

Safety Instructions

Gammapilot FTG20

ATEX, IECEx: Ex db ia IIC Gb
Ex db [ia] IIC Gb
Ex tb ia IIIC Db
Ex tb [ia] IIIC Db



Gammapilot FTG20

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About this document



This document has been translated into several languages. Legally determined is solely the English source text.

The document translated into EU languages is available:

- In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Manuals and Datasheets -> Type: Ex Safety Instruction (XA) -> Text Search: ...
- In the Device Viewer: www.endress.com -> Product tools -> Access device specific information -> Check device features



If not yet available, the document can be ordered.

Associated documentation

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

BA01035F/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

Manufacturer's certificates

EU Declaration of Conformity

Declaration Number:
EG12020

The EU Declaration of Conformity is available:

In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Declaration -> Type: EU Declaration -> Product Code: ...

EU type-examination certificate

Certificate number:
BVS 12 ATEX E 054 X

List of applied standards: See EU Declaration of Conformity.

IEC Declaration of Conformity

Certificate number:
IECEX BVS 12.0080 X

Affixing the certificate number certifies conformity with the following standards (depending on the device version):

- IEC 60079-0 : 2017
- IEC 60079-1 : 2014
- IEC 60079-11 : 2011
- IEC 60079-31 : 2013

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

FTG20	-	*****	+	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: Gammapilot



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

FTG20

Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
FTG20	BA	ATEX II 2 G Ex db ia IIC T6...T4 Gb
	BB	ATEX II 2 G Ex db [ia] IIC T6...T4 Gb
	BD	ATEX II 2 D Ex tb ia IIIC Txxx°C Db
	BE	ATEX II 2 D Ex tb [ia] IIIC Txxx°C Db
	IA	IECEX Ex db ia IIC T6...T4 Gb
	IB	IECEX Ex db [ia] IIC T6...T4 Gb
	ID	IECEX Ex tb ia IIIC Txxx°C Db
	IE	IECEX Ex tb [ia] IIIC Txxx°C Db

Position 4 (Electronics, Output)		
Selected option		Description
FTG20	4	FEG24; relay DPDT, 19-253VAC, 19-55VDC
	5	FEG25; 8/16mA, 11-35VDC

Position 5 (Housing Transmitter)		
Selected option		Description
FTG20	A	F13 Alu IP66/67 NEMA Type4/6 Encl.
	B	F27 316L IP66/68 NEMA Type4X/6P Encl.

Position 6 (Electrical Connection)		
Selected option		Description
FTG20	1 ¹⁾	Gland M20
	2	Thread M20
	3	Thread G1/2
	4	Thread NPT3/4

1) Only in connection with Position 1 = BA, BD, BE, IA, ID, IE

Position 7 (Housing Sensor)		
Selected option		Description
FTG20	B	316L IP66/68 NEMA Type4X/6P Encl.
	D	316L IP66/68 NEMA Type4X/6P Encl. + connection compartment

Optional specifications

ID Nx (Accessory Mounted)		
Selected option		Description
FTG20	NA	Cooling tube
	NB	Glass cover

Safety instructions:
General

- The device is intended to be used in explosive atmospheres as defined in the scope of IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the manufacturer's specifications.
- Comply with the installation and safety instructions in the Operating Instructions.
- 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.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. enclosure, sensor element, special varnishing, attached additional plates, ..)
 - Of isolated capacities (e.g. isolated metallic plates)

Safety instructions:
Special conditions

In the event of additional or alternative special varnishing on the enclosure or other metal parts:

- Observe the danger of electrostatic charging and discharge.
- Do not rub surfaces with a dry cloth.

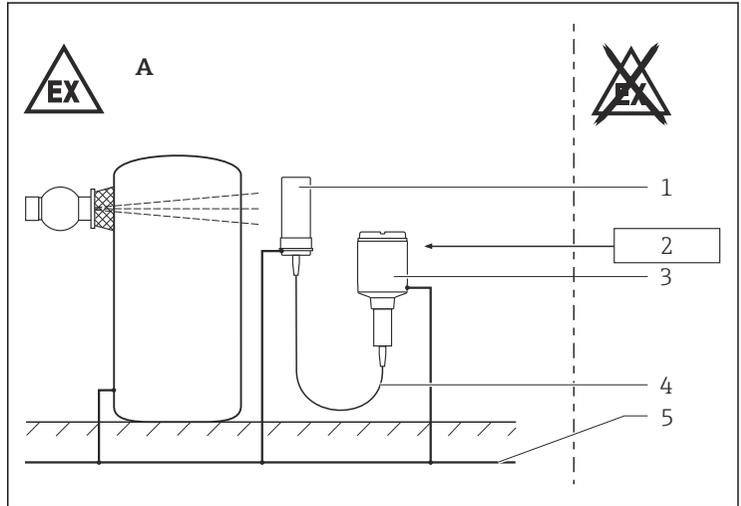
Connecting cable between sensor and transmitter

- Do not install in the vicinity of processes generating strong electrostatic charges.
- Avoid electrostatic charging of the sensor cable (e.g. do not rub dry and install outside the filling flow).
- Do not leave cable hanging loosely when installed.
- If the connecting cable is removed from both the sensor and the transmitter: Ensure that measures are taken to avoid electrostatic discharge in an explosive atmosphere.

Basic specification, Position 5 = A

Avoid sparks caused by impact and friction.

Safety instructions: Installation



1

A Zone 1, Zone 21

1 Sensor

2 Basic specification, Position 4 = 4: Power supply

Basic specification, Position 4 = 5: Associated intrinsically safe apparatus
[Ex ia]

3 Basic specification, Position 4 = 4: Transmitter (Ex d or Ex t)

Basic specification, Position 4 = 5: Transmitter (Ex ia)

4 Connection cable (Ex ia)

5 Potential equalization

 Cable designation: Lapp Ölflex Heat 180 EWKF or Helu Thermflex 180 EWKF-C

- To maintain the ingress protection of the enclosure: Install the enclosure cover, cable glands and blind plugs correctly.
- Seal unused entry glands with sealing plugs.
- Continuous service temperature of the connecting cable: $\geq T_a + 20 \text{ K}$.
- After aligning (rotating) the enclosure, retighten the fixing screw (see Operating Instructions).

Explosion protection "Flameproof enclosure Ex db"

Basic specification, Position 1, 2 = BB, IB and Position 6 = 3

Flameproof equipment with G threaded entry holes is not intended for new installations but only for replacement of equipment in existing installations. Application of this equipment shall comply with the local installation requirements.

Potential equalization

Integrate the device into the local potential equalization.

Safety instructions: Ex d joints

- If required or if in doubt: ask manufacturer for specifications.
- Flameproof joints are not intended to be repaired.

Safety instructions: Zone 1

Basic specification, Position 4 = 4

- Connect the device:
 - Using suitable cable and wire entries of protection type "Flameproof Enclosure (Ex db)".
 - Using piping systems of protection type "Flameproof Enclosure (Ex db)".
- Seal unused entry glands with approved Ex db sealing plugs.
- The plastic sealing plug is used only as transport protection.
- Only use certified cable entries or sealing plugs. The metal sealing plugs supplied meet this requirement.
- Before operation:
 - Screw in the cover all the way.
 - Tighten the securing clamp on the cover.
- Replace cable glands and sealing plugs only with identical parts.
- Lay connecting cable and secure.
- The intrinsically-safe signal circuits are galvanically isolated from other circuits up to a peak value of the nominal voltage of 375 V.

Basic specification, Position 4 = 4 and Position 5

Do not open in a potentially explosive atmosphere.

Safety instructions: Zone 21

Basic specification, Position 4 = 4

- Connect the device:
 - Using suitable cable and wire entries.
 - Using piping systems.
- Only use cable and wire entries suitable for Zone 21 with the degree of protection IP68. Cable and wire entries must be suitable for an ambient temperature of at least -40 to $+70$ °C.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection.
- The plastic sealing plug is used only as transport protection.
- Lay connecting cable and secure.
- Replace cable glands and sealing plugs only with identical parts.
- The intrinsically-safe signal circuits are galvanically isolated from other circuits up to a peak value of the nominal voltage of 375 V.

Basic specification, Position 4 = 4 and Position 5

Do not open in a potentially explosive dust atmosphere.

Safety instructions:
Zone 1, Zone 21

Basic specification, Position 4 = 5

- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 500 V_{rms}.
- The intrinsically safe signal circuit of the sensor is isolated from ground. The dielectric strength is at least 500 V_{rms}.
- When the device is connected to an intrinsically safe circuit Ex ib, the type of protection changes to Ex ib.
- When the device is connected to an intrinsically safe circuit Ex ic, the type of protection changes to Ex ic. Do not operate intrinsically safe circuits Ex ic in Zone 1 or Zone 21.

Safety instructions:
Zone 21, Zone 22

Basic specification, Position 4 = 5

For service operations, the transmitter enclosure may be opened under voltage for a short time. When the terminal compartment is opened make sure that no dust may deposit.
After configuration screw the cover down to limit stop.

Temperature tables

Basic specification, Position 4 = 4

Type of protection	Transmitter			Temperature class		Operating condition
	Enclosure	Enclosure	Signal circuit	Surface temperature	Ambient temperature range	
				Transmitter	Sensor	Sensor
Ex db ia IIC T6 Gb	Ex db	Ex db	Ex ia	T6 for T _a = -40 to +70 °C	T6 for T _a = -40 to +70 °C	Without water cooling or water cooling out of operation.
Ex db ia IIC T4 Gb					T4 for T _a = -40 to +120 °C	With water cooling in operation.
Ex tb ia IIIC T90°C Db	Ex tb	Ex tb	Ex ia	T90°C for T _a = -40 to +70 °C	T75°C for T _a = -40 to +70 °C	Without water cooling or water cooling out of operation.
Ex tb ia IIIC T125°C Db					T125°C for T _a = -40 to +120 °C	With water cooling in operation.

Basic specification, Position 4 = 5

Type of protection	Transmitter			Temperature class		Operating condition
	Enclosure	Enclosure	Signal circuit	Surface temperature	Ambient temperature range	
	Transmitter Enclosure	Sensor Enclosure	Signal circuit	Transmitter	Sensor	Sensor
Ex db ia IIC T6 Gb	Ex ia	Ex db	Ex ia	T6 for $T_a = -40$ to $+40$ °C T4 for $T_a = -40$ to $+70$ °C	T6 for $T_a = -40$ to $+70$ °C	Without water cooling or water cooling out of operation.
Ex db ia IIC T4 Gb					T4 for $T_a = -40$ to $+120$ °C	With water cooling in operation.
Ex tb ia IIIC T75°C Db	Ex ia	Ex tb	Ex ia	T75°C for $T_a = -40$ to $+70$ °C	T75°C for $T_a = -40$ to $+70$ °C	Without water cooling or water cooling out of operation.
Ex tb ia IIIC T125°C Db					T125°C for $T_a = -40$ to $+120$ °C	With water cooling in operation.

Connection data

Transmitter

Basic specification, Position 4 = 4

Power supply terminal 1, 2:

19 to 253 V_{AC}
 19 to 55 V_{DC}
 $U_m = 253$ V_{AC}

Terminal 3, 4, 5 and 6, 7, 8 relay contacts:

250 V_{AC}, 4 A
 1000 VA (cos φ = 1),
 750 VA (cos φ = 0.7)
 or
 30 V_{DC}, 4 A
 125 V_{DC}, 0.2 A

1 — Terminals

2 — Potential equalization

A0037875

Basic specification, Position 4 = 5

Terminal 1, 2:

$U_1 = 30 \text{ V}$
 $I_1 = 100 \text{ mA}$
 $P_1 = 1 \text{ W}$
 $C_1 = 2.4 \text{ nF}$
 $L_1 = 0$

1
2

3

1 Terminals
2 Potential equalization

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Sensor

Only for connection to Gammapilot FTG20.

Basic specification, Position 7 = B

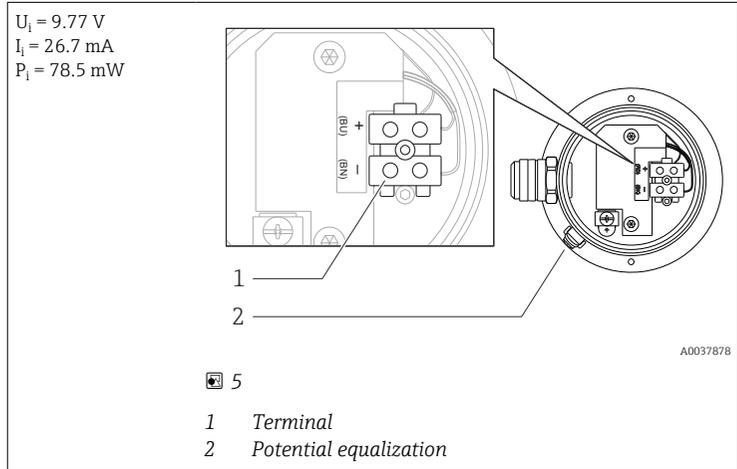
$U_1 = 9.77 \text{ V}$
 $I_1 = 26.7 \text{ mA}$
 $P_1 = 78.5 \text{ mW}$

1
2

4

1 Supplied cable with coded plug connectors
2 Potential equalization

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Basic specification, Position 7 = D**Cable entry parameters****Ex tb [ia] III C**

Basic specification, Position 1, 2 = BE, IE

Cable gland: Basic specification, Position 5 = A and Position 6 = 1

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

1) Standard

2) Separate clamping inserts available

Cable gland: Basic specification, Position 5 = B and Position 6 = 1¹⁾

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	$\varnothing 7$ to 12 mm	1.4404	NBR	EPDM ($\varnothing 17 \times 2$)

1) 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.



- 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.



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