



## KOBOLD NTS Capacitive Level Limit Switch for Bulk Goods Instruction Manual

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NTS Capacitive Level Limit Switch for Bulk Goods  
Instruction Manual



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## Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website [www.kobold.com](http://www.kobold.com) are always for the currently manufactured versions of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email ([info.de@kobold.com](mailto:info.de@kobold.com)) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfill the EC-machine guidelines.

## Instrument Inspection

Instruments are inspected before shipping and sent out in the perfect condition.

Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service /forwarding agent immediately, since they are responsible for damages during transit.

### Scope of delivery:

The standard delivery includes:

- Capacitive Level Limit Switch for bulk goods  
model: NTS

## Regulation Use

Any use of the Capacitive Level Limit Switch for bulk goods, model: NTS, which exceeds the manufacturer's specification may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

## Operating Principle

The Kobold NTS Level Limit Switch for bulk goods operates on the capacitive measuring technique. The measuring probe, tank, or vessel wall forms a capacitor.

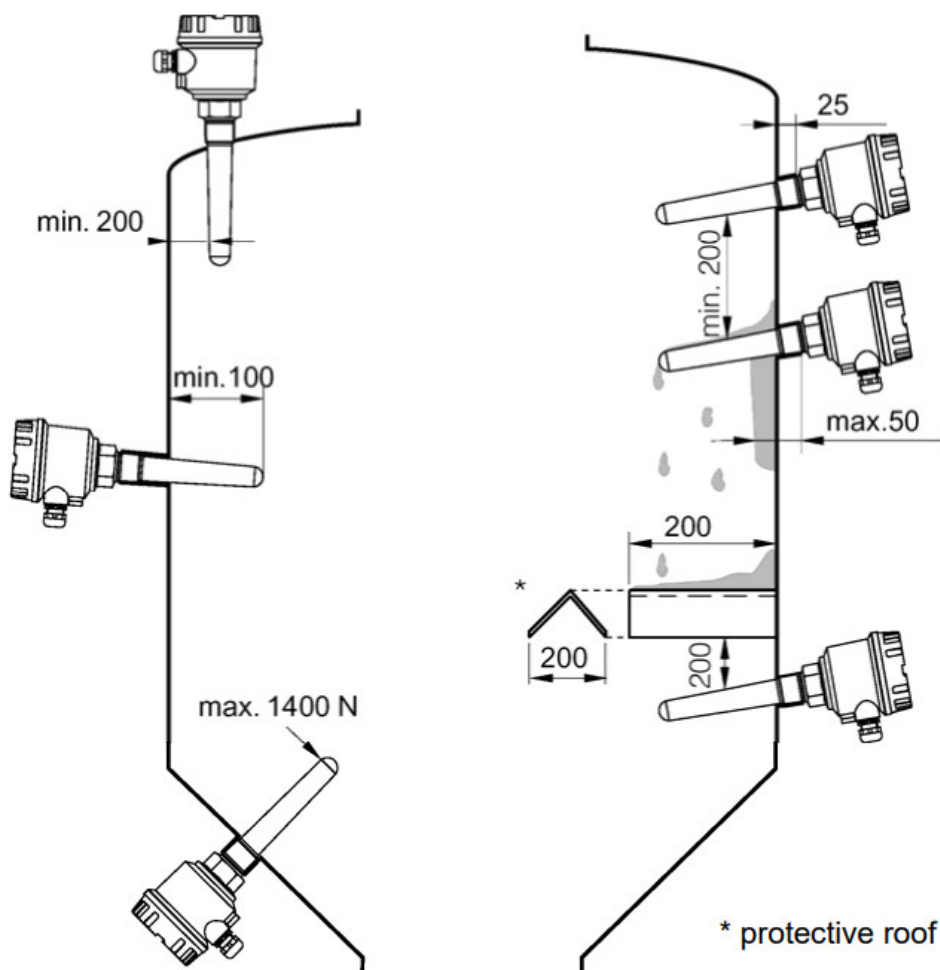
The capacitance depends on the medium between the probe and the wall.

If air is present (tank empty), the capacitance is low. As soon as the product touches the probe, the capacitance increases. This change in capacitance is detected electronically and converted to a switching signal when the capacitance rises above or drops below the limit.

The instrument has a changeover feature for minimum/ maximum safety. The switch point is always accurately maintained by the "deposit compensation" even with deposit formation. The effect of deposit compensation depends on the density of the coating on the probe, the conductance of the coating as well as the adjustable sensitivity. The NTS is adjusted at the factory; the sensitivity can be re-adjusted however. For non-conductive vessels, the earth connection must be attached to nearby conductive and earthed objects.

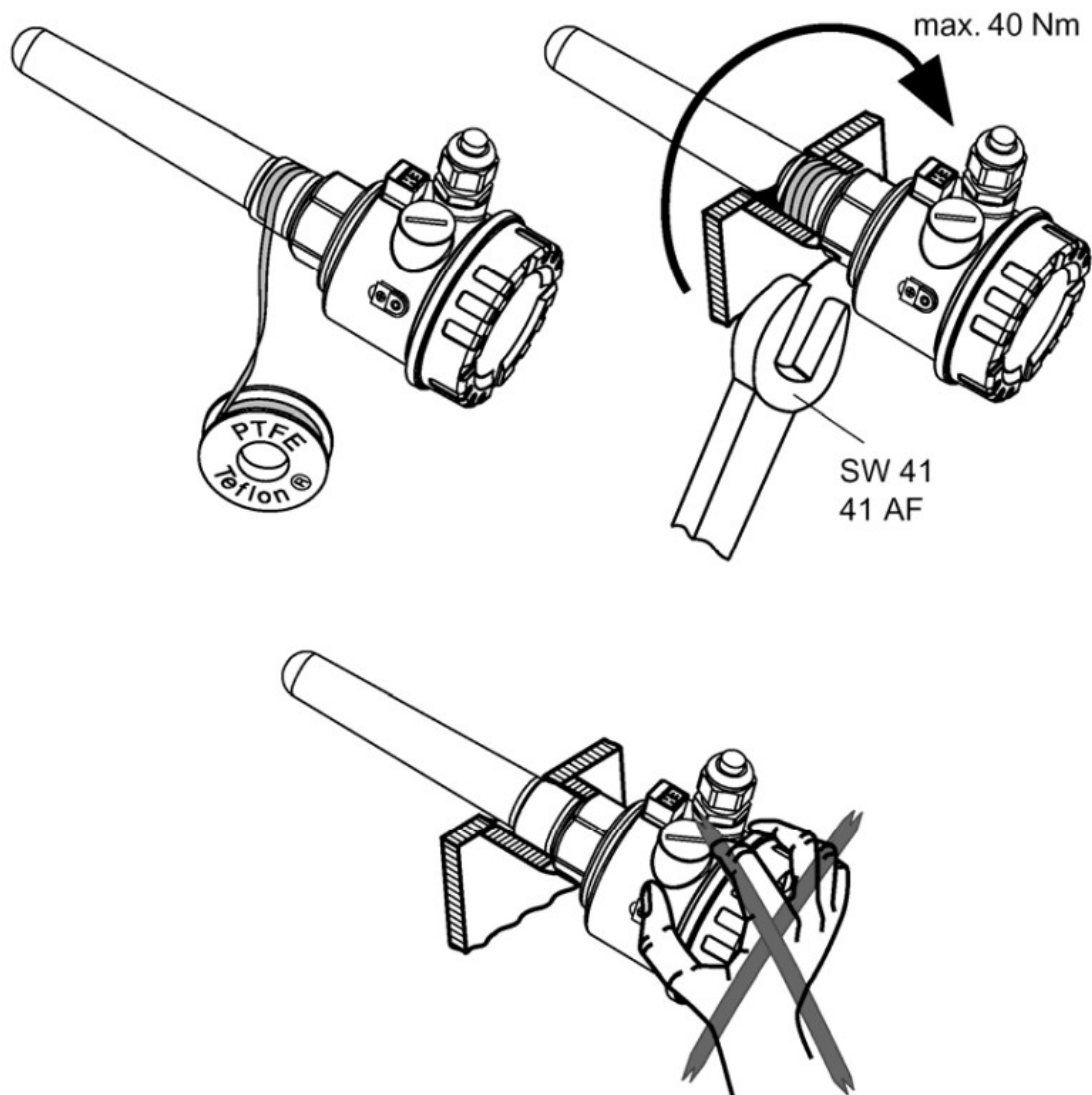
## Mechanical Connection

### 6.1. Installation examples



### 6.2. Installation

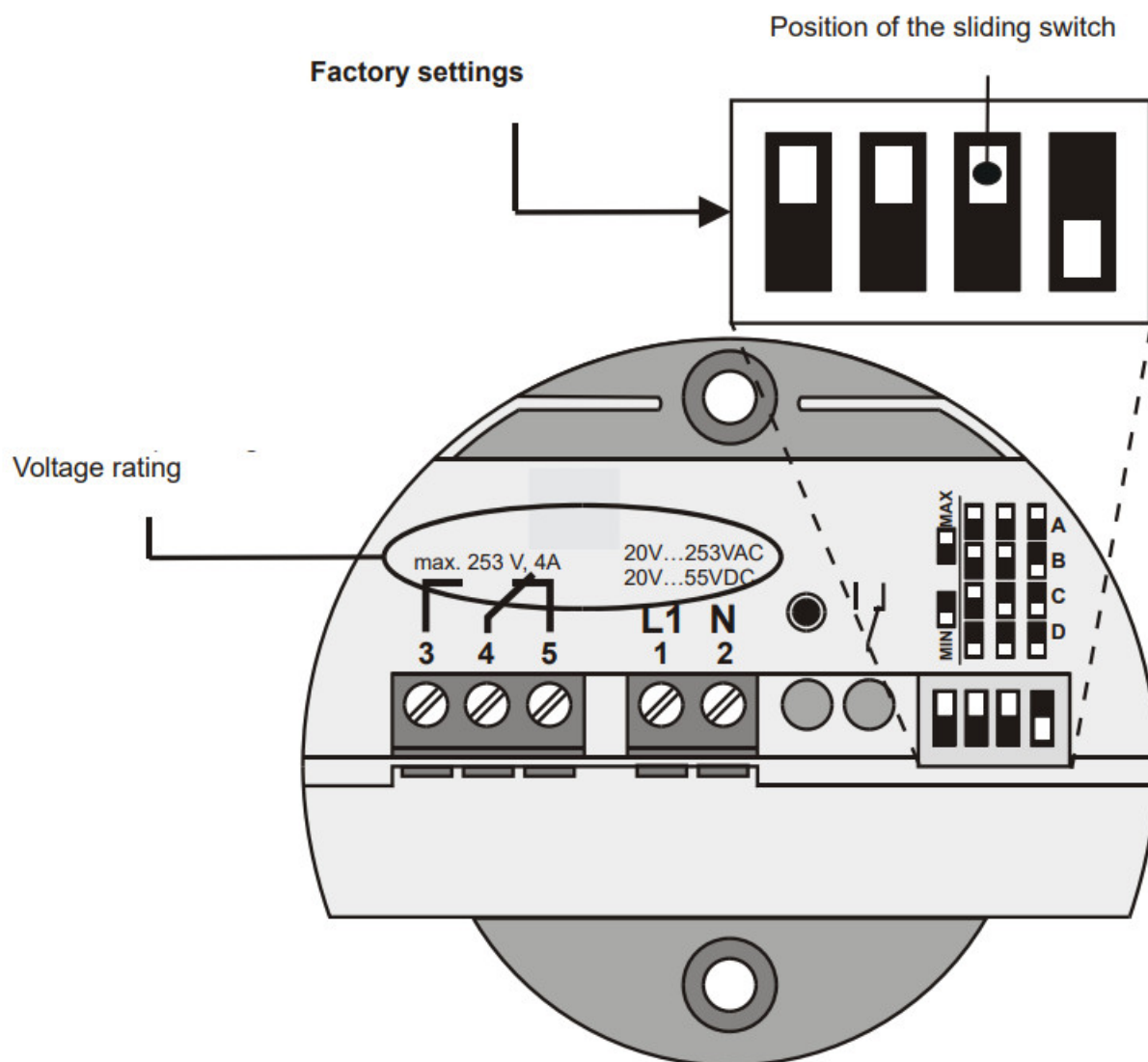
Screw in the NTS limit switch. Do not use housing to turn.



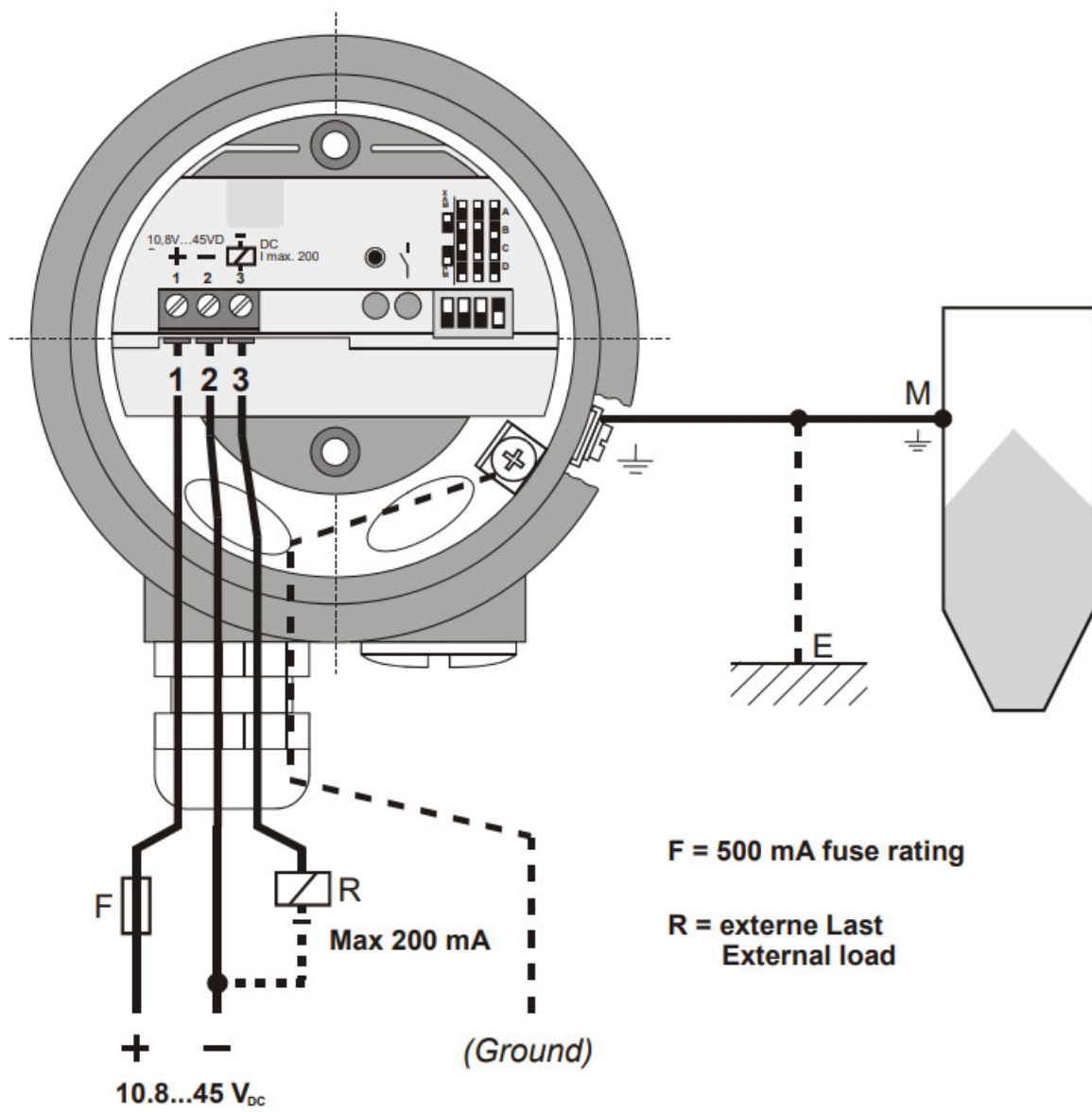
## Electrical Connection



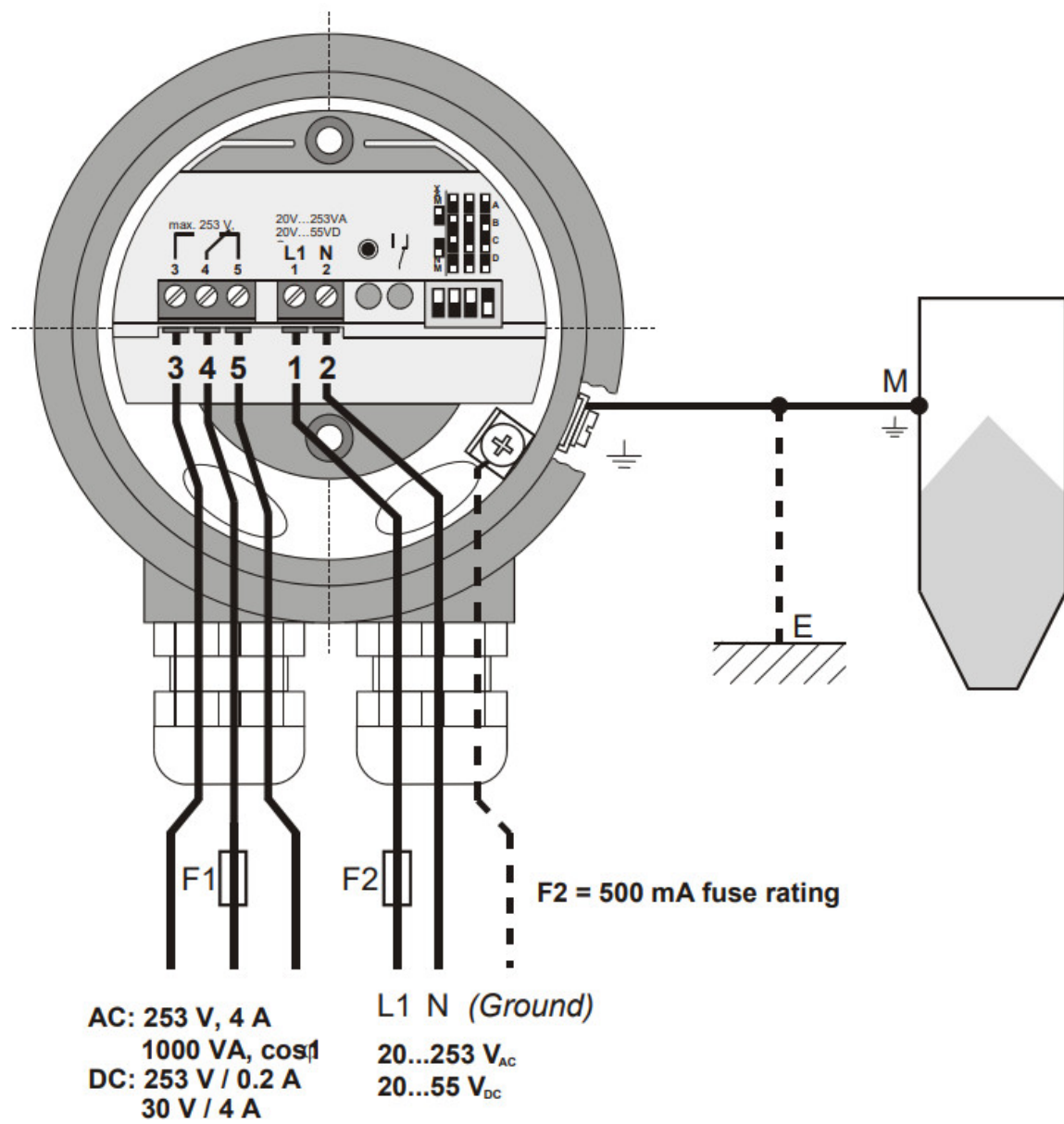
**Caution!** Make sure that the voltage values of your system correspond with the voltage values of the measuring unit.



### 7.1. DC version, PNP (DC terminal)







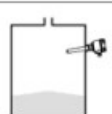
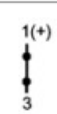



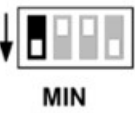





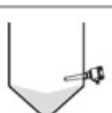











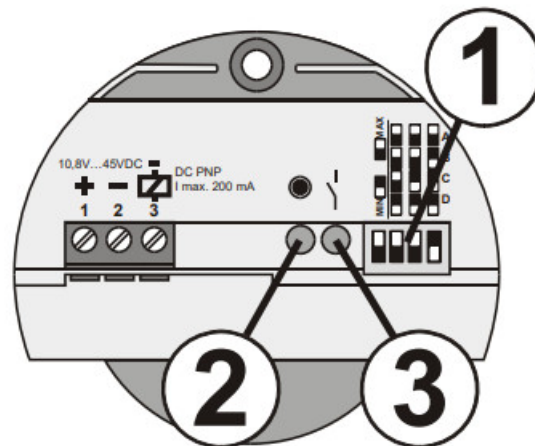
## 7.2. AC / DC version (AC-DC universal terminal)



## Operation

### 8.1. Setting fail-safe mode

①		DC-PNP	AC/DC-SPDT	②	③
 MAX					
					
 MIN					
					
					



1 = Position of switch

2 = Green illuminating diode for operating state

3 = Red illuminating diode for switching state

## 8.2. Optimising performance

Proper device function is ensured in switch configuration B (= factory setting).

This setting does not normally need to be changed.

The switch configuration should be changed only under the following conditions:

- Tendency to heavy build-up on the probe
- Mounting in a non-metallic vessel



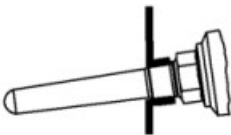


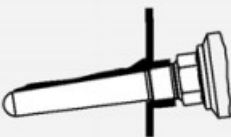


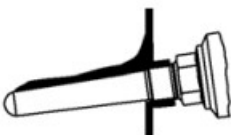



### Explanation of display:

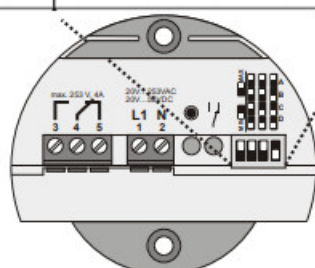
N = container non-metallic

M = container metallic

$\epsilon_r$  = relative permittivity of the bulk material (DK-value)

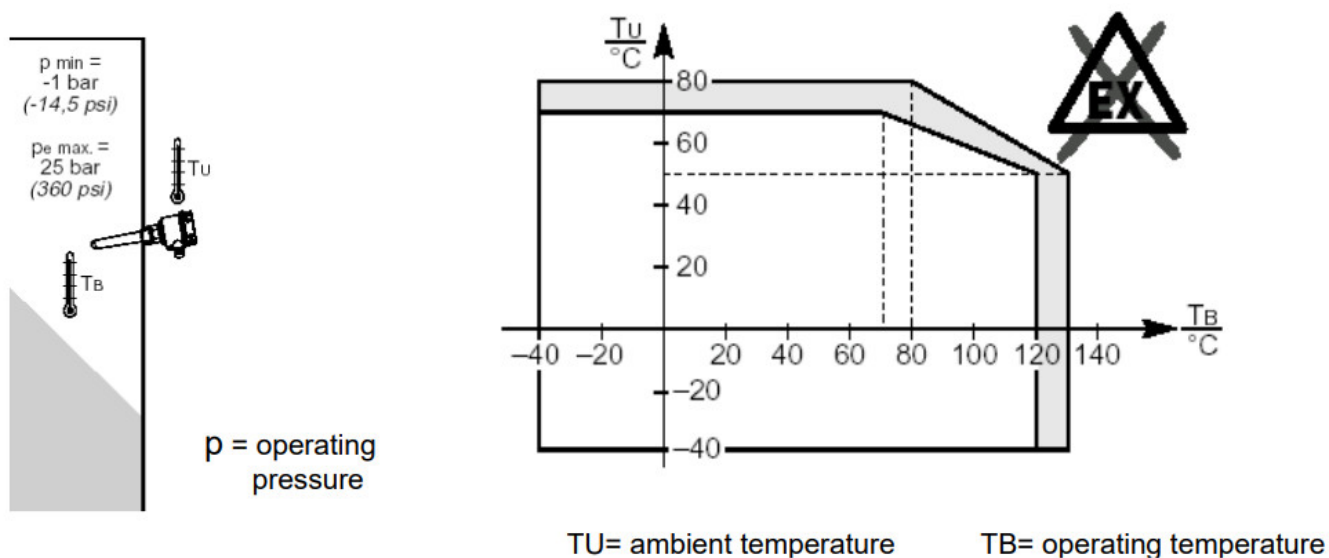


A		 <table><tr><td>N</td><td><math>\epsilon_r &gt; 1.6</math></td></tr><tr><td>M</td><td>—</td></tr></table>	N	$\epsilon_r > 1.6$	M	—	
N	$\epsilon_r > 1.6$						
M	—						
B		 <table><tr><td>N</td><td><math>\epsilon_r &gt; 2.0</math></td></tr><tr><td>M</td><td><math>\epsilon_r &gt; 1.6</math></td></tr></table>	N	$\epsilon_r > 2.0$	M	$\epsilon_r > 1.6$	
N	$\epsilon_r > 2.0$						
M	$\epsilon_r > 1.6$						
C		 <table><tr><td>N</td><td><math>\epsilon_r &gt; 2.5</math></td></tr><tr><td>M</td><td><math>\epsilon_r &gt; 2.0</math></td></tr></table>	N	$\epsilon_r > 2.5$	M	$\epsilon_r > 2.0$	
N	$\epsilon_r > 2.5$						
M	$\epsilon_r > 2.0$						
D		 <table><tr><td>N</td><td><math>\epsilon_r &gt; 3.5</math></td></tr><tr><td>M</td><td><math>\epsilon_r &gt; 2.5</math></td></tr></table>	N	$\epsilon_r > 3.5$	M	$\epsilon_r > 2.5$	
N	$\epsilon_r > 3.5$						
M	$\epsilon_r > 2.5$						

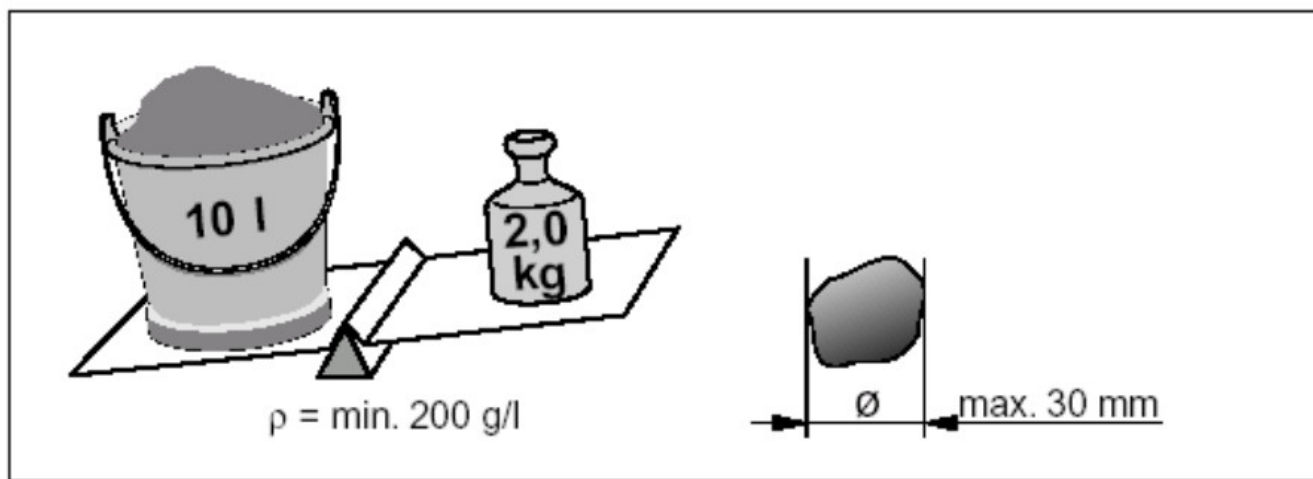


## Technical Information

Housing:	Plastic
Probe:	PPS (polyphenylene sulfide)
Medium:	DK value $\epsilon_r \geq 1.6$ bulk materials up to grain size 30mm, bulk weight min. 200 g/L
Connection:	R 1 male thread DIN 2999/ISO 7 Option: installation coupling R 1 1/2 or G 1 1/2
Auxiliary power:	DC version 10.8 to 45 VDC/max. 30 mA AC/DC version 20 to 253 VAC or 20 to 55 VDC max. 130 mA
Output:	DC version PNP/ $I_{max}$ 200 mA overload and short-circuit proof AC/DC version Change-over contact potential-free: $I_{max}$ 4 A; $I_{min}$ 1 mA; $U_{max}$ 253 V $U_{min}$ 6 V; $P_{max}$ 1000 VA
Failure signal:	DC-PNP < 100 $\mu$ A AC/DC relay dropped out
Switch delay:	0.5 s becoming uncovered/becoming covered
Error of measurement:	horizontal $\pm 3$ mm vertical $\pm 6$ mm
Hysteresis:	horizontal 4 mm vertical 7 mm
Switch point:	horizontal: middle of probe -5 mm Vertical: 40 mm above end of probe
Electrical connection:	terminal connection
Protection:	IP 66
Medium temperature:	– 40 to 120 °C
Ambient temperature:	– 40 to 70 °C
Operating pressure:	– 1 to 25 bar



### 9.1. Bulk material density $\rho$

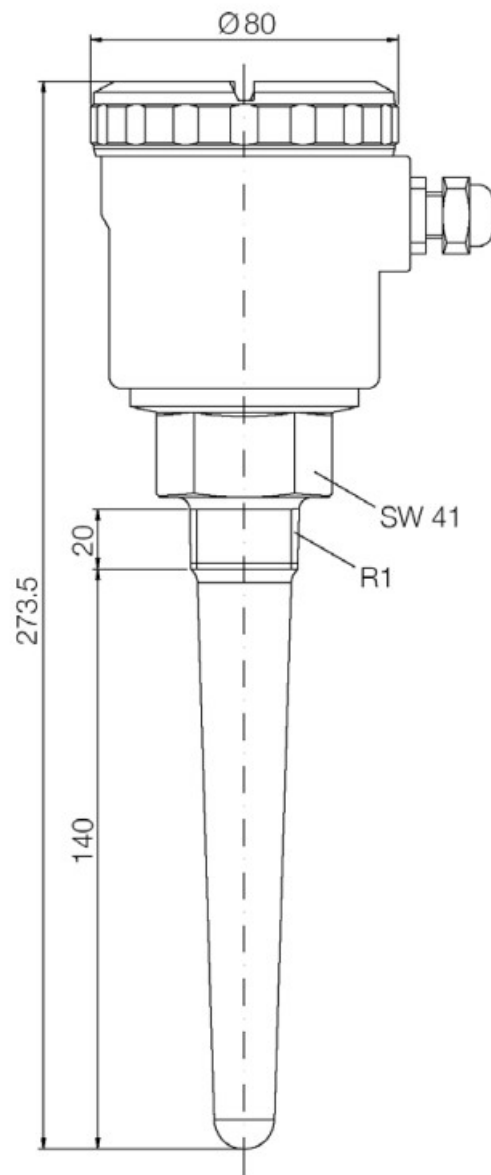


### Order Codes

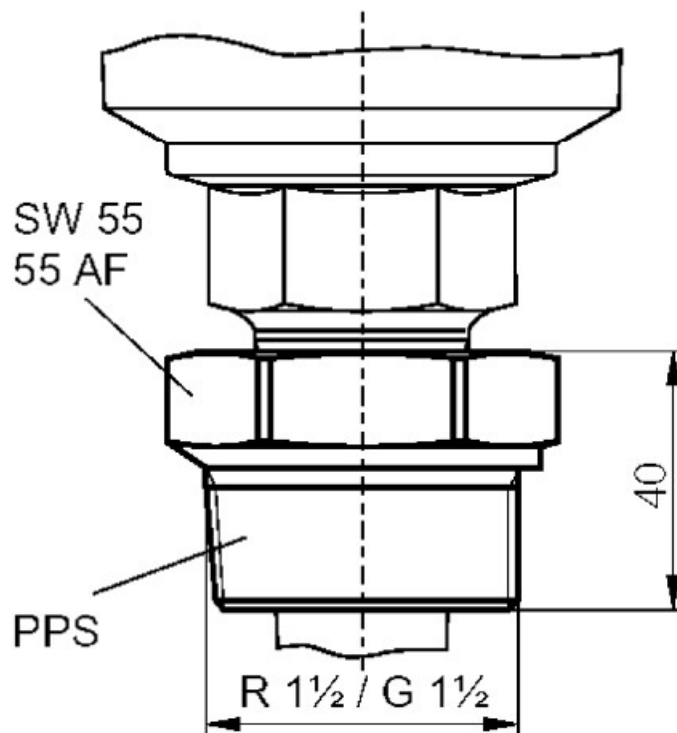
(Example: NTS-1000R25)

Connection male thread	Order number	
	20-55 VDC 20-253 VAC	10,8-45 VDC
Standard R 1 male thread	NTS-1000 R25	NTS-1001 R25
Option: with installation coupling R 1 ½	NTS-1000 R40	NTS-1001 R40
Option: with installation coupling G 1 ½	NTS-1000 G40	NTS-1001 G40

### Dimensions



**NTS**  
**Adapter for NTS:**



## EU Declaration of Conformance

We, KOBOLD-Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Capacitive Level Limit Switch for bulk goods model: NTS

to which this declaration relates is in conformity with the standards noted below:

EN 61010-1:2010

Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements

EN 61326-1:2013

Electrical equipment for measurement, control, and laboratory use – EMC requirements – Part 1: General requirements

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

The following EEC guidelines are also fulfilled:

2014/35/EU Low voltage guideline

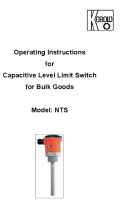
2014/30/EU Electromagnetic compatibility

Hofheim, 22. Sept. 2016

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General Manager

M. Wenzel  
Proxy Holder

## Documents / Resources

	<p><a href="#">KOBOLD NTS Capacitive Level Limit Switch for Bulk Goods</a> [pdf] Instruction Manual NTS Capacitive Level Limit Switch for Bulk Goods, NTS, Capacitive Level Limit Switch for Bulk Goods</p>
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## References

- [K Industrial measuring and control equipment in the field of flow, pressure, level & temperature | Kobold Messring GmbH](#)