

# 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 14058 U** **Issue 0**
- [4] Product: **FB IO models: FB1203\*, FB1208\*, FB5204\* and FB5205\*;  
FB GW models: FB8205\* - FB8209\*, FB8211\***
- [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:



<p><b>II 2(1) G</b> <b>II (1) D</b> <b>I (M1)</b></p>	<p>For FB IO all models: <b>Ex db eb q [ia Ga] IIC Gb</b> <b>[Ex ia Da] IIIC</b> <b>[Ex ia Ma] I</b></p>	<p>For FB GW models FB8205* - FB8209*: <b>II 2(1) G Ex db eb q [ia Ga] IIC Gb</b> For FB GW models FB8211*: <b>II 2(1) G Ex db eb q [ib] IIC Gb</b></p>
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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

[13] **Schedule**

[14] **EU-Type Examination Certificate No:** Presafe 19 ATEX 14058 U Issue 0

[15] **Description of Product**

The components FB IO, models FB1203\*, FB1208\*, FB5204\* and FB5205\* act as interface for signals between field devices and process control systems. All these modules are of type Input. The components FB GW communication units FB8205\* - FB8209\* and FB8211\* act as communication interface for process control systems.

The components FB IO and FB GW 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] or [Ex ib] (model depending):

For FB IO: [Ex ia] up to areas requiring EPL Ga (Zone 0), EPL Da (Zone 20), EPL Ma;

For FB GW models FB8205\* - FB8209\*: [Ex ia] up to areas requiring EPL Ga (Zone 0);

For FB GW models FB8211\*: [Ex ib] up to areas requiring EPL Gb (Zone 1).

The component FB IO is also called "FB-Module" type I/O, component FB GW is called "FB-Module" type Gateway and component FB BP is also called "FB-Backplane".

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

**Type designation**

FB1203\*, FB1208\*, FB5204\*, FB5205\*, FB8205\* - FB8209\*, FB8211\*

**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 12V:

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>

Power supply 5.4V:

Value	Backplane Connector Pin 4 [+], Pin 5 [-]
Nominal voltage ( $U_n$ )	5.4 V <sub>DC</sub> (-5/+5%), SELV/PELV
Rated voltage ( $U_r$ )	5.6 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 ( $U_n$ )	$\pm 2.5$ V signal with reference level $2.5 V_{DC}$ (Manchester-Signal)
Rated voltage ( $U_r$ )	$12.48 V_{DC}$ (SELV/PELV, same GND reference as power supply)
Maximum common mode voltage ( $U_m$ )	$60 V_{DC}$

**Intrinsically safe connections:**

The maximum values listed in the following tables apply to each channel if not specified otherwise.

**FB1203\* Digital Input**

Module Type Terminal assignment	Type of circuit	Maximum values						Ex ia IIC		Ex ia IIB / Ex ia IIIC		Ex ia IIA		Ex ia I	
		Charac- teristic	$U_o$ [V]	$I_o$ [mA]	$P_o$ [mW]	$C_i$ [nF]	$L_i$ [mH]	$C_o$ [ $\mu$ F]	$L_o$ [mH]	$C_o$ [ $\mu$ F]	$L_o$ [mH]	$C_o$ [ $\mu$ F]	$L_o$ [mH]	$C_o$ [ $\mu$ F]	$L_o$ [mH]
FB1203* ch1: 1(+), 2(-) ch2: 4(+), 5(-) all (-) connected internally	2 Inputs	linear	10.5	23.34 ( $\Sigma I_o$ , ch. 1+2)	61.27 ( $\Sigma P_o$ , ch. 1+2)	3.3	0	2.41	65	16.8	100	75	100	95	100

Module Type Terminal assignment	Type of circuit	$L_o/R_o$ [mH/ $\Omega$ ]			
		Ex ia IIC	Ex ia IIB / Ex ia IIIC	Ex ia IIA	Ex ia I
FB1203* ch1: 1(+), 2(-) ch2: 4(+), 5(-) all (-) connected internally	2 Inputs	0.581	2.325	4.651	7.630

**FB1208 \*Digital Input**

Module Type Terminal assignment	Type of circuit	Maximum values (per channel)							Ex ia IIC		Ex ia IIB / Ex ia IIIC		Ex ia IIA		Ex ia I	
		Charac- teristic	U <sub>o</sub> [V]	I <sub>o</sub> [mA]	P <sub>o</sub> [mW]	C <sub>i</sub> [nF]	L <sub>i</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	
<b>FB1208*</b> ch1-8: 1/3/5/9/11/13/15(+), 2/4/8/10/12/14/16(-)  All (-) connected internally	8 Inputs	linear	14.9	15.7	58.2	1.65	0	0.59	100	3.65	100	14.3	100	16.3	100	

Module Type Terminal assignment	Type of circuit	L <sub>o</sub> /R <sub>o</sub> [mH/Ω]			
		Ex ia IIC	Ex ia IIB / Ex ia IIIC	Ex ia IIA	Ex ia I
<b>FB1208*</b> ch1-8: 1/3/5/9/11/13/15(+), 2/4/8/10/12/14/16(-)  All (-) connected internally	8 Inputs	0.577	2.30	4.61	7.57

**FB5204 \*Temperature Measuring Input (RTD), multi (quad) channel**

Module Type Terminal assignment	Type of circuit	Maximum values							Ex ia IIC		Ex ia IIB / Ex ia IIIC		Ex ia IIA		Ex ia I	
		Charac- teristic	U <sub>o</sub> [V]	I <sub>o</sub> [mA]	P <sub>o</sub> [mW]	C <sub>i</sub> [nF]	L <sub>i</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	
<b>FB5204*</b> ch1: 1,2,3,4 ch2: 5,6,7,8	2 Inputs	linear	7.14	70 (Σ I <sub>o</sub> , ch. 1+2)	123 (Σ P <sub>o</sub> , ch. 1+2)	52	0	13.4	7	240	29	1000	58	1000	95	
ch3: 9,10,11,12 ch4: 13,14,15,16	2 Inputs	linear	7.14	70 (Σ I <sub>o</sub> , ch. 3+4)	123 (Σ P <sub>o</sub> , ch. 3+4)	52	0	13.4	7	240	29	1000	58	1000	95	

Module Type Terminal assignment	Type of circuit	L <sub>o</sub> /R <sub>o</sub> [mH/Ω]			
		Ex ia IIC	Ex ia IIB / Ex ia IIIC	Ex ia IIA	Ex ia I
<b>FB5204*</b> ch1: 1,2,3,4 ch2: 5,6,7,8	2 Inputs	0.285	1.138	2.276	3.735
ch3: 9,10,11,12 ch4: 13,14,15,16	2 Inputs	0.285	1.138	2.276	3.735

**FB5205\*Temperature Measuring Input (Thermocouple), multi (quad) channel**

Module Type Terminal assignment	Type of circuit	Maximum values						Ex ia IIC		Ex ia IIB / Ex ia IIIC		Ex ia IIA		Ex ia I	
		Charac- teristic	U <sub>o</sub> [V]	I <sub>o</sub> [mA]	P <sub>o</sub> [mW]	C <sub>i</sub> [nF]	L <sub>i</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]
<b>FB5205*</b> ch1: 1(+), 2(-) ch2: 5(+), 6(-) ch3: 9(+), 10(-) ch4: 13(+), 14(-)	4 Inputs	trapezoidal	1.0	71 (Σ I <sub>o</sub> , ch. 1+2+ 3+4)	62 (Σ P <sub>o</sub> , ch. 1+2+ 3+4)	0	0	33	5	140	20	250	20	350	20
		Ri = 500Ω													

**FB8205\* - FB8209\* Gateway**

The front plug X103 is not intended for connecting intrinsically safe field devices. It is only permitted for connecting with another identical gateway module types for redundancy purposes. Therefore no L<sub>o</sub>/R<sub>o</sub> values are given.

Module Type Terminal assignment	Maximum values per channel						Ex ia IIC Ga		Ex ia IIB Ga		Ex ia IIA Ga	
	Charac- teristic	U <sub>o</sub> [V]	I <sub>o</sub> [mA]	P <sub>o</sub> [mW]	C <sub>i</sub> [nF]	L <sub>i</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]	C <sub>o</sub> [μF]	L <sub>o</sub> [mH]
<b>FB8205*</b> <b>FB8206*</b> <b>FB8207*</b> <b>FB8208*</b> <b>FB8209*</b>	linear	6.5	44	71	0	0	25	15	570	60	1000	100
X103 1, 3, 4, 5, 6(+) 2(-)												

**FB8211 \* Gateway**

The front plug X103 is not intended for connecting intrinsically safe field devices. It is only permitted for connecting the SERV8001.

The front plug X104 is not intended for connecting intrinsically safe field devices. It is only permitted for connecting with another gateway module FB8211 for redundancy purposes. Therefore no  $L_o/R_o$  values are given.

Module Type Terminal assignment	Maximum values per channel						Ex ib IIC Gb		Ex ib IIB Gb		Ex ib IIA Gb	
	Charac- teristic	$U_o$ [V]	$I_o$ [mA]	$P_o$ [mW]	$C_i$ [nF]	$L_i$ [mH]	$C_o$ [μF]	$L_o$ [mH]	$C_o$ [μF]	$L_o$ [mH]	$C_o$ [μF]	$L_o$ [mH]
<b>FB8211*</b>  X103: ch1: 13(+) ch2: 14(+) to 9/10/11/12/15/16 (-)  X104: ch1: 1(+) ch2: 2(+) ch3: 3(+) ch4: 4(+) to 5/6/7/8(-)  All (-) connected internally -> X103 (-) internally connected to X104 (-)	linear	7.14	48.1	85.8	0	0	13.5	15	240	55	1000	100

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 μF 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 or FB GW.

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

"nn" = for specific model refer to the following table, "Ts".



	Function	Type (width)	Front-Side <sup>1</sup>			Rear-Side <sup>2</sup>	Ts <sup>3</sup>
			Con	LCD	LEDs	Connector	
FB1203*	Frequency input ch1: frequency ch2: revolution direction	Single	1 × 6	-	×	7 pins (1 row)	+91.5 °C
FB1208*	Binary input 8 channels, common ground	Double	2 × 8	-	×	7 pins (1 row)	+88.4 °C
FB5204*	RTD input (4 channel)	Double	2 × 8	-	×	7 pins (1 row)	+85.4 °C
FB5205*	Thermocouple input (4 channel)	Double	2 × 8	-	×	7 pins (1 row)	+87.9 °C
FB8205* - FB8209*	Gateway module	Double	1 × 6	-	×	14 pins (2 rows)	+81.9 °C
FB8211*	Gateway module	Double	2 × 8	-	×	14 pins (2 rows)	+86.5 °C

- (1) "1 × 6" means 1 front connector with 6 contacts; "2 × 8" means 2 front connectors with 8 contacts.  
 (2) At the rear side of the enclosure, there are connector pins to establish a connections type of protection "Ex d" with their counterpart socket on FB-backplane. There are one or two rows of pins used.  
 (3) Service temperature of components

**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 (for FB IO only): Dielectric strength test between input and output windings of transformers T01 and T02 with a voltage of ≥ 1500VAC for 60 s or ≥ 1800VAC for at least 1 s.

[16] **Report No.:** D0003772\_5

[17] **Schedule of Limitations**

- The components FB IO and FB GW shall be provided with protection that ensures a pollution degree 2 (or better).
- The components FB IO and FB GW shall only be used together with approved backplanes FB BP, power supply FB PS and bus-termination FB BT.
- Supply the components FB IO and FB GW 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 Um = 60 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 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.

[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
16-1380EX-00	Description	-	2018-09-25
16-1380EX-01	Schematics	-	2018-01-16
16-1380EX-02	BOM / Part list safety components	-	2018-04-24
16-1380EX-03	Assembly plan (PCB)	-	2018-01-16
16-1380EX-04	Mechanical Drawing	-	2018-01-18
16-1380EX-05	Layouts	-	2018-01-16
16-1380EX-07	Assembly of FB-Module	-	2018-01-18
16-1380EX-09	Extract of instruction	-	2018-01-12
16-1380PR-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
16-1380EX-47_1	Standard update checklists IEC(EN) 60079-0	-	2018-03-27
16-1380EX-47_2	Standard update checklists IEC(EN) 60079-1	-	2018-03-27
16-1380EX-47_3	Standard update checklists IEC(EN) 60079-7	-	2018-03-27
16-1380EX-47_4	Standard update checklists IEC(EN) 60079-11	-	2018-07-10

[20] **Certificate History**

Issue	Description	Issue date	Report no.
0	Original issue	2019-03-20	D0003772_5

END OF CERTIFICATE