



## Universal Input/Output (HART) FB7204B3

- 4-channel
- Inputs Ex ia, Outputs Ex ia
- Installation in suitable enclosures in Zone 1
- Module can be exchanged under voltage (hot swap)
- Analog input, digital input, analog output, digital output
- Supply circuit 21.5 V (4 mA)
- HART communication via field bus or service bus
- Simulation mode for service operations (forcing)
- Line fault detection (LFD): one LED per channel
- Permanently self-monitoring



### Function

The device is a configurable universal module. Each channel can operate in the following modes:

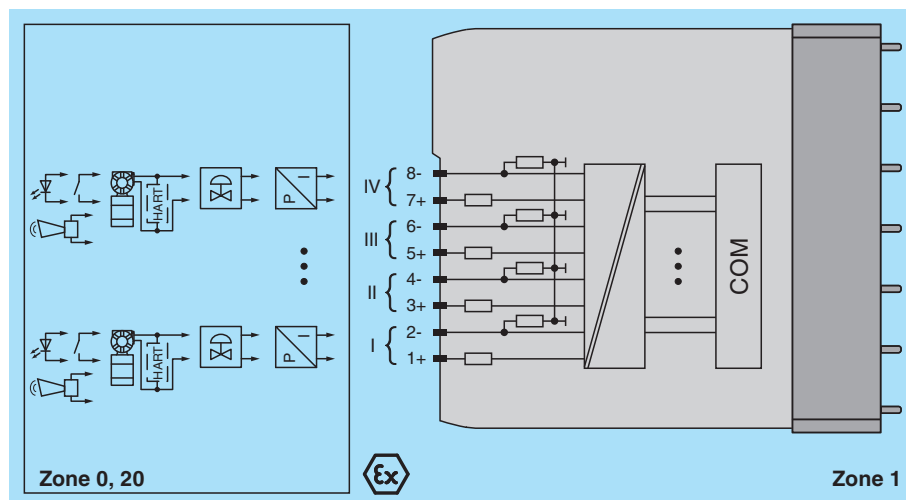
- As an analog input (AI) it feeds 2-wire transmitters.
- As an analog output (AO) it can drive proportional valves, I/P converters, or local indicators.
- As a digital input (DI) it reads dry contacts.
- As a digital output (DO) it can drive solenoids, sounders, or LED.

A combination of analog and digital I/O is possible.

Channel LEDs indicate the status of each channel. White LEDs indicate whether AI, AO, DI, DO are selected.

The intrinsically safe signals are galvanically isolated from the bus and the power supply.

### Connection



### Technical Data

#### Slots

|                |   |
|----------------|---|
| Occupied slots | 1 |
|----------------|---|

#### Supply

|                   |                                                                  |
|-------------------|------------------------------------------------------------------|
| Connection        | backplane bus                                                    |
| Rated voltage     | $U_r$ 12 V DC, only in connection with the power supplies FB92** |
| Power dissipation | 2 W                                                              |
| Power consumption | 3 W                                                              |

#### Internal bus

|            |               |
|------------|---------------|
| Connection | backplane bus |
|------------|---------------|

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

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## Technical Data

|                            |  |                                                                                                      |
|----------------------------|--|------------------------------------------------------------------------------------------------------|
| Interface                  |  | manufacturer-specific bus to standard com unit                                                       |
| Analog input               |  |                                                                                                      |
| Number of channels         |  | 4                                                                                                    |
| Suitable field devices     |  |                                                                                                      |
| Field device               |  | pressure converter                                                                                   |
| Field device [2]           |  | flow converter                                                                                       |
| Field device [3]           |  | level converter                                                                                      |
| Field device [4]           |  | Temperature Converter                                                                                |
| Field device interface     |  |                                                                                                      |
| Connection                 |  | 2-wire transmitter                                                                                   |
| Connection                 |  | terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-                                                             |
| Transmitter supply voltage |  | min. 15 V at 20 mA ; 21.5 V at 4 mA                                                                  |
| Input resistance           |  | 15 Ω                                                                                                 |
| Line fault detection       |  | can be switched on/off for each channel via configuration tool , configurable via configuration tool |
| Short-circuit              |  | factory setting: > 21 mA Can be parameterized in the range 0 ... 22 mA                               |
| Open-circuit               |  | factory setting: < 3.6 mA Can be parameterized in the range 0 ... 22 mA                              |
| HART communication         |  | yes                                                                                                  |
| HART secondary variable    |  | yes                                                                                                  |
| Analog output              |  |                                                                                                      |
| Number of channels         |  | 4                                                                                                    |
| Suitable field devices     |  |                                                                                                      |
| Field device               |  | Proportional Valve                                                                                   |
| Field device [2]           |  | I/P converters                                                                                       |
| Field device [3]           |  | on-site display                                                                                      |
| Connection                 |  | terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-                                                             |
| Current                    |  | 0 ... 20 mA short-circuit protected                                                                  |
| Line fault detection       |  | can be switched on/off for each channel via configuration tool , configurable via configuration tool |
| Short-circuit              |  | factory setting: < 50 Ω configurable between 0 ... 26 mA                                             |
| Open-circuit               |  | deviation of preset output value > 0.5 mA                                                            |
| Load                       |  | max. 750 Ω at 20 mA                                                                                  |
| HART communication         |  | yes                                                                                                  |
| HART secondary variable    |  | yes                                                                                                  |
| Watchdog                   |  | output off 0.5 s after serious fault                                                                 |
| Digital input              |  |                                                                                                      |
| Number of channels         |  | 4                                                                                                    |
| Sensor interface           |  |                                                                                                      |
| Connection [2]             |  | volt-free contact                                                                                    |
| Connection                 |  | terminals 1+, 2-; 3+, 4-; 5+, 6-; 7+, 8-                                                             |
| Line fault detection       |  | can be switched on/off for each channel via configuration tool                                       |
| Connection                 |  | mechanical switch with additional resistors (see connection diagram)                                 |
| Short-circuit              |  | > 7 mA                                                                                               |
| Open-circuit               |  | < 0.1 mA                                                                                             |
| Digital signals (active)   |  |                                                                                                      |
| Switching point: ON        |  | > 2.1 mA                                                                                             |
| Switching point: OFF       |  | < 1.2 mA                                                                                             |
| Digital output             |  |                                                                                                      |
| Number of channels         |  | 4                                                                                                    |
| Suitable field devices     |  |                                                                                                      |
| Field device               |  | Solenoid Valve                                                                                       |
| Field device [2]           |  | audible alarm                                                                                        |
| Field device [3]           |  | visual alarm                                                                                         |
| Connection                 |  | terminals 1+, 2-, 3+, 4-, 5+, 6-, 7+, 8-                                                             |

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## Technical Data

|                                                                |           |                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drive capability                                               |           | 12 V / 22 mA                                                                                                                                                                                                                                                                                                                                                                                                 |
| Internal resistor                                              | $R_i$     | 385 $\Omega$                                                                                                                                                                                                                                                                                                                                                                                                 |
| Current limit                                                  | $I_{max}$ | 22 mA                                                                                                                                                                                                                                                                                                                                                                                                        |
| Open loop voltage                                              | $U_s$     | min. 22.7 V                                                                                                                                                                                                                                                                                                                                                                                                  |
| Line fault detection                                           |           | can be switched on/off for each channel via configuration tool                                                                                                                                                                                                                                                                                                                                               |
| Test current                                                   |           | 0.4 mA                                                                                                                                                                                                                                                                                                                                                                                                       |
| Short-circuit                                                  |           | < 50 $\Omega$                                                                                                                                                                                                                                                                                                                                                                                                |
| Open-circuit                                                   |           | < 0.2 mA                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Transfer characteristics</b>                                |           |                                                                                                                                                                                                                                                                                                                                                                                                              |
| Deviation                                                      |           |                                                                                                                                                                                                                                                                                                                                                                                                              |
| After calibration                                              |           | 0.1 % of the signal range at 20 °C (68 °F)                                                                                                                                                                                                                                                                                                                                                                   |
| Influence of ambient temperature                               |           | 0.1 %/10 K of the signal range                                                                                                                                                                                                                                                                                                                                                                               |
| Resolution                                                     |           | 12 Bit (0 ... 26 mA)                                                                                                                                                                                                                                                                                                                                                                                         |
| Refresh time                                                   |           | approx. 100 ms (4 channels)                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Indicators/settings</b>                                     |           |                                                                                                                                                                                                                                                                                                                                                                                                              |
| LED indication                                                 |           | Power LED (P) green: supply<br>Diagnostic LED (I) red: module fault , red flashing: communication error , white: fixed parameter set (parameters from com unit are ignored) , white flashing: requests parameters from com unit<br>Status LED (1-4) red: line fault (lead breakage or short circuit) , yellow: state of digital I/O (0/1)<br>Configuration LED (AI, AO, DI, DO) white: selected channel mode |
| 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                                            |           | -40 ... 60 °C (-40 ... 140 °F)                                                                                                                                                                                                                                                                                                                                                                               |
| Storage temperature                                            |           | -40 ... 85 °C (-40 ... 185 °F)                                                                                                                                                                                                                                                                                                                                                                               |
| Relative humidity                                              |           | 95 % non-condensing                                                                                                                                                                                                                                                                                                                                                                                          |
| 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<br>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)<br>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. 425 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                                |           | Presafe 19 ATEX 14057U                                                                                                                                                                                                                                                                                                                                                                                       |
| Marking                                                        |           | Ⓔ II 2(1)G Ex db eb q [ia Ga] IIC Gb<br>II (1)D [Ex ia Da] IIIC<br>I (M1) [Ex ia Ma] I                                                                                                                                                                                                                                                                                                                       |
| Supply                                                         |           |                                                                                                                                                                                                                                                                                                                                                                                                              |

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|                                   |       |                                                                                                                                                                                                                                                              |
|-----------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage                           | $U_o$ | 27 V                                                                                                                                                                                                                                                         |
| Current                           | $I_o$ | 87 mA                                                                                                                                                                                                                                                        |
| Power                             | $P_o$ | 575 mW (linear characteristic)                                                                                                                                                                                                                               |
| Input                             |       | Ex ia                                                                                                                                                                                                                                                        |
| Voltage                           | $U_o$ | 27 V                                                                                                                                                                                                                                                         |
| Current                           | $I_o$ | 87 mA                                                                                                                                                                                                                                                        |
| Power                             | $P_o$ | 575 mW (linear characteristic)                                                                                                                                                                                                                               |
| Internal capacitance              | $C_i$ | 0 nF                                                                                                                                                                                                                                                         |
| Internal inductance               | $L_i$ | 0 mH                                                                                                                                                                                                                                                         |
| Output                            |       | Ex ia                                                                                                                                                                                                                                                        |
| Voltage                           | $U_o$ | 27 V                                                                                                                                                                                                                                                         |
| Current                           | $I_o$ | 87 mA                                                                                                                                                                                                                                                        |
| Power                             | $P_o$ | 575 mW (linear characteristic)                                                                                                                                                                                                                               |
| Galvanic isolation                |       |                                                                                                                                                                                                                                                              |
| Rated voltage                     | $U_m$ | 250 V field circuits to control and supply circuits                                                                                                                                                                                                          |
| 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                                                                                                                                                                                      |
| Directive conformity              |       |                                                                                                                                                                                                                                                              |
| Directive 2014/34/EU              |       | EN IEC 60079-0:2018+AC:2020<br>EN 60079-1:2014<br>EN 60079-5:2015<br>EN 60079-7:2015+A1:2018<br>EN 60079-11:2012                                                                                                                                             |
| <b>International approvals</b>    |       |                                                                                                                                                                                                                                                              |
| ATEX approval                     |       | Presafe 19 ATEX 14057U                                                                                                                                                                                                                                       |
| IECEx approval                    |       |                                                                                                                                                                                                                                                              |
| IECEx certificate                 |       | IECEx PRE 19.0012U                                                                                                                                                                                                                                           |
| IECEx marking                     |       | Ex db eb q [ia Ga] IIC Gb<br>[Ex ia Da] IIC<br>[Ex ia Ma] I                                                                                                                                                                                                  |
| <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

