

# Digital Output with Shutdown Input FB2201ER



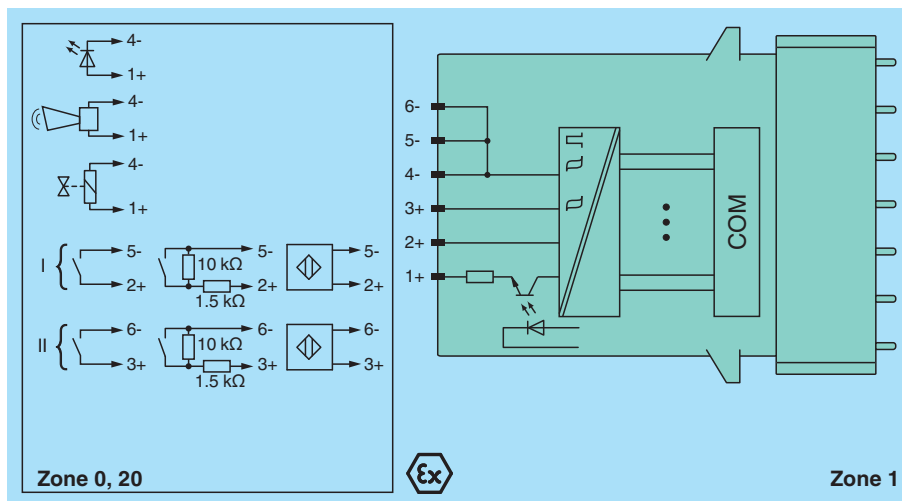
- 1 digital output, 2 digital inputs
- Inputs and output Ex ia
- Installation in suitable enclosures in Zone 1
- Module can be exchanged under voltage (hot swap)
- Positive or negative logic selectable
- Simulation mode for service operations (forcing)
- Line fault detection (LFD)
- Permanently self-monitoring
- Output with watchdog
- Output with bus-independent safety input



## Function

The digital output features 1 output with 2 feedback inputs.  
The device can be used to switch solenoids, sounders, or indicators (without line fault detection) in the field. Furthermore, the device accepts digital input signals of NAMUR sensors or mechanical contacts from the field.  
The output can be switched off via a contact. This can be used for bus-independent safety applications.  
Open and short-circuit line faults are detected.  
The intrinsically safe inputs and the output are galvanically isolated from the bus and the power supply.

## Connection



## Technical Data

### Slots

Occupied slots	1
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### Functional safety related parameters

Safety Integrity Level (SIL)	SIL 2
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### Supply

Connection		backplane bus
Rated voltage	U <sub>r</sub>	12 V DC , only in connection with the power supplies FB92**
Power dissipation		1.3 W
Power consumption		1.6 W

### Internal bus

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

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## Technical Data

Connection		backplane bus
Interface		manufacturer-specific bus to standard com unit
<b>Digital input</b>		
Number of channels		2
Sensor interface		
Connection		NAMUR sensor
Connection [2]		volt-free contact
Connection [3]		active binary signal 24 V DC
Connection		channel I: 2+, 5-; channel II: 3+, 6-
Rated values		acc. to EN 60947-5-6 (NAMUR)
Switching point/switching hysteresis		1.2 ... 2.1 mA / $\pm 0.2$ mA
Internal resistor	$R_i$	1 k $\Omega$
Line fault detection		can be switched on/off for each channel via configuration tool
Connection		mechanical switch with additional resistors (see connection diagram) proximity switches without additional wiring
Short-circuit		< 360 $\Omega$
Open-circuit		< 0.35 mA
Minimum pulse duration		1 ms
<b>Digital output</b>		
Number of channels		1
Suitable field devices		
Field device		Solenoid Valve
Field device [2]		audible alarm
Field device [3]		visual alarm
Connection		channel I: 1+, 4-
Internal resistor	$R_i$	315 $\Omega$
Current limit	$I_{max}$	53 mA
Open loop voltage	$U_s$	22 V
Line fault detection		can be switched on/off for each channel via configuration tool , also when turned off (every 2.5 s the valve is turned on for 2 ms)
Short-circuit		< 120 $\Omega$
Open-circuit		> 2 k $\Omega$
Response time		20 ms (depending on bus cycle time)
Watchdog		within 0.5 s the device goes in safe state, e.g. after loss of communication
<b>Indicators/settings</b>		
LED indication		LED green: supply LED red: output line fault LED yellow: status output
Coding		optional mechanical coding via front socket
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013
<b>Conformity</b>		
Electromagnetic compatibility		NE 21
Degree of protection		IEC 60529
Environmental test		EN 60068-2-14
Shock resistance		EN 60068-2-27
Vibration resistance		EN 60068-2-6
Damaging gas		EN 60068-2-42
Relative humidity		EN 60068-2-78
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 60 $^{\circ}$ C (-4 ... 140 $^{\circ}$ F)
Storage temperature		-25 ... 85 $^{\circ}$ C (-13 ... 185 $^{\circ}$ F)
Relative humidity		95 % non-condensing

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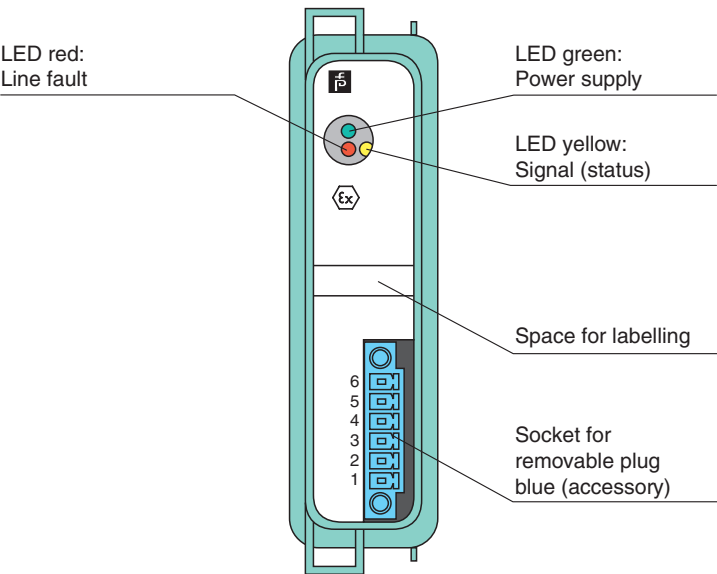
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## Technical Data

Shock resistance		shock type I, shock duration 11 ms, shock amplitude 15 g, number of shocks 18
Vibration resistance		frequency range 10 ... 150 Hz; transition frequency: 57.56 Hz, amplitude/acceleration $\pm 0.075$ mm/1 g; 10 cycles frequency range 5 ... 100 Hz; transition frequency: 13.2 Hz amplitude/acceleration $\pm 1$ mm/0.7 g; 90 minutes at each resonance
Damaging gas		designed for operation in environmental conditions acc. to ISA-S71.04-1985, severity level G3
<b>Mechanical specifications</b>		
Degree of protection		IP20 (module) , a separate housing is required acc. to the system description
Connection		removable front connector with screw flange (accessory) wiring connection via spring terminals (0.14 ... 1.5 mm <sup>2</sup> ) or screw terminals (0.08 ... 1.5 mm <sup>2</sup> )
Mass		approx. 350 g
Dimensions		28 x 107 x 132 mm (1.1 x 4.2 x 5.2 inch)
<b>Data for application in connection with hazardous areas</b>		
EU-type examination certificate		PTB 97 ATEX 1074 U
Marking		Ⓔ II 2(1) G Ex d [ia Ga] IIC Gb Ⓔ II (1) D [Ex ia Da] IIIC
<b>Input</b>		
Voltage	U <sub>o</sub>	14.1 V
Current	I <sub>o</sub>	16 mA
Power	P <sub>o</sub>	55 mW (linear characteristic)
Internal capacitance	C <sub>i</sub>	1.65 nF
<b>Output</b>		
Voltage	U <sub>o</sub>	24.9 V
Current	I <sub>o</sub>	91 mA
Power	P <sub>o</sub>	558 mW
Internal capacitance	C <sub>i</sub>	1.65 nF
<b>Galvanic isolation</b>		
Input/power supply, internal bus		safe electrical isolation acc. to EN 60079-11, voltage peak value 375 V
Output/power supply, internal bus		safe electrical isolation acc. to EN 60079-11, voltage peak value 375 V
<b>Directive conformity</b>		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 EN 60079-1:2014 EN 60079-11:2012
<b>International approvals</b>		
ATEX approval		PTB 97 ATEX 1075 ; PTB 97 ATEX 1074 U
<b>General information</b>		
System information		The module has to be mounted in appropriate backplanes and housings (FB92**) in Zone 1, 2, 21, 22 or outside hazardous areas (gas or dust). Here, observe the corresponding EC-type examination certificate.
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

Front view



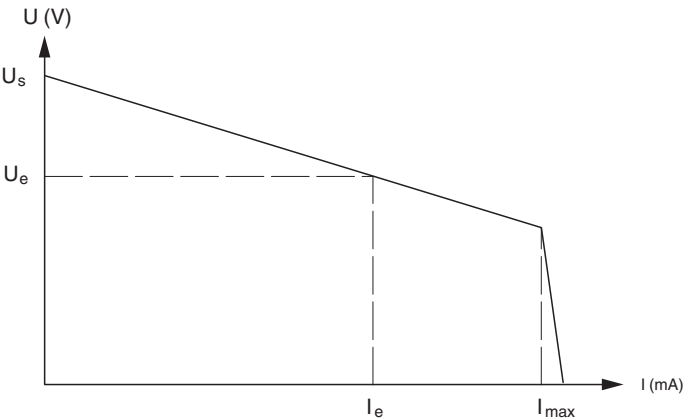
Load calculation

$R_{load}$  = Field loop resistance

$U_e = U_s - R_i \times I_e$

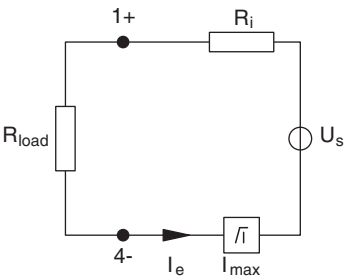
$I_e = U_s / (R_i + R_{load})$

Characteristic Curve




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Characteristic Curve



Accessories

	<b>LB9180</b>	Watchdog Plug, 1-channel
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