

# Valve Coupler

## FD0-VC-EX4.PA



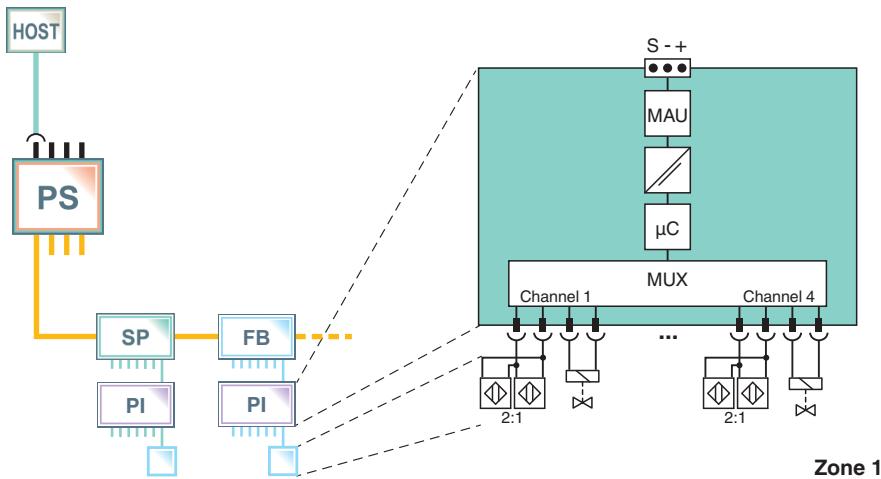
- For four intrinsically safe valves with position sensors
- Installation in Zone 1 and Zone 2
- Valves in Zone 0
- Connection to fieldbus acc. to FISCO or Entity
- For PROFIBUS PA
- PCS integration with FDT/DTM technology
- Monitors lead breakage and short circuits
- Valve monitoring and diagnostics integrated
- Conducts partial stroke testing
- Conforms to PROFIBUS PA profile



### Function

The valve coupler for PROFIBUS PA connects up to four intrinsically safe low-power valves to the DCS via fieldbus. It is installed pre-wired in a field enclosure or directly outside, close to the valves in the hazardous area. The valve coupler drives four low-power auxiliary valves and gathers positioning information via pairs of inductive proximity switches. The valve coupler communicates all data, configuration, and alarms via one fieldbus address to the DCS. It supports DCS integration through GSD file and FDT/DTM technology. Fieldbus powers the actors, sensors and the valve coupler itself. Additional power or wiring is not required. The valve coupler supports the PROFIBUS PA profile for easy integration with summary diagnostics according to NAMUR recommendations, and detects lead breakage and short circuit conditions. It monitors and reports runtime and breakaway time during each operation and can conduct partial stroke tests.

### Connection



### Technical Data

General specifications	
Design / Mounting	Outside installation
Fieldbus connection	
PROFIBUS PA	
Connection	Connection +, -
Rated voltage	9 ... 32 V
Rated current	max. 23 mA
Baud rate	31.25 kBit/s
Protocol	IEC 61158-2
Terminal "S"	only for the connection of the cable screen (BUS) and/or the potential compensation

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Technical Data

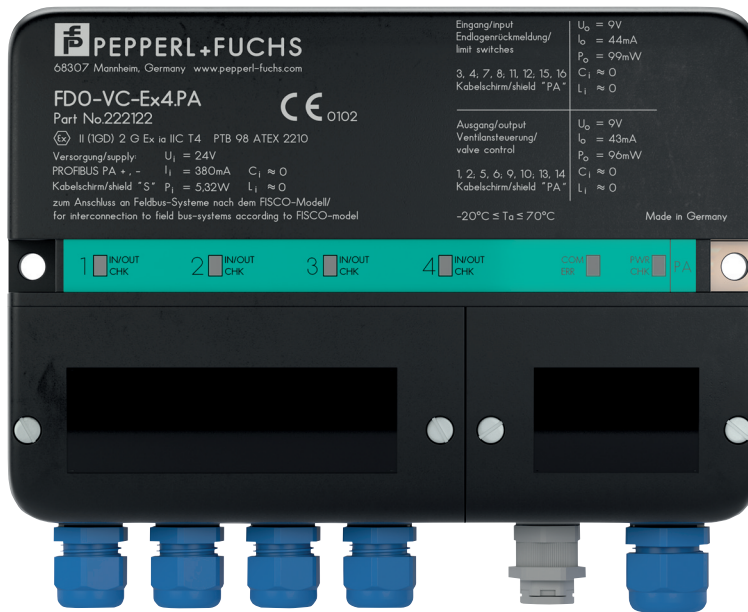
Terminal "PA"		only for the connection of the cable screen (sensor interface) and/or grounding
Grounding plate		only for the connection of the potential compensation
<b>Field circuit</b>		
Inputs		
Connection		8, for binary sensors: terminals 3, 4, 7, 8, 11, 12, 15, 16
Sensor supply voltage		5 V
Sensor supply current		5 mA
Time delay before availability		2 ms
Max. cycle time		max. 160 ms
Outputs		
Connection		terminals 1+, 2-; 5+, 6-; 9+, 10-; 13+, 14-
Output voltage		6.4 ... 7.9 V
Output rated operating current		1.5 mA
Holding current		1 mA
<b>Galvanic isolation</b>		
PROFIBUS PA/Field circuit		safe galvanic isolation acc. to EN 60079-11, voltage peak value 60 V
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013
<b>Standard conformity</b>		
Galvanic isolation		EN 60079-11
Electromagnetic compatibility		NE 21:2006
Degree of protection		IEC/EN 60529
Fieldbus standard		IEC 61158-2
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 70 °C (-4 ... 158 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Corrosion resistance		acc. to ISA-S71.04-1985, severity level G3
<b>Mechanical specifications</b>		
Core cross section		Bus cable: Ø 5 mm ... 10 mm Cable sensors/valve: Ø 4 mm ... 8 mm
Housing		187 mm x 129 mm x 46 mm
Degree of protection		IP65
Installation position		Cable glands downwards
Mass		approx. 290 g
Mounting		wall mounting
<b>Data for application in connection with hazardous areas</b>		
EU-type examination certificate		PTB 98 ATEX 2210
Marking		Ⓜ II 2G (1) Ex ia [ia Ga] IIC T4 Gb , Ⓜ II (1D) [Ex ia Da] IIIC , Ⓜ II 3G Ex ic IIC T4 Gc , Ⓜ II (3D) [Ex ic Dc] IIIC
<b>PROFIBUS PA</b>		
Voltage	$U_i$	24 V
Current	$I_i$	380 mA
Power	$P_i$	5.32 W
Rated voltage		9 ... 32 V
Rated current		23 mA
FDE (Fault Disconnect Equipment)		6.7 mA
Terminal "S"		only for the connection of the cable screen (BUS) and/or the potential compensation
Terminal "PA"		only for the connection of the cable screen (sensor interface) and/or grounding
Grounding plate		only for the connection of the potential compensation
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012 , EN 60079-11:2012

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**Technical Data**

<b>International approvals</b>	
IECEX approval	IECEX TUN 04.0002
Approved for	Ex ia [ia Ga] IIC T4 Gb , [Ex ia Da] IIIC , Ex ic IIC T4 Gc , [Ex ic Dc] IIIC
<b>General information</b>	
Supplementary information	EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

**Assembly**



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**Additional Information**

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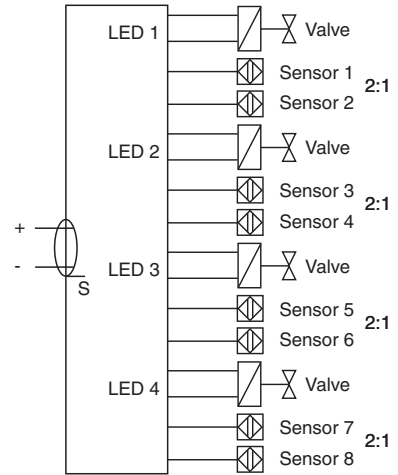
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**Accessories**

Electrical connection

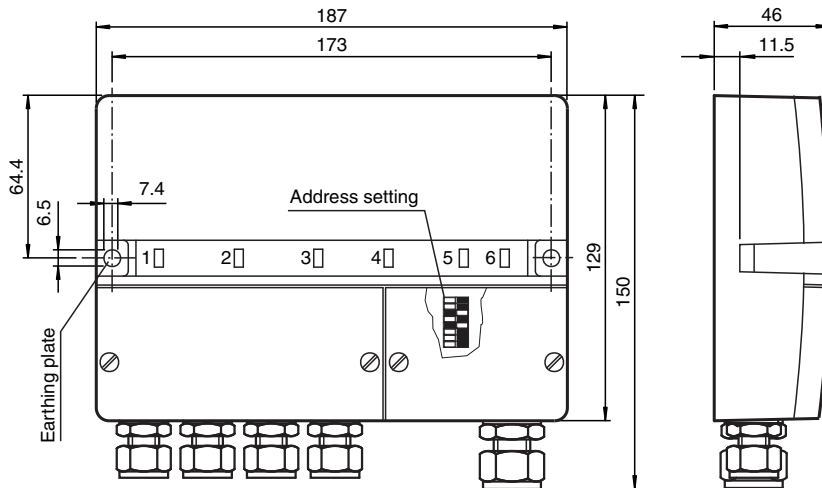
Terminal 1	Valve 1+
Terminal 2	Valve 1-
Terminal 3	Sensor 1+, Sensor 2-
Terminal 4	Sensor 1-, Sensor 2+
Terminal 5	Valve 2+
Terminal 6	Valve 2-
Terminal 7	Sensor 3+, Sensor 4-
Terminal 8	Sensor 3-, Sensor 4+
Terminal 9	Valve 3+
Terminal 10	Valve 3-
Terminal 11	Sensor 5+, Sensor 6-
Terminal 12	Sensor 5-, Sensor 6+
Terminal 13	Valve 4+
Terminal 14	Valve 4-
Terminal 15	Sensor 7+, Sensor 8-
Terminal 16	Sensor 7-, Sensor 8+
Terminal +	PROFIBUS PA+
Terminal S	Shield
Terminal -	PROFIBUS PA-



Note

The device-specific master data file (GSD) is required to use this device. The file is available through the PROFIBUS User Organisation or it can be downloaded from our website on the Internet (<http://www.pepperl-fuchs.com>).

**Dimensions**



**LED-Assignment**

- 1 IN/OUT CHK
- 2 IN/OUT CHK
- 3 IN/OUT CHK
- 4 IN/OUT CHK
- 5 COM/ERR
- 6 PWR/CHK

**Example address setting**

	ON	OFF	
8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$2^6$
7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$2^5$
6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$2^4$
5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$2^3$
4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$2^2$
3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$2^1$
2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$2^0$
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	$2^0$

Switch 8: Hardware write protection.  
In setting 1 (ON) all acyclic write accesses are blocked

The address setting on delivery is 40  
(=  $2^3 + 2^2$ )

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**Connectable sensors (2:1 procedure)**

The 2:1 procedure allows to transfer two independent binary signals on a single wire pair without a bus system. To do this, the two sensors (or mechanical switches) are controlled and evaluated antiparallel in time multiplex mode. Due to the condition of time multiplex mode, not all NAMUR proximity switches can be operated using the 2:1 procedure.

For information regarding connectable sensor types, contact Pepperl+Fuchs.

Some sensor types can be connected by means of additional external Polarity Reversal Protection.

**Connectable low-power Ex valves**

Herion	low-power valve, 6 V design, Type 2085
ASCO/Joucomatic	Piezo valve, 6 V design, No. 63000059, No. 63000060, No. 63000061, No. 63000062
Samson	Type 3776, 3701, 3775, 3962, 3963, 3766 all based on the 6-V design
Seitz	solenoid valve PV12 F73 Xio H



Attention

Do not connect any additional current consumers to the valve circuit (e.g., LEDs).

If additional consumers are connected to the valve circuit, successful operation of the valve coupler cannot be ensured.