting top:**	
	Self-threading screw	**Tightening torque**	**Self-threading screw**	**Tightening torque**
CPV10/14	M4 x 10	1.5 Nm	M3 x 18	1.5 Nm ± 0.2 Nm
CPV18	M5 x 10	4 Nm	–	–

Tab. 2/2: Fitting onto a wall, tightening torques

Type of mounting rear



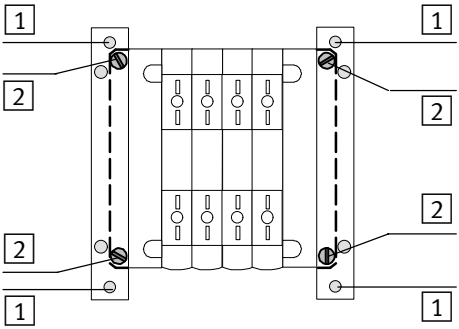
1 M4 (CPV10/14) or M5 screw (CPV18) for fastening onto a wall

2 Additional self-threading screw with CPV18 valve terminals

3 Self-threading screws for fastening the profile sections onto the CPV valve terminal

4 Fixing bolts (only CPV10/14)

Type of mounting top



1 5.5 mm bore for wall fastening

2 Self-threading screws for fastening the profile sections onto the CPV valve terminal

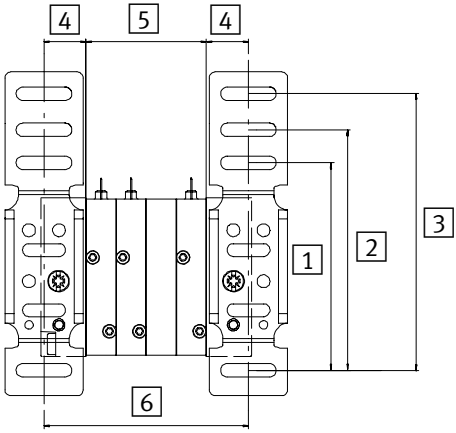
Fig. 2/1: Connecting the CPV valve terminal

- Make sure there is sufficient space for connecting the power supply and compressed air tubing. For “top” fitting, a suitable spacer or appropriate cut-out wall section is required for the electrical connections (see Fig. 2/3).

➔

Please note
The hole dimensions for rear fitting of the CPV valve terminal (Fig. 2/3) do not apply to CPV10/14 valve terminals with direct connection for Interbus Loop (type CPV..-GE-IL-..) or AS-Interface connection with inputs/outputs (type CPV..-GE-ASI..E/..A).

Type of mounting rear

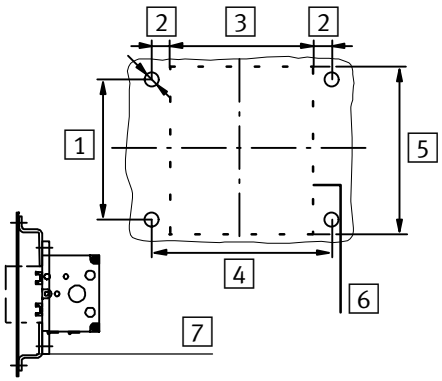


	CPV10/14	CPV18
1	69 mm 1)	
2	80 mm 1)	120 mm
3	92 mm 1)	
4	14 mm (18 mm) 2)	15 mm
5	10 mm x number of plates (14 mm x number of plates) 2)	18 mm x number of plates
6	28 mm + 5 (36 mm + 5) 2)	30 mm + 4

1) With CPV10/14 valve terminals the following applies:
– Dimension 1 for CPV10/14 valve terminals with IC connection.
– Dimension 2 for CPV valve terminal with MP, CP or AS-Interface connection (without inputs/outputs).
– Dimension 3 for CPV valve terminal with DI connection.
2) Values in brackets for CPV14.

Tab. 2/3: Dimensions of the fastening holes

Type of mounting top



	CPV10	CPV14
1	109.5 mm	109.5 mm
2	26 mm	10 mm
3	10 mm x number of plates	14 mm x number of plates
4	52 mm + 3	20 mm + 3
5	120 mm 1)	120 mm 1)
6	Wall cut-out if a spacer is not used	
7	Spacer	

1) Depends on the design of the electrical connector sockets

Tab. 2/4: Dimensions of the wall cut-outs

Drill four mounting holes or threaded holes in the fastening surface (see table).

Valve terminal	Type of mounting rear:		Type of mounting top:	
	Dimensions of the fastening holes	Threaded hole for	Dimensions of the fastening holes	Threaded hole for
CPV10/14	4.5 mm	M4 screw	5.5 mm	M5 screw
CPV18	5.5 mm	M5 screw	–	–

Tab. 2/5: Holes for wall fitting

- Fasten the CPV valve terminal with four M4 or M5 screws of sufficient length to the wall.

2.1.2 Fitting onto a hat rail



In order to fit the CPV valve terminal onto a hat rail you will require the following mounting kits:
– CPV10/14 valve terminal:
  Mounting kit CPV10/14-VI-BG-NRH-35
– CPV18 valve terminal:
  Mounting kit CPV18-VI-BG-NRH-35
Both mounting kits consist of 2 brackets, 2 or 4 M4x10 self-threading screws (CPV10/14) or M5x10 (CPV18) and 2 M4x10 screws with clamping elements and springs.

Proceed as follows:

- Make sure that the fastening surface can support the weight of the CPV valve terminal.
- Fit the following hat rail:

Hat rail for CPV10/14 valve terminal	**Hat rail for CPV18 valve terminal**
Support rail DIN 50022 - 35x7.5; width 35 mm, height 7.5 mm)	Support rail DIN 50022 - 35x15 (width 35 mm, height 15 mm)

Tab. 2/6: Hat rails

- Make sure that there is sufficient space for connecting the supply cables and tubing, and that extra space is available for fitting CPV valve terminals with large surface-mounted silencers.
- Fasten the hat rail to the fastening surface approximately every 100 mm.
- Fasten the two brackets to the end plates with the screws supplied as shown in the diagram below. With CPV10/14 valve terminals, make sure that the fastening bolts of the brackets grip into the recess in the CPV valve terminal.

CPV valve terminal	**Self-threading screw**	**Tightening torque**
CPV10/14	M4x10	1.5 Nm
CPV18	M5x10	4 Nm

Tab. 2/7: Hat rail adapter, tightening torques

1 Per end plate one M4x10 screw (CPV10), two M4x10 screws (CPV14) or M5x10 (CPV18)

2 Hat rail

3 Fixing bolts (only CPV10/14)

4 Hat rail clamping unit

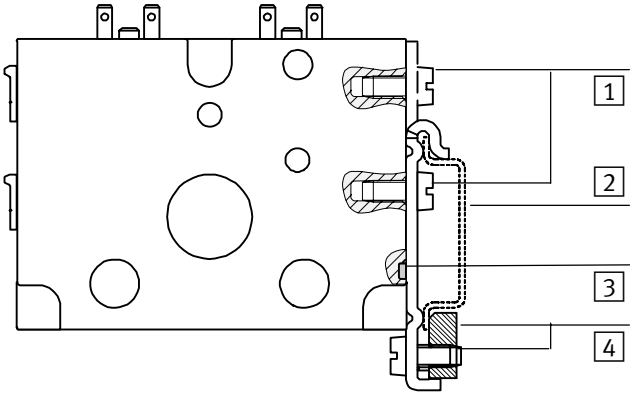


Fig. 2/2: Fitting the valve terminal on a hat rail

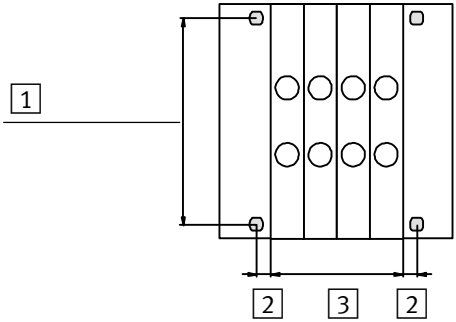
- Hang the CPV valve terminal onto the hat rail. Secure the CPV valve terminal on both sides with the hat rail clamping unit against slipping or sliding down.

2.1.3 Fitting onto a stand

In order to fit the CPV valve terminal onto a stand (fitting on the level of work connections 2 and 4), you will require the following fastening screws:
– 4 M4x45 socket head screws (CPV10)
– 4 M4x50 socket head screws (CPV14)
– 4 M6x65 socket head screws (CPV18)

Proceed as follows:

- Prepare the mounting surface. Make a suitable bracket. The position of and distances between the mounting holes of the CPV valve terminal are shown in the following diagram:



	CPV10 valve terminal	CPV14 valve terminal	CPV18 valve terminal
1	53 mm	66 mm	87 mm
2	4 mm	5 mm	8.1 mm
3	10 mm x number of plates	14 mm x number of plates	18 mm x number of plates

Tab. 2/8: Position of the fastening holes

- Make sure that there is sufficient space for connecting the supply cables and tubing, and that extra space is available for fitting CPV valve terminals with large surface-mounted silencers.
- With CPV valve terminals with IC connection:
  insert the four socket head screws supplied into the holes in the left-hand and right-hand end plates (see diagram).

	CPV10	CPV14	CPV18
Socket head screws	M4x45	M4x50	M6x65

Tab. 2/9: Mounting on a stand, fastening screws

1 Socket head screws: M4 x 45 or M4 x 50 or M6 x 65

2 End plates

3 Fastening bracket

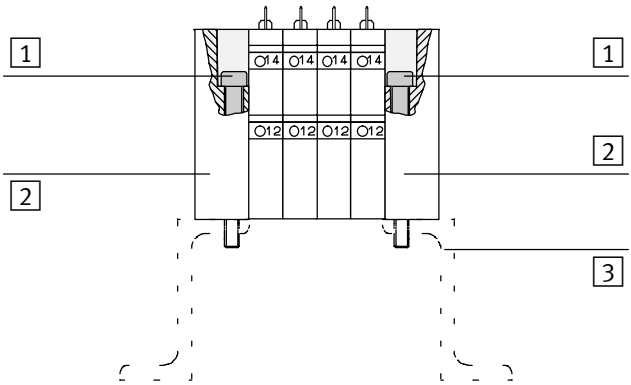


Fig. 2/3: Position of the fastening holes

- Screw the CPV valve terminal to the connection surface or to the fastening bracket.

2.1.4 Fitting the CPV valve terminal to the SIMATIC ET200X

Instructions on the decentral periphery device ET200X can be found in the relevant manual from SIEMENS AG.

A CPV valve terminal with:

- IC connection,
- 8 valve sub-bases,
- mounted fastening CPV..-VI-BG-ET200X
- and appropriate flat seal.

can be mounted on a pneumatic interface module type EM 148-P-DO 16 x P/CPV.. for the decentral periphery device ET200X.

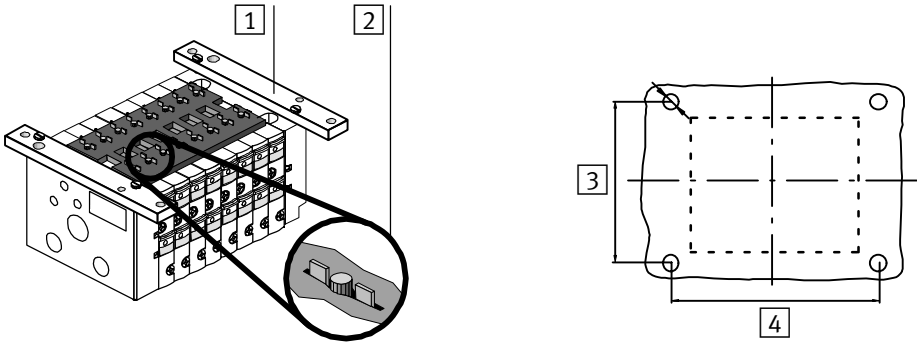
When the terminal is fitted into place, the switching status of the valve soleoid coils can be seen on the relevant LED on the pneumatic interface module.

Fitting

Proceed as follows:

1. The fastening is already fitted to the CPV valve terminal. Make sure that the flat seal is placed correctly over the terminal lugs and the centring bolt which lies between them (see Fig. 2/4).

2. Mark the positions of the four holes for the fastening screws on the background (see diagram).
   Tip: Hold the pneumatic interface module against the mounting surface and mark the positions of the holes.
   Drill the four fastening holes for screws of size M5.



1	Fastening CPV..-VI-BG-ET200X	3	109.5 mm
2	Terminal lug with centring bolt	4	132 mm

Fig. 2/4: Preparing for fitting onto the SIMATIC ET200X

3. Place the valve terminal carefully and without tilting onto the pneumatic interface module.
   – Insert the centring pins in the appropriate holes.
   – Do not bend the terminal lugs.
   Screw tight the valve terminal and the pneumatic interface module on the mounting surface with four screws (see diagram).

1 M5 screws, at least 60 mm long (ISO 1207/ ISO 1580 – DIN 84 or DIN 912)

2 Centring pins

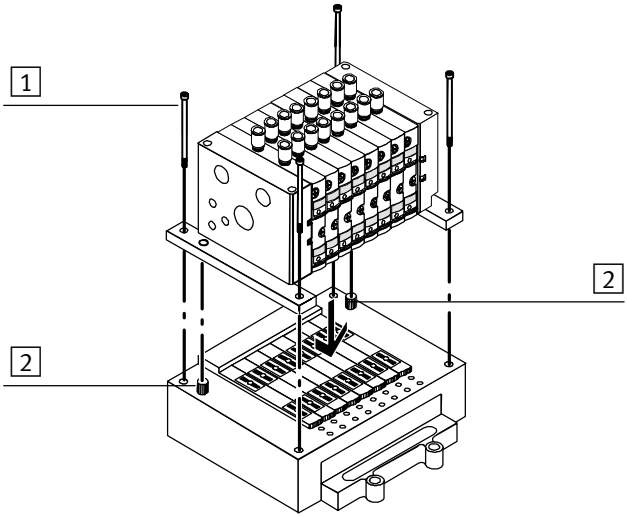


Fig. 2/5: Fitting the CPV valve terminal onto the Siemens SIMATIC ET200X

Please note
Removing the CPV valve terminal from the pneumatic interface module.

- Pull the CPV valve terminal carefully upwards without tilting.

When refitting the CPV valve terminal onto the pneumatic interface module:

- Replace the flat seals on the following CPV valve terminals if they have been operated in a dirty environment:
  - type CPV10-GE-8
  - type CPV14-GE-8

2.2 CPV valve terminal with pneumatic multipin

Only CPV valve terminals fitted with appropriate end plates may be mounted on the pneumatic multipin. CPV valve terminals with end plates for individual tubing need to be converted before they can be fitted onto the pneumatic multipin. For this purpose fit the appropriate end plates (see chapter 5 “Converting the end plates” and Appendix B “Summary of the end plates”).

The pneumatic multipin is available in two forms:

– Without asssembly step: This pneumatic multipin fits flush with the end plates. The fastening holes for fitting onto a wall or floor are in the connection side of the pneumatic multipin.

– With assembly step: This pneumatic multipin projects over the end plates. The fastening holes are in the step, thereby facilitating fitting. Two additional holes running diagonally through this pneumatic multipin also enable the CPV valve terminal to be fitted from the rear (see chapter “Summary of system” Fig. 1/2).

CPV valve terminals with large surface-mounted silencers, which are fitted onto the pneumatic multipin with assembly step, can only be fitted onto a wall. Use here the holes running diagonally through the pneumatic multipin. The mounting holes running vertically through the pneumatic multipin are covered by the large surface-mounted silencer.

2.2.1 Fitting the pneumatic multipin

Make sure that the fastening surface can support the pneumatic multipin and the CPV valve terminal. Make sure that there is sufficient space for connecting the supply cables and tubing, and that extra space is available for fitting CPV valve terminals with large surface-mounted silencers.

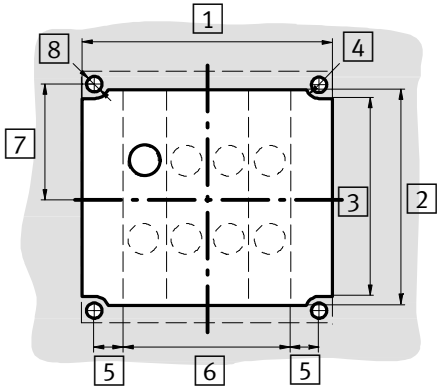
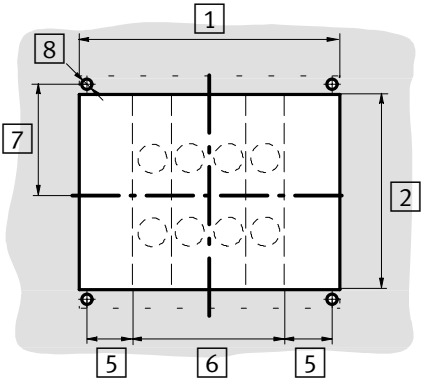
Fitting the pneumatic multipin (connection side)

Proceed as follows in order to fit the pneumatic multipin with the connection side onto a mounting surface:

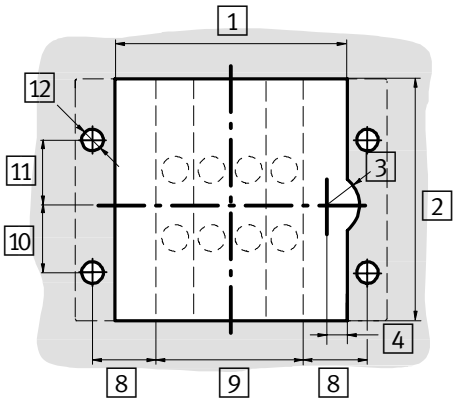
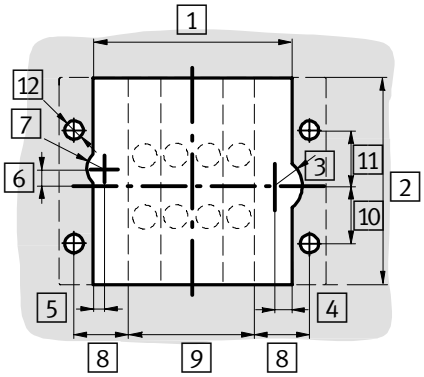
- Cut out an opening in the fastening surface (dimensions see table 2/11 or table 2/12).
- Drill four mounting holes in the fastening surface (diameter see table). Position of and distance between these holes (see table 2/11 or table 2/12).
- Screw the pneumatic multipin to the fastening surface with four screws of sufficient length (see table).

Pneumatic multipin (without step)		**Pneumatic multipin (with step)**
CPV10/14	CPV18	CPV10/14/18
4.5 mm	5.5 mm	6.5 mm
M4	M5	M6

Tab. 2/10: Diameter of the fastening holes and screw size

CPV10/14		CPV18
		
CPV10 valve terminal	**CPV14 valve terminal**	**CPV18 valve terminal**
1 29.5 mm + 6 2 60 mm 3 55 mm 4 R4 5 11.25 mm 6 10 mm x number of plates 7 31.5 mm 8 Diameter 4.3 mm	39.5 mm + 6 76.6 mm 68.6 mm R4 12.75 mm 14 mm x number of plates 38.3 mm Diameter 4.3 mm	1 59.0 mm + 6 2 98 mm 3 — 4 — 5 25.5 mm 6 18 mm x number of plates 7 54 mm 8 Diameter 5.5 mm

Tab. 2/11: Dimensions of wall cut-out for pneumatic multipin (without step)

CPV10/14	CPV18
	

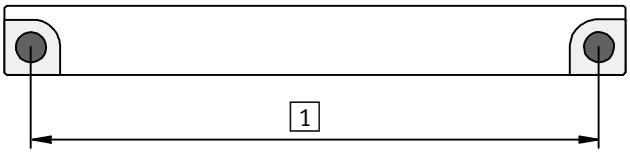
	CPV10 valve terminal	CPV14 valve terminal		CPV18 valve terminal
1	30 mm + 9	40 mm + 9	1	60 mm + 9
2	73 mm	89 mm	2	118 mm
3	R12	R14	3	R22
4	6.3 mm	9.0 mm	4	15 mm
5	—	4.7 mm	5	—
6	—	5.55 mm	6	—
7	—	R8	7	—
8	21 mm	26 mm	8	35.5 mm
9	10 mm x number of plates	14 mm x number of plates	9	18 mm x number of plates
10	21.5 mm	29.5 mm	10	44 mm
11	18.5 mm	29.5 mm	11	44 mm
12	Diameter 6.5 mm	Diameter 6.5 mm	12	Diameter 6.5 mm

Tab. 2/12: Dimensions of wall cut-out for pneumatic multipin (with step)

Fitting the pneumatic multipin (rear side)

Proceed as follows in order to fit the pneumatic multipin (with step) with its rear side onto a mounting surface:

- Drill two mounting holes in the fastening surface for screws of size M6. Position of and distance between these holes see table.



Dimensions 1			
Number of valve locations	**CPV10**	**CPV14**	**CPV18**
2	62 mm	80 mm	107 mm
4	82 mm	108 mm	143 mm
6	102mm	136 mm	179 mm
8	122 mm	164 mm	215 mm

Tab. 2/13: Hole dimensions for rear fitting

- Screw the pneumatic multipin to the fastening surface with two M6 screws of sufficient length.

2.2.2 Fitting the CPV valve terminal to the pneumatic multipin

Proceed as follows:

- With CPV valve terminals with IC connection, insert the socket head screws supplied into the fastening holes. With MP, AS-Interface, DI or CP connections, the socket head screws are already in the fastening holes under the electrical sub-base and are secured against loss.
- Place the 3-part or 4-part seal for sealing the supply channels into the grooves in the left or right-hand end plate.
- In order to seal the work channels, carefully press the two seals into the thread of the work connections.
- Fasten the CPV valve terminal with the 4 socket head screws on the multipin. Tighten the screws in diagonally opposite sequence with 2 Nm (CPV10/14) or 4 Nm (CPV18).

1 3-part seal in the connections of the left-hand end plate

2 2 seals per valve sub-base for the work connections

3 4-part seal in the connections of the right-hand end plate

4 Socket head fastening screws of the pneumatic multipin

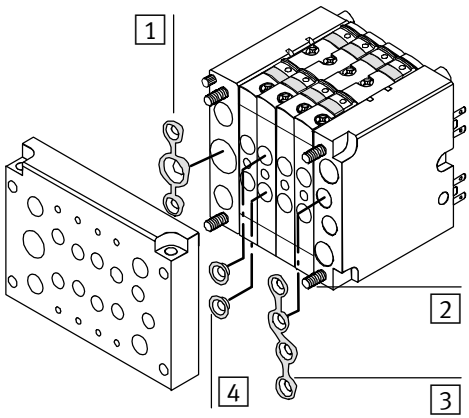


Fig. 2/6: Fitting the CPV valve terminal onto the pneumatic multipin

2.3 Fitting the valve extensions



Please note

- If the pneumatic multipin is used with assembly step, the outer valve sub-bases cannot be fitted with valve extensions.
- The valve extension 5/3G is intended for use with one working pressure for each valve sub-base, i.e. it must not be used in two-pressure operation (different pressure at connections 1 and 11).
- If other valve sub-bases are to be fitted onto the CPV valve terminal in two-pressure mode, the valve plate fitted with the 5/3G valve extension must be separated from compressed air channels 1 and 11 by means of a dividing plate.

Proceed as follows:

- Place the seals supplied with the product into the recesses in the appropriate valve extension.
- Fasten the valve extension with the screws supplied with 0.8 Nm (CPV10) or 1.2 Nm (CPV14).
- Connect the work lines as described under “Connecting the supply and work lines” in chapter 3.
- Note that the flow control valve extensions or one-way flow control valve extensions (Ident. code P, Q and V) require a minimum operating pressure of 0.5 bar.

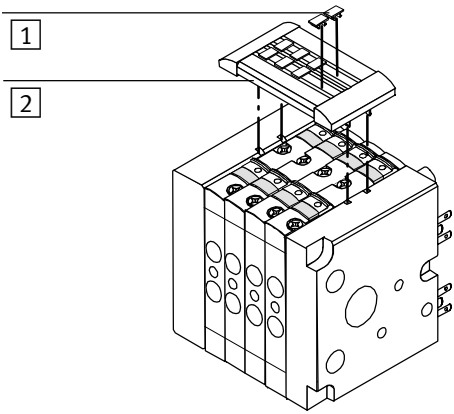
2.4 Fitting the identifier support

Before the valve identifier signs can be fitted, the CPV valve terminal must be fitted with an identifier support. This will also protect the manual overrides against unauthorised operation. It should be fitted at the front above the manual override.

The identifier support cannot be fitted if the CPV valve terminal is equipped with relay plates.

Proceed as follows:

- Clip the identifier support into the recess in the left and right-hand end plates (see diagram).
- Clip the identifier signs into the grooves in the identifier support (see diagram).



[1] Valve identifier labels

[2] Identifier support

Fig. 2/7: Fitting the identifier support

2.5 Fitting the manual override cover

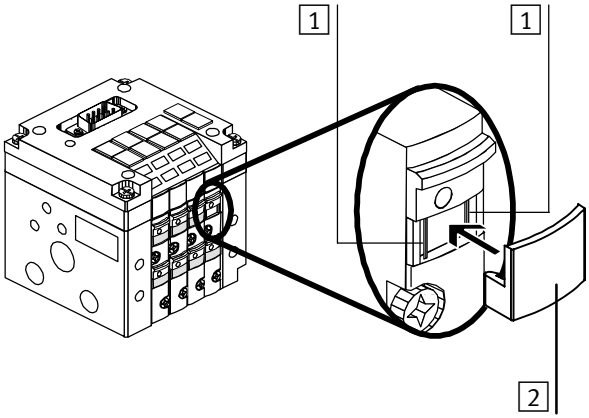
Covers can be fitted onto the manual override to protect it against unauthorized use. The covers must be fitted over each manual override.

The manual override covers are not intended for re-use. Fit the manual override covers only when you do not require the manual override any more (e.g. after testing the valves).

Proceed as follows:

- Clip the covers into the grooves in the manual override (see diagram).

If your CPV valve terminal is equipped with non-locking manual override, you must remove the safety clips before fitting the manual override covers (see chapter 5, section “Conversion from non-locking to locking manual override”).



1 Guide grooves of the manual override

2 Manual override cover

Fig. 2/8: Fitting the manual override covers

Installation

Chapter 3

Contents

3.	**Installation**	**3-1**
3.1	Preparing the compressed air	3-3
3.1.1	Operation with non-lubricated compressed air	3-3
3.1.2	Operation with lubricated compressed air	3-4
3.2	General connecting methods	3-6
3.3	Connecting the CPV valve terminal	3-8
3.3.1	Auxiliary pilot air	3-8
3.3.2	Connecting the supply and work lines	3-11
3.3.3	Connecting the electric cables	3-16

3.1 Preparing the compressed air



Caution
Dirty or incorrectly lubricated compressed air will reduce the service life of the valve terminal.

3.1.1 Operation with non-lubricated compressed air



Caution
Too much residual oil content in the compressed air will reduce the service life of the valve terminal.

- If bio-oils are used (oils with synthetic ester or true ester basis, e.g. rape oil methylester) the resuidual oil content must not ecxceed 0.1 mg/m^3 (see ISO 8573-1 class 2).
- If mineral oils are used (e.g. HLP oils as per DIN 51524 parts 1 to 3) or corresponding oils on a polyalphaolefine basis (PAO), the residual oil content must not exceed 5 mg/m^3 (see ISO 8573-1 class 4).

You will thereby avoid functional damage of the valves.

Excessive residual oil cannot be permitted irrespective of the compressor oil, as otherwise the basic lubrication will be washed out during the course of time.

3.1.2 Operation with lubricated compressed air



Please note
Please use non-lubricated air in your system if possible in order to protect the environment. Festo pneumatic valves and cylinders have been designed so that, if used as intended, they will not require additional lubrication and will still achieve a long service life.

Please note the following instructions if lubricated compressed air must be used.

- The compressed air prepared with the compressor must correspond in quality to non-lubricated compressed air.
- If possible, do not operate the complete system with lubricated compressed air.
- If possible, always install the lubricators directly in front of the relevant cylinder.



Caution
Incorrect additional oil and too much residual oil content in the compressed air will reduce the service life of the valve terminal.

- Use Festo special oil OFSW-32 or the other oils listed in the Festo catalogue (as per DIN51524-HLP32, basic viscosity 32cST at 40 °C).
- The additional lubrication must not exceed 25 mg/m^3 (ISO 8573-1 class 5).
- Make sure that the lubricator setting is correct (see following section).

You will thereby avoid functional damage of the valves.

Setting the lubricator

With the machine running (typical operating status) 0.2 to max. 1 drop/min. or 0.5 to 5 drops/1000 l air.

Checking the lubricator setting

Proceed as follows:

- Check the service unit in respect of condensate and lubricator setting twice a week.

1. Ascertain the cylinder which is furthest from the lubricator.
2. Ascertain the valve terminal which controls this cylinder.
3. Remove the silencer, if fitted, from connection 3/5.
4. Hold a piece of white cardboard 10 cm in front of the exhaust port.
5. Let the system run for a short period.
   - There must only be a slight yellow colouring on the cardboard. If oil drops out, this is an indication that too much oil has been used.

A further indication of excessive lubrication is the colouring or status of the exhaust silencer. A distinctly yellow colouring of the filter element or drops of oil on the silencer indicate that the lubricator setting is too high.

3.2 General connecting methods



Warning
Switch off the following power supplies before undertaking installation and/or maintenance work:

- the compressed air supply
- the power supply for the valve solenoid coils

You can thereby avoid:

– sudden uncontrolled movements of loose tubing,

– unexpected movements of the connected actuators,

– non-defined switching states of the electronic components.



Pay particular attention to the following:
The components of the valve terminal contain electrostatically sensitive elements. The components will be damaged if you touch the contact surfaces of the plug connectors and if you do not observe the regulations for handling electrostatically sensitive components.

Laying the tubing



Please note

- If necessary, place a suitable seal under each screw connector or silencer in order to avoid leakage.

– If elbow screw connectors or multiple distributors are used, the airflow will be reduced slightly.

Basic information

Connecting

1. Push the tubing as far as possible over or into the tube connection of the screw connector.
2. If necessary, pull locking ring (A) over the tube connection or tighten locking screw (B).
3. For reasons of clarity, group the tubing together with
   – tube straps or
   – multiple hose holders.

Removing

1. Loosen the locking screw or locking ring of the screw connector.
2. Pull out the tubing.
3. If necessary, replace the screw connector with a blanking plug (C).

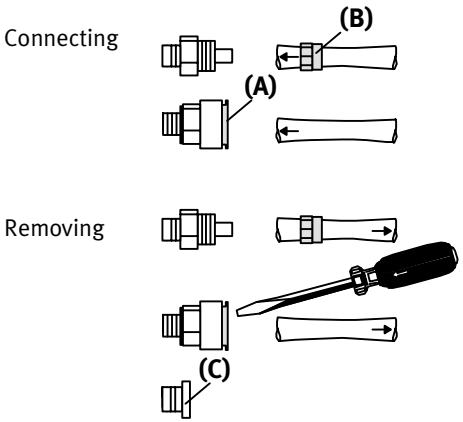


Fig. 3/1: Fitting the tubing

3.3 Connecting the CPV valve terminal

In order to guarantee the optimum efficiency of your CPV valve terminal, we recommend in the following cases that you connect the compressed air tubing and, if necessary, also the exhaust air tubing on both sides (appropriate end plate pairs see Appendix B “Overview of the end plates”):

– when large volume cylinders are operated at high speeds.

– when several valves are switched simultaneously to the flow position.



Please note
- CPV valve terminal with two pressure zones. Connect the supply pressures to the end plates or to both sides of the pneumatic multipin.

3.3.1 Auxiliary pilot air



Caution
– If possible, operate the CPV valve terminal with non-lubricated auxiliary pilot air (connections 12/14). Otherwise observe the instructions in the section “Operation with lubricated compressed air.”
– With CPV valve terminals with internally branched auxiliary pilot air, the above mentioned remark also applies to the supply air (connection 1/11).

With CPV valve terminals with two pressure zones and internally branched auxiliary pilot air:
– Due to the internally branched auxiliary pilot air in the right-hand end plate, the pressure in the right-hand pressure zone must be 3...8 bar.

The CPV valve terminal is intended for internal or external pilot air, depending on the end plates fitted. Please refer to your order forms or to the table in Appendix B to ascertain which types of end plates are fitted on your CPV valve terminal.

Internal pilot air

If the supply pressure of your CPV valve terminal lies between 3...8 bar, you can operate the terminal with internally branched auxiliary pilot air. In this case the auxiliary pilot air will be taken from connection 1 or 11 in the left or right-hand end plate.



Please note
Using the CPV valve terminal with internal auxiliary pilot air

- Seal connection 12/14 with a blind plug.

External pilot air

If the supply pressure of your CPV valve terminal lies between 3...8 bar, you can operate the terminal with external auxiliary pilot air. In this case the auxiliary pilot air is supplied via connection 12/14 on the CPV valve terminal. End plates for supplying the CPV valve terminal with external auxiliary pilot air see Appendix B “Overview of end plates.”



Please note

- Used closed-loop controlled auxiliary pilot air (3...8 bar). Reliable faultless operation of the CPV valve terminal is then possible.
- Please note that the closed-loop controlled auxiliary pilot air for all valve sub-bases on the CPV valve terminal need only be supplied or branched at one position with common tubing. This also applies if the CPV valve terminal is operated with different pressure zones (see diagram).

1 Separator plates

2 Blanking plug

3 Pressure zone 2

4 Pressure zone 1

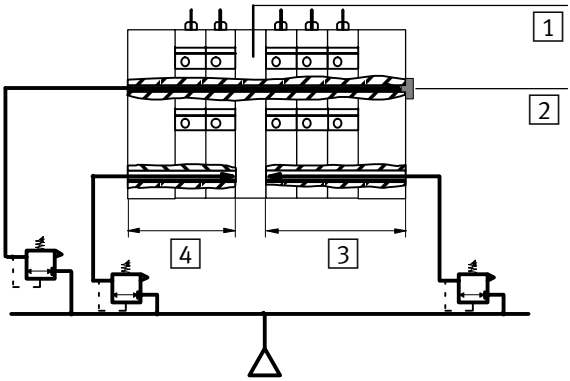


Fig. 3/2: Auxiliary pilot air

3.3.2 Connecting the supply and work lines

Please note

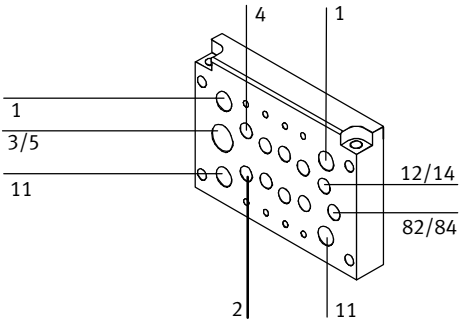
- Unused connections. Seal all connections **not** required for functioning with blind plugs (see Appendix B).
- Unused connections. Seal work connections 2 and 4 with blind plugs.
- Valve sub-base with Ident. code C (two 3/2-way valves closed in basic position):
  With the 5/3G valve extension you can implement the function “in mid-position blocked” with this CPV10/14 valve sub-base. This valve extension is mounted on the connection side of the above-mentioned valve sub-base (see 2.3 “Fitting the valve extensions”).
- Connect the work lines as follows, depending on the tool you are using:

– screw connector with hexagon socket head: Any sequence is possible.

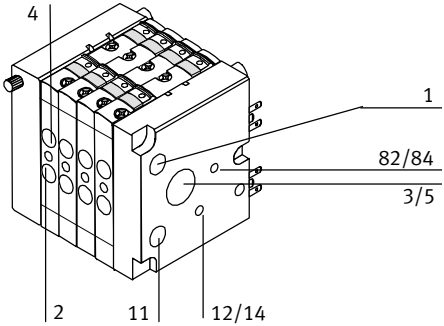
– screw connector with external hexagon socket head: Connection must be made from left to right (space for wrench).

Fit the screw connector or the silencers according to the table below. Then connect the pneumatic tubing.

Pneumatic multipin



CPV valve terminal



Connection identifier ISO 5599	**Tubing**	**Connection size ISO 228, specifications in brackets are for pneumatic multipin with step**			**Connection**
		CPV10	**CPV14**	**CPV18**	
1 or 11	Compressed air/ vacuum	G1/8	G1/4	G3/8	Screw connector in end plates or pneumatic multipin
2 or 4	Work air/vacuum	M7	G1/8	G1/4	Screw connector
3/5	Exhaust right-hand/ left-hand end plate Pneumatic multipin	G3/8 G1/4	G1/2 G3/8	G1/2 G1/2	Screw connector – for ducted exhaust air – for silencers
12/14 or 82/84	Auxiliary pilot air or exhaust right-hand/ left-hand end plate Pneumatic multipin	M5 M7 (M5)	G1/8 G1/8	G1/4 G1/4	Screw connector at connection 82/84 – for ducted exhaust air – for silencers

Tab. 3/1: Sizes of the pneumatic connections

Please note
If you have several systems with central ducted exhaust air:
use non-return valves in the common exhaust lines in order to prevent functional impairment due to back pressures.

1 CPV valve terminal 1
2 Common 3/5
3 Common 82/84
4 CPV valve terminal 2
5 Central 3/5
6 Central 82/84

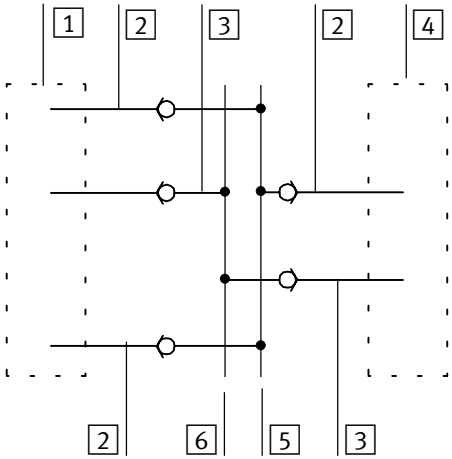


Fig. 3/3: Common lines with non-return valves

Please note
The exhaust is passed through channels 3/5 and 82/84. These connections must not be sealed with blanking plugs.

Exhaust channels 3 and 5 are grouped together in the CPV valve terminal. Separate exhaust restriction of channels 3 or 5 is not therefore possible.

Restriction of exhaust 3/5 on the vacuum generator plates (Ident. codes A and E) is not permitted.

Please note
With CPV valve terminals with ducted supply air:
Seal connections 11 and 12/14 with blind plugs

Pressure zones of the CPV valve terminals

The CPV valve terminal can be operated with up to four pressure zones, depending on the components fitted. The maximum possible number of pressure zones is determined by the combination of the following components:

- Separator plate
  (see 1.2 “Description of components”)
- End plate pairs (see Appendix B.2)
- Valve plates (see Appendix B.1)

Please note
With CPV valve terminals with two pressure zones and internally branched auxiliary pilot air in the right-hand end plate:
Due to the internally branched auxiliary pilot air, the pressure in the right-hand pressure zone must be 3...8 bar.

Vacuum/low pressure operation

The CPV valve terminal can be operated with vacuum or low pressure (< 3 bar), if closed-loop controlled auxiliary pilot air is applied separately. An overview of the end plates required can be found in Appendix B.2.

Vacuum generator plates

Please note
A high back pressure in exhaust channel 3/5 will impair the functioning of the vacuum generator.

- Make sure that there is optimal exhausting.

If the CPV valve terminal is fitted with valve sub-bases and vacuum generator plates, the exhaust air from the valve sub-bases (in channel 3/5) can influence the vacuum generation.

- In this case, separate exhaust channel 3/5 between the vacuum generator plates and the valve sub-bases by means of the separator plate with Ident. code S.

Connect the work lines to the vacuum generator plate:

Vacuum valve sub-base with Ident. code A:

- Connect the vacuum suction nozzle to work connection 4.
- Seal work connection 2 with a blind plug.

Vacuum valve sub-base with Ident. code E:

- Connect the vacuum suction nozzle to work connection 4.
- Connect work connections 2 and 4 together with tubing or with vacuum valve extension CPV..-BS-GRZ-V... .

3.3.3 Connecting the electric cables

Information on the connection procedure as well as on cables and current requirements can be found in the manual "CP System, installation and commissioning."



Warning

- Use only PELV **circuits** as per IEC/DIN EN 60204-1 (Protective Extra-Low Voltage, PELV) for the electrical supply. Consider also the general requirements for PELV circuits in accordance with IEC/DIN EN 60204-1.
- Use power **supplies** which guarantee reliable electrical isolation of the operating voltage as per IEC/DIN EN 60204-1.

By the use of PELV circuits, protection against electric shock (protection against direct and indirect contact) is guaranteed in accordance with IEC/EN 60204-1 (Electrical equipment for machines, General requirements).



Please note

Check within the framework of your EMERGENCY STOP circuit, to ascertain the measures necessary for putting your machine/system into a safe state in the event of an EMERGENCY STOP (e.g. switching off the operating voltage for the valves and output modules, switching off the compressed air).

Earthing the CPV valve terminal

For earthing purposes, all variants of the CPV valve terminal have an earthing connection. This is on the left-hand end plate (see diagram).

[1] Earth/ground connection

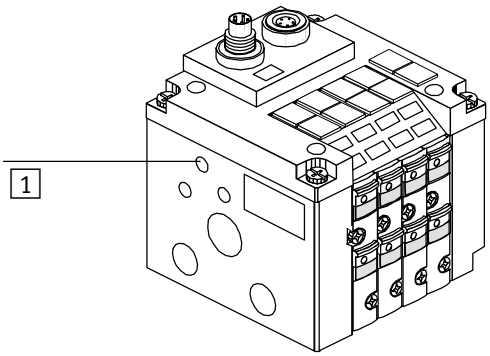


Fig. 3/4: Earthing connections on the CPV valve terminal

Please note
Earth your CPV valve terminal.

- Connect the earth connection on the left-hand end plate (see Fig. 2/5) with low impedance (short cable with large cross-sectional area) to the earth potential.
- Tighten the earthing screw with max. 1 Nm.

In this way, you will avoid interference caused by electro-magnetic influences.

Connecting current-consuming devices to the relay plate

Please note
- Use only ready-to-use connector sockets KRP-1-24-... from Festo for connecting current-consuming devices to the relay outputs.

Connect the current-consuming devices to the relay outputs as follows:

- Carefully place the socket first on the terminal lug of the lower relay output (see diagram).
- Screw the socket together with the central locking screw with 0.15 Nm.
- Fit the second socket in the same way to the upper relay output.

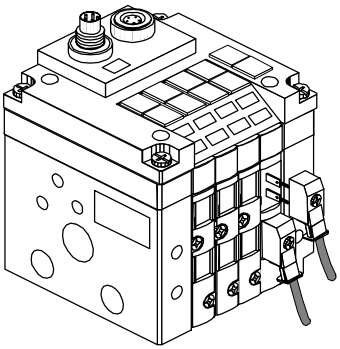


Fig. 3/5: Fitting the relay output sockets

CPV valve terminal with IC connection

With this CPV valve terminal variant each valve solenoid coil is connected separately.

Please note

- Use only the following ready-to-use sockets from Festo for connecting the valve solenoid coils:

– For CPV10/14:
KMYZ-7-24-...-LED, an LED and the holding current reduction are incorporated in the transparent socket. The LED indicates the switching status of the valve solenoid coil.

– For CPV18:
KMYZ-2-24-...-LED, an LED is incorporated in the transparent socket. The LED indicates the switching status of the valve solenoid coil.

Address assignment of the valves

- The addresses must be assigned in ascending order without gaps.
- Counting begins from left to right, on the individual valve plates from the front to the rear (see Fig. 3/6).

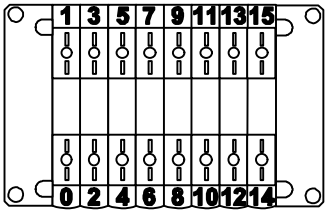


Fig. 3/6: Address assignment of a CPV valve terminal with IC connection and 8 valve locations

Connect the valve solenoid coils as follows:

- Use connector socket KMYZ-7-... (CPV10/14) or KMEB-2-... (CPV18). Connector socket KMYZ-7-... is fitted with current reduction.
- Insert the socket onto the terminal lugs of the appropriate pilot solenoid (see diagram). The socket can also be fitted turned 180°. Make sure that the centring bolt between the terminal lugs grips into the hole in the socket. Screw the socket together with the central locking screw with 0.15 Nm.

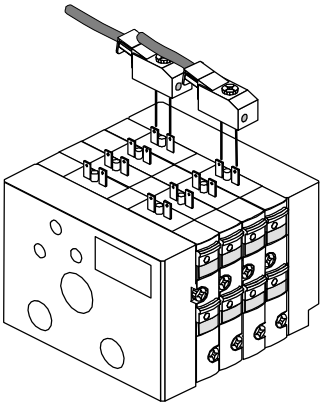


Fig. 3/7: Fitting the individual connecting sockets

CPV valve terminal with multipin or AS-Interface connection

Connecting the multipin or AS-Interface cable

Detailed instructions on wiring up the electrical connections of the CPV valve terminal with multipin or AS-Interface connection can be found in the leaflet supplied with the product.

CPV valve terminal with CP connection

Connecting the CP cables

Detailed instructions on connecting the CPV valve terminal with CP connection can be found in the manual “CP system – General installation and commissioning,” chapter 3.

CPV valve terminal with direct connection

Connecting the field bus cable

Detailed instructions on connecting the CPV valve terminals with direct connection can be found in the manual “CPV valve terminal with direct connection.”

Commissioning

Chapter 4

Contents

4. Commissioning 4-1

4.1 General instructions 4-3
4.2 Testing the valves 4-6
4.2.1 Checking the valve functions 4-7
4.2.2 Checking the valve-cylinder combination 4-9
4.3 Eliminating faults 4-13

4.1 General instructions

Before commissioning

- Switch off the power supply before connecting or disconnecting plugs (otherwise this could lead to functional damage).
- Earth the CPV valve terminal on the left-hand end plate.
- Commission only a valve terminal which has been fitted and wired completely.
- Make sure that there is a sufficient supply of fresh air (cooling) for the following operating conditions:
  – when the maximum number of valves are fitted,
  – when the maximum operating voltage is applied,
  – when the solenoid coils are constantly under stress.
- If necessary, use the flow control valve extension or the one-way flow control valve extension.



Please note

– When unscrewing the adjusting screw, make sure that you do not unscrew it beyond the resistance, as this would damage the cover.

– Note that the flow control valve extensions or one-way flow control valve extensions (Ident. codes P, Q and V) require a minimum operating pressure of 0.5 bar.



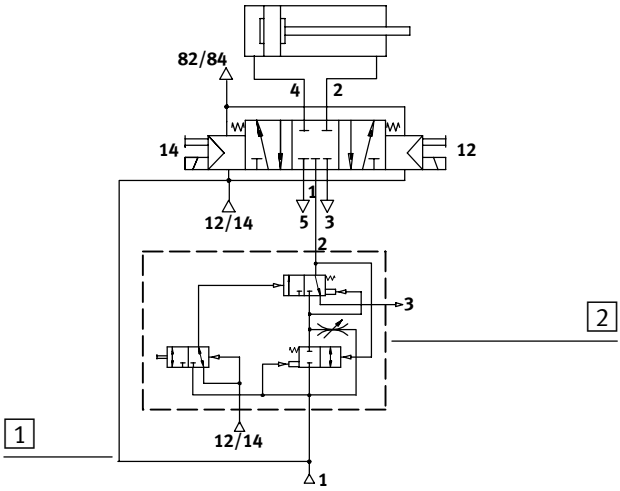
Warning
If the build-up in pressure of the auxiliary pilot air is too slow or delayed, this may cause the actuators to perform sudden unexpected movements.

– Switch on the compressed air with a safety start-up valve (slow build up of pressure) and
– When there are electric signals (e.g. after EMERGENCY STOP).

This can cause damage to the machine or system and even injury to human beings.

- Supply the auxiliary pilot air via the left-hand end plate (3...8 bar).

The auxiliary pilot air must reach a pressure of 3...8 bar as soon as it is switched on, otherwise the valve cannot be guaranteed to switch (see diagram).
If the pressure is less than 3 bar, there may be a delay before the valve is switched, in spite of an electric signal being present. The slow increase in pressure of the complete supply does not then affect the cylinder. Depending on the valve function, the cylinder would extend or retract suddenly.



1 Externally supplied auxiliary pilot air (3 to 7 bar), branched from the safety start-up valve

2 Safety start-up valve (slow build up of pressure of complete supply)

Fig. 4/1: Example of valve-cylinder combination with slow increase in pressure of the complete supply

The table below shows the effects of slow start-up pressurization when there are electric signals.

External auxiliary pilot air	Pressure increase in complete supply	Pressure increase in the auxiliary pilot air (12/14)	Time of switching point of a valve	Movement of the cylinder
Branched after the safety start-up valve	**slow**	slow	**after** pressure increase with (1)	**fast**
Branched in front of the safety start-up valve	**slow**	fast	**before** pressure increase with (1)	**slow**

Tab. 4/1: Effects of slow start-up pressurization

4.2 Testing the valves



Please note
Before commissioning the CPV valve terminal, note the specifications concerning the medium in chapter 3.

The CPV valve terminal should be commissioned as follows:

Commissioning variants	Activity
Preliminary test of the pneumatic tubing	Testing the valve-cylinder-combination by means of the manual override
Complete commissioning of the complete system	Installing and connecting the complete system. Program control via PLC/industrial PC

Tab. 4/2: Commissioning variants

Commissioning the pneumatic components by means of the manual override is described below. Commissioning of the CP system is described in the appropriate manual for the CP node.

4.2.1 Checking the valve functions

Manual override



Warning
Before actuating the manual override:

- Disconnect the power supply to the valve solenoid coils of the relevant connections (IC, MP, ASI, DI or CP connections). You will thereby avoid undesired actuation of the valve solenoid coils.
- Before switching on the power supply: Make sure that all manual override locking actuations are in their basic positions. You will thereby avoid undefined switching states of the valves.

You should use the manual override especially when commissioning the pneumatic system, in order to check the functioning and operation of the valve or the valve-cylinder-combination.

By actuating the manual override, you can switch the valve without an electric signal. You only need to switch on the compressed air supply.

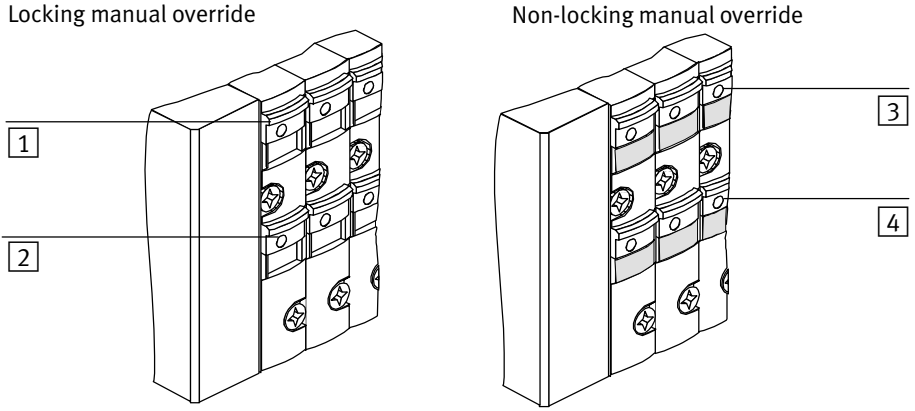
Types of manual override

The manual override has been designed to be used as follows:

Types of manual override	Method of operation
Manual override with automatic return (non-locking)	After actuation the manual override is reset by a spring.
Locking manual override	The manual override remains actuated until it is reset by hand.
Manual override covered	The manual override is covered for safety reasons. It cannot be actuated

Tab. 4/3: Designs of manual override

The diagram below shows the assignment of the manual overrides to the pilot solenoids.



1 Slide of the locking manual override to pilot solenoid 14 (in basic position)

2 Slide of the locking manual override to pilot solenoid 12 (in basic position)

3 Push button of non-locking manual override to pilot solenoid 14

4 Push button of non-locking manual override to pilot solenoid 12

Fig. 4/2: Assignment of manual overrides to the pilot solenoids

4.2.2 Checking the valve-cylinder combination

Carrying out the test

Proceed as follows:

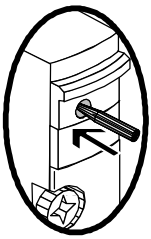
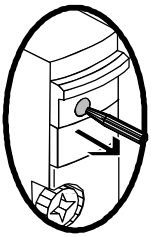
1. Switch on the compressed air supply.
2. Check the functioning and operation of each individual valve-cylinder combination by actuating the manual override as shown in the following diagrams.



Please note
Incorrect actuation of the non-locking manual override can lead to malfunctioning or damage to the manual override.

- Use a blunt pencil for actuating the non-locking manual override.
- Actuate the manual override only with max. 30 N.

3. In the case of the CPV valve terminal with pneumatic multipin: After testing the valves, make sure that all manual override actuations are in their basic positions.
4. Switch off the compressed air supply after checking the valves.

Actuating the manual override with automatic reset (non-locking)		**Reaction of the valve**
	Carefully press down the plunger of the manual override as far as possible.	The valve: – moves to the switching position
	Hold the plunger of the manual override pressed down.	– remains in the switch position
	Release the plunger. The spring resets the plunger of the manual override to the starting position.	– moves back to the basic position (**not with 5/2-way double-solenoid valve, Ident. code J)**

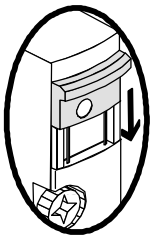
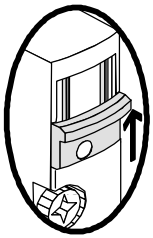
Tab. 4/4: Non-locking actuation of the manual override



Caution
Before commissioning your machine/system:

- Make sure that double-solenoid valves (Ident. code J) are in their basic positions again. To do this actuate manual override 12 of the relevant valve or apply current to pilot solenoid 12.
- Bring the locking manual override actuations into the basic position again. The valve plates with Ident. codes D, I, C, N, H and the vacuum generator plate with Ident.code E are each fitted with two valves. With manual override 14 you control the valve on control side 14; with manual override 12 you control the valve on control side 12 (see switching symbols of the valve sub-bases Appendix B).

In this way you will avoid undefined switching states when commissioning the machine/system.

Actuating the manual override with stop (locking)		Reaction of the valve
	Press down the plunger of the manual override as far as possible.	The valve: – moves to the switching position
	Leave the plunger in the lower position.	– remains in the switch position
	Press the plunger of the manual override into the upper position as far as possible (basic position).	– moves back to the basic position (**not with 5/2-way double-solenoid valve, Ident. code J)**

Tab. 4/5: Locking actuation of the manual override

4.3 Eliminating faults

Impairment of function

After switching on the compressed air supply or when subsequently testing the individual valves, you can learn the following about the operating status of the pneumatic system:

Operating status of the pneumatic system	**Valve position**	**Error treatment when the compressed air supply has been switched off**
Air escapes from ... – the common line connections	– Basic position	• Checking the seal ring or the tube fittings
– the work line connections	– Switch position	• Checking the seal ring or the tube fittings
– between the modules	– Basic position	• After switching on again, regulate external pilot air to 3...8 bar).
The valve or the pneumatic system – does not react as expected	– Switch position	• Check the tubing
– does not react	– Switch position	• After switching on again check the operating pressure (e.g. pressure zones) • Bring the locking manual override into the basic position
– does not react	– Basic position	• Servicing required • Check the controller connection (apply pressure > 3 bar at controller)

Tab. 4/6: Function impairment of the pneumatic system

If the operating status of the pneumatic system differs from the desired pneumatic operating status, the following conditions are probably not fulfilled:

Desired pneumatic operating status	**Prerequisites**	**Remarks**
Free of leakage	– Tubing connected with care – Regulated auxiliary pilot air	—
Fast reaction	Sufficient pressure supply via pressure supply points	• Exhaust the valve terminal at the left and right-hand end plates (3/5, 82/84)
Faultless	Non-return valves in common exhaust line	– Applies in the case of several systems with centrally ducted exhaust
Two pressure zones	Limiting the pressure zones with a separator plate	– Subsequent conversion possible
Vacuum operation/ low-pressure operation	Externally supplied auxiliary pilot air (3...8 bar)	– Controller can only be operated with pressure (between 3...8 bar)
Maximum vacuum (created by vacuum generator)	– Sufficient compressed air supply – Minimum supply pressure – No back pressure in exhaust channel 3/5	• The supply pressure must not break down even when several vacuum generators are switched on at the same time. If necessary, increase the supply pressure. • Silencers must not generate a high back pressure in exhaust channel 3/5. If necessary, fit efficient silencers or increase the supply pressure. • In order to prevent the exhausting of the valve affecting the generation of vacuum, you must fit a separator plate with Ident. code S between the valve plate and the vacuum generator plate.

Desired pneumatic operating status	Prerequisites	Remarks
EMERGENCY STOP of pressure zones	Guarantees the controller function for the auxiliary pilot air despite the complete supply being switched off	– The controller regulates the auxiliary pilot air of all valves sub-bases on a valve terminal
Slow start-up after EMERGENCY STOP	If there are control signals, the auxiliary pilot air must have a pressure of 3...8 bar immediately after being switched on.	

Tab. 4/7: Pneumatic operating states

LED display of the valves

There is a yellow LED for every valve solenoid coil (see diagram). With a ready to operate CPV valve terminal, this LED indicates the switching status of the valve solenoid coils.

Please note
The LEDs show the signal states only when there are valve coils at the relevant valve locations. For this purpose the load voltage must lie within the permitted tolerance.

Note the assignment of the LEDs to the relevant manual override (see also following diagram).

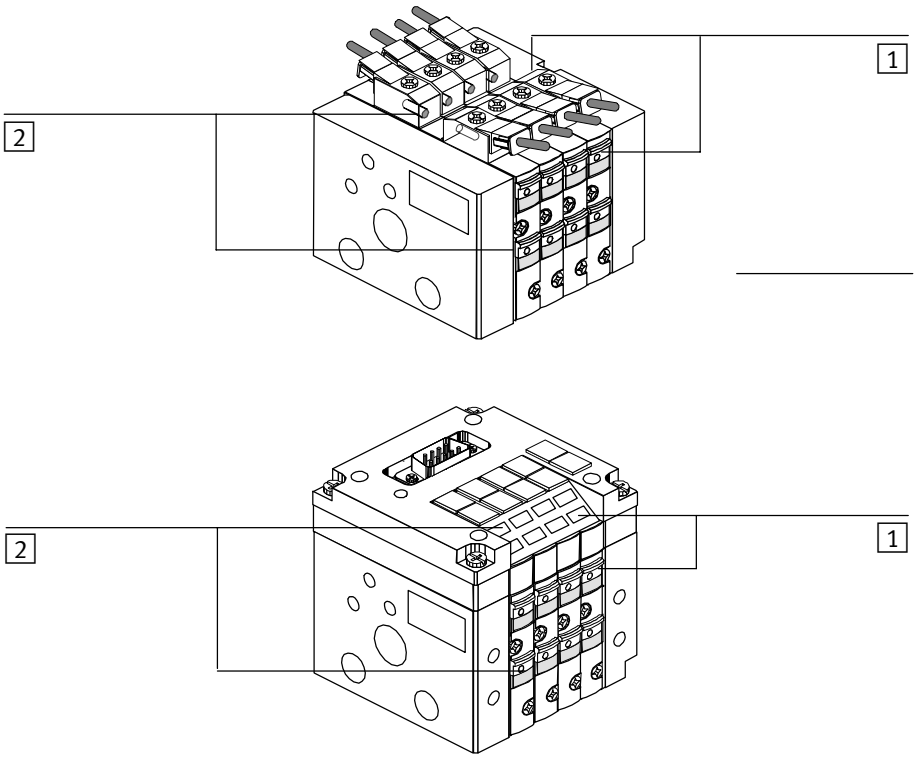
Note the following with the IC connection:

– LED in the front plug connector to upper manual override (14)
– LED in the rear plug connector to lower manual override (12)

Note the following with the MP, ASI, DI and CP connections:

– Lower LED in the connector cover to upper manual override (14)
– Upper LED in the connector cover to lower manual override (12)

The diagram below shows the position of the LED in respect of the manual override actuations.



[1] LED and manual override to pilot solenoid 14

[2] LED and manual override to pilot solenoid 12

Fig. 4/3: LED assignment

With valve sub-bases the LEDs indicate the switching status of the valve solenoid coils. The following table explains the meanings.

LED	Switching position of the valve	Meaning
yellow out	Basic position	Logical 0 (no signal)
yellow alight *)	– switch position or – basic position	Logical 1 (signal present) Logical 1 but: – operating voltage of outputs below permitted tolerance range (20.4...26.4 V DC) or – compressed air supply not OK or – pilot exhaust blocked or – servicing required
*) With double-solenoid valves (Ident. code J) the LED lights up only when the signal is present.		

Tab. 4/8: Meaning of the LED display

LED display of the relays

There is a yellow LED for every relay. This LED indicates the switching status of the relay coil when the CPV valve terminal is ready for operation.



Please note
Note the assignment of the LEDs to the relevant relay connection (see also following diagram).

Note the following with the MP, ASI, DI and CP connections:

– Lower LED in the connector cover to upper relay connection
– Upper LED in the connector cover to lower relay connection

The diagram below shows the assignment of the LEDs to the relay connections.

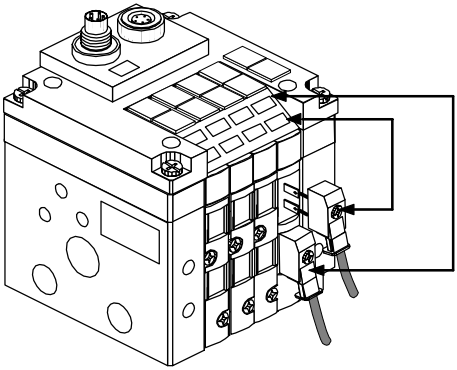


Fig. 4/4: LED assignment of relay plate

Maintenance and conversion

Chapter 5

Contents

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5.1 Cleaning/replacing the large surface-mounted silencer



Caution
Dirt in the large surface-mounted silencer can cause an increase in pressure in the exhaust channel.

- Clean the silencer if it is yellow/black or a dark colour or replace it by a new one.

In this way you can ensure that the large surface-mounted silencer functions correctly and that the valves operate correctly.

Proceed as follows:

1. Loosen and remove the screws in the fastening frame.
2. Remove the silencer from the end plate.
3. Replace the silencer or clean it in benzine or petroleum. Do not use **TRI** for cleaning.
4. Place the cleaned or the new silencer and the fastening frame on the end plate.
5. Fasten the silencer only with the original screws (see table).

Fastening screws of the silencer as per DIN 912, strength class 12.9

Valve terminal	Screw	Tightening torque
CPV10	M 2.5 x 8	1.0 Nm ± 10 %
CPV14	M 3 x 10	1.7 Nm ± 10 %
CPV18	M 5 x 28	5.0 Nm ± 1 Nm

Tab. 5/1: Tightening torques for large surface-mounted silencer

5.2 Fitting/removing CPV valve terminal components



Warning
Switch off the following power supplies before undertaking installation and/or maintenance work:

- the compressed air supply
- the power supply for the valve solenoid coils

You can thereby avoid:

– uncontrolled movements of loose tubing,

– unexpected movements of the connected actuators,

– non-defined switching states of the electronic components.

Some components on the CPV valve terminal may only be operated in combination with other components, see the following compatibility list.

Components, Ident. code [1]	**Cover plate**				
	AS-Interface	**CP**	**IC** [2]	**MP**	**DI**
Vacuum generator plates: A, E	No limits Please note the recommendations in chapter 3				
Valve sub-bases: C, D, H, I, J, M, N	No limits				
Valve sub-base: F (only CPV10)	No limits	No limits	Only with connector socket with current reduction KMYZ-7-...	Without HSA [3] – only every 2nd. valve sub-base With HSA: – no limits	No limits
Valve sub-base: G	CPV10/14: If the pneumatic multipin is used with assembly step, the outer valve sub-bases cannot be fitted with the necessary 5/3G valve extension. CPV18: No limits				
Blanking plate: L	No limits				
Relay plate: R	Not permitted with CPV14	No limits	–	Without HSA [3] – not permitted With HSA: – no limits	No limits
Separator plates: S, T	Combination depends on end plate combination [4]				

1) List of Ident. codes see chapter 1 “Identification code.”
2) CPV valve terminals for Siemens ET 200 X: Valve sub-base Ident. code F and relay plate not permitted.
3) MP connection with HSA (holding current reduction), CPV10: s from 10/2000, CPV14 as from 11/2000.
4) Combination list of end plates see section “End plate combinations.”

Tab. 5/2: Compatibility list of valve location components

5.2.1 Removing components from valve locations

The components on the CPV valve terminal can easily be removed for maintenance and conversion work.

Proceed as follows:

Loosen the electrical connections

Note the following with the MP, AS-Interface and CP connections

- Loosen the multipin lug or the AS-Interface, DI or CP connector plug and pull it off carefully.
- Then loosen the four fastening screws in the electrical sub-base. Pull the sub-base carefully away from the terminal lugs of the valve sub-bases.
- If necessary remove the connector sockets on the relay outputs. Loosen first the locking screws of the upper connector socket. Pull the socket carefully away from the terminal lugs. Then loosen the lower connector socket in the same way.

Note the following with the IC connection

- In order to remove the valve sub-bases, loosen the locking screws on the connector sockets of the valve sub-bases to be replaced.
- Pull the sockets carefully away from the terminal lugs. Mark the connector sockets.
- With the CPV valve terminals with pneumatic multipin, we recommend that you remove the connector sockets from each valve sub-base.

Loosen the electrical connections

With the CPV valve terminal with individual tubing (CPV valve terminal without pneumatic multipin)

- Loosen the tubing at work connections 2 and 4 of the valve sub-base or valve extension to be replaced (see section 3.2 “General connection methods”).

Remove the CPV valve terminal from the fastening surface

CPV valve terminal with pneumatic multipin

- Loosen the fastening screws of the pneumatic multipin in the left and right-hand end plates one turn in diagonally opposite sequence. Then remove the screws completely. Remove the die CPV valve terminal from the pneumatic multipin.

Fitting the CPV valve terminal on a floor stand

- In this case loosen the fastening screws in the right-hand end plate and pull them out.

Fitting the CPV valve terminal onto a wall or onto a hat rail

- In this case loosen the right-hand wall fastening or hat rail clamping unit.

Remove the components

- Loosen the two lower tie rods one turn.
- Then loosen the upper tie rod and pull it out over the component to be replaced.
- Unscrew the two lower tie rods so that the screw heads are flush with the outer surface of the end plate (do not remove the tie rod).
- Pull the valve terminal apart so that the distance between the components to be replaced and the neighbouring components is approx. 2 mm in each case.

1 Components to be replaced

2 Tie rod

3 Distance approx. 2 mm

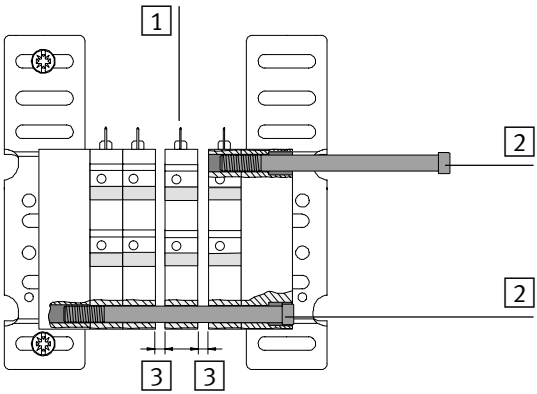


Fig. 5/1: Removing the valves

- Swing the component forwards around the front tie rod.

1 Front tie rod

2 Rear tie rod

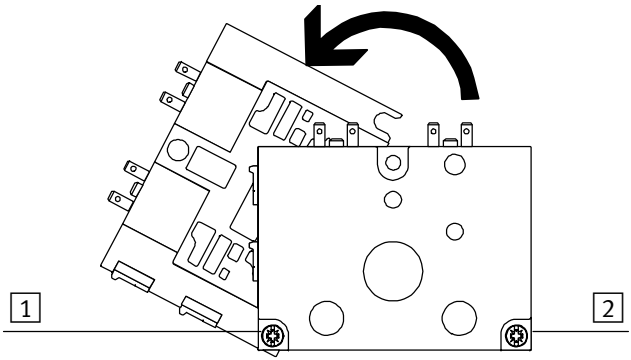


Fig. 5/2: Position of the tie rods

- Pull the component so that it snaps out of the front tie rod.

5.2.2 Fitting components in valve locations

Please note

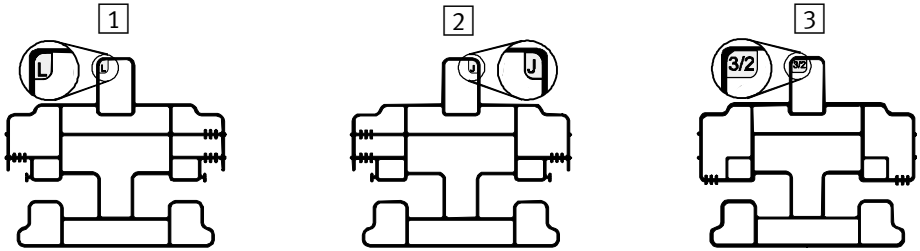
– Please note the instructions in the brief description of the relevant CPV valve terminal with AS-Interface connection or the instructions for fitting equipment on the valve sub-bases.
– Please note the instructions on fitting the valve terminal with valve sub-bases and vacuum generator plates under “Vacuum generator plates” in chapter 3.
– If the CPV10 valve terminal is fitted with valve sub-bases with Ident.code F, please note the instructions on fitting and application in Appendix B1.
– Please note the limits for fitting the CPV valve terminals with relay plates (Ident. code R). See compatibility list in this chapter.

Proceed as follows:

- Make sure that the seals are correctly seated between the components on the valve terminal. They must lie correctly in the appropriate seal grooves.

Only CPV10/14 valve terminals

- Check the position of the seals when fitting valve sub-bases with pneumatic spring valves or double-solenoid valves. It is not symmetrical (see diagram).



1 Pneumatic spring valve (Ident. code M or F):
The designation “L” on the seal must face forwards.

2 Double-solenoid valve (Ident. code J):
The designation **“J”** on the seal must face forwards.

3 The seal for valve plates with 2/2 or 3/2-way valves (Ident. codes D, I or C, H, and N as well as for all end plates is symmetrical and marked with **3/2**.

Fig. 5/3: Position and designation of the seals with pneumatic spring valves or double-solenoid valves (only CPV10/14 valve terminals)



Please note
There is only one type of seal for all valve plates on the CPV18 valve terminal. The position of the seal is the same on all valve plates.

- Place the component on the front tie rod. Press the component so that it snaps onto the tie rod.
- Swing the component carefully backwards. Make sure that there is sufficient space for the flat seals.
- Push the upper tie rod as far as possible into the CPV valve terminal and screw it in a few turns.
- Align the CPV valve terminal components on a flat surface so that they are not offset.
- Tighten first the upper, then the lower tie rod with 0.3 Nm. Then tighten all the tie rods with 2 Nm.

Note the following with the MP, ASI, DI and CP connections

Please note
The flat seals between the valve block and the sub-base have been modified. If the glued flat seals are more than one year old, replace them by new flat seals.
You can then be sure that your CPV valve terminal is sealed correctly.

The flat seals are situated on the bottom of the electrical sub-base (see diagram).

- Remove the self-adhesive flat seal from the recess. To do this, carefully loosen a corner of the seal with a screwdriver (see Fig. 5/4). Then pull the seal carefully away from the electrical sub-base.

[1] Flat seals

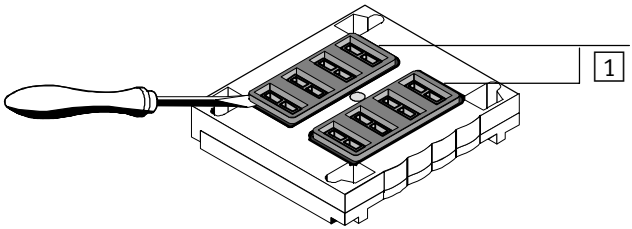


Fig. 5/4: Position of the flat seal on the electrical sub-base

- The new one-piece flat seal is no longer glued onto the bottom of the electric sub-base, but simply on the terminal lugs of the valve solenoid coils (see diagram).

[1] New flat seal

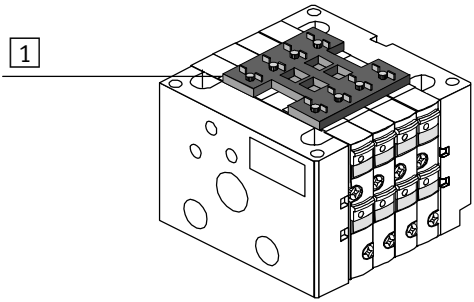


Fig. 5/5: Flat seal

- Place the connector cover onto the terminal lugs of the valve block. Carefully press down the connector cover.
- Tighten the screws on the electric sub-base in diagonally opposite sequence with 0.75 ± 0.15 (CPV10/14) or 3 Nm (CPV18).

With CPV valve terminals with relay plates

- Fit the connector plugs onto the relay outputs as described under “Connecting current-consuming devices to the relay plate” in chapter 3.

Fitting the CPV valve terminal

CPV valve terminal with pneumatic multipin

- In this case, place the 3-piece and 4-piece seals in the recesses in the left or fight-hand end plate. Press the 2-piece seals carefully into the threads in the work connections.
- Place the CPV valve terminal on the pneumatic multipin and tighten the fastening screws in the left and right-hand end plates in diagonally opposite sequence with 0.3 Nm. Tighten the screws in diagonally opposite sequence with 2 Nm (CPV10/14) or 4 Nm (CPV18).

With floor mounting

- In this case, insert the fastening screws into the right-hand end plate and tighten the valve terminal.

Fitting onto a wall or hat rail

- Fasten the right-hand wall fitting to the wall with two M4 screws or tighten the right-hand hat rail clamping unit.

Fitting the pneumatic and electrical connections

- Fit the connections (see chapter 3).

5.3 Conversion from non-locking to locking manual override

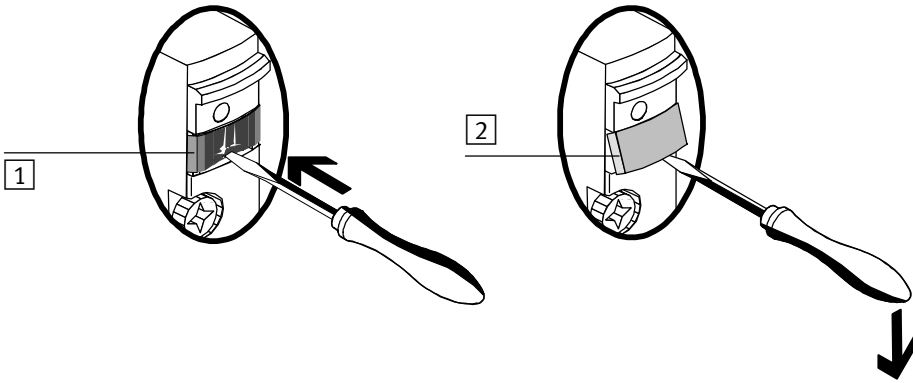
By removing a safety clip, you can convert your CPV valve terminal from non-locking to locking manual override. Proceed as follows:

If you do **not** wish to re-use the safety clip:

- Use a screwdriver to press in the centre of the safety clip, as shown under 1. The safety clip will then bend and snap out of the support.

If you wish to re-use the safety clip:

- Use a thin object (e.g. a spatula) to lift the safety clip out of the support, as shown in 2.



1 Removing the safety clip by pressing it out

2 Removing the safety clip by lifting it out (clip can be re-used)

Fig. 5/6: Safety clip for the manual override

5.4 Converting the end plates

By exchanging the end plates you can adapt the CPV valve terminal to new requirements of your machine or system. The following end plates are available:

– End plates with supply connections for internal or external auxiliary pilot air.

– End plates without supply connections.

– End plates suitable for the pneumatic multipin for internal or external auxiliary pilot air.

– End plates with large surface-mounted silencer.

A list of all available end plates can be found in Appendix B.2.

Proceed as follows:

- Loosen the electrical and pneumatic connections (see section “Removing components from valve locations”).
- Remove the CPV valve terminal from the fastening surface. Proceed here in the reverse sequence to that described under the section “Fitting onto a wall,” “Hat rail clamping unit” or “Fitting on the floor” in the chapter “Fitting.”
- Remove the appropriate sub-base on CPV valve terminals with CP, AS-Interface, DI or MP connection (see the section “Removing components from valve locations”).
- Place the CPV valve terminal on the left-hand end plate. Loosen the outer tie rod maximum 1 turn (see Fig. 5/1). You will then avoid overloading the centre tie rod.
- Then loosen the centre tie rod and remove it.
- Unscrew the outer tie rod.
- Remove the end plate from the CPV valve terminal. Make sure that the other components remain together.

- Place the right-hand end plate to be fitted on the CPV valve terminal and insert the tie rods.
- Place the CPV valve terminal on the right-hand end plate. Make sure that the tie rods, which are not yet screwed tight, do not fall out of the CPV valve terminal.
- Remove the left-hand end plate from the CPV valve terminal.
- Place the left-hand end plate to be fitted on the CPV valve terminal. Swing the CPV valve terminal onto the left-hand end plate.
- Screw in the tie rods and tighten them to the same amount with 0.3 Nm.
- Tighten first the centre and then the outer tie rods with 2 + 0.2 Nm (CPV10/14) or 4 Nm (CPV18).
- Fit the appropriate sub-base on CPV valve terminals with CP, AS-Interface, DI or MP connection (see the section “Fitting components in valve locations”).
- Fit the CPV valve terminals onto the fastening surface (see sections “Fitting onto a wall,” “Hat rail clamping unit” or “Fitting on the floor” in the chapter “Fitting”).
- Then fit the pneumatic and electrical connections (see chapter “Installation”).

5.5 Conversion to internal or external auxiliary pilot air

By fitting the appropriate left and right-hand end plates, you can convert your CPV valve terminal to internal or external auxiliary pilot air.

Please note

- Mixed operation of the CPV valve terminal with internal and external auxiliary pilot air is not intended. The auxiliary pilot air channel will not be divided into two pressure zones by means of separator plates.
- With end plates CPV..-EPR-PG (part number 161373 and 162543), connection 12/14 is sealed internally.
- Take into account the extra space required for end plates with large surface-mounted silencers.

Change the end plates of the CPV valve terminal as described in the section “Converting the end plates.”

5.6 Conversion to individual tubing/central tubing

In order to convert your CPV valve terminal from individual tubing to tubing on the pneumatic multipin, you will require:

– the pneumatic multipin

– special end plates for the CPV valve terminal.

Proceed as follows:

- Change the end plates of the CPV valve terminal as described in the section “Converting the end plates.”
- Fit the pneumatic multipin as described under “Fitting the pneumatic multipin” in chapter 2.

5.7 Conversion of the CPV valve terminal to two pressure zones

In order to convert your CPV valve terminal to two pressure zones, you will require a separator plate (must be ordered separately).



Please note

- When installing the CPV valve terminal, note that the compressed air must be supplied on both sides of the valve terminal.
- Seal non-required connections (supply or auxiliary pilot air connections) with blind plugs.

Fit the separator plate as described in the section “Fitting components on valve locations.”

5.8 Converting the CPV valve terminal to a variant with different electrical connections

Due to the modular structure of the CPV valve terminal, you can easily convert it to IC, MP, AS-Interface, DI or CP connections.



Please note
Please note the instructions in the compatibility list in this chapter as regards combining versions with different electrical connections with the following plates:
– Single-solenoid 5/2-way valve (Ident. code F)
– Relay plates (Ident. code R).

Proceed as follows:

CPV valve terminals with IC connection

- Loosen the locking screws on the connector sockets.
- Pull the sub-base carefully away from the terminal lugs of the pilot solenoids.
- Insert the MP, AS-Interface, DI or CP connection onto the terminal lugs of the pilot solenoids.
- Secure the sub-base with the 4 Philips screws. Tighten the screws in diagonally opposite sequence.

Note the following on CPV valve terminals with MP, AS-Interface, DI and CP connections

- Loosen the 4 Philips screws in the sub-base.
- Pull the sub-base carefully away from the terminal lugs of the pilot solenoids.
- Insert the sub-base of the other connection variants (MP, AS-Interface, DI or CP connection) into the terminal lugs of the pilot solenoids.
- Secure the sub-base with the 4 Philips screws.
- Tighten the screws in diagonally opposite sequence.

Technical appendix

Appendix A

Contents

A. Technical appendix A-1

A.1 Technical specifications A-3
A.2 Accessories A-10

A.1 Technical specifications

General		
Permitted temperature range – Storage – Operation – Medium	 - 20 to + 40 °C - 5 to + 50 °C (vacuum generator plates: 0 to + 50) - 5 to + 50 °C (vacuum generator plates: 0 to + 50)	
Protection class as per EN 60 529	IP65 (with cable from Festo accessories)	
Relative humidity	90 %	
Corrosion protection (as per FN 940070)	KBK 2 (vacuum generator plates: KBK 1)	
Mounting position	As desired	
Torques – Connector socket for IC connection – Connector socket for relay outputs – Field bus plug – Fastening screw for wall support or hat rail – Fastening screws of the CP valve terminal on the pneumatic multipin – Electrical sub-base – Earth/ground connection – Tie rod – Large surface-mounted silencer element on the end plate – Valve actuators	**CPV10/14** 0.15 Nm 0.15 Nm 1.15 ± 0.15 Nm 1.5 Nm 2.0 Nm 0.75 ± 0.15 Nm 1.0 Nm 1. Step 0.3 Nm 2. Step 2.0 Nm CPV10: 1.0 Nm ± 10 % CPV14: 1.7 Nm ± 10 % CPV10: 0.8 Nm CPV14: 1.2 Nm	**CPV18** 4.0 Nm 1.15 ± 0.15 Nm 4.0 Nm 3.0 Nm 1.0 Nm 1. Step 0.3 Nm 2. Step 4.0 Nm 5.0 Nm ± 1 Nm
Materials – Plates, covers, pneumatic multipin – Seals	 AL, AL-GD, Ms, PAXMD6, PET, POM, PPS, PA, ST NBR, HNBR	

General	
Vibration (as per DIN/IEC 68 part 2-6)	
– Transport	3.5 mm path at 2...9 Hz 1 g acceleration at 9...200 Hz
– Operation	0.35 mm path at 10...60 Hz 5 g acceleration at 60...150 Hz
– Shock (as per DIN/IEC 68 part 2-27)	30 g acceleration at 11 ms duration

Tab. A/1: General technical specifications

General			
Approx. weights (in kg)	**CPV10**	**CPV14**	**CPV18**
Electric sub-base with AS-Interface connection			
– on CP valve terminals with 2 valve locations	0.085	0.130	0.275
– on CP valve terminals with 4 valve locations	0.110	0.175	0.355
Electrical sub-base with CP connection			
– on CP valve terminals with 4 valve locations	0.145	0.230	0.375
– on CP valve terminals with 6 valve locations	0.180	0.250	0.450
– on CP valve terminals with 8 valve locations	0.200	0.300	0.540
Electrical sub-base with MP connection			
– on CP valve terminals with 4 valve locations	0.110	0.170	0.400
– on CP valve terminals with 6 valve locations	0.140	0.230	0.425
– on CP valve terminals with 8 valve locations	0.165	0.275	0.515
End plates	0.160	0.280	0.740
Pneumatic multipin			
– on CP valve terminals with 2 valve locations	0.120	0.270	0.520
– on CP valve terminals with 4 valve locations	0.165	0.390	0.750
– on CP valve terminals with 6 valve locations	0.225	0.510	0.870
– on CP valve terminals with 8 valve locations	0.270	0.630	1.300
Large surface-mounted silencer	0.147	0.234	—
Relay plate	0.035	0.055	—
Blanking plate	0.025	0.045	0.090
Separator plates	0.025	0.045	0.090
Valve sub-bases, vacuum generator plates	0.65	0.110	0.260
Valve extension: 5/3G function	0.46	0.105	—
Valve extensions: One-way flow control valves	0.025	0.054	0.125

Tab. A/2: Technical specifications – weight of the CPV valve terminal



Caution
- If possible, operate the CPV valve terminal with non-lubricated auxiliary pilot air (connections 12/14). Otherwise observe the instructions in the section “Operation with lubricated compressed air” in chapter 3.
- In the case of CP valve terminals with internally branched auxiliary pilot air, the above mentioned remark also applies to the supply air (connection 1/11).

Pneumatics		
Medium	– Compressed air, filtered (40 µm), lubricated (oil: VG 32) or non-lubricated/vacuum – Inert gases permitted	
Design	Valve plates with spool valves	
Pressure range	**CPV10/14**	**CPV18**
– Optimum operating pressure	5...7 bar	5...7 bar
– Rated supply pressure	6 bar	6 bar
– With internally branched auxiliary pilot air from 1 or 11	3...8 bar	3...8 bar
– With externally supplied auxiliary pilot air 1 or 11 for vacuum generator plates	- 0.9...10 bar	- 0.9...10 bar
Connection 1	2...10 bar	3.5...8 bar (Ident. code G)
Connection 11	0...10 bar	2...8 bar (Ident. code J)
– 12/14	3...8 bar	3...8 bar (all other valves)
Manual override	Locking or non-locking	

Tab. A/3: Technical specifications – medium and pressure ranges



Please note
The screw connectors of the pneumatic connections cause a reduction in the flow rate of the valves.

Pneumatics						
Flow rates	**CPV10**		**CPV14**		**CPV18**	
(without screw connector) in [l/min]						
– **from 11 ⇒ 2 or 1 ⇒ 4**	400		800		1600 1400 (5/3-way valve)	
– **from 2 ⇒ 3/5 or 4 ⇒ 4**	400		800		1600	
Valve switching times in ms	**CPV10**		**CPV14**		**CPV18**	
Measuring method 10 %, as per FN 942032	**On, change-over**	**Off**	**On, change-over**	**Off**	**On, change-over**	**Off**
– 2/2-way valve (Ident. code D and I)	15	17 (at 0 %)	13	16 (at 0 %)	14	20 (at 0 %)
– 2/2-way valve for reject pulse in vacuum generator plate (Ident. code E)	15	17 (at 0 %)	13	16 (at 0 %)	14	20 (at 0 %)
– 3/2-way valve, open or closed (Ident. codes C, H, N)	17	25	24	30	18	24
– 5/2-way,, single-solenoid (Ident. code M)	17	27	25	35	18.5	26
– 5/2-way, single-solenoid (Ident. code F)	13	17	—	—	—	—
– 5/2-way double-solenoid (Ident. code J)	10	—	12	—	12	—
– 5/3-way valve, mid-position locked (Ident. code G)	—	—	—	—	14	32
Vacuum generator plates – Vacuum (V_{max})	- 0.85 bar (the highest possible vacuum is reached within the working pressure range.					
Connections	**CPV10**		**CPV14**		**CPV18**	
(different values for pneumatic multipin in brackets)						
– Compressed air (1; 11)	G 1/8		G 1/4		G 3/8	
– Exhaust (3/5)	G 3/8 (G 1/4)		G 1/2 (G 3/8)		G 1/2	
– Auxiliary pilot air (12; 14; 82/84)	M5 (M7)		G 1/8		G 1/4	
– Work air (2; 4)	M7		G 1/8		G 1/4	

Tab. A/4: Technical specifications – rated flows, valve switching times and connection sizes

Electrics (CPV valve terminal with IC or CP connection)			
Electromagnetic compatibility of the CPV valve terminal with CP connection – Interference emitted – Resistance to interference (the maximum permitted signal cable length is 30 m)	Tested as per DIN EN 61000-6-4 (industry)[1)] Tested as per DIN EN 61000-6-2 (industry)		
Protection against electric shock (protection against direct and indirect contact as per IEC/DIN EN 60204-1)	by means of PELV circuits (Protective Extra-Low Voltage)		
Protection against explosion (as per EU guideline 94/9/EG, EN 50021 and EN 50281-1-1) Do not disconnect electrical connections which are under tension.	II 3 G/D EEx nA II T5 - 5 °C ≤ Ta ≤ + 50 °C T 80 °C IP65 (year of manufacture see Ex-marking on product) Plugs or adapters of the electric connections must comply at least with protection class IP64.		
Relay plate	Consisting of two relays for controlling 2 electrically isolated outputs		
Operating voltage – Tolerance – Residual ripple	24 V DC 20.4...26.4 V 4 Vpp		
Power consumption at 21 V Values in brackets for 24 V	**CPV10**	**CPV14**	**CPV18**
CPV valve terminal all connection variants: – per valve solenoid coil valve sub-base with Ident. code F CPV valve terminals: – per relay plate CPV valve terminal with IC connection: – additional per IC connector plug	0.46 W (0.6 W) (0.65 W) (1.2 W) ≤ 0.26 W	0.65 W (0.9 W) (1.2 W) ≤ 0.26 W	1.16 W (1.5 W) — ≤ 0.26 W
Input current consumption of electronics – CP valve terminal with CP connection	20 mA		25 mA
Current consumption – CP valve terminal with IC connection	20 mA in 24 ms at 24 V		63 mA
[1)] The component is intended for industrial use.			

Electrics (CPV valve terminal with IC or CP connection)		
Data of load current circuit of the relay outputs (at 24 V + 10 %)	1 A; floating contacts	—
Switching times of the relay outputs (at nominal voltage) – Pick-up – Drop-out	 5 ms 2 ms	

Tab. A/5: Technical specifications – electric components

Please note
Data on the electric components of the CPV valve terminal with Multipin, AS-Interface or direct connection are enclosed with the relevant product.

A.2 Accessories

Components	CPV10/14	CPV18
Mounting kits:		
– for hat rail fitting	CPV10/14-VI-BG-NRH-35	CPV18-VI-BG-NRH-35
– for wall fitting	CPV10/14-VI-BG-RWL-B	CPV18-VI-BG-RWL-B
– for wall (top) fitting the CPV valve terminal onto the Siemens SIMATIC ET200X	CPV..-VI-BG-ET200X	
Identifier labels	IBS6x10	IBS9x20
Identifier support	CPV..-VI-BZ-T-..	CPV18-VI-BZ-T...
Manual override cover	CPV10/14-HV	
Manual override security	CPV10/14-HS	
Valve extensions:		
– 5/3G	CPV..-BS-5/3G-..	
– Supply air one-way flow control valve	CPV..-BS-2xGRZZ-..	CPV..-BS-2xGRZZ-..
– Exhaust air one-way flow control valve	CPV..-BS-2xGRAZ-..	CPV..-BS-2xGRAZ-..
– One-way flow control valve for reject pulse	CPV..-BS-GRZ-V-..	CPV..-BS-GRZ-V-..
Blanking plug	B-M..	
Socket with cable for relay plate	KRP-1-24-...	
Socket without cable for relay plate	MSSD-ZBZC	
CP valve terminal with AS-Interface connection		
Addressing device	KASI-PRG-ADR	
Adapter cable	KASI-ADR	
AS-Interface combi power pack	ASI-CNT-115/230VAC-B	
AS-Interface bus cable (yellow)	KASI-1.5-Y-100	
AS-Interface additional supply cable (black)	KASI-1.5-Z-100	
AS-Interface cable cap	ASI-KK-FK	
AS-Interface cable sleeve	ASI-KT-FK	
Sensor cable	KM8-M8-GSGD	
CPV valve terminal with CP connection		
CP cable	KVI-CP-1... KVI-CP-2... (suitable for drag chain)	

Components	CPV10/14	CPV18
CP valve terminal with IC connection		
– IC connector plug		
Socket with cable	KMYZ-7-24-...-LED (with current reduction)	KMEB-2-24-..-LED
Socket without cable	MSSD-ZBZC	MSSD-ZBZC
CPV valve terminal with MP connection		
Ready-to-use multipin cable	KMP3-..P-..-.	
Multipin cable (suitable for drag chain)	KMP4-..P-...	
Multipin socket	SD-SUB-D-BU-..	

Tab. A/6: Festo accessories for CPV valve terminal

Summary of components

Appendix B

Contents

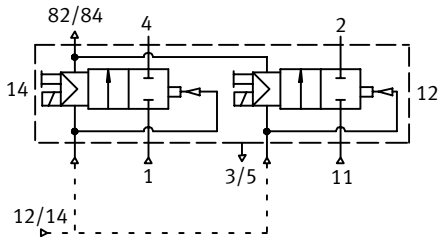
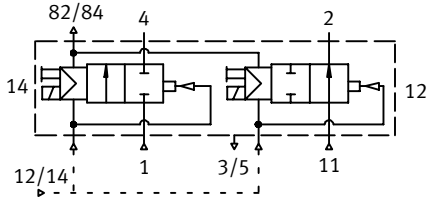
B. Summary of components B-1

B.1 Overview of valve sub-bases and vacuum generator plates B-3
B.2 Overview of end plates B-8

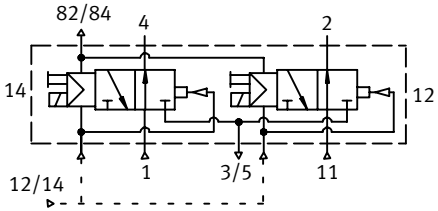
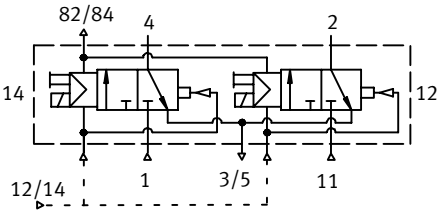
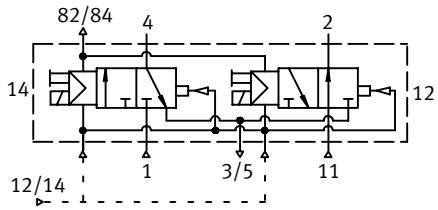
B.1 Overview of valve sub-bases and vacuum generator plates

The CPV valve terminals are available with the following valve sub-bases and vacuum generator plates:

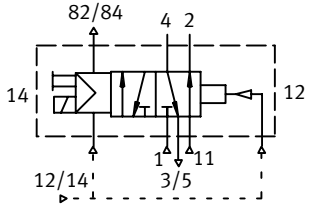
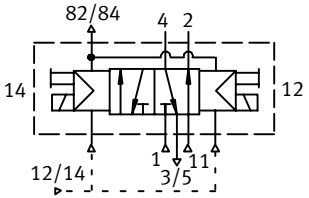
Please note
The numbers in the following circuit diagrams are the designations of the connections, coils and manual overrides; e.g. designation 14 stands for manual override 14 or coil 14. They are not logic designations.

Valve sub-base	Remarks
	Ident. code: D Valves: – two 2/2-way valves – single-solenoid – blocked in output position – pneumatic spring return
	Ident. code: I Valves: – two 2/2-way valves – single-solenoid – control side 14 blocked in basic position – control side 12 open in basic position – pneumatic spring return

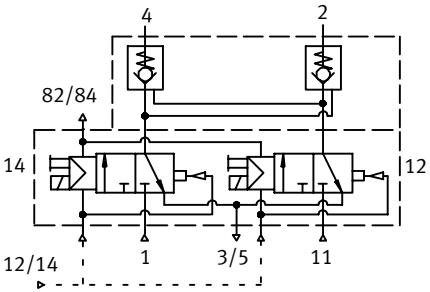
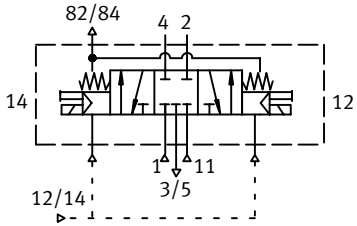
Tab. B/1: Overview valve sub-bases with 2/2-way valves

Valve sub-base (continued)	Remarks
	Ident. code: N Valves: – two 3/2-way valves – single-solenoid – open in basic position – pneumatic spring return Function: The function of a 5/3-way valve in mid-position pressurized can be implemented with these valves in basic position open.
	Ident. code: C Valves: – two 3/2-way valves – single-solenoid – blocked in basic position – pneumatic spring return Function: The function of a 5/3-way valve in mid-position exhausted can be implemented with these valves in basic position blocked. **Please note** If you control a double-acting cylinder with this valve sub-base, please note that the function of a 5/3-way mid-position valve can be implemented if both valve solenoid coils are actuated simultaneously.
	Ident. code: H Valves: – two 3/2-way valves – single-solenoid – control side 14 blocked in basic position – control side 12 open in basic position – pneumatic spring return

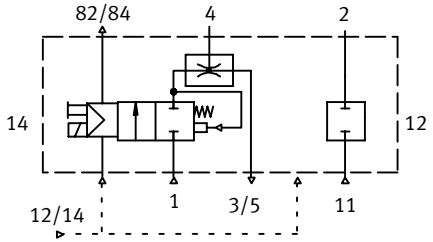
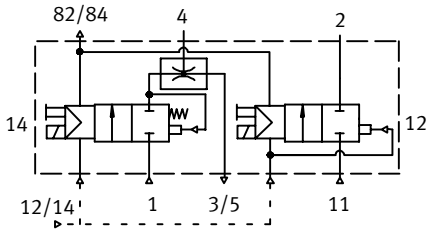
Tab. B/2: Overview valve sub-bases with 3/2-way valves

Valve sub-base (continued)	Remarks
	Ident. code: F (only CPV10 valve terminal) or M Valve: – 5/2-way valve – single-solenoid – pneumatic spring return – with Ident. code F fast switching **Please note** In the case of CPV valve terminals with the following connections, please note the limits on using the valve sub-base with Ident. code F. – IC connection: ”F valve sub-bases” may only be used with a connector socket for current reduction KMYZ-... . – Interbus direct connection type CPV10-GE-IL-..: These CPV valve terminals must not be used with ”F valve sub-bases.”
	Ident. code: J Valve: – 5/2-way double-solenoid valve

Tab. B/3: Overview valve sub-bases with 5/2-way valves

Valve sub-base (continued)	Remarks
CPV10/14:  	Ident. code: G Function: – 5/3-way valve blocked in mid-position Valve (CPV10/14): – two 3/2-way valves – single-solenoid – blocked in basic position – pneumatic spring return – 5/3G valve extension (two unlockable non-return valves)
CPV18:  	Valve (CPV18): – 5/3-way valves – blocked in mid-position – single-solenoid – pneumatic spring return

Tab. B/4: Overview valve sub-base or function (5/3-way valves)

Vacuum generator plate	Remarks
	Ident. code: A Function: Vacuum generator (control side 14) Valve: – 2/2-way valve – single-solenoid – blocked in basic position – air-assisted pneumatic spring return – flow control valve at output 4
	Ident. code: I Function: – vacuum generator (control side 14) – reject pulse (control side 12) Valve at control side 14: – 2/2-way valve – single-solenoid – blocked in basic position – air-assisted pneumatic spring return – flow control valve at output 4 Valve at control side 12: – 2/2-way valve – single-solenoid – blocked in basic position – pneumatic spring return

Tab. B/5: Overview vacuum generator plates

B.2 Overview of end plates

By means of the part number (position see below) and the table below, you can ascertain which end plates are fitted on your CPV valve terminal. In the case of CPV valve terminals with AS-Interface, CP or MP connection, the electrical sub-base must be dismantled for this purpose.

[1] Part number

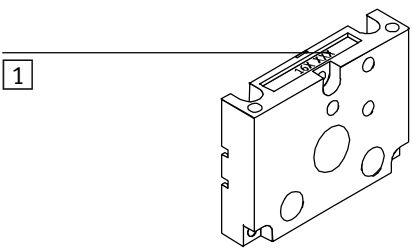
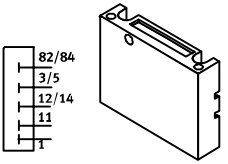
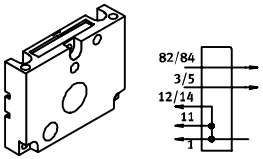
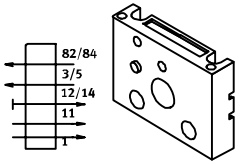
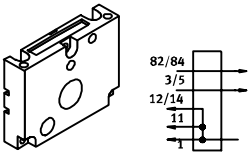
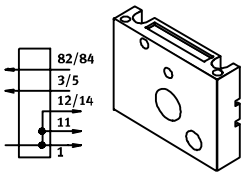
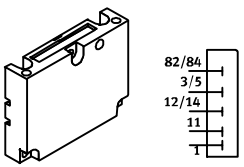


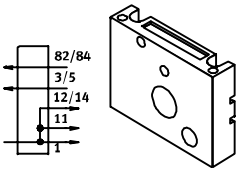
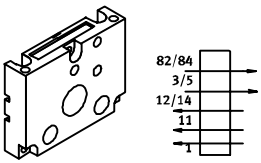
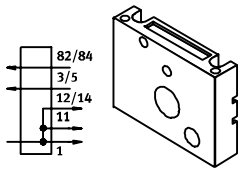
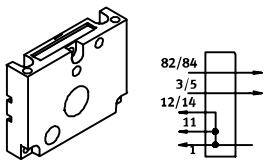
Fig. B/1: Position of end plate part number

End plate		Part number		
		CPV10	CPV14	CPV18
Left-hand end plates				
CPV..-EPL:	no connections	161 378	162 548	163 280
CPV..-EPL-E:	axial connections, connections 1 and 11 separate	161 374	162 544	163 196
CPV..-EPL-G:	axial connections, connections 1 and 11 connected	161 376	162 546	163 198
CPV..-EPL-PE:	for pneumatic multipin, connections 1 and 11 separate	161 370	162 540	163 194
CPV..-EPL-PG:	for pneumatic multipin, connections 1 and 11 connected	161 372	162 542	163 192
CPV..-EPL-EU:	with large surface-mounted silencer	188 454	188 458	192 939
CPV..-EPR-PEU:	with large surface-mounted silencer, for pneumatic multipin, connections 1 and 11 separate	188 452	188 456	192 938
Right-hand end plates				
CPV..-EPR:	no connections	161 379	162 549	163 281
CPV..-EPR-E:	axial connections, connections 1 and 11 separate external auxiliary pilot air	161 375	162 545	163 197
CPV..-EPR-G:	axial connections, connections 1 and 11 connected internal auxiliary pilot air	161 377	162 547	163 199
CPV..-EPR-PE:	for pneumatic multipin, connections 1 and 11 separate external auxiliary pilot air	161 371	162 541	163 195
CPV..-EPR-PG:	for pneumatic multipin, connections 1 and 11 connected internal auxiliary pilot air	161 373	162 543	163 193
CPV..-EPR-EU:	with large surface-mounted silencer	188 455	188 459	192 941
CPV..-EPR-PEU:	with large surface-mounted silencer, for pneumatic multipin, connections 1 and 11 separate, external auxiliary pilot air	188 453	188 457	192 940
CPV..-EPR-PGU:	with large surface-mounted silencer, for pneumatic multipin, connections 1 and 11 connected, internal auxiliary pilot air	193 913	193 914	194 006

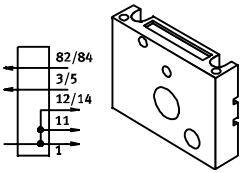
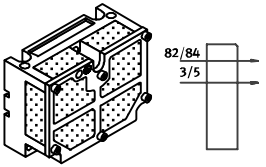
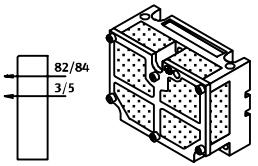
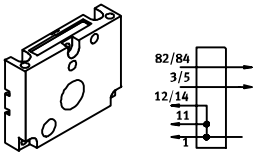
Tab. B/6: Overview end plate identification

All available end plate combinations are listed in the following tables. Check the end plates you wish to use with regard to their compatibility, see following tables.

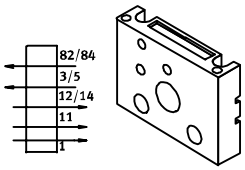
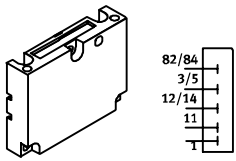
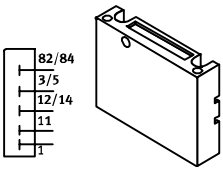
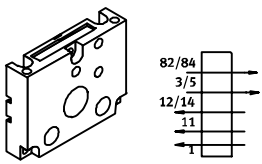
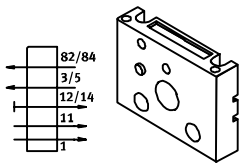
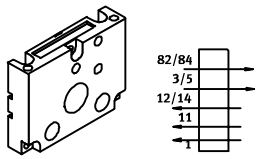
End plate pairs for internal auxiliary pilot air (internal pilot air), with pneumatic connections	**Description**
CPV..-EPL  CPV..-EPR-G 	Ident. code: U – Connections only in the right-hand end plate – Pressure zone separation not permitted – Cannot be used for vacuum
CPV..-EPL-E  CPV..-EPR-G 	Ident. code: Y: – Connections in left and right-hand end plates – Pressure zone separation permitted – Maximum number of pressure zones 3 – Valves to the left of the separator plate can be used for vacuum • Connections, which are not required for the function of the valve terminal, must be sealed (see also section 3.3.2 “Connecting the supply and work tubing).
CPV..-EPL-G  CPV..-EPR 	Ident. code: V – Connections only in the left-hand end plate – Pressure zone separation not permitted – Cannot be used for vacuum

End plate pairs for internal auxiliary pilot air (internal pilot air), with pneumatic connections	Description
CPV..-EPL-G  CPV..-EPR-E  	Ident. code: --- – Connections in left and right-hand end plates – Pressure zone separation permitted – Maximum number of pressure zones 3 – Valves to the right of the separator plate can be used for vacuum – Connection 12/14 in the right-hand end plate must be sealed with a blind plug. • Connections, which are not required for the function of the valve terminal, must be sealed (see also section 3.3.2 “Connecting the supply and work tubing).
CPV..-EPL-G  CPV..-EPR-G  	Ident. code: --- – Connections in left and right-hand end plates – Pressure zone separation only permitted with separator plate Ident.code S for exhaust separation. – Maximum number of pressure zones 1 – Cannot be used for vacuum

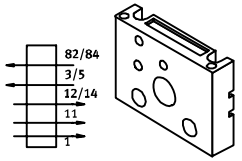
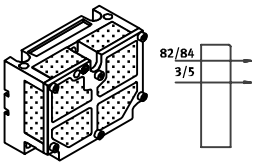
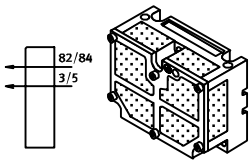
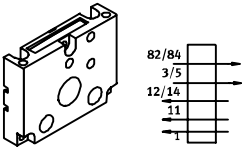
Tab. B/7: End plates for internal auxiliary pilot air

End plate pairs for internal auxiliary pilot air (internal pilot air), with pneumatic connections and large surface-mounted silencer	**Description**
CPV..-EPL-G  CPV..-EPR-EU 	Ident. code: B – Connections in the left-hand end plate – Pressure zone separation not permitted – Cannot be used for vacuum
CPV..-EPL-EU  CPV..-EPR-G 	Ident. code: A – Connections in the right-hand end plate – Pressure zone separation not permitted – Cannot be used for vacuum

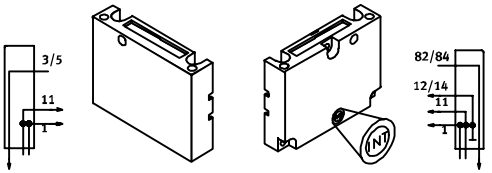
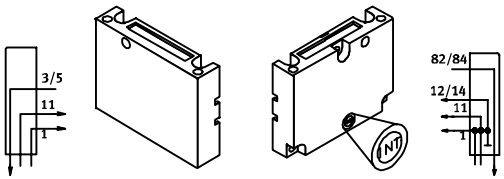
Tab. B/8: End plates for internal auxiliary pilot air, with large surface-mounted silencer

End plate pairs for internal auxiliary pilot air (internal pilot air), with pneumatic connections	Description
CPV..-EPL-E  CPV..-EPR 	Ident. code: X – Connections only in the left-hand end plate – Pressure zone separation not permitted – Can be used for vacuum
CPV..-EPL  CPV..-EPR-E 	Ident. code: W – Connections only in the right-hand end plate – Pressure zone separation not permitted – Can be used for vacuum
CPV..-EPL-E  CPV..-EPR-E 	Ident. code: Z – Connections in left and right-hand end plates – Pressure zone separation permitted – Maximum number of pressure zones 4 – Can be used for vacuum • Connections, which are not required for the function of the valve terminal, must be sealed (see also section 3.3.2 “Connecting the supply and work tubing).

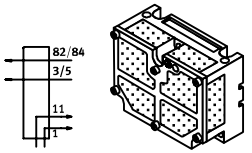
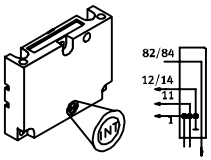
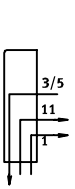
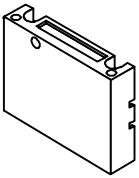
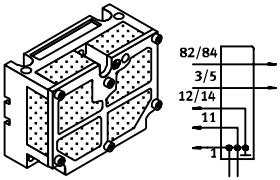
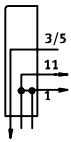
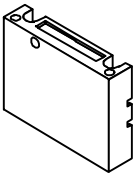
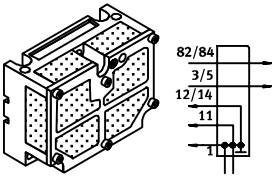
Tab. B/9: End plates for external auxiliary pilot air

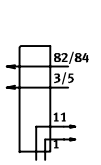
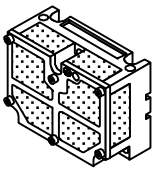
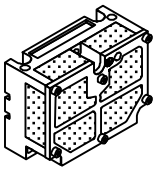
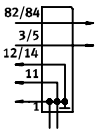
End plate pairs for external auxiliary pilot air (external pilot air), with pneumatic connections and large surface-mounted silencer	**Description**
CPV..-EPL-E  CPV..-EPR-EU 	Ident. code: D – Connections in the left-hand end plate – Pressure zone separation not permitted – Can be used for vacuum
CPV..-EPL-EU  CPV..-EPR-E 	Ident. code: C – Connections in the right-hand end plate – Pressure zone separation not permitted – Can be used for vacuum

Tab. B/10: End plates for external auxiliary pilot air, with large surface-mounted silencer

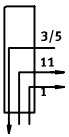
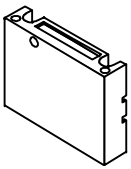
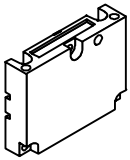
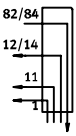
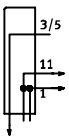
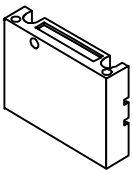
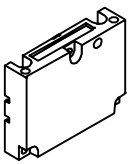
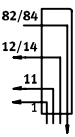
End plate pairs for internal auxiliary pilot air (internal pilot air) and pneumatic multipin	Description
CPV..-EPL-PG CPV..-EPR-PG 	Ident. code: Y – Connections on the pneumatic multipin – Pressure zone separation only permitted with separator plate Ident. code T. – Maximum number of pressure zones 2 – Valves to the left of the separator plate can be used for vacuum – Right-hand end plate with internally branched auxiliary pilot air is marked with **INT**.
CPV..-EPL-PE CPV..-EPR-PG 	Ident. code: --- – Connections on the pneumatic multipin – Pressure zone separation only permitted with separator plate Ident. code T. – Maximum number of pressure zones 3 – Valves to the left of the separator plate can be used for vacuum – Right-hand end plate with internally branched auxiliary pilot air is marked with **INT**.

Tab. B/11: End plate pairs for internal auxiliary pilot air and pneumatic multipin

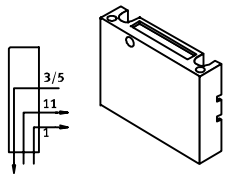
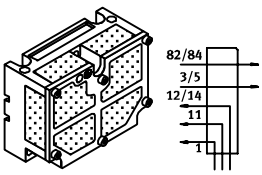
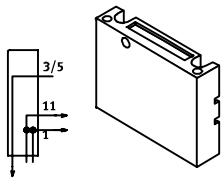
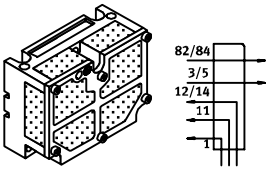
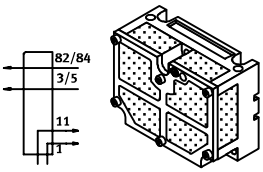
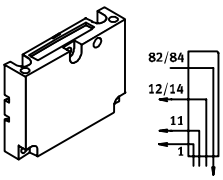
End plate pairs for internal auxiliary pilot air (internal pilot air) and pneumatic multipin, with large surface-mounted silencer	**Description**
CPV..-EPL-PEU  CPV..-EPR-PG 	Ident. code: G – Connections on the pneumatic multipin – Exhaust conducted via a large surface-mounted silencer – Pressure zone separation only permitted with separator plate Ident. code T. – Maximum number of pressure zones 3 – Cannot be used for vacuum – Right-hand end plate with internally branched auxiliary pilot air is marked with **INT**.
CPV..-EPL-PE   CPV..-EPR-PGU 	Ident. code: K – Connections on the pneumatic multipin ***)** – Exhaust conducted via a large surface-mounted silencer – Pressure zone separation permitted – Maximum number of pressure zones 3 – In conjunction with separator plate can be used for vacuum
CPV..-EPL-PG   CPV..-EPR-PGU 	Ident. code: --- – Connections on the pneumatic multipin ***)** – Exhaust conducted via a large surface-mounted silencer – Pressure zone separation permitted – Maximum number of pressure zones 2
***)** Close connections 11 and 12/14 on the pneumatic multipin below the right-hand end plate.	

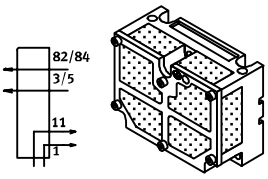
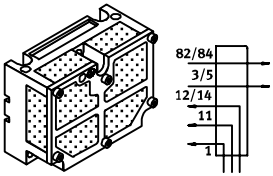
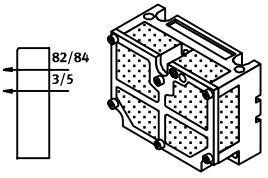
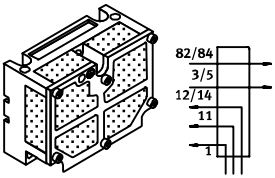
End plate pairs for internal auxiliary pilot air (internal pilot air) and pneumatic multipin, with large surface-mounted silencer	**Description**
CPV..-EPL-PEU   CPV..-EPR-PGU  	Ident. code: J – Connections on the pneumatic multipin ***)** – Exhaust conducted via a large surface-mounted silencer – Pressure zone separation permitted – Maximum number of pressure zones 3 – Valves to the left of the separator plate can be used for vacuum
***)** Close connections 11 and 12/14 on the pneumatic multipin below the right-hand end plate.	

Tab. B/12: End plate pairs for internal auxiliary pilot air and pneumatic multipin, with large surface-mounted silencer

End plate pairs for external auxiliary pilot air (external pilot air) and pneumatic multipin	**Description**
CPV..-EPL-PE   CPV..-EPR-PE  	Ident. code: Z – Connections on the pneumatic multipin – Pressure zone separation only permitted with separator plate Ident. code T. – Maximum number of pressure zones 4 – Can be used for vacuum
CPV..-EPL-PG   CPV..-EPR-PE  	Ident. code: --- – Connections on the pneumatic multipin – Pressure zone separation only permitted with separator plate Ident. code T. – Maximum number of pressure zones 3 – Can be used for vacuum

Tab. B/13: End plate pairs for external auxiliary pilot air and pneumatic multipin

End plate pairs for external auxiliary pilot air (external pilot air) and pneumatic multipin, with large surface-mounted silencer	**Description**
CPV..-EPL-PE  CPV..-EPR-PEU 	Ident. code: I – Connections on the pneumatic multipin – Exhaust conducted via a large surface-mounted silencer – Pressure zone separation only permitted with separator plate Ident. code T. – Maximum number of pressure zones 4 – Can be used for vacuum
CPV..-EPL-PG  CPV..-EPR-PEU 	Ident. code: --- – Connections on the pneumatic multipin – Exhaust conducted via pneumatic multipin and large surface-mounted silencer – Pressure zone separation only permitted with separator plate Ident. code T. – Maximum number of pressure zones 3 – Can be used for vacuum
CPV..-EPL-PEU  CPV..-EPR-PE 	Ident. code: F – Connections on the pneumatic multipin – Exhaust conducted via a large surface-mounted silencer – Pressure zone separation only permitted with separator plate Ident. code T. – Maximum number of pressure zones 4 – Can be used for vacuum

End plate pairs for external auxiliary pilot air (external pilot air) and pneumatic multipin, with large surface-mounted silencer	**Description**
CPV..-EPL-PEU  CPV..-EPR-PEU  	Ident. code: H – Connections on the pneumatic multipin – Pressure zone separation permitted – Maximum number of pressure zones 4 – Can be used for vacuum
CPV..-EPL-EU  CPV..-EPR-PEU  	Ident. code: --- – Connections on the pneumatic multipin – Pressure zone separation not permitted – Can be used for vacuum

Tab. B/14: End plate pairs for external auxiliary pilot air and pneumatic multipin, with large surface-mounted silencer

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