GESTRA® Industrial Electronics

Level Probes NRG 21-11, NRG 21-12

Issue Date: 1/97

NRG 21-11/12 **B 1**

Purpose and Application

Completely insulated rod-type probes for level control of vessels with liquids or granular products not prone to form deposits.

Depending on the electronic units connected the following applications are possible: Modulating or on-off fill or discharge control, high and low-level alarms and remote level indication.

Application in conductive and dielectric media.

Design

The level probes are provided with a metal rod completely insulated by a Teflon tube. The rod forms one plate of a capacitor, the earth plate being the vessel wall or the protection tube.

The two ends of the rod are pressure-tight and electrically insulated. A pressure-balancing system between measuring rod and probe body enables the probe to be used in a steam atmosphere under pressure.

A preamplifier fitted in the probe body produces the measuring frequency and evaluates the capacitance which is a function of the level.

The following designs are available:

Rod-type probe type NRG 21-11 with screwed connection, 1½" BSP (1½" NPT, on request).

Rod-type probe type NRG 21-12 with flange, PN 16 *), DN 50 mm.

Operation

A high-frequency oscillator in the terminal box of the probe fed from the connected electronic unit produces a current flow between measuring rod and vessel wall. The current varies with the depth of immersion of the probe, i.e. proportional to the level, and is rectified for transmission to the connected electronic unit.

Technical Data

Installation
Inside the vessel

Max. service pressure
6 barg (85 psig)

Max. temperature
164 °C

Media
Conductive and dielectric liquids, non-abrasive, granular products

Connection
NRG 21-11:
Screwed 1½" BSP
(screwed NPT, on request)
NRG 21-12:
Flanged DIN PN 16 *), DN 50 mm
inspection to 3.1 B

Control range H
max. length L
see "Dimensions"

Materials
Body: U St 37-2 (DIN No. 1.0036)
Flange (NRG 21-12): C 22-8 (1.0460)
Rod: X 5 CrNi 18 10 (1.4301)
Insulating tube: PTFE

Max. permissible ambient temperature at terminal box
60 °C

Electric connection
Four-pole connector with screw terminals, cable strain relief and cable gland Pg 11

Supply voltage
12 V, 3 mA

Output current
0.2 . . . 1 mA

Approx. weight
NRG 21-11: 1.4 kg
NRG 21-12: 2.8 kg

Important Notes

Recommended cable for wiring: Screened cable, e.g. 4 x 0.5 mm^2, max. cable length 100 m.

If, over the complete length of the measuring rod, the distance to the vessel wall is not constant or if the vessel wall is not made of metal an earth electrode (protection-tube) has to be provided.

When installing probe consider thermal expansion of measuring point (see "Dimensions").

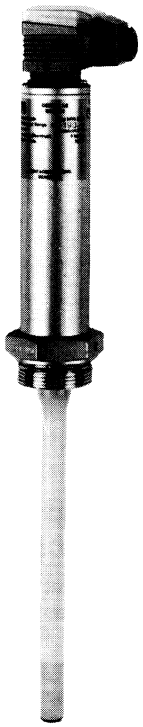
CONNECTIONS ON SITE
see "Installation and Service Instructions" and "Technical Data".

Order and Enquiry Specifications

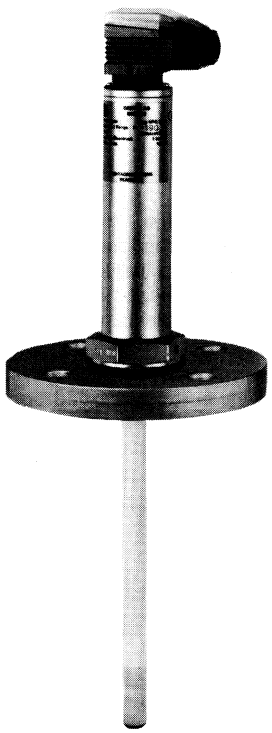
GESTRA level probe for modulating or on-off level control with the GESTRA electronic units for evaluation:

Level probe (rod-type) type NRG 21-. . .,
PN 6,
connection . . . . .
control range H . . . . . mm
medium . . . . .

The following test certificates can be issued on request, at extra cost:
In accordance with DIN 50049-2.1, -2.2 and -3.1 B.
All inspection requirements have to be stated with the order. After supply of the equipment certificates can no longer be established. Charges and extent of the above mentioned certificates as well as the different tests confirmed therein are listed in our leaflet "Test and Inspection Charges for Standard Equipment". For other tests and inspections than those listed above, please consult us.



Level probe NRG 21-11



Level probe NRG 21-12

*) Flanged PN 6, on request only

B1 NRG 21-11/12

GESTRA

Associated Equipment

Level controller type NRR 2-1b as three-position stepping controller with proportional action

Max.-min. limit switch type NRS 2-1b for MAX and MIN alarms

Level transmitter type NRT 2-1b with current output 0 to 20 mA or 4 to 20 mA

Level indicator type ARZ with LED analogue display

or

Level controller type NRR 2-2e (fill or discharge control) as three-position stepping controller with proportional action, with additional signal output for high and low level alarms and current output 0/4 to 20 mA for remote level indication

Other electronic units on request

Electric control valves, series 100/200 with feedback potentiometer

Pneumatic control valves, series 400/500 with electro-pneumatic transducer

Installation and Service Instructions

Avoid subjecting level probe to shocks as these might cause damage to the electrode seal. The PTFE tube must not be damaged.

Installation

From a length > 300 mm, the probe must be installed vertically.

NRG 21-11: Screw probe with ring joint supplied into vessel and tighten.

NRG 21-12: Mount probe flange to flange provided on vessel or boiler standpipe.

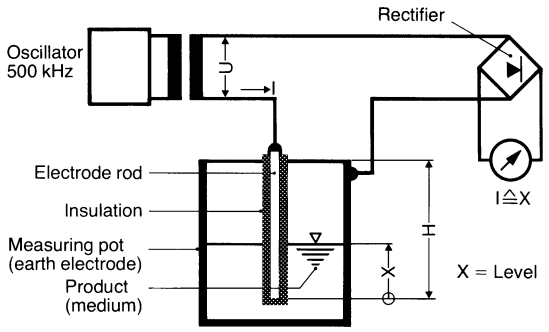
Note

The probe body situated above the hexagonal part must not be insulated.

Wiring (Figs.)

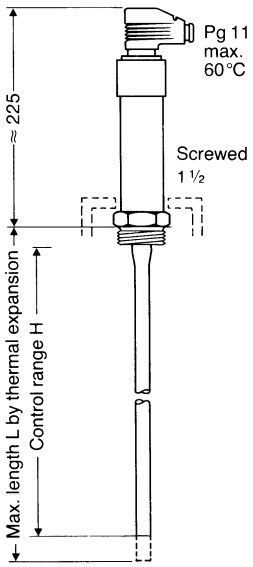
Use screened cable for wiring. Connect screen only to corresponding terminal of the electronic unit connected to the probe in accordance with respective wiring diagram. Do not connect screen to earth connection of probe.

When several probes are fitted in a steam boiler or vessel the electrode body and the terminal box should be marked to avoid confusion.



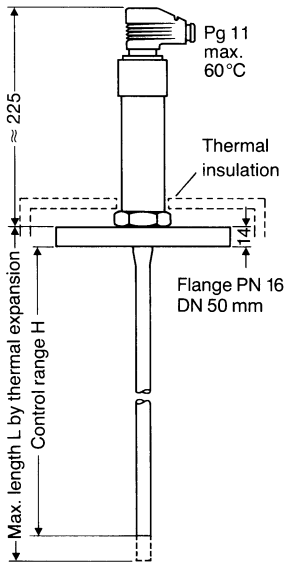
Schematic diagram of level probes type NRG 21

Dimensions

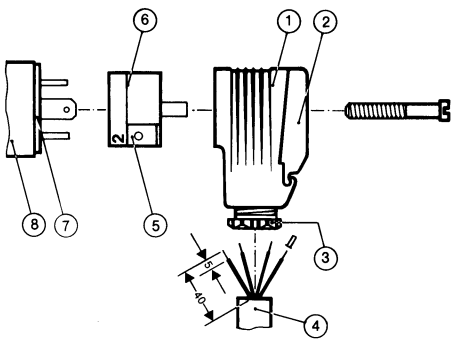


Control range H	Max. length L by thermal expansion
300 mm	349 mm
400 mm	454 mm
500 mm	559 mm
600 mm	663 mm
700 mm	768 mm
800 mm	873 mm
900 mm	978 mm
1000 mm	1083 mm
1500 mm	1607 mm
2000 mm	2130 mm

Level probe type NRG 21-11

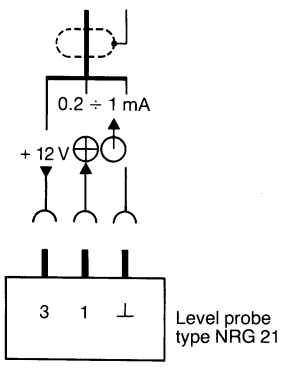


Level probe type NRG 21-12



① Terminal box housing
② Cap
③ Cable gland Pg 11 with internal cable strain relief for circular cables 6-10 mm diameter
④ Connecting cable
⑤ Terminal block with terminals
⑥ Strip with terminal marking points
⑦ Flat joint gasket
⑧ Plug on electrode head

Terminal box with item numbers and marking points



Wiring of level probe

Technical modifications reserved.

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