Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Rod probe 11375Z

Conductive level limit detection
Partially insulated rod probe for use in conductive liquids

Application

- Conductive level limit detection in process or storage tanks for all kinds of liquids:
  – for conductivity as of 0.02 mS/cm
  – for temperatures from –40 °C to 200 °C
  – for pressures up to 50 bar
- As overfill protection with line monitoring even in Ex-area Zone 0
- For minimum or maximum detection in tanks
- As pump protection in pipes
- Can be used for two-point control

Your benefits

- Cooling adapter for higher fluid temperatures, as of 100 °C
- Subsequent probe length shortening possible
- WHG (German Water Resources Act) + ATEX II 1/2 G approval
- Can be connected to separate switching units FTW325, FTW470Z, FTW570Z
- Safety thanks to line monitoring
- Long operating life and reliable function without wear since no moving parts in the tank
- Cost-effective probe for conductive liquid

TI298F/00/en

Endress+Hauser
People for Process Automation

Table of contents

Function and system design

Measuring principle

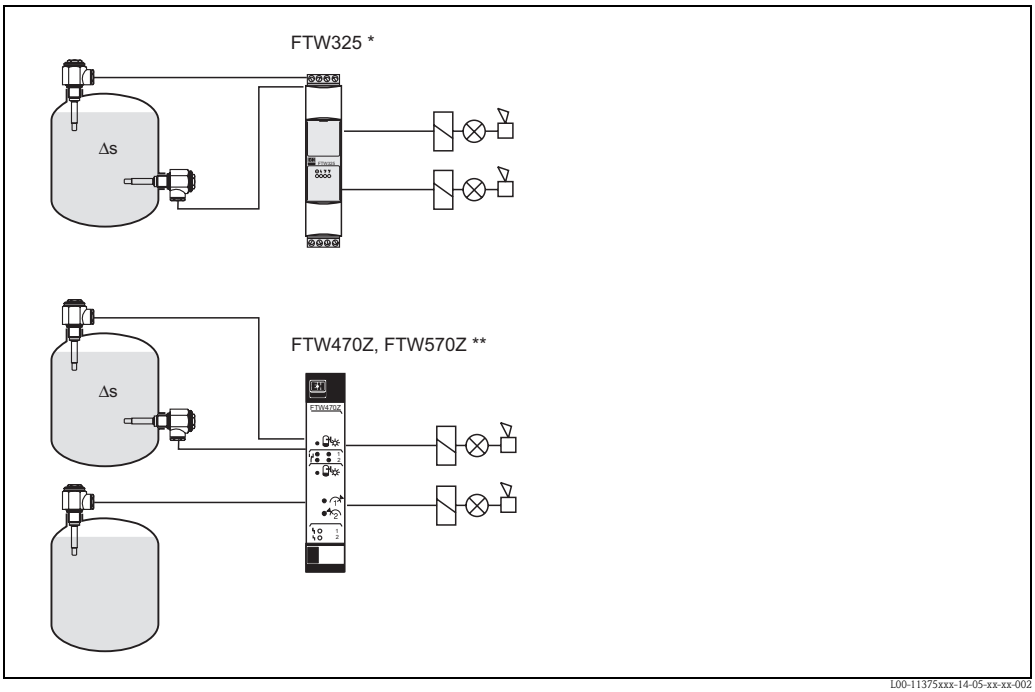
Alternating voltage is supplied to the probe by means of a transmitter (e.g. Nivotester FTW325).
As soon as the conductive liquid forms a connection to the partition and the sensor, a measurable current flows which causes the sensor to switch.
The use of alternating voltage prevents corrosion on the probe rod and electrolytic corrosion of the medium.

Measuring system

11375Z probe in the liquid tank, Nivotester FTW level limit switch in the control room

The measuring system consists of:

- At least one 11375Z probe
- A switching unit (e.g. FTW325 or FTW470Z, FTW570Z)
- Controllers, switch transmitters or signal transmitters, e.g. process control systems PLC, relays etc.



* *For two independent level limits or a two-point control (Δs)*
** *For two independent level limits or two two-point controls independent of one another (Δs) or one level limit and one two-point control (Δs)*

Input

Measured variable

Change in resistance between tank wall and probe rod caused by presence/absence of conductive product (limit value, binary).

Measuring range (detection range)

The measuring range depends on the probe mounting location.
The probes can be max. 2000 mm long.

Input signal

Probe covered => A measurable current flows between the probe rod and tank wall
Probe not covered => A measurable current does not flow between the probe rod and tank wall

Output

Switching units

Nivotester FTW325, FTW470Z, FTW570Z

Output signal

Relay output with floating change-over contacts for level alarms;
For more information, see Nivotester FTW325, FTW470Z, FTW570Z; Technical Information

Line monitoring

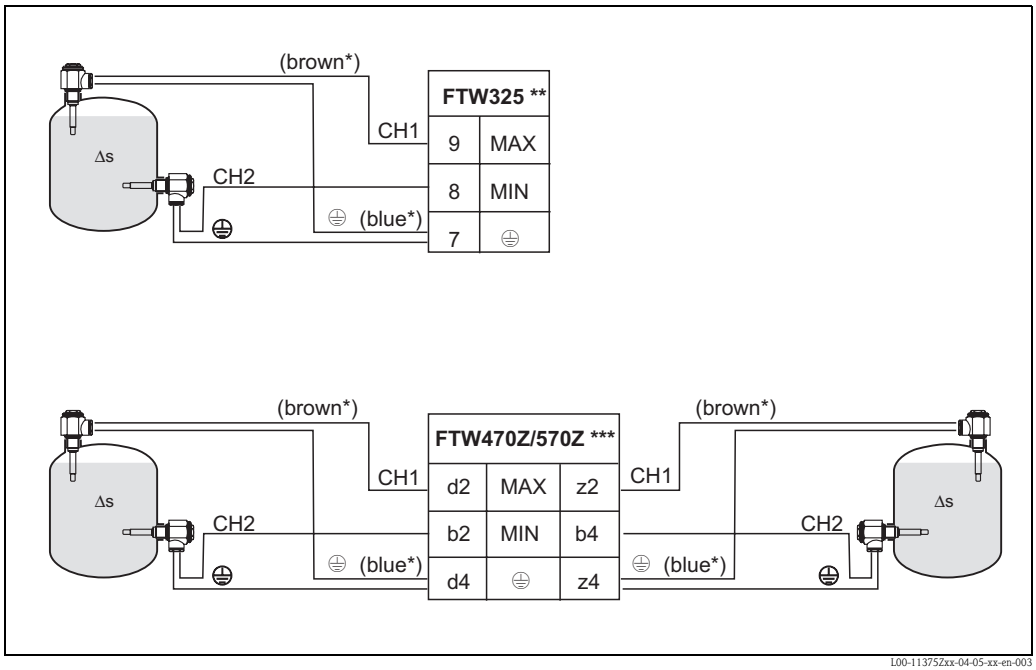
An additional printed circuit board for line monitoring is installed in the housing for probes with WHG approval. It is always switched or connected between the rod and housing wall.

Note!
It has to be removed if using switching units (transmitters) that do not support line monitoring.

Power supply

Electrical connection

Standard + ATEX: 2 terminals for core cross-section to 2.5 mm^2 in housing
With line monitoring: 2 m captive cable



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* *With line monitoring*
** *For two independent level limits or a two-point control (Δs)*
*** *For two independent level limits or two two-point controls independent of one another (Δs) or one level limit and one two-point control (Δs)*

Cable entry

The cable gland PG16 is suitable for cable diameters from 7 mm to 12 mm.

The terminals in the housing are designed for strands up to 2.5 mm^2 in wire end ferrules
– central terminal for the probe rod,
– lateral terminal for earth connection.

Note!
A 2 m captive twin-core cable is supplied for line monitoring.

Cable specifications

Use usual commercial cable (25 Ω per core).
The connecting cable must comply with the requirements at the place of deployment.

Use a screened cable in the event of strong electromagnetic influence.

Operating conditions

Installation

Installation instructions

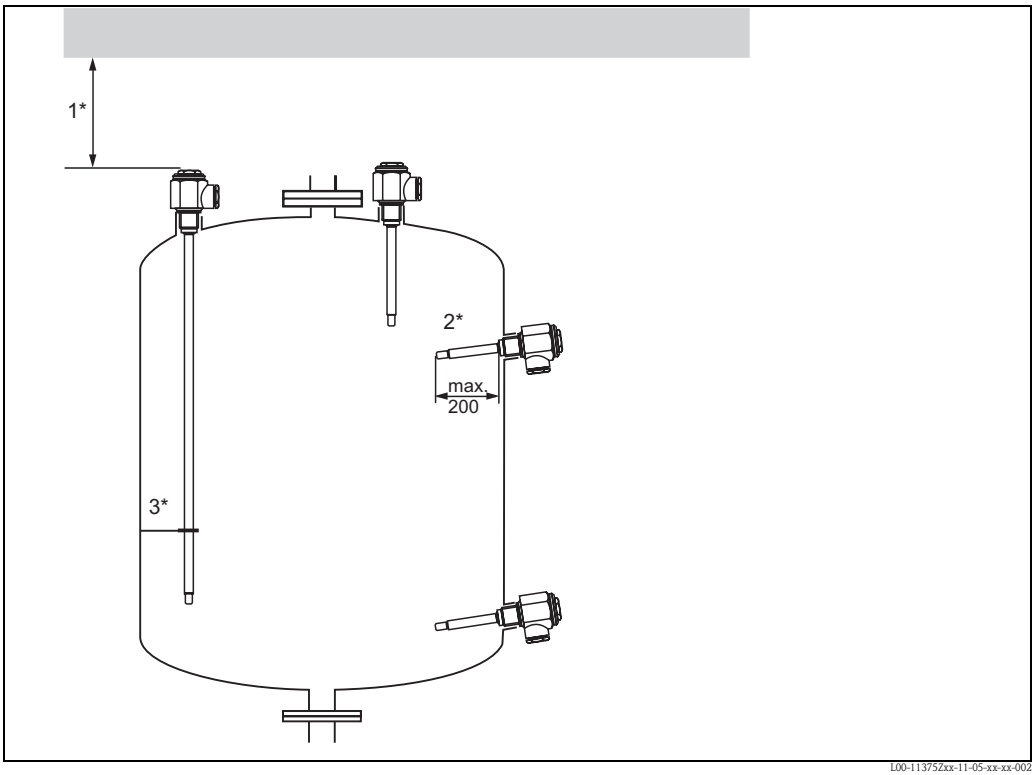
Mounting location

The orientation is preferably vertical from above. In the case of lateral mounting, mount the probes with the tip of the probe pointing slightly downwards.

Use cooling adapter for fluid temperatures as of 100 °C.

Orientation

Level limit detection for standard applications in metal tanks.



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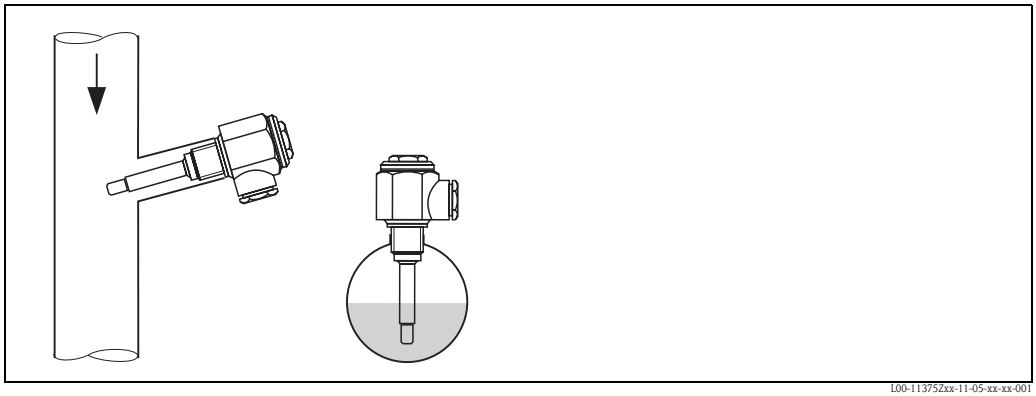
1 Sufficient clearance provided outside the tank so the probe can be inserted without the application of force.*
2 A short probe (maximum length 200 mm) can also be installed laterally, preferably with the tip of the probe pointing slightly downwards, so that the liquid can drain off better and conductive build-up does not form.*
3 If used in agitated liquids, probes over 1 m in length must be laterally supported by insulated brackets.*

Shortening probe rod

The probe can be shortened to any length.

Note!
– Do not damage the insulation at any other point
– After shortening, remove insulation over at least 20 mm at the tip of the probe
– No mechanical strain may be put on the probe when shortening the probe rod

Mounting in piping



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Environment

Ambient temperature range

Depends on the fluid temperature (limited through permitted interior temperatures of the connection housing)

Permitted interior temperatures of the connection housing:

Standard: –40 °C…+200 °C, depends on the connecting cable and seal in the cable gland
ATEX: –40 °C…+135 °C, depends on the connecting cable and seal in the cable gland
WHG: –20 °C…+ 65 °C (with line monitoring)

Storage temperature

–40 °C…+80 °C
–20 °C…+65 °C (with line monitoring)

Degree of protection

IP55 as per EN 60529

Electromagnetic compatibility

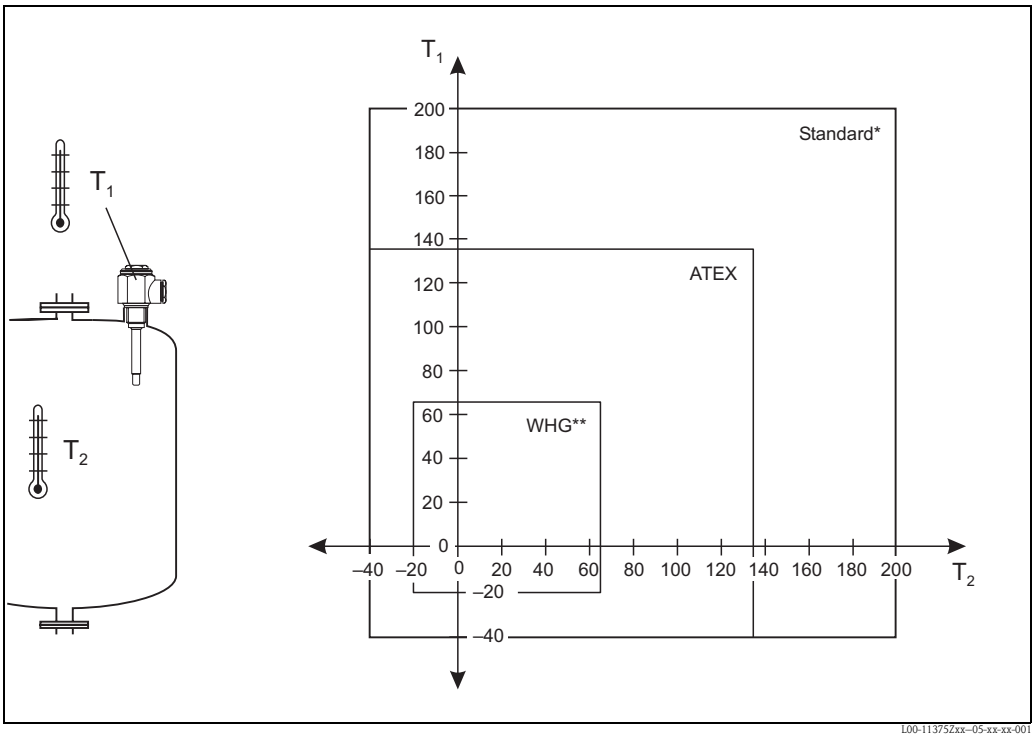
For interference emission and interference immunity, see connected Nivotester FTW limit switch
EMC test procedures, see TI241F/00/en

Process

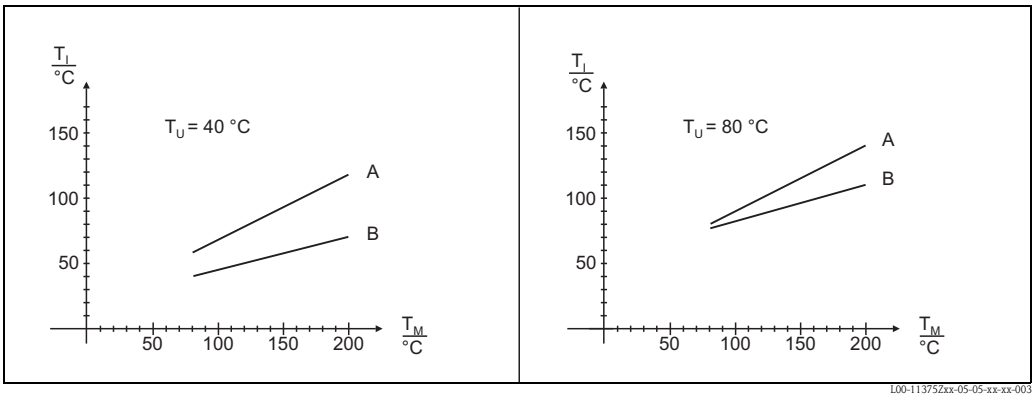
Medium temperature range

Standard: –40 °C…+200 °C
ATEX: –40 °C…+135 °C (depending on temperature class)
WHG: –20 °C…+ 65 °C (with line monitoring)

Connection between fluid temperature and interior temperature of the connection housing depending on ambient temperature and cooling adapter:



* *With cooling adapter*
** *With line monitoring*



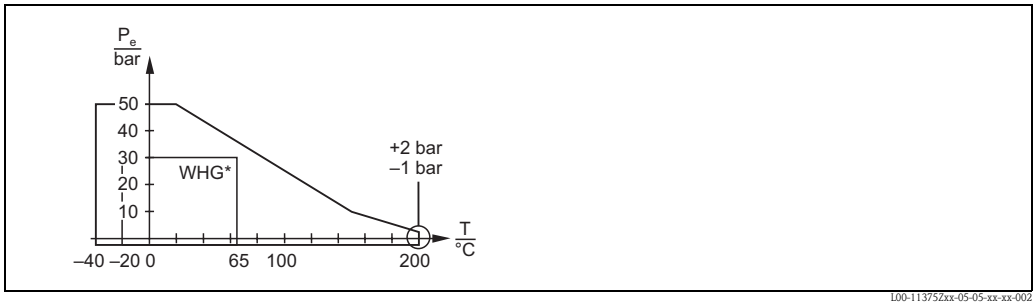
A = Without cooling adapter
B = With cooling adapter
T_I = Interior temperature of the housing
T_M = Medium temperature
T_U = Ambient temperature

Conductivity

Min. 0.02 mS/cm, see limit switch connected

Process material pressure limits

Standard: Line pressure pe –1 bar…+50 bar, see graphic
ATEX + WHG: Note explosion protection directives and information in the certificates



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** With line monitoring*

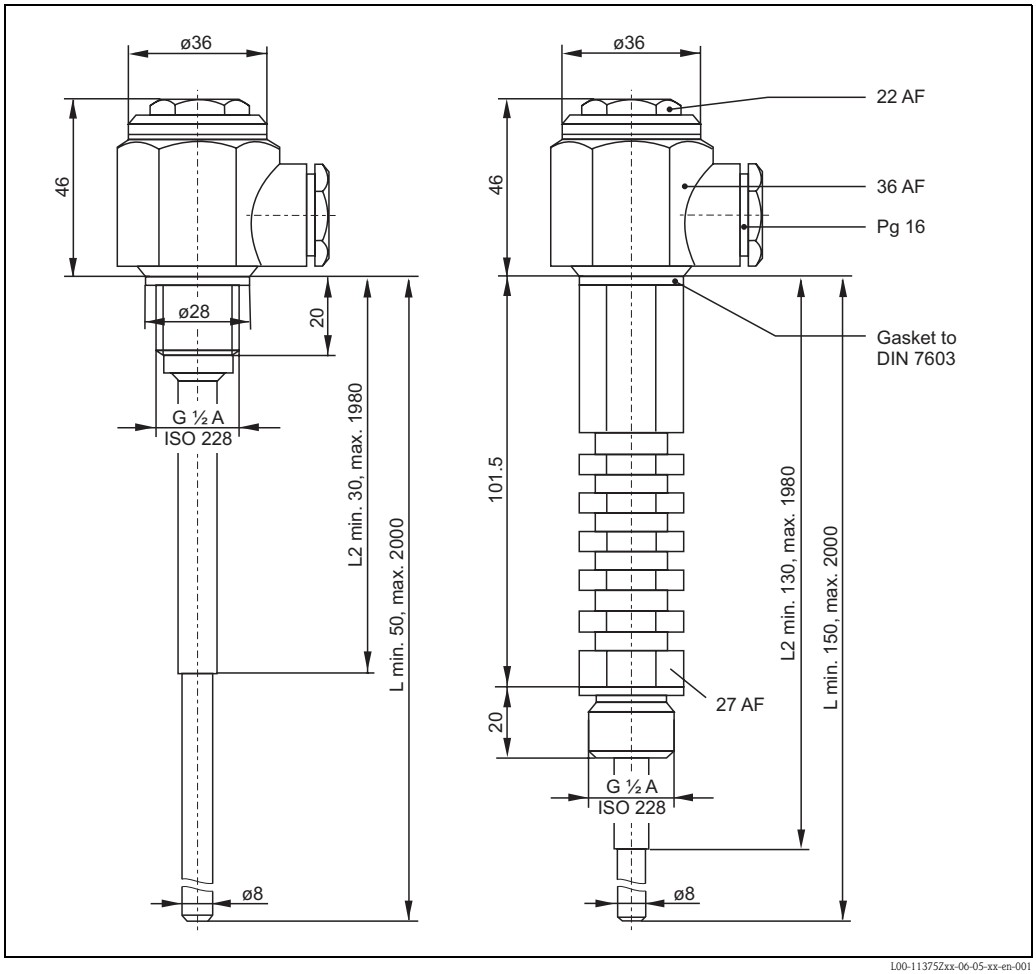
Mechanical construction

Note!
All dimensions in mm

Design, dimensions

With adapter

With cooling adapter



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Note!
Length of partial insulation min. 20 mm shorter than the probe length.
Please indicate the desired probe length in mm when ordering.

Weight	**Rod 1 m in length** 500 g
Wetted materials	**Probe rod** Corrosion-resistant steel 316Ti (1.4571) **Process connections** Corrosion-resistant steel 316Ti (1.4571) **Partial insulation** PTFE **Seal** Copper **Cooling adapter** Corrosion-resistant steel 316Ti (1.4571)
Fitted electrodes	**Rod probe** ■ Diameter without insulation: 4 mm ■ Maximum rod length: 2000 mm ■ Minimum rod length: 50 mm ■ Insulation thickness: 0.5 mm ■ Length of non-insulated area (tip of rod): 20 mm

Certificates and approvals

CE mark	The device is in conformity with the statutory requirements of the EC Directives. Endress+Hauser confirms that the device has been tested successfully by applying the CE mark.
Overfill protection	WHG (German Water Resources Act)
Type of protection	Conductive ■ EC type-examination certificate TÜV 02 ATEX 1951 X

Ordering information

Rod probe 11375Z

10	Approval
P	ATEX II 1/2 G EEx ia IIC T6
Q	ATEX II 1/2 G EEx ia IIC T6, WHG
R	Non-hazardous area
S	Non-hazardous area, WHG
Y	Special version

20	Application
Q	FTW470Z, FTW570Z
X	Non-specified switching unit
Y	Special version

30	Process connection, material
G1	Thread ISO228 G ½ A, 316Ti
K1	Thread ISO228 G ½ A, 316Ti + cooling adapter
Y9	Special version

40	Partial insulation material
A	PTFE
Y	Special version

50	Length of partial insulation L2	
1	..... mm	L2
2	230 mm	L2 (standard)
5	..... inch	L2
6	9 inch	L2
9	Special version	

60	Rod material
A	Rod 316Ti
Y	Special version

70	Length of probe L	
1	..... mm	L
2	250 mm	L, can be shortened
3	500 mm	L, can be shortened
4	1,000 mm	L, can be shortened
5	..... inch	L
6	10 inch	L, can be shortened
7	20 inch	L, can be shortened
8	39 inch	L, can be shortened
9	Special version	

11375Z	complete product designation

Note!
Cooling adapter for higher medium temperatures up to +200 °C only for use in non-hazardous areas (R).

Documentation

Technical Information

- Nivotester FTW325
  TI373F/00/en
- Nivotester FTW470Z, FTW570Z
  TI039F/00/en

Operating Instructions

- Rod probe 11375Z
  KA240F/00/a6
- Nivotester FTW325
  KA199F/00/a6
- Nivotester FTW470, FTW570
  see TI039F/00/en

Certificates

General construction supervision approval

- Conductive level limit detection
  ZE043F/00/de

Safety instructions (ATEX)

- Conductive level limit detection
  XA197F/00/a3

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