

Safety Instructions

Liquiphant FTL64

Ex nA IIC T6...T1 Gc
Ex tD A22 IP6X T**°C




Liquiphant FTL64

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About this document

 This document has been translated into several languages. Legally determined is solely the English source text.

Associated documentation

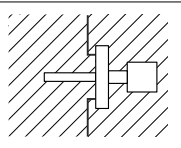
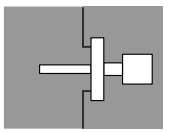
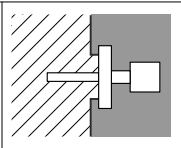
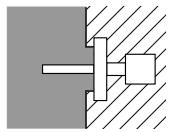
This document is an integral part of the following Operating Instructions:
BA02037F/00

Supplementary documentation


Explosion-protection brochure: CP00021Z/11
The Explosion-protection brochure is available:

- In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

**General notes:
Combined approval**

					
Ex nA IIC Zone 2	Ex tD Zone 22	Ex nA IIC Zone 2	Ex tD Zone 22	Ex tD Zone 22	Ex nA IIC Zone 2

The device is designed for operation in explosive gas or explosive dust atmosphere as shown in the sketch above. In the event of potentially explosive gas-air and dust-air mixtures occurring simultaneously: Suitability requires further assessment.

 A sequential change between gas and dust explosion protection is only possible if:

- A period with non-explosive atmosphere is realized during the transition or
- Special examinations are done which are not covered by the certificate

Manufacturer's certificates

NEPSI Declaration of Conformity

Certificate number:
GYJ21.1248X

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

- GB 3836.1-2010
- GB 3836.3-2010
- GB 3836.8-2014
- GB 12476.1-2013
- GB 12476.5-2013

Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany
or

Endress+Hauser (Suzhou) Automation Instrument Co., Ltd. No.491,
Suhong Middle Road, Suzhou Industrial Park, China, 215021

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

FTL64	-	*****	+	A*B*C*D*E*F*G*..
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>

* = Placeholder

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

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.

Extended order code: Liquiphant



The following specifications reproduce an extract from the product structure and are used to assign:

- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

Device type

FTL64

Basic specifications


Position 1, 2 (Approval)		
Selected option		Description
FTL64	NL	NEPSI Ex nA IIC T6...T1 Gc ¹⁾ NEPSI Ex nA nC IIC T6...T1 Gc ²⁾ NEPSI Ex tD A22 IP6X T**°C

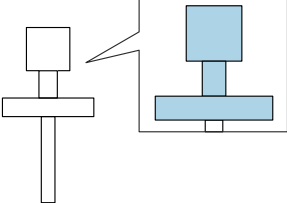
1) Only in connection with Position 3, 4 (Output) = A2, A7, A8, GA

2) Only in connection with Position 3, 4 (Output) = A3, A4

Position 3, 4 (Output)		
Selected option		Description
FTL64	A2	FEL62, 3-wire PNP 10-55VDC + test button
	A3	FEL64DC, relay DPDT 9-20VDC
	A4	FEL64, relay DPDT 19-253VAC/19-55VDC contact 253V/6A + test button
	A7	FEL67, 2-wire PFM + test button
	A8	FEL68, 2-wire NAMUR + test button
	GA	FEL60D, density/concentration

Position 6 (Housing, Material)		
Selected option		Description
FTL64	B	Single compartment; Alu, coated
	C	Single compartment; 316L, cast
	M	Dual compartment L-shape; Alu, coated

 Shown in the temperature tables exemplary as follows:




Position 7 (Electrical Connection)		
Selected option		Description
FTL64	B ¹⁾	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
	C ²⁾	Gland M20, 316L, IP66/68 NEMA Type 4X/6P
	F	Thread M20, IP66/68 NEMA Type 4X/6P
	G	Thread G1/2, IP66/68 NEMA Type 4X/6P
	I	Thread NPT3/4, IP66/68 NEMA Type 4X/6P
	Y	Special version: Thread NPT1/2, IP66/68 NEMA Type 4X/6P

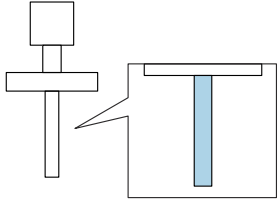
- 1) Only in connection with Position 6 (Housing, Material) = B, M
 2) Only in connection with Position 6 (Housing, Material) = B, C

Position 8 (Application)		
Selected option		Description
FTL64	D	Process max 280°C/536°F, max 100bar
	E	Process max 230°C/446°F, max 100bar
	R	Process max 230°C/446°F, max 40bar (PFA)
	9	Special version: Process max 300°C/572°F, max 100bar

Position 9 (Surface Refinement)		
Selected option		Description
FTL64	A	Standard Ra<3,2um/126uin
	R	Coating PFA (conductive)

Position 10 (Type of Probe)		
Selected option		Description
FTL64	1	Compact version
	2	Extension tube

 Shown in the temperature tables exemplary as follows:



Optional specifications

ID Nx, Ox (Accessory Mounted)		
Selected option		Description
FTL64	NF ¹⁾	Bluetooth VU121, Labeling: VA13-02
	NG ²⁾	Prepared for Heartbeat Verification + Monitoring + Bluetooth VU121, Labeling: VA13-01

- 1) Only in connection with Position 3, 4 (Output) = A2-A4, A7, Position 6 (Housing, Material) = B, M
- 2) Only in connection with Position 3, 4 (Output) = A8, Position 6 (Housing, Material) = B, M

ID Px, Rx (Accessory Enclosed)		
Selected option		Description
FTL64	PA ¹⁾	Weather protection cover, 316L
	PB ²⁾	Weather protection cover, plastic
	R6 ³⁾	Test magnet

- 1) Only in connection with Position 6 (Housing, Material) = M
- 2) Only in connection with Position 6 (Housing, Material) = B, C
- 3) Only in connection with Position 3, 4 (Output) = A2-A4, A8

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
- For installation, use and maintenance of the device, users must also observe the requirements stated in the Operating Instructions and the standards:
 - GB 50257-2014: "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
 - GB 3836.13-2013: "Explosive atmospheres, Part 13: Equipment repair, overhaul and reclamation".
 - GB/T 3836.15-2017: "Explosive atmospheres, Part 15: Electrical installations design, selection and erection".
 - GB/T 3836.16-2017: "Explosive atmospheres, Part 16: Electrical installations inspection and maintenance".
 - GB/T 3836.18-2017: "Explosive atmospheres, Part 18: Intrinsically safe electrical systems".
 - GB 15577-2018: "Safety regulations for dust explosive prevention and protection". (Only if installed in dust hazardous area.)
- 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.
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. housing, sensor element, special varnishing, attached additional plates, ..)
 - Of isolated capacities (e.g. isolated metallic plates)
- 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 class.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- If the degree of protection IP66/67 or IP66/68 is ensured, the device may be installed in an environment of pollution degree 4.

Safety instructions:
Special conditions

Permitted ambient temperature range at the electronics housing:
 $-40\text{ °C} \leq T_a \leq +70\text{ °C}$

- Limitations of the maximum ambient temperature at the electronics housing may be required dependent on device configuration, process temperatures and temperature classification.
- Details of limitations: → 13, "Temperature tables".
- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the housing or other metal parts or for adhesive plates:
 - Observe the danger of electrostatic charging and discharge.
 - Do not install in the vicinity of processes (≤ 0.5 m) generating strong electrostatic charges.

Basic specification, Position 6 (Housing, Material) = B, M
Avoid sparks caused by impact and friction.

Optional specification, ID Px, Rx (Accessory Enclosed) = PA
Connect the weather protection cover to the local potential equalization.

Optional specification, ID Px, Rx (Accessory Enclosed) = PB
Avoid electrostatic charging of the weather protection cover (e.g. friction, cleaning, maintenance, strong medium flow).

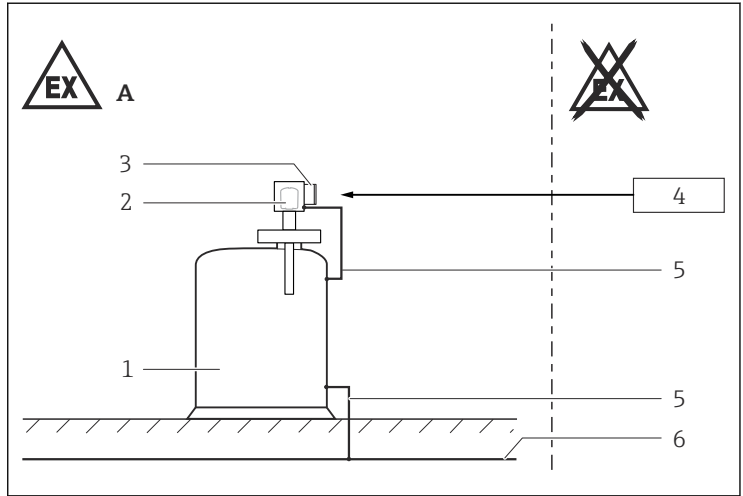
Optional specification, ID Px, Rx (Accessory Enclosed) = R6
Suitable for use in explosion hazardous areas.

Gas group IIC and dust

Basic specification, Position 9 (Surface Refinement) = R

- Due to the surface resistance $1 \text{ G}\Omega$ (|R| PFA-conductive), this coating is suitable without restrictions.
- Prevent damage to the conductive surface layer (e.g. by abrasion).

Safety instructions: Installation



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- A Zone 2, Zone 22
 1 Tank; Zone 2, Zone 22
 2 Electronic insert; Electronics compartment
 3 Connection compartment Ex nA
 (only Basic specification, Position 6 (Housing, Material) = M)
 4 Power supply or power supply unit
 5 Potential equalization line
 6 Potential equalization

- Perform the following to achieve the degree of protection IP66/67 or IP66/68:
 - Screw the cover tight.
 - Mount the cable entry correctly.
- In potentially explosive atmospheres:
 - Do not disconnect the electrical connection of the power supply circuit when energized.
 - Do not open the connection compartment cover and the electronics compartment cover when energized.
- Continuous service temperature of the connecting cable / cable gland / cable entry:
 - Basic specification, Position 3, 4 (Output) = GA, A7, A8: $\geq T_a + 20 \text{ K}$
 - Basic specification, Position 3, 4 (Output) = A2: $\geq T_a + 35 \text{ K}$
 - Basic specification, Position 3, 4 (Output) = A3, A4: $\geq T_a + 45 \text{ K}$
- Observe the maximum process conditions according to the manufacturer's Operating Instructions.
- At high medium temperatures, note flange pressure load capacity as a factor of temperature.

- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- Support extension tube of the device if a dynamic load is expected.
- Only use certified cable entries suitable for the application. Observe national regulations and standards. Accordingly, the connection terminal does not include any ignition sources.
- When operating the transmitter housing at an ambient temperature under $-20\text{ }^{\circ}\text{C}$, use appropriate cables and cable entries permitted for this application.
- Supplied cable glands and metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.
- The device can be equipped with the Bluetooth® module: refer to the Operating Instructions and specifications in the "Bluetooth® module" chapter.
- 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.
- Before operation:
 - Screw in the cover all the way.
 - Tighten the securing clamp on the cover.

Cross section connecting wire	Tightening torque of terminal screw	Stripped insulation
0.2 to 2.5 mm ²	0.5 to 0.6 Nm	8 mm

Application in dust

- To ensure the ingress protection IP66/67: Only use the unit-mounted cable entries, sealing plugs and O-rings.
- Supplied cable glands and metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.

Accessory: Sliding sleeve

The sliding sleeve can be used for a continuous setting of the switch point (see Operating Instructions).

Potential equalization

Integrate the device into the local potential equalization.

Optional specification, ID Px, Rx (Accessory Enclosed) = PA
Connect the weather protection cover to the local potential equalization.

Bluetooth® module

Basic specification, Position 3, 4 (Output) = A7

If the device is equipped with the Bluetooth® module, no battery is required or allowed.

Basic specification, Position 3, 4 (Output) = A8

- If the device is equipped with the Bluetooth® module, a battery is required.
- Removal or replacement of the battery is only permitted in non-hazardous areas.
- Observe the information in the Safety Instructions (XA) included with the Bluetooth® module.

Temperature tables**General notes****Ex nA IIC**

Optional specification, ID Px, Rx (Accessory Enclosed) = PB

When using the weather protection cover: Reduce the values T_a of P1, P2, P3 by 16 K.

Ex tD

Optional specification, ID Px, Rx (Accessory Enclosed) = PB

When using the weather protection cover: Reduce the values T_a by 16 K.

Description notes

Unless otherwise indicated, the positions always refer to the basic specification.

Zone 2

1st line: Position 6 (Housing, Material) = A, B, ...

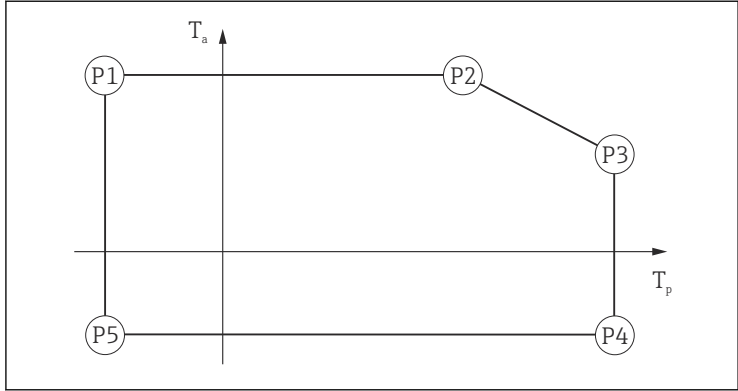
1st column: Position 8 (Application) = A, B, ...

2nd column: Maximum load current

3rd column: Temperature classes T6 (85 °C) to T1 (450 °C)

Column P1 to P5: Position (temperature value) on the axes of the derating

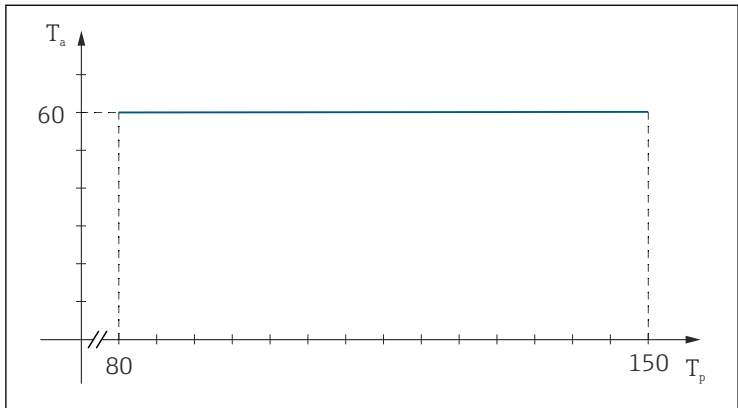
- T_a : Ambient temperature in °C
- T_p : Process temperature in °C



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Zone 22

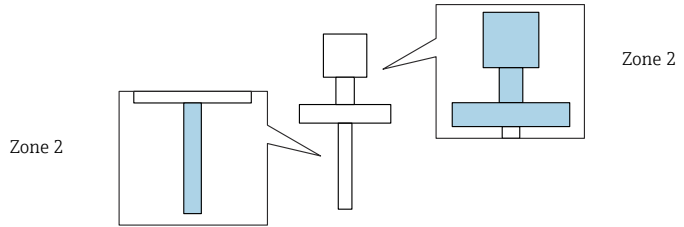
- 1st column: Position 8 (Application) = A, B, ...
- 2nd column: Maximum load current
- 3rd column: Process temperature range in °C
- 4th column: Ambient temperature range in °C
- 5th column: Maximum surface temperature in °C



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T_a Ambient temperature in °C
 T_p Process temperature in °C

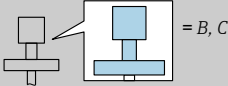
Zone 2



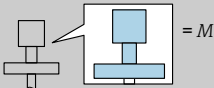
Position 3, 4 (Output) = A2

				P1		P2		P3		P4		P5	
				T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
<i>E, R</i>	350 mA												
		T6	-60	52	65	52	80	51	80	-40	-60	-40	
		T5	-60	67	80	67	95	66	95	-40	-60	-40	
		T4	-60	67	82	67	130	64	130	-40	-60	-40	
		T3	-60	67	82	67	195	60	195	-40	-60	-40	
		T2...T1	-60	67	82	67	230	58	230	-40	-60	-40	

				P1		P2		P3		P4		P5	
				T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
<i>E, R</i>	350 mA												
		T6	-60	55	55	55	80	53	80	-40	-60	-40	
		T5	-60	70	70	70	95	68	95	-40	-60	-40	
		T4	-60	70	130	70	130	70	130	-40	-60	-40	
		T3	-60	70	133	70	195	67	195	-40	-60	-40	
		T2...T1	-60	70	133	70	230	65	230	-40	-60	-40	

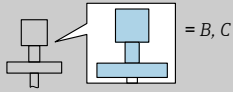
												
D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
		T1	-60	67	87	67	280 300 ¹⁾	58	280 300 ¹⁾	-40	-60	-40
		T6	-60	52	71	52	80	51	80	-40	-60	-40
		T5	-60	67	86	67	95	66	95	-40	-60	-40
		T4	-60	67	87	67	130	65	130	-40	-60	-40
		T3	-60	67	87	67	195	62	195	-40	-60	-40
		T2	-60	67	87	67	280 290 ¹⁾	58	280 290 ¹⁾	-40	-60	-40

1) Only in connection with Position 8 (Application) = 9

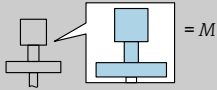
												
D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	350 mA											
		T6	-60	55	56	55	80	54	80	-40	-60	-40
		T5	-60	70	71	70	95	69	95	-40	-60	-40
		T4	-60	70	130	70	130	70	130	-40	-60	-40
		T3	-60	70	154	70	195	68	195	-40	-60	-40
		T2	-60	70	154	70	280 290 ¹⁾	65	280 290 ¹⁾	-40	-60	-40
		T1	-60	70	154	70	280 300 ¹⁾	65	280 300 ¹⁾	-40	-60	-40

1) Only in connection with Position 8 (Application) = 9

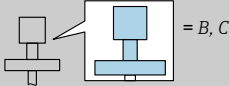
Position 3, 4 (Output) = A3, A4



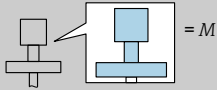
E, R			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	2 A											
		T6	-60	52	60	52	80	50	80	-40	-60	-40
		T5	-60	67	75	67	95	65	95	-40	-60	-40
		T4	-60	70	118	70	130	69	130	-40	-60	-40
		T3	-60	70	118	70	195	64	195	-40	-60	-40
		T2...T1	-60	70	118	70	230	61	230	-40	-60	-40
	4 A											
		T6	-60	43	58	43	80	41	80	-40	-60	-40
		T5	-60	58	73	58	95	56	95	-40	-60	-40
		T4	-60	70	80	70	130	67	130	-40	-60	-40
		T3	-60	70	80	70	195	63	195	-40	-60	-40
	T2...T1	-60	70	80	70	230	59	230	-40	-60	-40	



E, R			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	2 A											
		T6	-60	55	61	55	80	54	80	-40	-60	-40
		T5	-60	70	76	70	95	69	95	-40	-60	-40
		T4	-60	70	130	70	130	70	130	-40	-60	-40
		T3	-60	70	176	70	195	69	195	-40	-60	-40
		T2...T1	-60	70	176	70	230	67	230	-40	-60	-40
	4 A											
		T6	-60	45	66	45	80	44	80	-40	-60	-40
		T5	-60	60	81	60	95	59	95	-40	-60	-40
		T4	-60	70	124	70	130	69	130	-40	-60	-40
		T3	-60	70	124	70	195	66	195	-40	-60	-40
		T2...T1	-60	70	124	70	230	65	230	-40	-60	-40

												
D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	2 A	T6	-60	52	64	52	80	51	80	-40	-60	-40
		T5	-60	67	79	67	95	66	95	-40	-60	-40
		T4	-60	70	130	70	130	70	130	-40	-60	-40
		T3	-60	70	139	70	195	67	195	-40	-60	-40
		T2	-60	70	139	70	280 290 ¹⁾	63	280 290 ¹⁾	-40	-60	-40
		T1	-60	70	139	70	280 300 ¹⁾	63	280 300 ¹⁾	-40	-60	-40
	4 A	T6	-60	43	66	43	80	42	80	-40	-60	-40
		T5	-60	58	80	58	95	57	95	-40	-60	-40
		T4	-60	70	85	70	130	68	130	-40	-60	-40
		T3	-60	70	85	70	195	65	195	-40	-60	-40
		T2	-60	70	85	70	280 290 ¹⁾	61	280 290 ¹⁾	-40	-60	-40
		T1	-60	70	85	70	280 300 ¹⁾	60	280 300 ¹⁾	-40	-60	-40

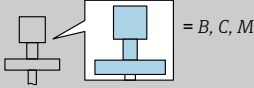
1) Only in connection with Position 8 (Application) = 9

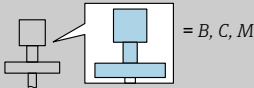


D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	2 A											
		T6	-60	55	62	55	80	54	80	-40	-60	-40
		T5	-60	70	77	70	95	69	95	-40	-60	-40
		T4	-60	70	130	70	130	70	130	-40	-60	-40
		T3	-60	70	195	70	195	70	195	-40	-60	-40
		T2	-60	70	208	70	280 290 ¹⁾	67	280 290 ¹⁾	-40	-60	-40
		T1	-60	70	208	70	280 300 ¹⁾	66	280 300 ¹⁾	-40	-60	-40
	4 A											
		T6	-60	45	73	45	80	44	80	-40	-60	-40
		T5	-60	60	88	60	95	59	95	-40	-60	-40
		T4	-60	70	130	70	130	70	130	-40	-60	-40
		T3	-60	70	142	70	195	68	195	-40	-60	-40
		T2	-60	70	142	70	280 290 ¹⁾	65	280 290 ¹⁾	-40	-60	-40
		T1	-60	70	142	70	280 300 ¹⁾	64	280 300 ¹⁾	-40	-60	-40

1) Only in connection with Position 8 (Application) = 9

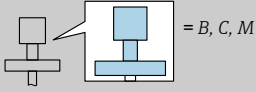
Position 3, 4 (Output) = A7, A8

												
E, R			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	350 mA											
		T6	-60	70	80	70	80	70	80	-40	-60	-40
		T5	-60	70	95	70	95	70	95	-40	-60	-40
		T4	-60	70	130	70	130	70	130	-40	-60	-40
		T3	-60	70	195	70	195	70	195	-40	-60	-40
		T2...T1	-60	70	200	70	230	67	230	-40	-60	-40

												
D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	350 mA											
		T6	-60	70	80	70	80	70	80	-40	-60	-40
		T5	-60	70	95	70	95	70	95	-40	-60	-40
		T4	-60	70	130	70	130	70	130	-40	-60	-40
		T3	-60	70	195	70	195	70	195	-40	-60	-40
		T2	-60	70	230	70	280 290 ¹⁾	69	280 290 ¹⁾	-40	-60	-40
		T1	-60	70	279	70	280 300 ¹⁾	68	280 300 ¹⁾	-40	-60	-40

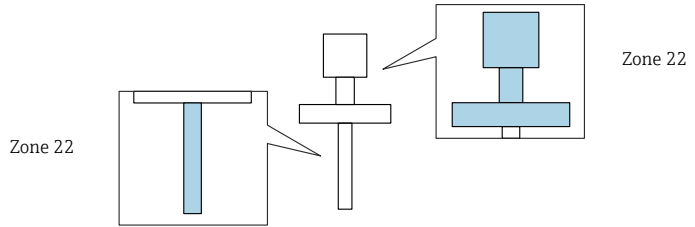
1) Only in connection with Position 8 (Application) = 9

Position 3, 4 (Output) = GA



<i>D, E, R, 9</i>			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
		T6...T1	-60	70	70	70	80	70	80	-40	-60	-40

Zone 22



Position 3, 4 (Output) = A2

<i>E, R</i>				
	350 mA			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$	T -40 to +80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$	T -40 to +95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$	T -40 to +130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$	T -40 to +195
		$-60 \leq T_p \leq +230$	$-40 \leq T_a \leq +70$	T -40 to +230

<i>D, 9</i>				
	350 mA			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$	T -40 to +80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$	T -40 to +95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$	T -40 to +130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$	T -40 to +195
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +290$ ¹⁾	$-40 \leq T_a \leq +70$	T -40 to +280 T -40 to +290 ¹⁾
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +300$ ¹⁾	$-40 \leq T_a \leq +70$	T -40 to +280 T -40 to +300 ¹⁾

1) Only in connection with Position 8 (Application) = 9

Position 3, 4 (Output) = A3, A4

E, R				
	2 A, 4 A, 6 A			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$	T -40 to +80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$	T -40 to +95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$	T -40 to +130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$	T -40 to +195
		$-60 \leq T_p \leq +230$	$-40 \leq T_a \leq +70$	T -40 to +230

D, 9				
	2 A, 4 A, 6 A			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$	T -40 to +80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$	T -40 to +95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$	T -40 to +130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$	T -40 to +195
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +290$ ¹⁾	$-40 \leq T_a \leq +70$	T -40 to +280 T -40 to +290 ¹⁾
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +300$ ¹⁾	$-40 \leq T_a \leq +70$	T -40 to +280 T -40 to +300 ¹⁾

1) Only in connection with Position 8 (Application) = 9

Position 3, 4 (Output) = A7, A8, GA

E, R				
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$	T -40 to +80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$	T -40 to +95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$	T -40 to +130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$	T -40 to +195
		$-60 \leq T_p \leq +230$	$-40 \leq T_a \leq +70$	T -40 to +230

D, 9				
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$	T -40 to +80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$	T -40 to +95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$	T -40 to +130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$	T -40 to +195
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +290$ ¹⁾	$-40 \leq T_a \leq +70$	T -40 to +280 T -40 to +290 ¹⁾
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +300$ ¹⁾	$-40 \leq T_a \leq +70$	T -40 to +280 T -40 to +300 ¹⁾

1) Only in connection with Position 8 (Application) = 9

Connection data

Optional specification, ID Nx (Accessory Mounted) = NF, NG

When using the Bluetooth® module: No changes to the connection values.

<i>Basic specification, Position 3, 4 (Output)</i>	Power supply	
A2	U = 10 to 55 V _{DC} ; P _{max} < 0.5 W	I _{max} = 350 mA
A3	U = 9 to 20 V _{DC} ; P _{max} < 1 W	2 potential free change-over contacts; 2 A Ex e, 6 A Ex t
A4	U = 19 to 253 V _{AC} , 50/60 Hz or 19 to 55 V _{DC} ; P _{max} < 25 VA or < 1.3 W	
A7	U = 9.5 to 12.5 V _{DC} ; PFM; I _{max} = 12 mA Connection only to power supply unit FTL325P or FTL375P from Endress+Hauser.	
A8	U = 4 to 8.2 V _{DC}	NAMUR; I _{max} = 3.8 mA
GA	U = 21 to 26 V _{DC} ; I _{max} = 16 mA Connection only to power supply unit FML621 from Endress+Hauser.	

Cable entry parameters

Cable gland: *Basic specification, Position 7 (Electrical Connection) = B*

mandatory for Position 6 (Housing, Material) = B, M

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 8 to 10,5 mm ¹⁾ (ø 6.5 to 13 mm) ²⁾	Ms, nickel-plated	Silicone	EPDM (ø 17x2)

- 1) Standard
- 2) Separate clamping inserts available

Cable gland: *Basic specification, Position 7 (Electrical Connection) = C*

preferably for Position 6 (Housing, Material) = C and possible for Position 6 (Housing, Material) = B, M

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 7 to 12 mm	1.4404	NBR	EPDM (ø 17x2)



- The tightening torque refers to cable glands installed by the manufacturer:
 - Recommended torque to connect the cable gland into the housing: 3.75 Nm
 - Recommended torque to tighten the cable into the cable gland: 3.5 Nm
 - Maximum torque to tighten the cable into the cable gland: 10 Nm
 - This value may be different depending on the type of cable. However, the maximum value must not be exceeded.
- Only suitable for fixed installation. The operator must pay attention to a suitable strain relief of the cable.
- To maintain the ingress protection of the housing: Install the housing cover, cable glands and blind plugs correctly.
- The cable glands are suitable for a low risk of mechanical danger (4 Joule) and must be mounted in a protected position if larger impact energy levels are expected.



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