

UK Type Examination Certificate CML 23UKEX2148U 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: FB1209***

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



CML 23UKEX2148U
Issue 0

11 Description

The component FB IO, model FB1209* (8 ch. Digital input), act as interface for signals between field devices and process control systems.

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

The component FB IO provides galvanically separated intrinsically safe digital inputs as associated apparatus [Ex ia], up to areas requiring EPL Ga (Zone 0), EPL Da (Zone 20) and Mining (M1).

The component FB IO, listed in this document, meets the relevant parameters of FB concept.

Type designation

FB1209*

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

Intrinsically safe connections:

Digital input (Namur), for passive sensors only:

Ex Parameters	Digital Input Pins: 1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14, 15-16
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CML 23UKEX2148U
Issue 0

Maximum values:	$U_o = 10V$ $I_o = 13 mA$ $P_o = 33 mW$ (linear) $C_i = \text{negligible}$ $L_i = \text{negligible}$	
Ex ia IIC	$C_o = 3 \mu F$ $L_o = 100 mH$	$L_o/R_o = 1.094 mH/\Omega$
Ex ia IIB / IIIC	$C_o = 20 \mu F$ $L_o = 100 mH$	$L_o/R_o = 4.376 mH/\Omega$
Ex ia IIA	$C_o = 100 \mu F$ $L_o = 100 mH$	$L_o/R_o = 8.752 mH/\Omega$
Ex ia I	$C_o = 180 \mu F$ $L_o = 100 mH$	$L_o/R_o = 14.358 mH/\Omega$

The values of L_o and C_o listed in the tables above are allowed if one of the following conditions is met:
the total L_i of the external circuit (excluding the cable) is $< 1\%$ of the L_o value or
the total C_i of the external circuit (excluding the cable) is $< 1\%$ of the C_o value.

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

the total L_i of the external circuit (excluding the cable) is $\geq 1\%$ of the L_o value and
the total C_i of the external circuit (excluding the cable) is $\geq 1\%$ of the C_o value.

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

Degrees of protection (IP Code)

IP20 (if mounted on backplane).

Temperature range:

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

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

Service temperature range of Ex component: $-40^{\circ}C \leq T_s \leq +97^{\circ}C$.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	13 Apr 2023	R16366B/00	Issue of Prime Certificate

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



CML 23UKEX2148U
Issue 0

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 that meets the requirements for safety extra-low voltage (SELV) or protected extra-low voltage (PELV) with a maximum voltage of $U_m=60\text{V}$
- 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.

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

- i. The components FB IO and FB GW 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 23UKEX2148U
Equipment FB IO model: FB1209*
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 14055U. In addition to the drawings listed on Presafe 19 ATEX 14055U, 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