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Safety Instructions
Proline t-mass 150

ATEX: II3G Ex nA IIC T4...T1 or Ex ec IIC T4...T1
IECEx: Ex nA IIC T4...T1 or Ex ec IIC T4...T1

Endress+Hauser
People for Process Automation

BG - Правила за техниката на безопасност за електрически средства за производство във взривоопасни зони. Ако не разбирате езика на това ръководство има възможност да споръчате 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 směrnicím. 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 πρότυπα 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 tällä 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 prijeti opasnost od eksplozije. Ako Vam nije moguće čitati ovaj naputak, onda imate mogućnost da kod nas naručite naputak sastavljen na Vašem materinskom 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 megfelelőségi nyilatkozattal és a CE-jelzés felhelyezésével kijelenti, hogy ez a termék megfelel az alkalmazandó európai irányelveknek. Az alkalmazott irányelvek, szabványok és dokumentumok a megfelelőségi 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 ordinarcene 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 ženklinimu 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 tulkojumu Jūsu valsts valodā.
ES atbilstības deklarācija
Ražotājs Endress+Hauser ar šo atbilstības apliecinājumu un CE zīmola lietojumu apstiprina, ka produkts izgatavots sakaņā 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 dukumenty 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 periclitate 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 şi prin aplicarea semnului CE că acest produs corespunde directivelor europene aplicabile. Directivele, normele aplicate şi documentele sunt menționate în declarația de conformitate.

SK - Bezpečnostné pokyny pre elektrické zariadenie prevádzkované v priestoroch s nebezpečenstvom výbuchu. Ak nemáte možnost' prečítat' si tento návod, môžete si u nás objednat' 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 veksplozivnih 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. Upoštevane 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 försäkrar 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.

Proline t-mass 150

Table of contents

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
t-mass A 150	BA01042D
t-mass B 150	BA01043D
t-mass T 150	BA01260D

Additional documentation

Contents	Document type	Documentation code
t-mass A 150 OEM	Special documentation	SD01921D
Explosion Protection	Brochure	CP00021Z/11

Manufacturer's certificates

EU Declaration of Conformity

Dokumentation code: EC_00296

IEC Certificate of Conformity

Certificate number:

IECEx CSA 13.0028X

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

- IEC 60079-0: 2017
- IEC 60079-7: 2017
- IEC 60079-15: 2010

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	6	Thermal mass flowmeter
2	Sensor	A, B, T	Sensor type
3	Transmitter	A	Transmitter type: 2-wire, compact version

Position	Order code for	Option selected	Description
4	Generation index	B	Platform generation
5, 6	Nominal diameter	A: DN 15 to 50 B: DN 80 to 1500 T: DN 40 to 1000	Nominal diameter of sensor

Basic specifications

Item	Order code	Option selected	Description
1, 2	Approval	BS, I5	Ex nA IIC T4...T1 Gc or Ex ec IIC T4...T1
3	Power supply	D	18-30VDC
4	Output, input	A	4-20mA HART
		B	4-20 mA HART, pulse/frequency/switch output
		K	Pulse/frequency/switch output
		Q	4-20 mA HART, pulse/frequency/switch output, status input
5	Display, Operation	A	W/o; via communication
		C	SD02 4-line; push buttons + data backup function
6	Housing	A	Compact, alu, coated
7	Electrical connection	A	Gland M20
		C	Thread G½
		D	Thread NPT½
		Q	2× M12 plug × 1

Optional specifications

No options specific to hazardous locations are available.

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. 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.
- Observe all the technical data of the device (see nameplate).

Safety instructions: Installation

- Continuous service temperature of the connecting cable: −40 to +80 °C; however, at least in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,min}$ and $T_{a,max}$ + 20 K).
- Only use certified cable entries and connection plugs M12×1 suitable for the application. Please comply with the selection criteria as defined in IEC/EN 60079-14.
- When the measuring device is connected, attention must be paid to explosion protection at the transmitter. → 🖹 12
- To ensure dust-tightness, securely seal the transmitter housing and cable entries.
- Only open all housing briefly, ensuring that no dust or moisture enters the housing.

Verbindungsstecker

- Only use M12 × 1 connectors that meet the requirements of the EN 61076-2-101 standard and that are suitable and certified for the particular application.
- Please comply with the relevant operating instructions and safety instructions for the connector.
- The temperature range of the measuring device can be limited by the temperature range of the connector. The lower temperature value applies.
- The use of approved connectors may require installation that provides impact protection. Please comply with the safety instructions of the connector.
- The degree of protection of the measuring device can be limited by the degree of protection of the connector.
- Close off any connections that are not used with sealing plugs that are both suitable and certified for the particular application. The plastic transport plug does not meet this requirement and must therefore be replaced at the time of installation.

- Please comply with the connection instructions for the connector to ensure protection of the housing. Tighten the connectors and/or sealing plugs.
- M12 connections may only be opened and closed in a sufficiently clean environment to prevent the infiltration of moisture and dirt. They may only remain open in the field for a short time to enable service operations.
- In an explosive atmosphere: Do not fit or remove the connectors under tension.

⚠ WARNING

Ex nA and Ex ec type of protection

- ▶ In potentially explosive atmosphere: Do not disconnect the electrical connection of the power supply circuit when energized.
- ▶ In potentially explosive atmospheres: Do not open the connection compartment cover when energized.
- ▶ In locations where extreme external air humidity and internal temperature fluctuations (e.g. frequent on/off cycles) may cause condensation inside the device, the interior should be inspected regularly.
- ▶ 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 or sealing plugs. The metal sealing plugs supplied meet this requirement.
- ▶ The M20 × 1.5 cable glands supplied are only suitable for permanently installed cables and connections. Ensure that strain relief is provided during installation.

The device can be connected to the Endress+Hauser service tool FXA291; pay attention to the Operating Instructions. Connection to the service connector is only permitted if the atmosphere is not a potentially explosive atmosphere.

Potential equalization

- Integrate the device into the local potential equalization → 🖹 12.
- 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.

Temperature tables

Ambient temperature

Minimum ambient temperature: $T_a = -40$ °C

Maximum ambient temperature: $T_a = +60$ °C

Medium temperature

Minimum medium temperature: T_m = −20 °C

Maximum medium temperature: T_m for T4-T1 depending on the maximum ambient temperature T_a

Compact version

Basic specification, position 4 (Output; Input) = A, B, K, Q

SI units

Sensor	T_a [°C]	T4 [135 °C]	T3 [200 °C]	T2 [300 °C]	T1 [450 °C]
t-mass A	60	100	100	100	100
t-mass B	60	100	100	100	100
t-mass T	60	100 [1)]	100 [1)]	100 [1)]	100 [1)]

1) For cleaning purposes (SIP) a temperature of 130 °C is permitted for a period of one hour.

Seal, clamping ferrule and sensor

Seal, clamping ferrule and sensor depending on the medium temperature T_m

SI units

Sensor	T_m [°C]
t-mass A	−40 to +100

SI units

Sensor	Seal (G thread only)	T_m [°C]
t-mass B	HNBR	−20 to +100
	EPDM	−40 to +100
t-mass T	HNBR	−20 to 100 [1)]
	EPDM	−20 to 100

1) For cleaning purposes (SIP) a temperature of 130 °C is permitted for a period of one hour.

SI units

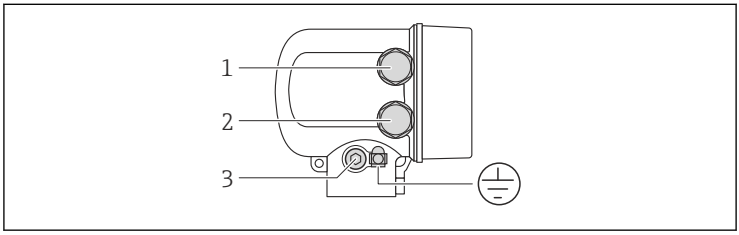
Sensor	Clamping ferrule	T_m [°C]
t-mass B	PEEK	−40 to +100
t-mass T	PEEK	−20 to 100 [1]
	1.4404	−20 to 100 [1]
	2.4602	−20 to 100 [1]

1) For cleaning purposes (SIP) a temperature of 130 °C is permitted for a period of one hour.

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.

Connecting the transmitter



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Item		Basic specification, Item 1, 2 Approval:	Type of protection used for cable entry	Description
1	Cable entry for output 1	BS, I5	Ex nA or Ex ec	The following applies to devices with basic specification, item 1, 2 (Approval) = BS, I5: For device versions with a plastic transport sealing plug, this plug does not meet the requirements of the type of protection and must be replaced during installation by a suitable entry that meets the approval specifications. 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. For device versions with a cable gland, this entry has a separate component approval and meets the requirements of the type of protection indicated on the nameplate. For device versions with a device plug, use a counterpart with a separate component approval that meets the requirements of the type of protection indicated on the nameplate.
2	Cable entry for output 2	BS, I5	Ex nA or Ex ec	The following applies to devices with basic specification, item 1, 2 (Approval) = BS, I5: For device versions with a plastic transport sealing plug, this plug does not meet the requirements of the type of protection and must be replaced during installation by a suitable entry that meets the approval specifications. 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. For device versions with a cable gland, this entry has a separate component approval and meets the requirements of the type of protection indicated on the nameplate. For device versions with a device plug, use a counterpart with a separate component approval that meets the requirements of the type of protection indicated on the nameplate.

Item		Description
3	Pressure compensation plug	NOTICE **Housing degree of protection voided due to insufficient sealing of the housing.** ► Do not open - not a cable entry.
⏚	Potential equalization	NOTICE **Terminal for connection to potential equalization.** ► Pay attention to the grounding concept of the facility.

Terminal assignment

Transmitter

The order code constitutes part of the extended order code. Detailed information on the codes for the device and on the structure of the extended order code → 🖹 7.

Connection version 4-20 mA HART, pulse/frequency/switch output, status input

Supply voltage

Order code for "Power supply"	Terminal numbers	
	1 (L+) [1]	2 (L-) [1]
Option **D**	DC 18 to 30 V [2]	

1) Securely tighten the screws of the terminal. Recommended torque: 0.5 Nm.
2) For connection to touch-safe circuits (e.g. SELV, PELV etc.)

Signal transmission

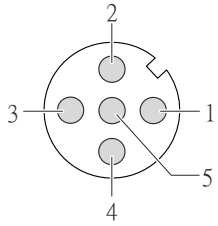
Order code for "Output, input"	Terminal numbers					
	Output 1		Output 2		Input	
	26 (+) [1]	27 (-) [1]	24 (+) [1]	25 (-) [1]	22 (+) [1]	23 (-) [1]
Option **A**	4-20 mA HART (active)		-		-	
Option **B**	4-20 mA HART (active)		Pulse/frequency/switch output (passive)		-	
Option **K**	-		Pulse/frequency/switch output (passive)		-	
Option **Q**	4-20 mA HART (active)		Pulse/frequency/switch output (passive)		Status input	

1) Securely tighten the screws of the terminal. Recommended torque: 0.5 Nm.

Pin assignment, device plug

Supply voltage

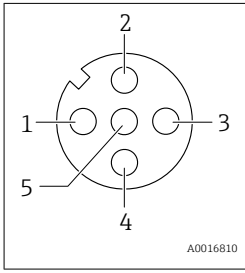
Supply voltage for all communication types (on the device side)



Pin	Assignment	
1	L+	DC 24 V
2	+	Status input
3	-	Status input
4	L-	DC 24 V
5		Grounding/shielding
Coding	**Plug/socket**	
A	Plug	

4-20 mA HART with pulse/frequency/switch output

4-20 mA HART with pulse/frequency/switch output (on the device side)



Pin		Assignment
1	+	4-20 mA HART (active)
2	-	4-20 mA HART (active)
3	+	Pulse/frequency/switch output (passive)
4	-	Pulse/frequency/switch output (passive)
5		Grounding/shielding
Coding		**Plug/socket**
A		Socket

Safety-related 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.

Ex nA or Ex ec type of protection

Order code for "Output"	Output type	Safety-related values
Option **A**	4-20mA HART	▪ Galvanically isolated: ▪ Active: 4 to 20 mA R_L < 750 Ω, R_L HART ≥ 250 Ω
Option **B**	4-20mA HART	▪ Galvanically isolated: ▪ Active: 4 to 20 mA R_L < 750 Ω, R_L HART ≥ 250 Ω
	Pulse/frequency/switch output	▪ Galvanically isolated: ▪ Passive: 30 V DC/25 mA Open collector Maximum frequency value 0 to 1 000 Hz (f_{max} = 1 250 Hz)
Option **K**	Pulse/frequency/switch output	▪ Galvanically isolated: ▪ Passive: 30 V DC/25 mA Open collector Maximum frequency value 0 to 1 000 Hz (f_{max} = 1 250 Hz)
Option **Q**	4-20mA HART	▪ Galvanically isolated: ▪ Active: 4 to 20 mA R_L < 750 Ω, R_L HART ≥ 250 Ω

Order code for "Output"	Output type	Safety-related values
	Pulse/frequency/switch output	▪ Galvanically isolated: ▪ Passive: 30 V DC/25 mA Open collector Maximum frequency value 0 to 1 000 Hz (f_{max} = 1 250 Hz)
	Status input	Galvanically isolated ▪ −3 to +30 V DC ▪ R_i = 5 kΩ

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