

Safety Instructions

Micropilot NMR81, NMR84

CA: XP / I / 1 / B,C,D / T* Ta*
IS / I / 1 / A,B,C,D / T* Ta*
I / 0/1 / Ex ia/db IIC T* Ga/Gb Ta*
I / 1 / Ex db [ia Ga] IIC T* Gb Ta*; Entity
US: XP / I / 1 / B,C,D / T* Ta*
IS / I / 1 / A,B,C,D / T* Ta*
I / 0/1 / AEx ia/db IIC T* Ga/Gb Ta*
I / 1 / AEx db [ia Ga] IIC T* Gb Ta*; Entity



Document: XA01436G-D
Safety instructions for electrical apparatus for explosion-hazardous areas → 3

Document: XA01436G-D
Temperature tables → 17

Document: XA01436G-D
Attachment: Nameplate view → 23

Micropilot NMR81, NMR84

Table of contents

Associated documentation	4
Manufacturer address	4
Extended order code	4
Safety instructions: General	7
Safety instructions: Special conditions	7
Safety instructions: Installation	8
Explosionproof / Flameproof	8
Class I, Div. 2, Groups A-G	9
Zone installation	9
Safety instructions: Zone 0	10
Process seals	10
Temperature tables	10
Connection data	11

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

- BA01450G/00 (NMR81)
- BA01453G/00 (NMR84)

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

NMR8x	–	*****	+	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: Micropilot



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

NMR81, NMR84

Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
NMR81	FE	FM C/US XP-AIS Cl.I Div.1 Gr.B-D, AEx db[ia] IIC T4...T1 Ta* detailed: FM16CA0006X: XP / I / 1 / B,C,D / T4...T1 Ta* IS / I / 1 / A,B,C,D / T4...T1 Ta* I / 0/1 / Ex ia/db IIC T4...T1 Ga/Gb Ta* I / 1 / Ex db [ia Ga] IIC T4...T1 Gb Ta*; Entity AIS / I,II,III / 1 / A,B,C,D,E,F,G; Entity ANI / I,II,III / 2 / A,B,C,D,E,F,G; NIFW FM16US0006X: XP / I / 1 / B,C,D / T4...T1 Ta* IS / I / 1 / A,B,C,D / T4...T1 Ta* I / 0/1 / AEx ia/db IIC T4...T1 Ga/Gb Ta* I / 1 / AEx db [ia Ga] IIC T4...T1 Gb Ta*; Entity AIS / I,II,III / 1 / A,B,C,D,E,F,G; Entity ANI / I,II,III / 2 / A,B,C,D,E,F,G; NIFW
NMR8x	FC	FM C/US XP-AIS Cl.I Div.1 Gr.B-D, AEx db[ia] IIC T6...T1 Ta* detailed: FM16CA0006X: XP / I / 1 / B,C,D / T6...T1 Ta* IS / I / 1 / A,B,C,D / T6...T1 Ta* I / 0/1 / Ex ia/db IIC T6...T1 Ga/Gb Ta* I / 1 / Ex db [ia Ga] IIC T6...T1 Gb Ta*; Entity AIS / I,II,III / 1 / A,B,C,D,E,F,G; Entity ANI / I,II,III / 2 / A,B,C,D,E,F,G; NIFW FM16US0006X: XP / I / 1 / B,C,D / T6...T1 Ta* IS / I / 1 / A,B,C,D / T6...T1 Ta* I / 0/1 / AEx ia/db IIC T6...T1 Ga/Gb Ta* I / 1 / AEx db [ia Ga] IIC T6...T1 Gb Ta*; Entity AIS / I,II,III / 1 / A,B,C,D,E,F,G; Entity ANI / I,II,III / 2 / A,B,C,D,E,F,G; NIFW

Position 4 (Power supply, Display)		
Selected option		Description
NMR8x	B	85-264VAC; LCD + operation
	D	52-75VAC; LCD + operation
	E	19-64VDC; LCD + operation

Position 5, 6 (Primary Output)		
Selected option		Description
NMR8x	A1	Modbus RS485
	B1	V1
	C1	WM550
	E1	4-20mA HART Ex d/XP
	H1	4-20mA HART Ex i/IS

Position 7, 8 (Secondary I/O Analogue)		
Selected option		Description
NMR8x	A1	Ex d/XP, 1x 4-20 mA HART, 1x RTD input
	A2	Ex d/XP, 2x 4-20 mA HART, 2x RTD input
	B1	Ex i/IS, 1x 4-20 mA HART, 1x RTD input
	B2	Ex i/IS, 2x 4-20 mA HART, 2x RTD input
	C2	1x Ex i/IS 4-20 mA HART, 2x RTD input + 1x Ex d/XP 4-20 mA HART
	X0	Not selected

Position 9, 10 (Secondary I/O Digital Ex d/XP)		
Selected option		Description
NMR8x	A1	2x relay + 2x module discrete
	A2	4x relay + 4x module discrete
	A3	6x relay + 6x module discrete
	B1	Modbus RS485
	B2	Modbus RS485 + 2x relay + 2x module discrete
	B3	Modbus RS485 + 4x relay + 4x module discrete
	C1	V1
	C2	V1 + 2x relay + 2x module discrete
	C3	V1 + 4x relay + 4x module discrete
	E1	WM550
	E2	WM550 + 2x relay + 2x module discrete
	E3	WM550 + 4x relay + 4x module discrete
	X0	Not selected

Position 11, 12 (Housing)		
Selected option		Description
NMR8x	AC	Transmitter Alu, coated, process 316/316L
	BC	Transmitter + process 316/316L

Position 14, 15 (Antenna)		
Selected option		Description
NMR81	AB	50 mm/2"
	AC	80 mm/3"
	AD	100 mm/4", align. device
NMR84	BD	Planar 100 mm/4"
	BF	Planar 150 mm/6"
	BG	Planar 200 mm/8"
	BH	Planar 250 mm/10"
	BJ	Planar 300 mm/12"

Position 16, 17 (Process Sealing)		
Selected option		Description
NMR81	B1	FKM GLT, -40...200 °C/-40...392 °F
	B2	FFKM, -20...200 °C/-4...392 °F
	B3	FKM -10...200°C /14...392°F, FDA conf.
NMR84	B1	FKM GLT, -40...150 °C/-40...302 °F
	B2	FFKM, -20...150 °C/-4...302 °F
NMR8x	A1	HNBR -30...150 °C/-22...302 °F

Optional specifications

No options specific to hazardous locations are available.

Safety instructions: General

- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
 - Be suitably qualified for their role and the tasks they perform
 - Be trained in explosion protection
 - Be familiar with national regulations
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only use the device in media to which the wetted materials have sufficient durability.
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. housing, sensor element, special varnishing, attached additional plates, ..)
 - Of isolated capacities (e.g. isolated metallic plates)
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the sensor and/or transmitter, depending on the range of application and the temperature class.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.

Safety instructions: Special conditions

Permitted ambient temperature range at the electronics housing:
→  18, "Temperature tables".

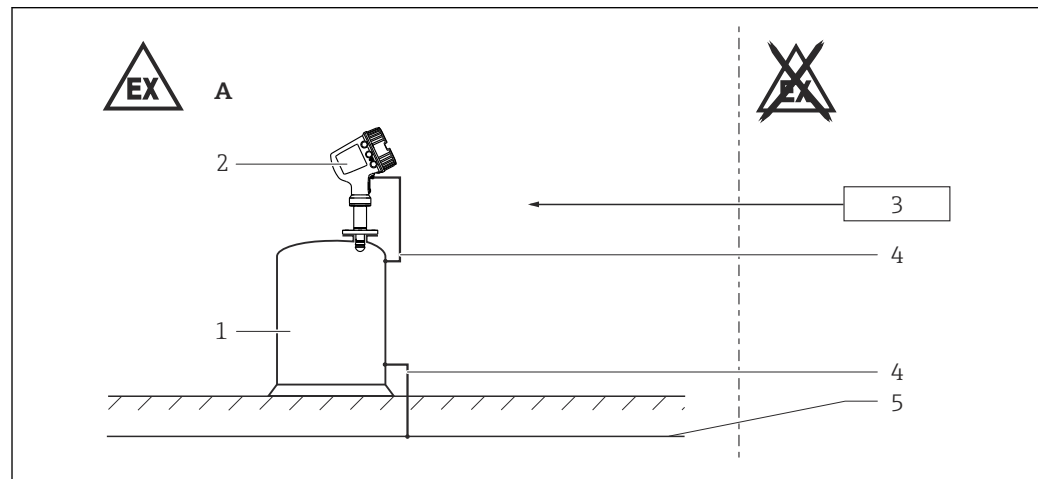
- Observe the information in the temperature tables.
- An antenna coated with non-conductive material can be used if avoiding electrostatic charging (e.g. through friction, cleaning, maintenance, strong medium flow).
- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- In the event of additional or alternative special varnishing on the housing or other metal parts:
 - Observe the danger of electrostatic charging and discharge.
 - Do not rub surfaces with a dry cloth.

Special conditions of use - US

- This is boundary wall equipment: The XP ratings are applicable to the transmitter portion. The IS ratings are applicable to the radar antenna portion.
- For ambient and process temperature range refer to XA01436G.
- Flamepath joints are not for repair. Contact the manufacturer.
- Use heat resisting cables rated ≥ 85 °C for $T_a > 50$ °C.
- Precautions shall be taken to minimize the risk from electrostatic discharge of non-metallic labels and isolated metal tags applied to the enclosure.
- To maintain the ingress protection ratings (IP66/68), teflon tape or pipe dope is required for blanking plugs.
- Explosionproof certified seals are required within 450 mm (18 in) for Group B, C, D and within 50 mm (2 in) for Group IIC on all used housing entries.

Special conditions of use - CA

- This is boundary wall equipment: The XP ratings are applicable to the transmitter portion. The IS ratings are applicable to the radar antenna portion.
- For ambient and process temperature range refer to XA01436G.
- Flamepath joints are not for repair. Contact the manufacturer.
- Use heat resisting cables rated $\geq 85\text{ °C}$ for $T_a > 50\text{ °C}$.
- Precautions shall be taken to minimize the risk from electrostatic discharge of non-metallic labels and isolated metal tags applied to the enclosure.
- To maintain the ingress protection ratings (IP66/68), teflon tape or pipe dope is required for blanking plugs.
- Explosionproof certified seals are required within 50 mm (2 in) on all used housing entries.

**Safety instructions:
Installation**

A0032009

1

- A Division 1, Zone 1 or Division 2
 1 Tank; Division 1, Zone 0, Zone 1
 2 Connection and electronics compartment AEx db/Ex db
 3 Power supply
 4 Potential equalization line
 5 Potential equalization

Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.

Explosionproof / Flameproof

Class I, Div. 1, Groups B, C, D, Class I, Zone 1, AEx db [ia] IIC/Ex db [ia] IIC

- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- For the maximum supply voltage: See "Connection data" section.
- Control room equipment may not use or generate over $250\text{ V}_{\text{rms}}$.
- Seal unused entries with approved 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.
- Antenna is intrinsically safe, AEx ia/Ex ia, and suitable for installation in Class I, Division 1 or Class I, Zone 0/1.
- Before operation:
 - Screw in the cover all the way.
 - Tighten the securing clamp on the cover.
- WARNINGS: Substitution of components may impair intrinsic safety.
- Do not open when explosive atmosphere is present.

Depending on approval be used, following issues to be considered:

Ex d (CA) / AEx d (US)	XP (C)	XP (US)
IIC Certified seal required within 50 mm (2") on all used housing entries	<ul style="list-style-type: none"> Groups B, C, D; Certified seal required within 50 mm (2") on all used housing entries Boundary wall equipment: The XP and Ex db ratings are applicable to the transmitter portion. The IS and Ex ia ratings are applicable to the radar antenna portion. 	Groups B, C, D; Certified seal required within 450 mm (18") on all used housing entries

Class I, Div. 2, Groups A-G

Device type NMR8x, Basic specification, Position 1, 2 (Approval) = FE and FC are not marked for use in Class I, Division 2; however, these devices are suitable for this application when installed using the intrinsic safety instructions for Class I, Division 1.

Standard Wiring installation (only for NPT conduit entries)

- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- Use wiring methods appropriate for the location.
- For the maximum supply voltage: See "Connection data" section.
- Antenna is intrinsically safe, AEx ia/Ex ia, and suitable for installation in Class I, Division 1 or Class I, Zone 0/1.
- WARNINGS: Explosion hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- WARNINGS: Substitution of components may impair suitability for hazardous locations.

Nonincendive Field Wiring (NIFW) installation

- The Nonincendive Field Wiring circuit concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus or associated apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when the following conditions are met: $V_{max} \geq V_{oc}$, $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$.
- For transmitter parameters: See "Connection data" section.
- The transmitter provides a current controlled circuit; therefore, the parameter I_{max} is not required and needs not to be aligned with I_{sc} of the associated nonincendive field wiring apparatus or associated apparatus.
- Control room equipment may not use or generate over 250 V_{rms}.
- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- WARNINGS: Substitution of components may impair suitability for Class I, Div. 2.
- Always follow the installation drawing provided by the associated apparatus manufacturer. The configuration of the associated apparatus must be approved for the country in use.

The NIFW wiring applies only for the "intrinsically safe outputs" of Main board and IOM_A:

- TRC[10] type "Main board"
- TRC[20] type "Analog module" (Ex i)

The additional marking for the application is as follows:

- NMR81: ANI / I / 2 / A, B, C, D, E, F, G; NIFW
- NMR84: ANI / I / 2 / A, B, C, D, E, F, G; NIFW

Zone installation

Overvoltage protection against atmospheric overvoltages.

The following Terminal outputs / configurations need no separate external overvoltage protection measures:

Position	Terminal
Power supply	G
HART interface	E
external Display	F

- Device configuration:
 - Basic specification, Position 5, 6 (Primary output) = A1, B1, C1, E1, H1
 - Basic specification, Position 7, 8 (Secondary I/O Analogue) = A1, A2, B1, B2, C2, X0
 - Basic specification, Position 9, 10 (Secondary I/O Digital Ex d/XP) = B1, C1, E1, X0
- All other configurations must be protected by separate additional measures to comply national regulations and standards.
- Observe the safety instructions of the overvoltage protection.

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.

Process seals

The following device types are Single Seal devices per UL 122701 (2017) and do not require the use of an external Add-on Secondary Seal.

Device type	Maximum Working Pressure (MWP) for the Single Seal rating
NMR81	1.6 MPa (16 bar) or 1.6 MPa (16 bar) limited up to 170 °C (see nameplate)
NMR84	2.5 MPa (25 bar)

The following device types are Dual Seal devices per UL 122701 (2017) and do not require the use of an external Add-on Secondary Seal.

Device type	Maximum Working Pressure (MWP) for the Dual Seal rating	Annunciation
NMR81	1.2 MPa (12 bar) or 1.2 MPa (12 bar) limited up to 170 °C (see nameplate)	without
NMR84	1.6 MPa (16 bar)	without

External Add-on Secondary Seal

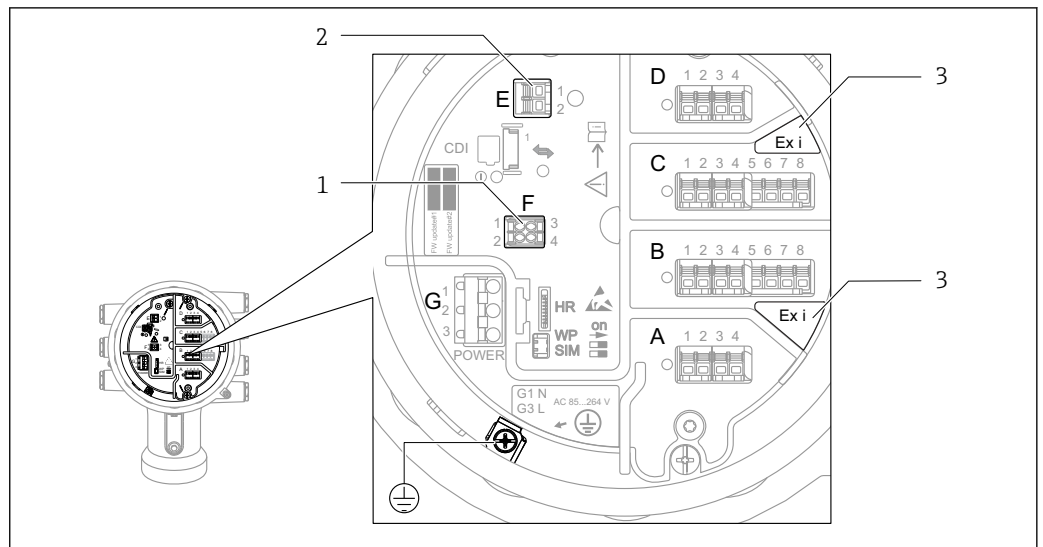
Device type	External Add-on Secondary Seal
NMR81	<ul style="list-style-type: none"> ▪ required for Single Seal if the T process is higher than 170 °C and the nameplate contains the indication "Single seal (170 °C)" ▪ required for Dual Seal with a higher process pressure than 1.2 MPa (12 bar)
NMR84	required for Dual Seal with a higher process pressure than 1.6 MPa (16 bar)

Temperature tables

→  18

Connection data

Connection compartment Ex db



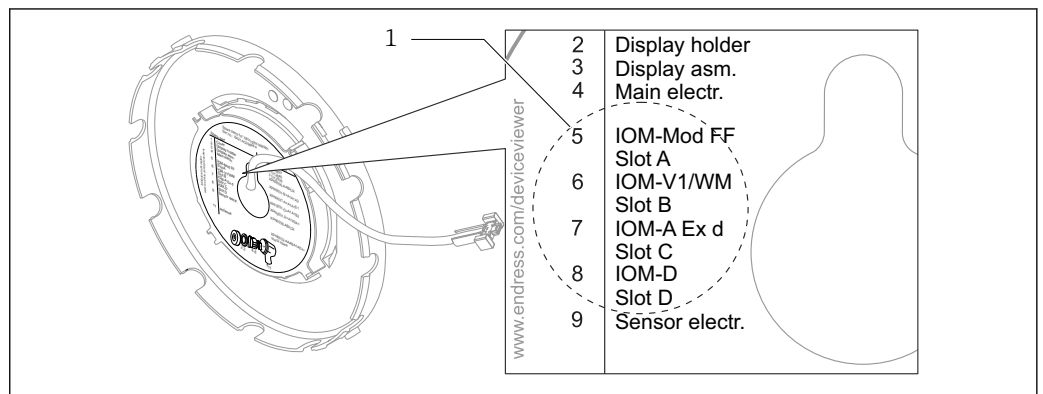
A0032010

2

- 1 Connection for external display Ex i
- 2 Connection for HART interface Ex i
- 3 only when "Analog Ex i" installed

Detailed configuration information located at the display holder.

Example for lettering:




A0032011

3

- 1 Area device configuration



For detailed information see Operating Instructions.

 Assignment of the terminals see designation of front plane.

TRC[01], type Power supply

Basic specification, Position 4 (Power supply, Display) = B

Terminal	G	CDI
	G1: N G2: not connected G3: L	plug connected
Designation	Power / Mains	Local LCD, CDI (internal)
non-Ex (functional)	$U_N = 85 \text{ to } 264 \text{ V}_{AC}, 50/60 \text{ Hz}$ $P_N = 28.8 \text{ VA}$	$U_N = 3.3 \text{ V}_{DC}$ $P_N = 41 \text{ mW}$

TRC[02], type Power supply

Basic specification, Position 4 (Power supply, Display) = D

Terminal	G	CDI
	G1: N G2: not connected G3: L	plug connected
Designation	Power / Mains	Local LCD, CDI (internal)
non-Ex (functional)	$U_N = 52 \text{ to } 75 \text{ V}_{AC}, 50/60 \text{ Hz}$ $P_N = 21.6 \text{ VA}$	$U_N = 3.3 \text{ V}_{DC}$ $P_N = 41 \text{ mW}$

TRC[03], type Power supply

Basic specification, Position 4 (Power supply, Display) = E

Terminal	G	CDI
	G1: L+ G2: not connected G3: L-	plug connected
Designation	Power / Mains	Local LCD, CDI (internal)
non-Ex (functional)	$U_N = 19 \text{ to } 64 \text{ V}_{DC}$ $P_N = 13.6 \text{ W}$	$U_N = 3.3 \text{ V}_{DC}$ $P_N = 41 \text{ mW}$

TRC[10], type Main board

Terminal	E	F
	E1: H+ E2: H-	F1: Vcc F2: A F3: B F4: gnd
Designation	4-20 mA HART	Remote display
Ex [ia]	$U_o = 29\text{ V}$ $I_o = 110\text{ mA}$ $P_o = 700\text{ mW}$ $C_o = 65\text{ nF}$ $L_o = 2.9\text{ mH}$	$U_o = 3.9\text{ V}$ $I_o = 500\text{ mA}$ $P_o = 230\text{ mW}$ $C_o = 99\text{ }\mu\text{F}$ $L_o = 140\text{ }\mu\text{H}$
non-Ex (functional)	$U_N = 24\text{ V}_{\text{DC}}$ $P_N \leq 426\text{ mW}$	$U_N = 3.3\text{ V}_{\text{DC}}$ $P_N = 41\text{ mW}$
NIFW	$V_{oc} = 24.5\text{ V}$ $I_{sc} = 33\text{ mA}$ $P_o = 498\text{ mW}$ $C_a = 421\text{ nF}$ $L_a = 73\text{ mH}$	$V_{oc} = 3.5\text{ V}$ $I_{sc} = 30\text{ mA}$ $P_o = 96\text{ mW}$ $C_a = 999\text{ }\mu\text{F}$ $L_a = 88\text{ mH}$

TRC[32], type "Modbus" module; optional

Terminal	Slot A through slot D	
	1: S Cable shielding; capacitive connected to earth 2: 0V Common reference 3: B- Non-inverting signal line 4: A+ Inverting signal line	
Designation	Modbus-Slave	FOUNDATION Fieldbus
non-Ex (functional)	$U_N = 12\text{ V}_{\text{DC}}$ $P_N \leq 12\text{ mW}$ $U_M = 250\text{ V}$	Currently not supported

TRC[33], type "V1" module; optional

Terminal	Slot A through slot D	
	1: S Cable shielding; capacitive connected to earth 2: not connected 3: B- Signal - 4: A+ Signal +	
Designation	V1-Slave	WM550
non-Ex (functional)	$U_N = 24\text{ V}_{\text{DC}}$ $P_N \leq 414\text{ mW}$ $U_M = 250\text{ V}$	Currently not supported

TRC[20], type "Analog module" (Ex i); 4-20 mA HART; optional

Terminal	Slot B or slot C	
Operation mode: ■ 4 to 20 mA output or HART slave + 4 to 20 mA output or ■ 4 to 20 mA input or HART master + 4 to 20 mA input or ■ HART master	4-wire RTD connection: Terminal 5 through 8 3-wire RTD connection: Terminal 5, 6 and 8 2-wire RTD connection: Terminal 5 and 8	Terminal active use: 2: H- 3: H+
		Terminal passive use: 1: H- 2: H+
Designation	24 V + RTD	4-20 mA HART
Ex [ia]	Terminals 4-5 (24 V): $U_o = 29\text{ V}$ $I_o = 108\text{ mA}$ $P_o = 776\text{ mW}$ $C_o = 63\text{ nF}$ $L_o = 3.0\text{ mH}$	Terminals 2-3 (Active): $U_o = 29\text{ V}$ $I_o = 106\text{ mA}$ $P_o = 760\text{ mW}$ $C_o = 63\text{ nF}$ $L_o = 3.1\text{ mH}$
	Terminals 5-8 (RTD): $U_o = 29\text{ V}$ $I_o = 36\text{ mA}$ $P_o = 263\text{ mW}$ $C_o = 64\text{ nF}$ $L_o = 26\text{ mH}$	Terminals 1-2 (Passive): $U_i = 29\text{ V}$ $I_i = 106\text{ mA}$ $P_i = 760\text{ mW}$ $C_i = 11\text{ nF}$ $L_i = 0$
non-Ex (functional)	Terminals 4-5 (24 V): $U_N = 24\text{ V}_{DC}$ $P_N \leq 600\text{ mW}$	Terminals 2-3 (Active): $U_N = 24\text{ V}_{DC}$ $P_N \leq 540\text{ mW}$
	Terminals 5-8 (RTD): $I_N = 400\text{ }\mu\text{A}_{DC}$ $P_N \leq 160\text{ }\mu\text{W}$	Terminals 1-2 (Passive): $U_N = 29\text{ V}_{DC}$ $P_N \leq 653\text{ mW}$
NIFW	Terminals 4-5 (24 V): $V_{oc} = 24\text{ V}$ $I_{sc} = 90\text{ mA}$ $P_o = 538\text{ mW}$ $C_a = 449\text{ nF}$ $L_a = 9.9\text{ mH}$	Terminals 2-3 (Active): $V_{oc} = 24\text{ V}$ $I_{sc} = 28\text{ mA}$ $P_o = 526\text{ mW}$ $C_a = 449\text{ nF}$ $L_a = 102\text{ mH}$
	Terminals 5-8 (RTD): $V_{oc} = 3.6\text{ V}$ $I_{sc} = 5\text{ mA}$ $P_o = 4\text{ mW}$ $C_a = 999\text{ }\mu\text{F}$ $L_a = 3.8\text{ H}$	Terminals 1-2 (Passive): $V_{max} = 29\text{ V}$ $I_{max}^{1)} = \text{not available}$ $P_i = \text{not available}$ $C_i = 11\text{ nF}$ $L_i = 0$

1) current controlled circuit

TRC[21], type "Analog module" (Ex d); 4-20 mA HART; optional

Terminal	Slot B or slot C	
Operation mode: <ul style="list-style-type: none"> ▪ 4 to 20 mA output or HART slave + 4 to 20 mA output or ▪ 4 to 20 mA input or HART master + 4 to 20 mA input or ▪ HART master 	4-wire RTD connection: Terminal 5 through 8	Terminal active use: 2: H- 3: H+
	3-wire RTD connection: Terminal 5, 6 and 8	Terminal passive use: 1: H- 2: H+
2-wire RTD connection: Terminal 5 and 8		
Designation	24 V + RTD	4-20 mA HART
non-Ex (functional)	Terminals 4-5 (24 V): not used	Terminals 2-3 (Active): $U_N = 24 V_{DC}$ $P_N \leq 540 mW$ $U_M = 250 V$
	Terminals 5-8 (RTD): $I_N = 400 \mu A_{DC}$ $P_N \leq 160 \mu W$ $U_M = 250 V$	Terminals 1-2 (Passive): $U_N = 29 V_{DC}$ $P_N \leq 653 mW$ $U_M = 250 V$

TRC[31], type "Digital"; optional

Terminal	Slot A through slot D	
Operation mode: <ul style="list-style-type: none"> ▪ disabled ▪ passive output ▪ passive input ▪ active input 	Installed in slot A:	
	1: A1-1 2: A1-2	3: A2-1 4: A2-2
	Installed in slot B:	
	1: B1-1 2: B1-2	3: B2-1 4: B2-2
Installed in slot C:		
1: C1-1 2: C1-2	3: C2-1 4: C2-2	
Installed in slot D:		
1: D1-1 2: D1-2	3: D2-1 4: D2-2	
Designation	Relay / Digital Input/Output 1	Relay / Digital Input/Output 2
non-Ex (functional)	Relay: $U_N = 250 V_{AC/DC}$ $I_N \leq 2 A$	Relay: $U_N = 250 V_{AC/DC}$ $I_N \leq 2 A$
	Digital Input: $U_N = 5 \text{ to } 230 V_{AC/DC}$ $U_M = 250 V$	Digital Input: $U_N = 5 \text{ to } 230 V_{AC/DC}$ $U_M = 250 V$



Micropilot NMR81, NMR84

Table of contents

Notes on the structure	18
Example diagrams of possible deratings	18
NMR81	19
NMR84	21

Notes on the structure

General notes

-  Observe the permitted temperature range at the antenna.
-  Observe the sealing restrictions: see *Basic specification, Position 16, 17 (Process Sealing)*
- For configurations other than listed: use configuration 1.

Configuration of electronics:

	1 (worst case)	2 (best case)	3	4	5
Enclosure	X	X	X	X	X
Slot A - IOM_D	X		X	X	X
Slot B - IOM_D	X				
Slot B - IOM_A (Ex ia)			X		X
Slot C - IOM_A (Ex ia)	X				
Slot D - IOM_D	X				X
PS_LV_DC	X	X	X	X	X
MB	X	X	X	X	X
ExLi	X	X	X	X	X

Description notes

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

1st column: Temperature classes T6 (85 °C) to T1 (450 °C)

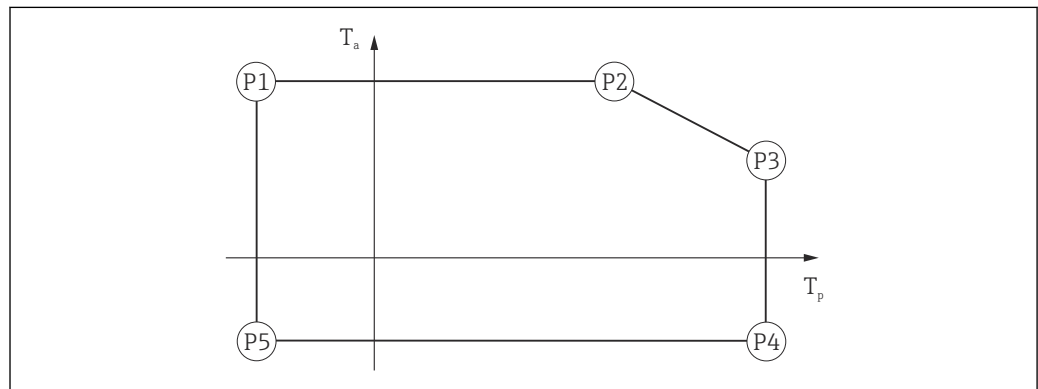
Column P1 to P5: Position (temperature value) on the axes of the derating

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

	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	-40	60	60	60	85	57	85	-40	-40	-40
T5	-40	60	60	60	100	56	100	-40	-40	-40
T4	-40	60	60	60	135	54	135	-40	-40	-40
T3, T2, T1	-40	60	60	60	150	53	150	-40	-40	-40

A0032014-EN

Example diagrams of possible deratings



A0033052

 4

NMR81

Position 11, 12 (Housing) = AC

Configuration 1

	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	-40	55	55	55	85	51	85	-40	-40	-40
T5	-40	55	55	55	100	46	100	-40	-40	-40
T4	-40	55	55	55	135	50	135	-40	-40	-40
T3...T1	-40	55	55	55	200	47	200	-40	-40	-40

Configuration 2

	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	-40	60	60	60	85	51	85	-40	-40	-40
T5	-40	60	60	60	100	46	100	-40	-40	-40
T4	-40	60	60	60	135	58	135	-40	-40	-40
T3...T1	-40	60	60	60	200	54	200	-40	-40	-40

Configuration 3

	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	-40	58	58	58	85	51	85	-40	-40	-40
T5	-40	58	58	58	100	46	100	-40	-40	-40
T4	-40	58	58	58	135	54	135	-40	-40	-40
T3...T1	-40	58	58	58	200	51	200	-40	-40	-40

Configuration 4

	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	-40	60	60	60	85	51	85	-40	-40	-40
T5	-40	60	60	60	100	46	100	-40	-40	-40
T4	-40	60	60	60	135	56	135	-40	-40	-40
T3...T1	-40	60	60	60	200	53	200	-40	-40	-40

Configuration 5

	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	-40	55	55	55	85	51	85	-40	-40	-40
T5	-40	55	55	55	100	46	100	-40	-40	-40
T4	-40	55	55	55	135	52	135	-40	-40	-40
T3...T1	-40	55	55	55	200	49	200	-40	-40	-40

Position 11, 12 (Housing) = BC

Configuration 1

	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	-40	43	43	43	85	40	85	-40	-40	-40
T5	-40	43	43	43	100	37	100	-40	-40	-40
T4	-40	43	43	43	135	37	135	-40	-40	-40
T3...T1	-40	43	43	43	200	32	200	-40	-40	-40

Configuration 2

	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	-40	55	55	55	85	46	85	-40	-40	-40
T5	-40	55	55	55	100	38	100	-40	-40	-40
T4	-40	55	55	55	135	52	135	-40	-40	-40
T3...T1	-40	55	55	55	200	46	200	-40	-40	-40

Configuration 3

	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	-40	50	50	50	85	45	85	-40	-40	-40
T5	-40	50	50	50	100	38	100	-40	-40	-40
T4	-40	50	50	50	135	45	135	-40	-40	-40
T3...T1	-40	50	50	50	200	40	200	-40	-40	-40

Configuration 4

	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	-40	53	53	53	85	46	85	-40	-40	-40
T5	-40	53	53	53	100	38	100	-40	-40	-40
T4	-40	53	53	53	135	46	135	-40	-40	-40
T3...T1	-40	53	53	53	200	43	200	-40	-40	-40

Configuration 5

	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	-40	45	45	45	85	44	85	-40	-40	-40
T5	-40	45	45	45	100	38	100	-40	-40	-40
T4	-40	45	45	45	135	40	135	-40	-40	-40
T3...T1	-40	45	45	45	200	36	200	-40	-40	-40

NMR84

Position 11, 12 (Housing) = AC

Configuration 1

	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	-40	55	55	55	85	52	85	-40	-40	-40
T5	-40	55	55	55	100	52	100	-40	-40	-40
T4	-40	55	55	55	135	49	135	-40	-40	-40
T3...T1	-40	55	55	55	150	49	150	-40	-40	-40

Configuration 2

	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	-40	60	60	60	85	60	85	-40	-40	-40
T5	-40	60	60	60	100	59	100	-40	-40	-40
T4	-40	60	60	60	135	56	135	-40	-40	-40
T3...T1	-40	60	60	60	150	56	150	-40	-40	-40

Configuration 3

	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	-40	58	58	58	85	55	85	-40	-40	-40
T5	-40	58	58	58	100	55	100	-40	-40	-40
T4	-40	58	58	58	135	53	135	-40	-40	-40
T3...T1	-40	58	58	58	150	53	150	-40	-40	-40

Configuration 4

	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	-40	60	60	60	85	57	85	-40	-40	-40
T5	-40	60	60	60	100	57	100	-40	-40	-40
T4	-40	60	60	60	135	54	135	-40	-40	-40
T3...T1	-40	60	60	60	150	54	150	-40	-40	-40

Configuration 5

	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	-40	55	55	55	85	55	85	-40	-40	-40
T5	-40	55	55	55	100	54	100	-40	-40	-40
T4	-40	55	55	55	135	51	135	-40	-40	-40
T3...T1	-40	55	55	55	150	51	150	-40	-40	-40

Position 11, 12 (Housing) = BC

Configuration 1

	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	-40	43	43	43	85	39	85	-40	-40	-40
T5	-40	43	43	43	100	39	100	-40	-40	-40
T4	-40	43	43	43	135	36	135	-40	-40	-40
T3...T1	-40	43	43	43	150	36	150	-40	-40	-40

Configuration 2

	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	-40	55	55	55	85	55	85	-40	-40	-40
T5	-40	55	55	55	100	54	100	-40	-40	-40
T4	-40	55	55	55	135	51	135	-40	-40	-40
T3...T1	-40	55	55	55	150	51	150	-40	-40	-40

Configuration 3

	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	-40	50	50	50	85	47	85	-40	-40	-40
T5	-40	50	50	50	100	47	100	-40	-40	-40
T4	-40	50	50	50	135	44	135	-40	-40	-40
T3...T1	-40	50	50	50	150	44	150	-40	-40	-40

Configuration 4

	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	-40	53	53	53	85	50	85	-40	-40	-40
T5	-40	53	53	53	100	50	100	-40	-40	-40
T4	-40	53	53	53	135	46	135	-40	-40	-40
T3...T1	-40	53	53	53	150	46	150	-40	-40	-40

Configuration 5

	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	-40	45	45	45	85	43	85	-40	-40	-40
T5	-40	45	45	45	100	43	100	-40	-40	-40
T4	-40	45	45	45	135	39	135	-40	-40	-40
T3...T1	-40	45	45	45	150	39	150	-40	-40	-40

Micropilot NMR81, NMR84

Table of contents

Attachment: Nameplate view 24

Attachment: Nameplate view

Position 11, 12 (Housing) = AC

Position 11, 12 (Housing) = BC

Pos	Position	VGR	Code	Text	Ex-relevant
1	Manufacturer address	-	-	Made in Germany, 79689 Maulburg, Hauptstr. 1	yes
2	Order code	010	FC, FE	NMR81-23 digits, mandatory	yes
3	Serial number	-	-	mandatory	yes
4	Extended order code	-	-	optional, digits not limited	no
5	Supply voltage	030	B	85...264 V AC (50/60 Hz) 28.8 VA	yes
			D	52...75 V AC (50/60 Hz) 21.6 VA	yes
			E	19...64 V DC 13.4 W	yes
6	Maximum process pressure	-	-	depends on antenna type and process connection	yes
7	Maximum process temperature	-	-	depends on antenna type and process connection	yes
8	Thread cable entry	090	A	Thread M20	yes
			B	Thread M25	yes
			E	Thread NPT1/2	yes
			F	Thread NPT3/4	yes
9	Material in contact with process	-	-	depends on antenna type	yes
10	Device ID	-	-		no
11	Firmware version	-	-		no
12	Device revision	-	-		no
13	PTB certification number	-	-		no
14	Customized parametrization data	-	-		no
15	Permissible ambient temperature	010	all	-40...+40°C or -40...+45°C or -40...+50°C or -40...+55°C or -40...+60 °C, depends on version	yes
16	CE mark / C-Tick mark	010	all	CE mark	no
17	Additional information of the device version	-	-	marks, not relevant for Ex: e.g. C-Tick, SIL, 3A,	no
18	Ingress protection	-	-	IP68 / 66, Type 4X / 6P Encl.	yes
19	Certificate symbol		FC, FE		yes
20			FC, FE	FM16US0006X XP CL I DIV 1 GP BCD T* IS CL I DIV 1 GP ABCD AIS CL I,II,III DIV 1 GP ABCDEFG ANI CL I,II,III DIV 2 GP ABCDEFG CL I Zn 0/1 AEx ia/db IIC T* Ga/Gb CL I Zn 1 AEx db [ia Ga] IIC T* Gb FM16CA0006X XP CL I DIV 1 GP BCD T* IS CL I DIV 1 GP ABCD AIS CL I,II,III DIV 1 GP ABCDEFG ANI CL I,II,III DIV 2 GP ABCDEFG Ex ia/db IIC T* Ga/Gb Ex db [ia Ga] IIC T* Gb T* for T-Code, Entity and NIFW Param. and Conduit seal reqs. see XA01436G	yes
21	General certificate of approval	010	all	e.g. Overspill protection, optional	no
22	Associated Safety Instruction (XA)	010	FC, FE	XA01436G-. (actual rev.)	yes
23	Manufacturing date	010	all	YYYY-MM	yes
24	QR code for E+H Operations App	-	-		no
25	Type of Process sealing: Single Seal (depends on "inner construction") Dual Seal without Annunciation	010	FC, FE	Single Seal or Single Seal (Max. T _{Process} +170°C) NMR81 with process connection rated in bar: Dual Seal Without Annucation (Max. P _{Process} 12 bar) or NMR81 with process connection rated in psi: Dual Seal Without Annucation (Max. P _{Process} 174 psi) NMR84 with process connection rated in bar: Dual Seal Without Annucation (Max. P _{Process} 16 bar) or NMR84 with process connection rated in psi: Dual Seal Without Annucation (Max. P _{Process} 232 psi)	yes
27	Radio Equipment			RTTE – no, resp. FCC-no: FCC ID: LCG NMR8X or other or in combination, depends on Market and national regulation	no

A0036942-EN



www.addresses.endress.com
