

Safety Instructions

Proservo NMS5/7

NEPSI: Ex d IIB T6...T3 Ga/Gb
Ex d IIC T6...T3 Ga/Gb
Ex d[ia] IIB T6...T3 Ga/Gb



Proservo NMS5/7


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Associated documentation	<p>This document is an integral part of the following Operating Instructions: BA00401G</p>										
Supplementary documentation	<p>Explosion-protection brochure: CP00021Z/11</p> <p>The Explosion-protection brochure is available:</p> <ul style="list-style-type: none"> ■ In the download area of the Endress+Hauser website: www.endress.com -> Downloads -> Media Type: Documentation -> Documentation Type: Brochures and catalogs -> Text Search: CP00021Z ■ On the CD for devices with CD-based documentation 										
Manufacturer's certificates	<p>NEPSI Declaration of Conformity</p> <p>Certificate number: GYJ20.1610X</p> <p>Affixing the certificate number certifies conformity with the following standards (depending on the device version):</p> <ul style="list-style-type: none"> ■ GB3836.1-2010 ■ GB3836.2-2010 ■ GB3836.4-2010 ■ GB3836.20-2010 										
Manufacturer address	<p>Endress+Hauser Yamanashi Co., Ltd. 406-0846 862-1 Mitsukunugi, Sakaigawa-cho, Fuefuki-shi, Yamanashi</p>										
Extended order code	<p>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.</p> <p>Structure of the extended order code</p> <table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td style="text-align: center;">NMS5</td> <td style="text-align: center;">-</td> <td style="text-align: center;">*****</td> <td style="text-align: center;">+</td> <td style="text-align: center;">A*B*C*D*E*F*G*..</td> </tr> <tr> <td style="text-align: center;"><i>(Device type)</i></td> <td></td> <td style="text-align: center;"><i>(Basic specifications)</i></td> <td></td> <td style="text-align: center;"><i>(Optional specifications)</i></td> </tr> </table> <p>* = Placeholder At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.</p> <p><i>Basic specifications</i></p> <p>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.</p> <p><i>Optional specifications</i></p> <p>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).</p>	NMS5	-	*****	+	A*B*C*D*E*F*G*..	<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>
NMS5	-	*****	+	A*B*C*D*E*F*G*..							
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>							

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: Proservo NMS5

-  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

NMS5

Basic specifications

Position 2 (Approval)		
Selected option		Description
NMS5	T	NEPSI Ex d ia IIB T6...T3
	V	NEPSI Ex d IIB T6...T3
	W	NEPSI Ex d IIC T6...T3
	X	NEPSI Ex d ia IIB T6...T3, -40 °C
	4	NEPSI Ex d IIB T6...T3, -40 °C

Optional specifications

No options specific to hazardous locations are available.

Safety instructions: General

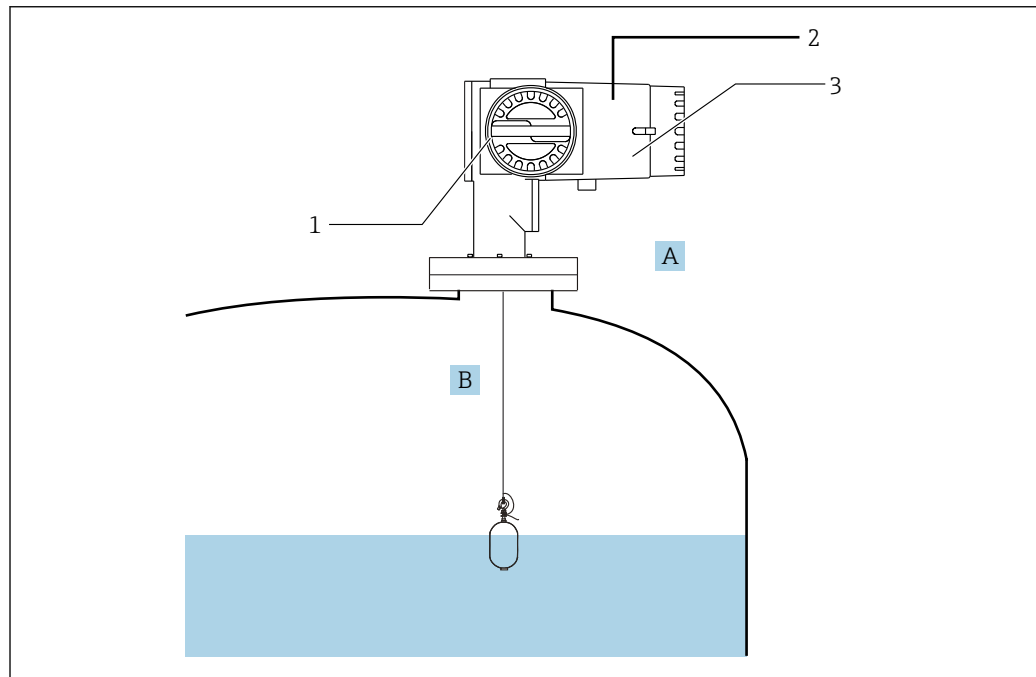
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
 - Be suitably qualified for their role and the tasks they perform
 - Be trained in explosion protection
 - Be familiar with national regulations
- For installation, use and maintenance of the device, users must also observe the requirements stated in the Operating Instructions and the standards:
 - GB50257-2014: "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
 - GB3836.13-2013: "Explosive atmospheres, Part 13: Equipment repair, overhaul and reclamation".
 - GB/T 3836.15-2017: "Explosive atmospheres, Part 15: Electrical installations design, selection and erection".
 - GB/T 3836.16-2017: "Explosive atmospheres, Part 16: Electrical installations inspection and maintenance".
- 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.
- 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.

Safety instructions: Special conditions

- Permitted ambient temperature range at the electronics housing:
- -20 to +60 °C (-4 to 140 °F) (Standard (IIB) Version, IIC Version)
 - -40 to +60 °C (-40 to 140 °F) (Low Temperature Version for Cold Area; Only IIB Version)

- 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.
- Flamepath joints are not for repair. Contact the manufacturer.
- Precautions shall be taken to minimize the risk from electrostatic discharge of non-metallic labels and isolated metal tags applied to the enclosure.

Safety instructions: Installation



A0045065

1 NMS5 installation


- A Zone 1
- B Zone 0
- 1 Drum compartment
- 2 Cable line to power supply
- 3 Electric compartment

- Install the device to exclude any mechanical damage or friction during the application.
- 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 $-20\text{ }^{\circ}\text{C}$, use appropriate cables and cable entries permitted for this application.
- Suitable certified cable entry and blind plug approved by ExTL according to GB3836.1-2010 and GB3836.2-2010 shall be used and correctly installed (flameproof enclosure).
- 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.

Thread form of cable entries

If mating conduits are not matched, reducing rings are to be used. Following table shows availability for reducing rings;


Thread of enclosure	Thread type of conduit								
	G1"	G3/4"	G1/2"	NPT1/2"	NPT3/4"	PG16	PG21	M20	M25
G1"	N/A	○	○	○	○	○	○	○	○
G3/4"	N/A	N/A	○	○	○	○	○	○	○

 ○ shows applicable and N/A shows not applicable.

G1" thread of conduit is screwed to the enclosure directly, G3/4" thread of conduit is screwed to the enclosure directly or use reducing ring (G1 to G3/4).

Tolerance of thread

Thread type	G	NPT	PG	M
Tolerance	Class B	Between 0 and +2 past the nominal mark (ANSI/ASME B1.20.1)	According to DIN 40430	Male : 6g Female : 6H

 The cable entries show "h" or "g" in order code of NMS5- abcdefghijklm and NMS7-abcdefghijklm

	NMS5 - h		NMS7 - g
E	Cable Entry: Four G(PF) 1/2" thread	A	Cable Entry: Four G(PF) 1/2" thread
F	Cable Entry: Four G(PF) 3/4" thread	B	Cable Entry: Four G(PF) 3/4" thread
G	Cable Entry: Four NPT 1/2" thread	C	Cable Entry: Four NPT 1/2" thread
H	Cable Entry: Four NPT 3/4" thread	D	Cable Entry: Four NPT 3/4" thread
J	Cable Entry: Four PG16 thread	E	Cable Entry: Four PG16 thread
K	Cable Entry: Four PG21 thread	F	Cable Entry: Four PG21 thread
L	Cable Entry: Four M20 thread	G	Cable Entry: Four M20 thread
M	Cable Entry: Four M25 thread	H	Cable Entry: Four M25 thread
Y	Special version	Y	Special version

External gland

For connection of an external earthing or bonding conductor a cable plug shall be used. The conductor shall be mounted so that it is secured against loosening and twisting. Sectional area of the conductor must equal or more than 4 mm².

Electrical compartment and drum compartment

 Disassembly and/or repair of electronic compartment and drum compartment (cylindrical joint part) are strictly prohibited.

The property class of the M6x28 fasteners used for the flameproof enclosure is 12.9.

Parts	Thread size	Pitch	Tolerance of fit	Engagement
Terminal box cover	M130	2	6H/6g	>= 5.4 threads
Display cover	M120	3	6H/6g	>= 5 threads

Potential equalization

Integrate the device into the local potential equalization.

Ambient temperature

Ambient temperature range


- -20 to +60 °C (-4 to 140 °F) (Standard(IIB)Version, IIC Version)
- -40 to +60 °C (-40 to 140 °F) (Low Temperature Version for Cold Area; Only IIB Version)

Process temperature range : -200 to +200 °C (-328 to 392 °F)

Temperature class of the equipment is depending on process (liquid) temperature as follows;

Ambient temperature

Temperature class	Ambient temperature	Process temperature (Temperature of displacer)
T6	-20 °C (-4 °F) (or -40 °C (-40 °F)) ≤ Ta ≤ +60 °C (+140 °F)	≤ +85 °C (+185 °F)
T5		≤ +100 °C (+212 °F)
T4		≤ +135 °C (+275 °F)
T3		≤ +200 °C (+392 °F)

 The process temperature shall not bring the enclosure of the electronics compartment besides the ambient temperature range.

Applicable maximum installation height


GB/T 3836.15 does not require contents of this section, however, the following is recommended that more safety to use this equipment. Avoid ignition hazard between the displacer and tank bottom when the displacer wire breaks and displacer drop down to tank bottom. Applicable maximum tank height (Hmax) is depending on displacer weight (Wd) as follows;

Displacer weight	252 g (Standard)	270 g (Standard: Maximum)	300 g (Weight & measure)
IIB version	50.5 m (165.68 ft)	47.1 m (154.53 ft)	42.4 m (139.10 ft)
IIC version	24.2 m (79.40 ft)	22.6 m (74.15 ft)	20.3 m (66.60 ft)

EN 13463-1:2009 clause 6.3.2.2.1 requirement of single impact energy limits:

- E ≤ 60 J (Zone 0, IIC)
- E ≤ 125 J (Zone 0, IIB)

Calculate function: $H_{max} = E / (Wd * 9.81)$

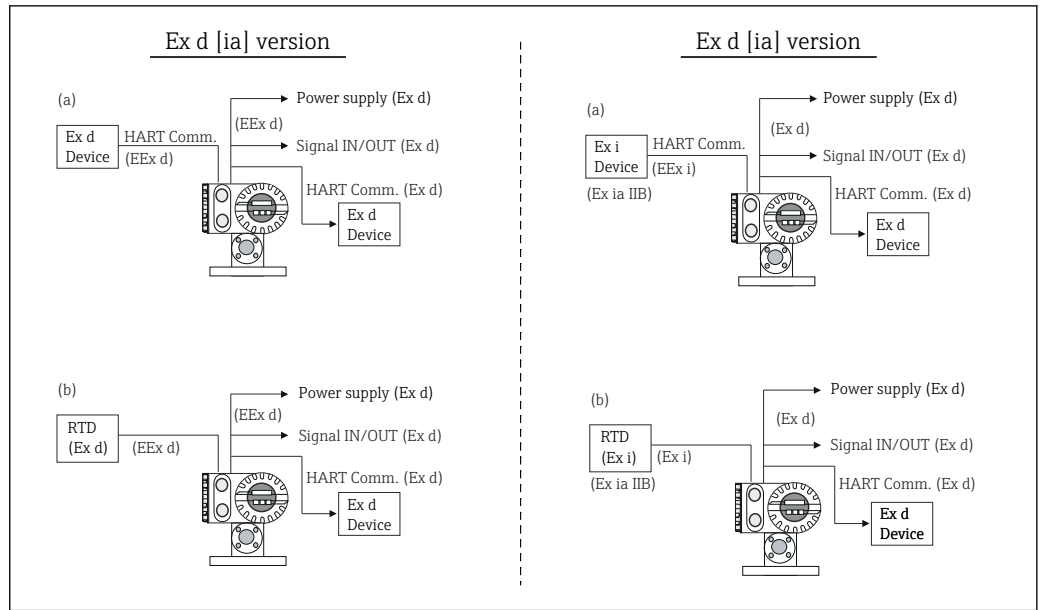
 In case of tank gauge installation over the maximum height, when the tank is empty and explosive gas/vapor is present, displacer should be down to tank bottom to avoid ignition hazard between the displacer and the tank bottom.

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.

Connection data

Connection compartment



A0045245

2 External connection

Supply, interface circuit and intrinsic safety signal circuit

Ex d Version

Power supply: [Terminals: 1(L+), 2(N-), 3(GND)]

High voltage type	Low voltage type
NMS5-.V.....3...., NMS5-.W.....3.... or NMS5-.4.....3....	NMS5-.V.....4...., NMS5-.W.....4.... or NMS5-.4.....4....
U = 85 to 264 V _{AC} , 50/60 Hz, max. 50 VA	U = 19 to 55 V _{AC} , 50/60 Hz, max. 50 VA U = 19 to 62 V _{DC} , max. 50 W

Interface circuit

Interface circuit	[Terminals:4-23]	U = 24 V, max. 50 mA
External device connection	[Terminals: 24(+), 25(-), 26(N.C.)]	U = 28.7 V
External RTD connection	[Terminals: 24(A), 25(B), 26(b)]	U = 11.3 V

Ex d [ia] version

Power supply: [Terminals: 1(L+), 2(N-), 3(GND)]

High voltage type	Low voltage type
NMS5-.T.....3.... or NMS5-.X.....3....	NMS5-.T.....4.... or NMS5-.X.....4....
U = 85 to 253 V _{AC} , 50/60 Hz, max. 50 VA Um = 253 V _{AC}	U = 19 to 55 V _{AC} , 50/60 Hz, max. 50 VA U = 19 to 62 V _{DC} , max. 50 W Um = 253 V _{AC}

Interface circuit: [Terminal: 4-23]

U = 24 V, max. 50 mA Um = 253 V _{AC}
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External intrinsic safety device connection: [Terminals: 24(+), 25(-), 26(N.C.)]

U _o = 28.7 V		
Lo = 114 mA	External capacitance	Co = 615 nF
Po = 816 mW	External inductance	Lo = 10 mH

Only for connection to a certified intrinsically safe device with the maximum value above

External RTD connection: [Terminals: 24(A), 25(B), 26(b)]

U _o = 11.3 V	Internal resistance	Ri min = 406 Ω
Lo = 81.6 mA	External capacitance	Co = 1.3 μF
Po = 406 mW	External inductance	Lo = 4.0 mH

Only for connection to a certified intrinsic safety RTD (EEx ia IIB) or simple apparatus with the maximum value above



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