

Control Panels

EJB* / EJBX*

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Validity

Specific processes and instructions in this instruction manual require special provisions to guarantee the safety of the operating personnel.

Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the device. The trained and qualified personnel must have read and understood the instruction manual.

Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location. Observe Directive 1999/92/EC in relation to hazardous areas.

The corresponding datasheets, manuals, declarations of conformity, EC-type-examination certificates, certificates, and control drawings if applicable (see datasheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com.

Intended use

The EJB series of Ex d IIB+H₂ certified enclosures forms the optimal basis for the application-specific configuration of terminal boxes, control stations as well as control and distribution panels. A wide range of components and control functions can be integrated in one out of many sizes of Ex d and Ex tb certified flameproof enclosures. They are manufactured from copper-free aluminum with increased corrosion resistance or from high-quality stainless steel. This durability and the comprehensive enclosure sizes cover the requirements of many industries including offshore and marine applications.

A choice of windows allows viewing of integrated monitoring functions. Electrical components can be integrated as per customer specification.

Mounting and Installation

Observe the installation instructions according to IEC/EN 60079-14.

If you intend to install the device or enclosure in areas that may be exposed to aggressive substances, ensure that the stated surface materials are compatible with these substances. If required, contact Pepperl+Fuchs for further information.

If other solid obstacles are present outside the enclosure, the minimum distance between the flamepath of the enclosure and these obstacles must not be less than the distance according to IEC/EN 60079-14.

- gas group IIA: ≥ 10 mm
- gas group IIB: ≥ 30 mm
- gas group IIB+H₂ or IIC: ≥ 40 mm

If mounting the enclosure on concrete use expansion anchors. When mounting the enclosure to a steel framework use vibration resistant mounting material.

Protect the device against long-term or excessive mechanical vibrations.

Observe the following points when installing cable glands:

- Only use cable glands that are suitably certified for the application.
- Only use cable glands with a temperature range appropriate to the application.
- Ensure that the degree of protection is not violated by the cable glands.

For control panels with IECEx certification, only use cable glands with metric thread or NPT thread.

Mount the device so that it complies with the specified degree of protection according to IEC/EN 60529.

Ensure that the degree of protection is not violated by the cable glands and the stopping plugs.

Close all unused enclosure holes with the appropriate stopping plugs.

The enclosure cover is heavy. In order to avoid personal injuries or property damage, make appropriate provisions for the mounting procedure.

Do not damage the flamepath surfaces between enclosure and enclosure cover during the opening of the control panel.

If one of the flamepath surfaces is damaged, exchange enclosure and enclosure cover.

Do not add additional components into the control panel, which are not listed in the original bill of materials.

Before fixing the enclosure cover to the enclosure, protect the flamepath surfaces with a thin layer of suitable protective grease.

Ensure that all fasteners are present.

When the enclosure cover is fitted, ensure that all fasteners are fully tightened.

The delivered control panel is completely wired. Do not modify or manipulate this control panel. Observe the wiring diagram when connecting the control panel.

Ensure that external ground connections exist, are in good condition, and are not damaged or corroded.

In order to minimize power dissipation, observe the maximum possible conductor lengths.

If radio frequency sources are present in the device, the usage of the device is bound to local restrictions. Ensure that the local restrictions allow usage of this device before commissioning.

Associated Apparatus / Intrinsically Safe Circuits

- When the control panel is equipped with an associated apparatus with intrinsically safe circuits and the panel is in addition equipped with a thermal probe for protecting the I.S. apparatus against ambient temperatures where it is not designed for, this thermal probe has to be connected to either an internal or external switch which switches OFF the power for the I.S. apparatus in case the temperature inside of the panel reaches the upper or lower thresholds of the I.S. apparatus. If an external temperature switch is used, the user has to configure the settings of that switch according to the following rules:
 - Maximum temperature response threshold of [(T_{IEx}-2) ± 2°C] T_{IEx} = Maximum value of the certified ambient temperature of the internal I.S. apparatus.
 - Minimum temperature response threshold of [(T_{minIEx}+2) ± 2°C]. T_{minIEx} = minimum value of the certified ambient temperature of the internal I.S. apparatus.

Schedule of Limitations

The enclosures provided with windows have been assessed and tested to be used in the range of operating temperatures from -50 °C to +180 °C. Operating temperatures are not to be confused with ambient temperatures which are significantly lower.

The width of the flameproof joints is superior to those specified in the tables of EN/IEC 60079-1.

The equipment installed inside the enclosure may be placed in any arrangement provided a minimum of 40% (for gas group IIB+H₂) respectively 20% (for gas group up to IIB) of each cross-sectional area remains free to permit an unimpeded gas flow and, therefore, unrestricted dispersion of the explosion.

Operation, Maintenance, Repair

Observe IEC/EN 60079-17 for maintenance and inspection.

The device must be disconnected from the power supply prior to installation and maintenance. The power supply may be activated only after all the circuits required for operation have been fully assembled and connected.

If the control panel was affected by a short circuit, check the following.

Check the functionality of the control panel.

Check that the integrity of the flameproof enclosure is present.

If the enclosure is damaged, replace enclosure and enclosure cover.

Check all surfaces of the flamepath for damage. If an actuator is present, check the flamepaths of the actuator for damage.

If the surfaces of the flamepath are damaged, replace the enclosure and the enclosure cover. If the surfaces of the flamepath of an actuator are damaged replace the complete actuator.

Do not paint or varnish the surfaces of the flamepath.

If the protective grease on the surfaces of the flamepath has become old, remove the protective grease and fat with new suitable protective grease.

Enclosures with degree of protection IP66/67 have seals in the flamepath.

Ensure that all seals are clean, undamaged, and correctly fitted.

Do not paint or varnish the threaded joints.

Control all threaded joints for damage.

Only use screws with a defined minimum yield stress for closing the enclosure cover.

If there is a defect, always replace the device with an original device.

Safety-relevant markings are found on the nameplate supplied. Ensure that the nameplate is present and legible. Take the ambient conditions into account.

If the internal equipment contains a battery and a potentially explosive atmosphere is present, do not open the enclosure.

If the device is installed in potentially explosive dust atmosphere, remove dust layers which exceed 5 mm in regular intervals.

Do not modify or manipulate the device.

Modifications are permitted only if approved in this instruction manual.

Delivery, Transport, Disposal

Disposing of device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.

Technical Specifications

General	
Type and variants	EJB*, see type code table EJBX*, see type code table
Data for application in hazardous areas	
EC-Type Examination Certificate	INERIS 10ATEX0035X INERIS 14ATEX0022X INERIS 14ATEX9010U
Marking	II 2 GD Ex d IIB Gb Ex d IIB+H2 Gb, depending on variant and certificate Ex tb IIC Db
Hazardous Area: Zones of Installation	1, 21 (Gas), 2, 22 (Dust), according to type label
IECEx Certificate	IECEx INE 14.0029X IECEx INE 14.0028U
CE Number	0080 or 0102 (only for ATEX, see also type label)
Temperature classes	T6/T85 °C, T5/T100 °C, T4/T135 °C, T3/T200 °C; depending on configuration, ambient temperature and built-in power loss.
Maximum dissipated power	See type label
Lamp nominal power (to maintain temperature class)	< 5 W (T4, T3 with power lamps of 5 W)
Minimum distance lamp to glass	5 mm
Operating voltage	660 V DC / 1000 V AC maximum
Operating current	1600 A max.
Max. cross section	300 mm ²
Ambient temperature	-50 °C to +60 °C, depending on variant and certificate. Ambient temperatures for control panels depend on the permissible ambient temperature of the inner components. Refer to drawing or enclosure type label.
Degree of Protection according to IEC/EN 60529	IP66 standard or as option IP66/67 with seal in the flamepath. Refer to enclosure type label.
Enclosure material	Copper-free aluminum alloy or AISI 316L (1.4404) stainless steel
Enclosure finish	aluminum: epoxy coated grey RAL7005 (standard) stainless steel: surface shot-peened (standard)
Tightening torques Cover Screws	M6 (EJB0 to EJB3A) 15 Nm M8 (EJB4-EJB10B, EJB12-EJB14A, EJB16) 20 Nm M10 (EJB11-EJB11B, EJB15-EJB15A) 30 Nm M10 (EJB17-EJB17A, EJB19-EJB19A) 30 Nm M12 (EJB17Q-EJB18B) 40 Nm M16 (EJB20-EJB20A) 65 Nm For stainless steel enclosures EJBX* add +5 Nm to the above values
Cover screw minimum yield stress	WARNING: USE SCREWS HAVING MINIMUM YIELD STRESS 450 N/mm ²
Flamepath grease	Greasil MS4 or NEVER SEEZ Marine Grade
Conformity standards	EN60079-0:2012/A11:2013; EN 60079-1:2007; EN 60079-7:2007; EN 60079-11:2012; EN 60079-28:2008; EN 60079-31:2014 and/or IEC 60079-0:2011; IEC 60079-1:2007-04; IEC 60079-7:2006-07; IEC 60079-11:2011; IEC 60079-28:2006-8 IEC 60079-31:2013;

Class of Temperature / Ambient Temperature

for Cable Entries and Cables

Only use cable entries and cables suitable for the class of temperature / ambient temperature as reported in the following table:

Max. Ambient Temperature	Class of temperature, type of protection Ex d IIA, IIB, IIB+H2			
	T6	T5	T4	T3
40 °C	N.A.	90 °C	120 °C	140 °C (with window) 175 °C (without window)
50 °C	N.A.	90 °C	120 °C	140 °C (with window) 175 °C (without window)
55 °C	N.A.	90 °C	120 °C	140 °C (with window) 175 °C (without window)
60 °C	N.A.	90 °C	120 °C	140 °C (with window) 175 °C (without window)
Connection with cables suitable for the above mentioned temperatures				

Comparative Table Marking / Thread of the Cable Entry

Table below with markings according to the requirements of IEC 60079-1 clause 13.2

Threaded entries in the enclosures are identified by the following coding:

00 C = 1/4" ISO228	00 N = 1/4" NPT	00 M = M12x1.5	9PG = PG9
1 C = 1/2" ISO228	0 N = 3/8" NPT	0 M = M16x1.5	11PG = PG11
3 C = 1" ISO228	1 N = 1/2" NPT	1 M = M20x1.5	13PG = PG13
00 G = 1/4" ISO 7/1	2 N = 3/4" NPT	2 M = M25x1.5	16GP = PG16
0 G = 3/8" ISO 7/1	3 N = 1" NPT	3 M = M32x1.5	21PG = PG21
1 G = 1/2" ISO 7/1	4 N = 1 1/4" NPT	4 M = M40x1.5	29PG = PG29
2 G = 3/4" ISO 7/1	5 N = 1 1/2" NPT	42 M = M42x1.5	36PG = PG36
3 G = 1" ISO 7/1	6 N = 2" NPT	5 M = M50x1.5	42PG = PG42
4 G = 1 1/4" ISO 7/1	7 N = 2 1/2" NPT	6 M = M63x1.5	48PG = PG48
5 G = 1 1/2" ISO 7/1	8 N = 3" NPT	7 M = M75x1.5	
6 G = 2" ISO 7/1		8 M = M85x1.5	
7 G = 2 1/2" ISO 7/1			
8 G = 3" ISO 7/1			

"G" means also equivalent type according UNI6125 or EN10266-2

Typecode

Type	
EJB	Enclosure Ex d IIB+H ₂
	Material
	Copper-free aluminum
X	Stainless steel
	Enclosure size
	0 ... 20A See dimensions table in data sheet
	Window
	No window
	W... Window with type indication, details see data sheet
	Electrical circuits
	D Without intrinsically safe circuits
I	Intrinsically safe circuits integrated
	Type of application
U	Empty enclosure
T	Terminal box
CP	Control panel
CS	Control station
DB	Distribution board
MS	Motor starter
PS	Power switching
RIO	Remote I/O field unit
IFS	Interface solution
OS	Optical solution
Q40	Q40 solution
	Variant number
	Yxxxxxx

Example: diameter of the hole Ref. 2 M = thread M25x1.5