FISCHER MESS- UND REGELTECHNIK

Operating Manual

NR56 | **Tank level encoder**

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1 Safety Instructions

1.1 General

This operating manual contains instructions fundamental to the installation, operation and maintenance of the device that must be observed unconditionally. It must be read by the assembler, operator and the specialized personnel in charge of the device before it is installed and put into operation.

This operating manual is part of the product and must be kept close by where it is easily accessible to the responsible specialized personnel.

The subsequent sections, in particular the instructions on assembly, commissioning and maintenance, contain important safety instructions, non-observance of which can endanger persons, animals, the environment and physical objects.

1.2 Personnel Qualification

The device may only be installed and commissioned by specialized personnel familiar with the installation, commissioning and operation of this product.

Specialized personnel are persons who can assess the work they have been assigned and recognize potential dangers by virtue of their specialized training, their skills and experience and their knowledge of the relevant standards.

1.3 Risks due to Non-Observance of Safety Instructions

Non-observance of these safety instructions, the intended use of the device or the limit values given in the technical specifications can be hazardous or cause harm to persons, the environment or the system itself.

The manufacturer will not be liable for damage claims if this should happen.

1.4 Safety Instructions for the Operating Company and the Operator

The safety instructions on correct operation of the device must be observed. The operating company must make them available to the installation, maintenance, inspection and operating personnel.

Dangers arising from electrical components, energy discharged by the medium, escaping medium or incorrect installation of the device must be eliminated. For more information, please see the applicable national and international regulations.

In Germany these are the DIN, EN, accident prevention regulations (UVV) and - for industry-specific individual applications - also in the industry guidelines issued by the DVWG, Ex, GL, etc. as well as VDE and local EVUs.

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1.5 Unauthorised Modification

Modifications of or other technical alterations to the device by the customer are not permitted. This also applies to replacement parts. Only the manufacturer is authorised to make any modifications or changes.

1.6 Inadmissible Modes of Operation

The operational safety of this device can only be guaranteed if it is used as intended. The device model must be suitable for the medium used in the system. The limit values given in the technical data may not be exceeded.

1.7 Safe working practices for maintenance and installation work

The safety instructions given in this operating manual, any nationally applicable regulations on accident prevention and any of the operating company's internal work, operating and safety guidelines must be observed.

The operating company is responsible for ensuring that all required maintenance, inspection and installation work is carried out by qualified specialized personnel.

1.8 Pictogram explanation

WARNING!
… indicates a potentially dangerous situation, non-observance of which could endanger persons, animals, the environment or objects.

INFORMATION!
… highlights important information efficient and smooth operation.

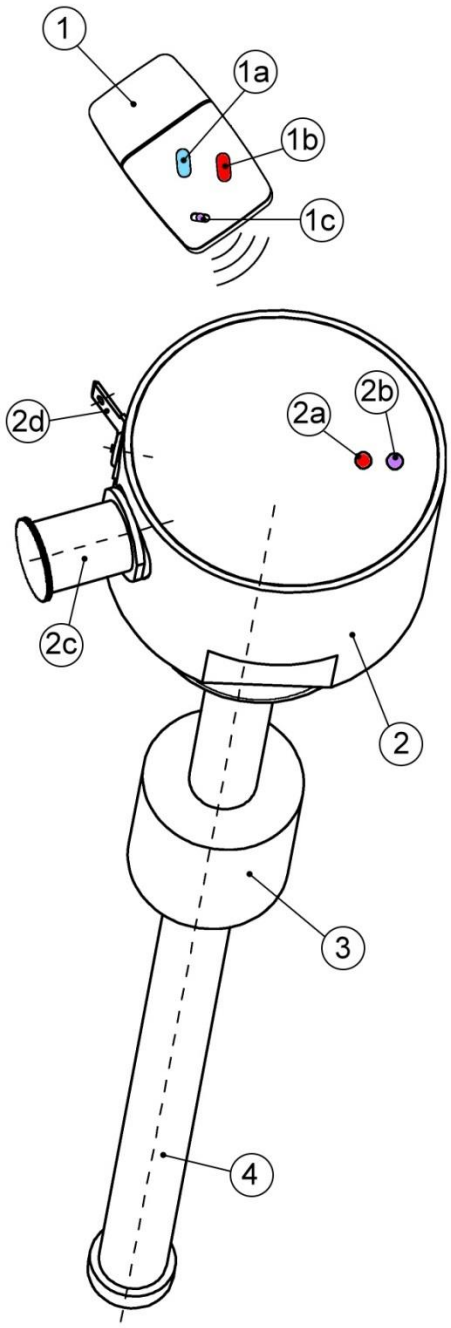
TIP!
… indicates recommendations that are not specifically necessary in certain situations but which could be useful.

2 Application Purpose

The tank content encoder NR56 was specially designed for heavy duty use on fore appliances and serves reliable indication of the filling level in the fuel, water and foam tanks.

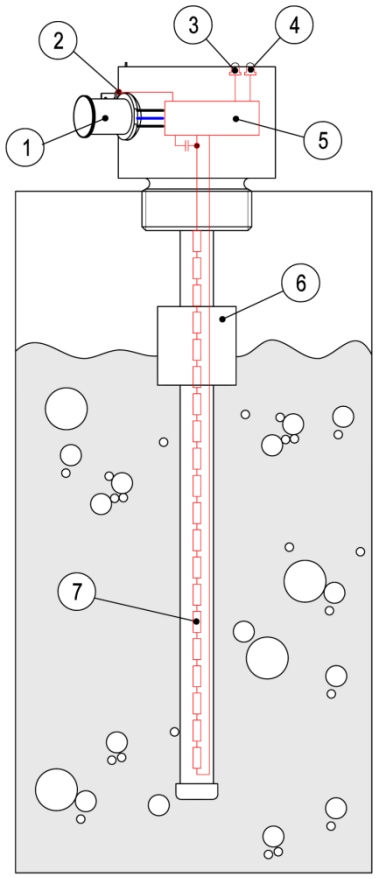
3 Description of the Product and Functional Description

3.1 Part designations



Pos	Description
1	EU04 Infrared remote control (accessories)
1a	MIN button
1b	MAX button
1c	IrDA transmitter diode
2	Probe head
2a	Operating LED
2b	IrDA receiver diode
2c	M12 plug
2d	Potential equalisation
3	Float magnet
4	Probe rod

3.2 Function Diagram



Pos	Description
1	M12 plug
2	Potential equalisation
3	Operating LED
4	IrDA receiver diode
5	Electronics
6	Float magnet
7	Reed chain

3.3 Design and mode of operation

The tank level encoder NR56 comprises a probe head with a probe rod with a length between 250 and 1400 mm on which a float magnet can move freely up and down. The probe head is equipped with a screw-in thread for assembly and an M12 connector for the electrical connection.

The filling height-proportional output signal of the probe is sent to the integrated measurement amplifier where it is converted into an electrical uniform signal. The output signal can be sent directly to a filling level display of the type EA01, EA14F or to another analysis system.

4 Installation and Assembly

All supply lines are arranged so that there are no mechanical forces acting on the device.

4.1 Process connection

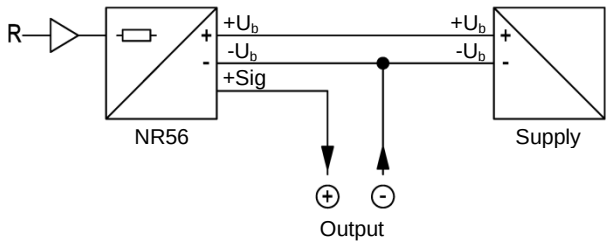
- By authorized and qualified specialized personnel only.

The tank level encoder NR56 is designed for vertical installation. It must be screwed into a suitable threaded connecting piece that is mounted at the highest point of the tank in the centre of the tank.

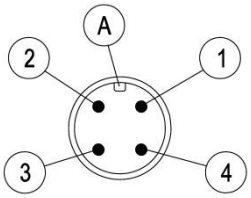
4.2 Electronic connection

- By authorized and qualified specialized personnel only.
- The electrical connection of the device shall be performed according to relevant national regulations.
- Disconnect the system from the mains before connecting the device.

4.2.1 3-wire circuit



4.2.2 Socket assignment

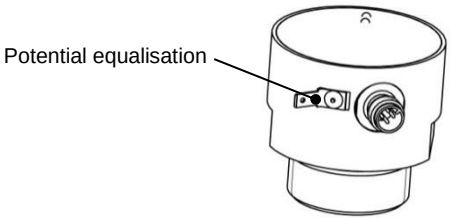


Pin	Signal name		Cable colour
1	Supply	$+U_b$	brown
2	not connected		white
3	Supply	$-U_b$	blue
4	Signal	+Sig	black
A	Coding		

4.2.3 Potential equalisation

To avoid measuring errors caused by wire-bound malfunctions, we recommend potential equalisations between the probe and tank, especially in the case of conductive fluids. Both need to be connected jointly to a low voltage external earth. An equivalent mass connection should be used on vehicles.

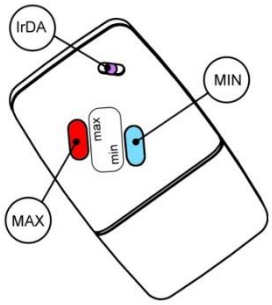
In the case of plastic tanks, it is mandatory to connect the probe to the earth or the vehicle mass.



5 Commissioning

The device must have been correctly installed before commissioning. All supply lines are arranged so that there are no mechanical forces acting on the device.

5.1 Adjustment



After fitting the probe into the tank and after all electrical connections has been made, the power supply can be switched on. The operating LED flashes briefly at regular intervals.

The filling level is compared in two steps:

1. Bring the tank to the lowest required filling level. Press and hold the button "MIN" of the infrared remote control. The operating LED starts to flash quickly. After 2...3 seconds, the lamp diode shines permanently. This signalises that the device has saved the zero-point. Now release the button.
2. Fill the tank up to the highest required filling level. Press and hold the button "MAX" of the infrared remote control. The operating LED starts to flash quickly. After 2...3 seconds, the lamp diode shines permanently. This signalises that the device has saved the end value. Now release the button.

This marks the end of the adjustment.

If the filling levels for the lowest and highest measured value need to be changed, the adjustment can be repeated at any time. If only one filling height is changed, only this needs to be compared again.

In the case of a falling characteristic curve, simple comparison of the MAX of an empty tank and MIN of a full tank is sufficient.

6 Maintenance and Repeat Tests

The instrument is maintenance-free. We recommend the following regular inspection to guarantee reliable operation and a long service life:

- Check the function in combination with downstream components.
- Check the leak-tightness of the pressure connection lines.
- Check the electrical connections.

The exact test cycles need to be adapted to the operating and environmental conditions. In combination with other devices, the operating instructions for the other devices also need to be observed.

7 Transport

The measuring device must be protected against impacts. It should be transported in the original packaging or a suitable transport container.

8 Service

All damaged or faulty devices must be sent directly to our repair department. Please coordinate all shipments with our sales department.

Warning

Process media residues in and on dismantled devices can be a hazard to people, animals and the environment. Take adequate preventive measures. If required, the devices must be cleaned thoroughly.

Return the device in the original packaging or a suitable transport container.

9 Accessories

EU04 Infrared remote control

10 Disposal

Incorrect disposal may pose a risk to the environment.

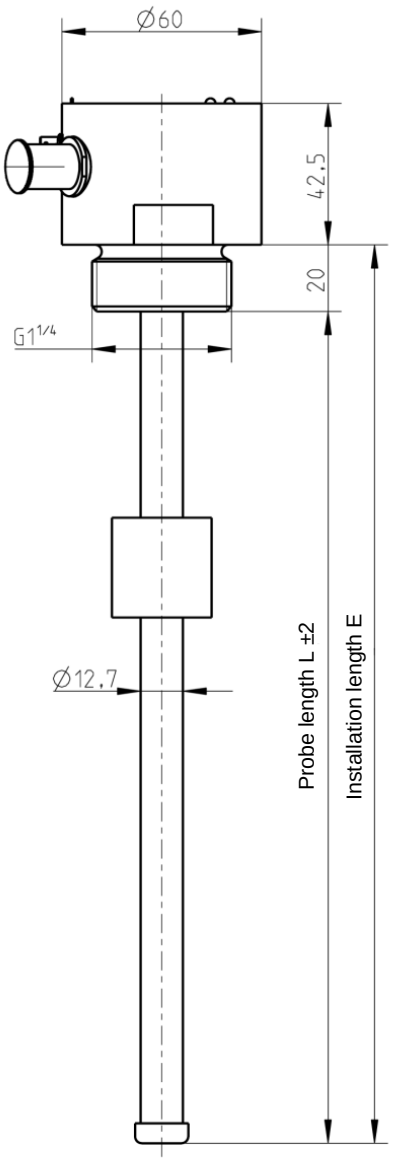
Please help to protect the environment by always disposing of the work pieces and packaging materials in compliance with the valid national waste and recycling guidelines or reuse them.

11 Technical data

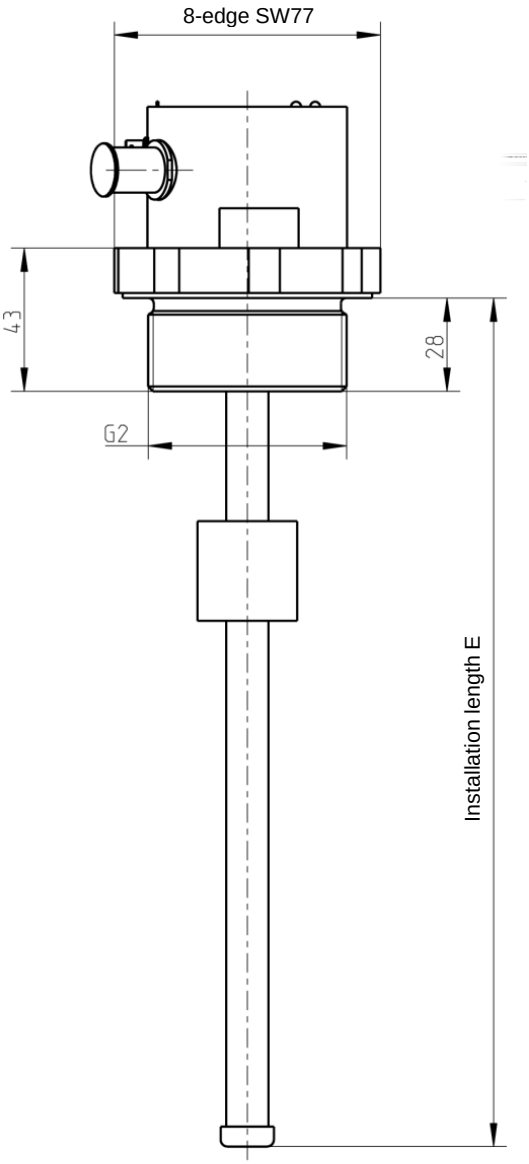
	General points				
Measuring procedure	Resistance reed chain activated with a float magnet				
for tank heights	250 … 1400 mm (See order code)				
Operating temperature:	-20 … +70 °C				
Threaded connection	G1¼“, optional adapter G2“				
Installation position	vertical				
Type of protection	IP67				
	Electrical data				
Operating voltage U_B	9-32 V DC	9-32 V DC	12-32 V DC	12-32 V DC	12-32 V DC
Current draw (without signal)	ca. 30 mA	ca. 30 mA	ca. 30 mA	ca. 30 mA	ca. 30 mA
Output signal	0-20 mA	4-20 mA	0-10 V DC	0/1-5 V DC	2-10 V DC
Apparent ohmic resistance	(U_B-9V) / 20 mA		> 5 k Ω	> 5 k Ω	> 5 k Ω
Electrical connection	4-pin M12 connector				
Potential equalisation	4.8 x 0.8 mm flat connector				
	Materials (media-contacting)				
Housing	Plastic				
probe	Stainless steel ANSI 316				
Swimmer	NBR-60				

12 Dimensional drawings

(All dimensions in mm unless otherwise stated)

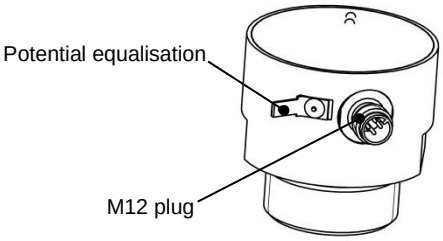


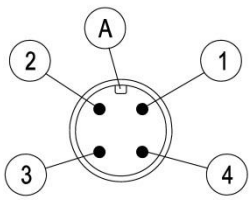
Installation length E = Probe length L + 20 mm



Installation length E = Probe length L + 5 mm

12.1 Electrical connection





Pin	Signal name		Cable colour
1	Supply	$+U_b$	brown
2	not connected		white
3	Supply	$-U_b$	blue
4	Signal	+Sig	black
A	Coding		

13 Order Codes

Tank level encoder **Type NR56**

							0	2	0	1	1

Installation length

250mm….1400mm ..... > **0 2 5 0**

From 250….300mm in 25mm steps ..... >
From 300….900mm in 50mm steps ..... >
From 900….1400mm in 100mm steps ..... >

1 4 0 0

Electrical output signal

0 – 20 mA 3-WIRE (Standard) ..... > **A**
0 – 10 V DC 3-WIRE (Standard) ..... > **C**
4 – 20 mA 3-WIRE (Standard) ..... > **P**
0 – 5 V DC linear, 3-WIRE voltage ..... > **U**
1 – 5 V DC linear, 3-WIRE voltage ..... > **D**
2 – 10 V DC linear, 3-WIRE voltage ..... > **Z**

Operating voltage

9 – 32 V DC (only for current output) ..... > **E**
12 – 32 V DC (only for voltage output) ..... > **F**

Process connection

Connecting piece G1¼ ..... > **O**
Connecting piece G2 ..... > **P**

Version

2011 ..... > **2011**

14 Manufacturer's Declarations and Certificates

EU Declaration of Conformity

For the product described as follows

Product designation **Tank Level Probe**

Type designation **NR56**

it is hereby declared that it corresponds with the basic requirements specified in the following designated directives:

2014/30/EU	*EMC Directive*
2011/65/EU	*RoHS Directive*
(EU) 2015/863	*Delegated Directive amending Annex II to Directive 2011/65/EU*

The products were tested in compliance with the following standards.

Electromagnetic compatibility (EMC)

DIN EN 61326-1:2013-07 *EN 61326-1:2013*	*Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements*
DIN EN 61326-2-3:2013-07 *EN 61326-2-3:2013*	*Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning*

RoHS Directive (RoHS 3)

DIN EN IEC 63000:2019-05 *EN IEC 63000:2018*	*Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*

Also they were subjected to the conformity assessment procedure „**Internal production control**“.

Sole responsibility for the issue of this declaration of conformity in relation to fulfilment of the fundamental requirements and the production of the technical documents is with the manufacturer.

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Documentation representative
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General Manager R&D

The devices bear the following marking: CE

Bad Salzuflen
27 April 2021

G. Gödde
Managing director

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