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Safety Instructions
Proline Promag 300

Class I, Zone 1
Zone 21

Endress+Hauser
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	Modbus RS485
Promag H 300	BA01392D	BA01477D	BA01396D	BA01865D	BA01394D
Promag P 300	BA01393D	BA01478D	BA01397D	BA01853D	BA01395D
Promag W 300	BA01918D	BA01938D	BA01928D	BA01940D	BA01939D

Measuring instrument	Documentation code			
	EtherNet/IP	PROFINET	PROFINET over Ethernet-APL	Modbus TCP over Ethernet-APL
Promag H 300	BA01716D	BA01718D	BA02106D	BA02391D
Promag P 300	BA01717D	BA01719D	BA02105D	BA02392D
Promag W 300	BA01937D	BA01941D	BA02104D	BA02393D

Additional documentation

Contents	Document type	Documentation code
Remote display and operating module DKX001	Special documentation	SD01763D
	Safety Instructions Zone 1, Zone 21; Class I, Division 1	XA01499D
Explosion Protection	Brochure	CP00021Z/11
Ethernet-APL Installation Drawing	Installation Drawing	HE_01622
Control drawing		As wanted on the nameplate.

Please note the documentation associated with the device.

Certificates and declarations

Certificate number

CSA 16.70087366

Notified body

CSA Group

Manufacturer address

Endress+Hauser Flowtec AG
Kägenstrasse 7
4153 Reinach BL
Switzerland

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	Selected option	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" Selected option	Position 4, 5 Order code for "Output, input 1" Selected option	Type of protection
C2 [1]	BA, GA, LA, MA, MB, NA, RA, RB, SA	Cl.I, Zone 1, AEx/Ex db eb ia IIC T6...T1 Gb Zone 21, AEx/Ex tb IIIC T** °C Db
	CA, CC, HA, MC, RC, TA	Cl.I, Zone 1, AEx/Ex db eb ia |ia Ga| IIC T6...T1 Gb Zone 21, AEx/Ex tb |ia Da| IIIC T** °C Db
C4 [2]	BA, GA, LA, MA, MB, NA, RA, RB, SA	Cl.I, Zone 1, AEx/Ex db eb ia IIC T6...T1 Gb Zone 21, AEx/Ex tb IIIC T** °C Db
	CA, CC, HA, MC, RC, TA	Cl.I, Zone 1, AEx/Ex db eb ia |ia Ga| IIC T6...T1 Gb Zone 21, AEx/Ex tb |ia Da| IIIC T** °C Db

1) Connection compartment of the transmitter: AEx/Ex eb
2) Connection compartment of the transmitter: AEx/Ex db

Position	Order code for	Selected option	Description
4, 5	Output; input 1	BA	4-20mA HART
		CA	4-20mA HART Ex-i passive
		CC	4-20mA HART Ex-i active
		GA	PROFIBUS PA

Position	Order code for	Selected option	Description
		HA	PROFIBUS PA Ex-i
		LA	PROFIBUS DP
		MA	Modbus RS485
		MB	Modbus TCP over Ethernet-APL/SPE, 10Mbit/s
		MC	Modbus TCP over Ethernet-APL, Ex-i, 10Mbit/s
		NA	EtherNet/IP 2-port switch integrated
		RA	PROFINET IO 2-port switch integrated
		RB	PROFINET over Ethernet-APL/SPE, 10Mbit/s
		RC	PROFINET over Ethernet-APL, Ex-i, 10Mbit/s
		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
8	Display; Operation	A	W/o; via communication
		F	4-line, illuminated; touch control

Position	Order code for	Selected option	Description
		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
11	Liner	A	PFA
		B	PFA High-temperature
		E	PTFE
		H	Hard rubber
		Q	PTFE 90°C
		U	Polyurethane
17, 18	Device Model	A1	1
		A2	2

1) DKX001 is separately approved.

Optional specifications

ID	Order code for	Selected option	Description
Px	Enclosed accessories	P8	Wireless antenna, wide area (external WLAN antenna) [1]

1) 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. CEC or NEC)
- 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.
- Use the device only in media where the wetted materials are known to be suitable.
- 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.
- An additional assessment must be conducted to confirm that the device is suitable for installation in hybrid mixtures (explosive gas and dust occurring simultaneously).
- Only open the cover of the transmitter housing if one of the following conditions is met:
  - An explosive atmosphere is not present.
  - A waiting time of 10 minutes is observed after switching off the power supply.
    The following warning notice is on the device:
    WARNING – AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING ENCLOSURE IN TYPE OF PROTECTION EX D
- In devices with damaged AEx/Ex db threads:
  - Use in hazardous areas is not permitted.
  - Repair of AEx/Ex db threads is not permitted.
- Observe all the technical data of the device (see nameplate).
- Avoid electrostatic charges which could result in electrostatic discharges while installing, operating, cleaning or maintaining:
  - For external non-metallic surfaces, e.g. housing, attached additional plates, RFID tag.
  - For attached external metallic parts that are not integrated into the local potential equalization system, e.g. nameplate tag, RFID tag.
  - Do not use in areas where the devices/electronic housing are exposed to highly charge-generating processes, pneumatically conveyed dusts and/or charge spraying in an electrostatic coating process.
  - Do no rub surfaces dry. Clean only with moist cloth.
  - Information on electrostatic hazards and how to minimize the generation of static electricity can be found in the technical specification CEC or NEC.

⚠ WARNING

Substitution of components is not permitted.

► Substitution of components may impair intrinsic safety.

Safety instructions: Installation

General installation instructions

- Continuous service temperature of the connecting cable:
  −40 to +85 °C; 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).
- The following applies when installing the transmitter with an AEx/Ex db connection compartment:
  Only use separately certified cable glands, sealing plugs and thread adapters (AEx/Ex db IIC) that are suitable for operating temperatures from −40 to +85 °C and for IP 66/67.
  The mounted metal thread extensions and sealing plugs are tested and certified as part of the devices for the type of protection AEx/Ex db IIC. The thread extension or the sealing plug labeled as follows for identification purposes:
  d or NPTd: NPT ½"
- The following applies when installing a transmitter with an AEx/Ex eb connection compartment:
  Only use separately certified cable glands, sealing plugs and thread adapters (AEx/Ex eb IIC) which are suitable for operating temperatures from −40 to +85 °C (−50 to +85 °C for optional specification) and for IP 66/67.
  The mounted metal thread extensions and sealing plugs supplied are tested and certified as part of the devices for the type of protection AEx/Ex eb IIC.
  The cables must be routed such that they are securely seated, and sufficient strain relief must be ensured.
- 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.
- For the device with order code "Output; Input 1", option MC:
  - When using Port 1 (terminal 26/27) as a 2-WISE power load APL port with the SLAA profile, Port 2 (RJ45) must not be used for Modbus TCP.
  - Parallel operation of Port 1 (terminal 26/27) and Port 2 (RJ45) is not permitted.
- Install transmitter circuit wiring, using threaded conduit or other suitable wiring methods, in accordance with the Canadian Electrical Code (CEC), Section 18, or the National Electrical Code (NEC), Articles 500–516, as applicable.

Installation 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.
- Exception for the device with order code "Approval; Transmitter + Sensor", options C2 (AEx/Ex db eb) and "Power Supply", option D (24V) and "Output; Input 1", options CA, CB, CC, HA, MC, RC, TA (Intrinsically safe circuits): the AEx/Ex eb connection compartment of the transmitter may be opened for a short period to perform live maintenance of intrinsically safe circuits. All internal non-intrinsically safe circuits are protected by an addition IP30 rated cover.
- Exception for the device with order code "Approval; Transmitter + Sensor", options C2 (AEx/Ex db eb) and "Output; Input 1", options CA, CB, CC, HA, MC, RC, TA (Intrinsically safe circuits):
  Transmitters with AEx/Ex db eb may only be connected to or operated with the service interface (Port 2, RJ45) if they are part of an Ex i (intrinsically safe) circuit.
  In all other configurations, connection to or operation with Port 2 is not permitted.

Use of cable glands, sealing plugs and thread adapters

- Only use Ex certified cable glands, sealing plugs and thread adapters that are suitable for the intended application (see nameplates).
- Plastic sealing plugs are mounted to cable entries and metallic thread extensions for temporary protection during transport and storage. These must be replaced with suitable Ex certified cable entry devices for permanent use.
- The mounted metallic thread extensions and sealing plugs are tested and certified as part of the device. These meet the device's specific requirements.
- Supplied Ex cable glands are separately certified and meet the device's specific requirements.
- All unused cable entries must be closed with suitable Ex certified sealing plugs.
- Observe selection criteria for Ex cable entry devices as per CEC or NEC.

Optional external WLAN antenna

- The external WLAN antenna (with or without extension cable) and the antenna feedthrough can only be installed in devices with an AEx/Ex eb connection compartment. Using them with an connection compartment is not permitted.
- Use only the external antenna (with or without extension cable) and the antenna feedthrough supplied by Endress+Hauser.
- The antenna feedthrough must be mounted to the transmitter with a tightening torque of 4 Nm.
- Use only an external antenna (with or without extension cable) equipped with a Type-N male connector (MIL-STD-348).
- The coupling nut of the Type-N male connector must be tightened by hand only.

Optional RFID TAG

- Do not use in areas with high electromagnetic field intensities.
- Avoid electrostatic charging.
- Ensure sufficient distance from processes generating high charges.

Intrinsic safety

- Observe the guidelines for interconnecting intrinsically safe circuits (e.g. CEC or NEC as applicable , proof of intrinsic safety).
- The device's intrinsically safe input/output circuits are rated AEx/Ex ia IIC Ga. When connected to certified intrinsically safe apparatus with an AEx/Ex ib IIC Gb or AEx/Ex ib IIB Gb rating, the level of protection of the overall system becomes AEx/Ex ib IIC Gb or AEx/Ex ib IIB Gb , respectively.
- The device's intrinsically safe output circuit for remote display is rated AEx/Ex ia IIC Ga. When connected to the remote display and operating module DKX001, which is rated AEx/Ex ia IIC Gb the level of protection of the overall system becomes AEx/Ex ia IIC Gb.

Remote display and operating module DKX001

- When using the remote display and operating module DKX001 the internal display and operating module must be removed.
- When connected to a separately ordered remote display and operating module DKX001, use only the following variants: Basic specification of the remote display and operating module DKX001, order code "Approval", option CI
- Observe additional instructions in the Safety Instructions (XA) of the remote display and operating module DKX001.

Potential equalization

- The device must be connected to the potential equalization system using designated protective ground terminals.
- It is also possible to integrate the device into the potential equalization system through a pipe system, provided that the pipe system meets the grounding requirements of applicable national regulations.

Safety instructions: Zone 21

- The enclosure may only be opened for brief maintenance or inspection activities where the area is confirmed to be free of combustible dust. Suitable precautions must be taken during this time to prevent dust entering the electronic compartment.
- Only use separately certified cable glands, sealing plugs and thread adapters (AEx/Ex tb IIIC) which are suitable for operating temperatures from −40 to +85 °C and for IP 66/67.
  The mounted metallic thread extensions and metallic sealing plugs are tested and certified as part of the devices for the type of protection AEx/Ex tb IIIC.
- The device's intrinsically safe output circuit for remote display is rated AEx/Ex ia IIIC Da. When connected to the remote display and operating module DKX001, which is rated AEx/Ex ia IIIC Db, the level of protection of the overall system becomes AEx/Ex ia IIIC Db.
  Connection values: Signal circuits, DKX001→ 🖹 20

Temperature tables

Minimum ambient temperature

$T_{a, min}$ = −40 °C depending on the selected device version (see nameplate!).

Maximum ambient temperature

$T_{a, max}$ = +60 °C depending on temperature class, maximum medium temperature and device-specific features. See the corresponding temperature tables.

Minimum medium temperature

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

Maximum medium temperature for devices without thermal insulation or with thermal insulation in accordance with Endress +Hauser specifications

$T_{m, max}$ varies depending on temperature class, maximum ambient temperature and device-specific features. See the corresponding temperature tables.

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...150	50	80 [1]	95	130	150	150	150
	55 [2]	65 [1]	80	130	150	150	150
	60 [2]	–	–	115	115	115	115

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

Promag P

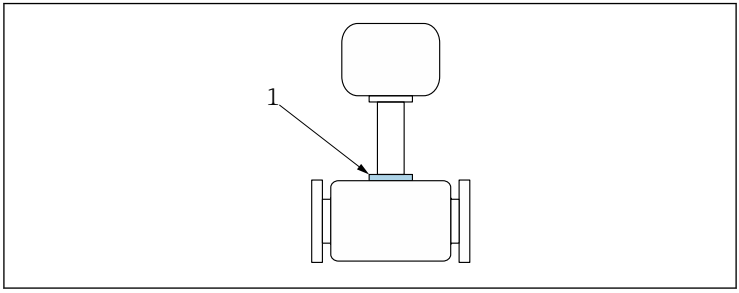
DN	Liner	$T_{a, max}$ [°C]	$T_{m, max}$ [°C]					
			T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
Without thermal insulation								
15...600	PTFE	45	80	90	130	130	130	130
		50	60	90	130	130	130	130
		55	–	–	130	130	130	130
		60	–	–	100	100	100	100
25...200	PFA	40	80	95	130	150	150	150
		45	80	95	130	130	130	130
		50	60	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...300	PTFE	50	60	95	130	130	130	130
		55	–	95	130	130	130	130
		60	–	–	100	100	100	100
25...200	PFA	45	80	95	130	150	150	150
		50	60	95	130	150	150	150
		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								
15…300	PTFE	45	80	90	130	130	130	130
		50	60	90	130	130	130	130
		55	–	–	130	130	130	130
		60	–	–	100	100	100	100
50…3000	Hard rubber	50	60	80	80	80	80	80
		60	–	–	80	80	80	80
25…1000	PU	50	50	50	50	50	50	50
Extended neck for insulation (Optional specification, ID Cx (Sensor Option) = CG), with or without thermal insulation								
15…300	PTFE	50	60	95	130	130	130	130
		55	–	95	130	130	130	130
		60	–	–	100	100	100	100
50…300	Hard rubber	50	60	80	80	80	80	80
		60	–	–	80	80	80	80
25…300	PU	50	50	50	50	50	50	50

Maximum medium temperature for devices with thermal insulation NOT in accordance with Endress+Hauser specifications

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]
56.4	71.3	72.0	72.0	72.0	72.0

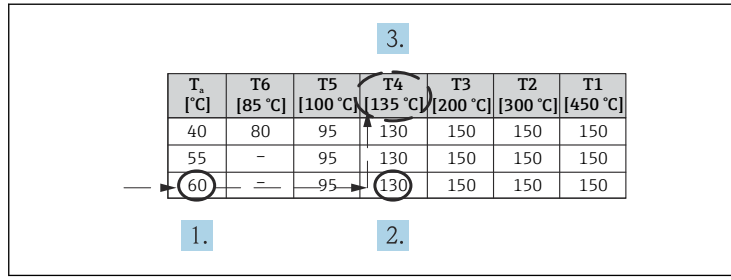
Explosion hazards arising from gas and dust

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 (Port 1)		Input/output 2		Input/output 3		Service interface (Port 2)
1 (+)	2 (–)	26 (+)	27 (-)	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.				

FOUNDATION fieldbus

Supply voltage		Input/output 1 (Port 1)		Input/output 2		Input/output 3		Service interface (Port 2)
1 (+)	2 (–)	26 (A)	27 (B)	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.				

PROFIBUS DP

Supply voltage		Input/output 1 (Port 1)		Input/output 2		Input/output 3		Service interface (Port 2)
1 (+)	2 (–)	26 (B)	27 (A)	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.				

PROFIBUS PA

Supply voltage		Input/output 1 (Port 1)		Input/output 2		Input/output 3		Service interface (Port 2)
1 (+)	2 (–)	26 (B)	27 (A)	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.				

Modbus RS485

Supply voltage		Input/output 1 (Port 1)		Input/output 2		Input/output 3		Service interface (Port 2)
1 (+)	2 (–)	26 (B)	27 (A)	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.				

Modbus TCP

Supply voltage		Input/output 1 1 (Port [1)])		Input/output 2		Input/output 3		Service interface (Port 2) [1)]
1 (+)	2 (–)	26 (+)	27 (-)	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.				

1) For Modbus TCP communication, either port 1 OR port 2 can be used.

PROFINET

Supply voltage		Input/output 1 (Port 1) [1)]	Input/output 2		Input/output 3		Service interface (Port 2) [1)]
1 (+)	2 (–)	RJ45	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
			Device-specific terminal assignment: adhesive label in terminal cover.				

1) Port can be used for communication or as a service interface (CDI-RJ45).

PROFINET over Ethernet-APL

Supply voltage		Input/output 1 (Port 1)		Input/output 2		Input/output 3		Service interface (Port 2 [1)])
1 (+)	2 (–)	26 (+)	27 (-)	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
				Device-specific terminal assignment: adhesive label in terminal cover.				

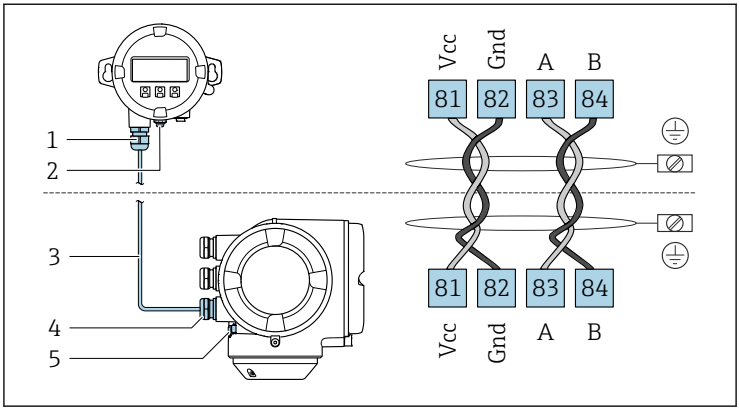
1) No PROFINET communication available on port 2

Ethernet/IP

Supply voltage		Input/output 1 (Port 1) [1]	Input/output 2		Input/output 3		Service interface (Port 2) [1]
1 (+)	2 (–)	RJ45	24 (+)	25 (–)	22 (+)	23 (–)	CDI-RJ45
			Device-specific terminal assignment: adhesive label in terminal cover.				

1) Port can be used for communication or as a service interface (CDI-RJ45).

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 for "Output; input 1"	Output type	Safety-related values	
		Output; input 1 (Port 1)	Service interface (Port 2)
Option **BA**	Current output 4-20 mA HART	U_N = 30 V_{DC} U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}
Option **GA**	PROFIBUS PA	U_N = 32 V_{DC} U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}
Option **LA**	PROFIBUS DP	U_N = 5 V U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}

Order code for "Output; input 1"	Output type	Safety-related values	
		Output; input 1 (Port 1)	Service interface (Port 2)
Option **MA**	Modbus RS485	U_N = 5 V U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}
Option **MB**	Modbus TCP over Ethernet-APL 10 Mbit/s, SPE 10 Mbit/s, Ethernet 100 Mbit/s	APL port profile SLAX SPE PoDL classes 10, 11, 12 U_N = 30 V_{DC} U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}
Option **NA**	EtherNet/IP	U_N = 3.3 V_{AC} U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}
Option **RA**	PROFINET	U_N = 3.3 V_{AC} U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}
Option **RB**	PROFINET over Ethernet-APL/SPE, 10Mbit/s	APL port profile SLAX SPE PoDL classes 10, 11, 12 U_N = 30 V_{DC} U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}
Option **SA**	FOUNDATION Fieldbus	U_N = 32 V_{DC} U_M = 250 V_{AC}	U_N = 3.3 V_{AC} U_M = 250 V_{AC}

Order code for "Output; input 2" "Output; input 3"	Output type	Safety-related values	
		Output; input 2	Output; input 3
Option **B**	Current output 4-20 mA	U_N = 30 V_{DC} U_M = 250 V_{AC}	
Option **D**	Configurable I/O initial setting off	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 4-20 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 (Port 1)	Service interface (Port 2)
Option CA	Current output 4-20mA HART Ex-i passive	**Ex ia** U_i = 30 V I_i = 100 mA P_i = 1.25 W L_i = 0 µH C_i = 6 nF	**Ex ia** U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 nF
Option CC	Current output 4-20mA HART Ex-i active	**Ex ia** U_0 = 21.8 V I_0 = 90 mA P_0 = 491 mW L_0 = 4.1 mH(IIC)/15 mH(IIB) C_0 = 160 nF(IIC)/1 160 nF(IIB) U_i = 30 V I_i = 10 mA P_i = 0.3 W L_i = 5 µH C_i = 6 nF	**Ex ia** U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 nF
Option HA	PROFIBUS PA Ex i (STANDARD + FISCO)	**Ex ia** U_i = 30 V I_i = 570 mA P_i = 8.5 W L_i = 10 µH C_i = 5 nF	**Ex ia** U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 nF

Order code for "Output; input 1"	Output type	Intrinsically safe values	
		Output; input 1 (Port 1)	Service interface (Port 2)
Option MC	Modbus TCP over Ethernet-APL, Ex-i, 10Mbit/s	**2-WISE power load, APL port profile SLAA** [1] **Ex ia** U_i = 17.5 V I_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 ft) Length of cable stubs: ≤1 m (3.3 ft)	**Ex ia** U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 nF
Option RC	PROFINET over Ethernet-APL, Ex-i, 10Mbit/s	**2-WISE power load, APL port profile SLAA** [1] **Ex ia** U_i = 17.5 V I_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 ft) Length of cable stubs: ≤1 m (3.3 ft)	**Ex ia** U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 nF
Option TA	FOUNDATION Fieldbus Ex i (STANDARD + FISCO)	**Ex ia** U_i = 30 V I_i = 570 mA P_i = 8.5 W L_i = 10 µH C_i = 5 nF	**Ex ia** U_i = 10 V I_i = n. a. P_i = n. a. L_i = 0 µH C_i = 200 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
Option C	Current output 4-20mA Ex-i passive	**Ex ia** U_i = 30 V I_i = 100 mA P_i = 1.25 W L_i = 0 C_i = 0	
Option G	Pulse/frequency/switch output Ex-i passive	**Ex ia** U_i = 30 V I_i = 100 mA P_i = 1.25 W L_i = 0 C_i = 0	

Remote display and operating module DKX001

A connecting cable with a ratio L_{cable}/R_{cable} = 0.024 mH/Ω and $C_{cable} \leq 600$ µF must be used when connecting the device with the remote display and operating module DKX001 or ODKX001. The connecting cable supplied by Endress+Hauser meets these requirements.

Basic specifications Position 1, 2 Order code for "Approval" Selected option	Terminal assignment	Basic specifications Position 8 Order code "Display; operation" Option O
Option [1] **C2, C4**	81, 82, 83, 84	U_0 = 3.9 V I_0 = 1.5 A P_0 = 600 mW L_0 = 0 C_0 = 670 µF

1) If the DKX001 is ordered separately: CI

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