

## Overview

### Features

Continuous level measurement of solids and interface applications

#### Process

- Independent of bulk material properties
- Very accurate measurement

#### Service

- Simple installation and commissioning
- Rope, tape and (optional) motor with increased service life
- Low maintenance

#### Approvals

- Approval for use in Hazardous Areas
- 2011/65/EU RoHS conform

#### Mechanics

- Measurement range up to 50 m (164 ft)
- 1½" process connection possible
- Internal tape cleaner for difficult materials
- Window in lid and outside start button (optional)

#### Electronics

- Micro processor controlled measurement
- Comprehensive diagnostic possibilities
- Output 0/ 4-20 mA/ Modbus/ Profibus DP/ counting pulses
- Programmable Relais (can be used as level limit switch outputs)

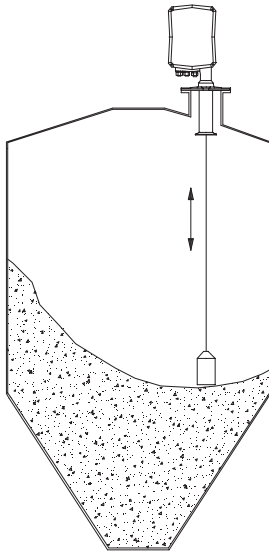
### Specification

				NB 3100/ 3200 Solids measurement	NB 3300/ 3400 Interface measurement
<b>Process</b>	Measurement range	Rope version	30 m (98.4 ft)	•	•
		Tape version	40 m (131 ft)/ 50 m (164 ft)	•	•
	Process temperature		80°C (176°F)	•	•
			150°C (302°F)	•	
			250°C (482°F)	•	
	Process overpressure		-0.3 .. +0.3 bar (-4.35 .. + 4.35 psi)	•	•
			-0.5 .. +1.1 bar (-7.3 .. +16 psi)	•	•
			-0.5 .. +1.7 bar (-7.3 .. +25 psi)	•	•
<b>Electronics</b>	Power supply	AC version	98 .. 253 V 50 - 60 Hz	•	•
		DC version	20 .. 28 V	•	•
	Output		0/ 4-20 mA	•	•
			4 relais	•	•
			Modbus RTU	•	•
			Profibus DP	•	•
<b>Approvals</b>	Dust Ex		ATEX 1/2D	•	•
			FM Cl. II, III Div. 1	•	•
			TR-CU	•	•
	Ordinary Locations		CE, FM, TR-CU	•	•

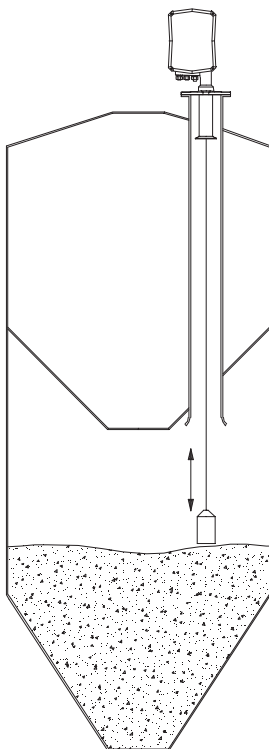
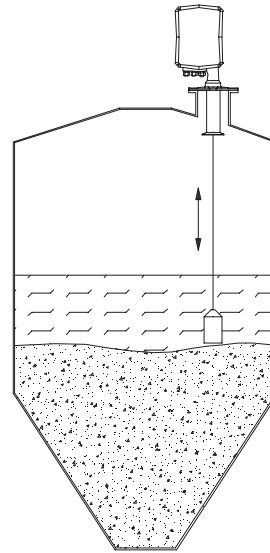
## Applications

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**Solids measurement**



**Interface measurement**  
(solids in water)



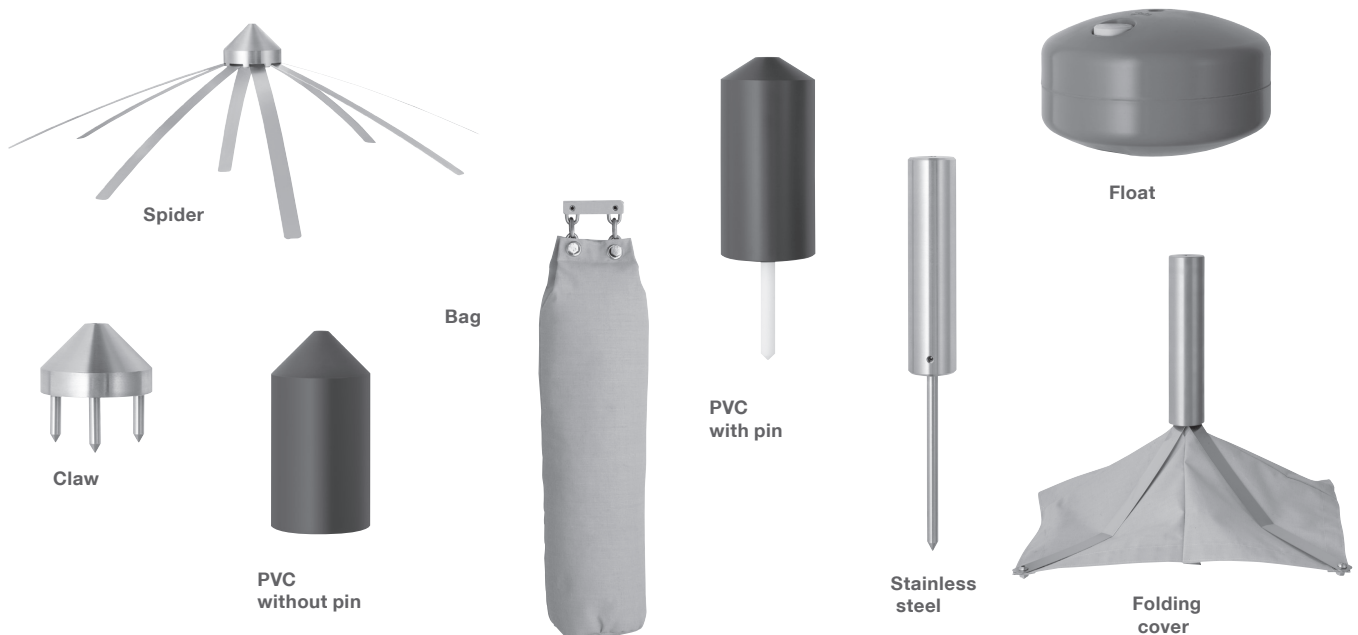
For measurements through a long pipe in a double chamber silo we recommend the use of NB 3200 (tape version).

## Applications

### Sensor weight guide (solids measurement)

Sensor weight	Application				Note	Fits through mounting hole				
	* Material density g/l (lb/ft³)	Material consistence	Angle of repose	Max. process temp.		Thread		Flange		
						1½"	3"	2"	3"	DN100 / 4"
PVC without pin	>300 (18)	granulate	flat	80°C (176°F)	Standard weight					•
PVC with pin	>300 (18)	granulate, powder	steep	80°C (176°F)	The pin penetrates into the material and avoids slipping or tilting of the sensor weight on the steep bulk surface.					•
Stainl. steel	>300 (18)	granulate, powder	flat, steep	250°C (482°F)	The pin penetrates into the material and avoids slipping or tilting of the sensor weight on the steep bulk surface.	•	•	•	•	•
Claw	>200 (12)	coarse (e.g. stones)	steep	250°C (482°F)	Avoids slipping or tilting on the steep bulk surface.					•
Folding cover	>20 (1.2)	light powder	flat, steep	80°C (176°F)	Big surface prevents the sensor weight from sinking into the material.	•	•	•	•	•
Spider	>40 (1.4)	light powder	flat, steep	250°C (482°F)	Big surface prevents the sensor weight from sinking into the material.					•
Bag	>300 (18)	granulate, powder	flat	80°C (176°F)	Prevents damage of the conveying screw. To be filled with bulk material.					•
Float	-	liquids only	-	80°C (176°F)	To be filled with material.					

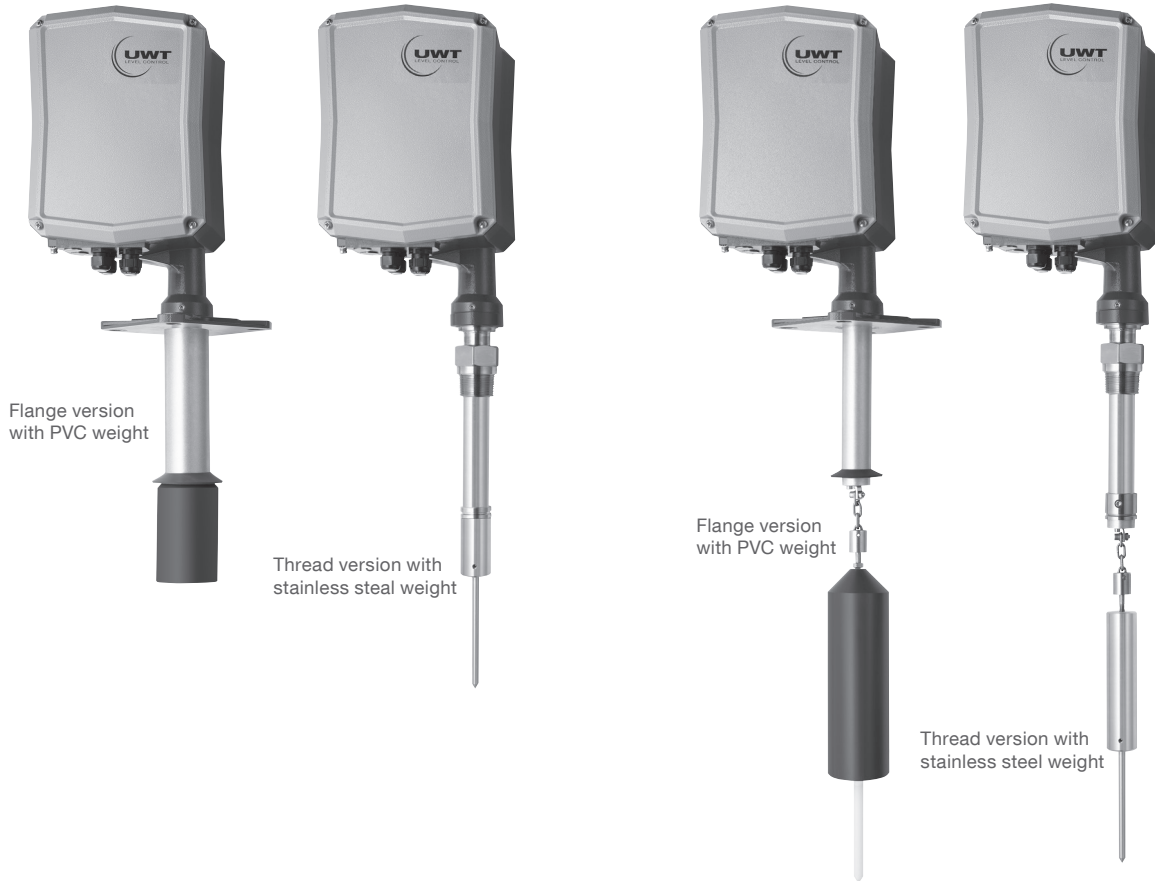
\* The above mentioned data is a guideline and is valid for material which has settled after filling. During the filling the bulk density can change (e. g. for fluidised material).



## Solids measurement

**NB 3100**  
Rope version

**NB 3200**  
Tape version



### Cable entries (by default)

Depending on selected version (options see pos.31):

- |                            |  |
|----------------------------|--|
| <p>CE, ATEX,<br/>TR-CU</p> | <p>Screwed cable gland: 2x M20 x 1.5 and 1x M25 x 1.5<br/>Blindplug: 2x M20 x 1.5</p>    |
| <p>FM</p>                  | <p>Open conduit ANSI B1.20.1: 1x NPT 3/4" and 2x NPT 1/2"<br/>Blindplug: 2x NPT 1/2"</p> |

## Interface measurement (solids in water)

### NB 3300 Rope version

For applications with soft/ muddy or compact material surface



### NB 3400 Tape version

For applications with compact material surface



#### Implemented

- Internal heater
- Rope/ tape roller with rubber coating to avoid slipping
- Plastic coated steel weight (rope version)
- Adjustment possibility for applications with soft/muddy material surface (rope version)

#### Cable entries (by default)

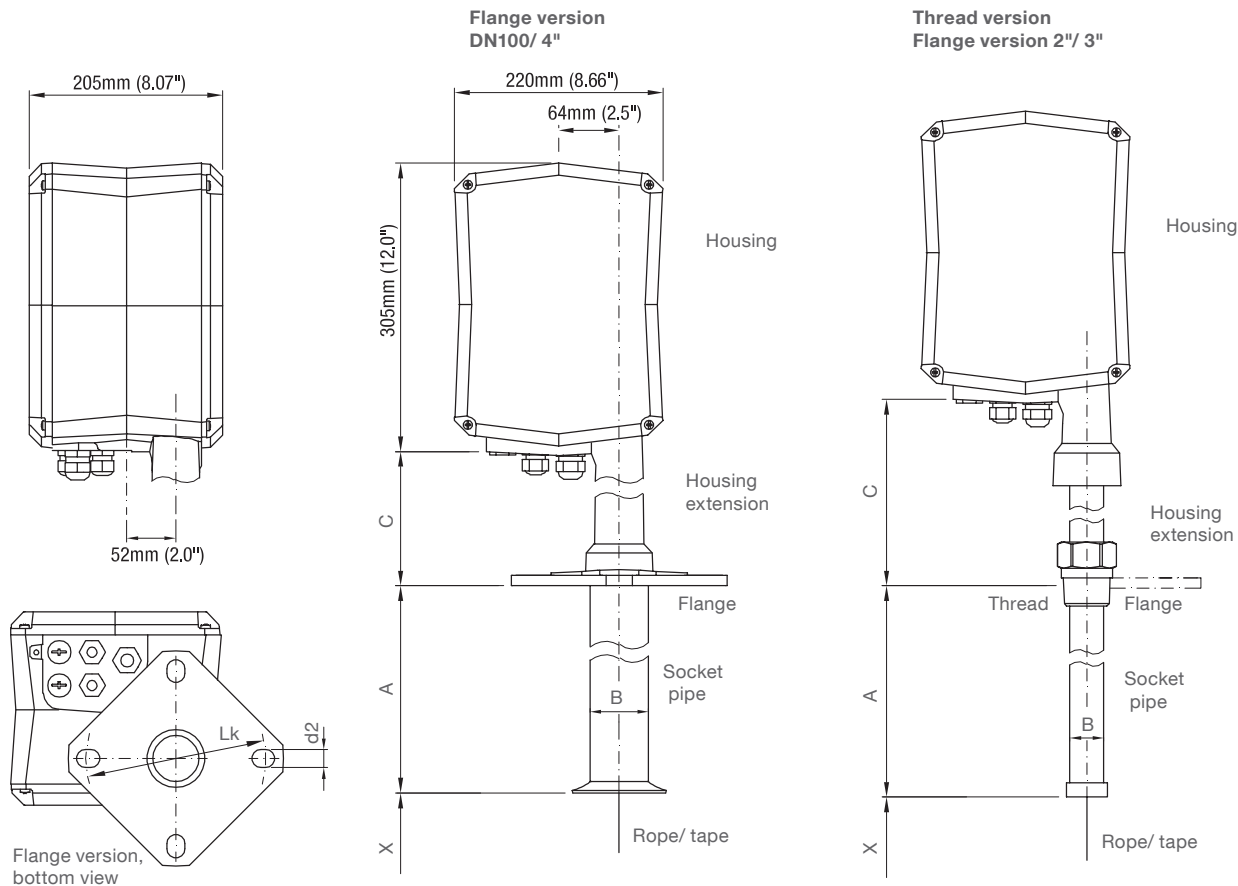
Depending on selected version (options see pos. 31):

CE, ATEX, TR-CU      Screwed cable gland: 2x M20 x 1.5 and 1x M25 x 1.5  
 Blindplug: 2x M20 x 1.5

FM                      Open conduit ANSI B1.20.1: 1x NPT ¾" and 2x NPT ½"  
 Blindplug: 2x NPT ½"

## Dimensions

### Basic type



### Dimensions

**X** = Length to bottom of sensor weight

**A** = Length of socket pipe  
 200 mm (7.9")  
 Optional 500 mm (19.7")/ 1,000 mm (39.4")

<b>B</b> = Diameter of socket pipe	
Rope version with Flange DN100/ 4"	ø60 mm (ø2.36")
All other versions	ø40 mm (ø1.57")

<b>C</b> = Housing extension		
Flange version DN 100/4"	80°C/ 150°C	95 mm (3.74")
	250°C	340 mm (13.4")
Other Versions	80°C/ 150°C	160 mm (6.3")
	250°C	340 mm (13.4")

<b>Rope</b>	ø1.0 mm (ø0.04")
<b>Tape</b>	12 x 0.2 mm (0.47 x 0.008")

<b>Flanges</b>	
fitting to: DN100 PN16/ 4" 150lbs	Lk = ø180 - 190.5 mm (ø7.1 - 7.5") slot d2 = ø19 mm (ø0.75")
fitting to: 2"/ 3" 150lbs	Lk = ø120.7 - 152.4 mm (ø4.75 - 6.0") slot d2 = ø19 mm (ø0.75")

### Materials

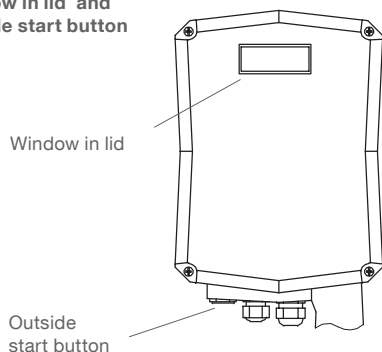
<b>Housing outside</b>	Aluminium, powder coated
<b>Housing inside</b>	Aluminium
<b>Housing extension</b>	Aluminium, powder coated or 1.4305 (303)
<b>Flange</b>	80°C/ 150°C: Aluminium, powder coated 250°C: 1.4305 (303)
<b>Thread</b>	1.4301 (304)
<b>Socket pipe</b>	Flange version DN100/ 4", 80°C/ 150°C: Aluminium All other versions: 1.4301 (304)
<b>Rope</b>	1.4401 (316)
<b>Tape</b>	1.4310 (301)

**With option "Increased corrosion resistance":**  
 All metal parts in contact with the process are coated.  
 The rope is plastic coated with PA.  
 The internal bearings are made of stainless steel.

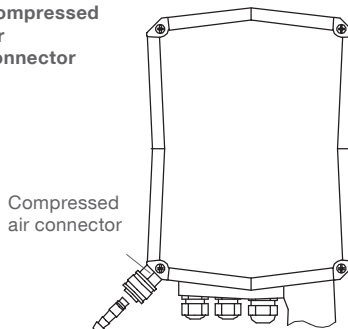
## Dimensions

### Options

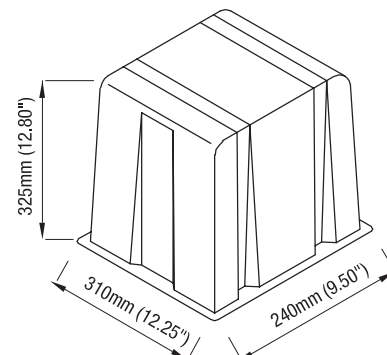
pos.25  
**Window in lid and outside start button**



pos.28  
**Compressed air connector**



pos.21  
**Weather protection cover**

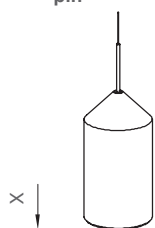


### Sensor weights

#### Solids measurement: Rope version

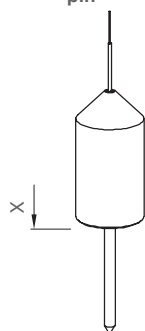
All weights ca. 1,0 kg (2.2 lbs)

**PVC without pin**



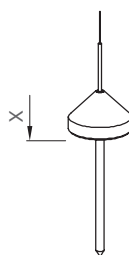
ø81 mm (ø3.2")  
 X = 137 mm (5.4")  
 Material: PVC

**PVC with pin**

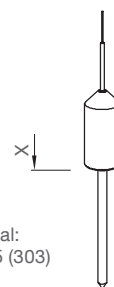


ø81 mm (ø3.2")  
 X = 137 mm (5.4")  
 Pin: 130 mm (5.1")  
 Material: PVC (pin POM)

**Stainless steel**



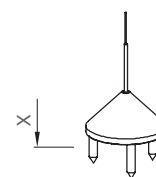
Version with  
 Flange DN100/ 4"  
 ø75 mm (ø3.0")  
 X = 25 mm (1.0")  
 Pin: 130 mm (5.1")



Material:  
 1.4305 (303)

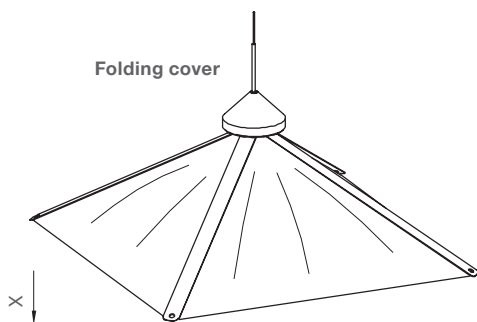
All other versions  
 ø42 mm (ø1.65")  
 X = 81 mm (3.19")  
 Pin: 130 mm (5.1")

**Claw**



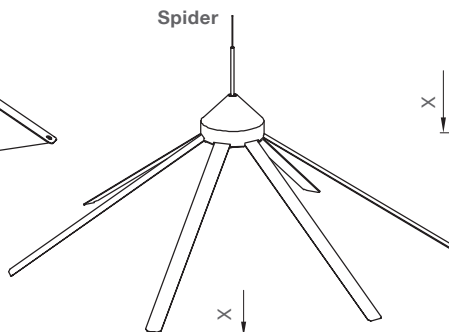
ø95 mm (ø3.7")  
 X = 71 mm (2.8")  
 Material: 1.4305 (303)

**Folding cover**



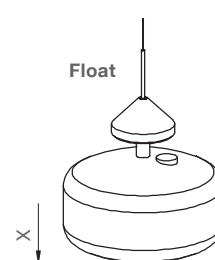
380 x 380 mm (15 x 15")  
 X = 150 mm (5.9")  
 Material: 1.4310 (301)/ 1.4305 (303)  
 PA canvas

**Spider**



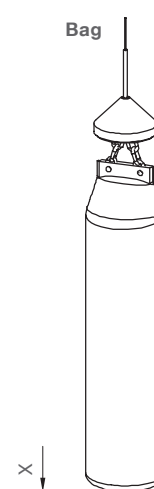
ø600 mm (ø23.6")  
 X = 160 mm (6.3")  
 Material: 1.4301 (304)/ 1.4305 (303)  
 1.4310 (301)

**Float**



ø190 mm (ø7.5")  
 X = 175 mm (6.9")  
 Material: Float PP,  
 Cone: aluminium

**Bag**

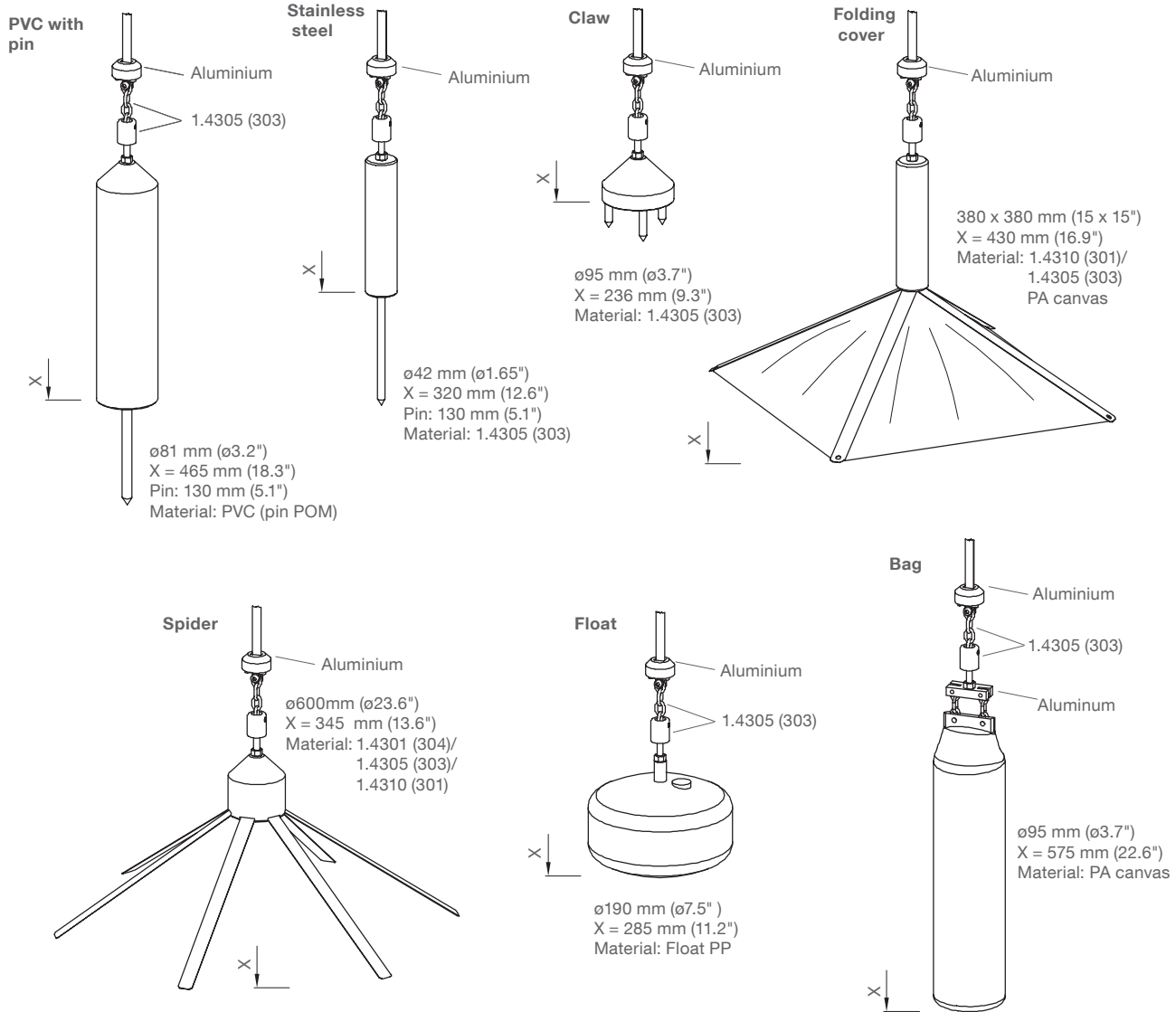


ø95 mm (ø3.7")  
 X = 460 mm (18.1")  
 Material: PA canvas,  
 Chain: 1.4305 (303)  
 Cone: aluminium

## Dimensions

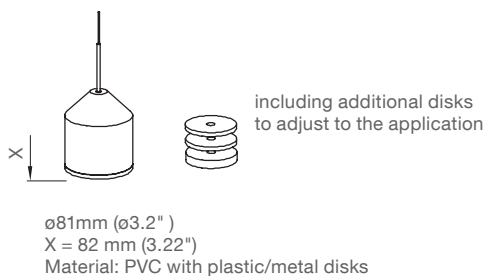
### Solids measurement: Tape version

All weights ca. 2.1 kg (4.6 lbs)



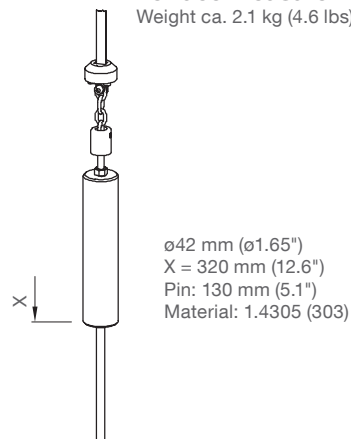
### Interface measurement: Rope version

Weight ca. 1.0 kg (2.2 lbs)



### Interface measurement: Tape version

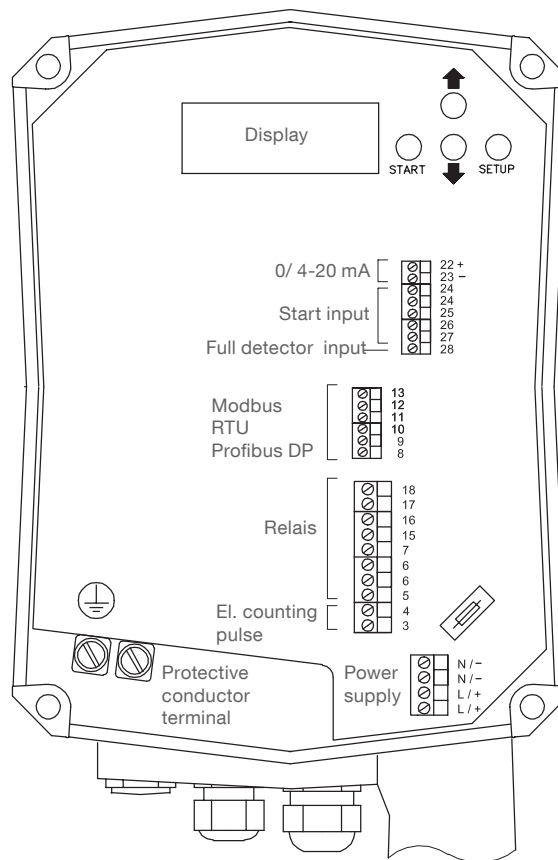
Weight ca. 2.1 kg (4.6 lbs)





## Electrical installation

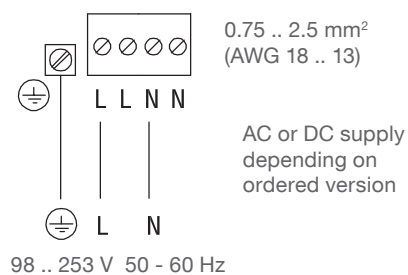
### Terminal location



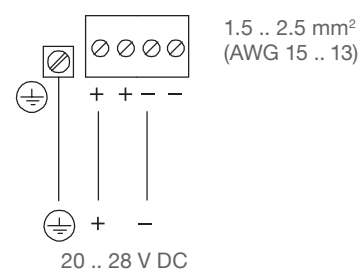
### Power supply and Signal input/ output

#### Power supply

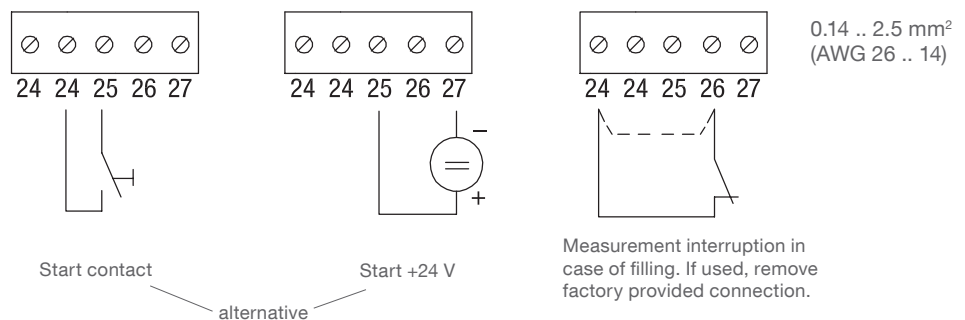
##### AC version



##### DC version

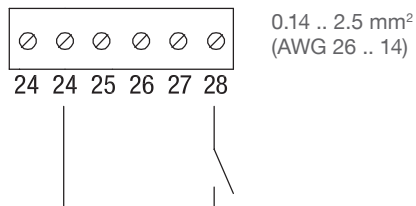


#### Signal input: Start of measurement

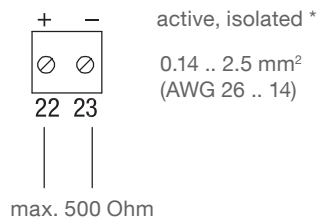


## Electrical installation

**Signal input:  
Full detector**

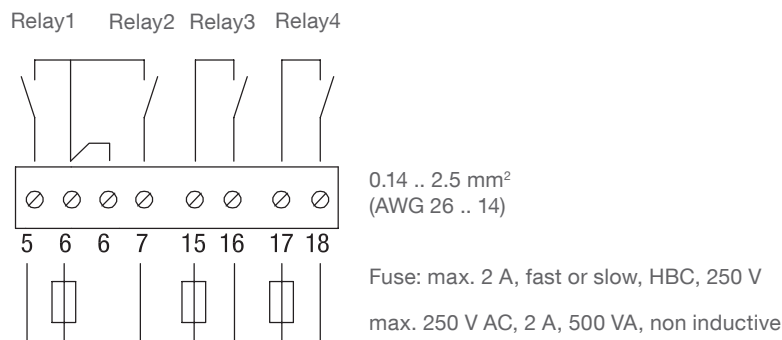


**Signal output:  
0/4-20 mA**

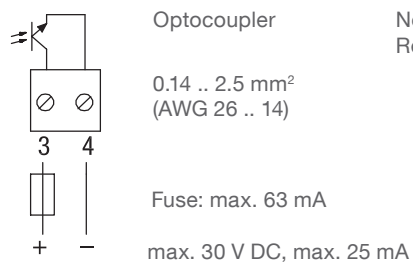


**\* CAUTION:**  
If connecting to a PLC with isolated (floating) 4-20 mA input, the "-" line must be connected to ground of the PLC. See user manual of the PLC.

**Signal output:  
Relay**



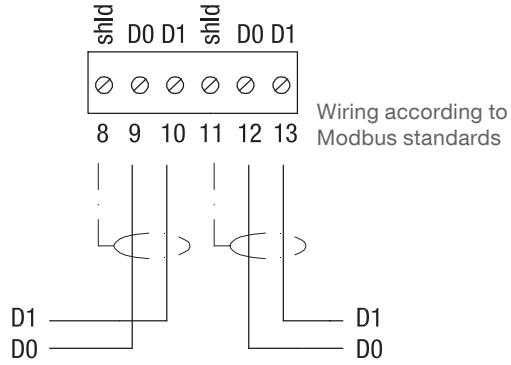
**Signal output:  
Electronic counting  
pulse**



**Note:**  
Reset pulse is done with Relay 2

## Electrical installation

### Modbus network



### Profibus DP network

