

# Safety Instructions

## Liquiphant FTL51B, FTL63

Ex db IIC T6...T1 Ga/Gb

Ex db IIC T6...T1 Gb

Ex ta/tb IIIC T\*\* °C Da/Db

Ex tb IIIC T\*\* °C Db





# Liquiphant FTL51B, FTL63

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**Associated documentation**

All documentation is available on the Internet:  
[www.endress.com/Deviceviewer](http://www.endress.com/Deviceviewer)  
 (enter the serial number from the nameplate).

To commission the device, please observe the Operating Instructions pertaining to the device:

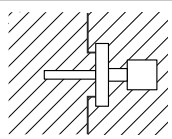
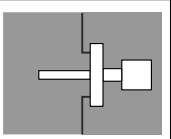
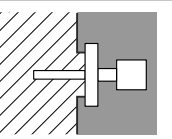
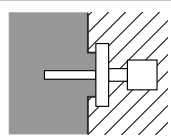
- BA01894F (FTL51B)
- BA02286F (FTL63)

**Supplementary documentation**


Explosion protection brochure: CP00021Z

The explosion protection brochure is available on the Internet:  
[www.endress.com/Downloads](http://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**

**NEPSI Declaration of Conformity**

Certificate number:  
 GYJ21.1248X

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

- GB/T 3836.1-2021
- GB/T 3836.2-2021
- GB/T 3836.31-2021

**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**

FTL51B, FTL63	–	*****	+	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

FTL51B, FTL63

#### Basic specifications


Position 1, 2 (Approval)		
Selected option		Description
FTL51B	NM	NEPSI Ex db IIC T6...T1 Ga/Gb
FTL63		NEPSI Ex db IIC T6...T1 Gb
		NEPSI Ex ta/tb IIIC T** °C Da/Db
		NEPSI Ex tb IIIC T** °C Db

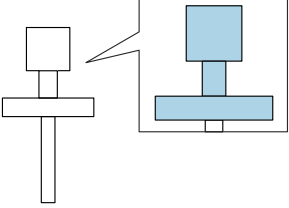
Position 3, 4 (Output)		
Selected option		Description
FTL51B	A1	FEL61, 2-wire 19-253VAC + test button
FTL63	A2	FEL62, 3-wire PNP 10-55VDC + test button
	A3	FEL64DC, relay DPDT 9-20VDC
	A4	FEL64, relay DPDT 19-253VAC/19-55VDC contact 253V/6A + test button
	A7	FEL67, 2-wire PFM + test button
	A8	FEL68, 2-wire NAMUR + test button
	GA	FEL60D, density/concentration

Position 5 (Display, Operation)		
Selected option		Description
FTL51B	A	W/o; switch
FTL63	B <sup>1)</sup>	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
FTL51B FTL63	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
FTL51B FTL63	F	Thread M20, IP66/68 NEMA Type 4X/6P
	G	Thread G1/2 <sup>1)</sup> , 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

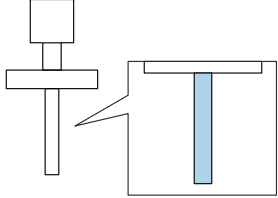
- 1) Reduction M20x1.5 to G1/2 enclosed

Position 8 (Application)		
Selected option		Description
FTL51B FTL63	A <sup>1)</sup>	Process max 150°C/302°F, max 64bar
	B <sup>1)</sup>	Process max 150°C/302°F, max 100bar
	C <sup>2)</sup>	Process max 80°C/176°F, max 25bar

- 1) Only in connection with Position 3, 4 = A1-A4, A7, A8  
 2) Only in connection with Position 3, 4 = GA

Position 10 (Type of Probe)		
Selected option		Description
FTL51B FTL63	1	Compact version
	2	Extension tube
	3	Short tube version

 Shown in the temperature tables exemplary as follows:



Position 11, 12 (Sensor Length, Material)		
Selected option		Description
FTL51B FTL63	AC	Compact version; AlloyC22
	AJ	Compact version; 316L
	BC	Short tube version; AlloyC22
	BJ	Short tube version; 316L
	CC	..... mm L, Ra<3,2um/126uin; AlloyC22
	CJ	..... mm L, Ra<3,2um/126uin; 316L
	DC	..... in L, Ra<3,2um/126uin; AlloyC22
	DJ	..... in L, Ra<3,2um/126uin; 316L

### Optional specifications

ID Jx, Kx (Test, Certificate, Declaration)		
Selected option		Description
FTL51B FTL63	JL	Ambient temperature -50°C/-58°F
	JN <sup>1)</sup>	Ambient temperature -52°C/-62°F
	JT <sup>1)</sup>	Ambient temperature -60°C/-76°F

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



ID Mx (Sensor Design)		
Selected option		Description
FTL51B	MR	Temperature separator
FTL63	MS	Pressure tight feed through (Second line of defence)

ID Nx, Ox (Accessory Mounted)		
Selected option		Description
FTL51B	NF <sup>1)</sup>	Bluetooth VU121, Labeling: VA13-02
FTL63	NG <sup>2)</sup>	Prepared for Heartbeat Verification + Monitoring + Bluetooth VU121, Labeling: VA13-01

- 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
FTL51B	PA <sup>1)</sup>	Weather protection cover, 316L
FTL63	PB <sup>2)</sup>	Weather protection cover, plastic
	R6 <sup>3)</sup>	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

- 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 equipment on fire and explosion hazard electrical equipment installation engineering".
  - GB/T 3836.13-2021: "Explosive atmospheres, Part 13: Equipment repair, overhaul, reclamation and modification".
  - 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. 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.

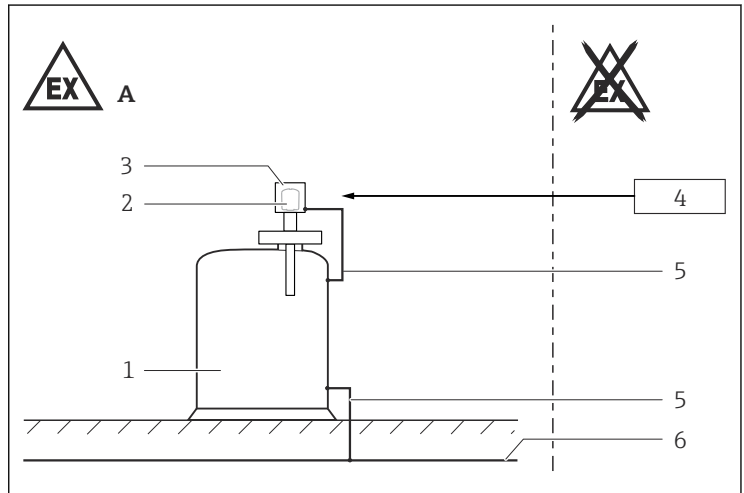
*Optional specification, ID Px, Rx = PB*

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.

## Safety instructions: Installation



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- 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 = GA, 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:*  $\geq T_a + 45 \text{ K}$
  - *Basic specification, Position 3, 4 = A2 in connection with Optional specification, ID Mx = MR, MS:*  $\geq T_a + 20 \text{ K}$
  - *Basic specification, Position 3, 4 = A3, A4 in connection with Optional specification, ID Mx = MR, MS:*  $\geq T_a + 25 \text{ K}$
- 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  $-20 \text{ }^\circ\text{C}$ , use appropriate cables and cable entries permitted for this application.

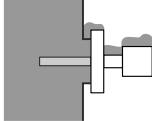
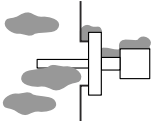
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.
- The device can be equipped with the Bluetooth® module: refer to the Operating Instructions and specifications in the "Bluetooth® module" chapter.
- Flameproof equipment 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**

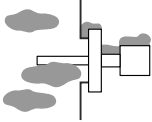
- To ensure the ingress protection IP66/67: Only use the unit-mounted sealing plugs and O-rings.
- Supplied metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.
- In case of very strongly abrasive or corrosive media: Additionally protect the wetted surface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

*Permitted ambient conditions*

**Ex ta/tb IIIC T\*\* °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 T\*\* °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.
- Observe the information in the Safety Instructions (XA) included with the Bluetooth® module.

**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  $\geq 1$  mm.

## Temperature tables



*Optional specification, ID Jx, Kx = JL*

Lower limit of the ambient temperature for explosion protection changes to  $-50\text{ }^{\circ}\text{C}$ .

*Optional specification, ID Jx, Kx = JN*

Lower limit of the ambient temperature for explosion protection changes to  $-52\text{ }^{\circ}\text{C}$ .

*Optional specification, ID Jx, Kx = JT*

Lower limit of the ambient temperature for explosion protection changes to  $-60\text{ }^{\circ}\text{C}$ .

### 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, ...

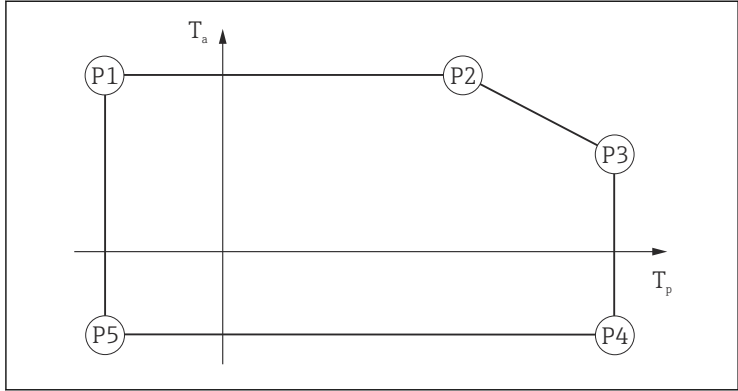
1st column: Position 8 = A, B, ...

2nd column: Maximum load current

3rd column: Temperature classes T6 ( $85\text{ }^{\circ}\text{C}$ ) to T1 ( $450\text{ }^{\circ}\text{C}$ )

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

- $T_a$ : Ambient temperature in  $^{\circ}\text{C}$
- $T_p$ : Process temperature in  $^{\circ}\text{C}$



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*Zone 20, Zone 21 or Zone 21*

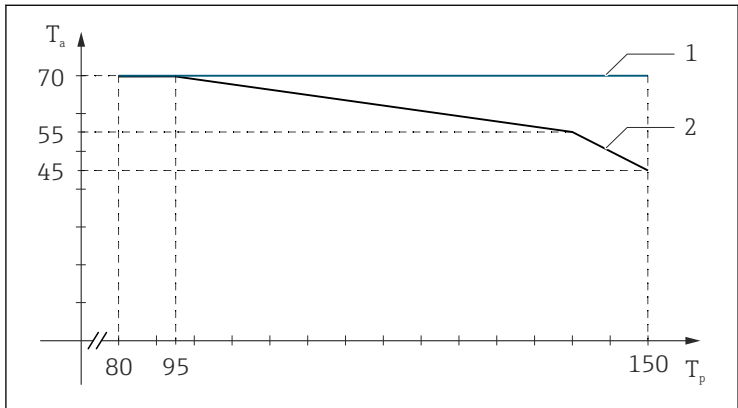
1st column: Position 8 = A, B, ...

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



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$T_a$  Ambient temperature in °C

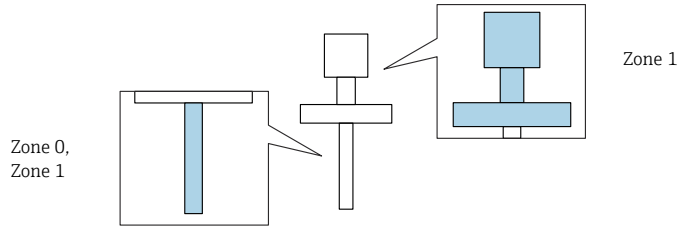
$T_p$  Process temperature in °C

1 With Optional Specification, ID Mx = MR, ...

2 Without Optional Specification, ID Mx = MR, ...



### Zone 0, Zone 1



Position 3, 4 = A1

Without Optional specification, ID Mx = MR, MS

A, B		= B, C										
		P1		P2		P3		P4		P5		
		T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
180 mA												
		T6	-50	55	55	55	80	46	80	-40 -50 <sup>1)</sup> -52 <sup>2)</sup> -60 <sup>3)</sup>	-50	-40
		T5	-50	70	70	70	95	61	95		-50	-52 <sup>2)</sup>
		T4	-50	70	76	70	130	50	130		-50	-60 <sup>3)</sup>
		T3...T1	-50	70	76	70	150	42	150		-50	

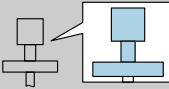
- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JN
- 3) Only in connection with Optional specification, ID Jx, Kx = JT

With Optional specification, ID Mx = MR, MS

A, B		= B, C										
		P1		P2		P3		P4		P5		
		T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
180 mA												
		T6	-50	55	55	55	80	53	80	-40 -50 <sup>1)</sup> -52 <sup>2)</sup> -60 <sup>3)</sup>	-50	-40
		T5	-50	70	70	70	95	68	95		-50	-52 <sup>2)</sup>
		T4	-50	70	94	70	130	67	130		-50	-60 <sup>3)</sup>
		T3...T1	-50	70	94	70	150	65	150		-50	
350 mA												
		T6	-50	37	49	37	80	34	80	-40 -50 <sup>1)</sup> -52 <sup>2)</sup> -60 <sup>3)</sup>	-50	-40
		T5	-50	52	64	52	95	49	95		-50	-52 <sup>2)</sup>
		T4	-50	69	69	69	130	64	130		-50	-60 <sup>3)</sup>
		T3...T1	-50	69	69	69	150	62	150		-50	

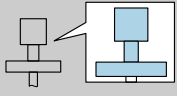
- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JN
- 3) Only in connection with Optional specification, ID Jx, Kx = JT

Without Optional specification, ID Mx = MR, MS

 = M												
A, B			P1		P2		P3		P4		P5	
			T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>
	<b>180 mA</b>											
		T6	-50	63	64	63	80	59	80	-40	-50	-40
		T5	-50	70	95	70	95	70	95	-50 <sup>1)</sup>	-50	-50 <sup>1)</sup>
		T4	-50	70	112	70	130	66	130	-52 <sup>2)</sup>	-50	-52 <sup>2)</sup>
		T3...T1	-50	70	112	70	150	61	150	-60 <sup>3)</sup>	-50	-60 <sup>3)</sup>
	<b>350 mA</b>											
		T6	-50	38	39	38	80	29	80	-40	-50	-40
		T5	-50	53	54	53	95	44	95	-50 <sup>1)</sup>	-50	-50 <sup>1)</sup>
		T4	-50	70	72	70	130	57	130	-52 <sup>2)</sup>	-50	-52 <sup>2)</sup>
		T3...T1	-50	70	72	70	150	53	150	-60 <sup>3)</sup>	-50	-60 <sup>3)</sup>

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

With Optional specification, ID Mx = MR, MS

 = M													
A, B			P1		P2		P3		P4		P5		
			T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
	<b>180 mA</b>												
		T6	-50	62	70	62	80	62	80	-40 -50 <sup>1)</sup> -52 <sup>2)</sup> -60 <sup>3)</sup>	-50	-40	
		T5	-50	70	95	70	95	70	95		-50	-50 <sup>1)</sup>	
		T4	-50	70	130	70	130	70	130		-50	-60 <sup>3)</sup>	
		T3...T1	-50	70	150	70	150	70	150		-50		
	<b>350 mA</b>												
		T6	-50	36	80	36	80	36	80	-40 -50 <sup>1)</sup> -52 <sup>2)</sup> -60 <sup>3)</sup>	-50	-40	
		T5	-50	51	95	51	95	51	95		-50	-52 <sup>2)</sup>	
		T4	-50	67	130	67	130	67	130		-50	-60 <sup>3)</sup>	
		T3...T1	-50	66	150	66	150	66	150		-50		

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

Position 3, 4 = A2

Without Optional specification, ID Mx = MR, MS

A, B		= B, C, M										
		P1		P2		P3		P4		P5		
		T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
	350 mA	T6	-50	55	55	55	80	46	80	-40	-50	-40
		T5	-50	70	70	70	95	61	95	-50 <sup>1)</sup>	-50	-50 <sup>1)</sup>
		T4	-50	70	76	70	130	50	130	-52 <sup>2)</sup>	-50	-52 <sup>2)</sup>
		T3...T1	-50	70	76	70	150	42	150	-60 <sup>3)</sup>	-50	-60 <sup>3)</sup>

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

With Optional specification, ID Mx = MR, MS

A, B		= B, C, M										
		P1		P2		P3		P4		P5		
		T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
	350 mA	T6	-50	55	55	55	80	53	80	-40	-50	-40
		T5	-50	70	70	70	95	68	95	-50 <sup>1)</sup>	-50	-50 <sup>1)</sup>
		T4	-50	70	94	70	130	67	130	-52 <sup>2)</sup>	-50	-52 <sup>2)</sup>
		T3...T1	-50	70	94	70	150	65	150	-60 <sup>3)</sup>	-50	-60 <sup>3)</sup>

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

Position 3, 4 = A3, A4

Without Optional specification, ID Mx = MR, MS

A, B		= B, C										
		P1		P2		P3		P4		P5		
		T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
	<b>2 A</b>											
		T6	-50	52	52	52	80	42	80	-40 -50 <sup>1)</sup> -52 <sup>2)</sup> -60 <sup>3)</sup>	-50	-40
		T5	-50	67	67	67	95	57	95		-50	-52 <sup>2)</sup>
		T4	-50	70	77	70	130	70	130		-50	-60 <sup>3)</sup>
		T3...T1	-50	70	77	70	150	70	150		-50	

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

With Optional specification, ID Mx = MR, MS

A, B		= B, C										
		P1		P2		P3		P4		P5		
		T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
	<b>2 A</b>											
		T6	-50	52	52	52	80	50	80	-40 -50 <sup>1)</sup> -52 <sup>2)</sup> -60 <sup>3)</sup>	-50	-40
		T5	-50	67	67	67	95	65	95		-50	-52 <sup>2)</sup>
		T4	-50	70	100	70	130	67	130		-50	-60 <sup>3)</sup>
		T3...T1	-50	70	100	70	150	66	150		-50	
		<b>4 A</b>										
		T6	-50	41	50	41	80	39	80	-40 -50 <sup>1)</sup> -52 <sup>2)</sup> -60 <sup>3)</sup>	-50	-40
		T5	-50	56	65	56	95	54	95		-50	-52 <sup>2)</sup>
		T4	-50	69	76	69	130	64	130		-50	-60 <sup>3)</sup>
		T3...T1	-50	69	76	69	150	63	150		-50	

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

Without Optional specification, ID Mx = MR, MS

A, B		= M											
		P1		P2		P3		P4		P5			
		T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>
	2 A												
		T6	-50	55	56	55	80	50	80	-40	-50	-40	-50
		T5	-50	70	71	70	95	65	95	-50 <sup>1)</sup>	-50	-50 <sup>1)</sup>	-50
		T4	-50	70	94	70	130	61	130	-52 <sup>2)</sup>	-50	-52 <sup>2)</sup>	-50
		T3...T1	-50	70	94	70	150	57	150	-60 <sup>3)</sup>	-50	-60 <sup>3)</sup>	-50

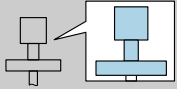
- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JN
- 3) Only in connection with Optional specification, ID Jx, Kx = JT

With Optional specification, ID Mx = MR, MS

A, B		= M												
		P1		P2		P3		P4		P5				
		T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
	2 A													
		T6	-50	55	59	55	80	53	80	-40	-50	-40	-50	
		T5	-50	70	74	70	95	68	95	-50 <sup>1)</sup>	-50	-50 <sup>1)</sup>	-50	
		T4	-50	70	130	70	130	70	130	-52 <sup>2)</sup>	-50	-52 <sup>2)</sup>	-50	
		T3...T1	-50	70	148	70	150	69	150	-60 <sup>3)</sup>	-50	-60 <sup>3)</sup>	-50	
	4 A													
		T6	-50	45	62	45	80	44	80	-40	-50	-40	-50	
		T5	-50	60	77	60	95	59	95	-50 <sup>1)</sup>	-50	-50 <sup>1)</sup>	-50	
		T4	-50	70	113	70	130	69	130	-52 <sup>2)</sup>	-50	-52 <sup>2)</sup>	-50	
		T3...T1	-50	70	115	70	150	67	150	-60 <sup>3)</sup>	-50	-60 <sup>3)</sup>	-50	

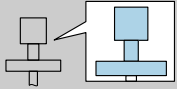
- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JN
- 3) Only in connection with Optional specification, ID Jx, Kx = JT

## Position 3, 4 = A7, A8

 = B, C, M													
A, B			P1		P2		P3		P4		P5		
			T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
		T6	-50	70	80	70	80	70	80	-40	-50	-40	
		T5	-50	70	95	70	95	70	95	-50 <sup>1)</sup>	-50	-50 <sup>1)</sup>	
		T4	-50	70	130	70	130	70	130	-52 <sup>2)</sup>	-50	-52 <sup>2)</sup>	
		T3...T1	-50	70	150	70	150	65	150	-60 <sup>3)</sup>	-50	-60 <sup>3)</sup>	

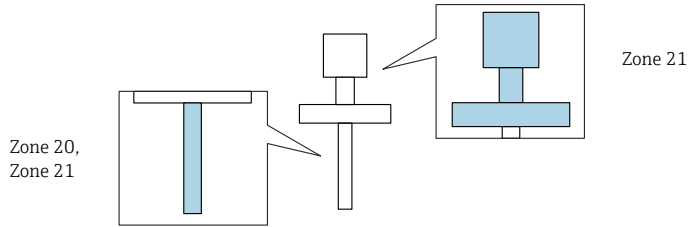
- 1) Only in connection with Optional specification, ID Jx, Kx = JL
- 2) Only in connection with Optional specification, ID Jx, Kx = JN
- 3) Only in connection with Optional specification, ID Jx, Kx = JT

## Position 3, 4 = GA

 = B, C, M													
C			P1		P2		P3		P4		P5		
			T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	T <sub>p</sub>	T <sub>a</sub>	
		T6...T1	-50	70	80	70	80	70	80	-40	-50	-40	



**Zone 20, Zone 21**



*Position 3, 4 = A1*

*Without Optional specification, ID Mx = MR, MS*

A, B				
	<b>150 mA</b>			
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +68$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +68$	T -40 to +80
		$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +95
		$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +60$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +60$	T -40 to +130
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +50$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +50$	T -40 to +150
	<b>350 mA</b>			
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +60$	T -40 to +80
		$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +67$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +67$	T -40 to +95
		$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +54$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +54$	T -40 to +130
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +46$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +46$	T -40 to +150

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

With Optional specification, ID Mx = MR, MS

A, B				
	<b>150 mA</b>			
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +80
		$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +95
		$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +130
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +150
	<b>350 mA</b>			
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +68$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +68$	T -40 to +80
		$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +95
		$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +130
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +69$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +69$	T -40 to +150

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

*Position 3, 4 = A2*

A, B				
	<b>350 mA</b>			
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +60$	T -40 to +80
		$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +95
		$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +130
	$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +150	

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

## Position 3, 4 = A3, A4

Without Optional specification, ID Mx = MR, MS

A, B				
	<b>2 A, 4 A</b>			
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +50$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +50$	T -40 to +80
		$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +65$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +65$	T -40 to +95
		$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +50$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +50$	T -40 to +130
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +45$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +45$	T -40 to +150
	<b>6 A</b>			
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +37$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +37$	T -40 to +80
		$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +50$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +50$	T -40 to +95
		$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +45$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +45$	T -40 to +130
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +40$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +40$	T -40 to +150

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

With Optional specification, ID Mx = MR, MS

A, B					
	<b>2 A, 4 A</b>				
			$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +58$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +58$	T -40 to +80
			$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +65$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +65$	T -40 to +95
			$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +130
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +150	
	<b>6 A</b>				
			$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +52$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +52$	T -40 to +80
			$-50 \leq T_p \leq +95$	$-40 \leq T_a \leq +60$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +60$	T -40 to +95
			$-50 \leq T_p \leq +130$	$-40 \leq T_a \leq +60$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +60$	T -40 to +130
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +58$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +58$	T -40 to +150	

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

Position 3, 4 = A7, A8

A, B				
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +80
		$-50 \leq T_p \leq +150$	$-40 \leq T_a \leq +70$ $-50^{1)}/-52^{2)}/-60^{3)} \leq T_a \leq +70$	T -40 to +150

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

Position 3, 4 = GA

C				
		$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +70$	T -40 to +80

**Connection data**

*Optional specification, ID Nx, Ox = NF, NG*

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

<i>Basic specification, Position 3, 4</i>	<b>Power supply circuit</b>	<b>Output</b>
A1	U = 19 to 253 V <sub>AC</sub> , 50/60 Hz; P <sub>max</sub> < 2 VA	I <sub>max</sub> = 180 mA I <sub>max</sub> = 350 mA <sup>1)</sup>
A2	U = 10 to 55 V <sub>DC</sub> ; P <sub>max</sub> < 0.5 W, P <sub>max</sub> < 1.2 W <sup>2)</sup>	I <sub>max</sub> = 350 mA
A3	U = 9 to 20 V <sub>DC</sub> ; P <sub>max</sub> < 1 W, P <sub>max</sub> < 1.7 W <sup>2)</sup>	2 potential free change-over contacts; 2 A Ex d, 6 A Ex t, 4 A Ex d, 6 A Ex t <sup>3)</sup>
A4	U = 19 to 253 V <sub>AC</sub> , 50/60 Hz or 19 to 55 V <sub>DC</sub> ; P <sub>max</sub> < 25 VA or < 1.3 W, P <sub>max</sub> < 31 VA or < 2 W <sup>2)</sup>	
A7	U = 9.5 to 12.5 V <sub>DC</sub> ; PFM; I <sub>max</sub> = 12 mA Connection only to power supply unit FTL325P or FTL375P from Endress+Hauser.	
A8	U = 4 to 8.2 V <sub>DC</sub>	NAMUR; I <sub>max</sub> = 3.8 mA
GA	U = 21 to 26 V <sub>DC</sub> ; I <sub>max</sub> = 16 mA Connection only to power supply unit FML621 from Endress+Hauser.	

- 1) Only in connection with Position 8 = A, B, Optional Specification ID Mx = MR, MS
- 2) Only in connection with Position 5 = B
- 3) Only in connection with Optional Specification ID Mx = MR, MS





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