

Safety Instructions

Liquiphant FTL64

Ex db IIC T6...T1 Ga/Gb

Ex db IIC T6...T1 Gb

Ex ta/tb IIIC Txx°C Da/Db

Ex tb IIIC Txx°C Db



Liquiphant FTL64

Table of contents

About this document 4

Associated documentation 4

Supplementary documentation 4

General notes: Combined approval 4

Certificates and declarations 5

Manufacturer address 5

Extended order code 5

Safety instructions: General 9

Safety instructions: Specific conditions of use 10

Safety instructions: Installation 11

Safety instructions: Ex d joints 14

Safety instructions: Zone 0 14


Safety instructions: Zone separation Zone 0, Zone 1 14

Explosion protection with heat insulation 14

Temperature tables 15

Connection data 34

About this document

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

Associated documentation

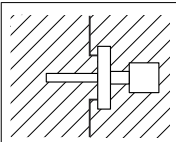
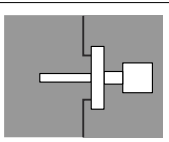
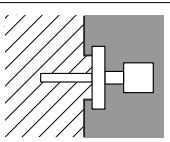
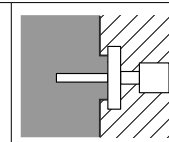
All documentation is available on the Internet:
www.endress.com/Deviceviewer
(enter the serial number from the nameplate).
To commission the device, please observe the Operating Instructions pertaining to the device:
BA02037F

Supplementary documentation


Special Documentation for cable gland M20 Ex d: SD02550F

Explosion protection brochure: CP00021Z
The explosion protection brochure is available on the Internet:
www.endress.com/Downloads

General notes:
Combined approval

							
Ex db IIC		Ex ta/tb IIIC		Ex db IIC		Ex ta/tb IIIC	
Zone 0 or Zone 1	Zone 1	Zone 20 or Zone 21	Zone 21	Zone 0 or Zone 1	Zone 21	Zone 20 or Zone 21	Zone 1

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

Certificates and declarations

Certificate of Conformity

Certificate number:
CML 24JPN1308X

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

- JNIO SH-TR-46-1 : 2020
- JNIO SH-TR-46-2 : 2018
- IEC 60079-26 : 2021
- JNIO SH-TR-46-9 : 2018

Manufacturer
address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany
Address of the manufacturing plant: See nameplate.

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*..
(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.

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	JM	JPN Ex db IIC T6...T1 Ga/Gb
		JPN Ex db IIC T6...T1 Gb
		JPN Ex ta/tb IIIC Txx°C Da/Db
		JPN Ex tb IIIC Txx°C Db

Position 3, 4 (Output)		
Selected option		Description
FTL64	A1	FEL61, 2-wire 19-253VAC + test button
	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

Position 5 (Display, Operation)

Selected option		Description
FTL64	A	W/o; switch
	B ¹⁾	LED module outside visible; switch

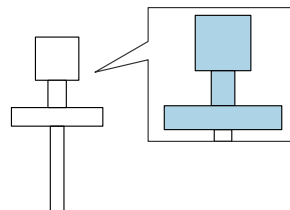
1) Only in connection with Position 3, 4 = A2-A4, Position 6 = B, M

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	F	Thread M20, IP66/68 NEMA Type 4X/6P
	G	Thread G1/2 ¹⁾ , 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) Reduction M20x1.5 to G1/2 enclosed

Position 8 (Application)

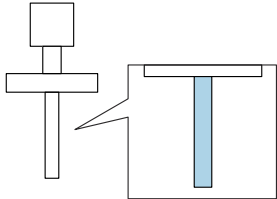
Selected option		Description
FTL64	D	Process max 280°C/536°F, max 100bar
	E	Process max 230°C/446°F, max 100bar
	R	Process max 230°C/446°F, max 40bar (PFA)
	9	Special version: Process max 300°C/572°F, max 100bar

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

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 Jx, Kx (Test, Certificate, Declaration)		
Selected option		Description
FTL64	JL	Ambient temperature -50°C/-58°F
	JT ¹⁾	Ambient temperature -60°C/-76°F

1) Only in connection with Position 3, 4 = A2-A4, A7, A8, Position 5 = A

ID Nx, Ox (Accessory Mounted)		
Selected option		Description
FTL64	NF ¹⁾	Bluetooth
	NG ²⁾	Bluetooth for NAMUR output
	OB	Blind plug marking according to IEC/ATEX Ex d

1) Only in connection with Position 3, 4 = A1-A4, A7, Position 6 = B, M, Position 5 = A
 2) Only in connection with Position 3, 4 = A8, Position 6 = B, M, Position 5 = A

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 = M
 2) Only in connection with Position 6 = B, C
 3) Only in connection with Position 3, 4 = A2-A4, A8

Safety instructions: General

- The device is intended to be used in explosive atmospheres as defined in the scope of IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the manufacturer's specifications.
- Devices suitable for zone separation (marked Ga/Gb or Da/Db) are always suitable for installation in the less critical zone (Gb or Db). Due to space limitations the corresponding marking maybe not indicated on the nameplate.
- 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
- 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. enclosure, 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.
- Alterations to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.

**Safety
instructions:
Specific
conditions of use**

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

- Limitations of the maximum ambient temperature at the electronics enclosure may be required dependent on device configuration, process temperatures and temperature classification.
- Details of limitations: →  15, "Temperature tables".
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts or for adhesive plates:
 - Observe the danger of electrostatic charging and discharge.
 - Do not install in the vicinity of processes ($\leq 0.5\text{ m}$) generating strong electrostatic charges.

Basic specification, Position 6 = B, M

- Covers with glass window only permitted for the following ambient temperatures:
 $-50\text{ °C} \leq T_a \leq +70\text{ °C}$
- Avoid sparks caused by impact and friction.

Basic specification, Position 6 = C

Covers with glass window not permitted.

Optional specification, ID Px, Rx = PA

Connect the weather protection cover to the local potential equalization.

Optional specification, ID Px, Rx = PB

Avoid electrostatic charging of the weather protection cover (e.g. friction, cleaning, maintenance, strong medium flow).

Optional specification, ID Px, Rx = R6

Suitable for use in explosion hazardous areas.

Device group IIC/IIB and Device group III

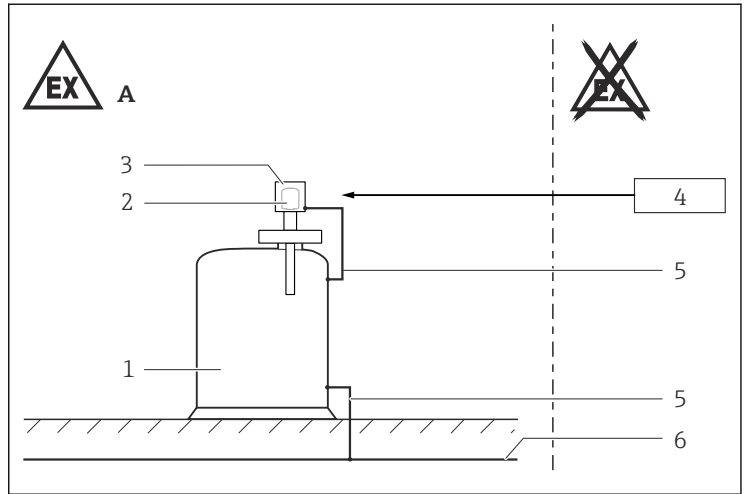
Basic specification, Position 9 = R, Y (Enamel)

- Due to the surface resistance $1\text{ G}\Omega$ ($|R|$ PFA-conductive) or the enamel (glass) surface, these coatings are suitable without restrictions.
- Prevent damage to the conductive surface layer (e.g. by abrasion).

Basic specification, Position 9 = Y (ECTFE, PFA (Edlon, RubyRed))

- Probes can be used in gases of Group IIC if avoiding electrostatic charging (e.g. through friction, cleaning, maintenance, strong medium flow). These probes are marked by the warning sign "Avoid Electrostatic Charge".
- If electrostatic charging cannot be avoided: Probe can be used in gases of Group IIB.

Safety instructions: Installation



A0025536

1

- A Zone 1, Zone 21
- 1 Tank; Zone 0, Zone 1, Zone 20, Zone 21
- 2 Electronic insert
- 3 Enclosure
- 4 Supply unit
- 5 Potential equalization line
- 6 Local potential equalization

- Before operation:
 - Screw in the cover all the way.
 - Tighten the securing clamp on the cover.
- 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.
- Continuous service temperature of the connecting cable / cable gland / cable entry:
 - Basic specification, Position 3, 4 = A1, A7, A8: $\geq T_a + 20\text{ K}$
 - Basic specification, Position 3, 4 = A2: $\geq T_a + 35\text{ K}$
 - Basic specification, Position 3, 4 = A3, A4: $\geq T_a + 45\text{ K}$
- Perform the following to achieve the degree of protection IP66/68:
 - Screw the cover tight.
 - Mount the cable entry correctly.
- 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.

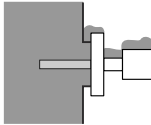
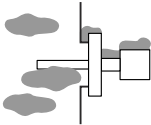
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- Support extension tube of the device if a dynamic load is expected.
- Only use certified cable entries suitable for the application. Observe national regulations and standards. Accordingly, the connection terminal does not include any ignition sources.
- 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.
- The built-in metallic sealing plug is examined and approved for explosion protection type Ex d with the device.
- When operating the transmitter enclosure at an ambient temperature under -20°C , use appropriate cables and cable entries permitted for this application.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.
- The device can be equipped with the Bluetooth® module: refer to the Operating Instructions and specifications in the "Bluetooth® module" chapter.
- Flameproof equipment with G threaded holes is not intended for new installations, but only for replacing equipment in existing installations. Use of this equipment shall comply with the local installation requirements.

Device group III, Application in dust

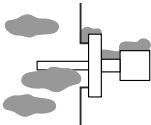
- To ensure the ingress protection IP66/67: Only use the unit-mounted sealing plugs and O-rings.
- Supplied metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.
- In case of very strongly abrasive or corrosive media: Additionally protect the wetted surface of the sensor in order to avoid abrasion of the zone separation wall.

Permitted ambient conditions

Ex ta/tb IIIC Txx°C Da/Db

Process Zone 20		Enclosure Zone 21
Continuous dust submersion		Dust accumulation or temporary explosive dust atmosphere
Continuous explosive dust atmosphere and deposits		Dust accumulation or temporary explosive dust atmosphere

Ex tb IIIC Txx°C Db

Process Zone 21		Enclosure Zone 21
Continuous dust deposits or temporary explosive dust atmosphere		Dust accumulation or temporary explosive dust atmosphere

Accessory high pressure sliding sleeve

The high pressure sliding sleeve can be used for a continuous setting of the switch point and is suited for zone separation if mounted properly (see Operating Instructions).

Potential equalization

Integrate the device into the local potential equalization.

Optional specification, ID Px, Rx = PA

Connect the weather protection cover to the local potential equalization.

Bluetooth® module

Basic specification, Position 3, 4 = A7

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

Basic specification, Position 3, 4 = 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.
- Connection or disconnection of the Bluetooth® module is permitted in hazardous areas.

Only use one of the following battery types:

Manufacturer	Battery type
Tadiran	SL-360/S
XENO ENERGY	ER14505 / XL-060F

Safety instructions: Ex d joints

- If required or if in doubt: ask manufacturer for specifications.
- Flameproof joints are not intended to be repaired.

Safety instructions: Zone 0

When using under non-atmospheric pressures and non-atmospheric temperatures: The sensor part of the device approved for Zone 0 does not cause any ignition hazards.

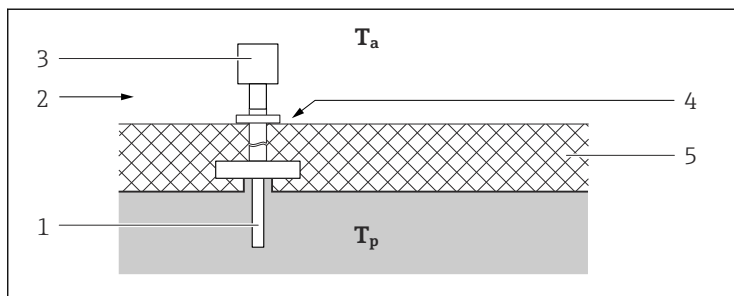
Safety instructions: Zone separation Zone 0, Zone 1

The zone separation wall of the device is made of stainless steel or high corrosion-resistant alloy of thickness $\geq 1\text{ mm}$.

Explosion protection with heat insulation

Basic specification, Position 8 = D, E, R, 9

- While observing the "temperature derating", the device is suitable for process temperatures up to 300 °C.
- When operating, ensure that you rule out contact between hot component surfaces and potentially explosive atmospheres beyond the limits of the corresponding temperature class. Suitable measures: e.g. thermal insulation at container and/or pipes.
- The temperature of 85 °C specified at the reference point may not be exceeded.
- To protect the electronics, observe the specified ambient temperature at the electronics enclosure.



A0025541

 2

T_a Ambient temperature

T_p Process temperature

1 Sensor

2 Temperature class, e.g. T6

3 Enclosure

4 Reference point: max. +85 °C

5 E.g. thermal insulation

Temperature tables



Optional specification, ID Jx, Kx = JL

Lower limit of the ambient temperature for explosion protection changes to -50 °C.

Optional specification, ID Jx, Kx = JT

Lower limit of the ambient temperature for explosion protection changes to -60 °C.

General notes

Ex db IIC



Optional specification, ID Px, Rx = PB

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

Ex ta/tb IIIC or Ex tb IIIC



Optional specification, ID Px, Rx = 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 0, Zone 1 or Zone 1

1st line: Position 6 = A, B, ...

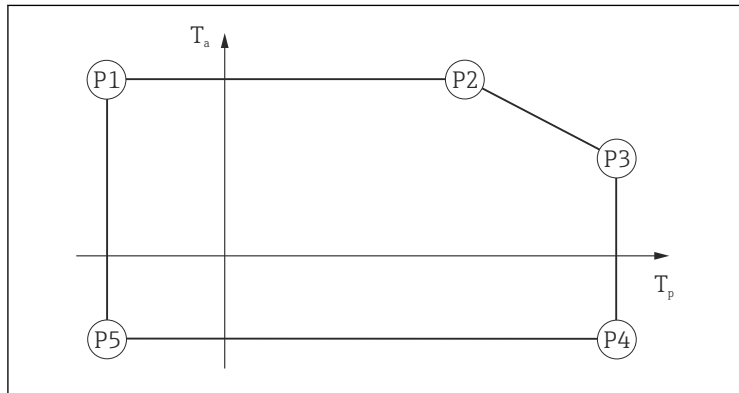
1st column: Position 8 = A, B, ...

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



A0033052

Zone 20, Zone 21 or Zone 21

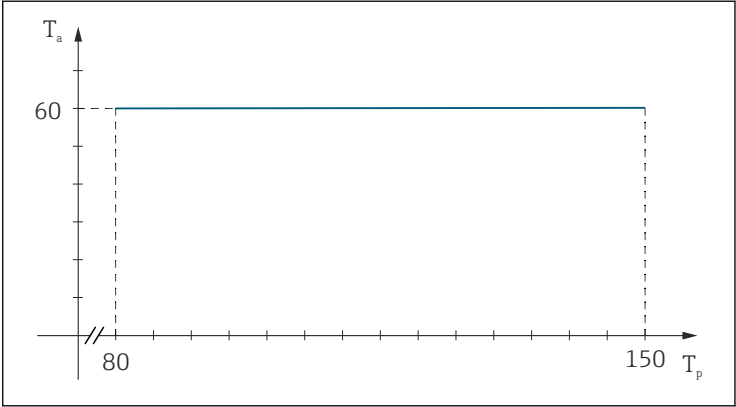
1st column: Position 8 = A, B, ...

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

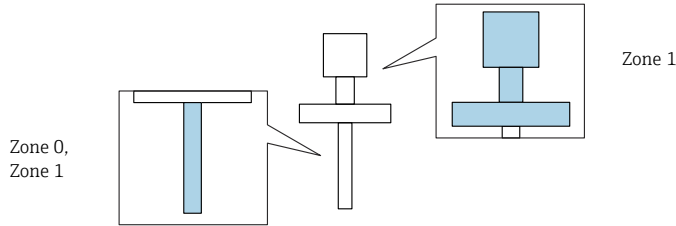


A0039764

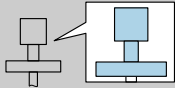
T_a Ambient temperature in °C

T_p Process temperature in °C

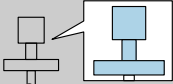
Zone 0, Zone 1



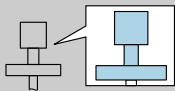
Position 3, 4 = A1

<div></div> <div>= B, C</div>													
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	
	180 mA												
		T6	-60	61	69	61	80	60	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾	
		T5	-60	70	95	70	95	70	95		-60		
		T4	-60	70	130	70	130	70	130		-60		
		T3	-60	70	193	70	195	69	195		-60		
		T2...T1	-60	70	193	70	230	65	230		-60		
	350 mA												
		T6	-60	37	57	37	80	36	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾	
		T5	-60	52	72	52	95	51	95		-60		
		T4	-60	69	69	69	130	66	130		-60		
		T3	-60	69	69	69	195	63	195		-60		
		T2...T1	-60	69	69	69	230	61	230		-60		

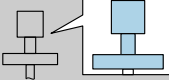
- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JT

<div></div> <div>= M</div>												
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
	180 mA											
		T6	-60	63	68	63	80	62	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾
		T5	-60	70	95	70	95	70	95		-60	
		T4	-60	70	130	70	130	70	130		-60	
		T3	-60	70	195	70	195	70	195		-60	
		T2...T1	-60	70	230	70	230	70	230		-60	
	350 mA											
		T6	-60	37	57	37	80	36	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾
		T5	-60	52	72	52	95	51	95		-60	
		T4	-60	69	69	69	130	66	130		-60	
		T3	-60	69	69	69	195	63	195		-60	
		T2...T1	-60	69	69	69	230	61	230		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JT

<div></div> <div>= B, C</div>												
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
	180 mA											
		T6	-60	61	72	61	80	60	80	-40	-60	-40
		T5	-60	70	95	70	95	70	95	-50 ¹⁾	-60	-50 ¹⁾
		T4	-60	70	130	70	130	70	130	-60 ²⁾	-60	-60 ²⁾
		T3	-60	70	195	70	195	70	195		-60	
		T2	-60	70	230	70	280 290 ³⁾	67	280 290 ³⁾		-60	
		T1	-60	70	230	70	280 300 ³⁾	67	280 300 ³⁾		-60	
	350 mA											
		T6	-60	37	58	37	80	36	80	-40	-60	-40
		T5	-60	52	73	52	95	51	95	-50 ¹⁾	-60	-50 ¹⁾
		T4	-60	69	69	69	130	66	130	-60 ²⁾	-60	-60 ²⁾
		T3	-60	69	69	69	195	63	195		-60	
		T2	-60	69	69	69	280 290 ³⁾	59	280 290 ³⁾		-60	
		T1	-60	69	69	69	280 300 ³⁾	59	280 300 ³⁾		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JT
- 3) Only in connection with Position 8 = 9

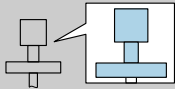
 = M												
D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	180 mA											
		T6	-60	63	70	63	80	60	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾
		T5	-60	70	95	70	95	70	95		-60	
		T4	-60	70	130	70	130	70	130		-60	
		T3	-60	70	195	70	195	70	195		-60	
		T2	-60	70	280	70	280 290 ³⁾	70	280 290 ³⁾		-60	
		T1	-60	70	280	70	280 300 ³⁾	67	280 300 ³⁾		-60	
	350 mA											
		T6	-60	37	58	37	80	36	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾
		T5	-60	52	73	52	95	51	95		-60	
		T4	-60	69	69	69	130	66	130		-60	
		T3	-60	69	69	69	195	63	195		-60	
		T2	-60	69	69	69	280 290 ³⁾	62	280 290 ³⁾		-60	
		T1	-60	69	69	69	280 300 ³⁾	59	280 300 ³⁾		-60	

1) Only in connection with Optional specification, ID Jx, Kx = JL

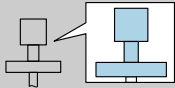
2) Only in connection with Optional specification, ID Jx, Kx = JT

3) Only in connection with Position 8 = 9

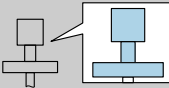
Position 3, 4 = A2

<div></div> <div>= B, C</div>												
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	55	55	55	80	53	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾
		T5	-60	70	70	70	95	68	95		-60	
		T4	-60	70	102	70	130	68	130		-60	
		T3	-60	70	102	70	195	64	195		-60	
		T2...T1	-60	70	102	70	230	62	230		-60	

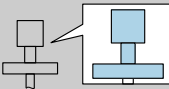
- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JT

<div></div> <div>= M</div>												
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	54	71	54	80	53	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾
		T5	-60	69	86	69	95	68	95		-60	
		T4	-60	70	130	70	130	70	130		-60	
		T3	-60	70	133	70	195	67	195		-60	
		T2...T1	-60	70	133	70	230	65	230		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JT

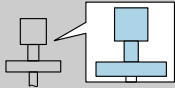
 = B, C												
D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	350 mA											
		T6	-60	55	56	55	80	54	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40
		T5	-60	70	71	70	95	69	95		-60	-50 ¹⁾ -60 ²⁾
		T4	-60	70	112	70	130	69	130		-60	
		T3	-60	70	112	70	195	66	195		-60	
		T2	-60	70	112	70	280 290 ³⁾	62	280 290 ³⁾		-60	
		T1	-60	70	112	70	280 300 ³⁾	62	280 300 ³⁾		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
 2) Only in connection with Optional specification, ID Jx, Kx = JT
 3) Only in connection with Position 8 = 9

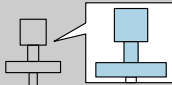
 = M												
D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	350 mA											
		T6	-60	54	77	54	80	53	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40
		T5	-60	69	70	69	95	68	95		-60	-50 ¹⁾ -60 ²⁾
		T4	-60	70	130	70	130	70	130		-60	
		T3	-60	70	154	70	195	68	195		-60	
		T2	-60	70	154	70	280 290 ³⁾	65	280 290 ³⁾		-60	
		T1	-60	70	154	70	280 300 ³⁾	65	280 300 ³⁾		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
 2) Only in connection with Optional specification, ID Jx, Kx = JT
 3) Only in connection with Position 8 = 9

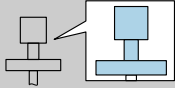
Position 3, 4 = A3, A4

<div></div> <div>= B, C</div>													
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	53	52	80	50	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾	
		T5	-60	67	68	67	95	65	95		-60		
		T4	-60	70	110	70	130	68	130		-60		
		T3	-60	70	110	70	195	65	195		-60		
		T2...T1	-60	70	110	70	230	63	230		-60		
	4 A												
		T6	-60	42	51	42	80	40	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾	
		T5	-60	57	66	57	95	55	95		-60		
		T4	-60	69	78	69	130	66	130		-60		
		T3	-60	69	78	69	195	62	195		-60		
		T2...T1	-60	69	78	69	230	60	230		-60		

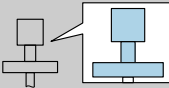
- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JT

<div></div> <div>= M</div>												
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 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾
		T5	-60	70	76	70	95	69	95		-60	
		T4	-60	70	130	70	130	70	130		-60	
		T3	-60	70	176	70	195	69	195		-60	
		T2...T1	-60	70	176	70	230	67	230		-60	
	4 A											
		T6	-60	45	66	45	80	44	80	-40 -50 ¹⁾ -60 ²⁾	-60	-40 -50 ¹⁾ -60 ²⁾
		T5	-60	60	81	60	95	59	95		-60	
		T4	-60	70	124	70	130	69	130		-60	
		T3	-60	70	124	70	195	66	195		-60	
		T2...T1	-60	70	124	70	230	65	230		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JT

<div></div> <div>= B, C</div>												
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	53	52	80	50	80	-40	-60	-40
		T5	-60	67	68	67	95	65	95	-50 ¹⁾ -60 ²⁾	-60	-50 ¹⁾ -60 ²⁾
		T4	-60	70	122	70	130	69	130		-60	
		T3	-60	70	122	70	195	66	195		-60	
		T2	-60	70	122	70	280 290 ³⁾	63	280 290 ³⁾		-60	
		T1	-60	70	122	70	280 300 ³⁾	62	280 300 ³⁾		-60	
	4 A											
		T6	-60	42	54	42	80	40	80	-40	-60	-40
		T5	-60	57	69	57	95	55	95	-50 ¹⁾ -60 ²⁾	-60	-50 ¹⁾ -60 ²⁾
		T4	-60	69	81	69	130	66	130		-60	
		T3	-60	69	81	69	195	64	195		-60	
		T2	-60	69	81	69	280 290 ³⁾	60	280 290 ³⁾		-60	
		T1	-60	69	81	69	280 300 ³⁾	59	280 300 ³⁾		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JT
- 3) Only in connection with Position 8 = 9

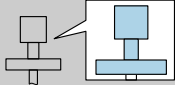
 = M												
D, 9			P1		P2		P3		P4		P5	
			T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	2 A											
		T6	-60	55	62	55	80	54	80	-40	-60	-40
		T5	-60	70	77	70	95	69	95	-50 ¹⁾	-60	-50 ¹⁾
		T4	-60	70	130	70	130	70	130	-60 ²⁾	-60	-60 ²⁾
		T3	-60	70	195	70	195	70	195		-60	
		T2	-60	70	208	70	280 290 ³⁾	67	280 290 ³⁾		-60	
		T1	-60	70	208	70	280 300 ³⁾	66	280 300 ³⁾		-60	
	4 A											
		T6	-60	45	73	45	80	44	80	-40	-60	-40
		T5	-60	60	88	60	95	59	95	-50 ¹⁾	-60	-50 ¹⁾
		T4	-60	70	130	70	130	70	130	-60 ²⁾	-60	-60 ²⁾
		T3	-60	70	142	70	195	68	195		-60	
		T2	-60	70	142	70	280 290 ³⁾	65	280 290 ³⁾		-60	
		T1	-60	70	142	70	280 300 ³⁾	64	280 300 ³⁾		-60	

1) Only in connection with Optional specification, ID Jx, Kx = JL

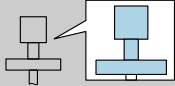
2) Only in connection with Optional specification, ID Jx, Kx = JT

3) Only in connection with Position 8 = 9

Position 3, 4 = A7, A8

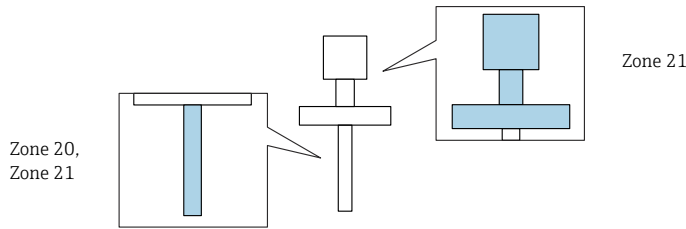
 = B, C, M											
E, R		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6	-60	70	80	70	80	70	80	-40	-60	-40
	T5	-60	70	95	70	95	70	95	-50 ¹⁾	-60	-50 ¹⁾
	T4	-60	70	130	70	130	70	130	-60 ²⁾	-60	-60 ²⁾
	T3	-60	70	195	70	195	70	195		-60	
	T2...T1	-60	70	200	70	230	67	230		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
 2) Only in connection with Optional specification, ID Jx, Kx = JT

 = B, C, M											
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
	T6	-60	70	80	70	80	70	80	-40	-60	-40
	T5	-60	70	95	70	95	70	95	-50 ¹⁾	-60	-50 ¹⁾
	T4	-60	70	130	70	130	70	130	-60 ²⁾	-60	-60 ²⁾
	T3	-60	70	195	70	195	70	195		-60	
	T2	-60	70	230	70	280 290 ³⁾	69	280 290 ³⁾		-60	
	T1	-60	70	279	70	280 300 ³⁾	68	280 300 ³⁾		-60	

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
 2) Only in connection with Optional specification, ID Jx, Kx = JT
 3) Only in connection with Position 8 = 9

Zone 20, Zone 21



Position 3, 4 = A1

E, R				
	150 mA			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 195
		$-60 \leq T_p \leq +230$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 230
	350 mA			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +67$ $-50^{1)}/-60^{2)} \leq T_a \leq +67$	T 195
		$-60 \leq T_p \leq +230$	$-40 \leq T_a \leq +66$ $-50^{1)}/-60^{2)} \leq T_a \leq +66$	T 230

1) Only in connection with Optional specification, ID Jx, Kx = JL
2) Only in connection with Optional specification, ID Jx, Kx = JT

D, 9				
	150 mA			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 195
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +290^{1)}$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 280 T 290 ¹⁾
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +300^{1)}$	$-40 \leq T_a \leq +65$ $-50^{2)}/-60^{3)} \leq T_a \leq +65$	T 280 T 300 ¹⁾
	350 mA			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +69$ $-50^{2)}/-60^{3)} \leq T_a \leq +69$	T 195
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +290^{1)}$	$-40 \leq T_a \leq +65$ $-50^{2)}/-60^{3)} \leq T_a \leq +65$	T 280 T 290 ¹⁾
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +300^{1)}$	$-40 \leq T_a \leq +65$ $-50^{2)}/-60^{3)} \leq T_a \leq +65$	T 280 T 300 ¹⁾

- 1) Only in connection with Position 8 = 9
 2) Only in connection with Optional specification, ID Jx, Kx = JL
 3) Only in connection with Optional specification, ID Jx, Kx = JT

Position 3, 4 = A2

E, R				
	350 mA			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$ $-50^{1)}/-60^{2)} \leq T_a \leq +60$	T 80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 195
		$-60 \leq T_p \leq +230$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 230

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
 2) Only in connection with Optional specification, ID Jx, Kx = JT

D, 9				
	350 mA			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$ $-50^{2)}/-60^{3)} \leq T_a \leq +60$	T 80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 195
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +290^{1)}$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 280 T 290 ¹⁾
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +300^{1)}$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 280 T 300 ¹⁾

- 1) Only in connection with Position 8 = 9
 2) Only in connection with Optional specification, ID Jx, Kx = JL
 3) Only in connection with Optional specification, ID Jx, Kx = JT

Position 3, 4 = A3, A4

E, R				
	2 A, 4 A, 6 A			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$ $-50^{1)}/-60^{2)} \leq T_a \leq +60$	T 80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 195
		$-60 \leq T_p \leq +230$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 230

- 1) Only in connection with Optional specification, ID Jx, Kx = JL
 2) Only in connection with Optional specification, ID Jx, Kx = JT

D, 9				
	2 A, 4 A, 6 A			
		$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$ $-50^{2)}/-60^{3)} \leq T_a \leq +60$	T 80
		$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 95
		$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 130
		$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 195
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +290^{1)}$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 280 T 290 ¹⁾
		$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +300^{1)}$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 280 T 300 ¹⁾

- 1) Only in connection with Position 8 = 9
 2) Only in connection with Optional specification, ID Jx, Kx = JL
 3) Only in connection with Optional specification, ID Jx, Kx = JT

Position 3, 4 = A7, A8

E, R			
	$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 80
	$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 95
	$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 130
	$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 195
	$-60 \leq T_p \leq +230$	$-40 \leq T_a \leq +70$ $-50^{1)}/-60^{2)} \leq T_a \leq +70$	T 230

1) Only in connection with Optional specification, ID Jx, Kx = JL

2) Only in connection with Optional specification, ID Jx, Kx = JT

D, 9			
	$-60 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 80
	$-60 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 95
	$-60 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 130
	$-60 \leq T_p \leq +195$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 195
	$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +290^{1)}$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 280 T 290 ¹⁾
	$-60 \leq T_p \leq +280$ $-60 \leq T_p \leq +300^{1)}$	$-40 \leq T_a \leq +70$ $-50^{2)}/-60^{3)} \leq T_a \leq +70$	T 280 T 300 ¹⁾

1) Only in connection with Position 8 = 9

2) Only in connection with Optional specification, ID Jx, Kx = JL

3) Only in connection with Optional specification, ID Jx, Kx = JT

Connection data *Optional specification, ID Nx, Ox = NF, NG*
 When using the Bluetooth® module: No changes to the connection values.

Basic specification, Position 3, 4	Power supply circuit	Output
A1	U = 19 to 253 V _{AC} , 50/60 Hz; P _{max} < 2 VA	I _{max} = 180 mA
A2	U = 10 to 55 V _{DC} ; P _{max} < 0.5 W, P _{max} < 1.2 W ¹⁾	I _{max} = 350 mA
A3	U = 9 to 20 V _{DC} ; P _{max} < 1 W, P _{max} < 1.7 W ¹⁾	2 potential free change-over contacts; 2 A Ex d, 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, P _{max} < 31 VA or < 2 W ¹⁾	
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 = 8.2 V _{DC} ±20 %	NAMUR; I _{max} = 3.8 mA

1) Only in connection with Position 5 = B



71675375

www.addresses.endress.com
