

# Compact performance



## FESTO

### Brief description

CPV-Valve  
terminal with  
AS-Interface  
Spec. 3.0  
profile S-7.A.7  
type CPV...-GE-  
ASI-4E4A-Z-CE

– English



8107493  
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[8107495]

Translation of the original instructions

## Documentation on the product



For all available product documentation  
→ [www.festo.com/pk](http://www.festo.com/pk)

Copyright:  
Festo SE & Co. KG  
Ruiter Straße 82  
73734 Esslingen  
Germany

Internet: <http://www.festo.com>  
E-Mail: [service\\_international@festo.com](mailto:service_international@festo.com)

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English ..... 3

# 1 User instructions

Valve terminal type CPV...-GE-ASI-4E4A-...-CE has been designed exclusively for controlling pneumatic actuators and for use in bus systems in accordance with AS-Interface specification 3.0. If used together with additional commercially available components, such as sensors and actuators, the specified limits for pressures, temperatures, electrical data, torques etc. must be observed.

AS-Interface bus systems and valve terminals may only be installed by personnel especially trained for this purpose. Specifications on the design and addressing of your bus system can be found in the manual for the AS-Interface master.

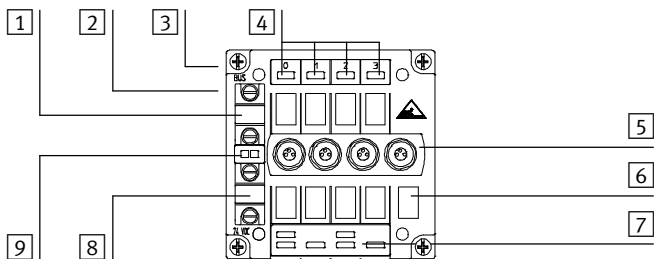
Detailed information on the pneumatic components of the valve terminal can be found in the Pneumatics manual P.BE-CPV-...



## **Warning**

- Switch off the power supply before connecting or disconnecting plugs (otherwise this could lead to functional damage).
- Connect one of the earth cables on the end plates with low impedance (short cable with large cross-sectional area) to the earth potential.
- Commission only a valve terminal which has been fitted and wired completely.

## 2 Connection and display elements



- |                                         |                                                   |
|-----------------------------------------|---------------------------------------------------|
| 1 AS-Interface bus connection           | 6 Inscription field for AS-Interface address      |
| 2 Earth connection                      | 7 LED status display for valves (yellow)          |
| 3 Type plate                            | 8 Load voltage connection for valves <sup>*</sup> |
| 4 LED status display for inputs (green) | 9 PWR LED (power, green), Fault LED (fault, red)  |
| 5 Sensor connections (PNP)              |                                                   |

<sup>\*</sup>) Valves can be switched off during EMERGENCY STOP, no voltage supply for the valves via AS-Interface bus

| PWR LED  | Fault LED | Meaning                                      |
|----------|-----------|----------------------------------------------|
| on       | off       | AS-Interface voltage present, no fault       |
| off      | off       | No AS-Interface voltage on the bus           |
| flashing | on        | AS-Interface address not set (= 0)           |
| on       | flashing  | Short circuit/overload at the inputs         |
| on       | on        | Bus communication failure (watchdog expired) |

## 3 Installation instructions

### 3.1 AS-Interface addresses

Before connecting to the AS-Interface bus: assign an unused address to each slave. Set the address you require using the AS-Interface addressing device. Permitted address range: 1A/B ... 31A/B.

#### Address assignment

The diagram below shows the assignment of the data bits to the inputs and outputs.

|            |                        |     |     |     |
|------------|------------------------|-----|-----|-----|
|            | IO code 7 <sub>H</sub> |     |     |     |
| Data bits: | D0                     | D1  | D2  | D3  |
|            | I/O                    | I/O | I/O | I/O |
| Inputs:    | I0                     | I1  | I2  | I3  |
| Outputs:   | O0                     | O1  | O2  | O3  |

I/O = **B**idirectional (B)

The address mapping depends on the configuration of the master.

### 3.2 Assigning the AS-Interface address



#### Please note

Addressing of valve terminal type CPV...-GE-ASI-4E4A-... is only permitted with addressing devices acc. to specification 2.1 or higher.

Other addressing devices may overwrite the ID1 code.

Recommendation: For addressing use addressing device type ASI-PRG-ADR with adapter cable type KASI-ADR from Festo.

Factory setting:     Address #0

The addressing device scans the existing slaves in the AS-Interface network.

- Assign the desired address to the slave.

Parameterisation of the AS-Interface slave is not necessary.

### **Operation with AS-Interface masters < specification 3.0**

Operation with AS-Interface masters < specification 3.0 is fundamentally **not** possible.

### **3.3 Address assignment of the valves**

The valve terminals may be configured as shown in the following table:

## Configuration of valve positions 1 to 4 (top view)

| 2 double-solenoid valves | 4 single-solenoid valves | 1 double-solenoid valve, 2 single-solenoid valves |  |
|--------------------------|--------------------------|---------------------------------------------------|--|
|                          |                          |                                                   |  |

## DIP switch setting (see 3.6)

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

- 1 ... 4 Addresses of the solenoid valves
- 5 Valve plates with 2 valve solenoid coils, such as 2 single-solenoid valves, 5/2-way double-solenoid valves or 5/3-way valves (e.g. J, N, C, H, G, D, I, E) or reserve / separator plate
  - 6 Reserve or separator plate (e.g. code L, S, T)
  - 7 Valve plates with 1 valve solenoid coil (e.g. code M, F, A) or reserve / separator plate

### 3.4 Connecting sensors (PNP inputs)

Use cable type NEBU-... or KM8-M8-GSGD-... and plug with union nut and M8x1 thread for connecting sensors.

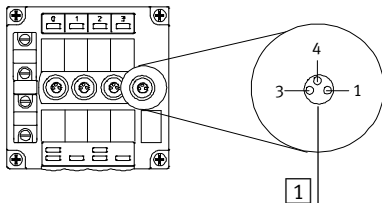
Fasten the plugs/sockets with the aid of the union nut in order to prevent unintentional loosening, e.g. due to shock. Seal unused sensor connections with the protective caps type ISK-M8. Only in this way can you comply with protection class IP65.



#### Please note

- The inputs have been designed in accordance with IEC 1131-2 type 02.
- The inputs are short-circuit proof. In the event of a short circuit the slave will be switched off. The AS-Interface master then regards this slave as absent. The slave reports back as functioning once the short circuit has been eliminated.

- 1** Pin assignment
- 1: 24 V
  - 3: 0 V
  - 4: Input Ix+3



### 3.5 Connecting the AS-Interface bus and the load voltage



#### **Please note**

The sensor supply for the inputs is provided via the AS-Interface bus.

The valves must be supplied separately with 24 V via the load voltage connection.

The AS-Interface features an integrated watchdog function which resets the outputs if communication with the bus fails.



#### **Warning**

Use only power units which guarantee reliable electrical isolation of the operating voltage as per IEC/DIN EN 60204-1. Observe also the general requirements for PELV power circuits as per IEC/DIN EN 60204-1.

By the use of PELV power units, protection against electric shock (protection against direct and indirect contact) is guaranteed in accordance with IEC/DIN EN 60204-1 (electrical equipment of machines, general requirements).

Please note with branch lines:

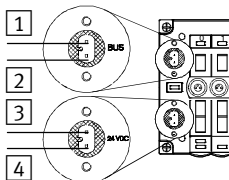
- the maximum total length of the AS-Interface bus: 100 m (without repeater/extender).
- the cable length of the load voltage connection (depends on the current consumption of the valve terminal and fluctuations in load voltage).

Pin assignment “Bus” (yellow cable):

- 1 Pin 2: AS-Interface + (brown)
- 2 Pin 1: AS-Interface - (light blue)

Pin assignment “24 V DC” (black cable):

- 3 Pin 2: +24 V (brown)
- 4 Pin 1: 0 V (blue)

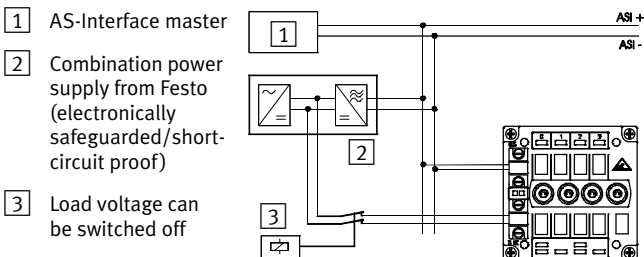


For connecting the valve terminal use the Festo cable sockets type ASI-SD-FK... You will then comply with protection class IP65. Proceed as follows:

1. Press the AS-Interface cable into the upper part of the cable socket.
2. Make sure that the cable is free of tension.
3. Replace and screw tight the cable socket (max. 0.3 Nm).

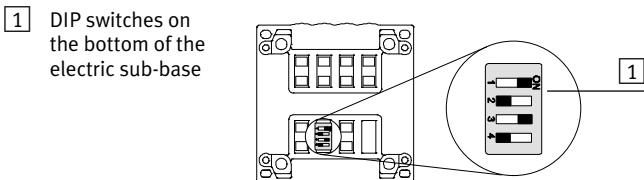
Seal open flat cable ends with the Festo cable cap type ASI-KK-FK or the cable sleeve type ASI-KT-FK. In this way you will avoid leakage currents and comply with protection class IP65.

### 3.6 Connection example – valve terminal type 10



### 3.7 Converting the valve terminal

The valve terminal can be fitted with double-solenoid and/or single-solenoid valves. During conversion, the new valve terminal configuration must be set with the DIP switches on the bottom of the electric sub-base.



Instructions on removing the electric sub-base can be found in the Pneumatics manual. The permitted valve combinations as well as the relevant DIP switch settings can be found in the table in section 3.3.

## 4 Technical specifications

| <b>Type CPV...-GE-ASI-4E4A-...-CE</b>                                                              |                                                                                                       |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| General technical data                                                                             | see Pneumatics manual<br>P.BE-CPV-...                                                                 |
| Protection class as per EN 60529                                                                   | IP65 (Seal unused sensor connections with the protective caps type ISK-M8)                            |
| CE mark (see declaration of conformity)<br>➔ <a href="http://www.festo.com">www.festo.com</a>      | in accordance with EU-EMC-Directive                                                                   |
| AS-Interface data<br>– ID code<br>– ID1 code <sup>1)</sup><br>– ID2 code<br>– IO code<br>– Profile | ID = A <sub>H</sub><br>ID1 = 7 <sub>H</sub><br>ID2 = 7 <sub>H</sub><br>IO = 7 <sub>H</sub><br>S-7.A.7 |
| <sup>1)</sup> Factory setting: Address #0                                                          |                                                                                                       |

## Type CPV...-GE-ASI-4E4A-...-CE

|                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                           |                  |                  |        |        |        |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|--------|--------|--------|--------|
| <p>AS-Interface bus connection</p> <ul style="list-style-type: none"> <li>– Voltage range (protected against incorrect polarity)</li> <li>– Residual ripple</li> <li>– Max. current consumption at -5 °C               <ul style="list-style-type: none"> <li>– all inputs in 0-status</li> <li>– all inputs in 1-status (max. current consumption by sensors)</li> </ul> </li> </ul> | <p>DC 26.5 ... 31.6 V</p> <p>≤ 20 mVss</p> <table border="0"> <tr> <td><u>CPV10-...</u></td> <td><u>CPV14-...</u></td> </tr> <tr> <td>20 mA</td> <td>20 mA</td> </tr> <tr> <td>200 mA</td> <td>200 mA</td> </tr> </table> | <u>CPV10-...</u> | <u>CPV14-...</u> | 20 mA  | 20 mA  | 200 mA | 200 mA |
| <u>CPV10-...</u>                                                                                                                                                                                                                                                                                                                                                                      | <u>CPV14-...</u>                                                                                                                                                                                                          |                  |                  |        |        |        |        |
| 20 mA                                                                                                                                                                                                                                                                                                                                                                                 | 20 mA                                                                                                                                                                                                                     |                  |                  |        |        |        |        |
| 200 mA                                                                                                                                                                                                                                                                                                                                                                                | 200 mA                                                                                                                                                                                                                    |                  |                  |        |        |        |        |
| <p>Load voltage connection</p> <ul style="list-style-type: none"> <li>– Rated value (protected against incorrect polarity)</li> <li>– Residual ripple</li> <li>– Current consumption for 4 valves (at 24 V)               <ul style="list-style-type: none"> <li>– switching on <sup>1)</sup></li> <li>– after current reduction (stationary)</li> </ul> </li> </ul>                  | <p>DC 21.6 ... 26.4 V</p> <p>4 Vss</p> <table border="0"> <tr> <td><u>CPV10-...</u></td> <td><u>CPV14-...</u></td> </tr> <tr> <td>115 mA</td> <td>175 mA</td> </tr> <tr> <td>55 mA</td> <td>75 mA</td> </tr> </table>     | <u>CPV10-...</u> | <u>CPV14-...</u> | 115 mA | 175 mA | 55 mA  | 75 mA  |
| <u>CPV10-...</u>                                                                                                                                                                                                                                                                                                                                                                      | <u>CPV14-...</u>                                                                                                                                                                                                          |                  |                  |        |        |        |        |
| 115 mA                                                                                                                                                                                                                                                                                                                                                                                | 175 mA                                                                                                                                                                                                                    |                  |                  |        |        |        |        |
| 55 mA                                                                                                                                                                                                                                                                                                                                                                                 | 75 mA                                                                                                                                                                                                                     |                  |                  |        |        |        |        |
| <p>Valves (see pneumatics manual)</p>                                                                                                                                                                                                                                                                                                                                                 | <p>Watchdog function active after 40 ... 100 ms (see 3.5)</p>                                                                                                                                                             |                  |                  |        |        |        |        |
| <p>Digital inputs</p> <ul style="list-style-type: none"> <li>– Design</li> <li>– Max. current consumption               <ul style="list-style-type: none"> <li>– per input</li> <li>– sum currents (all inputs)</li> </ul> </li> <li>– Logic level</li> <li>– Reference potential</li> <li>– Response delay</li> </ul>                                                                | <p>4 digital inputs based on IEC 1131-2 type 2</p> <p>DC 24 V, PNP, status display (LED)</p> <p>200 mA</p> <p>200 mA</p> <p>ON: +11 ... +30 V</p> <p>OFF: -30 ... +5 V</p> <p>0 V</p> <p>typically 3 ms (at 24 V)</p>     |                  |                  |        |        |        |        |
| <p><sup>1)</sup> For max. 30 ms, all valve coils switched simultaneously</p>                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                           |                  |                  |        |        |        |        |

