Products   Solutions   Services

Safety Instructions
Proline Promag 300

EAC: Zone 2

Endress+Hauser [EH]

People for Process Automation

Proline Promag 300

Table of contents

About this document

The document number of these Safety Instructions (XA) must match the information on the nameplate.

Associated documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *Device Viewer* (www.endress.com/deviceviewer): Enter serial number from nameplate.
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

To commission the device, please observe the Operating Instructions pertaining to the device:

Measuring instrument	Documentation code			
	HART	FOUNDATION Fieldbus	PROFIBUS PA	PROFIBUS DP
Promag H 300	BA01392D	BA01477D	BA01396D	BA01865D
Promag P 300	BA01393D	BA01478D	BA01397D	BA01853D
Promag W 300	BA01918D	BA01938D	BA01928D	BA01940D

Measuring instrument	Documentation code			
	Modbus RS485	EtherNet/IP	PROFINET	PROFINET mit Ethernet-APL
Promag H 300	BA01394D	BA01716D	BA01718D	BA02106D
Promag P 300	BA01395D	BA01717D	BA01719D	BA02105D
Promag W 300	BA01939D	BA01937D	BA01941D	BA02104D

Additional documentation

Contents	Document type	Documentation code
Remote display and operating module DKX001	Special documentation	SD01763D
	Safety Instructions 2Ex ec IIC T6 Gc	XA01665D
Explosion Protection	Brochure	CP00021Z/11
Ethernet-APL Installation Drawing	Installation Drawing	HE_01622

Please note the documentation associated with the device.

Manufacturer's certificates

Measuring instruments meet the fundamental health and safety requirements for the design and construction of devices and protective

systems intended for use in potentially explosive atmospheres in accordance with TR CU 012/2011.

Certification body

LLP "T-Standard"

Certificate number

ЕАЭС KZ 7500525.01.01.01597

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

- ГОСТ 31610.0-2019 (IEC 60079-0:2017)
- ГОСТ 31610.7-2017 (IEC 60079-7:2015)
- ГОСТ 31610.11-2014 (IEC 60079-11:2011)
- ГОСТ 31610.15-2014 (IEC 60079-15:2010)

Manufacturer address

Endress+Hauser Flowtec AG
35, rue de l'Europe
68700 Cernay
France

Endress+Hauser Flowtec (India) Pvt. Ltd.
M-171/176, Waluj Industrial Area, MIDC
IN-431 136 Aurangabad
India

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

* * * * * *	_	* * * * * ... * * * * *	+	A*B*C*D*E*F*G*...
(Device type)		*(Basic specifications)*		*(Optional specifications)*

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

Device type

The device and the device design is defined in the "Device type" section (Product root).

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.

Device type

Position	Order code for	Option selected	Description
1	Instrument family	5	Electromagnetic flowmeter
2	Sensor	H, P, W [1]	Sensor type
3	Transmitter	3	Transmitter type: 4-wire, compact version
4	Generation index	B	Platform generation
5, 6	Nominal diameter	Examples: 02, 04, 40, 50, 1H, 1Z, T0, E4 [2] [3]	Nominal diameter of sensor

1)   For replacement transmitter only: X
2)   For the exact specification of the nominal diameter, see nameplate
3)   For replacement transmitter only: XX

Basic specifications

Position 1, 2 Order code for "Approval" Option selected	Position 4, 5 Order code for "Output, input 1" Option selected	Type of protection	
		Transmitter	Sensor
GS, BS	BA, BB, GA, LA, MA, NA, RA, SA, MB, RB	2Ex ec nC ic IIC T5...T1 Gc X	2Ex ec ic IIC T5...T1 Gc X
	HA, TA, MC, RC	2Ex ec nC ic [ic] IIC T5...T1 Gc X	

Position	Order code for	Option selected	Description
4, 5	Output, input 1	BA	4-20mA HART
		GA	PROFIBUS PA
		HA	PROFIBUS PA Ex-i
		LA	PROFIBUS DP
		MA	Modbus RS485
		MB	Modbus TCP with Ethernet-APL
		MC	Modbus TCP with Ethernet-APL Ex i
		NA	EtherNet/IP 2-port switch integrated
		RA	PROFINET IO 2-port switch integrated
		RB	PROFINET with Ethernet-APL
		RC	PROFINET with Ethernet-APL Ex i
		SA	FOUNDATION Fieldbus
		TA	FOUNDATION Fieldbus Ex-i
6	Output, input 2	A	W/o
		B	4-20mA
		C	4-20mA Ex-i passive
		D	Configurable I/O initial setting off
		E	Pulse/frequency/switch output
		F	Pulse output, phase-shifted
		G	Pulse/frequency/switch output Ex-i passive
		H	Relay
		I	4-20mA input
		J	Status input
7	Output, input 3	A	W/o
		B	4-20mA
		C	4-20mA Ex-i passive
		D	Configurable I/O initial setting off
		E	Pulse/frequency/switch output
		F	Pulse output, phase-shifted
		G	Pulse/frequency/switch output Ex-i passive
		H	Relay
		I	4-20mA input
		J	Status input

Position	Order code for	Option selected	Description
8	Display; Operation	A	W/o; via communication
		F	4-line, illuminated; touch control
		G	4-line, illuminated; touch control + WLAN
		M	Without; prepared for remote display DKX001 [1]
		O	Separate, with remote display DKX001 [1], 4-line, illuminated; 10 m / 30 ft cable; touch control
9	Housing	A	Alu, coated
		B	Stainless, hygienic
11	Liner	A	PFA
		B	PFA High-temperature
		E	PTFE
		H	Hard rubber
		Q	PTFE 90℃
		U	Polyurethane
17, 18	Device Model	A1	1
		A2	2

1)   DKX001 is separately approved.

Optional specifications

ID	Order code for	Option selected	Description
Cx	Sensor option	CG	Extended neck for insulation [1]
Px	Enclosed accessories	P8	Wireless antenna, wide area (external WLAN antenna) [2]

1)   Only for Promag W and Promag P available
2)   The external WLAN antenna is available with the order code for "Accessory Enclosed", option P8.

Safety instructions: General

- 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 or guidelines (e.g. ГОСТ IEC 60079-14-2013)
- 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.
- 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 classes.
- Alterations to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- Observe all the technical data of the device (see nameplate).

Safety instructions: Installation

- In the case of a horizontal orientation and the order code for "Housing", option **B** "Stainless, hygienic": install the transmitter at the side of or below the sensor.
  For more information on the orientation, see the Operating Instructions for the device → 🕮 4
- The following applies for devices with order code for "Housing", Option B "Stainless, hygienic": Thermal insulation is not allowed.
- Continuous service temperature of the connecting cable: −40 to +80 ℃; but at least according to the operating temperature range of the application plus allowance for process conditions ($T_{a, min}$ and $T_{a, max}$ + 20 K).
- Only use certified cable glands suitable for the application. Observe selection criteria as per ГОСТ IEC 60079-14-2013.
- When the measuring device is connected, attention must be paid to the type of protection at the transmitter.
- Turning the transmitter housing
  - Loosen both hexagon socket screws until the transmitter housing can be turned.
  - Turn transmitter housing to desired position (mechanically limited); if necessary turn 270° in other direction.
  - Tighten both hexagon socket screws with a maximum of 7 Nm.
- In potentially explosive atmospheres:
  - Do not disconnect the electrical connection of the power supply circuit when energized.
  - Do not open the connection compartment cover when the device is energized.

Ex ec type of protection

- In potentially explosive atmospheres: Do not disconnect the electrical connection of the power supply circuit when energized.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection.
- Only use certified cable entries or sealing plugs.
- Equipment in type of protection Ex ec, shall be installed using a transient protection not exceeding 140% of the peak rated voltage value at the power supply terminals and IO terminals.
- For measuring devices with order code "Housing", option B "Stainless, hygienic":
  - To close the connection compartment cover, first hand-tight the cover and then tighten it further 45° (corresponds to 15 Nm).
  - In combination with order code "Display; Operation", option F or G "4-line illum.": Prevent electrostatic charge. Clean only with moist cloth.

Optional external WLAN antenna

- Connect the antenna bushing H337 to the transmitter housing and tighten by hand.
- Use only external antennas supplied by Endress+Hauser.
- Connect antenna or antenna cable with plug-in connector type N (MIL-STD-348) to antenna bushing H337.

Intrinsic safety

Observe the guidelines for interconnecting intrinsically safe circuits (e.g. ГОСТ IEC 60079-14-2013 , proof of intrinsic safety).

- When using the remote display and operating module DKX001 the internal display and operating module must be removed.
- When using the separate approved, remote display and operating module DKX001, only use the following variants: Basic specification of the remote display and operating module DKX001, order code "Approval", option GS, BS

Potential equalization

- Integrate the device into the potential equalization .
- If the ground connection has been established via the pipe as specified, it is also possible to integrate the sensor into the potential equalization system via the pipe.
- The antenna bushing H337 of the external antenna must be integrated into the potential equalization system. This is the case if the sensor is connected in accordance with the regulations via the coupling.

Temperature tables	**Ambient temperature**

Minimum ambient temperature

$T_{a, min}$ = –40 °C

Maximum ambient temperature

$T_{a, max}$ = +60 °C depending on the medium temperature and temperature class.

Medium temperature

Minimum medium temperature

$T_{m, min}$ = –40 to 0 °C depending on the selected device version (see nameplate!)

Maximum medium temperature

$T_{m, max}$ for T5...T1 depending on the maximum ambient temperature $T_{a, max}$.

Maximum medium temperature with or without thermal insulation according to Endress+Hauser specifications

Promag H

DN	$T_{a, max}$ [°C]	$T_{m, max}$ [°C]					
		T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
Without thermal insulation							
2 to 150	50	–	95 [1]	130	150	150	150
	55 [2]	–	80 [1]	130	150	150	150
	60 [2]	–	–	100	100	100	100

[1] The maximum admissible ambient temperature changes for devices with order code for "Housing", Option B "Stainless, hygienic" in connection with temperature class T5: $T_a = T_a - 3$ K

[2] $T_{a, max}$ = 50 °C for optional specification, ID Cx (Sensor option) = CI (Fluid Temperature Probe)

Promag P

DN	Liner	$T_{a, max}$ [°C]	$T_{m, max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
Without thermal insulation								
15 to 600	PTFE	50	–	90	130	130	130	130
		55	–	–	130	130	130	130
		60	–	–	100	100	100	100

DN	Liner	$T_{a, max}$ [°C]	$T_{m, max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
25 to 200	PFA	40	–	–	–	150	150	150
		45	–	95	130	130	130	130
		50	–	90	130	130	130	130
		60	–	–	100	100	100	100
Extended neck for insulation (Optional specification, ID Cx (Sensor Option) = CG), with or without thermal insulation								
15 to 300	PTFE	50	–	90	130	130	130	130
		55	–	–	130	130	130	130
		60	–	–	100	100	100	100
25 to 200	PFA	40	–	–	–	150	150	150
		45	–	95	130	130	130	130
		50	–	90	130	130	130	130
		60	–	–	100	100	100	100
High-temperature version (Order code for "Liner", option B) without thermal insulation								
25 to 200	PFA	45	–	95	130	180	180	180
		50	–	90	130	160	160	160
		60	–	–	100	100	100	100
High-temperature version (Order code for "Liner", option B) with thermal insulation								
25 to 200	PFA	45	–	95	130	170	170	170
		50	–	90	130	160	160	160
		60	–	–	100	100	100	100

Promag W

DN	Liner	$T_{a, max}$ [°C]	$T_{m, max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
Without thermal insulation								
25 to 300	PTFE	50	–	90	90	90	90	90
		55	–	–	90	90	90	90
		60	–	–	90	90	90	90
50 to 3000	Hard rubber	50	–	80	80	80	80	80

| DN	Liner	T$_{a, max}$ [°C]	T$_{m, max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
		60	–	–	80	80	80	80
25 to 1200	PU	50	–	50	50	50	50	50
Extended neck for insulation (Optional specification, ID Cx (Sensor Option) = CG), with or without thermal insulation								
25 to 300	PTFE	50	–	90	90	90	90	90
		55	–	–	90	90	90	90
		60	–	–	90	90	90	90
50 to 300	Hard rubber	50	–	80	80	80	80	80
		60	–	–	80	80	80	80
25 to 1200	PU	50	–	50	50	50	50	50

With thermal insulation without Endress+Hauser specifications

NOTICE

The following applies for devices with order code for "Housing", Option B "Stainless, hygienic":

▶ Thermal insulation is not allowed.

The specified reference temperature T_{ref} and the maximum medium temperature $T_{m, max}$ for each temperature class must not be exceeded.
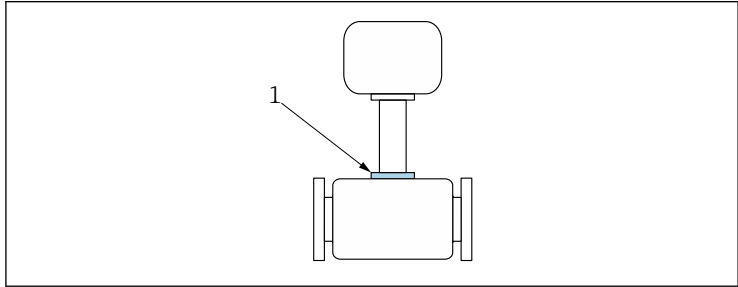
 1   *High-temperature version or extension neck for insulation: position of reference point for temperature measurement*

1   Reference point (T_{ref})

Reference temperature T_{ref}

T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
–	62.2	74,0	75.6	75.6	75.6

Explosion hazards arising from gas and dust

Determining the temperature class and surface temperature with the temperature table

- In the case of gas: Determine the temperature class as a function of the maximum ambient temperature $T_{a, max}$ and the maximum medium temperature $T_{m, max}$.
- In the case of dust: Determine the maximum surface temperature as a function of the maximum ambient temperature $T_{a, max}$ and the maximum medium temperature $T_{m, max}$.

Example

- Measured maximum ambient temperature: $T_{a, max} = 63$ °C
- Measured maximum medium temperature: $T_{m, max} = 108$ °C

T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
40	80	95	130	150	150	150
55	–	95	130	150	150	150
60	–	95	130	150	150	150

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🖻 *2   Procedure for determining the temperature class and surface temperature*

1. In the column for the maximum ambient temperature $T_{a, max}$ select the temperature that is immediately greater than or equal to the maximum ambient temperature $T_{a, max}$ that is present.
   ↳ $T_{a, max}$ = 60 °C.
   The row showing the maximum medium temperature is determined.

2. Select the maximum medium temperature $T_{m, max}$ of this row, which is immediately greater than or equal to the maximum medium temperature $T_{m, max}$ that is present.
   ↳ The column with the temperature class for gas is determined: 108 °C ≤ 130 °C → T4.

3. The maximum temperature of the temperature class determined corresponds to the maximum surface temperature for dust: T4 = 135 °C.

| Connection values: Signal circuits | The following tables contain specifications which are dependent on the transmitter type and its input and output assignment. Compare the following specifications with those on the nameplate of the transmitter. |

Terminal assignment

Transmitter: supply voltage, input/outputs

HART

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (−)	26 (+)	27 (−)	24 (+)	25 (−)	22 (+)	23 (−)
		Device-specific terminal assignment: adhesive label in terminal cover.					

FOUNDATION Fieldbus

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (−)	26 (A)	27 (B)	24 (+)	25 (−)	22 (+)	23 (−)
		Device-specific terminal assignment: adhesive label in terminal cover.					

PROFIBUS DP

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (−)	26 (B)	27 (A)	24 (+)	25 (−)	22 (+)	23 (−)
		Device-specific terminal assignment: adhesive label in terminal cover.					

PROFIBUS PA

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (−)	26 (B)	27 (A)	24 (+)	25 (−)	22 (+)	23 (−)
		Device-specific terminal assignment: adhesive label in terminal cover.					

Modbus RS485

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (−)	26 (B)	27 (A)	24 (+)	25 (−)	22 (+)	23 (−)
		Device-specific terminal assignment: adhesive label in terminal cover.					

Modbus TCP with Ethernet-APL

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (−)	26 (+)	27 (−)	24 (+)	25 (−)	22 (+)	23 (−)
		Device-specific terminal assignment: adhesive label in terminal cover.					

PROFINET

Supply voltage		Input/output 1	Input/output 2		Input/output 3	
1 (+)	2 (−)	PROFINET (RJ45 connector)	24 (+)	25 (−)	22 (+)	23 (−)
			Device-specific terminal assignment: adhesive label in terminal cover.			

PROFINET with Ethernet-APL

Supply voltage		Input/output 1		Input/output 2		Input/output 3	
1 (+)	2 (−)	26 (+)	27 (−)	24 (+)	25 (−)	22 (+)	23 (−)
		Device-specific terminal assignment: adhesive label in terminal cover.					

EtherNet/IP

Supply voltage		Input/output 1	Input/output 2		Input/output 3	
1 (+)	2 (−)	EtherNet/IP (RJ45 connector)	24 (+)	25 (−)	22 (+)	23 (−)
			Device-specific terminal assignment: adhesive label in terminal cover.			

Remote display and operating module DKX001
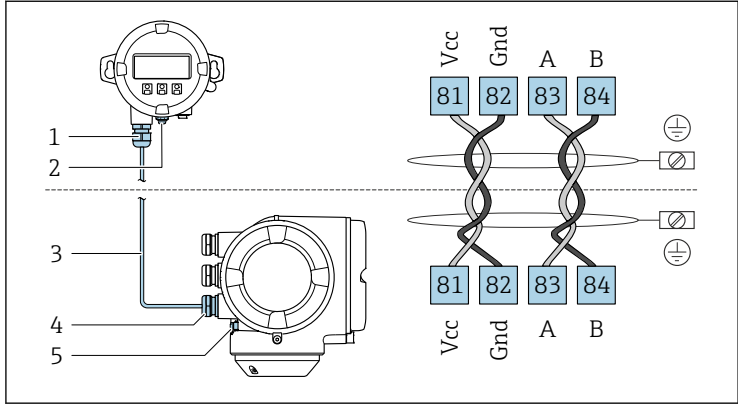
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1   Remote display and operating module DKX001
2   Protective earth (PE)
3   Connecting cable
4   Measuring device
5   Protective earth (PE)

Safety-related values

Order code "Output; input 1"	Output type	Safety-related values "Output; input 1"	
		26 (+)	27 (−)
Option **BA**	Current output 4 to 20 mA HART	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	
Option **GA**	PROFIBUS PA	$U_N = 32\ V_{DC}$ $U_M = 250\ V_{AC}$	
Option **LA**	PROFIBUS DP	$U_N = 32\ V_{DC}$ $U_M = 250\ V_{AC}$	
Option **MA**	Modbus RS485	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	
Option **MB**	Modbus TCP with Ethernet-APL	APL port profile SLAX SPE PoDL classes 10, 11, 12 $U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	
Option **SA**	FOUNDATION Fieldbus	$U_N = 32\ V_{DC}$ $U_M = 250\ V_{AC}$	
Option **NA**	EtherNet/IP	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	

Order code "Output; input 1"	Output type	Safety-related values "Output; input 1"	
		26 (+)	27 (−)
Option **RA**	PROFINET	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	
Option **RB**	PROFINET with Ethernet-APL	APL port profile SLAX SPE PoDL classes 10, 11, 12 $U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$	

Order code "Output; input 2"; "Output; input 3"	Output type	Safety-related values			
		Output; input 2		Output; input 3	
		24 (+)	25 (−)	22 (+)	23 (−)
Option **B**	Current output 4 to 20 mA	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$			
Option **D**	User-configurable input/output	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$			
Option **E**	Pulse/frequency/ switch output	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$			
Option **F**	Double pulse output	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$			
Option **H**	Relay output	$U_N = 30\ V_{DC}$ $I_N = 100\ mA_{DC}/500\ mA_{AC}$ $U_M = 250\ V_{AC}$			
Option **I**	Current input 4 to 20 mA	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$			
Option **J**	Status input	$U_N = 30\ V_{DC}$ $U_M = 250\ V_{AC}$			

Intrinsically safe values

Order code for "Output; input 1"	Output type	Intrinsically safe values "Output; input 1"	
		26 (+)	27 (−)
Option HA	PROFIBUS PA Ex i (STANDARD + FISCO)	U_i = 32 V l_i = 570 mA P_i = 8.5 W L_i = 10 µH C_i = 5 nF	
Option MC	Modbus TCP with Ethernet-APL Ex i	**2-WISE power load, APL port profile SLAC** [1] **Ex ic** U_i = 17.5 V l_i = 380 mA P_i = 5.32 W L_i = 10 µH C_i = 5 nF **Cable specifications according to 2-WISE:** R_c = 15 to 150 Ω/km L_c = 0.4 to 1 mH/km C_c = 45 to 200 nF/km C_c = C_c line/line + 0,5 C_c line/screen, if both lines are floating, or C_c = C_c line/line + C_c line/screen, if the screen is connected to one line Length of cable (not including cable stubs): ≤≤200 m (656.2) Length of cable stubs: ≤1 m (3.3 ft)	
Option RC	PROFINET with Ethernet-APL Ex i		
Option TA	FOUNDATION Fieldbus Ex i (STANDARD + FISCO)	U_i = 32 V l_i = 570 mA P_i = 8.5 W L_i = 10 µH C_i = 5 nF	

1)   For further options see Ethernet-APL Installation Drawing HE_01622.

Order code for "Output; input 2"; "Output; input 3"	Output type	Intrinsically safe values			
		Output; input 2		Output; input 3	
		24 (+)	25 (−)	22 (+)	23 (−)
Option **C**	Current output 4 to 20 mA Ex i passive	U_i = 30 V l_i = 100 mA P_i = 1.25 W L_i = 0 C_i = 0			
Option **G**	Pulse/frequency/ switch output Ex i passive	U_i = 30 V l_i = 100 mA P_i = 1.25 W L_i = 0 C_i = 0			

Remote display DKX001

Basic specification, position 1, 2 Approval	Terminal assignment	Basic specification, position 8 Display; operation Option O
Option **GS, BS**	81, 82, 83, 84	U_n = 3.3 V
		I_n = 150 mA

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