

IOM-D21-D31-EX D-B:SEPT 2020

DELTA MOBREY

MANUFACTURE OF PRESURE TRANSMITTERS
AND CONTROL INSTRUMENTS

EXPLOSION-PROOF DEVICE USER MANUAL

SMART PRESSURE TRANSMITTERS

D21, D21 SAFETY

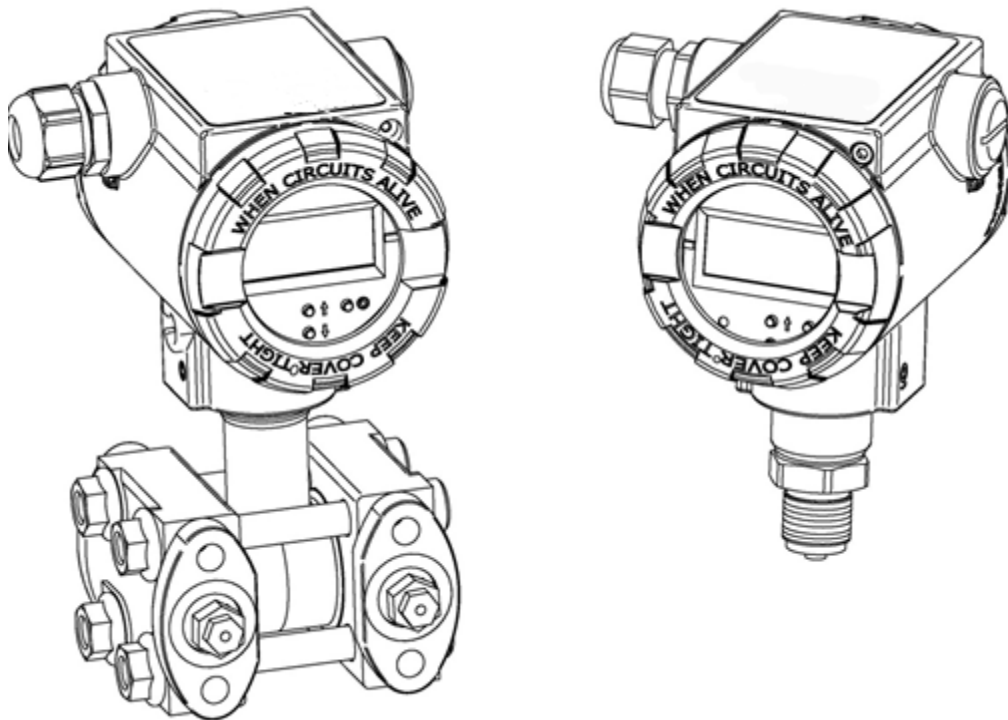
SMART PRESSURE DIFFERENTIAL TRANSMITTERS

D31, D31 SAFETY, D35,

D34

SMART LEVEL PROBES

D45







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Symbols used

Symbol	Description
	Warning about the necessity follow strictly the information provided in the documentation in order to ensure safety and full functionality of the device.
	Information particularly useful for device installation and operation.
	Information particularly useful for Ex device installation and operation.
	Waste of electrical and electronic equipment disposal information.

BASIC REQUIREMENTS AND OPERATION SAFETY

- The manufacturer shall not be liable for any damage resulting from incorrect installation, failure to maintain the device in proper condition, or device use other than intended.
- Installation should be carried out by qualified staff having the required authorization to install electrical and I&C equipment. The fitter is responsible for performing the installation in accordance with this manual and with the electromagnetic compatibility and safety regulations and standards applicable to the type of installation.
- If leakage in systems with I&C equipment occurs, pressurized medium poses a threat to the personnel. All safety and protection requirements must be observed during transmitter installation, operation and inspections.
- If a malfunction occurs, the device should be removed and sent for repair to the manufacturer or a facility authorized by the manufacturer.



In order to minimize the risk of malfunction and associated risks to staff, do not install or use the device in particularly adverse conditions, where the following hazards occur:

- Possible mechanical impacts, excessive shocks and vibration;
- Excessive temperature fluctuation;
- Water condensation, dust, icing.



Explosion-proof installations should be made with special care and in accordance with standards and regulations applicable to this type of installations.

Changes can be made in the manufacturing before the paper version of user documentation is updated. Up-to-date user manuals are available on the manufacturer's website: www.deltamobrey.com

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1. INTRODUCTION

This manual is only applicable to the D21, D21 Safety, D31, D31 Safety, D35, D34 and D45 series transmitters in Exi (intrinsically safe), Exd (flameproof), and both Exi and Exd variants. The transmitters are identified on nameplates as specified in section 4 with Ex information in the “Product Certificate”.

The manual contains most important information on intrinsically safe and flameproof transmitters compliant with ATEX directive and IECEx requirements. If explosion-proof transmitters are installed, refer to this manual and IOM-D21-D31-SAFETY manual for D21 Safety, D31 Safety series transmitters, and IOM-D21-D31 manual for D21, D31, D34, D35 and D45 series transmitters.

2. SAFETY

- Read this manual carefully before installing, commissioning and operating the transmitter.
- Installation and maintenance should be carried out by qualified staff having the required authorization to install electrical and measuring devices.
- The transmitter should be used as intended within permissible parameters.
- Power source must be disconnected before installing or removing the transmitter.
- No repairs or alterations to the transducer electronic system are permitted. Only the manufacturer or a facility authorized by the manufacturer may assess damages and repair the device (if possible).
- Do not use damaged instruments. In case of failure, the device must be disconnected.
- If the equipment is used in Ex zones, the technical requirements specified in this manual and applicable local (national) regulations must be followed.



3. COMPLETE DELIVERY CHECKLIST

The user receives the following with the transmitter:

- a) Product Certificate, which also constitutes a warranty card.
- b) Declaration of Conformity.
- c) Certificate copy (on request).
- d) IOM-D21-D31-EX D explosion-proof device user manual
- e) IOM-D21-D31-SAFETY or IOM-D21-D31 user manual.

Items b), c), d), e) are available at www.delta-mobrey.com

4. IDENTIFICATION MARKS.

Ex transmitters are delivered with a nameplate which contains data specified in section 6.2, IOM-D21-D31-SAFETY or IOM-D21-D31 and also the following:

- Designation of explosion-proof design type, certificate number.
- Parameter values, e.g. U_i , I_i , C_i , L_i for Exi transmitters.
- Year of manufacture.
- “SA Version” inscription — isolated power supply for intrinsically safe transmitters with overvoltage protection in which ground isolated power supply should be used.

delta-mobrey CE 0598
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TYPE
 Process connection:
 ID:.....
 P
 PS
 U
 I
 Ser.-No:
 Year of production:
 Mat:
 IP:

Intrinsic safety design as specified in section 9.2
 $-40^{\circ}\text{C} \leq T_a \leq 80^{\circ}\text{C}$ Exi

Flameproof design as specified in section 12.2
 T6 $-40^{\circ}\text{C} \leq T_a \leq 40^{\circ}\text{C}$
 T5 $-40^{\circ}\text{C} \leq T_a \leq 75^{\circ}\text{C}$ Exd

Delta Mobrey Ltd, Dogflud Way, Farnham, GU9 7SS

For a transmitter with common Exi and Exd designation, the box indicating the intended Exi or Exd explosion proof protection type should be permanently marked before the transmitter is installed

Figure 1. Sample transmitter nameplate with common Exi and Exd designation

5. TRANSMITTER DESIGN

The basic transmitter components are: an enclosure made of 316 (1.4401) stainless steel or aluminum, measuring head where a pressure signal is converted to an electrical signal, and an electronic module converting the signal from the head to an output signal. Transmitters in aluminum enclosures are allowed for II and III group, and transmitters in steel enclosures are allowed for I, II and III group.

6. ELECTROSTATIC HAZARDS

The paint, plastic nameplate and diaphragm seals coated with PTFE form a non-conducting layer applied on a conducting base of enclosure or diaphragm seals. Transmitters with this design in a dust-explosion zone should be installed in a place where electrostatic charging is impossible, in particular by contact with electrically charged dust falling off or blown from neighboring devices.

7. SPECIAL CONDITIONS OF USE

- a) The maximum temperature of the external heating source cannot heat the transmitter above the maximum declared ambient temperature.
- b) Some gaps of flameproof joint are smaller and longer than those required in table 1 of EN 60079-1 (see **Table 7**).
- c) In hazardous zones of dust explosion, transmitters with painted aluminum enclosures as well as transmitters equipped with plastic nameplate and PTFE-coated diaphragm separator components should be installed a way that prevents electrostatic charging specified in accordance with point 6.6.
- d) A diaphragm separator with titan components must be protected from mechanical impacts.
- e) An intrinsically safe transmitter version with surge arrester, marked on the nameplate as "SA" does not meet the requirements of clause 10.3 of EN 60079-11 (500Vrms). The device should be installed in accordance with point 11.
- f) If a transmitter with a nameplate containing various explosion-proof designs is used, the applied protection type must be permanently marked on the nameplate before installation (see Figure 1).
- g) For a transmitter with a flameproof enclosure, the diaphragm should not be exposed to damage during transmitter installation and operation. The transmitter diaphragm is made of stainless steel, Hastelloy or tantalum and must not be exposed to contact with a medium that may damage it

8. TRANSMITTER PROTECTION LEVEL (EPL) AND HAZARDOUS AREAS

Ga/Gb (Da/Db) EPL protection level means that the transmitter can be installed in Zone 1 (21) or 2 (22), and transmitter process connectors can connect to Zone 0 (20). Gb (Db) EPL protection level means that the transmitter and process connector can be installed in Zone 1 (21) or 2 (22). Da EPL protection level means that the transmitter and process connector can be installed in Zone 20 or 21. Transmitters for mining applications Mb should be turned off if explosion hazard occurs.

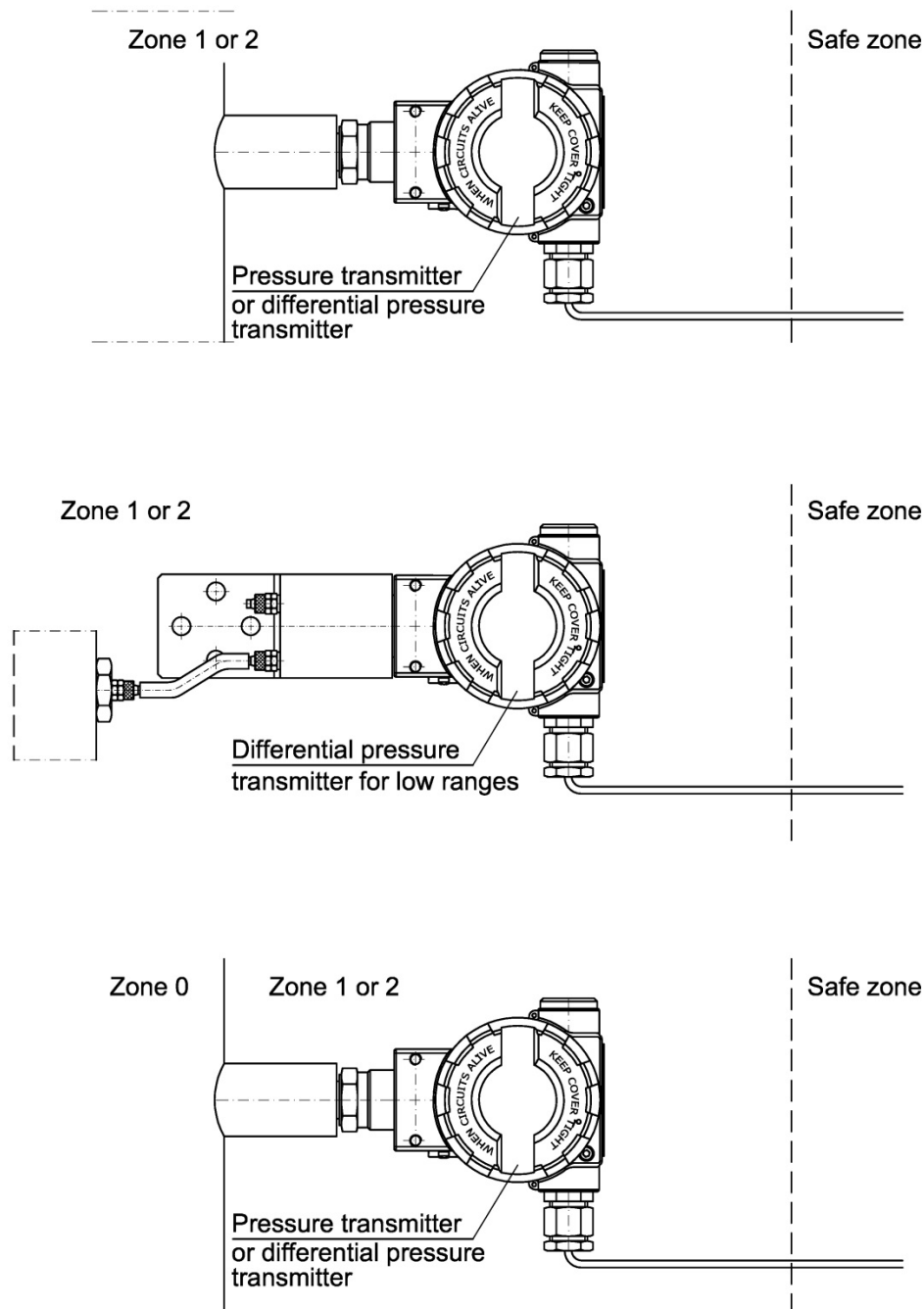


Figure 2. Transmitter installation in potentially explosive areas.

9. INTRINSICALLY-SAFE Exi TRANSMITTERS

9.1. Standards used for assessment

The transmitters are manufactured in compliance with the following standards:

EN 60079-0:2012+A11:2013 (IEC 60079-0:2011 ed. 6.0)

EN 60079-11:2012 (IEC 60079-11:2011 ed. 6.0).

9.2. Transmitter explosion-proofing designations

ATEX:



I M1 Ex ia I Ma (for the version with stainless steel enclosure)

II 1/2G Ex ia IIC T4/T5 Ga/Gb

II 1D Ex ia IIIC T105°C Da

KDB 19ATEX 0045X

IECEX:

I M1 Ex ia I Ma (for the version with stainless steel enclosure)

Ex ia IIC T4/T5 Ga/Gb

Ex ia IIIC T105°C Da

IECEX KDB 19.0006X



As standard, the transmitters are manufactured for explosive gas atmospheres. A customer can also order a transmitter for explosive dust atmospheres and for mining applications.

10. PERMISSIBLE PARAMETERS OF Exi TRANSMITTERS

Table 1. Permissible input parameters of an Exi transmitter

Linear power supply	Orthogonal power supply		Trapezoidal power supply
$U_i = 30 \text{ V}$	$U_i = 24 \text{ V}$	$U_i = 24 \text{ V}$	$U_i = 24 \text{ V}, U_Q = 48 \text{ V}$
$I_i = 0.1 \text{ A}$	$I_i = 0.025 \text{ A}$	$I_i = 0.05 \text{ A}$	$I_i = 0.05 \text{ A}$
$P_i = 0.75 \text{ W}$	$P_i = 0.6 \text{ W}$	$P_i = 1.2 \text{ W}$	$P_i = 0.7 \text{ W}$
$C_i = 2.5 \text{ nF}$	$C_i = 2.5 \text{ nF}$	$C_i = 2.5 \text{ nF}$	$C_i = 2.5 \text{ nF}$
$L_i = 18 \text{ } \mu\text{H}$	$L_i = 18 \text{ } \mu\text{H}$	$L_i = 18 \text{ } \mu\text{H}$	$L_i = 18 \text{ } \mu\text{H}$
$-40^\circ\text{C} \leq T_a \leq +80^\circ\text{C} \text{ (T5)}$	$-40^\circ\text{C} \leq T_a \leq +80^\circ\text{C} \text{ (T5)}$	$-40^\circ\text{C} \leq T_a \leq +80^\circ\text{C} \text{ (T4)}$	$-40^\circ\text{C} \leq T_a \leq +80^\circ\text{C} \text{ (T5)}$

Supply power to transmitters from supply and measurement devices with applicable intrinsic safety certificates whose parameters of outputs to a hazard zone should not exceed the permissible transmitter power supply parameters specified above.



10.1. Linear power supply example

For example, linear power supply is provided by a typical barrier with the following parameters

$$U_o = 28 \text{ V}; I_o = 0.093 \text{ A}; P_o = 0.7 \text{ W}; R_w = 280 \Omega.$$

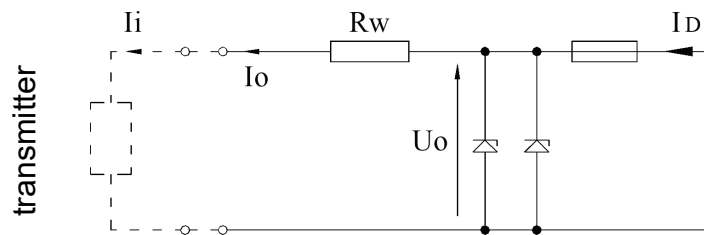


Figure 3. Principle of power supply from a linear source.

10.2. Trapezoidal power supply example

$$U_o = 24 \text{ V}; I_o = 50 \text{ mA}; P_o = 0.7 \text{ W}$$

An example of trapezoidal power supply is shown in Figure 4.

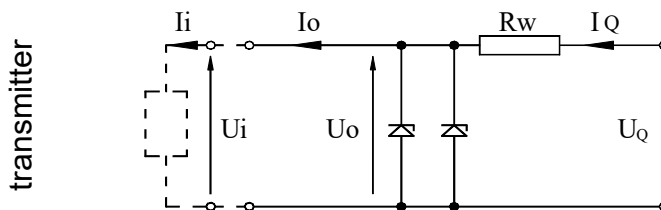


Figure 4. Principle of power supply from a trapezoidal source.

If $U_o = \frac{U_Q}{2}$, U_Q , I_o , P_o have the following relations:

$$U_o = \frac{4P_o}{I_o} \quad R_w = \frac{U_Q}{I_o} \quad P_o = \frac{U_o(U_Q - U_o)}{R_w} \quad \text{for } U_o \leq 1/2U_Q$$

10.3. Orthogonal power supply example

$$U_o = 24 \text{ V} \quad I_o = 25 \text{ mA} \quad P_o = 0.6 \text{ W}$$

$$U_o = 24 \text{ V} \quad I_o = 50 \text{ mA} \quad P_o = 1.2 \text{ W}$$

Orthogonal power supply means that the voltage of an intrinsically safe power adapter does not change until the current limiter is activated.

The level of protection of orthogonal power supply adapters is usually "ib". A transmitter supplied from such power adapter is usually an "ib" intrinsically safe device.

An example of power supply in practice:

A stabilized power adapter with $U_o = 24 \text{ V}$, "ib" protection level and current limited to $I_o = 25 \text{ mA}$.

10.4. Minimum supply voltage

Table 2. Minimum supply voltage of and Exi transmitter

Minimum supply voltage for transmitters with backlight off	Minimum supply voltage for transmitters with backlight on *)
11.5 V	14.5 V
*) Backlight can only be turned on at transmitter manufacturing stage	

10.5. Load resistance

- a) For a linear power supply from a barrier

$$R_{o \max} [\Omega] = \frac{U_{app} - 11.5 V - (R_W * 0.02066 A)}{0.02066 A}$$

- b) For power supply from a trapezoidal or orthogonal source.

$$R_{o \max} [\Omega] = \frac{U_{app} - 11.5 V}{0.02066 A}$$

R_W – barrier resistance;

U_{app} – minimum voltage of the barrier used

11. CONNECTING Exi TRANSMITTERS AND PROBES



Transmitter and equipment in the transmitter measurement loop must be connected in compliance with intrinsic safety and explosion proofing standards and conditions for application in risk zones. If intrinsic safety rules are not followed, explosion can occur and people can be exposed to danger.

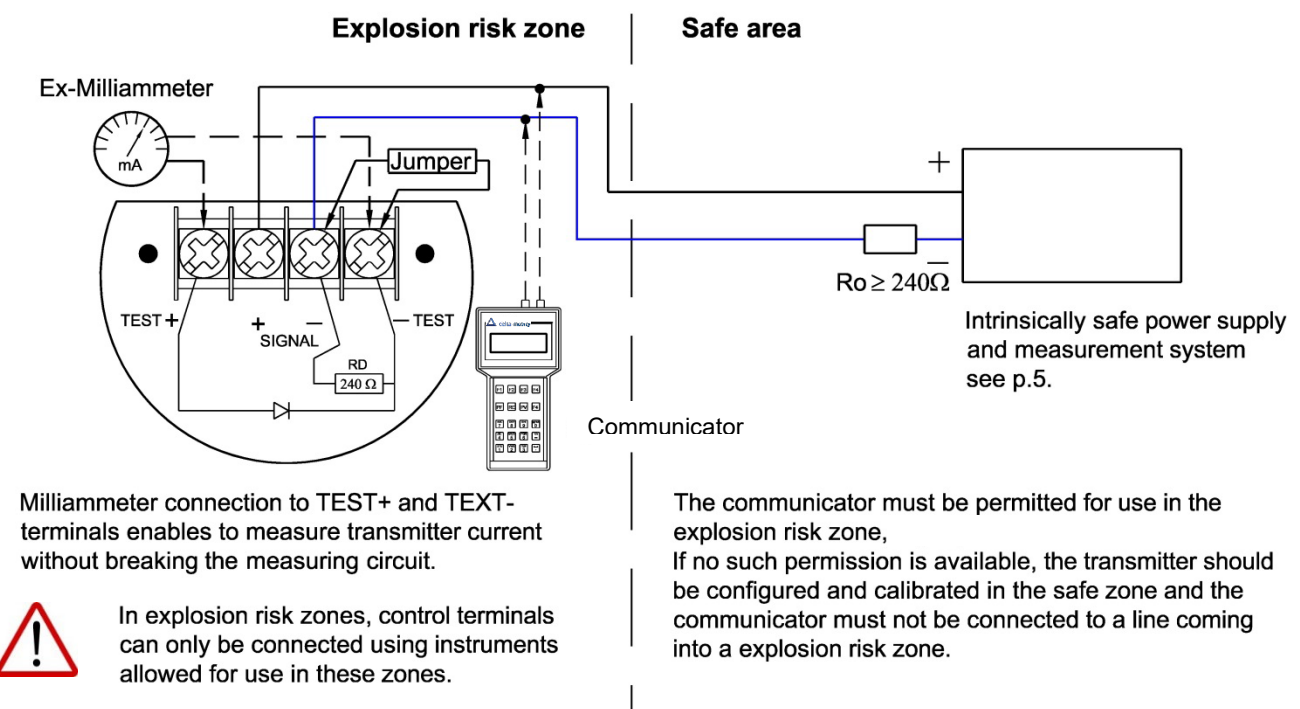


Figure 5. Connecting Exi transmitters and probes



The transmitter is equipped with an additional communication resistor $R_D=240\Omega$. <SIGNAL -> and <TEST -> terminals are short-circuited in factory. R_D resistor is used when the transmitter need to be communicated with locally (from its terminals) and a $R_o < 240 \Omega$. <SIGNAL -> and <TEST -> terminals must be open-circuited then.



If the medium temperature can exceed $T_a=80^\circ\text{C}$, separating elements, such as diaphragm separators, siphon tubes, etc., should be used. The transmitter operating temperature T_p must meet the $T_p \leq T_a$ condition.



The electrical system for connecting transmitters should meet installation requirements of applicable standards.



No repairs or alterations to the transmitter electrical system are permitted. Only the manufacturer or a facility authorized by the manufacturer may asses damages and repair the device (if possible).



“Version SA” transmitters should be supplied from devices equipped with galvanically isolated power supply. If galvanically isolated power supply is not possible, the transmitter or metal parts connected to it should be properly grounded, for instance with an equipotential wiring or an equipotential bonding between the transmitter and the negative pole of power supply barrier.



A transmitter enclosure has two holes for installing a cable entry and blinding plug with M20x1.5 or 1/2 NPT thread. Transmitters with common Exi and Exd designation, as presented in Figure 1, become intrinsically safe transmitters when Exi field is permanently marked. If such transmitter is delivered without a cable gland, the customer is obliged to install a cable gland with at least IP66 protection and operation temperature range suitable for the installation site. In transmitters used in dust explosion zones, the cable glands installed by the customer should be certified and have a designation proper to dust zones where the transmitters are used.

12. FLAMEPROOF Exd TRANSMITTERS

12.1. Standards used for assessment

The transmitters are manufactured in compliance with the following standards:

EN 60079-0:2012+A11:2013 (IEC 60079-0:2011 ed. 6.0)

EN 60079-11:2012 (IEC 60079-11:2011 ed. 6.0)

EN 60079-1:2014 (IEC 60079-1:2014 ed. 7.0)

EN 60079-31:2014 (IEC 60079-31:2013 ed. 2.0)

EN 60079-26:2015 (IEC 60079-26:2014 ed. 3.0)

12.2. Transmitters explosion-proofing designations

ATEX: **KDB 19 ATEX 0045X**



I M2 Ex db ia I Mb (for the version with stainless steel enclosure)

II 1/2G Ex ia/db IIC T6/T5 Ga/Gb

II 1/2D Ex ia/tb IIIC T105°C Da/Db

Or



I M2 Ex db ia I Mb (for the version with stainless steel enclosure)

II 2G Ex ia/db IIC T6/T5 Gb

II 2D Ex ia/tb IIIC T105°C Db

IECEX: **IECEX KDB 19.0006X**

Ex db ia I Mb (for the version with stainless steel enclosure)

Ex ia/db IIC T6/T5 Ga/Gb

Ex ia/tb IIIC T105°C Da/Db

Or

Ex db ia I Mb (for the version with stainless steel enclosure)

Ex ia/db IIC T6/T5 Gb

Ex ia/tb IIIC T105°C Db

13. PERMISSIBLE PARAMETERS OF Exd TRANSMITTERS

13.1. Ambient temperature range and temperature classes

Table 3. Ambient temperature range and temperature classes for Exd transmitters

Operating temperature range		Temperature class and maximum surface temperature
Ambient temperature	Process temperature	
$-40^{\circ}\text{C} \leq T_a \leq 40^{\circ}\text{C}$	$-40^{\circ}\text{C} \div 40^{\circ}\text{C}$	T6/T85°C
$-40^{\circ}\text{C} \leq T_a \leq 75^{\circ}\text{C}$	$-40^{\circ}\text{C} \div 75^{\circ}\text{C}$	T5/T105°C



If the medium temperature can exceed $T_{a\max}$, separating elements, such as diaphragm separators, siphon tubes, etc., should be used. The transmitter operating temperature T_p must meet the $T_p \leq T_{a\max}$ condition.

13.2. Power supply, connection and operation of Exd transmitters

Connect the transmitter according to the wiring diagram (**Figure 6**). The transmitter electrical connections in potentially explosive zones should be made by personnel having necessary knowledge and experience in this respect. The transmitters should be properly grounded by means of a grounding terminal. If the transmitter has metal contact with structural elements or piping connected to equipotential wiring, separate transmitter grounding is not necessary.



Transmitter and equipment in the transmitter measurement loop must be connected in compliance with explosion proofing standards and conditions for application in explosion risk zones. If these rules are not followed, explosion can occur and people can be exposed to danger.

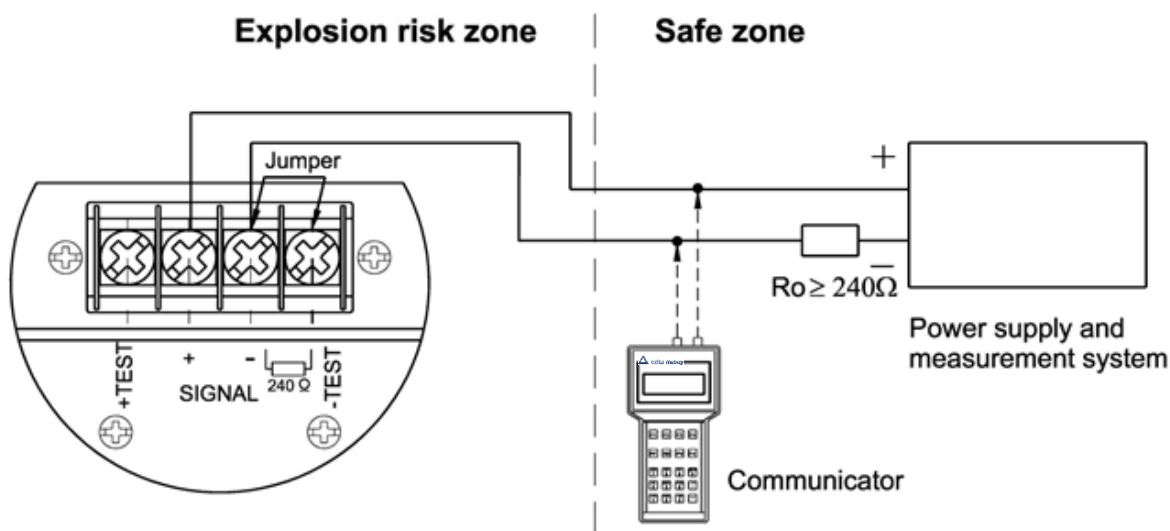


Figure 6. Connecting Exd transmitters and probes

The transmitters should be supplied with maximum voltage specified in the table below (24 VDC rating) from transformer power supplies or other devices providing at least enhanced isolation between primary and secondary winding in which voltages not



larger than 250 VAC occur. It is responsibility of the user to provide power supply compliant with the requirements above.

Table 4. Maximum supply voltage for Exd transmitters

Maximum supply voltage	
D21 Safety, D31 Safety	D21, D31, D35, D34, D45
36 VDC	55 VDC



In an explosion risk zone, do not remove the cover of supplied transmitter and do not connect to the terminals, and do not change the position of local indicator and its backlighting.

For transmitter calibration or check outside a risk zone, a communicating device can be connected to <SIGNAL +> and <TEST +> terminals.



The transmitter is equipped with a communication resistor $R_D = 240 \Omega$, which is short-circuited at <SIGNAL -> and <TEST -> terminals in factory. R_D resistor is used when the transmitter need to be communicated with locally (from its terminals) and a $R_o < 240 \Omega$. <SIGNAL -> and <TEST -> terminals must be open-circuited then.



Cover locking before removal and possible transmitter security sealing is shown in IOM-D21-D31-SAFETY-B:2020 or IOM-D21-D31-B:2020 user manuals.



No repairs or alterations to the transmitter enclosure elements and electrical system are permitted. Only the manufacturer or a facility authorized by the manufacturer may asses damages and repair the device (if possible).



Due to the type of enclosure material (light alloy with high aluminum content), the user is obliged to ensure that in the transmitter installation site its enclosure cannot be hit and, consequently, damaged.



A transmitter enclosure has two holes for installing a cable entry and blinding plug with M20x1.5 or 1/2 NPT thread. After consultation with the manufacturer, the user can purchase a transmitter with a cable gland or purchase the missing cable gland separately. As standard, the transmitter is delivered to the customer without cable gland installed. In cable gland locations, a transport plug can be installed. In such case, the transport plug should be removed and appropriate cable gland installed (**Figure 7**) before the transmitter is installed. It is responsibility of the user to install a certified cable gland compliant with the list of equivalent cable glands in **Table 5**. List of equivalent cable entries. As a blinding plug, an Delta Mobrey plug supplied with the transmitter or a certified blinding plug compliant with the list of equivalent blinding plugs in **Table 6** can be used. Both the cable entry and blinding plug must be compatible with the transmitter documentation accepted during the approval process.

Apply LOCTITE 577 on the 1/2 NPT thread of cable gland before installation.

When connecting, make sure that the cable type and dia is suitable for the cable gland used and temperature in the installation site.

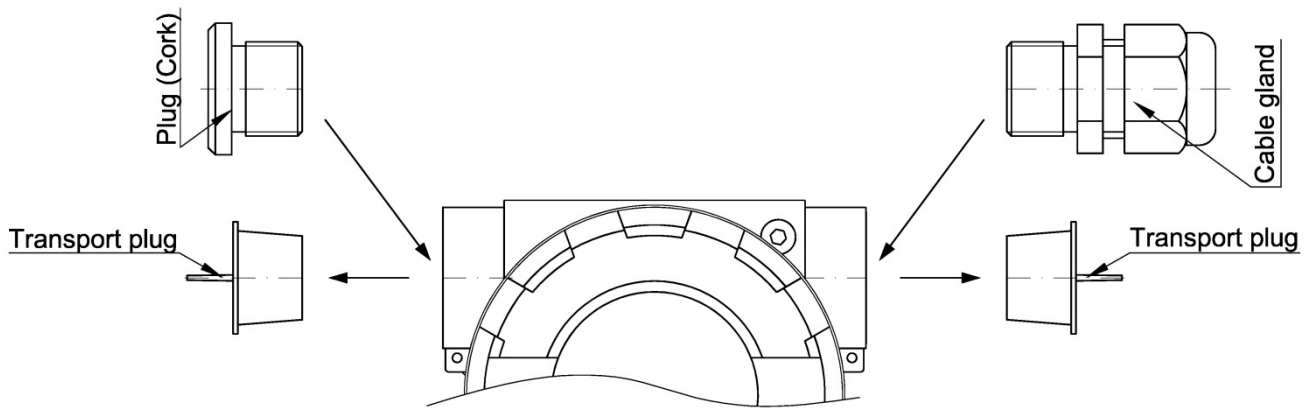


Figure 7. Installation of cable entries and blinding plugs

Table 5. List of equivalent cable entries

Cable entry type	Manufacturer	Thread	Designation	IP	Certificate no.
501/423	Hawke International	M20x1.5 (1/2" NPT)	Exd IIC Gb Extb IIIC Db	67	Baseefa 06ATEX0056X
501/421	Hawke International	M20x1.5 (1/2" NPT)	Exd IIC Gb Extb IIIC Db	67	Baseefa 06ATEX0056X
ICG 623	Hawke International	M20x1.5 (1/2" NPT)	Exd IIC Gb Extb IIIC Db	67	Baseefa 06ATEX0058X
501/453/RAC	Hawke International	M20x1.5 (1/2" NPT)	Exd IIC Gb Extb IIIC Db	67	Baseefa 06ATEX0056X
501/453/Universal	Hawke International	M20x1.5 (1/2" NPT)	Exd IIC Gb Extb IIIC Db	67	Baseefa 06ATEX0057X
ICG/653/Universal	Hawke International	M20x1.5 (1/2" NPT)	Exd I Mb	67	Baseefa 06ATEX0058X
ICG/653/Universal /L	Hawke International	M20x1.5 (1/2" NPT)	Exd IIC Gb Extb IIIC Db	67	Baseefa 06ATEX0058X
A2F, A2FRC	CMP-Products	M20x1.5 (1/2" NPT)	Exd IIC Gb Exta IIIC Da Exd I Mb	67	SIRA 13ATEX1068X
SS2K	CMP-Products	M20x1.5 (1/2" NPT)	Exd IIC Gb Exta IIIC Da Exd I Mb	67	SIRA 13ATEX1069X
E1FW, E2FW	CMP-Products	M20x1.5 (1/2" NPT)	Exd IIC Gb Exta IIIC Da	67	SIRA 13ATEX1071X

			Exd I Mb		
PX2K, PXSS2K, PX2KX	CMP- Products	M20x1.5 (1/2" NPT)	Exd IIC Gb Exta IIIC Da Exd I Mb	67	SIRA 13ATEX1072X

Table 6. List of equivalent blinding plugs

Plug type	Manufacturer	Thread	Designation	IP	Certificate no.
475	Hawke International	M20x1.5 (1/2" NPT)	Exd IIC Gb Extb IIIC Da Exd I Mb	67	Baseefa 10ATEX0262X
477	Hawke International	M20x1.5 (1/2" NPT)	Exd IIC Gb Extb IIIC Da Exd I Mb	67	Baseefa 10ATEX0262X
747, 757 and 767	CMP- Products	M20x1.5 (1/2" NPT)	Exd IIC Gb Exta IIIC Da Exd I Mb	67	SIRA 13ATEX1265X

It is allowed to install other types of certified cable entries and blinding plugs with at least IP66 protection and -40°C...75°C temperature range.

Use a shielded or unshielded, non-reinforced cable with compact structure and circular cross-section in an non-hygroscopic sheath made of an elastomer, e.g. YKSLY 2*1, YnTKSYekw 1*2*1, LIYCY 2*1.



If a cable of different design has to be used, it should be agreed on with the transmitter manufacturer in order to choose a suitable cable gland or individually purchase a cable gland suited to the cable used. The list of equivalent cable entries is given above (**Table 5**). The cables should be protected from damage by routing them in cable trays, jacket tubes, cable ladders, by using fixed mounts, etc.



When periodic inspections are performed, the cover tightness, cable entry and cable fixing in the cable entry the should be checked. Visually check the enclosure and cable for mechanical damage, and the nameplate for illegibility. The diaphragm should also be included in periodic inspections. It should have no signs of damage. It is recommended to apply acid-free petroleum jelly on threads during maintenance.

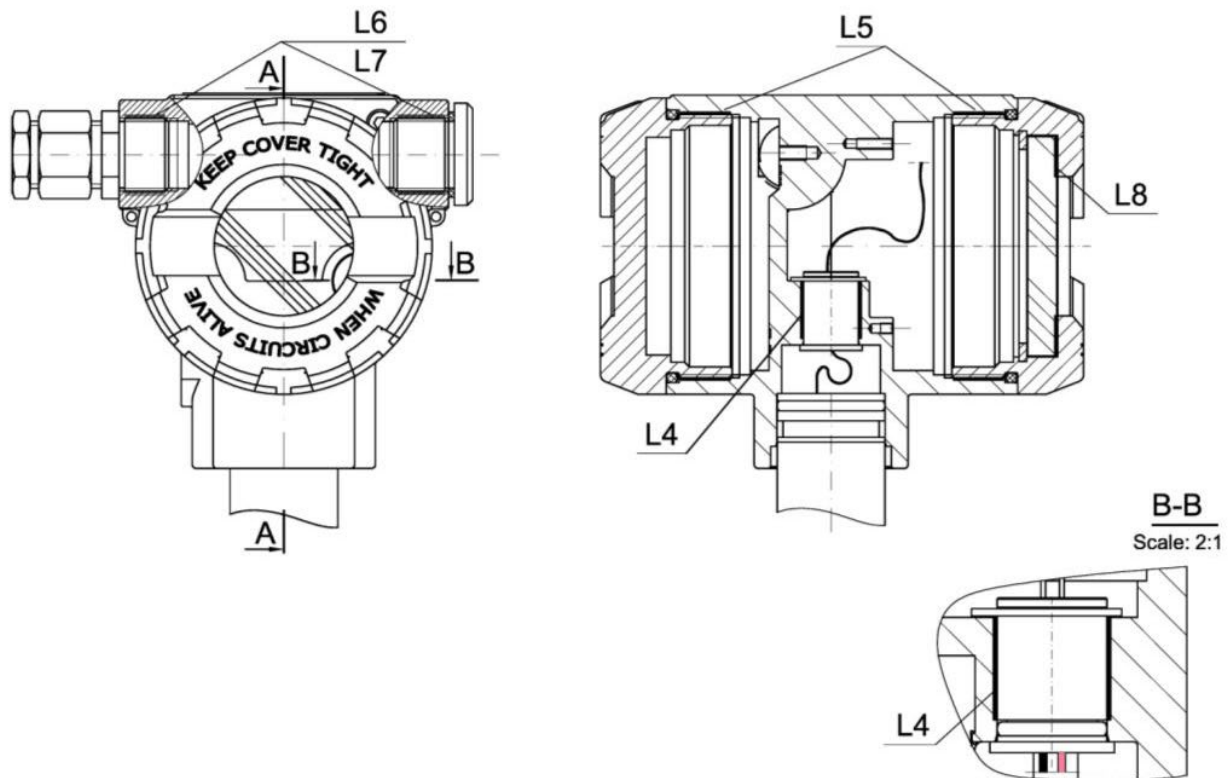


Figure 8. Flameproof joints of enclosure.

Table 7. List of flameproof joints in a flameproof enclosure

No	Length of joint (min. actual) L [mm]	Diameter		D-d [mm]	Quantity of joint	Comments (min. values acc. to EN 60079-1)
		D [mm]	d [mm]			
L4	13.2	$\varnothing 15^{+0,027}$	$\varnothing 15^{-0,040}_{-0,070}$	0.079	2	length of joint min.12,5
L5	12	M72x1. 5	M72x1. 5		2	min. 5 meshing turns
L6	9	M20x1. 5	M20x1. 5		2	min. 5 meshing turns
L7	12.7	1/2 NPT	1/2 NPT		2	min. 5 meshing turns on each surface
L8	10				1	Bonded joint, length of joint min.10



The diaphragm should not be exposed to damage during transmitter installation and operation. The transmitter diaphragm is made of stainless steel or Hastelloy and must not be exposed to contact with a medium that may damage it.

The general rules of connecting and operating an Exd transmitter should be compliant with the rules and standards applicable to devices in a flameproof enclosure:

EN 60079-14 – Electrical devices in explosive atmospheres. Part 14: Electrical installations in risk areas (other than mines).



EN 60079-17 – Electrical devices in explosive atmospheres. Part 17: Electrical installations inspection and maintenance in risk areas (other than mines).



Due to possible damage, the transmitter should be protected from heating above 80°C also when explosion hazard does not occur.