

**UK Type Examination Certificate CML 23UKEX2149U Issue 0****United Kingdom Conformity Assessment**

1 Product or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended) – Schedule 3A, Part 1

2 Equipment **FB IO model: FB3204\* and FB3205\***

3 Manufacturer **Pepperl+Fuchs SE**

4 Address **Lilienthalstrasse 200  
68307 Mannheim  
Germany**

5 The equipment is specified in the description of this certificate and the documents to which it refers.

6 Eurofins E&E CML Limited, Newport Business Park, New Port Road, Ellesmere Port, CH65 4LZ, United Kingdom, Approved Body Number 2503, in accordance with Regulation 43 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.

The examination and test results are recorded in the confidential reports listed in Section 12.

7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to specific conditions of use (affecting correct installation or safe use). These are specified in Section 14.

8 This UK Type Examination certificate relates only to the design and construction of the specified equipment. Further requirements of the Regulations apply to the manufacturing process and supply of the product. These are not covered by this certificate.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

EN IEC 60079-0:2018


EN 60079-1:2014

EN 60079-5:2015


EN IEC 60079-7:2015+A1:2018

EN 60079-11:2012


10 The equipment shall be marked with the following:

 II 2(1)G

Ex db eb q [ia Ga] IIC Gb

 II (1)D

[Ex ia Da] IIIC

 I (M1)

[Ex ia Ma] I



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## 11 Description

The components FB IO, consisting of models FB3204\* and FB3205\* act as interface for signals between field devices and process control systems.

The components FB IO are intended to be mounted in areas requiring EPL Gb (Zone 1) on approved backplanes FB BP.

Additionally, the component FB IO provide intrinsically safe circuits, type of protection: [Ex ia], up to areas requiring EPL Ga (Zone 0), EPL Da (Zone 20) and Mining (M1).

The components FB IO, listed in this document, meet the relevant parameters of FB concept.

### Type designation

FB3204\*, FB3205\*

### Electrical Data

All Non-IS signals listed below are Extra-low voltage supply system signals, type: SELV or PELV, derived from Power supply module FB PS, placed at a dedicated slot on the backplane FB BP. All NON-IS signals must meet Over voltage category II (or better).

Voltage  $U_m$  (e.g. 60V) shall apply as a common mode failure voltage (in respect to PA / PE) only. As differential mode failure voltage the rated voltage  $U_r$  (e.g. +12.48V) has to be applied.

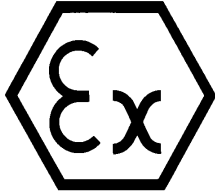
### Non-intrinsically safe connections:

Power supply:

Value	Backplane Connector Pin 6 [+], Pin 5 [-]
Nominal voltage ( $U_n$ )	12VDC (-2/+4%), SELV/PELV
Rated voltage ( $U_r$ )	12.48VDC
Maximum common mode voltage ( $U_m$ )	60VDC

Bus signal / Communication signal:

Value	Backplane Connector Pin 2, Pin 3
Nominal operating voltage ( $U_n$ )	$\pm 2.5V$ signal with reference level 2.5VDC (Manchester-Signal)
Rated voltage ( $U_r$ )	12.48VDC (SELV/PELV, same GND reference as power supply)
Maximum common mode voltage ( $U_m$ )	60VDC



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**Intrinsically safe connections:**

All devices provide 2-wire IS interfaces (device related 1 up to 4 channels) appropriate for connection to passive sensors or passive actors only.

FB3204* FB3205*	<b>Transmitter Supply</b> 2-wire transmitter (FB3205*2 with HART) or 3-wire supply:	<b>Analog input</b> Rs = 32.67 kΩ 4- or 3-wire input:	<b>3-wire Transmitter</b> (combination of transmitter supply and analog input)
Characteristic	Linear	Trapezoidal	Linear
Maximum values per channel:	U <sub>o</sub> = 27V I <sub>o</sub> = 90 mA P <sub>o</sub> = 588 mW C <sub>i</sub> = negligible L <sub>i</sub> = negligible	U <sub>o</sub> = 0.7V I <sub>o</sub> = 2.78 mA P <sub>o</sub> = 2 mW C <sub>i</sub> = 242 nF L <sub>i</sub> = negligible	U <sub>o</sub> = 27V I <sub>o</sub> = 93 mA (< 0.7 V) <sup>3</sup> P <sub>o</sub> = 630 mW C <sub>i</sub> = 242 nF <sup>3</sup> L <sub>i</sub> = negligible
	N.A.	U <sub>i</sub> = 30VDC <sup>(1)</sup> I <sub>i</sub> = 100 mA P <sub>i</sub> = 100 mW <sup>(1)</sup>	N.A.
Ex ia IIC	C <sub>o</sub> = 0.09 μF L <sub>o</sub> = 4.47 mH L <sub>o</sub> /R <sub>o</sub> = 57.74 μH/Ω	C <sub>o</sub> = 50.7 μF <sup>(2)</sup> L <sub>o</sub> = 100 mH	C <sub>o</sub> = 0.090 μF <sup>(3)</sup> L <sub>o</sub> = 4.1 mH L <sub>o</sub> /R <sub>o</sub> = 56.6 μH/Ω
Ex ia IIB / IIIC	C <sub>o</sub> = 0.705 μF L <sub>o</sub> = 17.89 mH L <sub>o</sub> /R <sub>o</sub> = 230.9 μH/Ω	C <sub>o</sub> = 239.7 μF <sup>(2)</sup> L <sub>o</sub> = 100 mH	C <sub>o</sub> = 0.705 μF <sup>(3)</sup> L <sub>o</sub> = 16.4 mH L <sub>o</sub> /R <sub>o</sub> = 226.5 μH/Ω
Ex ia IIA	C <sub>o</sub> = 2.33 μF L <sub>o</sub> = 35.78 mH L <sub>o</sub> /R <sub>o</sub> = 481.9 μH/Ω	C <sub>o</sub> = 349.7 μF <sup>(2)</sup> L <sub>o</sub> = 100 mH	C <sub>o</sub> = 2.33 μF <sup>(3)</sup> L <sub>o</sub> = 32.8 mH L <sub>o</sub> /R <sub>o</sub> = 453.1 μH/Ω
Ex ia I	C <sub>o</sub> = 4.12 μF L <sub>o</sub> = 58.7 mH L <sub>o</sub> /R <sub>o</sub> = 793 μH/Ω	C <sub>o</sub> = 459.7 μF <sup>(2)</sup> L <sub>o</sub> = 100 mH	C <sub>o</sub> = 4.12 μF <sup>(3)</sup> L <sub>o</sub> = 53.9 mH L <sub>o</sub> /R <sub>o</sub> = 743.3 μH/Ω
100mW at 0.7V (Voltage is internal limited to 0.7V, clearance and creepage distances designed for 30V); power dissipation based on current.			
listed values apply only if no external source exceeding Co = 0.7V			
listed values apply due internal limiting of analog input to 0.7V, therefore Ci is negligible			

The values of Lo and Co listed in the tables above are allowed if one of the following conditions is met:

The values of Lo and Co listed in the tables above are allowed if one of the following conditions is met:

- i. the total Li of the external circuit (excluding the cable) is < 1% of the Lo value or
- ii. the total Ci of the external circuit (excluding the cable) is < 1% of the Co value.



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The values of Lo and Co listed in the tables above shall be reduced to 50% when both of the following conditions are met:

- i. the total Li of the external circuit (excluding the cable) is  $\geq 1\%$  of the Lo value and
- ii. the total Ci of the external circuit (excluding the cable) is  $\geq 1\%$  of the Co value.

Note: The reduced capacitance of the external circuit (including cable) shall not be greater than 1  $\mu\text{F}$  for groups I, IIA, IIB and 600 nF for IIC.

### Degrees of protection (IP Code)

IP20 (if mounted on backplane).

### Temperature range:

$-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +60^{\circ}\text{C}$

Ambient temperature range is referenced to measurement point in a distance of 30 mm perpendicular to the centre of the front of the component FB IO.

Service temperature range of Ex component:  $-40^{\circ}\text{C} \leq T_{\text{s}} \leq +94^{\circ}\text{C}$

## 12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	13 Apr 2023	R16366C/00	Issue of Prime Certificate

Note: Drawings that describe the equipment are listed or referred to in the Annex.

## 13 Conditions of Manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

- i. A dielectric strength test in accordance with EN 60079-5:2015 is required for each batch of the filling material before the filling process is carried out.
- ii. Routine test for infallible transformer: Dielectric strength test between input and output windings of transformers T01 and T02 with a voltage of  $\geq 1500\text{VAC}$  for 60 s or  $\geq 1800\text{VAC}$  for at least 1 s.

## 14 Schedule of Limitations

The following conditions relate to safe installation and/or use of the component.

- i. The components FB IO shall be provided with protection that ensures a pollution degree 2 (or better).
- ii. The components FB IO shall only be used together with approved backplanes FB BP, power supply FB PS, gateway FB GW and bus-termination FB BT.
- iii. Supply the device with a power supply FB PS that meets the requirements for safety extra-low voltage (SELV) or protected extra-low voltage (PELV) with a maximum voltage of  $U_{\text{m}}=60\text{V}$ .
- iv. All circuits connected to the device shall comply with the overvoltage category II (or better) according to EN 60664-1.
- v. Permitted supply short-circuit current for the components is 50A.



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Installation in areas requiring category 2G/EPL Gb equipment:

- i. The components FB IO shall be installed and operated only in surrounding enclosures that comply with the safety requirements for EPL Gb enclosures according to EN 60079-0 and are rated with the degree of protection IP54 according to EN 60529.

## Certificate Annex

**Certificate Number** CML 23UKEX2149U  
**Equipment** FB IO model: FB3204\* and FB3205\*  
**Manufacturer** Pepperl+Fuchs SE



The following documents describe the equipment defined in this certificate:

### Issue 0

For drawings describing the equipment, refer to attached certificate Presafe 19 ATEX 14056U. In addition to the drawings listed on Presafe 19 ATEX 14056U, the following drawings include the additional marking required for this UK Type Examination certification:

Drawing No	Sheets	Rev	Approved date	Title
16-1555CM-10	1 to 2	0	13 Apr 2023	Additional Marking Requirements for UKCA