

Translation

EU-Type Examination Certificate

Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014

EU-Type Examination Certificate Number: **BVS 22 ATEX E 047 X** Issue: **02**

Equipment: **EtherCAT Box type EPX****_****_******

Manufacturer: **BECKHOFF Automation GmbH & Co. KG**

Address: **Hülshorstweg 20, 33415 Verl, Germany**

This product and any acceptable variations thereto are specified in the appendix to this certificate and the documents referred to therein.

DEKRA Testing and Certification GmbH, Notified Body number 0158, 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 the confidential Report No. BVS PP 23.2005 EU / N1.

This issue of the EU-Type Examination Certificate replaces the previous issue of the EU-Type Examination Certificate BVS 22 ATEX E 047 X issue 01.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018	General requirements
EN IEC 60079-7:2015 + A1:2018	Increased Safety "e"
EN 60079-11:2012	Intrinsic Safety "i"
IEC 60079-31:2022	Protection by Enclosure "t"

Where additional criteria beyond those given here have been used, they are listed at item 18 in the Schedule.

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the "Specific Conditions of Use" listed under item 17 of this certificate.

This EU-Type Examination Certificate relates only to the technical design of the specified product in accordance with the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

The marking of the product shall include the following:

 **II 3(1)G Ex ec [ia Ga] IIC T4 Gc**
II 3(1)D Ex tc [ia Da] IIIC T135°C Dc
I (M1) [Ex ia Ma] I

DEKRA Testing and Certification GmbH
Bochum, 2023-12-12

Signed: Oliver Brumm

Managing Director

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15 Product description

15.1 Subject and type

EtherCAT Box type EPX****_****_****

Instead of the *** in the complete denomination letters and numerals will be inserted which characterize the different modifications:

		Type EPX * * * * _ * * * * _ * * * *											
1058	8-channel digital input box NAMUR												
3158	8-channel analog input box 4...20 mA												
3184	4-Kanal-Analog-Eingang Box 4...20 mA, HART												
0022	wide body housing, M12 connectors												
0092	breites Gehäuse, M12-Steckverbinder, TwinSAFE SC												
Software revision													
(Not Ex-relevant, for information purposes only)													

15.2 Description

Reason for this issue:

- Approval of the new box type EPX3184-0022-****
- Additional cables were approved
- A protective housing was approved
- Functional modifications to the O-board of the EPX box EPX3158-0022
- Redesign of the lower board EPX0020U.2-V1 to EPX0020U.4-V1

Description of the product:

The EtherCAT Box type EPX****_****_**** is an I/O module with input connectors rated in the type of protection "ec" resp. "tc" (supply connectors).

Their intrinsically safe output circuits, type of protection Ex ia, can be led into areas which require EPL Ga (zone 0), EPL Da (zone 20) or EPL Ma (Mining) equipment.

The fully encapsulated electronics are built into a plastic housing with IP67.

EtherCAT Box type EPX****_****_**** can only be used with the listed accessories:

EtherCAT cables – ZK1090-****_****

Designation of the test line	Designation of the product series
ZK1090-3100-1010	ZK1090-31xx-1xxx
ZK1090-3100-0005	ZK1090-31xx-0xxx
ZK1090-3300-0100	ZK1090-33xx-0xxx
ZK1090-3191-2020	ZK1090-31xx-2xxx
ZK1090-3100-6010	ZK1090-31xx-6xxx

Power cables – ZK2020-****_****

Designation of the test line	Designation of the product series
ZK2020-3400-0005	ZK2020-34xx-0xxx*
ZK2020-3100-0010	ZK2020-31xx-0xxx*
ZK2020-3200-6010	ZK2020-32xx-6xxx
ZK2020-3132-6005	ZK2020-31xx-6xxx
ZK2020-3300-0050	ZK2020-33xx-0xxx*
ZK2020-3200-0020	ZK2020-32xx-0xxx*
ZK2027-3132-0020	ZK2027-31xx-0xxx
ZK2027-3200-0010	ZK2027-32xx-0xxx

* see Specific Conditions of Use

Sensor Actuator Cables - ZK2000-****_****

Designation of the test line	Designation of the product series
ZK2000-6100-6020	ZK2000-61xx-6xxx*
ZK2000-6300-0020	ZK2000-63xx-0xxx*
ZK2000-5100-0003	ZK2000-51xx-0xxx*
ZK2000-5300-0010	ZK2000-53xx-0xxx*
ZK2000-6100-0005	ZK2000-61xx-0xxx*
ZC1066-0000-0001	ZC1064-0000-000x* ZC1065-0000-000x* ZC1066-0000-000x*

* see Specific Conditions of Use

Protections Caps ZS5000-****_****

- ZS5000-0014
- ZS5000-0010
- ZS5000-0020

Protective housing BG2000-0020

Other

Designation of the test line	Designation of the product series
ZC2000-0000-0250	ZC2000-0000-0050

Listing of all components used referring to older standards

None

15.3 Parameters

15.3.1 Non-intrinsically safe circuits in level of protection ec or tc

Power supply circuits:

- Power supply connector, M8 plug, 4 pin (IN)
- Power supply connector, M8 socket, 4 pin (OUT)

EtherCAT circuits

- o EtherCAT connector M8 socket, 4 pin, green (IN)
- o EtherCAT connector M8 socket, 4 pin, green (OUT)

For each non-intrinsically safe circuit, the following values apply:

Rated nominal input voltage

- | | | | |
|----------------------|-------|----|------------------|
| - Control voltage | U_S | DC | 24 (-15%/+20%) V |
| - Peripheral voltage | U_P | DC | 24 (-15%/+20%) V |

Rated maximal input current

- | | | | | |
|----------------------|-------|----|---|---|
| - Control current | I_S | DC | 4 | A |
| - Peripheral current | I_P | DC | 4 | A |

Maximum voltage

U_m	DC	60	V
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15.3.2 Intrinsically safe output circuits in level of protection "ia" for connection of intrinsically safe sensors or actuators

15.3.2.1 Type **EPX1058-0022-******

Channel 1: M12 socket, 5 pin, X01 Pin 1 (Uv1), Pin 4 (Input1)

Channel 2: M12 socket, 5 pin, X02 Pin 11 (Uv2), Pin 14 (Input2)

Channel 3: M12 socket, 5 pin, X03 Pin 21 (Uv3), Pin 24 (Input3)

Channel 4: M12 socket, 5 pin, X04 Pin 31 (Uv4), Pin 34 (Input4)

Channel 5: M12 socket, 5 pin, X05 Pin 6 (Uv5), Pin 9 (Input5)

Channel 6: M12 socket, 5 pin, X06 Pin 16 (Uv6), Pin 19 (Input6)

Channel 7: M12 socket, 5 pin, X07 Pin 26 (Uv7), Pin 29 (Input7)

Channel 8: M12 socket, 5 pin, X08 Pin 36 (Uv8), Pin 39 (Input8)

(the remaining pins are not used)

Each channel

- | | | | |
|-------------------------------|-------|-------|----|
| Maximum output voltage | U_o | 10.72 | V |
| Maximum output current | I_o | 10.4 | mA |
| Linear output characteristics | | | |
| Maximum output power | P_o | 28 | mW |

Maximum external capacitance C_o or maximum external inductance L_o :

	I	IIA	IIIB / IIIC	IIIC
C_o [μF]	58	66	15	2.14
L_o [mH]	100	100	100	100

The cable capacitance $C_c = 200$ pF/m and the cable inductance $L_c = 1$ μH/m depending on the cable length have not yet been taken into account.

15.3.2.2 Type **EPX3158-0022-******

Channel 1: M12 socket, 5-pin, X01 Pin 1 (UV1), Pin 2 (Input1), Pin 3 (Ground1)
 Channel 2: M12 socket, 5-pin, X02 Pin 11 (UV2), Pin 12 (Input2), Pin 13 (Ground2)
 Channel 3: M12 socket, 5-pin, X03 Pin 21 (UV3), Pin 22 (Input3), Pin 23 (Ground3)
 Channel 4: M12 socket, 5-pin, X04 Pin 31 (UV4), Pin 32 (Input4), Pin 33 (Ground4)
 Channel 5: M12 socket, 5-pin, X05 Pin 6 (UV5), Pin 7 (Input5), Pin 8 (Ground5)
 Channel 6: M12 socket, 5-pin, X06 Pin 16 (UV6), Pin 17 (Input6), Pin 18 (Ground6)
 Channel 7: M12 socket, 5-pin, X07 Pin 26 (UV7), Pin 27 (Input7), Pin 28 (Ground7)
 Channel 8: M12 socket, 5-pin, X08 Pin 36 (UV8), Pin 37 (Input8), Pin 38 (Ground8)

(the remaining pins are not used)

Each channel:

Maximum output voltage	U_o	27	V
Maximum output current	I_o	80	mA
Linear output characteristics			
Maximum output power	P_o	540	mW

Maximum external capacitance C_o or maximum external inductance L_o :

	I	IIA	IIB / IIIC	IIC
C_o [μ F]	3.75	2.33	0.705	0.09
L_o [mH]	49	35	21	2.8

The cable capacitance $C_c = 200$ pF/m and the cable inductance $L_c = 1$ μ H/m depending on the cable length have not yet been taken into account.

15.3.2.3 Type **EPX3184-0022-******

Channel 1: M12 socket, 5 pin, X01 Pin 1 (Uv1), Pin 2 (I_CH1)
 Channel 2: M12 socket, 5 pin, X02 Pin 11 (Uv2), Pin 12 (I_CH2)
 Channel 3: M12 socket, 5 pin, X03 Pin 6 (Uv3), Pin 7 (I_CH3)
 Channel 4: M12 socket, 5 pin, X04 Pin 16 (Uv4), Pin 17 (I_CH4)

(the remaining pins are not used)

Each channel

Maximum output voltage	U_o	27	V
Maximum output current	I_o	79	mA
Linear output characteristics			
Maximum output power	P_o	534	mW

Maximum external capacitance C_o or maximum external inductance L_o :

	I	IIA	IIB / IIIC	IIC
C_o [μ F]	3.75	2.33	0.705	0.09
L_o [mH]	49	35	21	2.8

The cable capacitance $C_c = 200$ pF/m and the cable inductance $L_c = 1$ μ H/m depending on the cable length have not yet been taken into account.

15.3.3 Ambient temperature range T_a -25 °C ... 70 °C

15.3.4 Ingress protection IP67

16 Report Number

BVS PP 23.2005 EU / N1, as of 2023-12-12

17 Specific Conditions of Use

- 17.1 Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.
- 17.2 The apparatus may only be connected to SELV / PELV-circuits according to EN 60950.
- 17.3 The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC 60664-1.
- 17.4 The equipment shall not be exposed to direct sunlight.
- 17.5 The EtherCAT Box must be operated in such a way that it is protected from mechanical hazards, for example by installation of the protective housing BG2000-0020.
- 17.6 Only accessories listed above may be used with the EtherCAT Box type EPX****_****_****.
- 17.7 The EtherCAT Box must be protected from the risk of electrostatic charge in EPL Gc. The following equipment must be protected from the risk of electrostatic charge under normal conditions of use in EPL Ga:

Power cables – ZK2020-****_****

- ZK2020-34xx-0xxx
- ZK2020-31xx-0xxx
- ZK2020-33xx-0xxx
- ZK2020-32xx-0xxx

Sensor Actuator Cables – ZK2000-****_****

- ZK2000-61xx-6xxx*
- ZK2000-63xx-0xxx*
- ZK2000-51xx-0xxx*
- ZK2000-53xx-0xxx*
- ZK2000-61xx-0xxx*
- ZC1064-0000-000x*
- ZC1065-0000-000x*
- ZC1066-0000-000x*

Other:

- ZC2000-0000-0050

18 Essential Health and Safety Requirements

Met by compliance with the requirements mentioned in item 9.

For this product the standard IEC 60079-31:2022 Ed. 3.0 is equivalent to the harmonized standard EN 60079-31:2014 in terms of safety.

19 Remarks and additional information

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2023-12-12
BVS-Hil/Mu A 20230418 / 343089600


Managing Director