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Subject to change.

All dimensions in mm (inches).

All prices in Euro, excluding VAT.

All prices are EXW Betzigau, excluding packaging costs.

Valid: From 01.04.2011 until 31.03.2012, 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

#### Mechanics

- Measurement range upto 40m (133ft)
- 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



**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)

### Interface measurement



**NB 3300**  
Rope version

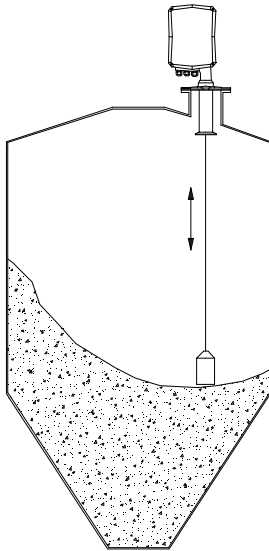
**NB 3400**  
Tape version

## Specifications

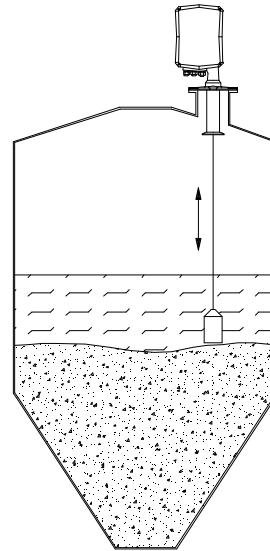
				NB 3100 / 3200 Solids measurement	NB 3300 / 3400 Interface measurement
<b>Process</b>	Measurement range	Rope version	30m (98.4ft)	•	•
		Tape version	40m (131ft)	•	•
	Process temperature		80°C (176°F)	•	•
			150°C (302°F)	•	
		250°C (482°F)	•		
	Process overpressure		-0,3 .. +0,3 bar (-4.35 .. + 4.35 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>Certificate</b>	Dust Ex		ATEX 1/2D	•	
			FM Cl. II, III Div. 1	•	
			GOST-R Ex und RTN Ex	•	
		General purpose		CE, FM	•

## Applications

**Solids measurement**



**Interface measurement  
(solids in water)**

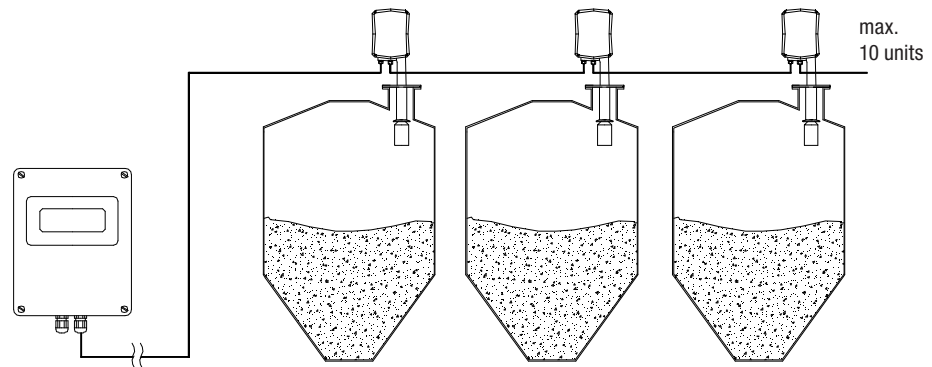


**Remote box NB 9000**

Connecting Nivobob units  
with Modbus RTU network

Features:

- Programming of the Nivobob units
- Display of level
- Start of measurement
- Display of diagnostics information

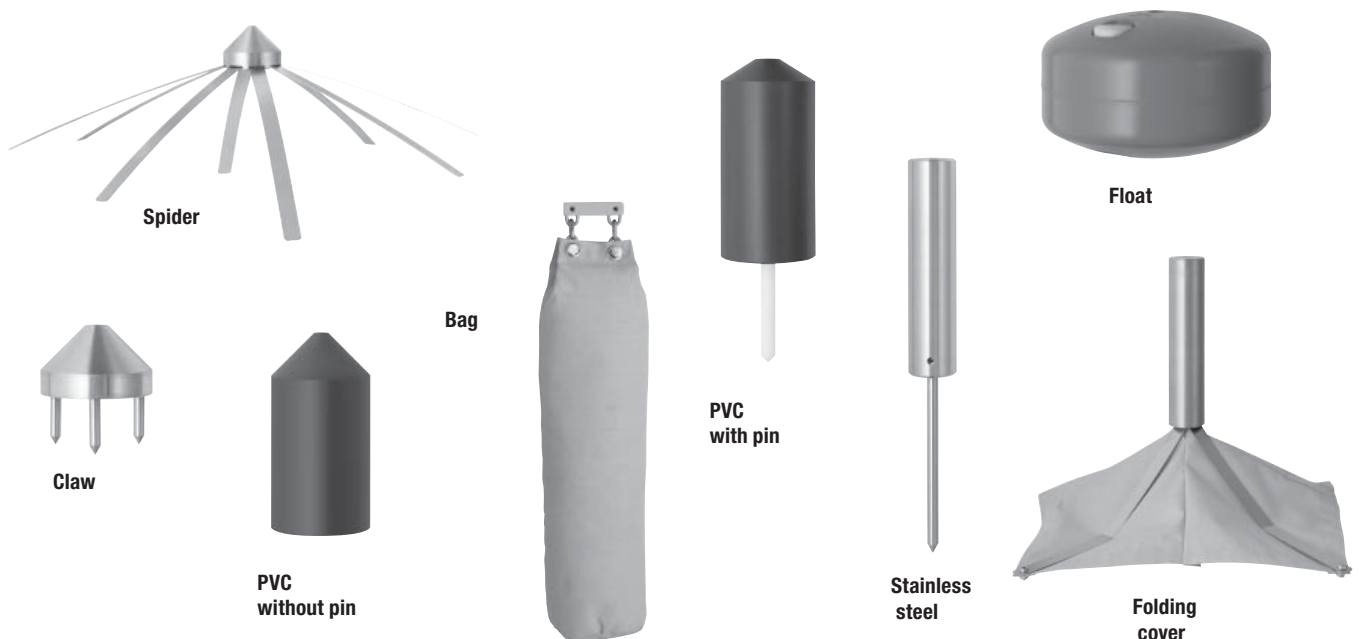


## Applications

### 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.					

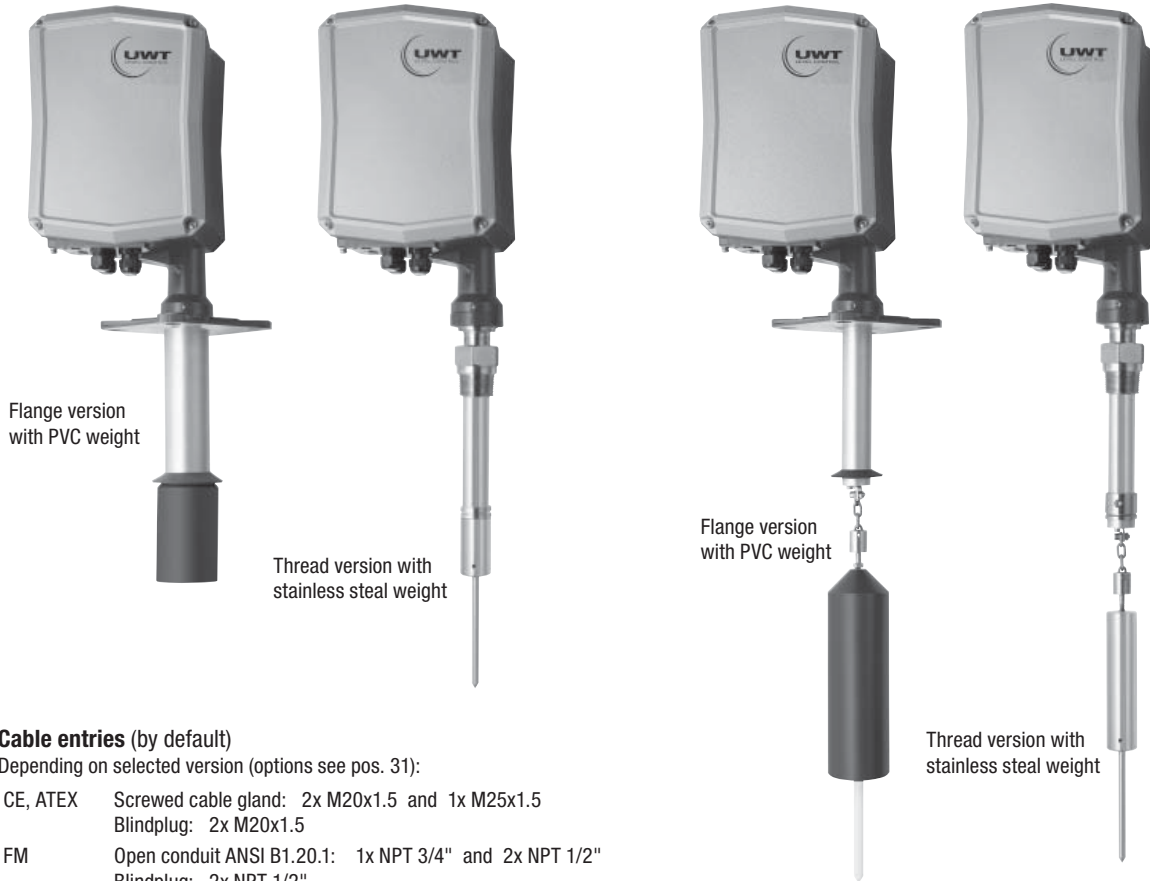
\* The above mentioned data is a guideline and is valid for material which has settled after filling. During the filling the bulk density can change (e. g. for fluidised material).



## Solids measurement

**NB 3100**  
 Rope version

**NB 3200**  
 Tape version



**Cable entries** (by default)

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

- CE, ATEX    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 P12

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>	O CE .....	
		W ATEX II 1/2 D .....	
		M FM general purpose .....	
		N FM Class II, III Div.1 Group E-G .....	
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) .....	



## 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  
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

## Interface measurement (solids in water)

- pos. 1      **Grundgerät**  
 E **NB 3300** Rope version (30m) incl. sensor weight .....
- F **NB 3400** Tape version (40m) incl. sensor weight .....
- pos. 2      **Certificate**  
 O CE .....
- M FM general purpose .....
- pos. 4      **Power supply**  
 1 98 .. 253V 50-60Hz .....
- 3 20 .. 28V DC .....
- pos. 5      **Signal output**  
 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      **Process connection**  
 X Flange DN100 PN16, EN1092-1 and flange 4" 150lbs ANSI B16.5 (unit is fitting to this flange) .....
- pos. 7      **Motor for high measurement frequency <sup>(1)</sup>**  
 1 standard .....
- 2 brushless motor .....

<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> Motor with increased service life

## Options

- pos. 25      **Window in lid and external start button** .....
- pos. 27      **Length of socket pipe**  
 A 500mm (19.7") .....
- B 1000mm (39.4") .....
- pos. 28      **Compressed air connector** .....
- Quick coupling including counter part, for hose diameter 9mm (0,35")
- pos. 29      **Increased corrosion resistance** .....
- 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      **Increased process overpressure** .....
- 0.5 to 1.7bar (-7.3 to 25psi) (for CE, pos.2 O)  
 -0.5 to 1.1bar (-7.3 to 16psi) (for FM general purpose, pos.2 M)
- pos. 31      **Cable entry**  
 Selection of the following options only necessary, if a deviation from the default cable gland / conduit is required:  
 O 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      **Preset fieldbus address (Modbus)** .....
- Enables easy commissioning with Remote Box NB 9000  
 Preset from address = "1" to "amount of ordered units". Address label on enclosure.  
 Termination resistor set on unit with highest address.

## Accessories

### NB 9000 Remote box

Connecting up to 10 units with Modbus RTU network

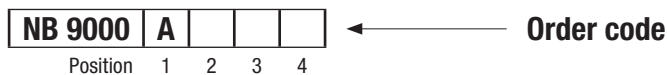
**Features:**

- Programming of the Nivobob units
- Display of level
- Start of measurement
- Display of diagnostics information



**NB 9000**  
**Panel mounting**

- pos. 1      **Basic Type**  
 A **NB 9000** .....
  
- pos. 2      **Language**
  - 1 German            (Display in meter) .....
  - 2 English           (Display in meter) .....
  - 4 English           (Display in feet) .....
  - 3 French            (Display in meter) .....
  
- pos. 3      **Mounting**
  - A Panel mounting .....
  - B Wall mounting with enclosure .....
  
- pos. 4      **Power supply**
  - 1 24V DC .....
  - 2 85 .. 264V 50-60Hz .....

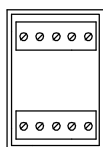


All positions are available in special design (use code "Z").

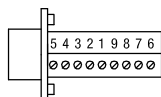
### NB 9000 Panel mounting

**Included parts**  
 For easy installation and proper functioning of the Modbus network

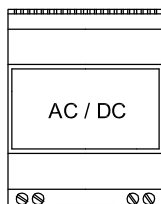
**Biasing network**  
 (with Termination resistor)



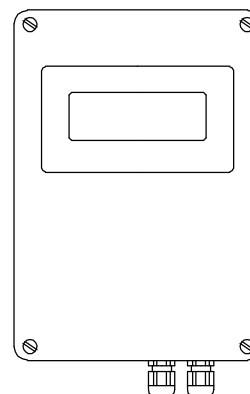
**Terminal Plug**  
 Supplies screwing terminals for connection between NB 9000 panel and Biasing network



**AC/DC converter**  
 (for pos.4 2)



### NB 9000 Wall mounting



Material: PC (fibre glas reinforced)  
 Biasing network implemented.  
 AC/DC converter (for pos.4 2) implemented

## Accessories

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### Extension cables

For connecting the NB 9000 Remote box or for building a Modbus network

#### Shielded cable

Functionality up to 50m (164ft).

**em300515** price/meter .....

#### Twisted pair cable

Functionality up to 1000m (3270ft).

**em300516** price/meter .....

#### Protection hose

For installation of Modbus cable in ATEX Zone 21

**em300529** price/meter .....

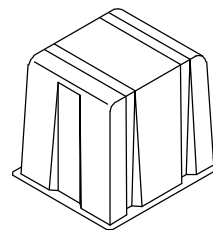
#### Threaded hose coupling

With thread M20 x 1,5. Fitting with protection hose em300529. Applicable for ATEX Zone 21.

**em100530** price/meter .....

### Weather protection cover

For Ex only approved for Zone 22 or Division 2



**zu300215** .....

### Mounting Kit

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

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

### Flange sealings

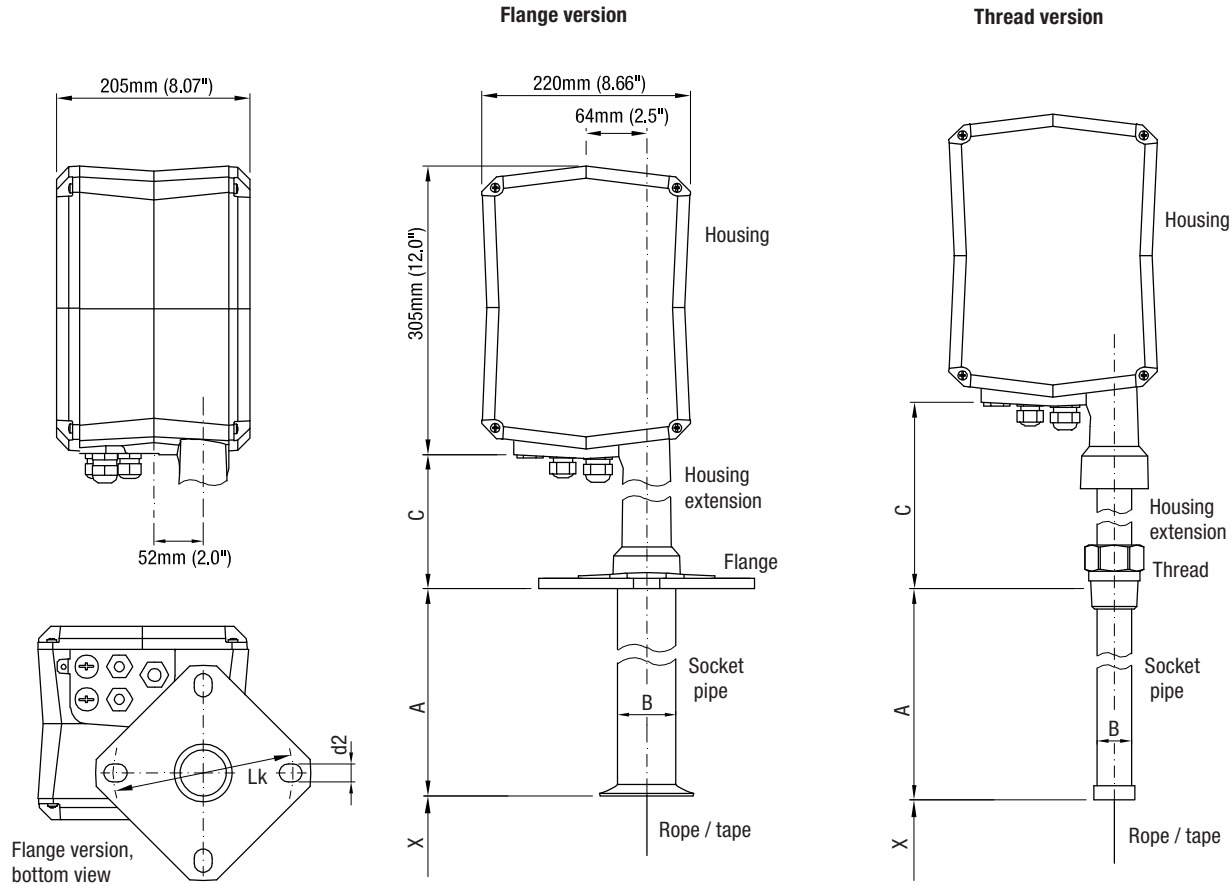
Sealings for mounting the unit on a flange.

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

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

## Dimensions

### Basic type



### Dimensions

**X** = Length to bottom of sensor weight  
 (in upper stop position): see next page

**A** = 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	80°C / 150°C	95mm (3.74")
	250°C	340mm (13.4")
Thread version	80°C / 150°C	160mm (6.3")
	250°C	340mm (13.4")

<b>Rope</b>	ø1,25mm (0.49")
<b>Tape</b>	12x0.2mm (0.47x0.008")

<b>Flanges</b>	
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

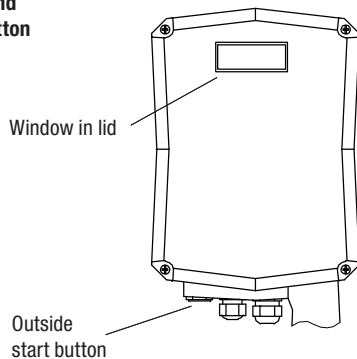
<b>Housing outside</b>	Aluminium, powder coated
<b>Housing inside</b>	Aluminium
<b>Housing extension</b>	Aluminium, powder coated or 1.4305 (303)
<b>Flange</b>	80°C / 150°C: Aluminium, powder coated 250°C: 1.4305 (303)
<b>Thread</b>	1.4301 (304)
<b>Socket pipe</b>	Flange version 80°C / 150°C: Aluminium All other versions: 1.4301 (304)
<b>Rope</b>	1.4301 (304)
<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.

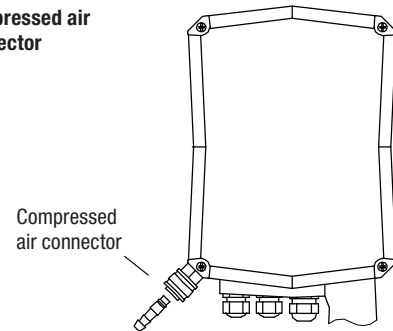
## Dimensions

### Options and Accessories

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



**Pos. 28**  
 Compressed air  
 connector

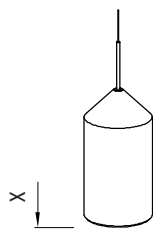


### Sensor weights

#### Solids measurement: Rope version

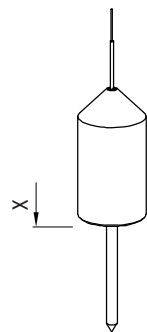
All weights ca. 1,0kg (2.2lbs)

**PVC without pin**



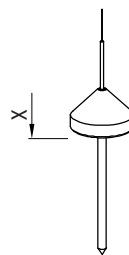
Ø81mm (3,2")  
 X = 137mm (5.4")  
 Material: PVC

**PVC with pin**



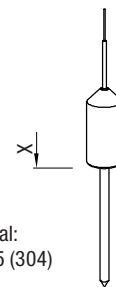
Ø81mm (3,2")  
 X = 137mm (5.4")  
 Pin: 130mm (5.1")  
 Material: PVC (pin POM)

**Stainless steel**



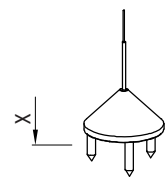
Version with  
 Flange DN100 / 4"  
 Ø75mm (3.0")  
 X = 25mm (1.0")  
 Pin: 130mm (5.1")

Material:  
 1.4305 (304)



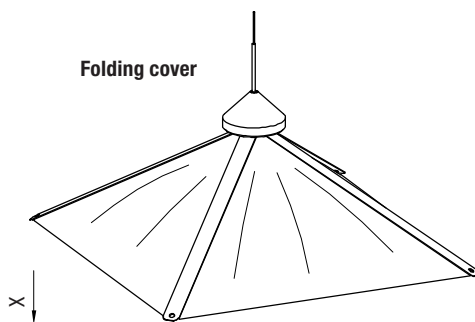
All other versions  
 Ø42mm (Ø 1.65")  
 X = 81mm (3.19")  
 Pin: 130mm (5.1")

**Claw**



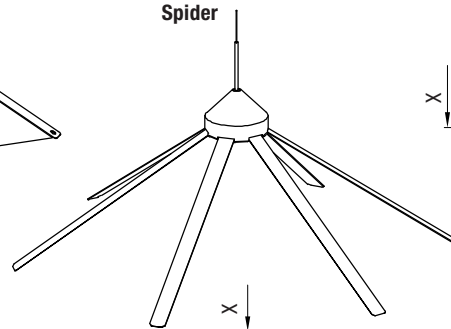
Ø95 (3.7")  
 X = 71mm (2.80")  
 Material: 1.4305 (304)

**Folding cover**



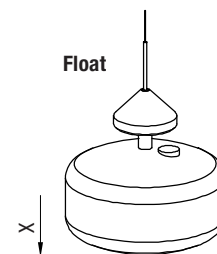
380x380mm (15x15")  
 X = 150mm (5.9")  
 Material: 1.4310 (301)  
 PA canvas

**Spider**



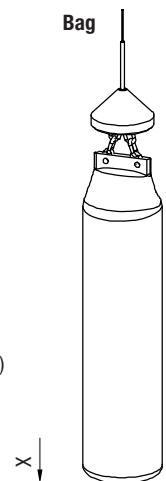
Ø600mm (23.6")  
 X = 160mm (6.3")  
 Material: 1.4301 (304) /  
 1.4310 (301)

**Float**



Ø190mm (7.5")  
 X = 175mm (6.9")  
 Material: Float PP,  
 Cone: 1.4305 (304)

**Bag**

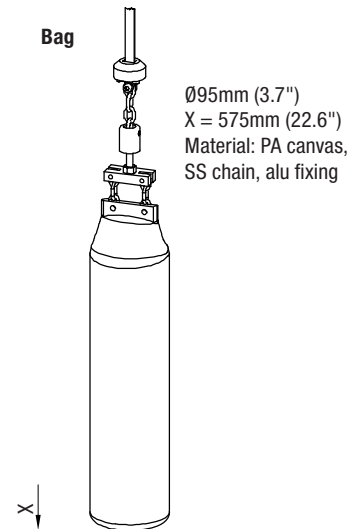
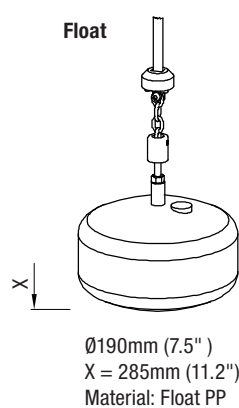
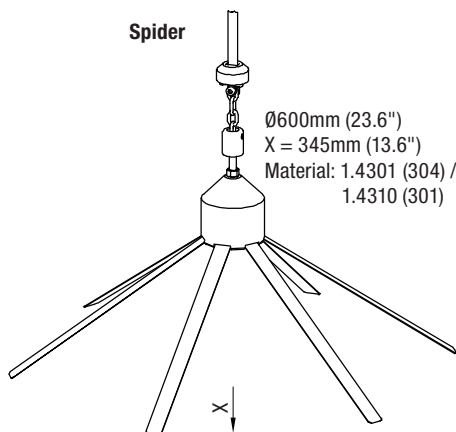
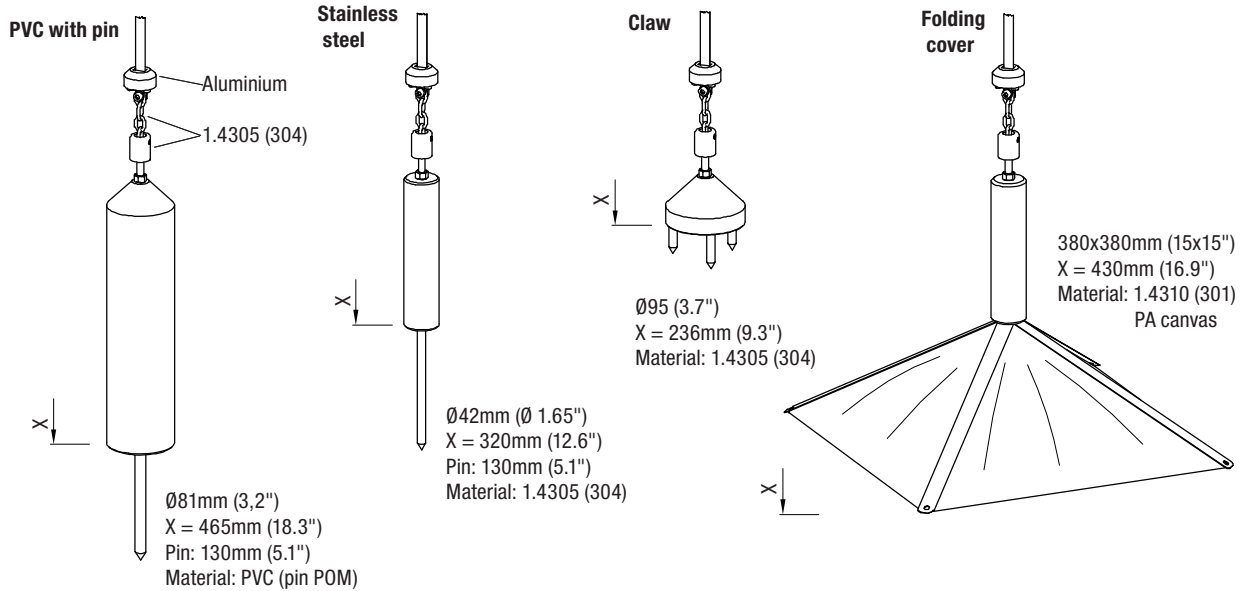


Ø95mm (3.7")  
 X = 460mm (18.1")  
 Material: PA canvas,  
 SS chain, alu cone

## Dimensions

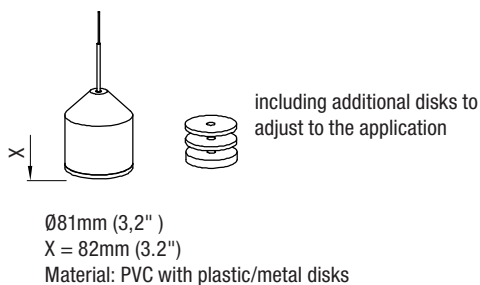
### Solids measurement: Tape version

All weights ca. 2.1kg (4.6lbs)



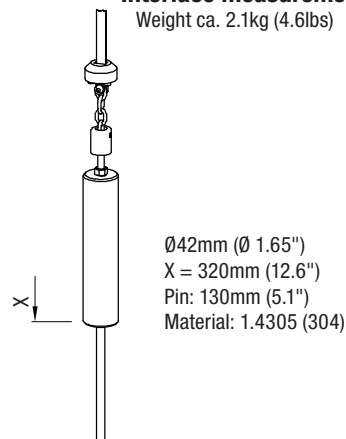
### Interface measurement: Rope version

Weight ca. 1,0kg (2.2lbs)



### Interface measurement: Tape version

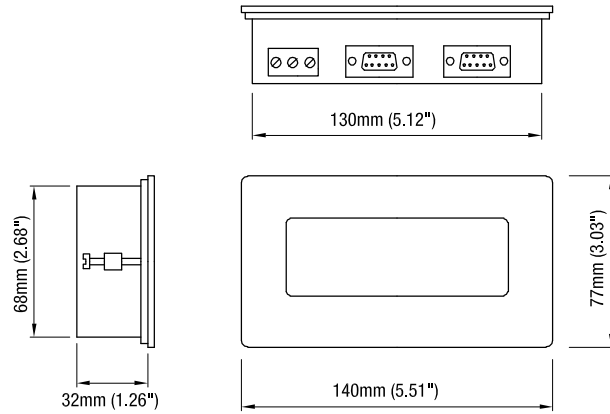
Weight ca. 2.1kg (4.6lbs)



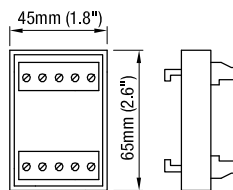
## Dimensions

### NB 9000 Remote Box

NB 9000  
 Panel mounting

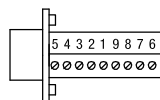


Biasing network

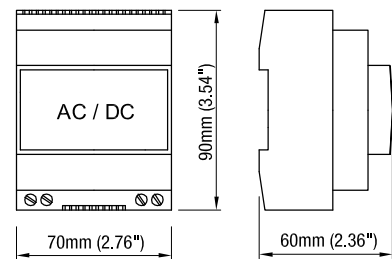


Mounting: DIN rail 35

Terminal plug

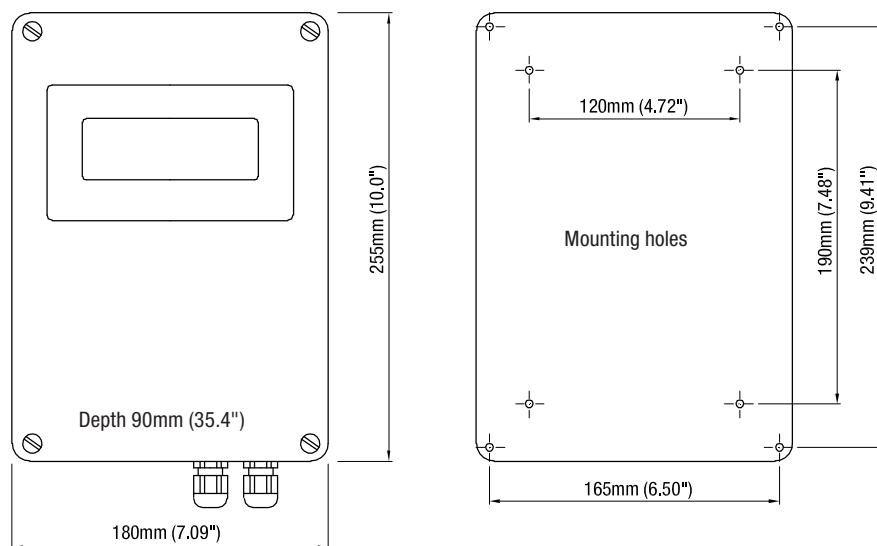


AC/DC converter



Mounting: DIN rail 35

NB 9000  
 Wall mounting



## Spare parts

### Rope roller

<b>sl102240</b>	Rope roller with 30m rope .....
<b>sl102242</b>	Rope roller with 30m rope for increased corrosion resistance (plastic coated) .....

### 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	PVC with pin .....
<b>sb102222</b>	Sensor weight for tape	Stainless steel .....
<b>sb102223</b>	Sensor weight for tape	Claw .....
<b>sb102224</b>	Sensor weight for tape	Folding cover .....
<b>sb102225</b>	Sensor weight for tape	Spider .....
<b>sb102226</b>	Sensor weight for tape	Bag .....
<b>sb102227</b>	Sensor weight for tape	Float .....

#### Interface measurement

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

### 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	Electronic 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	Electronic 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) .....

### 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 .....

### Remote Box NB 9000

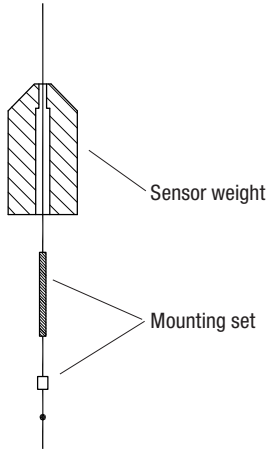
<b>em100910</b>	Panel	24V DC .....
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## Spare parts

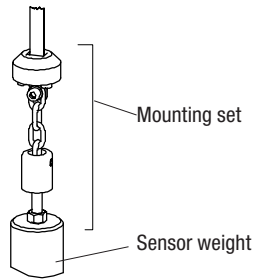
### Sensor weights

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

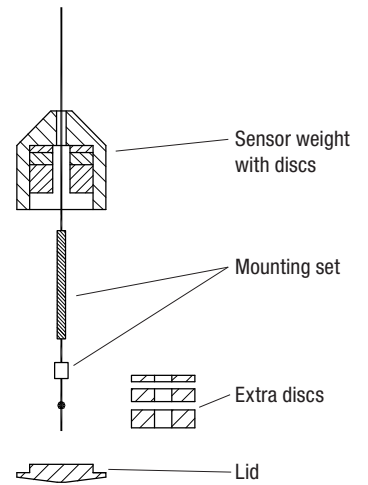
#### Solids measurement: rope version



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

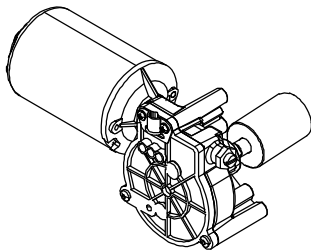


#### Interface measurement: rope version

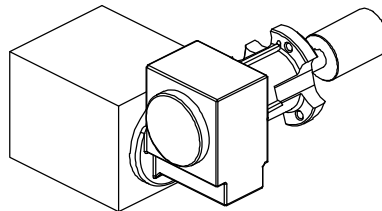


### Motor

#### Standard

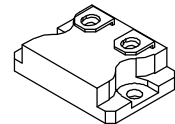


#### Brushless motor



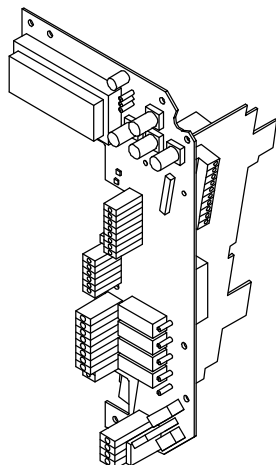
Delivery including: cable, plug, sealing, mounting tools

### Heater



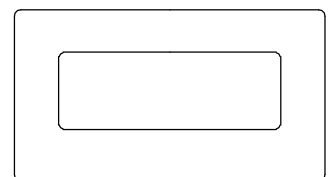
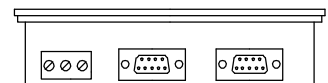
Delivery including cable and plug

### Electronics



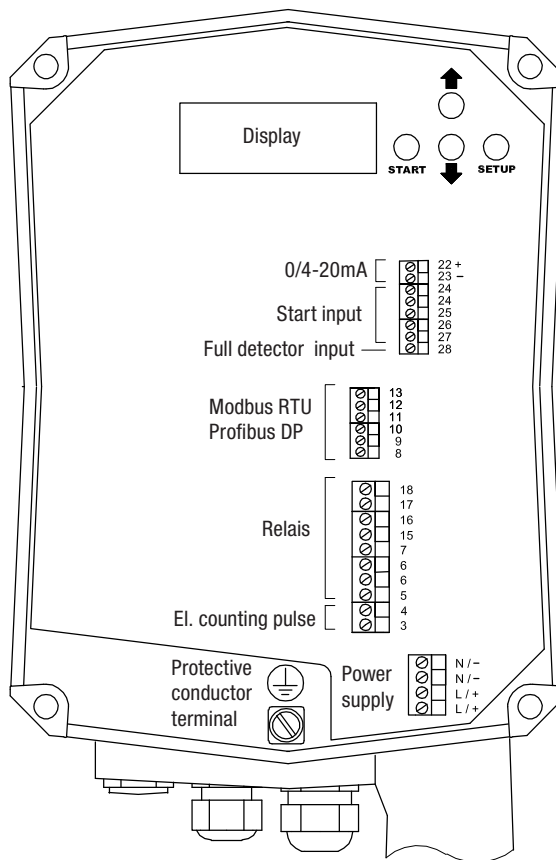
### Remote Box NB 9000

#### Panel



## Electrical installation

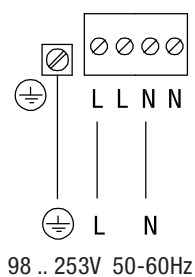
### Terminal location



### NB 3000 - Power supply and Signal input /output

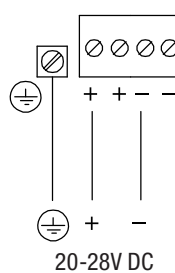
#### Power supply

##### AC version



AC or DC supply depending on ordered version

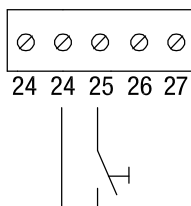
##### DC version



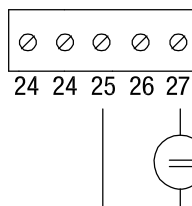
0.14 .. 2.5mm<sup>2</sup>  
(AWG 26 .. 14)

#### Signal input:

##### Start of measurement

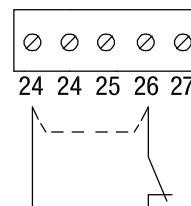


Start contact



Start +24V

alternative

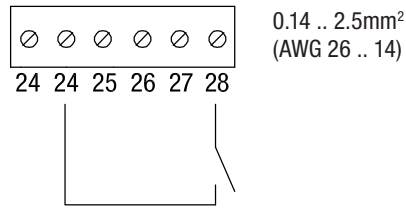


Measurement interruption in case of filling. If used, remove factory provided connection.

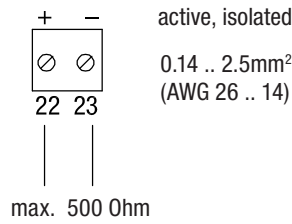
0.14 .. 2.5mm<sup>2</sup>  
(AWG 26 .. 14)

## Electrical installation

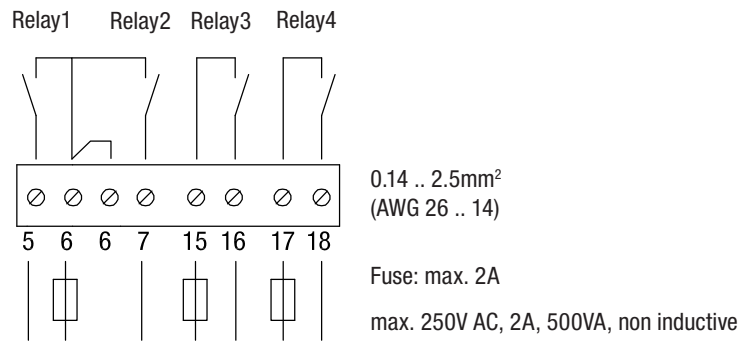
**Signal input:  
Full detector**



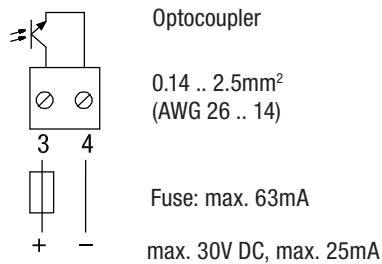
**Signal output:  
0/4-20mA**



**Signal output:  
Relay**



**Signal output:  
Electronic counting pulse**



Note:  
Reset pulse is done with Relay 2

