

Capacitive Limit Detection Probes 11303 Z, 11303 ZM

**PTFE fully insulated rod probe with probe
breakage monitoring**



Versions

Four basic versions, each with its own variations, cover all applications:

- 11303 Z with threaded boss
- 11303 Z with flange
- 11303 ZM with ground tube and threaded boss
- 11303 ZM with ground tube and flange

The versions with ground tubes are especially designed for non-conductive liquids with low dielectric constants

Application: Overspill Protection

The probes 11303 with rod breakage monitoring and self-monitoring level limit switches are used for capacitive limit detection.

They are approved for use in explosion-hazardous areas Zone 0 and are especially designed for overspill protection with flammable and water-polluting liquids conforming to VbF and VAWS (§ 19 WHG).

Endress + Hauser

Nothing beats know-how



Measuring System

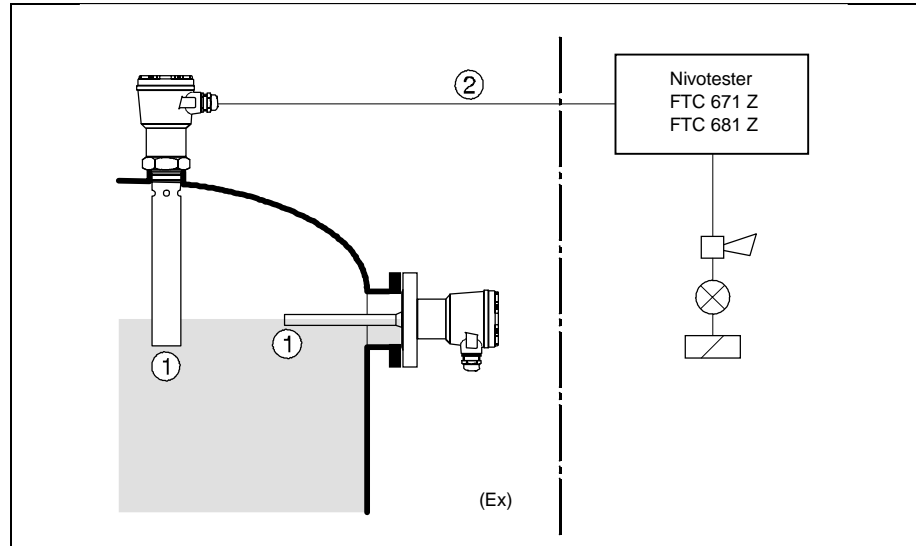
A complete measuring system consists of:

- Probe 11303 Z or 11303 ZM
- Electronic insert EC 27 Z, mounted in the probe head housing, or the electronic insert in the separate protective housing HTC 27 Z
- Safety level limit switch Nivotester FTC 671 Z
- Signalling and control instruments (e.g. klaxon, solenoid valve)

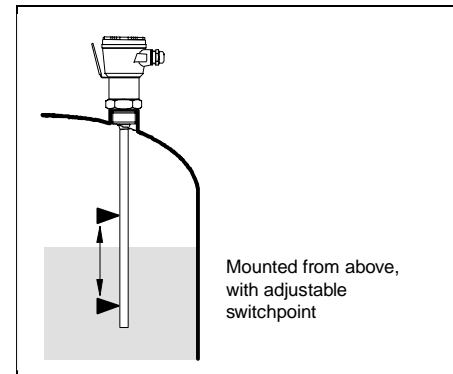
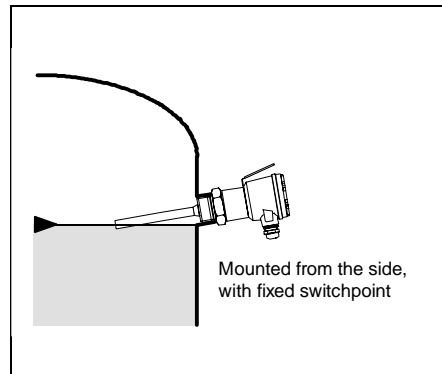
Probe Monitoring

The probe tip is connected to an insulated electrical conductor within the probe rod. The electrical circuit, formed by the outer probe and this inner conducting material, is monitored by the level limit switch Nivotester FTC 671 Z every 1.5 s using the EC 27 Z. The probe is therefore continually monitored right to the probe tip.

Measuring system
 ① The probe is monitored right to the tip
 ② Interference immune signal between the electronic insert EC 27 Z in probe housing and the Nivotester



Mounting Connecting



Mounting from the Side

When the probe is mounted from the side, the Nivotester always accurately switches at the limit point specified by where the sensor is installed.

For recommended probe lengths please refer to Page 7.

For applications with organic materials, a probe with ground tube is recommended in order to produce large capacitance changes with small dielectric constants.

If the probe is mounted from the side, then it should be tilted slightly downwards so that the liquid can flow off more easily (and out of the ground tube, if used) and prevent build-up. The ground tube is not suitable for viscous products.

Mounting from Above

If the probe is mounted from above, then the switchpoint may be varied by adjusting the setting on the Nivotester.

Note: A probe with a ground tube is recommended for use with organic materials. This kind of probe is also recommended for applications with strong turbulence or high lateral loads. Please refer to Page 7 for minimum lengths when mounting from above. As the capacitance can be adjusted within a very wide range, it is useful to select a probe which is somewhat longer than required.

Mounting Regulations

Please note the instructions given in the certificate of conformity and the IfBT certificate if the probe is to be used for overspill protection.

For capacitive level limit detection or continuous level measurement, probes without ground tubes should not be too close to each other if mounted in a metal tank or in plastic tanks situated close together. This is to ensure that no mutual interference can occur. Please contact Endress+Hauser if they are mounted at intervals of less than 500 mm.

Connection

Please refer to the Technical Information about the EC 27 Z for the electrical connections when installing the electronic insert in the probe head. The electronic insert in the HTC 27 Z housing must be used if the ambient temperature of the probe head housing exceeds the operating temperature of the electronic insert.

No moisture must enter the probe head housing during storage of the probe, connection of the electronic insert or during operation.

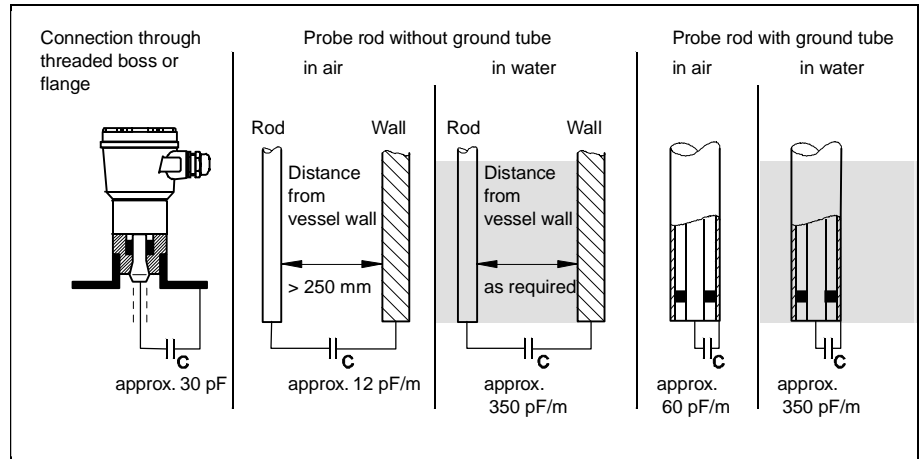
Technical Data

Operating Data

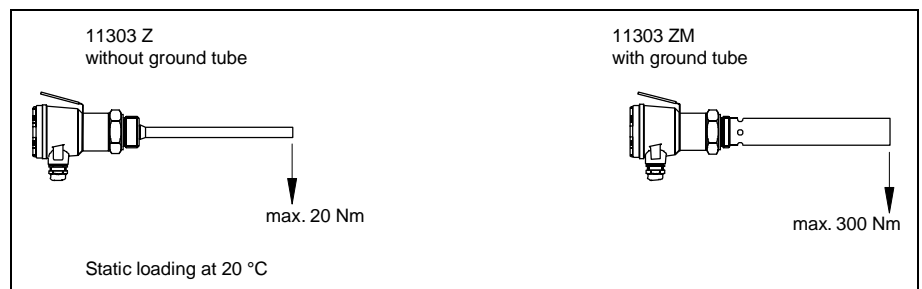
Relationship between maximum operating pressure and temperature:

Maximum pressure p_e	50 bar	30 bar	10 bar	0 bar	Suitable for vacuum
Operating temperature, at the threaded boss or flange	-80 °C to +50 °C	100 °C	150 °C	200 °C	Leakage rate on request

Probe capacitance values:



Maximum permissible lateral load on the probe:



Materials

Probe rod: steel or 1.4571 stainless steel
 Full rod insulation: 2 mm PTFE with bonded PFA seal at probe tip
 Ground tube: 1.4301 or 1.4571 stainless steel
 Threaded boss: G 1 1/2 A: galvanized steel or 1.4581 stainless steel

Flange: primed steel or 1.4571 stainless steel or steel or 1.4571 stainless steel coated with PTFE on side in contact with vessel

Housings



A
 Aluminium housing with standard cable gland PG 16, Protection IP 55

B
 Aluminium housing with water-tight cable gland PG 16, Protection IP 66

R
 Aluminium housing with plastic coating, for aggressive atmospheres; with water-tight cable gland PG 16, Protection IP 66

K
 Plastic housing in PBTP with water-tight cable gland PG 16, Protection IP 66 (on request)

Cable Gland

Housing IP 55: standard PG in nickel-plated brass with NBR sealing for cable diameter 7...10 mm.
 Housing IP 66: water-tight in polyamide with neoprene CR sealing for cable diameter 5...12 mm

Probe length tolerances:

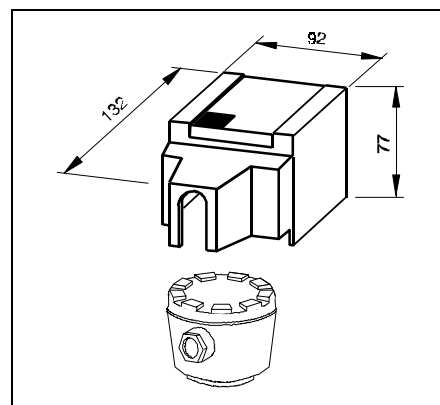
Probe length	Tolerance
to 1 m	+0 mm, -5 mm
to 3 m	+0 mm, -10 mm
to 6 m	+0 mm, -20 mm

Subject to modification

Accessories

- Sealing for threaded boss G 1 1/2 A: elastomer-fibre sealing (asbestos-free), supplied
- Protective sun cover for aluminium housing
 Material: polyamide

The protective sun cover should be used when mounting in the open. This protects the probe with aluminium housing from excessive temperatures and condensation caused by large temperature variations.

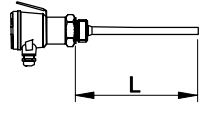
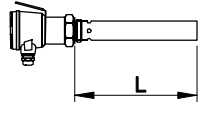


Dimensions of the protective sun cover (accessory).

Probe Length

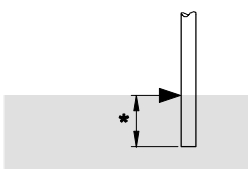
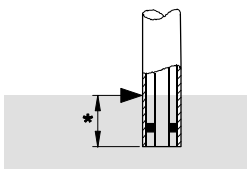
Guidance when selecting the probe length for level limit detection with the Nivotester FTC 671 Z.

Mounting from the Side

	Without ground tube	With ground tube
Material characteristics, relative dielectric constant ϵ_r		
electrically conductive	approx. 100 mm	(approx. 100 mm)
non-electrically conductive		
$\epsilon_r > 10$	approx. 150 mm	approx. 100 mm
ϵ_r approx. 4...10	approx. 200 mm	approx. 100 mm
ϵ_r approx. 2...4	approx. 400 mm	approx. 200 mm
ϵ_r approx. 1.5...2	approx. 600 mm	approx. 300 mm

Mounting from Above

The lengths given here incorporate the additional minimum lengths from the sealing surface of the flange or threaded boss up to the limit point required.

	Without ground tube	With ground tube
Material characteristics relative dielectric constant ϵ_r		
	* additional length for covering	* additional length for covering
electrically conductive	50 mm	(50 mm)
non-electrically conductive		
$\epsilon_r > 10$	100 mm	50 mm
ϵ_r approx. 4...10	200 mm	100 mm
ϵ_r approx. 2...4	400 mm	200 mm
ϵ_r approx. 2	600 mm	250 mm
ϵ_r approx. 1.5...2		300 mm

Please contact us if the dielectric constant of the material is not known. There must be a difference of at least 5 pF between the values when the probe is covered and free.

Certificates

- Certificate of Conformity
PTB No. Ex 80/2145 X
with VbF approval
01/PTB III B/E 29815 B-F
- IfBT test approval PA-VI 830.05

Supplementary Documentation

- Electronic insert EC 27
Technical Information 11.84.02
- Electronic insert in protective
housing HTC 27 Z
Technical Information 09.82.01
- Nivotester FTC 671 Z
Fail-safe level limit switch in
Racksyst plug-in card design
Technical Information TI 088/00/e

Order details

- Order code
- Probe length *
- Special version if required
- Accessories (e.g. Protective sun
cover)

* Note: The probe rod must not be shortened. Self-monitoring and resistance to chemical corrosion will be lost.

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