

# EU-TYPE EXAMINATION CERTIFICATE

- [2] COMPONENT INTENDED FOR USE ON/IN AN EQUIPMENT OR PROTECTIVE SYSTEM INTENDED FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES DIRECTIVE 2014/34/EU
- [3] EU-Type Examination Certificate Number: **Presafe 19 ATEX 14055 U** **Issue 0**
- [4] Product: **FB IO model: FB1209\***
- [5] Manufacturer: **Pepperl+Fuchs GmbH**
- [6] Address: **Lilienthalstrasse 200  
68307 Mannheim  
Germany**
- [7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- [8] DNV GL Presafe AS, notified body number 2460, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
- The examination and test results are recorded in confidential reports listed in section 16.
- [9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN 60079-0:2012/A11:2013, EN 60079-1:2014, EN 60079-5:2015, EN 60079-7:2015 and EN 60079-11:2012**
- [10] The sign "U" is placed after the certificate number. It indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certification may be used as a basis for certification of an equipment or protective system
- [11] This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
- [12] The marking of the product shall include 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**



Date of issue:  
2019-03-20



Bjørn Spongsveen  
 For DNV GL Presafe AS  
 The Certificate has been digitally signed.  
 See [www.dnvgl.com/digitalsignatures](http://www.dnvgl.com/digitalsignatures) for info

This certificate may only be reproduced in its entirety and without any change, schedule included.

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[13] **Schedule**

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[15] **Description of Product**

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. 60 V) 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. +12.48 V) has to be applied.

**Non-intrinsically safe connections:**

Power supply:

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

Bus signal / Communication signal:

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

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

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  $\mu\text{F}$  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 center of the front of the component FB IO.

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

**Routine tests**

The manufacturer shall carry out the following routine tests:

- The dielectric strength test for the filling material of each batch before filling process.
- 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.

[16] **Report No.:** D0003772\_2

[17] **Schedule of Limitations**

- The component FB IO shall be provided with protection that ensures a pollution degree 2 (or better).
- 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.
- 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  $U_m = 60\text{ V}$
- All circuits connected to the device shall comply with the overvoltage category II (or better) according to EN 60664-1.
- Permitted supply short-circuit current for the components is 50 A

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

- The component 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.

[18] **Essential Health and Safety Requirements**

Essential Health and Safety Requirements (EHSRs) are covered by the standards listed at item 9

[19] **Drawings and documents**

Number	Title	Rev.	Date
16-1385EX-00	Description	-	2017-07-18
16-1385EX-01	Schematics	-	2017-08-24
16-1385EX-02	BOM / Part list safety components	-	2017-07-18
16-1385EX-03	Assembly plan (PCB)	-	2017-08-24
16-1385EX-04	Mechanical Drawing	-	2017-07-05
16-1385EX-05	Layouts	-	2017-08-24
16-1385EX-07	Assembly of FB-Module	-	2017-07-05
16-1385EX-09	Extract of instruction	-	2017-07-18
16-1385PR-10	Marking	-	2019-02-26
16-1000EX-00	FB-Module enclosure	-	2016-09-05
16-1000EX-04_2	Specification Filling Material (Glass beads) (1 page)	-	2017-05-18
16-1395PF-00	FB Concept paper (19 Pages)		2018-01-26

[20] **Certificate History**

Issue	Description	Issue date	Report no.
0	Original issue	2019-03-20	D0003772_2

END OF CERTIFICATE