

## Table of contents

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	Page
Overview	2
-----	
Specifications	3
-----	
Applications	4
-----	
NB 3000                      Solids measurement	6
-----	
NB 3000                      Interface measurement (solids in water)	8
-----	
Accessories	10
-----	
Dimensions	11
-----	
Spare parts	14
-----	
Electrical installation	16

Subject to change.

All dimensions in mm (inches).

All prices in Euro, excluding VAT.

All prices are EXW Betzigau, excluding packaging costs.

Valid: From 01.04.2017 until 31.03.2018, unless otherwise agreed.

By publishing this selection list all other lists become invalid.

We assume no liability for typing errors.

Different variations to those specified are possible. Please contact our technical consultants.

## 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 50m (164ft)
- 1 1/2" 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 0/4-20mA / Modbus / Profibus DP / counting pulses
- Programmable Relais (can be used as level limit switch outputs)

### Solids measurement

### Interface measurement



**NB 3100**  
 Rope version  
 (fig. with process connection thread and stainless steel weight)



**NB 3200**  
 Tape version  
 (fig. with process connection thread and stainless steel weight)



**NB 3300**  
 Rope version



**NB 3400**  
 Tape version

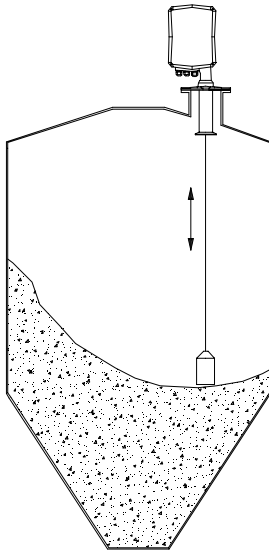
## Specifications

				NB 3100 / 3200 Solids measurement	NB 3300 / 3400 Interface measurement	
<b>Process</b>	Measurement range	Rope version	30m (98.4ft)	•	•	
		Tape version	40m (131ft)/50m (164ft)	•	•	
	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 .. +1.7bar (-7.3 .. +25psi)	•	•	
<b>Electronics</b>	Power supply	AC version	98 .. 253V 50-60Hz	•	•	
		DC version	20-28V	•	•	
	Output		0/4-20mA		•	•
			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	•	•	

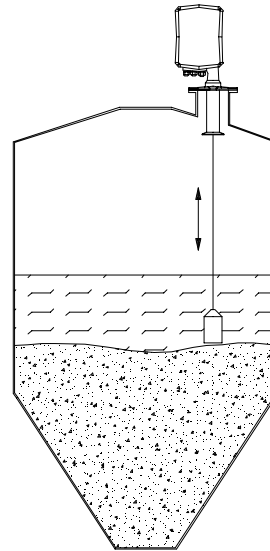
## Applications

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**Solids measurement**



**Interface measurement**  
(solids in water)

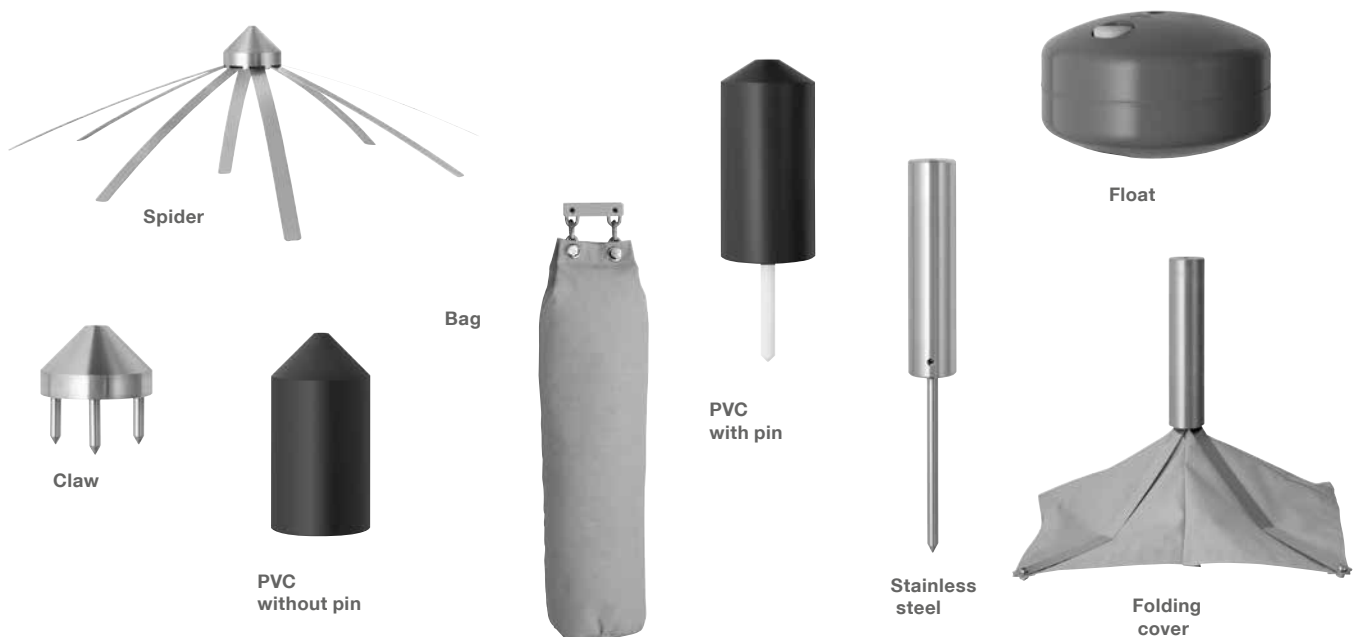


## Applications

### 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		
						1 1/2"	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.					

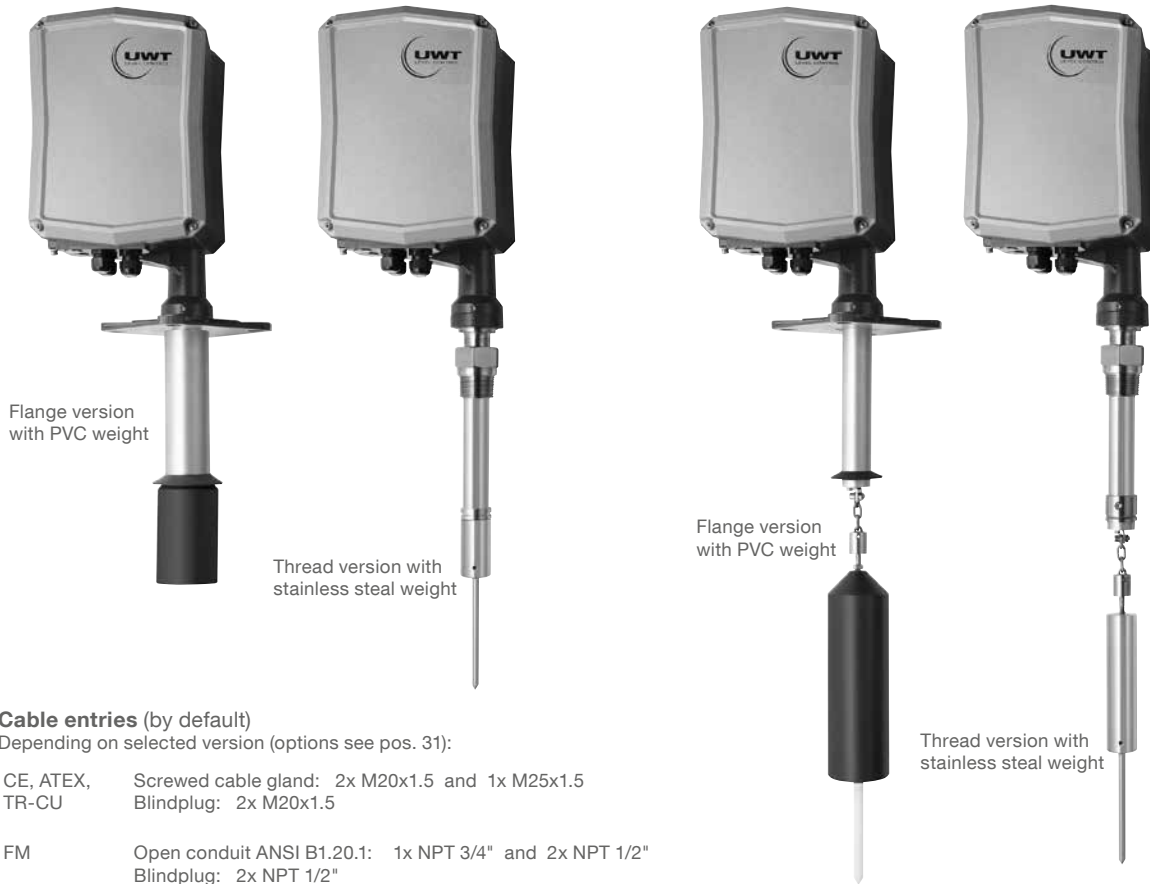
\* The above mentioned data is a guideline and is valid for material which has settled after filling. During the filling the bulk density can change (e. g. for fluidised material).



## Solids measurement

**NB 3100**  
Rope version

**NB 3200**  
Tape version



**Cable entries** (by default)

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

- CE, ATEX, TR-CU      Screwed cable gland: 2x M20x1.5 and 1x M25x1.5  
                          Blindplug: 2x M20x1.5
- FM                    Open conduit ANSI B1.20.1: 1x NPT 3/4" and 2x NPT 1/2"  
                          Blindplug: 2x NPT 1/2"

**Dimensions** see page 12

pos. 1	<b>Basic type</b> C <b>NB 3100</b> Rope version (30m) ..... D <b>NB 3200</b> Tape version (40m) .....	• •
pos. 2	<b>Certificate</b> 0 CE <sup>(1)</sup> ..... W ATEX II 1/2 D ..... M FM general purpose ..... N FM Class II, III Div.1 Group E-G ..... E TR-CU Ex ta/tb IIIC T! Da/Db X .....	• • • • •
pos. 3	<b>Process temperature</b> A max. + 80°C (176°F) ..... S max. +150°C (302°F) ..... T max. +250°C (482°F) .....	• • •
pos. 4	<b>Power supply</b> 1 98 .. 253V 50-60Hz ..... 3 20 .. 28V DC .....	• •
pos. 5	<b>Signal output</b> D 0/4-20mA Modbus Relay counting pulse (5cm 10cm 1/6ft 1/3ft) ..... B 0/4-20mA Modbus Electronic counting pulse (1cm 2.5cm 1/20ft 1/10ft) ..... E 0/4-20mA Profibus DP Relay counting pulse (5cm 10cm 1/6ft 1/3ft) .....	• • •
pos. 6	<b>Process connection</b> X Flange DN100 PN16 (EN1092-1) and flange 4" 150lbs ANSI B16.5 (unit is fitting to this flange) ..... Y Flange 2" and flange 3" 150lbs ANSI B16.5 (unit is fitting to this flange) ..... A Thread R1½" tapered DIN 2999 ..... B Thread NPT1½" tapered ANSI B1.20.1 ..... C Thread NPT 3" tapered ANSI B1.20.1 .....	• • • • •

## Solids measurement

pos. 7	<b>Motor for high measurement frequency <sup>(1)</sup></b>	
	1 Standard .....	•
	2 Brushless motor <sup>(2)</sup> .....	•
pos. 8	<b>Sensor weight <sup>(3,4)</sup></b>	
	Y without <sup>(5)</sup> .....	•
	A PVC without pin only with rope version pos.1 C, max. 80°C .....	•
	B PVC with pin max. 80°C .....	•
	C Stainl. steel .....	•
	D Claw stainless steel .....	•
	E Folding cover max. 80°C, stainless steel, PA canvas .....	•
	F Spider stainless steel .....	•
	G Bag max. 80°C, PA canvas .....	•
	H Float max. 80°C, PP .....	•

<b>NB 3..00</b>										← <b>Order code</b>
Position	1	2	3	4	5	6	7	8		

All positions are available in special design (use code "Z").

- (1) TR-CU (Ordinary Locations) included
- (2) Motor with increased service life
- (3) For use in Hazardous Locations (Dust Ex): It must be ensured, that no static discharge from the material surface can occur. Sensor weights, which can be used in case of possible static discharge, on request.
- (4) See Sensor weight guide on page 5
- (5) Including mounting set for sensor weight (see page 14: Sensor weights)

## Options

pos. 11	x <b>Guarantee extension to 5 years</b> .....	•
	Wear and tear parts rope/tape and standard motor pos. 7 1 not included	
pos. 21	<b>Weather protection cover</b> .....	•
	For Ex only approved for Zone 22 or Division 2	
pos. 23	<b>Measurement range 50m</b> .....	•
	Available with tape version pos.1 D, not with sensor weight pos.8 G,H	
pos. 25	<b>Window in lid and external start button</b> .....	•
pos. 26	<b>Internal heater</b> .....	•
	Needed for: ambient temp. <-20°C (-4°F) or condense water inside silo or wet process atmosphere (Note: <-20°C (-4°F) with ATEX, FM Class II or TR-CU possible on request)	
pos. 27	<b>Length of socket pipe</b>	
	A 500mm (19.7") .....	•
	B 1000mm (39.4") .....	•
pos. 28	<b>Compressed air connector</b> .....	•
	Quick coupling including counter part, for hose diameter 9mm (0,35")	
pos. 29	<b>Increased corrosion resistance</b> .....	•
	All metal parts on process side coated, rope with plastic coating, use of stainless steel bearings Available with: Rope version (pos.1 C), CE or FM gen.purp. (pos.2 0,M), 80°C (pos.3 A), PVC weight (pos.8 A,B)	
pos. 30	<b>Increased process overpressure</b> .....	•
	-0.5 to 1.7bar (-7.3 to 25psi) (for CE and ATEX, Pos.2 0,W) -0.5 to 1.1bar (-7.3 to 16psi) (for FM general purpose, pos.2 M)	
pos. 31	<b>Cable entry</b>	
	Selection of the following options only necessary, if a deviation from the default cable gland / conduit is required:	
	0 Screwed cable gland 1x M25x1,5 + 2x M20x1,5 + blindplug 2x M20x1,5 .....	•
	A Conduit 1x NPT¾" + 2x NPT½" + blindplug 2x NPT½" .....	•
pos. 33	<b>Preset fieldbus address (Modbus)</b> .....	•
	Enables easy commissioning with Nivotec Level Monitoring System Preset from address = "1" to "amount of ordered units". Address label on enclosure. Termination resistor set on unit with highest address.	

## Interface measurement (solids in water)

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### **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,           Screwed cable gland: 2x M20x1.5 and 1x M25x1.5  
TR-CU               Blindplug: 2x M20x1.5

FM                    Open conduit ANSI B1.20.1: 1x NPT $\frac{3}{4}$ " and 2x NPT $\frac{1}{2}$ "  
Blindplug: 2x NPT $\frac{1}{2}$ "

**Dimensions** see page 12



## Interface measurement (solids in water)

pos. 1	<b>Basic unit</b>								
	E	<b>NB 3300</b>	Rope version (30m) incl. sensor weight	.....					•
	F	<b>NB 3400</b>	Tape version (40m) incl. sensor weight	.....					•
pos. 2		<b>Certificate</b>							
	0	CE <sup>(1)</sup>	.....						•
	W	ATEX II 1/2 D	.....						•
	M	FM general purpose	.....						•
	N	FM Class II, III Div.1 Group E-G	.....						•
	E	TR-CU Ex ta/tb IIIC T! Da/Db X	.....						•
pos. 4		<b>Power supply</b>							
	1	98 .. 253V 50-60Hz	.....						•
	3	20 .. 28V DC	.....						•
pos. 5		<b>Signal output</b>							
	D	0/4-20mA Modbus Relay counting pulse (5cm 10cm 1/6ft 1/3ft)	.....						•
	B	0/4-20mA Modbus Electronic counting pulse (1cm 2.5cm 1/20ft 1/10ft)	.....						•
	E	0/4-20mA Profibus DP Relay counting pulse (5cm 10cm 1/6ft 1/3ft)	.....						•
pos. 6		<b>Process connection</b>							
	X	Flange DN100 PN16, EN1092-1 and flange 4" 150lbs ANSI B16.5 (unit is fitting to this flange)	.....						•
pos. 7		<b>Motor for high measurement frequency</b>							
	1	Standard	.....						•
	2	Brushless motor <sup>(2)</sup>	.....						•

<b>NB 3..00</b>			<b>A</b>			<b>X</b>		<b>1</b>	← <b>Order code</b>
Basic type	1	2	3	4	5	6	7	8	

All positions are available in special design (use code "Z").

<sup>(1)</sup> TR-CU (Ordinary Locations) included

<sup>(2)</sup> Motor with increased service life

### Options

pos. 11	x	<b>Warranty extension to 5 years</b>	.....						•
		Wear and tear parts rope/tape and standard motor pos.7 1 not included							
pos. 21		<b>Weather protection cover</b>	.....						•
		For Ex only approved for Zone 22 or Division 2							
pos. 25		<b>Window in lid and external start button</b>	.....						•
pos. 27		<b>Length of socket pipe</b>							
	A	500mm (19.7")	.....						•
	B	1000mm (39.4")	.....						•
pos. 28		<b>Compressed air connector</b>	.....						•
		Quick coupling including counter part, for hose diameter 9mm (0,35")							
pos. 29		<b>Increased corrosion resistance</b>	.....						•
		All metal parts on process side coated, rope with plastic coating, use of stainless steel bearings Available with rope version (pos.1 E)							
pos. 30		<b>Increased process overpressure</b>	.....						•
		-0.5 to 1.7bar (-7.3 to 25psi) (for CE, pos.2 0) -0.5 to 1.1bar (-7.3 to 16psi) (for FM general purpose, pos.2 M)							
pos. 31		<b>Cable entry</b>							
		Selection of the following options only necessary, if a deviation from the default cable gland / conduit is required:							
	0	Screwed cable gland 1x M25x1,5 + 2x M20x1,5 + blindplug 2x M20x1,5	.....						•
	A	Conduit 1x NPT 3/4"+ 2x NPT 1/2" + blindplug 2x NPT 1/2"	.....						•
pos. 33		<b>Preset fieldbus address (Modbus)</b>	.....						•
		Enables easy commissioning with Nivotec Level Monitoring System. Preset from address = "1" to "amount of ordered units". Address label on enclosure. Termination resistor set on unit with highest address.							

## Accessories

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### Mounting Kit

Bolts, washers and nuts for mounting the unit on a flange

	material	bolts	washers	nuts
zu107000	stainless steel / A2	4 pieces M16x60	8 pieces	4 pieces .....

### Flange sealings

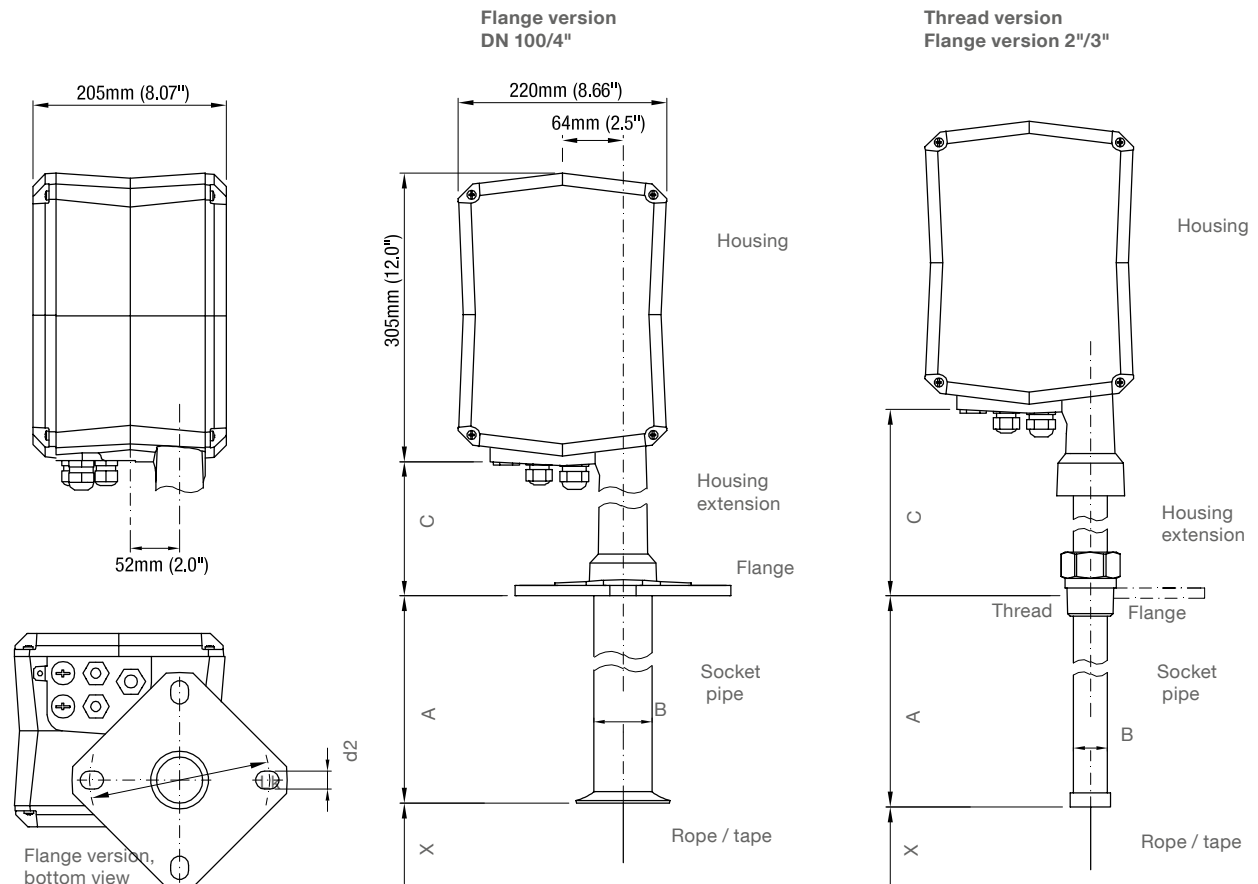
Sealings for mounting the unit on a flange.

Material: neoprene (85°C), temperature resistive plastic AFM30 (250°C)

	suitable for flanges	max. temp.	suitable mounting kit
di300125	DN100 PN16 / 4"	+85°C (185°F)	zu107000 .....
di300108	DN100 PN16 / 4"	+250°C (482°F)	zu107000 .....
di300127	2" / 3" 150lbs	+85°C (185°F)	zu107000 .....
di300128	2" / 3" 150lbs	+250°C (482°F)	zu107000 .....

## Dimensions

### Basic type



### Dimensions

<b>X</b> = Length to bottom of sensor weight (in upper stop position): see next page
---

<b>A</b> = Length of socket pipe
200mm (7.9") Optional 500mm (19.7") / 1000mm (39.4")

<b>B</b> = Diameter of socket pipe	
Rope version with Flange DN100 / 4"	ø60mm (2.36")
All other versions	ø40mm (1.57")

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

<b>Rope</b>	ø1,0mm (0.04")
<b>Tape</b>	12x0.2mm (0.47x0.008")

Flanges	
fitting to: DN100 PN16 / 4" 150lbs	Lk = ø180-190.5mm (7.1-7.5") slot d2 = ø19mm (0.75")
fitting to: 2" / 3" 150lbs	Lk = ø120.7-152.4mm (4.75-6.0") slot d2 = ø19mm (0.75")

### Materials

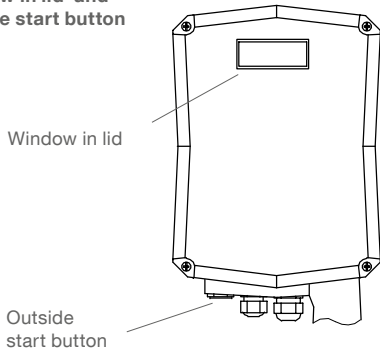
<b>Housing outside</b>	Aluminium, powder coated
<b>Housing inside</b>	Aluminium
<b>Housing extension</b>	Aluminium, powder coated or 1.4305 (303)
<b>Flange</b>	80°C / 150°C: Aluminium, powder coated 250°C: 1.4305 (303)
<b>Thread</b>	1.4301 (304)
<b>Socket pipe</b>	Flange version DN 100/4", 80°C / 150°C: 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.

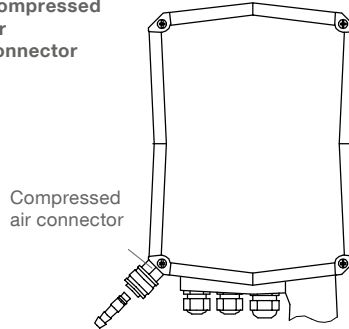
## Dimensions

### Options and Accessories

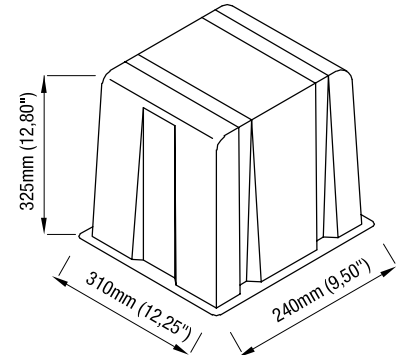
Pos. 25  
 Window in lid and  
 outside start button



Pos. 28  
 Compressed  
 air  
 connector



Pos. 21  
 Weather protection cover

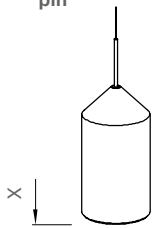


### Sensor weights

#### Solids measurement: Rope version

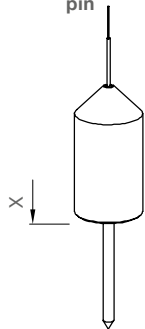
All weights ca. 1,0kg (2.2lbs)

PVC without  
 pin



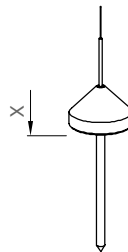
Ø81mm (3,2")  
 X = 137mm (5,4")  
 Material: PVC

PVC with  
 pin

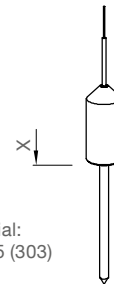


Ø81mm (3,2")  
 X = 137mm (5,4")  
 Pin: 130mm (5,1")  
 Material: PVC (pin POM)

Stainless steel



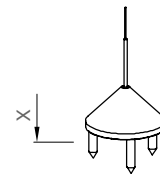
Version with  
 Flange DN100 / 4"  
 Ø75mm (3,0")  
 X = 25mm (1,0")  
 Pin: 130mm (5,1")



Material:  
 1.4305 (303)

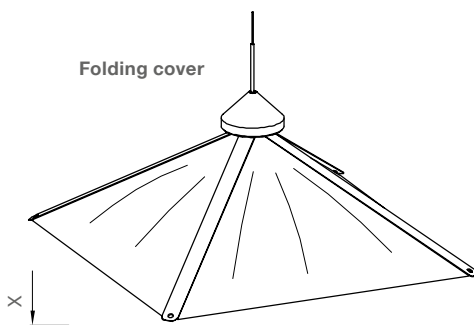
All other versions  
 Ø42mm (Ø 1,65")  
 X = 81mm (3,19")  
 Pin: 130mm (5,1")

Claw



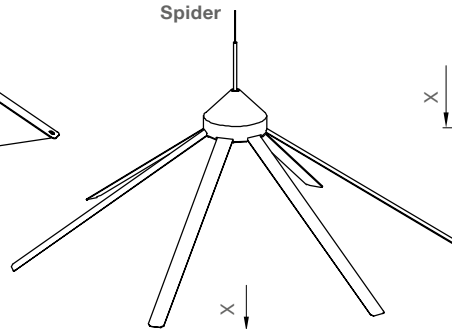
Ø95 (3,7")  
 X = 71mm (2,80")  
 Material: 1.4305 (303)

Folding cover



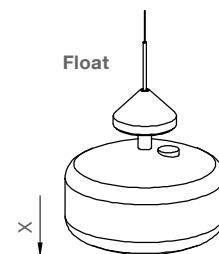
380x380mm (15x15")  
 X = 150mm (5,9")  
 Material: 1.4310 (301)/1.4305 (303)  
 PA canvas

Spider



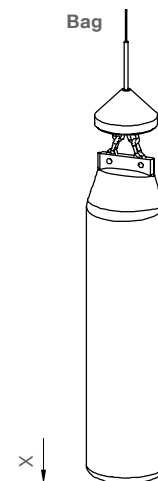
Ø600mm (23,6")  
 X = 160mm (6,3")  
 Material: 1.4301 (304)/1.4305 (303)  
 1.4310 (301)

Float



Ø190mm (7,5")  
 X = 175mm (6,9")  
 Material: Float PP,  
 Cone: aluminium

Bag

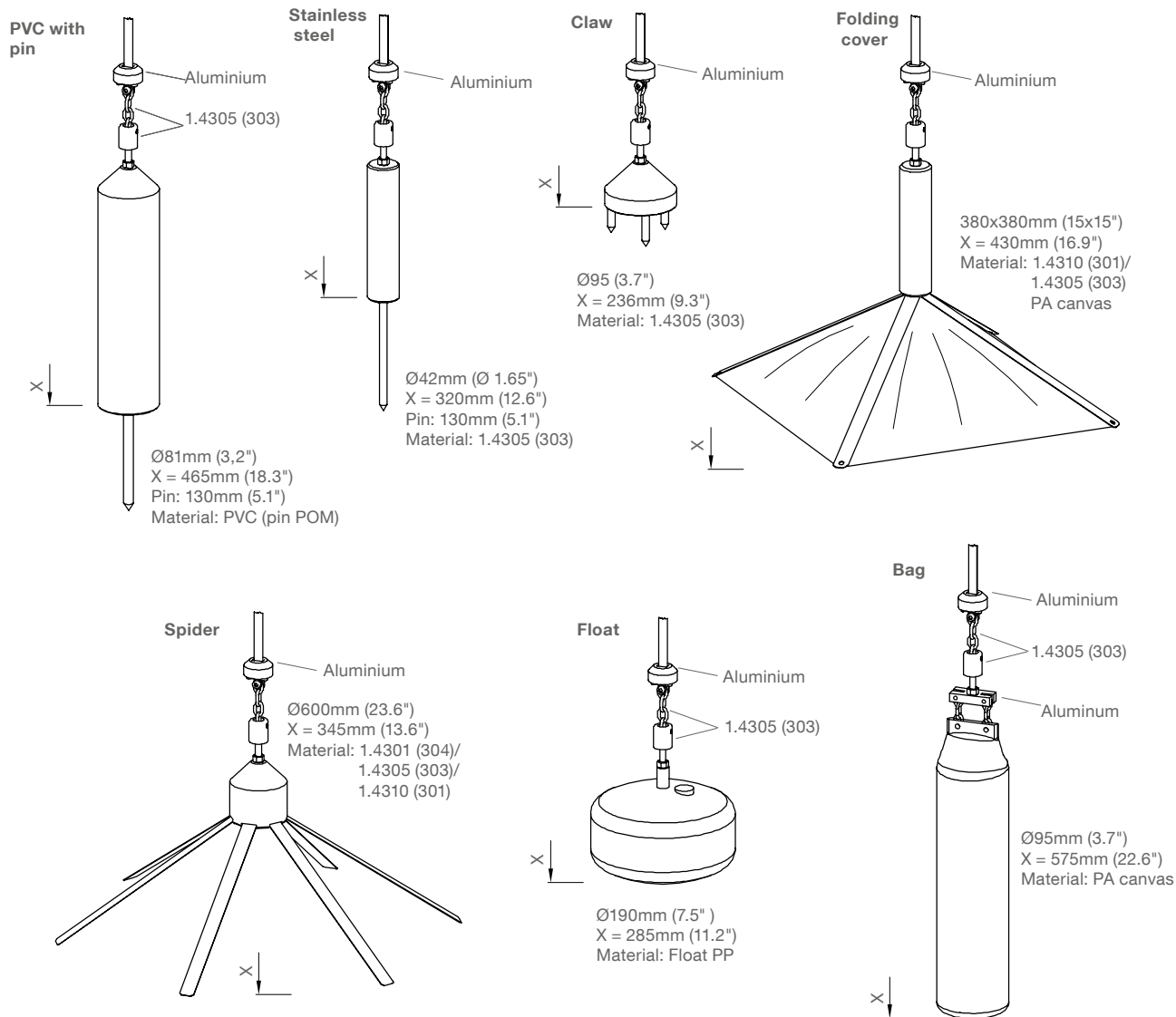


Ø95mm (3,7")  
 X = 460mm (18,1")  
 Material: PA canvas,  
 Chain: 1.4305 (303)  
 Cone: aluminium

## Dimensions

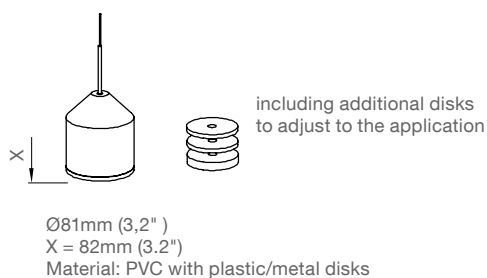
### Solids measurement: Tape version

All weights ca. 2.1kg (4.6lbs)



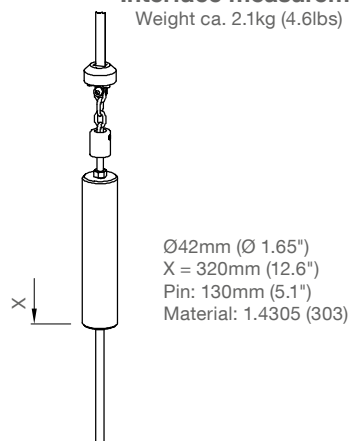
### Interface measurement: Rope version

Weight ca. 1,0kg (2.2lbs)



### Interface measurement: Tape version

Weight ca. 2.1kg (4.6lbs)



## Spare parts

### Rope roller

<b>sl102243</b>	Rope roller with 30m rope (13mm* rope chamber) Process temperature max. 80°C .....	•
<b>sl102240</b>	Rope roller with 30m rope (33mm* rope chamber) Process temperature max. 80°C .....	•
<b>sl102242</b>	Rope roller with 30m rope for increased corrosion resistance (plastic coated) .....	•

\*For safe function 13mm and 33mm rope chamber must be substituted only by the same type

### Tape roller

<b>sb102240</b>	Tape roller with 40m tape .....	•
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### Sensor weights

All sensor weights are delivered incl. mounting set for proper fixing to the rope/tape and excl. rope/tape

#### Solid measurement

<b>sl102220</b>	Sensor weight for rope	PVC without pin .....	•
<b>sl102221</b>	Sensor weight for rope	PVC with pin .....	•
<b>sl102222</b>	Sensor weight for rope	Stainless steel Ø75mm (3,0") .....	•
<b>sl102228</b>	Sensor weight for rope	Stainless steel Ø42mm (1,65") .....	•
<b>sl102223</b>	Sensor weight for tape	Claw .....	•
<b>sl102224</b>	Sensor weight for rope	Folding cover .....	•
<b>sl102225</b>	Sensor weight for rope	Spider .....	•
<b>sl102226</b>	Sensor weight for rope	Bag .....	•
<b>sl102227</b>	Sensor weight for rope	Float .....	•
<b>sb102221</b>	Sensor weight for tape 40m	PVC with pin .....	•
<b>sb102222</b>	Sensor weight for tape 40m	Stainless steel .....	•
<b>sb102223</b>	Sensor weight for tape 40m	Claw .....	•
<b>sb102224</b>	Sensor weight for tape 40m	Folding cover .....	•
<b>sb102225</b>	Sensor weight for tape 40m	Spider .....	•
<b>sb102226</b>	Sensor weight for tape 40m	Bag .....	•
<b>sb102227</b>	Sensor weight for tape 40m	Float .....	•

#### Interface measurement

<b>sl102230</b>	Sensor weight for rope	PVC with metal core .....	•
<b>sb102230</b>	Sensor weight for tape	Stainless steel .....	•

### Mounting set without sensor weights

<b>sl100270</b>	For rope version 80°C .....	•
<b>zu108030</b>	For tape version .....	•

### Motor

<b>gm102202</b>	Motor standard version .....	•
<b>gm102211</b>	Motor brushless version .....	•

### Electronics

<b>pl102691</b>	Electronics	98 .. 253V 50-60Hz	0/4-20mA	Modbus	Relay counting pulse (5cm 10cm 1/6ft 1/3ft) .....	•
<b>pl102690</b>	Electronics	98 .. 253V 50-60Hz	0/4-20mA	Modbus	Electr. counting pulse (1cm 2.5cm 1/20ft ..1/10ft)	•
<b>pl102692</b>	Electronics	98 .. 253V 50-60Hz	0/4-20mA	Profibus DP	Relay counting pulse (5cm 10cm 1/6ft 1/3ft) .....	•
<b>pl102696</b>	Electronics	20 .. 28V DC	0/4-20mA	Modbus	Relay counting pulse (5cm 10cm 1/6ft 1/3ft) .....	•
<b>pl102695</b>	Electronics	20 .. 28V DC	0/4-20mA	Modbus	Electr. counting pulse (1cm 2.5cm 1/20ft 1/10ft) ...	•
<b>pl102697</b>	Electronics	20 .. 28V DC	0/4-20mA	Profibus DP	Relay counting pulse (5cm 10cm 1/6ft 1/3ft) .....	•

**Required information:** Rope or Tape version. Evt. further menu presettings.

### Internal Heater

<b>em100372</b>	220 Ohms	For power supply 98 .. 253V 50-60Hz .....	•
<b>em100371</b>	8 Ohms	For power supply 20 .. 28V DC .....	•

### Weather protection cover

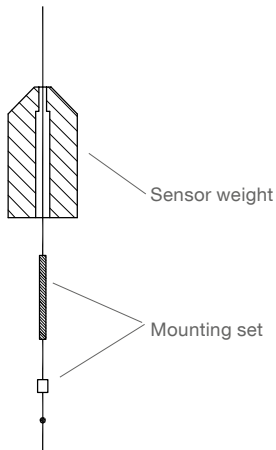
<b>zu400215</b>	.....	•
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## Spare parts

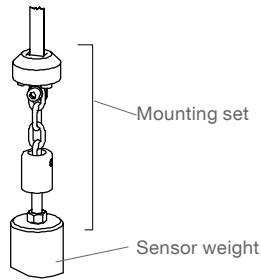
### Sensor weights/ Mounting set

All sensor weights are delivered including stated parts for proper fixing to the rope / tape

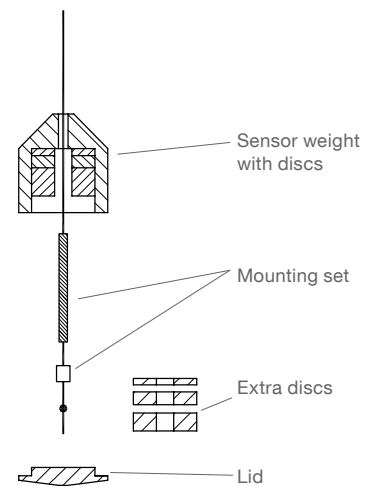
#### Solids measurement: rope version



#### Solids measurement: tape version Interface measurement: tape version

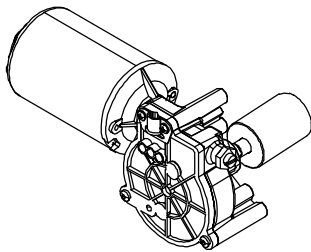


#### Interface measurement: rope version

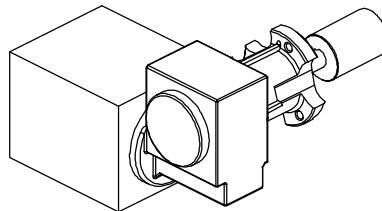


### Motor

#### Standard

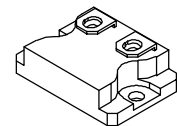


#### Brushless motor



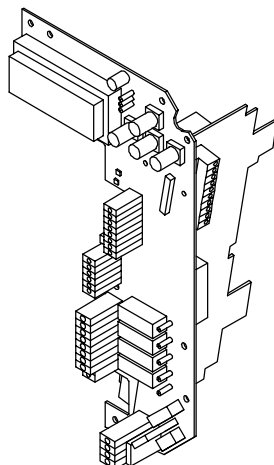
Delivery including: cable, plug, sealing, mounting tools

### Heater

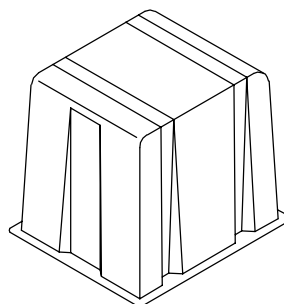


Delivery including cable and plug

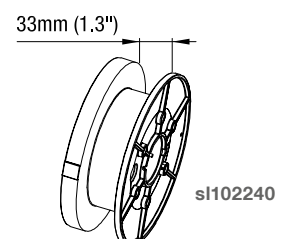
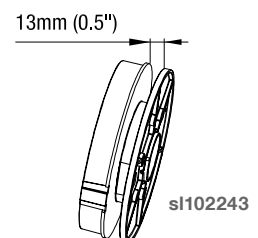
### Electronics



### Weather protection cover

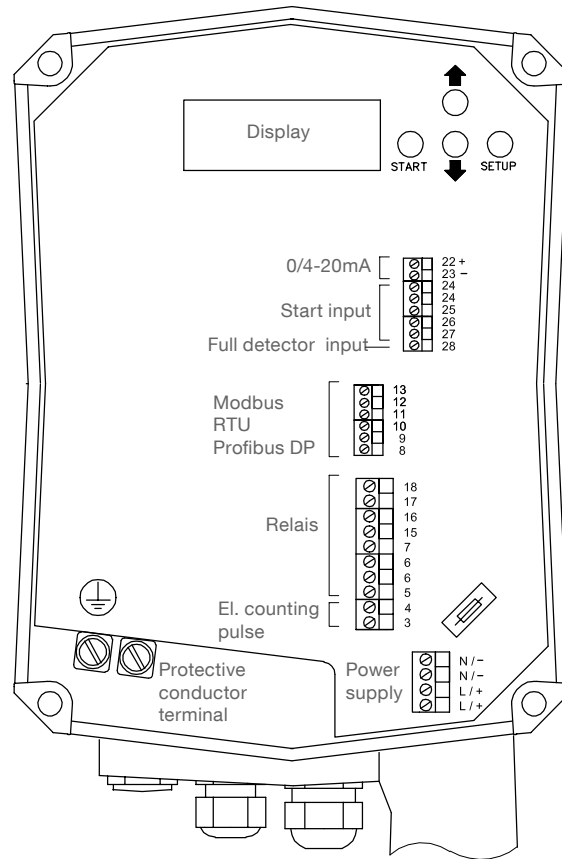


### Rope roller



## Electrical installation

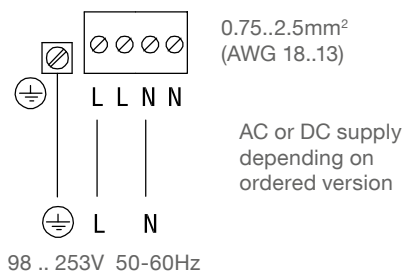
### Terminal location



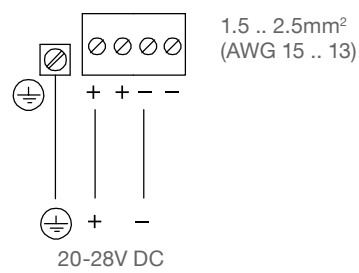
### Power supply and Signal input /output

#### Power supply

#### AC version

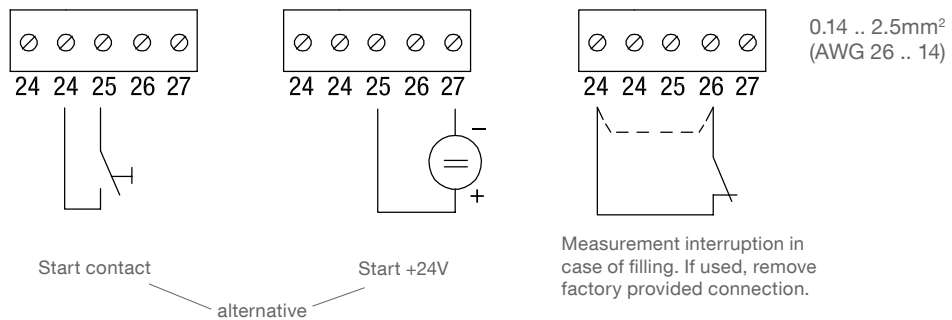


#### DC version



#### Signal input:

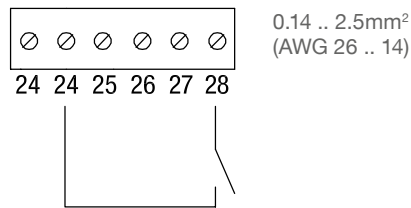
#### Start of measurement



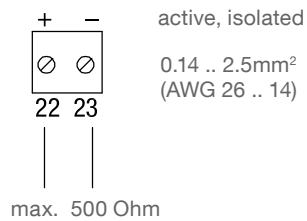


## Electrical installation

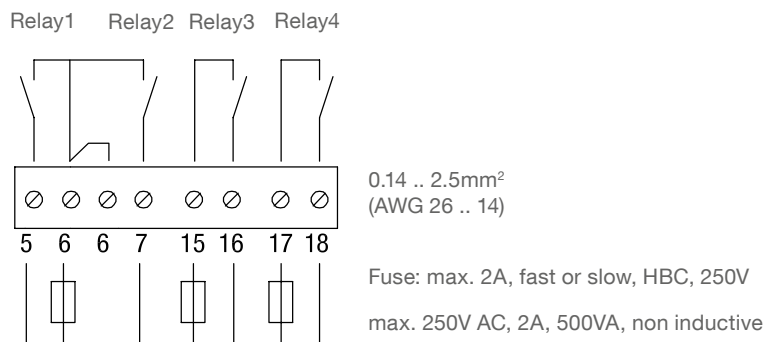
**Signal input:**  
**Full detector**



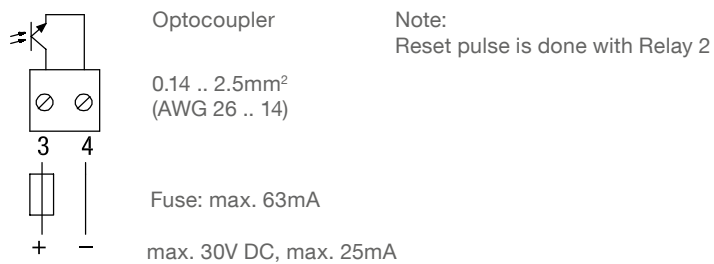
**Signal output:**  
**0/4-20mA**



**Signal output:**  
**Relay**

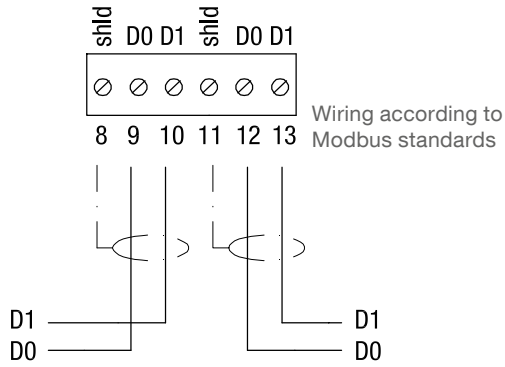


**Signal output:**  
**Electronic counting pulse**



## Electrical installation

### Modbus network



### Profibus DP network

