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Safety Instructions
Levelflex FMP50/51/52/53/54/55

PROFIBUS PA, FOUNDATION Fieldbus

Ex ia/db [ia Ga] IIC T6...T1 Ga/Gb

Segurança

INMETRO DEKRA OCP 0089

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Endress+Hauser
People for Process Automation

Levelflex FMP50/51/52/53/54/55

PROFIBUS PA, FOUNDATION Fieldbus

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Associated documentation

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

PROFIBUS PA
- BA01005F/00 (FMP50)
- BA01006F/00 (FMP51, FMP52, FMP54)
- BA01007F/00 (FMP53)
- BA01008F/00 (FMP55)

FOUNDATION Fieldbus
- BA01051F/00 (FMP50)
- BA01052F/00 (FMP51, FMP52, FMP54)
- BA01053F/00 (FMP53)
- BA01054F/00 (FMP55)

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

Manufacturer's certificates

Certificate of Conformity

Certificate number:
DEKRA 13.0006 X

Affixing the certificate number certifies conformity with the following standards (depending on the device version):
- ABNT NBR IEC 60079-0 : 2013
- ABNT NBR IEC 60079-1 : 2016
- ABNT NBR IEC 60079-11 : 2013
- ABNT NBR IEC 60079-26 : 2016

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

FMP5x	–	**********	+	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: Levelflex

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

FMP50, FMP51, FMP52, FMP53, FMP54, FMP55

Basic specifications

Position 1, 2 (Approval)		
Selected option		**Description**
FMP5x	MC	INMETRO Ex ia/db [ia Ga] IIC T6...T1 Ga/Gb

Position 3 (Power Supply, Output)		
Selected option		**Description**
FMP5x	E	2-wire, FOUNDATION Fieldbus, switch output (PFS)
	G	2-wire, PROFIBUS PA, switch output (PFS)

Position 4 (Display, Operation)		
Selected option		**Description**
FMP5x	A	Without, via communication
	C	SD02, 4-line, push buttons + data backup function
	E	SD03, 4-line, illum., touch control + data backup function
	L	Prepared for display FHX50 + M12 connection
	M	Prepared for display FHX50 + custom connection
	N	Prepared for display FHX50 + NPT1/2"

Position 5 (Housing)		
Selected option		**Description**
FMP51 FMP52 FMP54 FMP55	B	GT18 dual compartment, 316L
FMP5x	C	GT20 dual compartment, Alu coated

Position 9, 10 (Seal)		
Selected option		**Description**
FMP50	A1	Viton, −20…80 °C
FMP51	A4	Viton, −30…150 °C
	B3	EPDM, −40…120 °C
	C3	Kalrez, −20…200 °C
	E1	FVMQ, −50…150 °C
FMP53	AD	FKM, FDA, USP Cl. VI, −10…150 °C
	B5	EPDM, FDA, USP Cl. VI, −20…130 °C
	C4	Kalrez, FDA, USP Cl. VI, −20…150 °C
FMP54	D1	Graphite, −196…280 °C (XT)
	D2	Graphite, −196…450 °C (HT)

Optional specifications

ID Jx (Test; Certificate)		
Selected option		**Description**
FMP51 [1)] FMP54	JN	Ambient temperature transmitter −50 °C

1) Only in connection with Position 9, 10 (Seal) = E1

ID Mx (Probe Design)		
Selected option		**Description**
FMP5x	MB	Sensor remote, 3 m/9 ft cable, detachable + mounting bracket
FMP53	MA	Sensor compact, detachable
FMP50-54	MC	Sensor remote, 6 m/18 ft cable, detachable + mounting bracket
	MD	Sensor remote, 9 m/27 ft cable, detachable + mounting bracket

ID Nx, Ox (Accessory Mounted)		
Selected option		**Description**
FMP51 FMP52 FMP55	NC	Gas-tight feed through

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
- 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)

- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- 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.
- When replacing the probe electronics or opening the connection between the remote cable and the probe, a jumper plug must be used or a short-circuit must be established between the probe contact and the potential equalization conductor to avoid electrostatically charging the probe.

Safety instructions: Special conditions

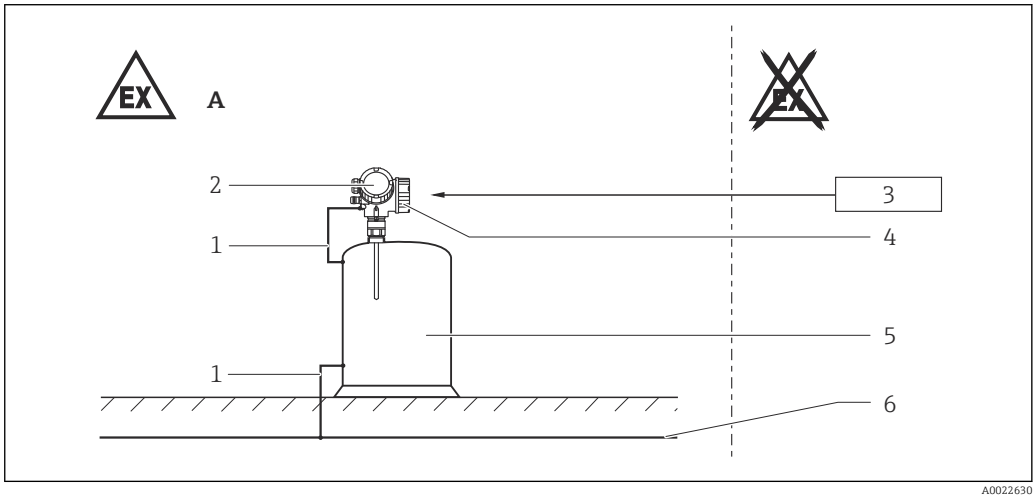
Permitted ambient temperature range at the electronics housing:
$-40\ °C \leq T_a \leq +80\ °C$

Optional specification, ID Jx (Test, Certificate) = JN
Permitted ambient temperature range at the electronics housing:
$-50\ °C \leq T_a \leq +80\ °C$

- Observe the information in the 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.
- Secure probes against swinging: e.g by fixing them to the wall or floor or by installing them in the ground tube.

Device type FMP52, FMP55 and Device type FMP5x with non-conductive plastic coated probes
A probe coated with non-conductive material can be used if avoiding electrostatic charging (e.g. through friction, cleaning, maintenance, strong medium flow).

Safety instructions: Installation



1

A Zone 1
1 Potential equalization line
2 Electronics compartment Ex ia; Electronic insert
3 Power supply
4 Connection compartment Ex db
5 Tank; Zone 0, Zone 1
6 Potential equalization

- After aligning (rotating) the housing, retighten the fixing screw (see Operating Instructions).
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- In potentially explosive atmospheres:
  - Do not disconnect the electrical connection of the power supply circuit when energized.
  - Do not open the connection compartment cover.

- 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 °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 housing.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation.
- Before operation:
  - Screw in the cover all the way.
  - Tighten the securing clamp on the cover.
- Continuous service temperature of the connecting cable: −40 °C to ≥ +85 °C; in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,min}$), ($T_{a,max}$ +20 K).

Optional specification, ID Jx (Test, Certificate) = JN
Continuous service temperature of the connecting cable: −50 °C to ≥ +85 °C; in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,min}$), ($T_{a,max}$ +20 K).

Basic specification, Position 4 (Display, Operation) = N
Observe the requirements according to IEC/EN 60079-14 for conduit systems and the wiring- and installation instructions of the suitable Safety Instructions (XA). In addition, observe national regulations and standards for conduit systems.

Explosion protection "Flameproof enclosure Ex db"
Flameproof equipment with G threaded entry holes is not intended for new installations but only for replacement of equipment in existing installations. Application of this equipment shall comply with the local installation requirements.

Intrinsic safety

The device can be connected to the Endress+Hauser FXA291 service tool: refer to the Operating Instructions.

Potential equalization

Integrate the device into the local potential equalization.

Safety instructions: Zone 0

- In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.
  - Temperature: −20 to +60 °C
  - Pressure: 80 to 110 kPa (0.8 to 1.1 bar)
  - Air with normal oxygen content, usually 21 % (V/V)
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, the device may also be operated under non-atmospheric conditions in accordance with the manufacturer's specifications.

Temperature tables

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Connection data

Connection compartment Ex db

Basic specification, Position 3 (Power Supply, Output) = E, G

The power consumption of I/O modules with passive PFS output can be limited for certain applications.

- Recommended: Power consumption = 1 W. This is obtained for a supply voltage at the terminals of 27 V_{DC}.
- For higher supply voltages (U_{max}): Insert a serial resistance (R_V) in order to limit the power consumption, see table below.

Table for the PFS serial resitance (R_V):

Power consumption	1.0 W
Total power consumption	1.88 W
Internal resistance R_I	760 Ω

U_{max} [V]	R_V min
35	205 Ω
34	177 Ω
33	150 Ω
32	122 Ω
31	95 Ω
30	67 Ω
29	39 Ω
28	12 Ω
27	0 Ω

For values associated with a higher or lower internal power consumption please contact Endress+Hauser.

Terminal 1 (+), 2 (–)	Terminal 3 (+), 4 (–)
Power supply U_N = 32 V_{DC} U_m = 250 V	Switch output (PFS) U_N = 35 V_{DC} U_m = 250 V

Electronics compartment Ex ia

Service interface (CDI)

Taking the following values into consideration, the device can be connected to the certified Endress+Hauser FXA291 service tool or a similar interface:

Service interface													
U_i = 7.3 V effective inner inductance L_i = negligible effective inner capacitance C_i = negligible													
U_o = 7.3 V I_o = 100 mA P_o = 160 mW													
L_o (mH) =	5.00	2.00	1.00	0.50	0.20	0.15	0.10	0.05	0.02	0.01	0.005	0.002	0.001
C_o (µF) [1] =	0.73	1.20	1.60	2.00	2.60	-	3.20	4.00	5.50	7.30	10.00	12.70	12.70
C_o (µF) [2] =	-	0.49	0.90	1.40	-	2.00	-	-	-	-	-	-	-

1) Values according to PTB "ispark" program
2) Values according to ABNT NBR IEC 60079-25, Annex C

Levelflex FMP50/51/52/53/54/55

PROFIBUS PA, FOUNDATION Fieldbus

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Notes on the structure

Extract from the extended order code

Device type

FMP50, FMP51, FMP52, FMP53, FMP54, FMP55

Basic specifications

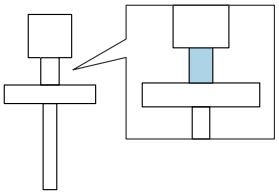
Position 1, 2 (Approval)		
Selected option		**Description**
FMP5x	MC	INMETRO Ex ia/db [ia Ga] IIC T6...T1 Ga/Gb

Position 3 (Power Supply, Output)		
Selected option		**Description**
FMP5x	E	2-wire, FOUNDATION Fieldbus, switch output (PFS)
	G	2-wire, PROFIBUS PA, switch output (PFS)

Position 5 (Housing)		
Selected option		**Description**
FMP51 FMP52 FMP54 FMP55	B	GT18 dual compartment, 316L
FMP5x	C	GT20 dual compartment, Alu coated

Position 9, 10 (Seal)		
Selected option		**Description**
FMP50	A1	Viton, −20...80 °C
FMP51	A4	Viton, −30...150 °C
	B3	EPDM, −40...120 °C
	C3	Kalrez, −20...200 °C
	E1	FVMQ, −50...150 °C
FMP53	AD	FKM, FDA, USP Cl. VI, −10...150 °C
	B5	EPDM, FDA, USP Cl. VI, −20...130 °C
	C4	Kalrez, FDA, USP Cl. VI, −20...150 °C
FMP54	D1	Graphite, −196...280 °C (XT)
	D2	Graphite, −196...450 °C (HT)

Shown in the temperature tables exemplary as follows:



Optional specifications

ID Jx (Test; Certificate)		
Selected option		**Description**
FMP51 [1)] FMP54	JN	Ambient temperature transmitter −50 °C

1) Only in connection with Position 9, 10 (Seal) = E1

ID Mx (Probe Design)		
Selected option		**Description**
FMP5x	MB	Sensor remote, 3 m/9 ft cable, detachable + mounting bracket
FMP53	MA	Sensor compact, detachable
FMP50-54	MC	Sensor remote, 6 m/18 ft cable, detachable + mounting bracket
	MD	Sensor remote, 9 m/27 ft cable, detachable + mounting bracket

General notes

Observe the permitted temperature range at the probe.

Basic specification, Position 3 (Power Supply, Output) = E, G
Deratings are based on a power consumption of 1 W (PFS); → 8.

Description notes

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

1st column: Position 5 (Housing) = A, B, ...

2nd column: Position 3 (Power Supply, Output) = A, B, ..
- (1): 1 channel used
- (2): 2 channels used

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

Column P1 to P6: Position (temperature value) on the axes of the derating
- T_a: Ambient temperature in °C
- T_p: Process temperature in °C

Column P6 is only relevant for version B of the derating.
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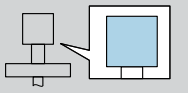

= C

(1)		P1		P2		P3		P4		P5		P6	
		T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
E, G	T6	-40	60	60	60	85	53	85	-40	-40	-40	-	-
	T5	-40	75	75	75	100	68	100	-40	-40	-40	-	-
	T4	-40	80	80	80	135	67	135	-40	-40	-40	-	-
	T3	-40	80	80	80	200	51	200	-40	-40	-40	-	-

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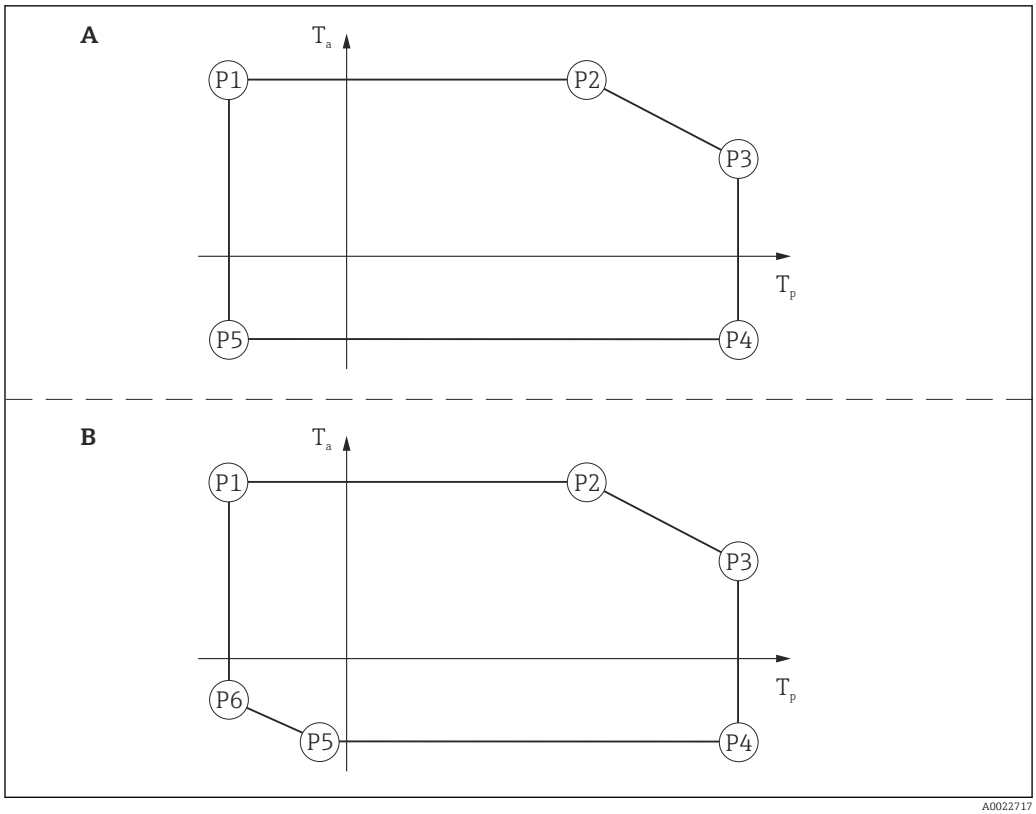
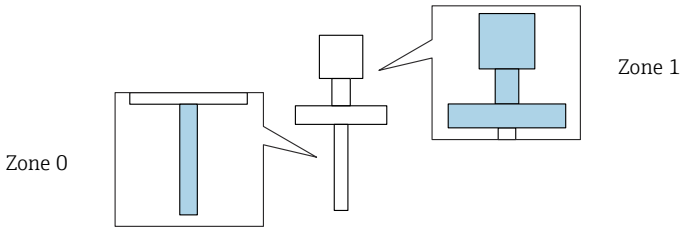
Example diagrams of possible deratings



2

Zone 0, Zone 1: Compact; 1 channel

Probe design: compact
Position 3 (Power Supply, Output) = E, G: 1 channel used



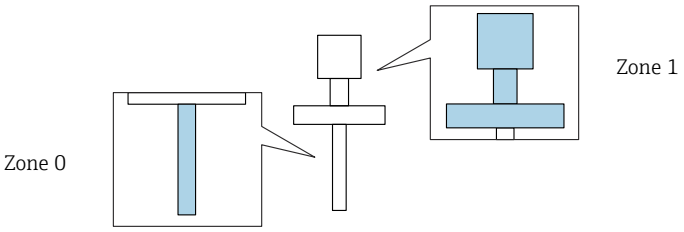
FMP5x

= *B, C*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a [1)]	T_p	T_a [1)]	T_p	T_a
	E, G	T6	−20	60	60	60	60	60	60	−40 −50 [2)]	−20	−40 −50 [2)]	–	–
		T5	−20	75	60	75	60	75	60	−40 −50 [2)]	−20	−40 −50 [2)]	–	–

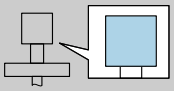
1) FMP50, FMP53: without remote sensor = −20 °C
2) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

Zone 0, Zone 1: Compact; 2 channels

Probe design: compact
Position 3 (Power Supply, Output) = E, G: 2 channels used



FMP5x

 = *B, C*	**(2)**		**P1**		**P2**		**P3**		**P4**		**P5**		**P6**	
			T_p	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**	**T_p**	**T_a** [1)]	**T_p**	**T_a** [1)]	**T_p**	**T_a**
	E, G	T6	−20	60	60	60	60	60	60	−40 −50 [2)]	−20	−40 −50 [2)]	–	–
		T5	−20	75	60	75	60	75	60	−40 −50 [2)]	−20	−40 −50 [2)]	–	–

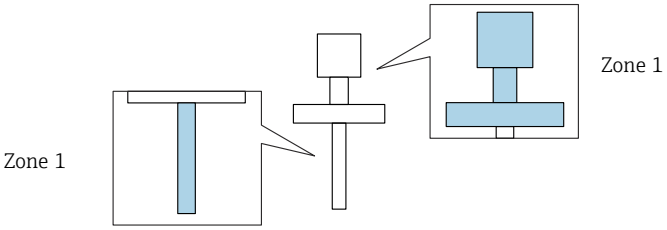
1) FMP50, FMP53: without remote sensor = −20 °C
2) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

Zone 1: Compact; 1 channel

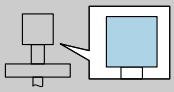
Probe design: compact
Position 3 (Power Supply, Output) = E, G: 1 channel used

Page references to the temperature tables of the respective device types: See the following list.

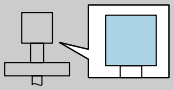
- FMP50 → 17
- FMP51 → 18
- FMP52 → 19
- FMP53 → 20
- FMP54 → 21
- FMP55 → 23



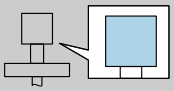
FMP50

 = *C*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–20	60	60	60	80	56	80	–20	–20	–20	–	–

FMP51

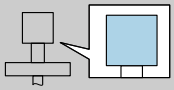
 = *B*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–40 –50 [1]	60	60	60	85	51	85	–40 –50 [1]	–40 –50 [1]	–40 –50 [1]	–	–
		T5	–40 –50 [1]	75	75	75	100	66	100	–40 –50 [1]	–40 –50 [1]	–40 –50 [1]	–	–
		T4	–40 –50 [1]	80	80	80	135	67	135	–40 –50 [1]	–40 –50 [1]	–40 –50 [1]	–	–
		T3	–40 –50 [1]	80	80	80	200	48	200	–40 –50 [1]	–40 –50 [1]	–40 –50 [1]	–	–

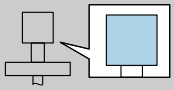
1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

 = *C*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–40 –50 [1]	60	60	60	85	53	85	–40 –50 [1]	–40 –50 [1]	–40 –50 [1]	–	–
		T5	–40 –50 [1]	75	75	75	100	68	100	–40 –50 [1]	–40 –50 [1]	–40 –50 [1]	–	–
		T4	–40 –50 [1]	80	80	80	135	69	135	–40 –50 [1]	–40 –50 [1]	–40 –50 [1]	–	–
		T3	–40 –50 [1]	80	80	80	200	56	200	–40 –50 [1]	–40 –50 [1]	–40 –50 [1]	–	–

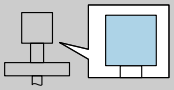
1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

FMP52

 = *B*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–50	60	60	60	85	52	85	–40	–40	–40	–50	–37
		T5	–50	75	75	75	100	67	100	–40	–40	–40	–50	–37
		T4	–50	80	80	80	135	68	135	–40	–40	–40	–50	–37
		T3	–50	80	80	80	200	52	200	–40	–40	–40	–50	–37

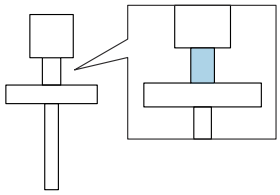
 = *C*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–50	60	60	60	85	54	85	–40	–40	–40	–50	–37
		T5	–50	75	75	75	100	69	100	–40	–40	–40	–50	–37
		T4	–50	80	80	80	135	70	135	–40	–40	–40	–50	–37
		T3	–50	80	80	80	200	58	200	–40	–40	–40	–50	–37

FMP53

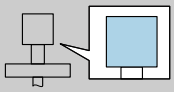
 = *C*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–20	60	60	60	85	54	85	–20	–20	–20	–	–
		T5	–20	75	75	75	100	69	100	–20	–20	–20	–	–
		T4	–20	80	80	80	135	69	135	–20	–20	–20	–	–
		T3 [1)]	–20	80	80	80	150	66	150	–20	–20	–20	–	–

1) Functional: Maximum permissible process temperature

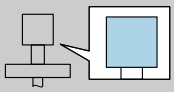
FMP54



= D1

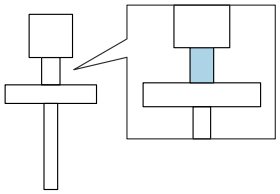
 = *B*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−196	60	60	60	85	56	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]
		T5	−196	75	75	75	100	71	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]
		T4	−196	80	80	80	135	73	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]
		T3	−196	80	80	80	200	64	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]
		T2 [2]	−196	80	80	80	280	54	280	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]

1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN
2) Functional: Maximum permissible process temperature

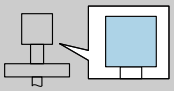
 = *C*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−196	60	60	60	85	57	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]
		T5	−196	75	75	75	100	72	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]
		T4	−196	80	80	80	135	75	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]
		T3	−196	80	80	80	200	68	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]
		T2 [2]	−196	80	80	80	280	60	280	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]

1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN
2) Functional: Maximum permissible process temperature

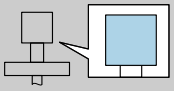
FMP54



= D2

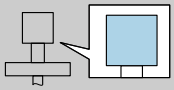
 = *B*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−196	60	60	60	85	57	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T5	−196	75	75	75	100	72	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T4	−196	80	80	80	135	76	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T3	−196	80	80	80	200	71	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T2	−196	80	80	80	300	64	300	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T1	−196	80	80	80	450	52	450	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]

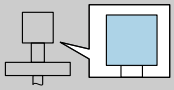
1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

 = *C*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−196	60	60	60	85	58	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T5	−196	75	75	75	100	73	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T4	−196	80	80	80	135	76	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T3	−196	80	80	80	200	72	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T2	−196	80	80	80	300	65	300	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T1	−196	80	80	80	450	54	450	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]

1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

FMP55

 = *B*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–50	60	60	60	85	52	85	–40	–40	–40	–50	–37
		T5	–50	75	75	75	100	67	100	–40	–40	–40	–50	–37
		T4	–50	80	80	80	135	68	135	–40	–40	–40	–50	–37
		T3	–50	80	80	80	200	52	200	–40	–40	–40	–50	–37

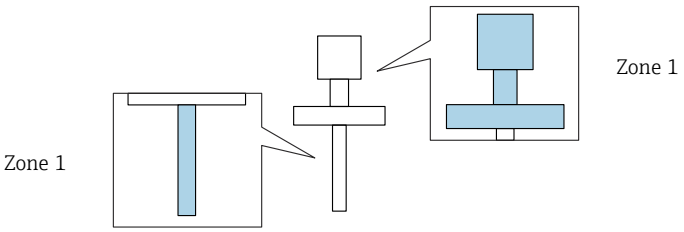
 = *C*	(1)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–50	60	60	60	85	54	85	–40	–40	–40	–50	–37
		T5	–50	75	75	75	100	69	100	–40	–40	–40	–50	–37
		T4	–50	80	80	80	135	69	135	–40	–40	–40	–50	–37
		T3	–50	80	80	80	200	57	200	–40	–40	–40	–50	–37

Zone 1: Compact; 2 channels

Probe design: compact
Position 3 (Power Supply, Output) = E, G: 2 channels used

Page references to the temperature tables of the respective device types: See the following list.

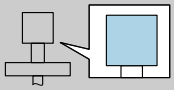
- FMP50 → 24
- FMP51 → 25
- FMP52 → 26
- FMP53 → 27
- FMP54 → 28
- FMP55 → 30



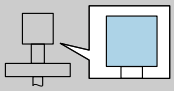
FMP50

= *C*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–20	60	60	60	80	56	80	–20	–20	–20	–	–

FMP51

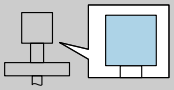
 = *B*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−40 −50 [1]	60	60	60	85	51	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	–	–
		T5	−40 −50 [1]	75	75	75	100	66	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	–	–
		T4	−40 −50 [1]	75	75	75	135	61	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	–	–
		T3	−40 −50 [1]	75	75	75	200	45	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	–	–

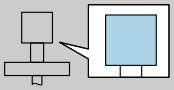
1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

 = *C*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−40 −50 [1]	60	60	60	85	53	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	–	–
		T5	−40 −50 [1]	75	75	75	100	68	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	–	–
		T4	−40 −50 [1]	75	75	75	135	63	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	–	–
		T3	−40 −50 [1]	75	75	75	200	50	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	–	–

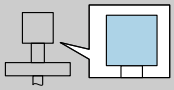
1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

FMP52

 = *B*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–50	60	60	60	85	52	85	–40	–40	–40	–50	–37
		T5	–50	75	75	75	100	67	100	–40	–40	–40	–50	–37
		T4	–50	75	75	75	135	62	135	–40	–40	–40	–50	–37
		T3	–50	75	75	75	200	47	200	–40	–40	–40	–50	–37

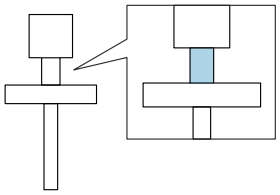
 = *C*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–50	60	60	60	85	54	85	–40	–40	–40	–50	–37
		T5	–50	75	75	75	100	69	100	–40	–40	–40	–50	–37
		T4	–50	75	75	75	135	64	135	–40	–40	–40	–50	–37
		T3	–50	75	75	75	200	52	200	–40	–40	–40	–50	–37

FMP53

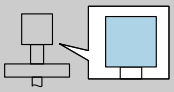
 = *C*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–20	60	60	60	85	54	85	–20	–20	–20	–	–
		T5	–20	75	75	75	100	69	100	–20	–20	–20	–	–
		T4	–20	75	75	75	135	63	135	–20	–20	–20	–	–
		T3 [1)]	–20	75	75	75	150	60	150	–20	–20	–20	–	–

1) Functional: Maximum permissible process temperature

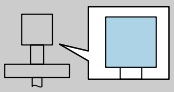
FMP54



= D1

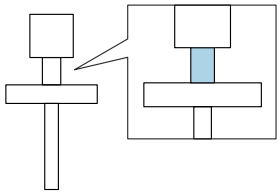
 = *B*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−196	60	60	60	85	56	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]
		T5	−196	75	75	75	100	71	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]
		T4	−196	75	75	75	135	67	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]
		T3	−196	75	75	75	200	59	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]
		T2 [2]	−196	75	75	75	280	48	280	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−16 −27 [1]

1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN
2) Functional: Maximum permissible process temperature

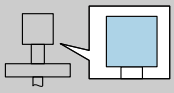
 = *C*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−196	60	60	60	85	57	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]
		T5	−196	75	75	75	100	72	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]
		T4	−196	75	75	75	135	69	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]
		T3	−196	75	75	75	200	63	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]
		T2 [2]	−196	75	75	75	280	55	280	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−23 −34 [1]

1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN
2) Functional: Maximum permissible process temperature

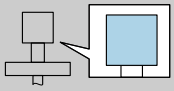
FMP54



= D2

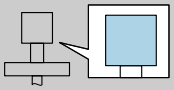
 = *B*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−196	60	60	60	85	57	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T5	−196	75	75	75	100	72	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T4	−196	75	75	75	135	71	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T3	−196	75	75	75	200	66	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T2	−196	75	75	75	300	58	300	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]
		T1	−196	75	75	75	450	47	450	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−26 −37 [1]

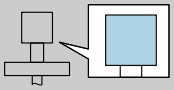
1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

 = *C*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	−196	60	60	60	85	58	85	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T5	−196	75	75	75	100	73	100	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T4	−196	75	75	75	135	71	135	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T3	−196	75	75	75	200	66	200	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T2	−196	75	75	75	300	59	300	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]
		T1	−196	75	75	75	450	49	450	−40 −50 [1]	−40 −50 [1]	−40 −50 [1]	−196	−27 −37 [1]

1) Only in connection with Optional specification, ID Jx (Test, Certificate) = JN

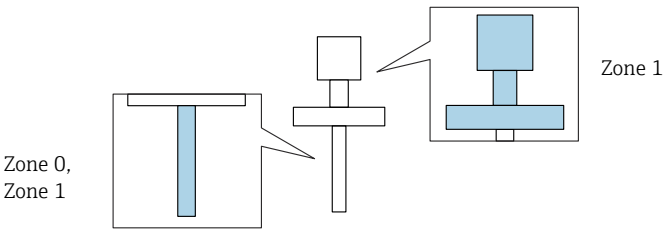
FMP55

 = *B*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–50	60	60	60	85	52	85	–40	–40	–40	–50	–37
		T5	–50	75	75	75	100	67	100	–40	–40	–40	–50	–37
		T4	–50	75	75	75	135	62	135	–40	–40	–40	–50	–37
		T3	–50	75	75	75	200	47	200	–40	–40	–40	–50	–37

 = *C*	(2)		P1		P2		P3		P4		P5		P6	
			T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
	E, G	T6	–50	60	60	60	85	54	85	–40	–40	–40	–50	–37
		T5	–50	75	75	75	100	69	100	–40	–40	–40	–50	–37
		T4	–50	75	75	75	135	63	135	–40	–40	–40	–50	–37
		T3	–50	75	75	75	200	51	200	–40	–40	–40	–50	–37

Zone 0/1, Zone 1: Remote; 1 channel

Probe design: remote
Position 3 (Power Supply, Output) = E, G: 1 channel used
Optional specification, ID Mx (Probe Design) = MB, MC, MD



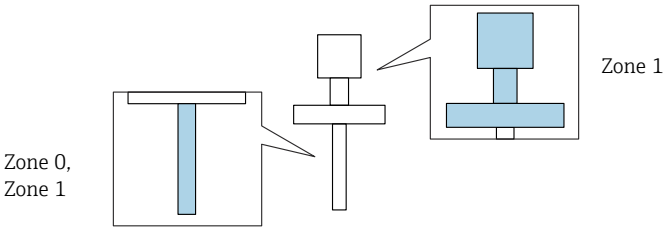
FMP5x

= *B, C*	**(1)**		**P1**		**P2**		**P3**		**P4**		**P5**		**P6**	
			T_p 1)	**T_a**	**T_p 1)**	**T_a**	**T_p 1)**	**T_a**	**T_p 1)**	**T_a**	**T_p 1)**	**T_a**	**T_p 1)**	**T_a**
	E, G	T6	–	60	–	60	–	60	–	–40	–	–40	–	–
		T5	–	75	–	75	–	75	–	–40	–	–40	–	–

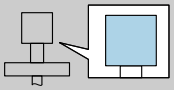
1) T_p = dependent on the sensor

Zone 0/1, Zone 1: Remote; 2 channels

Probe design: remote
Position 3 (Power Supply, Output) = E, G: 2 channels used
Optional specification, ID Mx (Probe Design) = MB, MC, MD



FMP5x

 = *B, C*	**(2)**		**P1**		**P2**		**P3**		**P4**		**P5**		**P6**	
			T_p [1]	**T_a**	**T_p** [1]	**T_a**	**T_p** [1]	**T_a**	**T_p** [1]	**T_a**	**T_p** [1]	**T_a**	**T_p** [1]	**T_a**
	E, G	T6	–	60	–	60	–	60	–	–40	–	–40	–	–
		T5	–	75	–	75	–	75	–	–40	–	–40	–	–

1) T_p = dependent on the sensor

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