

Safety Instructions

Liquiphant FTL62

II 1/2 G Ex ia IIC/IIB T6...T1 Ga/Gb

II 2 G Ex ia IIC/IIB T6...T1 Gb

II 1/2 D Ex ia IIIC Txxx°C Da/Db

II 2 D Ex ia IIIC Txxx°C Db



Liquiphant FTL62

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Associated documentation

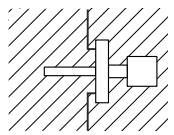
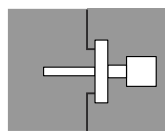
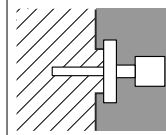
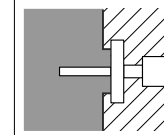
This document is an integral part of the following Operating Instructions:
BA02036F/00

Supplementary documentation


Explosion-protection brochure: CP00021Z/11
The Explosion-protection brochure is available:

- In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

**General notes:
Combined approval**

							
Ex ia IIC		Ex ia IIIC		Ex ia IIC		Ex ia IIIC	
Zone 0 or Zone 1	Zone 1	Zone 20 or Zone 21	Zone 21	Zone 0 or Zone 1	Zone 21	Zone 20 or Zone 21	Zone 1

The device is designed for operation in explosive gas or explosive dust atmosphere as shown in the sketch above. In the event of potentially explosive gas-air and dust-air mixtures occurring simultaneously: Suitability requires further assessment.

-  A sequential change between gas and dust explosion protection is only possible if:
- A period with non-explosive atmosphere is realized during the transition or
 - Special examinations are done which are not covered by the certificate

Manufacturer's certificates

UK Declaration of Conformity

Declaration Number:
UK_00031

The UK Declaration of Conformity is available:
In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Declaration -> Type: UKCA Declaration -> Product Code: ...

UKCA type-examination certificate

Certificate number:
CSAE 21UKEX1183X

List of applied standards: See UK Declaration of Conformity.

Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

Other standards

Among other things, the following standards shall be observed in their current version for proper installation:

- IEC/EN 60079-14: "Explosive atmospheres - Part 14: Electrical installations design, selection and erection"
- EN 1127-1: "Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology"

Extended order code

The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated Operating Instructions.

Structure of the extended order code

FTL62	-	*****	+	A*B*C*D*E*F*G*..
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>

* = Placeholder

At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

Basic specifications

The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available.

The selected option of a feature can consist of several positions.

Optional specifications

The optional specifications describe additional features for the device (optional features). The number of positions depends on the number of features available. The features have a 2-digit structure to aid identification (e.g. JA). The first digit (ID) stands for the feature group and consists of a number or a letter (e.g. J = Test, Certificate). The second digit constitutes the value that stands for the feature within the group (e.g. A = 3.1 material (wetted parts), inspection certificate).

More detailed information about the device is provided in the following tables. These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

Extended order code: Liquiphant



The following specifications reproduce an extract from the product structure and are used to assign:

- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

Device type

FTL62


Basic specifications

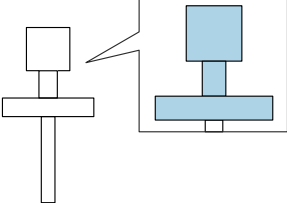
Position 1, 2 (Approval)		
Selected option		Description
FTL62	UK ¹⁾	UK Ex II 1/2 G Ex ia IIC/IIB T6...T1 Ga/Gb UK Ex II 2 G Ex ia IIC/IIB T6...T1 Gb UK Ex II 1/2 D Ex ia IIIC Txxx°C Da/Db UK Ex II 2 D Ex ia IIIC Txxx°C Db

- 1) In connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG:
The temperature classes change to T4...T1

Position 3, 4 (Output)		
Selected option		Description
FTL62	A7	FEL67, 2-wire PFM + test button
	A8	FEL68, 2-wire NAMUR + test button
	GA	FEL60D, density/concentration

Position 6 (Housing, Material)		
Selected option		Description
FTL62	B	Single compartment; Alu, coated
	C	Single compartment; 316L, cast
	M	Dual compartment L-shape; Alu, coated

 Shown in the temperature tables exemplary as follows:




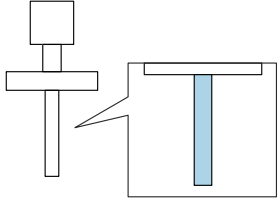
Position 7 (Electrical Connection)		
Selected option		Description
FTL62	B ¹⁾	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
	C ²⁾	Gland M20, 316L, IP66/68 NEMA Type 4X/6P
	F	Thread M20, IP66/68 NEMA Type 4X/6P
	G	Thread G1/2, IP66/68 NEMA Type 4X/6P
	I	Thread NPT3/4, IP66/68 NEMA Type 4X/6P
	Y	Special version: Thread NPT1/2, IP66/68 NEMA Type 4X/6P

- 1) Only in connection with Position 6 = B, M
 2) Only in connection with Position 6 = B, C

Position 8 (Application)		
Selected option		Description
FTL62	C ¹⁾	Process max 80°C/176°F, max 25bar
	N ²⁾	Process max 120°C/248°F, max 40bar (ECTFE)
	P ²⁾	Process max 150°C/302°F, max 40bar (PFA)
	T ²⁾	Process max 150°C/302°F, max 25bar (Enamel)

- 1) Only in connection with Position 3, 4 = GA
 2) Only in connection with Position 3, 4 = A7, A8

Position 9 (Surface Refinement)		
Selected option		Description
FTL62	N	Coating ECTFE
	P	Coating PFA (Edlon)
	Q	Coating PFA (RubyRed)
	R	Coating PFA (conductive)
	T	Coating Enamel

Position 10 (Type of Probe)		
Selected option		Description
FTL62	2	Extension tube
	3	Short tube version
<p> Shown in the temperature tables exemplary as follows:</p> 		

Optional specifications

ID Jx, Kx (Test, Certificate, Declaration)		
Selected option		Description
FTL62	JL ¹⁾	Ambient temperature -50°C/-58°F
	JN ¹⁾	Ambient temperature -52°C/-62°F

1) Only in connection with Position 3, 4 = A7, A8

ID Nx, Ox (Accessory Mounted)		
Selected option		Description
FTL62	NF ¹⁾	Bluetooth VU121, Labeling: VA13-02
	NG ²⁾	Prepared for Heartbeat Verification + Monitoring + Bluetooth VU121, Labeling: VA13-01

1) Only in connection with Position 3, 4 = A7, Position 6 = B, M
 2) Only in connection with Position 3, 4 = A8, Position 6 = B, M

ID Px, Rx (Accessory Enclosed)		
Selected option		Description
FTL62	PA ¹⁾	Weather protection cover, 316L
	PB ²⁾	Weather protection cover, plastic
	R6 ³⁾	Test magnet


- 1) Only in connection with Position 6 = M
 2) Only in connection with Position 6 = B, C
 3) Only in connection with Position 3, 4 = A8

Safety instructions: General

- Devices suitable for zone separation (marked Ga/Gb or Da/Db) are always suitable for installation in the less critical zone (Gb or Db). Due to space limitations the corresponding marking maybe not indicated on the nameplate.
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
 - Be suitably qualified for their role and the tasks they perform
 - Be trained in explosion protection
 - Be familiar with national regulations
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only use the device in media to which the wetted materials have sufficient durability.
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. enclosure, sensor element, special varnishing, attached additional plates, ..)
 - Of isolated capacities (e.g. isolated metallic plates)
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the sensor and/or transmitter, depending on the range of application and the temperature class.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.

Safety instructions: Special conditions

Permitted ambient temperature range at the electronics enclosure:
 $-40\text{ °C} \leq T_a \leq +70\text{ °C}$

- Limitations of the maximum ambient temperature at the electronics enclosure may be required dependent on device configuration, process temperatures and temperature classification.
- Details of limitations: →  13, "Temperature tables".
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts or for adhesive plates:
 - Observe the danger of electrostatic charging and discharge.
 - Do not install in the vicinity of processes (≤ 0.5 m) generating strong electrostatic charges.

Basic specification, Position 6 = B, M

Avoid sparks caused by impact and friction.

Optional specification, ID Px, Rx = PA

Connect the weather protection cover to the local potential equalization.

Optional specification, ID Px, Rx = PB

Avoid electrostatic charging of the weather protection cover (e.g. friction, cleaning, maintenance, strong medium flow).

Optional specification, ID Px, Rx = R6

Suitable for use in explosion hazardous areas.

Device group IIC/IIB and Device group III

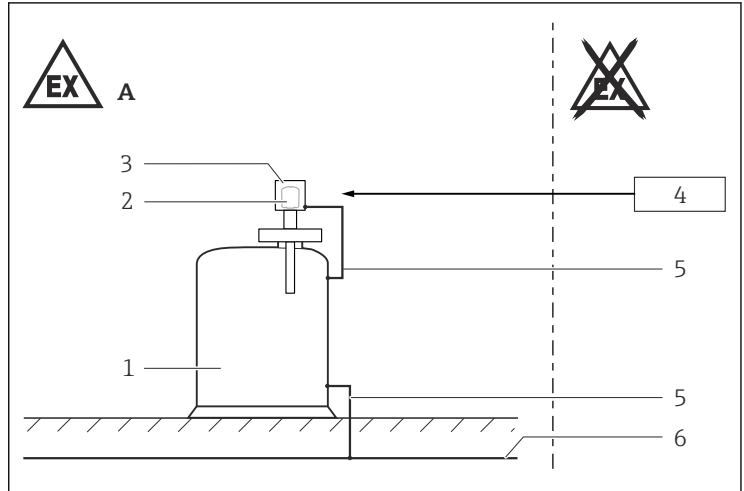
Basic specification, Position 9 = N, P, Q

- Probes can be used in gases of Group IIC or dust Group III if avoiding electrostatic charging (e.g. through friction, cleaning, maintenance, strong medium flow). These probes are marked by the warning sign "Avoid Electrostatic Charge".
- If electrostatic charging cannot be avoided:
 - Probe can be used in gases of Group IIB.
 - Probe must not be used in dust Group III.

Basic specification, Position 9 = R, T

- Due to the surface resistance $1 \text{ G}\Omega$ ([R] PFA-conductive) or the enamel (glass) surface [T], these coatings are suitable without restrictions.
- Prevent damage to the conductive surface layer (e.g. by abrasion).

Safety instructions: Installation



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- A Zone 1, Zone 21
 1 Tank; Zone 0, Zone 1, Zone 20, Zone 21
 2 Electronic insert
 3 Enclosure
 4 Basic specification, Position 3, 4 = A7, A8:
 Associated intrinsically safe power supply units
 Basic specification, Position 3, 4 = GA:
 Only associated intrinsically safe power supply unit FML621 from
 Endress+Hauser
 5 Potential equalization line
 6 Local potential equalization

- Connect the device using suitable cable and wire entries of protection type "Intrinsic safety (Ex i)". An ingress protection of at least IP54 must be achieved.
- When the device is connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC and IIB, the type of protection changes to Ex ib IIC and Ex ib IIB.
- Continuous service temperature of the connecting cable: $\geq T_a + 20 \text{ K}$.
- Perform the following to achieve the degree of protection IP66/67:
 - Screw the cover tight.
 - Mount the cable entry correctly.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection.
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.

- Observe the maximum process conditions according to the manufacturer's Operating Instructions.
- At high medium temperatures, note flange pressure load capacity as a factor of temperature.
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- Support extension tube of the device if a dynamic load is expected.
- The device can be equipped with the Bluetooth® module: refer to the Operating Instructions and specifications in the "Bluetooth® module" chapter.

Device group III, Application in dust

- To ensure the ingress protection IP66/67: Only use the unit-mounted cable entries, sealing plugs and O-rings.
- Supplied cable glands and metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.

Permitted ambient conditions

Ex ia IIIC Txxx°C Da/Db

Process Zone 20	Enclosure Zone 21
Continuous dust submersion	Dust accumulation or temporary explosive dust atmosphere
Continuous explosive dust atmosphere and deposits	Dust accumulation or temporary explosive dust atmosphere

Ex ia IIIC Txxx°C Db

Process Zone 21	Enclosure Zone 21
Continuous dust deposits or temporary explosive dust atmosphere	Dust accumulation or temporary explosive dust atmosphere

Intrinsic safety

- The device is only suitable for connection to certified, intrinsically safe equipment with explosion protection Ex ia / Ex ib.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least $500 V_{\text{rms}}$.

Potential equalization

Integrate the device into the local potential equalization.

Optional specification, ID Px, Rx = PA

Connect the weather protection cover to the local potential equalization.

Bluetooth® module

Basic specification, Position 3, 4 = A7

If the device is equipped with the Bluetooth® module, no battery is required or allowed.

Basic specification, Position 3, 4 = A8

- If the device is equipped with the Bluetooth® module, a battery is required.
- Removal or replacement of the battery is only permitted in non-hazardous areas.
- Observe the information in the Safety Instructions (XA) included with the Bluetooth® module.

Safety instructions: Zone 0

- In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.
 - Temperature: -20 to $+60$ °C
 - Pressure: 80 to 110 kPa (0.8 to 1.1 bar)
 - Air with normal oxygen content, usually 21 % (V/V)
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, the device may also be operated under non-atmospheric conditions in accordance with the manufacturer's specifications.
- When using under non-atmospheric pressures and non-atmospheric temperatures: The sensor part of the device approved for Zone 0 does not cause any ignition hazards.

Temperature tables



Optional specification, ID Jx, Kx = JL

Lower limit of the ambient temperature for explosion protection changes to -50 °C.

Optional specification, ID Jx, Kx = JN

Lower limit of the ambient temperature for explosion protection changes to -52 °C.

General notes

Ex ia IIC



Optional specification, ID Px, Rx = PB

When using the weather protection cover: Reduce the values T_a of P1, P2, P3 by 16 K.

Ex ia IIIC



Optional specification, ID Px, Rx = PB

When using the weather protection cover: Reduce the values T_a by 16 K.

Description notes



Unless otherwise indicated, the positions always refer to the basic specification.

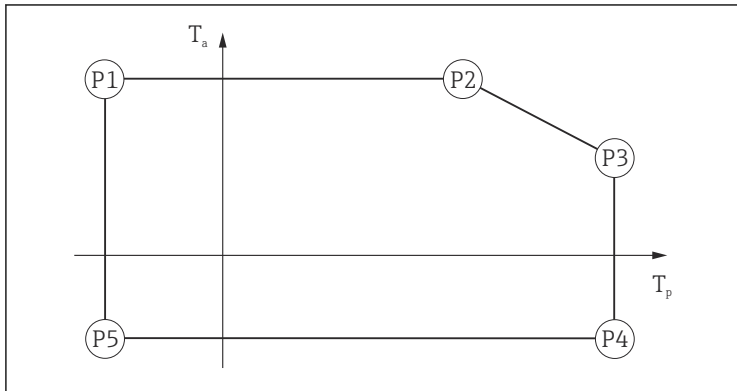
Zone 0, Zone 1

1st column: Position 8 = A, B, ...

2nd column: Temperature classes T6 (85 °C) to T1 (450 °C)

Column P1 to P5: Position (temperature value) on the axes of the derating

- T_a : Ambient temperature in °C
- T_p : Process temperature in °C



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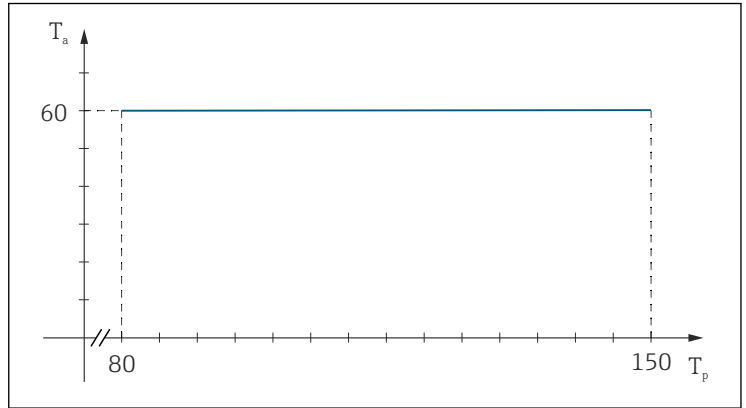
Zone 20, Zone 21 or Zone 21

1st column: Position 8 = A, B, ...

2nd column: Process temperature range in °C

3rd column: Ambient temperature range in °C

4th column: Maximum surface temperature in °C

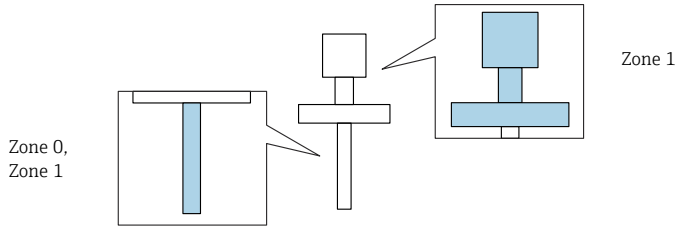


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T_a Ambient temperature in °C

T_p Process temperature in °C

Zone 0, Zone 1

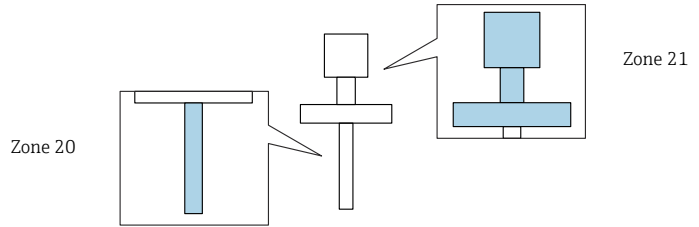


N, P, T		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6	-50	67 65 ¹⁾	67	67 65 ¹⁾	75	60	75	-40 -50 ²⁾ -52 ³⁾	-50	-40 -50 ²⁾ -52 ³⁾
	T5	-50	70 65 ¹⁾	70	70 65 ¹⁾	90	60	90		-50	
	T4 ⁴⁾	-50	70 65 ¹⁾	70	70 65 ¹⁾	125 120 ⁵⁾	60	125 120 ⁵⁾		-50	
	T3...T1 ⁴⁾	-50	70 65 ¹⁾	70	70 65 ¹⁾	150 120 ⁵⁾	60	150 120 ⁵⁾		-50	

- 1) Only in connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG
- 2) Only in connection with Optional specification, ID Jx, Kx = JL
- 3) Only in connection with Optional specification, ID Jx, Kx = JN
- 4) In connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG: The temperature classes change to T4...T1
- 5) Only in connection with Position 9 = N

C		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6	-50	67	67	67	75	60	75	-40	-50	-40
	T5...T1	-50	70	70	70	75	60	75	-40	-50	-40

Zone 20, Zone 21



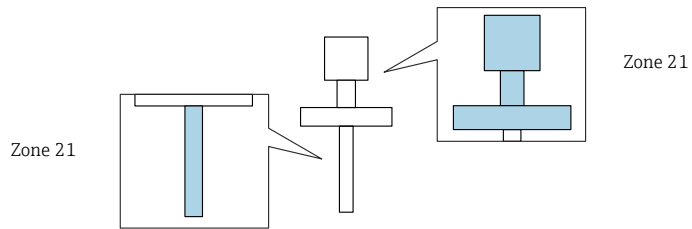
<i>N, P, T</i>			
	$-50 \leq T_p \leq +150$ $-50 \leq T_p \leq +120$ ¹⁾	$-40 \leq T_a \leq +60$ $-50 \leq T_a \leq +60$ ²⁾ $-52 \leq T_a \leq +60$ ³⁾	Zone 20: $T_{200} -25$ to $+165$ ⁴⁾
			Zone 21: $T_L -48$ to $+155$ ⁵⁾

- 1) Only in connection with Position 9 = N
- 2) Only in connection with Optional specification, ID Jx, Kx = JL
- 3) Only in connection with Optional specification, ID Jx, Kx = JN
- 4) With 200 mm dust deposit
- 5) With dust accumulation T_L

<i>C</i>			
	$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$	Zone 20: $T_{200} -25$ to $+95$ ¹⁾
			Zone 21: $T_L -35$ to $+85$ ²⁾

- 1) With 200 mm dust deposit
- 2) With dust accumulation T_L

Zone 21



<i>N, P, T</i>			
	$-50 \leq T_p \leq +150$ $-50 \leq T_p \leq +120$ ¹⁾	$-40 \leq T_a \leq +60$ $-50 \leq T_a \leq +60$ ²⁾ $-52 \leq T_a \leq +60$ ³⁾	$T_L -48$ to $+155$ ⁴⁾

- 1) Only in connection with Position 9 = N
- 2) Only in connection with Optional specification, ID Jx, Kx = JL
- 3) Only in connection with Optional specification, ID Jx, Kx = JN
- 4) With dust accumulation T_L

<i>C</i>			
	$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$	$T_L -35$ to $+85$ ¹⁾

- 1) With dust accumulation T_L

Connection data

Optional specification, ID Nx, Ox = NF, NG

When using the Bluetooth® module: No changes to the connection values.

Associated intrinsically safe power supply unit with max. electrical specifications below the characteristic values of the electronic inserts

<i>Basic specification, Position 3, 4</i>	Power supply circuit
A7	$U_i = 14.6 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 633 \text{ mW}$ $L_i = 0$ $C_i = 3 \text{ nF}$
A8	$U_i = 16 \text{ V}$ $I_i = 52 \text{ mA}$ $P_i = 170 \text{ mW}$ $L_i = 0$ $C_i = 30 \text{ nF}$

Only associated intrinsically safe power supply unit FML621 from Endress+Hauser

<i>Basic specification, Position 3, 4</i>	Power supply circuit
GA	$U_i = 27.6 \text{ V}$ $I_i = 93 \text{ mA}$ $P_i = 640 \text{ mW}$ $L_i = 3 \text{ }\mu\text{H}$ $C_i = 3 \text{ nF}$

Cable entry parameters

Ex ia IIC

Not relevant.

Ex ia IIIC

Cable gland: *Basic specification, Position 7 = B*

mandatory for Position 6 = B, M

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 8 to 10.5 mm ¹⁾ (ø 6.5 to 13 mm) ²⁾	Ms, nickel-plated	Silicone	EPDM (ø 17x2)

1) Standard

2) Separate clamping inserts available

Cable gland: *Basic specification, Position 7 = C*

preferably for Position 6 = C and possible for Position 6 = B, M

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 7 to 12 mm	1.4404	NBR	EPDM (ø 17x2)



- The tightening torque refers to cable glands installed by the manufacturer:
 - Recommended torque to connect the cable gland into the enclosure: 3.75 Nm
 - Recommended torque to tighten the cable into the cable gland: 3.5 Nm
 - Maximum torque to tighten the cable into the cable gland: 10 Nm
- This value may be different depending on the type of cable. However, the maximum value must not be exceeded.
- Only suitable for fixed installation. The operator must pay attention to a suitable strain relief of the cable.
- To maintain the ingress protection of the enclosure: Install the enclosure cover, cable glands and blind plugs correctly.
- The cable glands are suitable for a low risk of mechanical danger (4 Joule) and must be mounted in a protected position if larger impact energy levels are expected.



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