

# Technical Information

## Promonitor NRF560

For tank side monitor and control of Proservo NMS5 intelligent tank gauge



### Application

Promonitor NRF560 is a monitoring unit for use with Proservo series of tank gauges. Mounted at the tank side or up to 1200m (meters) away (local HART connection). NRF560 provides indication of measured level, temperature data and operating status, and can send operating commands to Proservo NMS5 from a convenient location.

### Features and Benefits

- Remote monitoring and control for NMS tank gauge
- Indication via two line illuminated display
- Operation via 3 optical keys (touch control) and Endress+Hauser user friendly
- Programming matrix
- Protection class IP 67 housing
- Explosion proof for hazardous area mounting





# Table of Contents

<b>Important Document Information</b> .....	<b>3</b>	<b>Mechanical Construction</b> .....	<b>9</b>
Notes on Safety Conventions and Symbols .....	3	Dimensions .....	9
<b>Function and System Design</b> .....	<b>4</b>	Weight .....	9
System Design .....	4	Housing Material .....	9
<b>Input and Auxiliary Energy</b> .....	<b>5</b>	<b>Human Interface</b> .....	<b>10</b>
Measured Variables .....	5	Operation Concept .....	10
Communication .....	5	Display Operation .....	10
NRF560 Terminals .....	5	<b>Certificates and Approvals</b> .....	<b>11</b>
Overvoltage Protection .....	5	CE Mark .....	11
Power Supply .....	5	Ex Approvals .....	11
Current Consumption .....	5	External Standards and Guide Line .....	11
Grounding .....	5	<b>Ordering Information</b> .....	<b>12</b>
<b>Performance Characteristics</b> .....	<b>6</b>	NRF560 .....	12
Display (LCD) .....	6	<b>Accessories</b> .....	<b>13</b>
<b>Operating Conditions: Installation</b> .....	<b>7</b>	Bracket .....	13
Mounting on The Wall .....	7	<b>Supplementary Documentation</b> .....	<b>14</b>
Display .....	7	Technical Information .....	14
Mounting on A Pipe .....	7	Operating Instructions .....	14
<b>Operating Conditions: Environment and Process</b> .....	<b>8</b>	Safety Instructions .....	14
Ambient Temperature .....	8		
Storage Temperature .....	8		
Degree of Protection .....	8		
Electromagnetic Compatibility .....	8		
Cable Entries .....	8		





## Important Document Information

### Notes on Safety Conventions and Symbols

#### Symbols for Safety Conventions

Symbol	Meaning
 <small>A0011189-EN</small>	<b>DANGER!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
 <small>A0011190-EN</small>	<b>WARNING!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
 <small>A0011191-EN</small>	<b>CAUTION!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
 <small>A0011192-EN</small>	<b>NOTICE!</b> This symbol contains information on procedures and other facts which do not result in personal injury.

#### Symbols for Certain Types of Information

Symbol	Meaning
 <small>A0011182</small>	<b>Allowed</b> Indicates procedures, processes or actions that are allowed.
 <small>A0011183</small>	<b>Recommendation</b> Indicates procedures, processes or actions that are recommended.
 <small>A0011184</small>	<b>Forbidden</b> Indicates procedures, processes or actions that are forbidden.
 <small>A0011193</small>	<b>Tip</b> Indicates additional information.

## Function and System Design

### System Design

NRF 560 is a tank side monitor and control station for NMS of intelligent tank gauges.

NRF 560 is a simple low-cost tank side monitor for displaying interface level, tank bottom level, and temperature. Additionally, NMS can be operated to measure the level, interface level, bottom level, or to hoist the displacer.

The tank gauge is operated by three visual operating elements ("touch control").

For the transmission between NMS5 and NRF 560, a two-wire HART protocol is utilized.

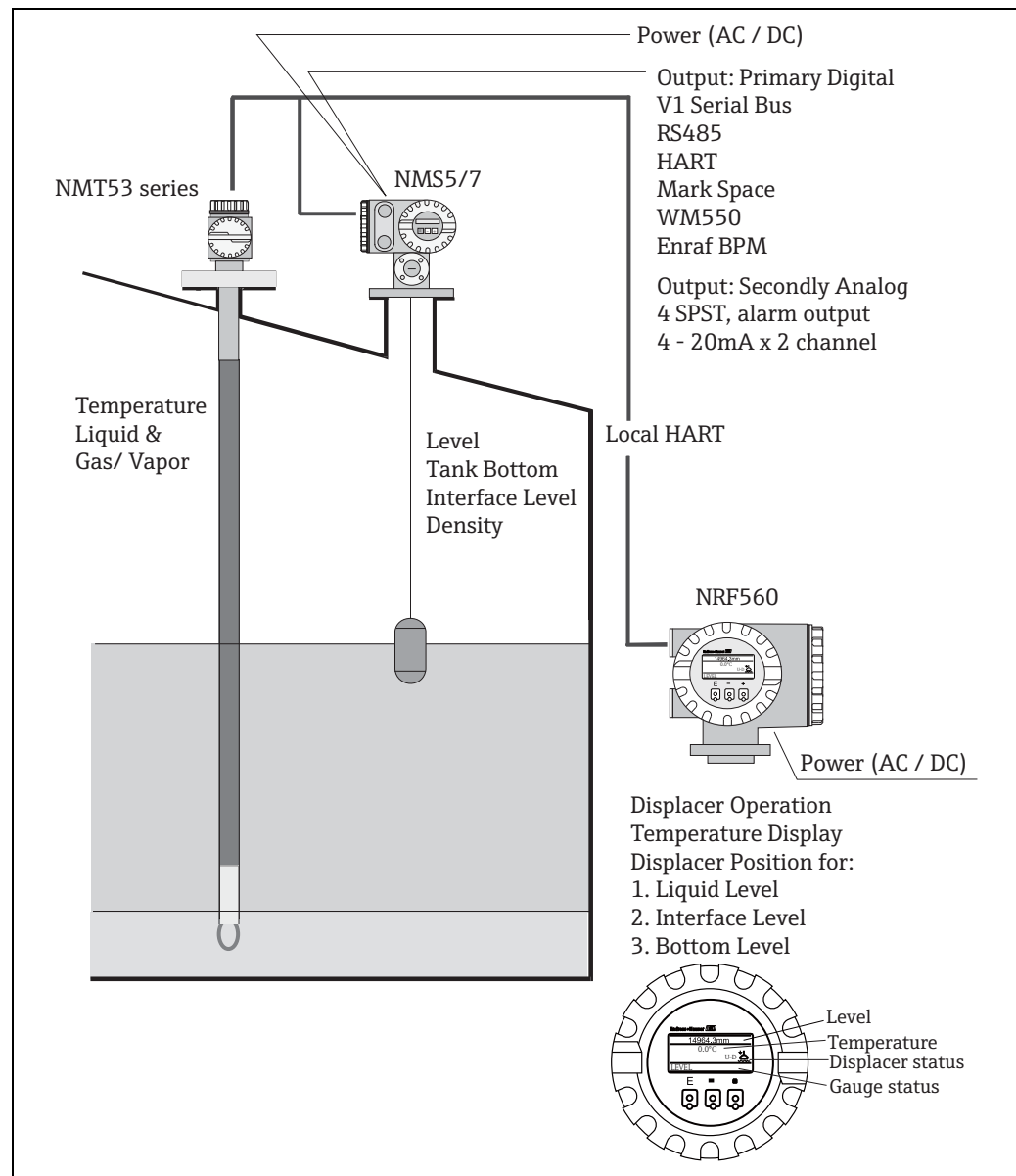


Figure 1: NRF560 System Configuration

# Input and Auxiliary Energy

<b>Measured Variables</b>	Multidrop local HART
<b>Communication</b>	2 wire, Endress + Hauser HART protocol to host communication gauge <ul style="list-style-type: none"> <li>▪ NMS auxiliary energy</li> </ul>

**NRF560 Terminals**

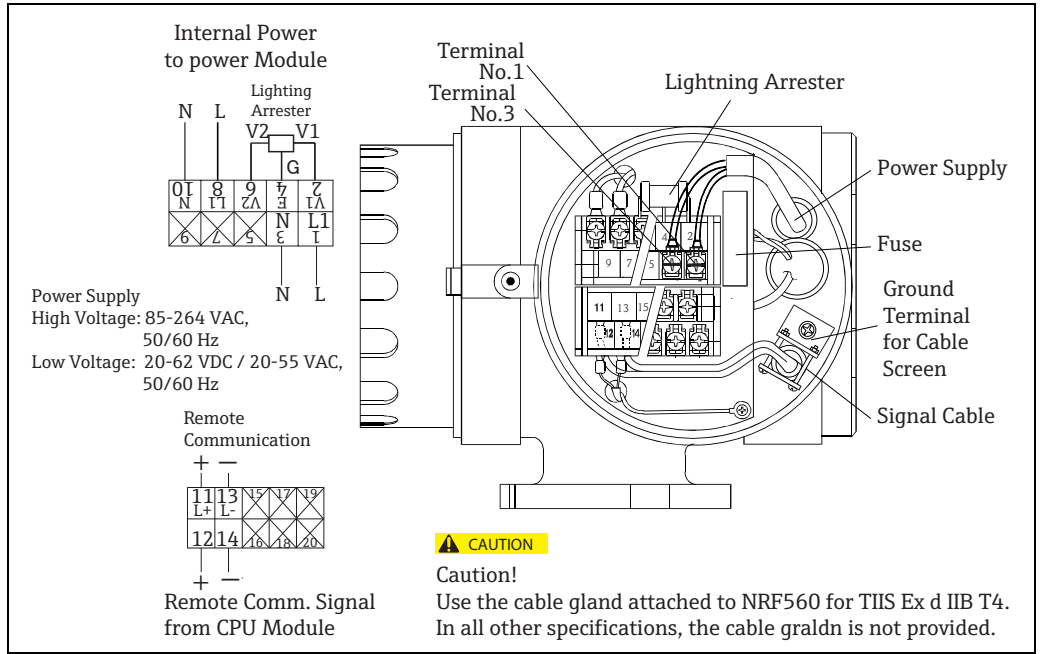


Figure 2: NRF560 Terminals

- Confirm that the main power is turned off.
- Insert power supply and signal cables from the designated cable entries (see below).
- Connect cables to each terminal.
- Use a general crimped connection (not supplied) and do make sure wires are safely and securely connected.
- After completing all electric connections, replace the terminal cover with screws.
- Secure the plastic terminal guard.
- Replace the terminal cover.

**Overvoltage Protection** NRF560 has internal surge arrester which complies with EN/IEC 61000-4-5 (Line to Line 1.0kV, Line to ground 2.0kV) Connect the metallic housing of the NRF560 to the tank wall or screen directly with an electrically conductive lead to ensure reliable potential matching.

**Power Supply** 85-264VAC, 50/60Hz, 25VA  
20-62VDC, 20-55VAC, 50/60Hz, 25VA

**WARNING**

Allowable voltage supply is specified depending on each Ex approval. Refer to the designated certification.

**Current Consumption** Maximum 25 VA

**Grounding** NRF560 must be grounded to the tank potential before connection to host gauge. All ground connections must be compliant with local and company regulations, and checked before the equipment is commissioned.

## Performance Characteristics

---

**Display (LCD)**

4 lines. 128 x 64 (pixels)

Language selection:

English, Chinese, Japanese

## Operating Conditions: Installation

### Mounting on The Wall

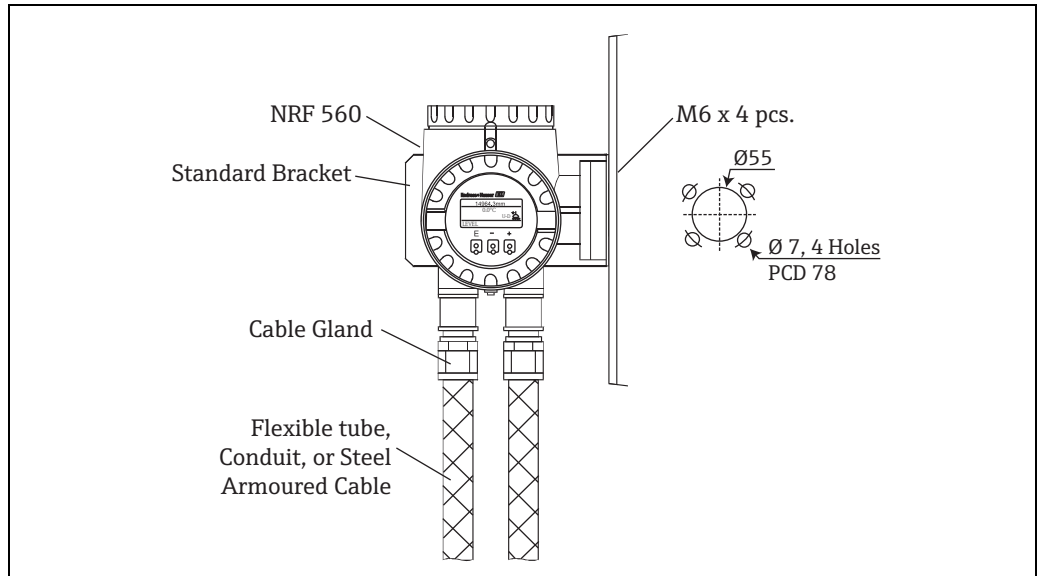


Figure 3: NRF560 Installation

### Display

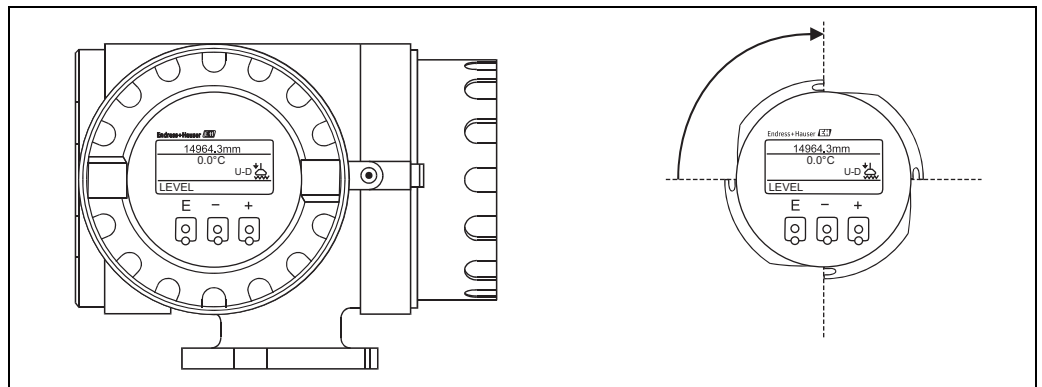


Figure 4: NRF560 Display

NRF560 display can be rotated at 90 degrees when removing the cover.

### Mounting on A Pipe

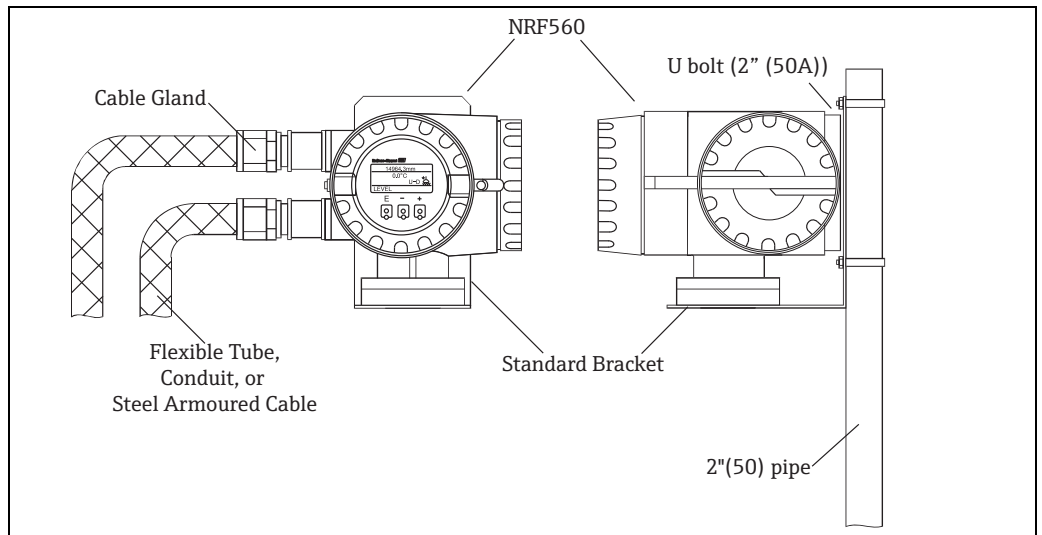


Figure 5: 2" (50A) Pipe

---

## Operating Conditions: Environment and Process

---

**Ambient Temperature** -20 to +60°C(-4 to +140°F)

---

**Storage Temperature** -20 to +60°C(-4 to +140°F)

---

**Degree of Protection** IP67

---

**Electromagnetic Compatibility** Electromagnetic compatibility meets with EN 61326-1.

---

**Cable Entries** The following cable entries are available:

- G1/2
- NPT 1/2
- M 20

 **CAUTION**

- For IIIS, Ex d IIB T4, cable glands are provided. Be sure to use provided cable glands.
- For all other specifications, except IIIS, Ex d IIB T4, cable glands are not provided.



## Mechanical Construction

### Dimensions

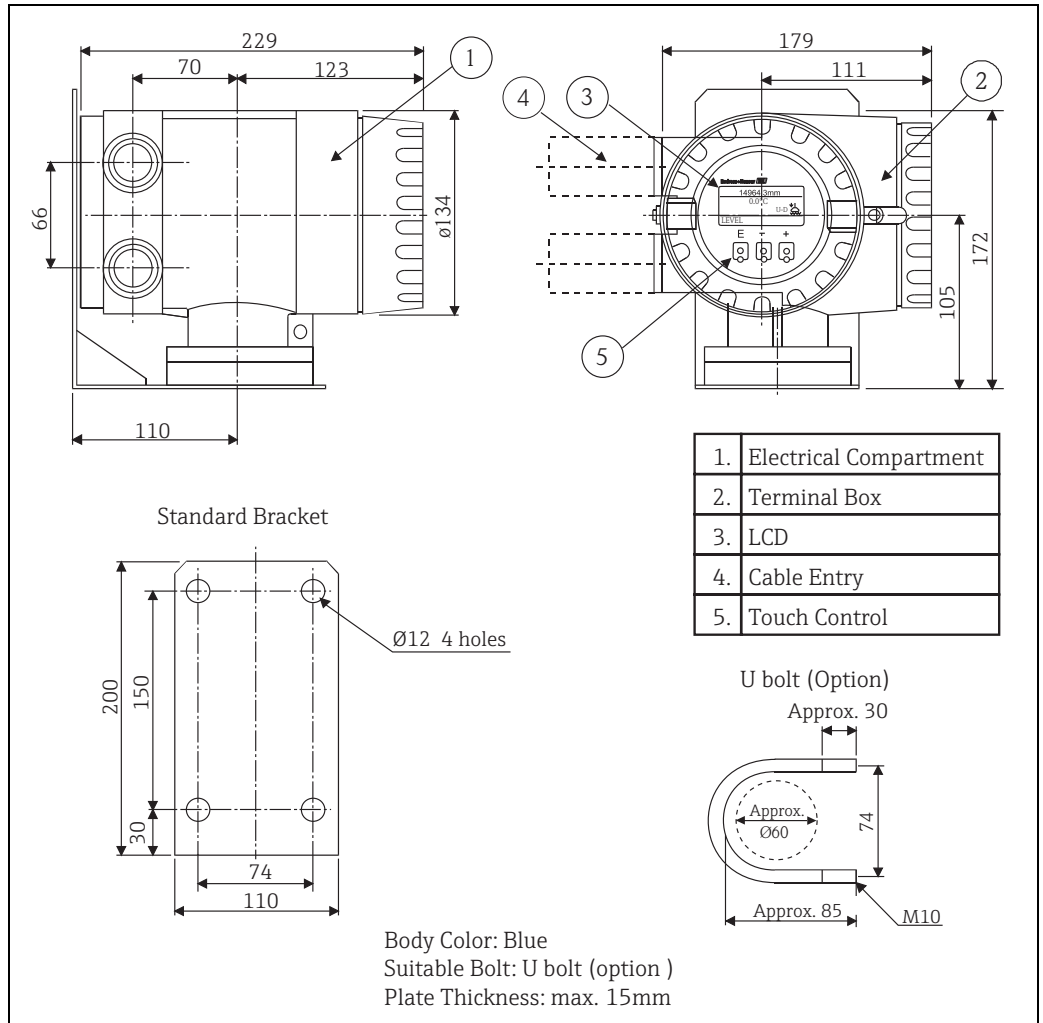


Figure 6: Dimensions

### Weight

Approx. 6.5 kg

### Housing Material

Aluminum, coated with rust-inhibitor paint




## Human Interface

### Operation Concept

NRF560 is operated by three visual operating elements, namely the keys "E", "+", and "-". They are actuated when the appropriate field on the protective glass of the front is touched with the finger ("touch control"). The corresponding transmitting and receiving diodes are not affected by external influences, e.g. direct sunlight. The software and hardware installed in NRF560 rule out any malfunction that may be caused in this way. Even in explosive hazardous areas, the explosion-proof housing of the touch control ensures a safe access to the data.

### Operational Security

The software and hardware installed in NRF560 rule out any malfunction that may be caused in this way. Even in explosion hazardous areas, the explosion-proof housing of the touch control ensures safe access to the data.

Key	Function
	<ul style="list-style-type: none"> <li>Access to the programming matrix (touching the key for more than 3 s)</li> <li>Return to the HOME position (touching the key for more than 3 s)</li> <li>Moving horizontally within a function group to select functions</li> <li>Saving parameters or access code</li> </ul>
 	<ul style="list-style-type: none"> <li>Moving vertically to select function groups</li> <li>Selecting or setting parameters</li> <li>Setting access code</li> </ul>

### Display Operation

NRF560 has an illuminated LCD that consists of 4 lines with 128 x 64 (pixels). During normal operation, NRF560 shows level, temperature, and status of the device at "HOME" position. NRF560 also shows other data by touching "E", "-", "+" keys (a light touch with the fingertips is enough to show data).

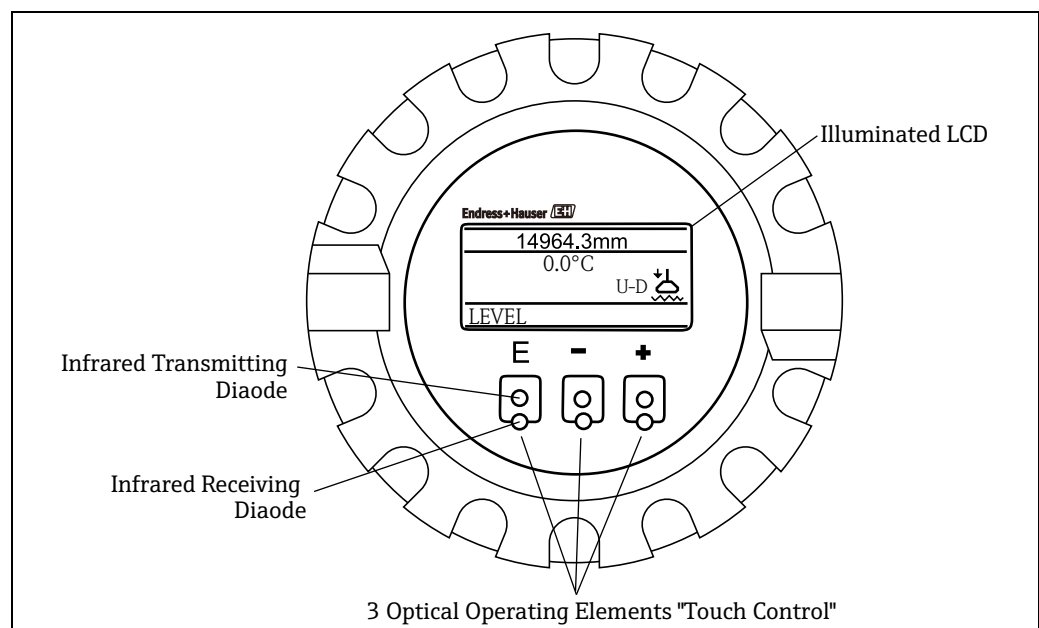


Figure 7: Display

## Certificates and Approvals

---

**CE Mark**

The measuring system meets the legal requirements of the EC-guidelines. Endress+Hauser confirms the instrument passing the required tests by attaching the CE mark.

---

**Ex Approvals**

TIIS Ex d IIB T4  
FM XP Cl.I, Div.1, Gr.A-D  
CSA Cl.I, Div.1, Gr.A-D  
ATEX II 2G Ex d IIC T4  
ATEX II 2G Ex d IIC T4, NMi  
IECEX, Ex d IIC T4 Gb  
NEPSI Exd IIC T4

---

**External Standards and Guide Line**

To conception and development for NRF560 have been followed the external standards and guidelines:

EMC-Directive 89/336/EC

EN 60529

Protection class of housing (IP code)

## Ordering Information

### NRF560

<b>010</b>	<b>Approval:</b>				
	0	Weather proof, IP67 NEMA 4X			
	1	TIIS Ex d IIB T4			
	4	FM XP Cl.I, Div.1, Gr.A-D			
	5	CSA Cl.I, Div.1, Gr.A-D			
	6	ATEX II 2G Ex d IIC T4			
	8	ATEX II 2G Ex d IIC T4, NMI			
	F	IECEX, Ex d IIC T4 Gb			
	G	NEPSI Exd IIC T4			
	9	Special version, TSP-no, to be spec.			
<b>020</b>	<b>Cable Entry:</b>				
	A	2x thread G1/2			
	B	2x thread NPT1/2			
	D	2x thread M20			
	Y	Special version, TSP-no, to be spec.			
<b>030</b>	<b>Power Supply:</b>				
	3	85-264VAC, 50/60Hz			
	4	20-62VDC, 20-55VAC, 50/60Hz			
	9	Special version, TSP-no, to be spec.			
<b>040</b>	<b>Mounting Bracket:</b>				
	0	not selected			
	1	selected			
	9	Special version, TSP-no, to be spec.			
<b>050</b>	<b>Color:</b>				
	0	blue			
	9	Special version, TSP-no, to be spec.			
<b>NRF560-</b>					Completion product designation

## Accessories

### Bracket

U bolt is not provided with bracket for installing NF560 to a tank. Contact Endress+Hauser Japan if needed.

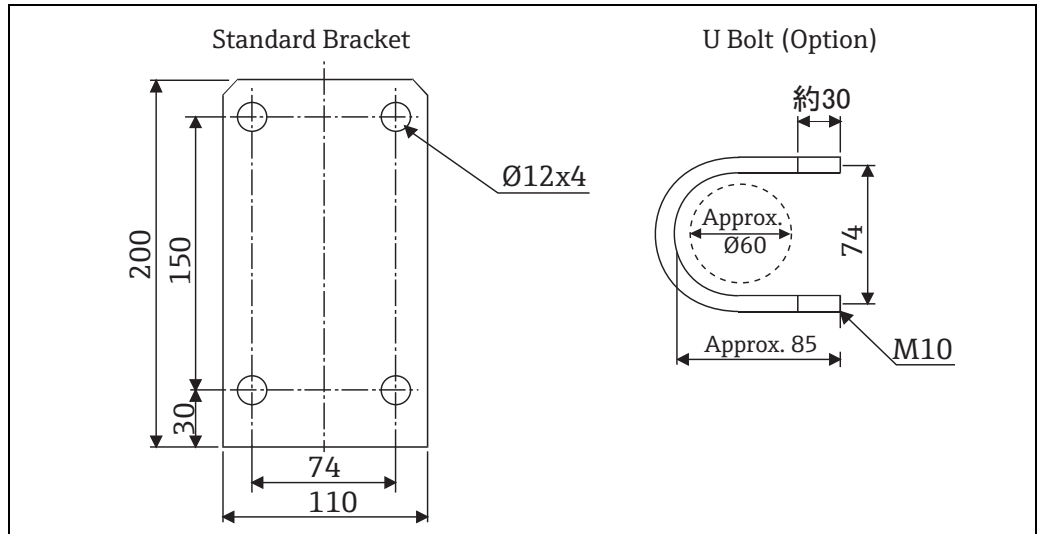


Figure 8: Bracket

## Supplementary Documentation

---

**Technical Information**      **TI 00452G**  
Technical Information Proservo NMS5

---

**Operating Instructions**      **BA 00425G**  
Operating Instructions NRF560

**BA 00401G**  
Operating Instructions Proservo NMS5

---

**Safety Instructions**

- XA 00664G (IECEX)
- XA 00586G (ATEX)
- XA01258G (NEPSI)

[www.addresses.endress.com](http://www.addresses.endress.com)

---