Safety Instructions
Gammapilot M FMG60
PROFIBUS PA, FOUNDATION Fieldbus (Ex ia)

Ex de [ia Ga] IIC T6 Gb
Ex d [ia Ga] IIC T6 Gb

TÜV 13.0916

Segurança
INMETRO TÜVRheinland OCP 0004

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Safety instructions for electrical apparatus for explosion-hazardous areas

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Gammapilot M
FMG60

PROFIBUS PA, FOUNDATION Fieldbus (Ex ia)

Associated Documentation

This document is an integral part of the following Operating Instructions:
PROFIBUS PA: BA00329F/00
FOUNDATION Fieldbus: BA00330F/00

The Operating Instructions which are supplied and correspond to the device type apply.

Supplementary Documentation

Explosion-protection brochure:
CP00021Z/11

Designation

Explanation of the labelling and type of protection can be found in the explosion protection brochure.

Designation of type of protection	**Ex de [ia Ga] IIC T6 Gb** **Ex d [ia Ga] IIC T6 Gb**

Applied standards

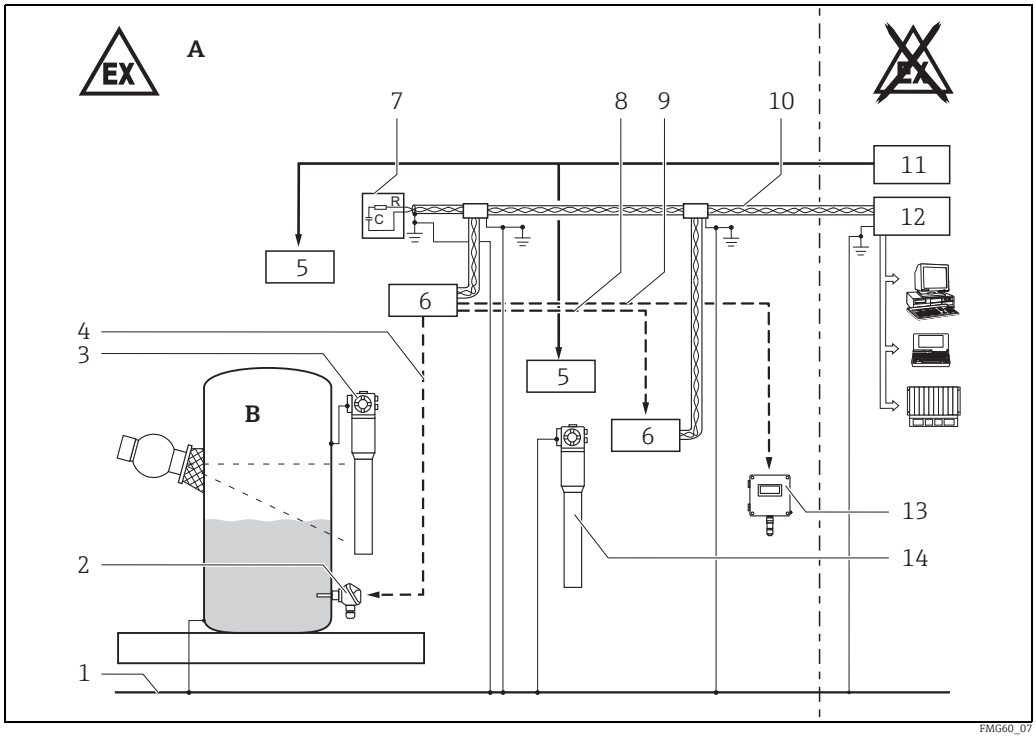
ABNT NBR IEC 60079-0 :2008
ABNT NBR IEC 60079-1 :2009
ABNT NBR IEC 60079-7 :2008
ABNT NBR IEC 60079-11:2009
ABNT NBR IEC 60079-26:2008

Communication PROFIBUS PA, FOUNDATION Fieldbus in type of protection Intrinsic Safety "ia"

Type:

FMG60-**B2*****, FMG60-**E2*****, FMG60-**J2*****, FMG60-**K2*****, FMG60-**L2***** or

FMG60-**B3*****, FMG60-**E3*****, FMG60-**J3*****, FMG60-**K3*****, FMG60-**L3*****



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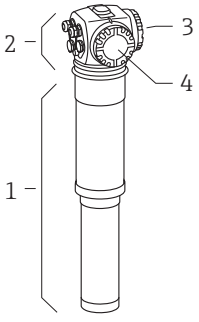
A *Zone 1 or Zone 2*
B *Zone 0 or Zone 1*

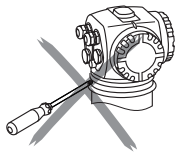
1 Local potential equalization line
2 PT100; certified apparatus
3 Gammapilot with NaJ crystal scintillator or PVT plastic scintillator
4 [Ex ia] circuit
5 Terminal compartment A (Ex d or Ex e)
6 Terminal compartment B (Ex i)
7 Approved terminating resistor Ex ia IIC
8 [Ex ia] circuit; Cascade in, out
9 [Ex ia] circuit
10 Communication: PROFIBUS PA or FOUNDATION Fieldbus, Ex ia
11 Power supply
12 Certified associated apparatus
13 Remote display FHX40
14 Gammapilot with NaJ crystal scintillator or PVT plastic scintillator



1 Pipe housing
2 Compartment housing
3 Terminal compartment A
4 Terminal compartment B

Safety instructions: Installation

- Comply with the installation and safety instructions in the Operating Instructions.
- Install the device according to the manufacturer's instructions and any other valid standards and regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- To maintain the ingress protection of the housing IP65/IP67, install the housing cover and cable glands correctly.
- Connect the apparatus to the on-site potential equalization line.
- Cable glands as well as sealing plugs of the terminal compartment A must not be exchanged with those of the terminal compartment B.
- During operation, the covers must be screwed all the way in and the safety catch of the cover must be fastened.
- Do not open the terminal compartment A when energized.
- In an explosive atmosphere: Minimum waiting time before opening the terminal compartment A after switching off the power supply: 3 minutes.
- The safety screws at the pipe housing must not be loosened:



When using the water cooling

- Use connecting cables for continuous service temperature $T \geq T_a$ +5 K.

Avoid electrostatic charging

- In case of additional or alternative special varnishing of the enclosure or other metallic parts:
  - Do not rub the surfaces dry.
  - Do not install in the vicinity of processes generating strong electrostatic charges.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. housing, sensor element, special varnishing , attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)

Power supply in type of protection Increased Safety "e"

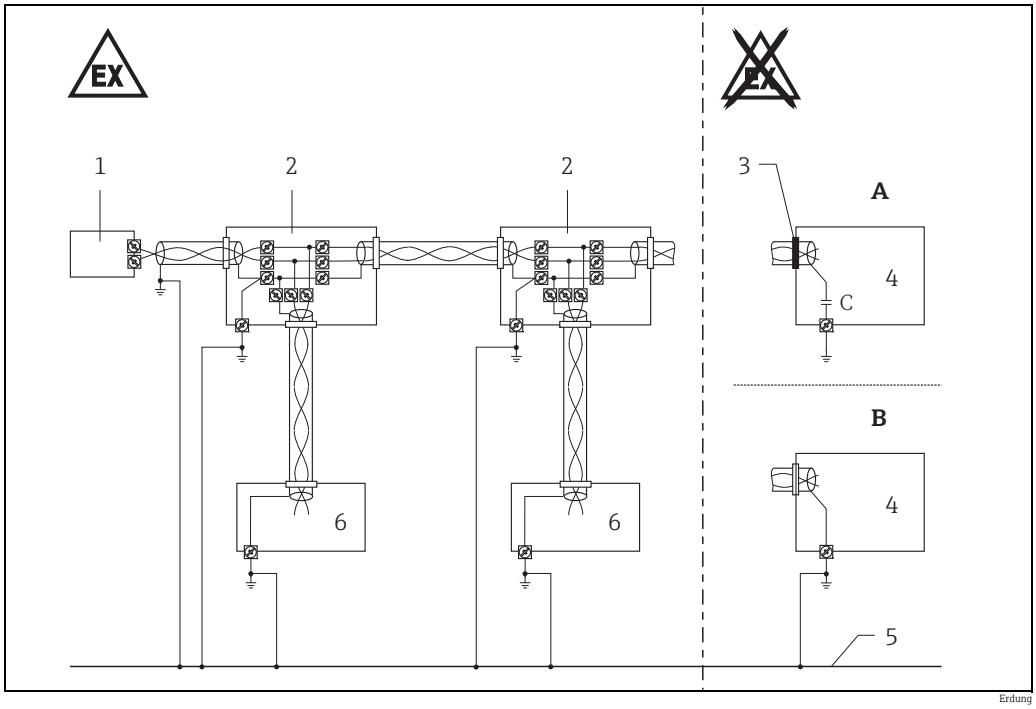
- Only use suitable certified Ex e cable glands providing an ingress protection rating of at least IP65/IP67, which are suitable for the intended ambient temperature range.
- Replace cable glands and sealing plugs only with identical parts.

Power supply in type of protection Flameproof Enclosure "d"

- Connect the device using suitable certified Ex d cable glands or using conduit systems of protection type Flameproof Enclosure "d".
- Close unused entry glands with approved Ex d sealing plugs.

Signal circuit in type of protection Intrinsic Safety "ia"

- The pertinent guidelines must be observed when intrinsically safe circuits are connected together (Proof of Intrinsic Safety).
- The instrinsically safe circuits are galvanically isolated from other circuits up to a peak value of the nominal voltage of 375 V.
- The intrinsically safe circuits of the device are isolated from ground potential and have a dielectric strength of at least 500 V_{rms} with respect to it.
- When the device is connected to an intrinsically safe circuit Ex ib, the type of protection changes to Ex ib. Do not operate the temperature sensor in Zone 0 if the device is connected to an intrinsically safe circuit of Category Ex ib.
- For grounding the screen, → 2.



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A *Version 1*
Use small capacitors (e.g. 1 nF, 1500 V, dielectric strength, ceramic).
Total capacitance connected to the screen may not exceed 10 nF.

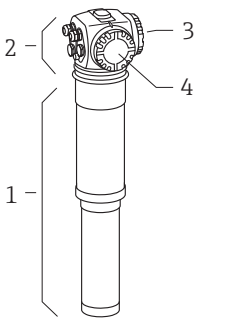
B *Version 2*

1 *Terminating resistor*
2 *Distributor/T box*
3 *Screen insulated*
4 *Supply unit/Segment coupler*
5 *Potential equalization (secured in high degree)*
6 *Field device*

Temperature tables

Temperature class
T6

Ambient temperature	
Detector without water cooling or detector with water cooling out of operation:	
▪ Devices with NaJ crystal scintillator:	$-40\,^{\circ}C \leq T_a \leq +60\,^{\circ}C$
▪ Devices with PVT plastic scintillator:	$-40\,^{\circ}C \leq T_a \leq +60\,^{\circ}C$
Detector with water cooling in operation:	
At the pipe housing (within the water cooling):	
▪ Devices with NaJ crystal scintillator:	$-40\,^{\circ}C \leq T_a \leq +60\,^{\circ}C$
▪ Devices with PVT plastic scintillator:	$-40\,^{\circ}C \leq T_a \leq +60\,^{\circ}C$
At the compartment housing:	$-40\,^{\circ}C \leq T_a \leq +80\,^{\circ}C$



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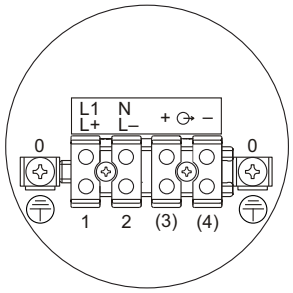
1 *Pipe housing*
2 *Compartment housing*
3 *Terminal compartment A*
4 *Terminal compartment B*

Type of protection	
Power supply circuit (Terminal compartment A)	Ex e or Ex d
Signal circuits (Terminal compartment B)	Ex ia

Connection data

Terminal compartment A

Increased Safety "e" or Flameproof Enclosure "d"



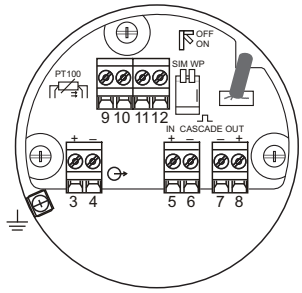
Power supply circuit		
Type AC-power supply	L1 N	U_e = 90…253 VAC, 50/60 Hz, 8.5 VA
Type DC-power supply	L+ L–	U_e = 18…36 VDC, 3.5 W U_m = 253 VAC

Signal circuit		
not connected	⊖▶ + –	

Terminal compartment B

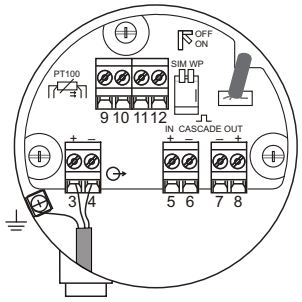
Intrinsic Safety "ia"

Type:
FMG60-*******1*



Type:
FMG60-*******2*,
FMG60-*******3*

M12 or 7/8" plug



Signal circuit			Ex ia IIC	Ex ia IIB	Ex ib IIC	Ex ib IIB
PA, FF *1	⊖► + –	$U_i \le 17.5$ V $I_i \le 500$ mA $P_i \le 5.5$ W or $U_i \le 24$ V $I_i \le 250$ mA $P_i \le 1.2$ W $C_i \le 5$ nF $L_i \le 10$ µH				
		suitable for connection to a fieldbus system according to the FISCO model				
*1 only available at the versions: FMG60-**B******, FMG60-**E******, FMG60-**J******, FMG60-**K******, FMG60-**L******.						
PT100	PT100	$U_o = 8.4$ V $I_o = 8.3$ mA $P_o = 17.5$ mW $R_i = 1012\ \Omega$ $C_i = 0$ $L_i = 0$ Characteristic curve: linear	$C_o = 1200$ nF at $L_o = 1$ mH $C_o = 1800$ nF at $L_o = 0.15$ mH	$C_o = 6$ µF at $L_o = 1$ mH $C_o = 5.2$ µF at $L_o = 2$ mH	$C_o = 5.2$ µF $L_o = 400$ mH	$C_o = 43$ µF $L_o = 400$ mH
Cascade out	⎍ – +	$U_o = 8.4$ V $I_o = 19.2$ mA $P_o = 40.3$ mW $R_i = 439\ \Omega$ $C_i = 5.3$ nF $L_i = 67$ µH Characteristic curve: linear	$C_o = 5.1$ µF $L_o = 69$ mH	$C_o = 42$ µF $L_o = 199$ mH	$C_o = 5.1$ µF $L_o = 69$ mH	$C_o = 42$ µF $L_o = 199$ mH
Only for connection to FMG60 signal circuit "Cascade in"						
Cascade in	⎍ + –	$U_i = 8.4$ V $I_i = 19.2$ mA $P_i = 40.3$ mW $C_i = 0$ $L_i = 67$ µH				
Only for connection to FMG60 signal circuit "Cascade out"						
Connection for FHX40		$U_o = 4.7$ V $I_o = 37.7$ mA $P_o = 44.3$ mW $R_i = 125\ \Omega$ $C_i = 12.7$ nF $L_i = 0$ Characteristic curve: linear	For connection to the approved display FHX40 with associated cable in type of protection Intrinsic Safety Ex ia IIC or IIB. Observe associated Safety Instructions! $C_o = 150$ µF $L_o = 25$ mH			

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