

Safety Instructions

Proline Prowirl 200


ATEX: II2G, II1/2G, II1G, II2D

IECEX: Zone 1, Zone 0/1, Zone 0, Zone 21

Ex i version



Document: XA01151D

Safety instructions for electrical apparatus for explosion-hazardous areas according to Directive 2014/34/EU (ATEX) and IEC 60079-0 →  5

- BG - Правила за техниката на безопасност за електрически средства за производство във взривоопасни зони. Ако не разбирате езика на това ръководство има възможност да спорьчате при нас едно ръководство, преведено на езика на Вашата страна.
ЕС декларация за съответствие
Производителят Endress+Hauser декларира с това заявление за съответствие и с предявяването на сертификата CE, че този продукт отговаря на изискванията на съответните европейски директиви. Прилаганите директиви, норми и документи са указани в заявлението за съответствие.
- CS - Bezpečnostní pokyny pro elektrické přístroje v místech s nebezpečím výbuchu. Pokud nemáte možnost přečíst si tento návod, můžete si u nás objednat návod přeložený do svého jazyka.
EU prohlášení o shodě
Společnost Endress+Hauser prohlašuje prostřednictvím tohoto prohlášení a použitím značky CE, že tento výrobek vyhovuje příslušným evropským směrnici. Zmíněné směrnice, normy a dokumenty jsou uvedeny v Prohlášení o shodě.
- DA - Sikkerhedsforskrifter for elektriske apparater certificeret til brug i eksplosionsfarlige områder. Hvis du ikke forstår denne manual, kan en oversat kopi af den på dit eget sprog bestilles fra os.
EU-overensstemmelseserklæring
Med denne overensstemmelseserklæring og tilføjelsen af CE-mærket sikrer producenten Endress+Hauser, at produktet er i overensstemmelse med relevante europæiske direktiver. Dokumentation for overensstemmelsen gives i de anførte direktiver, standarder og dokumenter.
- EL - Οδηγίες ασφαλείας ηλεκτρικών συσκευών για επικίνδυνες για έκρηξη περιοχές. Σε περίπτωση που δεν μπορείτε να διαβάσετε αυτές τις οδηγίες, τότε μπορείτε να παραγγείλετε ένα αντίτυπο μεταφρασμένο στη γλώσσα σας.
Δήλωση συμμόρφωσης ΕΕ
Με αυτή τη δήλωση πιστότητας και την τοποθέτηση του σήματος CE ο κατασκευαστής Endress+Hauser δηλώνει, ότι αυτό το προϊόν συμμορφώνεται με τις ευρωπαϊκές οδηγίες που πρέπει να εφαρμοστούν. Οι οδηγίες, τα πορότυπα και τα έγγραφα που εφαρμόστηκαν αναφέρονται στη δήλωση πιστότητας.
- ES - Instrucciones de seguridad de aparatos eléctricos homologados para su utilización en áreas expuestas a riesgos de deflagración. Si no entiende este manual, puede pedir un ejemplar en su idioma.
Declaración UE de conformidad
Por la presente declaración y la inclusión de la marca CE, el fabricante Endress+Hauser, declara que el producto cumple con las directivas europeas pertinentes. Las directivas, normas y documentos de aplicación se indican en la declaración de conformidad.
- ET - Ohutusjuhised plahvatusohtlikus keskkonnas kasutatavate elektriseadmete kohta. Kui Te ei saa käesolevast juhendist aru, võite meilt tellida Teie riigikeelde tõlgitud juhendi.
EL i vastavusdeklaratsioon
Tootja Endress+Hauser kinnitab juurdelisatud vastavusdeklaratsiooni esitamisega ja CE-märgise kandmisega tootele, et käesolev toode vastab kohaldatavate Euroopa Liidu direktiivide nõuetele. Kohaldatavad direktiivid, standardid ja dokumendid on ära toodud vastavusdeklaratsioonis.
- FI - Turvallisuusohjeita sähkölaitteille, jotka on vahvistettu käytettäväksi räjähdysvaarallisilla alueilla. Jos et ymmärrä tätä käsikirjaa, voit tilata meiltä käännöksen omalla kansallisella kielelläsi.
EU-vaatimustenmukaisuusvakuutus
Valmistaja Endress+Hauser vakuuttaa täällä vaatimustenmukaisuustodistuksella ja CE-merkin kiinnittämisellä, että tämä tuote täyttää sovellettavien EU-direktiivien määräykset. Sovellettavat direktiivit, normit ja dokumentit on merkitty vaatimustenmukaisuustodistukseen.
- HR - Sigurnosni naputci za elektromaterijal u sredini u kojoj prijete opasnost od eksplozije. Ako Vam nije moguće čitati ovaj naputak, onda imate mogućnost da kod nas naručite naputak sastavljen na Vašem materninskom jeziku.
EU izjava o sukladnosti
Dobavljač Endress+Hauser jamči ovom izjavom i stavljanjem oznake CE da ovaj proizvod udovoljava zahtjevima europskih direktiva koje su na snazi. U izjavi o usuglašenosti se navode direktive, norme i dokumenti koji su na snazi.
- HU - Biztonsági információk robbanásveszélyes területre való elektromos eszközökhöz. Amennyiben nem tudja elolvasni ezt az útmutatót, akkor megrendelheti az Ön anyanyelvére lefordítva is.
EU-megfelelőségi nyilatkozat
Az Endress+Hauser mint gyártó jelen megfeleléségi nyilatkozattal és a CE-jelzés felhelyezésével kijelenti, hogy ez a termék megfelel az alkalmazandó európai irányelveknek. Az alkalmazott irányelvek, szabványok és dokumentumok a megfeleléségi nyilatkozatban fel vannak tüntetve.

- IT - Istruzioni di sicurezza per apparecchiature elettriche certificate per l'utilizzo in aree con pericolo di esplosione. Se il presente manuale non risulta comprensibile potete ordinarne una copia tradotta nella vostra lingua.
Dichiarazione di conformità UE
 Con questa dichiarazione e con l'applicazione del marchio CE, il costruttore Endress+Hauser, assicura che il prodotto è conforme alle direttive europee vigenti. Prova della conformità è fornita dall'osservanza delle direttive, delle norme e dei documenti elencati.
- LT - Elektros įrenginio saugumo nurodymai, susiję su sprogimo zonomis. Jeigu negalite perskaityti šios instrukcijos, kreipkitės į mus, kad užsisakytumėte į jūsų gimtąją kalbą išverstą instrukciją.
ES atitikties deklaracija
 Gamintojas Endress+Hauser šia atitikties deklaracija ir CE ženkliniu patvirtina, kad gaminys atitinka taikytinas ES direktyvas. Taikomos direktyvos, normos ir dokumentai yra pateikiami atitikties deklaracijoje.
- LV - Drošības norādījumi elektrisko darba instrumentu lietošanai apgabalos, kas pakļauti sprādzienbīstamībai. Ja Jums nav iespēju izlasīt šos norādījumus, Jūs varat pasūtīt pie mums tulkojumus Jūsu valsts valodā.
ES atbilstības deklarācija
 Ražotājs Endress+Hauser ar šo atbilstības apliecinājumu un CE zīmola lietojumu apstiprina, ka produkts izgatavots saskaņā ar atbilstošajām Eiropas vadlīnijām. Piemērotās vadlīnijas, normas un dokumenti atrunāti atbilstības apliecinājumā.
- NL - Veiligheidsinstructies voor elektrisch materieel in explosiegevaarlijke omgeving. Wanneer u deze handleiding niet kunt lezen, kunt u een in uw landstaal vertaalde handleiding bij ons bestellen.
EU-conformiteitsverklaring
 De leverancier Endress+Hauser waarborgt met deze verklaring en het aanbrengen van het CE-teken, dat dit product overeenstemt met de geldende Europese richtlijnen. De geldende richtlijnen, normen en documenten zijn aangegeven in de conformiteitsverklaring.
- PL - Wskazówki dot. bezpieczeństwa dla urządzeń elektrycznych stosowanych w obszarze zagrożonym wybuchem. Jeśli niniejsza instrukcja napisana jest w języku, którym się nie posługujesz, możesz zamówić u nas przetłumaczony dokument.
Deklaracja zgodności UE
 Producent Endress+Hauser w niniejszej deklaracji zgodności wraz z nadaniem znaku CE oświadcza, że produkt ten jest zgodny z obowiązującą Europejską Dyrektywą. Zastosowane wytyczne, normy oraz dokumenty podane są w deklaracji zgodności.
- PT - Instruções de segurança para dispositivos eléctricos certificados para utilização em áreas de risco de incêndio. Se não compreender este manual, pode encomendar-nos directamente uma cópia na sua língua.
Declaração UE de conformidade
 Com esta declaração de conformidade e a aplicação da marca CE, o fabricante Endress+Hauser, garante que o produto obedece às directivas europeias a aplicar. As directivas, normas e documentos são apresentadas na declaração de conformidade.
- RO - Indicații de siguranță pentru mijloacele de producție electrice pentru zonele periclitare de explozie. Dacă nu puteți citi aceste instrucțiuni, atunci puteți comanda la noi instrucțiunile traduse în limba țării dumneavoastră.
Declarația UE de conformitate
 Producătorul Endress+Hauser declară prin declarația de conformitate alăturată și prin aplicarea semnelui CE că acest produs corespunde directivelor europene aplicabile. Directivele, normele aplicate și documentele sunt menționate în declarația de conformitate.
- SK - Bezpečnostné pokyny pre elektrické zariadenie prevádzkované v priestoroch s nebezpečenstvom výbuchu. Ak nemáte možnosť 'prečítať' si tento návod, môžete si u nás objednať návod preložený do svojho jazyka.
EÚ vyhlásenie o zhode
 Spoločnosť Endress+Hauser vyhlasuje prostredníctvom tohto vyhlásenia o konformite a použitím značky CE, že tento výrobok vyhovuje príslušným európskym smerniciam. Zmieňované smernice, normy a dokumenty sú uvedené vo Vyhlásení o konformite.
- SL - Varnostni napotki glede električne opreme, namenjene za uporabo v eksplozivnih območjih. Če teh navodil ne morete razumeti, lahko pri nas naročite prevod v vaš jezik.
Izjava EU o skladnosti
 Proizvajalec Endress+Hauser s to izjavo o skladnosti in navedbo oznake CE izjavlja, da je ta izdelek skladen s predpisanimi evropskimi smernicami. Upoštewane smernice, standardi in dokumenti so navedeni v izjavi o skladnosti.
- SV - Säkerhetsföreskrifter för elektrisk utrustning certifierad för användning i explosionsfarliga områden. Om du inte förstår denna manual, kan en översatt kopia på ditt eget språk beställas från oss.
EU-försäkran om överensstämmelse
 Endress+Hauser försäkras med vidstående försäkran om överensstämmelse och med CE-märkningen att denna produkt överensstämmer med de tillämpbara europeiska riktlinjerna. De tillämpade riktlinjerna, normerna och dokumenten anges i försäkran om överensstämmelse.

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Associated documentation

All documentation is available:

- On the CD-ROM supplied (not included in the delivery for all device versions).
- Available for all device versions via:
 - Internet: www.endress.com/deviceviewer
 - Smart phone/tablet: *Endress+Hauser Operations App*
- In the Download Area of the Endress+Hauser web site: www.endress.com → Download

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

Measuring device	Documentation code		
	HART	FOUNDATION Fieldbus	PROFIBUS PA
Prowirl D 200	BA01153D	BA01216D	BA01221D
Prowirl F 200	BA01154D	BA01217D	BA01222D
Prowirl O 200	BA01155D	BA01218D	BA01223D
Prowirl R 200	BA01156D	BA01219D	BA01224D

Additional documentation:

Document type	Contents	Documentation code
Special documentation	Remote display FHX50	SD01007F
Special documentation	Overvoltage Protection (OVP)	SD01090F
Safety Instructions	Remote display FHX50: II2G, II2D Ex ia	XA01053F
Brochure	Explosion Protection	CP00021Z/11

Please note the documentation associated with the device.

Manufacturer's certificates

EC Declaration of Conformity

Documentation code: EC_00308

EC type-examination certificate

Certificate number:
KEMA 10ATEX0072

IEC certificate of conformity

Certificate number:
IECEX KEM 10.0032

Affixing the certificate number certifies conformity with the standards under www.IECEx.com (depending on the device version).

- IEC 60079-0: 2011
- IEC 60079-11: 2011
- IEC 60079-26: 2014
- IEC 60079-31: 2013

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
	* =	Spaceholder: 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	Selected option	Description
1	Instrument family	7	Vortex flowmeter
2	Sensor	D, F, O, R	Sensor type
3	Transmitter	2	Transmitter type: 2-wire, compact version, remote version
4	Generation index	B	Platform generation
5, 6	Nominal diameter	D: DN 15 to 150 F: DN 15 to 300 O: DN 15 to 150 R: "R-type" DN 25 to 200, "S-type" DN 40 to 250	Nominal diameter of sensor

Basic specifications

Position	Order code for	Selected option	Description
1, 2	Approval	BA, IA	Ex ia IIC T6...T1 Ga
		BB, IB	Ex ia IIC T6...T1 Ga/Gb
		BJ, IJ	Ex ia IIC T6...T1 Gb
		B2, I4	Ex ia IIC T6...T1 Ga/Gb
			Ex tb IIIC Txx °C Db ¹⁾
3	Output, input	A	4-20mA HART
		B	4-20mA HART, pulse/frequency/switch output
		C	4-20mA HART + 4-20mA analog
		D	4-20mA HART, pulse/frequency/switch output, 4-20mA input
		E	FOUNDATION Fieldbus, pulse/frequency/switch output
		G	PROFIBUS PA, pulse/frequency/switch output

Position	Order code for	Selected option	Description
4	Display, operation	A	W/o; via communication
		C	SD02 4-line; push buttons + data backup function
		E	SD03 4-line, illum.; touch control + data backup function
		L	Prepared for display FHX50 + M12 connection ²⁾
		M	Prepared for display FHX50 + custom connection ²⁾

- 1) The labeling changes according to whether "Display; operation" = "L" or "M": Ex tb|ia Da| IIIC Txx °C Db.
- 2) FHX50 is approved according to IECEx DEK12.0046X or DEKRA 12ATEX0151X.

Optional specifications

ID	Order code	Option selected	Description
Jx	Test, certificate	JN	Ambient temperature transmitter -50 °C
Nx	Accessory mounted	NA	Overvoltage Protection (OVP)

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 (e.g. IEC/EN 60079-14)
- 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.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- When using in hybrid mixtures (gas and dust occurring simultaneously), observe additional measures for explosion protection.
- Observe all the technical data of the device (see nameplate).

Safety instructions: Installation

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 according to EN 1127-1, the device may also be operated under non-atmospheric conditions in accordance with the manufacturer's specifications.

- Continuous service temperature of the connecting cable: -40 to +80 °C (-50 to +80 °C for optional specifications, ID Jx (test, certificate) = JN); but at least in accordance with the operational temperature range of the application, taking into account additional influences of the process conditions ($T_{a,min}$ and $T_{a,max} + 20$ K).
- Only use certified cable entries that are suitable for the application. Observe selection criteria as per IEC/EN 60079-14 .
- When the measuring device is connected, attention must be paid to the type of protection at the transmitter →  20.

Intrinsic safety

- The device can be connected to the Endress+Hauser FXA291 service tool: refer to the Operating Instructions.
- *Basic specification, position 3 (output) = A, B, C, D, E, G*
 - When the intrinsically safe Ex ia circuits of the device are connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC or IIB, the type of protection changes to Ex ib IIC or Ex ib IIB.
 - When the intrinsically safe Ex ia circuits of the device are connected to certified intrinsically safe circuits of Category Ex ia for Equipment Groups IIB, the type of protection changes from Ex ia IIC to Ex ia IIB.
- Observe the guidelines for interconnecting intrinsically safe circuits (e.g. IEC/EN 60079-14, Proof of Intrinsic Safety).
- The intrinsically safe input power circuit of the device is isolated from ground. If the device is equipped with only one input, the dielectric strength of the input to ground is at least $500 V_{rms}$, and the dielectric strength of the inputs vis-à-vis one another is also at least $500 V_{rms}$.
- The device can be connected to the remote display FHX50 with Ex ia explosion protection; refer to the Special Documentation and Ex documentation.

Potential equalization

- Integrate the device into the local potential equalization → 20.
- 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.

Overvoltage protection

Optional specification, ID Nx (Accessory Mounted) = NA

- Minimum ambient temperature when using Overvoltage Protection (OVP): -40 °C
- When using the internal overvoltage protection: Reduce the admissible ambient temperature at the housing by 2 K.
- For installations which require overvoltage protection to comply with national regulations or standards (e.g. IEC/EN 60079-14).
- Observe the safety instructions of the overvoltage protection.
- If an overvoltage protection according to IEC/EN 60079-14 against atmospheric over voltages is required: no other circuits may leave the housing during normal operation without additional measures.
- The intrinsically safe input power circuit of the device is isolated from ground. If the device is only equipped with one input, the dielectric strength of the input is at least $290\text{ V}_{\text{rms}}$. If the device is equipped with more than one input, the dielectric strength of each individual input to ground is at least $290\text{ V}_{\text{rms}}$, and the dielectric strength of the inputs vis-à-vis one another is also at least $290\text{ V}_{\text{rms}}$.

Safety instructions: Zone 0


Basic specification, position 1, 2 (approval) = BB, B2, IB, I4

The intrinsically safe version of the device can be used in the measuring pipe in Zone 0.

Basic specification, position 1, 2 (approval) = BA, IA

Transmitter or connection housing of sensor made from coated aluminum AlSi10Mg installed in Zone 0: install so it is protected from impacts. The identification of the certificate number changes in IECEx DEK 13.0032X or KEMA 10ATEX0072X.


Safety instructions: Zone 21

- To ensure dust-tightness, securely seal the transmitter housing, cable entries and sealing plugs.
- Only open the transmitter housing briefly, ensuring that no dust or moisture enters the housing.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation.
- Only use certified cable entries and sealing plugs. The metal cable entries, extensions and sealing plugs supplied meet this requirement.
- If the transmitter is connected to the remote display FHX50, the circuit has type of protection Ex ia IIIC.
Connection values →  19

Temperature tables

Ambient temperature

Minimum ambient temperature:

- *Basic specification, position 3 (Output; Input) = A, B, D in conjunction with optional specification, ID Jx (Test, Certificate) = JN*
 $T_a = -50\text{ °C}$
(Not permitted in conjunction with *optional specification, ID Nx (Accessory Mounted) = NA* →  11)
- *Basic specification, position 3 (Output; Input) = A, B, C, D, E, G*
 $T_a = -40\text{ °C}$

Maximum ambient temperature:

- Compact version
 $T_a = +70\text{ °C}$ depending on the medium temperature and temperature class
- Transmitter remote version
 $T_a = +75\text{ °C}$ depending on the medium temperature and temperature class
- Sensor remote version
 $T_a = +85\text{ °C}$ depending on the medium temperature and temperature class

Medium temperature

The following relationship of ambient temperature to medium temperature applies when $T_m < -50\text{ °C}$:

$T_m\text{ [°C]}$	-50	-100	-150	-200
$T_a\text{ [°C]}$	-50	-47	-44	-39

Compact version

Basic specification, position 3 (output; input) = A

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_a - 2 \text{ K}$

Version with max. $T_m = 280 \text{ °C}$						
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	195	280	-
60	-	95	130	195	280	-
65	-	-	130	195	280	-
70	-	-	130	-	-	-

Basic specification, position 3 (output; input) = B

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_a - 2 \text{ K}$

Version with max. $T_m = 280 \text{ °C}$						
T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
35 ¹⁾	80	95	130	195	280	-
50 ²⁾	-	95	130	195	280	-
60	-	-	130	195	280	-
65	-	-	130	195	280 ³⁾	-
70	-	-	130	195 ⁴⁾	280 ⁴⁾	-

1) $T_a = 40 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.85 \text{ W}$

2) $T_a = 55 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.85 \text{ W}$

3) $T_a = 65 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.7 \text{ W}$

4) $T_a = 70 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.7 \text{ W}$

Basic specification, position 3 (output; input) = C

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_m - 2 \text{ K}$

Version with max. $T_m = 280 \text{ °C}$						
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	195	280	-
55	-	95	130	195	280	-
60	-	-	130	195	280	-
65	-	-	130	195	280 ¹⁾	-
70	-	-	130	-	-	-

1) $T_a = 65 \text{ °C}$ for pulse/frequency/switch output $P_1 = 0 \text{ W}$

Basic specification, position 3 (output; input) = D

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_m - 2 \text{ K}$

Version with max. $T_m = 280 \text{ °C}$						
T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
35	80	95	130	195	280	-
50	-	95	130	195	280	-
55	-	-	-	195	280	-
60	-	-	-	195	-	-

Basic specification, position 3 (output; input) = E, G

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_m - 2 \text{ K}$

Version with max. $T_m = 280 \text{ °C}$						
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	195	280	-
50 ¹⁾	-	95	130	195	280	-
60	-	-	130	195	280	-
65	-	-	130	195	280 ²⁾	-
70	-	-	130	195 ³⁾	280 ³⁾	-

1) $T_a = 60 \text{ °C}$ for pulse/frequency/switch output $P_i = 0 \text{ W}$

2) $T_a = 65 \text{ °C}$ for pulse/frequency/switch output $P_i = 0 \text{ W}$

3) $T_a = 70 \text{ °C}$ for pulse/frequency/switch output $P_i = 0 \text{ W}$

High-temperature version

Basic specification, position 3 (output; input) = A

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_m - 2 \text{ K}$

Version with max. $T_m = 440 \text{ °C}$						
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	195	290	440
60	-	95	130	195	290	440
70	-	-	130	195	290	440

Basic specification, position 3 (output; input) = B

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_m - 2 \text{ K}$

Version with max. $T_m = 440 \text{ °C}$						
T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
35 ¹⁾	80	95	130	195	290	440
50 ²⁾	-	95	130	195	290	440
65	-	-	130	195	290	440
70	-	-	130	195 ³⁾	290	440 ³⁾

- 1) $T_a = 40 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.85 \text{ W}$
- 2) $T_a = 55 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.85 \text{ W}$
- 3) $T_a = 70 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.85 \text{ W}$

Basic specification, position 3 (output; input) = C

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_m - 2 \text{ K}$

Version with max. $T_m = 440 \text{ °C}$						
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	195	290	440
55	-	95	130	195	290	440
65	-	-	130	195	290	440
70	-	-	130	195 ¹⁾	290 ¹⁾	440 ¹⁾

- 1) $T_a = 70 \text{ °C}$ for pulse/frequency/switch output $P_i = 0 \text{ W}$

Basic specification, position 3 (output; input) = D

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_a - 2 \text{ K}$

Version with max. $T_m = 440 \text{ °C}$						
T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
35	80	95	130	195	290	440
50	-	95	130	195	290	440
55	-	-	-	195	290	440
60	-	-	-	195	290	440
65	-	-	-	-	290	-

Basic specification, position 3 (output; input) = E, G

NOTICE**The ambient temperature changes for installations with overvoltage protection in conjunction with temperature classes T5 and T6.**

The following applies to the basic specification, position 1, 2 (approval) = BA, BB, BJ, B2, IA, IB, IJ, I4:

► $T_a = T_a - 2 \text{ K}$

Version with max. $T_m = 440 \text{ °C}$						
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	195	290	440
50 ¹⁾	-	95	130	195	290	440
65	-	-	130	195	290	440
70	-	-	130	195 ²⁾	290 ²⁾	440 ²⁾

1) $T_a = 60 \text{ °C}$ for pulse/frequency/switch output $P_1 = 0 \text{ W}$

2) $T_a = 70 \text{ °C}$ for pulse/frequency/switch output $P_1 = 0 \text{ W}$

Remote version

Transmitter

Basic specification, Position 3 Output; input ¹⁾	Basic specification, position 1, 2 Approval	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]
A	All	40	60	75
B	All	35 ²⁾	50 ³⁾	70 ⁴⁾
C	All	40	55	70 ⁵⁾
D	All	35	50	65
E	All	40	55	70 ⁵⁾
G				

- 1) The following applies for installations with overvoltage protection in conjunction with basic specification, position 1, 2 (approval) = BA, BB, BD, BH, BJ, B2, IA, IB, ID, IH, IJ, I4, C2: $T_a = T_m - 2 \text{ K}$
- 2) $T_a = 40 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.85 \text{ W}$
- 3) $T_a = 60 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.85 \text{ W}$
- 4) $T_a = 75 \text{ °C}$ for pulse/frequency/switch output $P_i = 0.85 \text{ W}$
- 5) $T_a = 75 \text{ °C}$ for pulse/frequency/switch output $P_i = 0 \text{ W}$

Sensor

Version with max. $T_m = 280 \text{ °C}$						
T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
55	80	95	130	195	280	–
70	–	95	130	195	280	–
85	–	–	130	195	280	–

High-temperature version

Version with max. $T_m = 440 \text{ °C}$						
T_a [°C]	T6 [85 °C]	T5 [100 °C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
55	80	95	130	195	290	440
70	–	95	130	195	290	440
85	–	–	130	195	290	440

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 and the maximum medium temperature T_m .
- In the case of dust: Determine the maximum surface temperature as a function of the maximum ambient temperature T_a and the maximum medium temperature T_m .

Example

- Measured maximum ambient temperature: $T_{ma} = 58\text{ }^\circ\text{C}$
- Measured maximum medium temperature: $T_{mm} = 108\text{ }^\circ\text{C}$

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	195	280	-
60	-	95	130	195	280	-
65	-	-	130	195	280	-

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1 Procedure for determining the temperature class and surface temperature

1. In the column for the maximum ambient temperature T_a select the temperature that is immediately greater than or equal to the maximum ambient temperature T_{ma} that is present.
 - ↳ $T_a = 65\text{ }^\circ\text{C}$.
The row showing the maximum medium temperature is determined.
2. Select the maximum medium temperature T_m of this row, which is immediately greater than or equal to the maximum medium temperature T_{mm} that is present.
 - ↳ The column with the temperature class for gas is determined:
 $108\text{ }^\circ\text{C} \leq 130\text{ }^\circ\text{C} \rightarrow T_4$.
3. The maximum temperature of the temperature class determined corresponds to the maximum surface temperature for dust: $T_4 = 135\text{ }^\circ\text{C}$.

Connection data: signal circuits

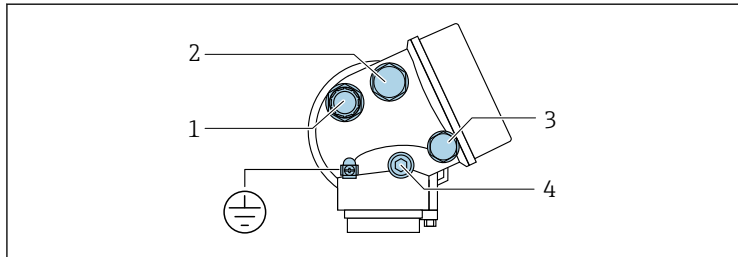
The following tables contain specifications which are dependent on the transmitter type and its input and output assignment. Compare the following specifications with those on the nameplate of the transmitter.

Cable specification: Connecting cable for remote version

The sensor cable connection between the sensor and the transmitter has Ex ia type of protection.

Cable parameter: $L/R \leq 38.2 \mu\text{H}/\Omega$

The cable supplied by Endress+Hauser complies with this value.

Connecting the transmitter

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Position		Basic specification, position 1, 2: Approval	Type of protection used for cable entry	Description
1	Cable entry for output 1	BA, BB, BJ, IA, IB, JJ B2, I4	Ex ia Ex ia/Ex tb	The following applies for devices with basic specification, position 1, 2 (approval) = B2, I4: In the case of device versions with a plastic transport sealing plug, this plug does not meet the explosion protection requirements and must be replaced during installation by a suitable entry that meets the approval specifications. In the case of device versions with a cable entry, this entry has a separate component approval and meets the requirements of the explosion protection indicated on the nameplate.
2	Cable entry for output 2	BA, BB, BJ, IA, IB, JJ B2, I4	Ex ia Ex ia/Ex tb	The following applies for devices with basic specification, position 1, 2 (approval) = B2, I4: In the case of device versions with metal extensions and sealing plugs, the latter are part of the device approval and meet the requirements of the explosion protection indicated on the nameplate. In the case of device versions with a cable entry, this entry has a separate component approval and meets the requirements of the explosion protection indicated on the nameplate.
3	Optional order code ¹⁾ : Cable entry of the remote display and operating module FHX50	BA, BB, BJ, IA, IB, JJ B2, I4	Ex ia Ex ia/Ex tb ²⁾	The following applies for devices with basic specification, position 1, 2 (approval) = B2, I4: In the case of device versions with metal extensions and sealing plugs, the latter are part of the device approval and meet the requirements of the explosion protection indicated on the nameplate. In the case of device versions with a cable entry, this entry has a separate component approval and meets the requirements of the explosion protection indicated on the nameplate.
Position		Description		
4	Pressure compensation plug	<p>NOTICE</p> <p>Housing degree of protection voided due to insufficient sealing of the housing.</p> <ul style="list-style-type: none"> ▶ Do not open - not a cable entry. 		
⊕	Potential equalization	<p>NOTICE</p> <p>Terminal for connection to potential equalization.</p> <ul style="list-style-type: none"> ▶ Pay attention to the grounding concept of the facility. 		

1) Basic specification, position 4 (display; operation) = L, M

2) The labeling changes according to whether "Display; operation" = "L" or "M": Ex tb|ia Da| IIIC Txx °C Db.

Terminal assignment

Transmitter



The order code is part of the extended order code. Detailed information on the features of the device and on the structure of the extended order code → 7.

Connection versions

Order code for "Output"	Terminal numbers					
	Output 1		Output 2		Input	
	1 (+)	2 (-)	3 (+)	4 (-)	5 (+)	6 (-)
Option A	4-20 mA HART (passive)		-		-	
Option B ¹⁾	4-20 mA HART (passive)		Pulse/frequency/switch output (passive)		-	
Option C ¹⁾	4-20 mA HART (passive)		4-20 mA analog (passive)		-	
Option D ^{1) 2)}	4-20 mA HART (passive)		Pulse/frequency/switch output (passive)		4-20 mA current input (passive)	
Option E ^{1) 3)}	FOUNDATION Fieldbus		Pulse/frequency/switch output (passive)		-	
Option G ^{1) 4)}	PROFIBUS PA		Pulse/frequency/switch output (passive)		-	

- 1) Output 1 must always be used; output 2 is optional.
- 2) The integrated overvoltage protection is not used with option D: Terminals 5 and 6 (current input) are not protected against overvoltage.
- 3) FOUNDATION Fieldbus with integrated reverse polarity protection.
- 4) PROFIBUS PA with integrated reverse polarity protection.

Intrinsically safe values



The order code is part of the extended order code. Detailed information on the features of the device and on the structure of the extended order code → 7.

Type of protection Ex ia

Order code for "Output"	Output type	Intrinsically safe values	
Option A	4-20mA HART	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 5\ nF$	
Option B	4-20mA HART	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 5\ nF$	
	Pulse/frequency/switch output	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$	
Option C	4-20mA HART	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 30\ nF$	
	4-20mA analog		
Option D	4-20mA HART	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 5\ nF$	
	Pulse/frequency/switch output	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$	
	4 to 20 mA current input	$U_i = DC\ 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 5\ nF$	
Option E	FOUNDATION Fieldbus	STANDARD $U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1.2\ W$ $L_i = 10\ \mu H$ $C_i = 5\ nF$	FISCO $U_i = 17.5\ V$ $I_i = 550\ mA$ $P_i = 5.5\ W$ $L_i = 10\ \mu H$ $C_i = 5\ nF$
	Pulse/frequency/switch output	$U_i = 30\ V$ $I_i = 300\ mA$ $P_i = 1\ W$ $L_i = 0\ \mu H$ $C_i = 6\ nF$	

Order code for "Output"	Output type	Intrinsically safe values	
Option G	PROFIBUS PA	STANDARD $U_i = 30 \text{ V}$ $I_i = 300 \text{ mA}$ $P_i = 1.2 \text{ W}$ $L_i = 10 \text{ } \mu\text{H}$ $C_i = 5 \text{ nF}$	FISCO $U_i = 17.5 \text{ V}$ $I_i = 550 \text{ mA}$ $P_i = 5.5 \text{ W}$ $L_i = 10 \text{ } \mu\text{H}$ $C_i = 5 \text{ nF}$
	Pulse/frequency/switch output	$U_i = 30 \text{ V}$ $I_i = 300 \text{ mA}$ $P_i = 1 \text{ W}$ $L_i = 0 \text{ } \mu\text{H}$ $C_i = 6 \text{ nF}$	

Remote display FHX50

Basic specification, position 1, 2 Approval	Cable specification	Basic specification, position 4 Display; operation Option L, M
Option BA, BB, BJ, B2, IA, IB, IJ, I4	Max. cable length: 60 m (196.85 ft)	$U_o = 7.3 \text{ V}$
		$I_o = 327 \text{ mA}$
		$P_o = 362 \text{ mW}$
		$L_o = 149 \text{ } \mu\text{H}$
		$C_o = 388 \text{ nF}$
		$C_c \leq 125 \text{ nF}$
		$L_c \leq 149 \text{ } \mu\text{H}$

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