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Subject to technical change.

All dimensions in mm (inches).

We assume no liability for typing errors.

Valid from 01.04.2010 until 31.03.2011 unless otherwise agreed.

By publishing this option list all other option lists become invalid.

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

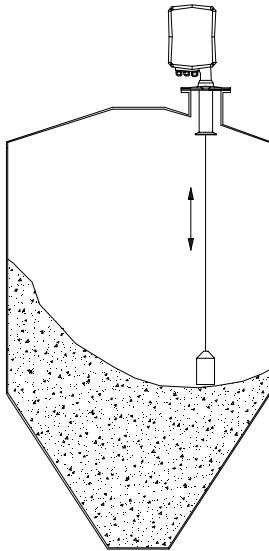
NB 3400
Tape version

Specifications

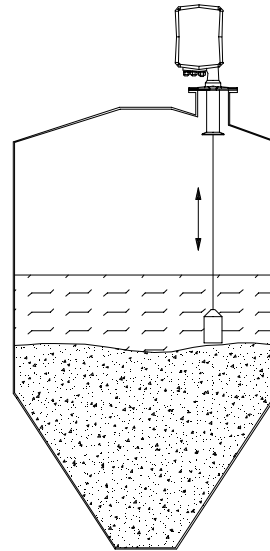
				NB 3100 / 3200 Solids measurement	NB 3300 / 3400 Interface measurement
Process	Measurement range	Rope version	30m (98.4ft)	•	•
		Tape version	40m (131ft)	•	•
	Process temperature		80°C (176°F)	•	•
			150°C (302°F)	•	
			250°C (482°F)	•	
	Process overpressure		-0,3 .. +0,3 bar (-4.35 .. + 4.35 psi)	•	•
		-0.5 .. +1.7bar (-7.3 .. +25psi)	•	•	
Electronics	Power supply	AC version	98 .. 253V 50-60Hz	•	•
		DC version	20-28V	•	•
	Output		0/4-20mA	•	•
			4 relais	•	•
			Modbus RTU	•	•
			Profibus DP	•	•
Certificate	Dust Ex		ATEX 1/2D	•	
			FM Cl. II, III Div. 1	•	
	General purpose		CE, FM	•	•

Applications

Solids measurement



**Interface measurement
(solids in water)**

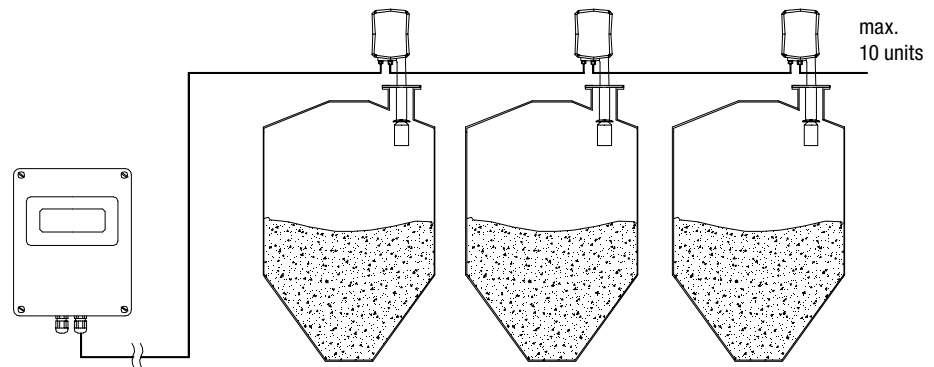


Remote box NB 9000

Connecting Nivobob units
with Modbus RTU network

Features:

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

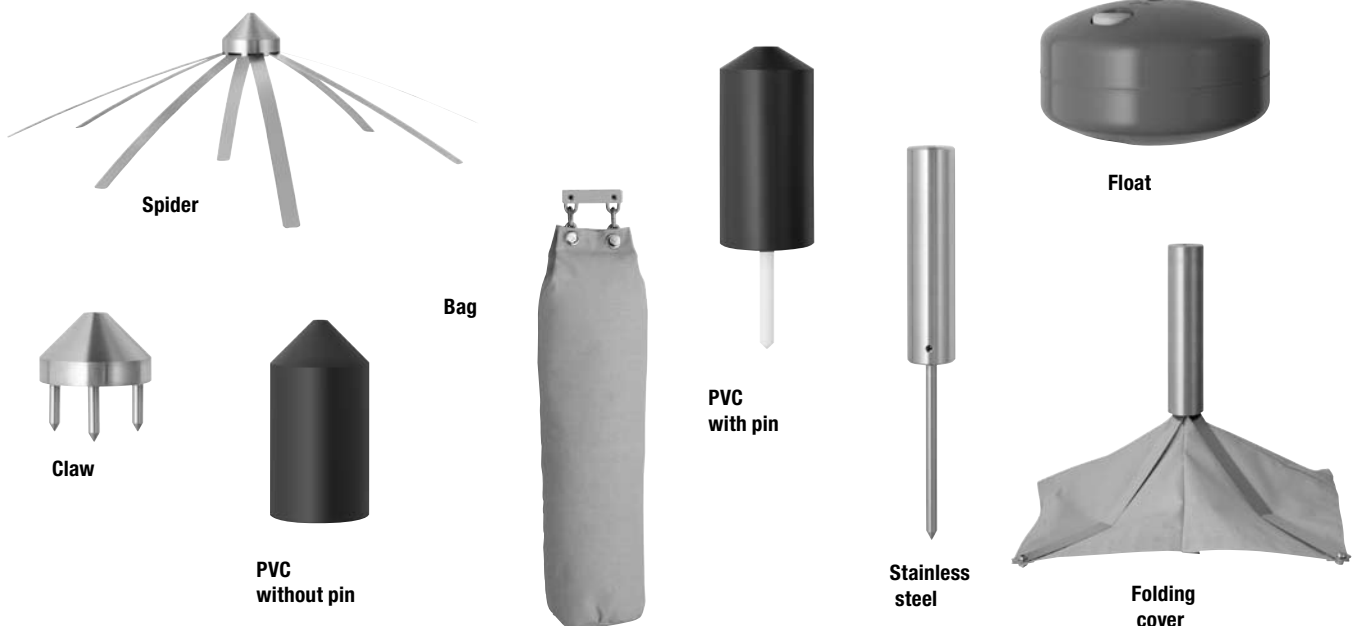


Applications

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.					

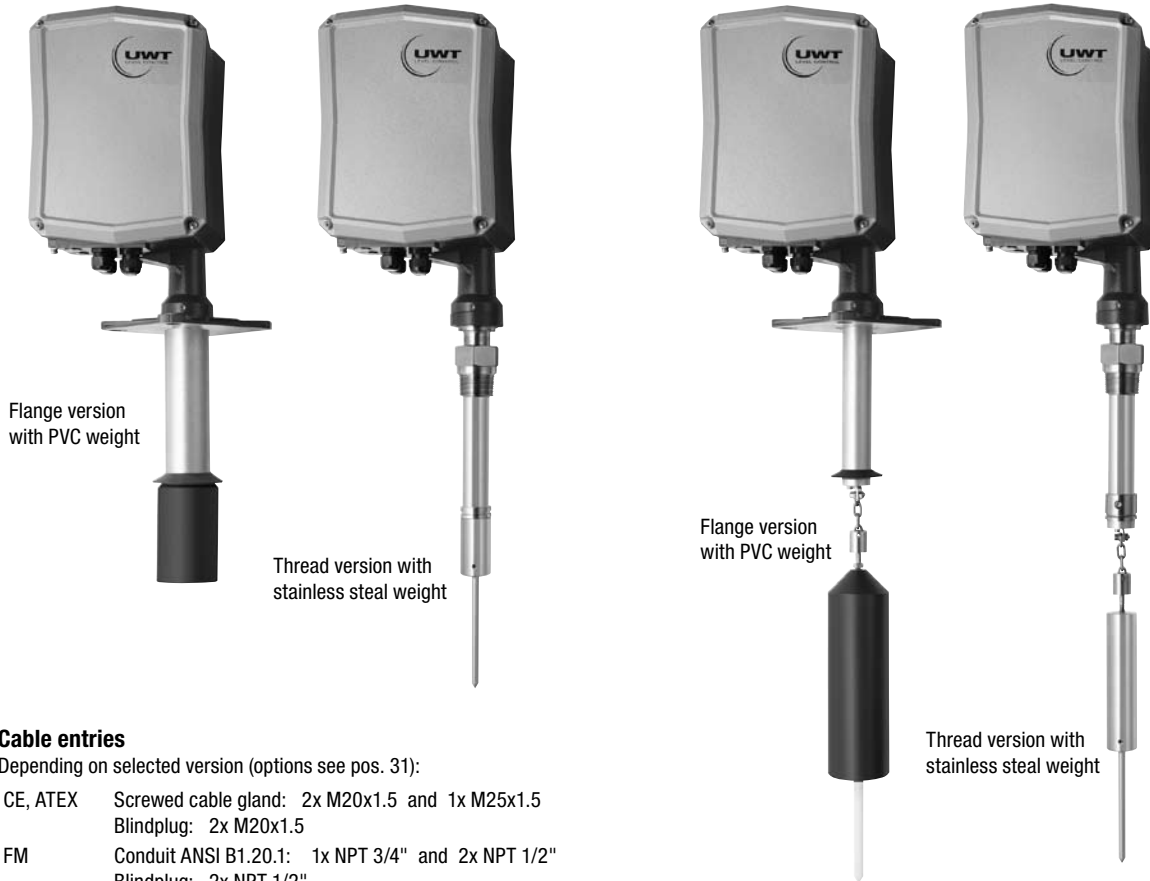
* The above mentioned data is a guideline and is valid for material which has settled after filling. During the filling the bulk density can change (e. g. for fluidised material).



Solids measurement

NB 3100
Rope version

NB 3200
Tape version



Cable entries

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 | 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	Basic type	
	C	NB 3100 Rope version (30m)
D	NB 3200 Tape version (40m)	
pos. 2	Certificate	
	0	CE
	W	ATEX II 1/2 D
	M	FM general purpose
N	FM Class II, III Div.1 Group E-G	
pos. 3	Process temperature	
	A	max. + 80°C (176°F)
	S	max. +150°C (302°F)
T	max. +250°C (482°F)	
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)

Solids measurement

pos. 6	Process connection	
	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 R 1 1/2 inch tapered DIN 2999
	B	Thread NPT 1 1/2 inch tapered ANSI B1.20.1
pos. 7	Motor for high measurement frequency ⁽¹⁾	
	1	standard
pos. 8	Sensor weight ^(2,3)	
	Y	without ⁽⁴⁾
	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

Basic type	1	2	3	4	5	6	7	8	Order code
NB 3..00									

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

⁽¹⁾ Motor with increased service life

⁽²⁾ 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.

⁽³⁾ See Sensor weight guide on page P5

⁽⁴⁾ Including mounting set for sensor weight (see page P17: Sensor weights)

Options

pos. 25	Window in lid and external start button
pos. 26	Internal heater
	Needed for: ambient temp. <-20°C (-4°F) or condense water inside silo or wet process atmosphere (Note: <-20°C (-4°F) with ATEX or FM Class II on request possible)
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 C), CE or FM gen.purp. (pos.2 0,M), 80°C (pos.3 A), PVC weight (pos.8 A,B)
pos. 30	Increased process overpressure
	-0.5 to 1.7bar (-7.3 to 25psi) (only with CE pos.2 0)
pos.31	Cable entry
	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	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.

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

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 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 **Basic Type**
 - E **NB 3300** Rope version (30m) incl. sensor weight
 - F **NB 3400** Tape version (40m) incl. sensor weight
- pos. 2 **Certificate**
 - 0 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** ⁽¹⁾
 - 1 standard
 - 2 brushless motor

Basic type	1	2	3	4	5	6	7	8
NB 3..00			A			X		1

Order code

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

⁽¹⁾ 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) (only with CE pos.2 0)
- pos.31 **Cable entry**
 - 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 **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

Basic type	1	2	3	4
NB 9000	A			

Order code

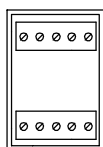
All positions are available in special design (use code "Z").

NB 9000
Panel mounting

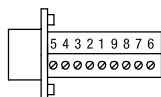
Included parts

For easy installation and proper functioning of the Modbus network

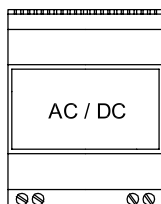
Biasing network
 (with Termination resistor)



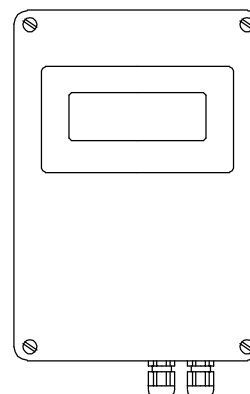
Terminal Plug
 Supplies screwing terminals for connection between NB 9000 panel and Biasing network



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

Rope roller

sl102240	Rope roller with 30m rope
sl102242	Rope roller with 30m rope for increased corrosion resistance (plastic coated)

Tape roller

sb102240	Tape roller with 40m tape
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Sensor weights

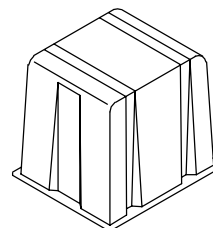
All sensor weights are delivered incl. mounting set for proper fixing to the rope/tape and excl. rope/tape

Solid measurement

sl102220	Sensor weight for rope	PVC without pin
sl102221	Sensor weight for rope	PVC with pin
sl102222	Sensor weight for rope	Stainless steel Ø75mm (3,0")
sl102228	Sensor weight for rope	Stainless steel Ø42mm (1,65")
sl102223	Sensor weight for tape	Claw
sl102224	Sensor weight for rope	Folding cover
sl102225	Sensor weight for rope	Spider
sl102226	Sensor weight for rope	Bag
sl102227	Sensor weight for rope	Flat

Weather protection cover

For Ex only approved for Zone 22 or Division 2



zu300215
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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

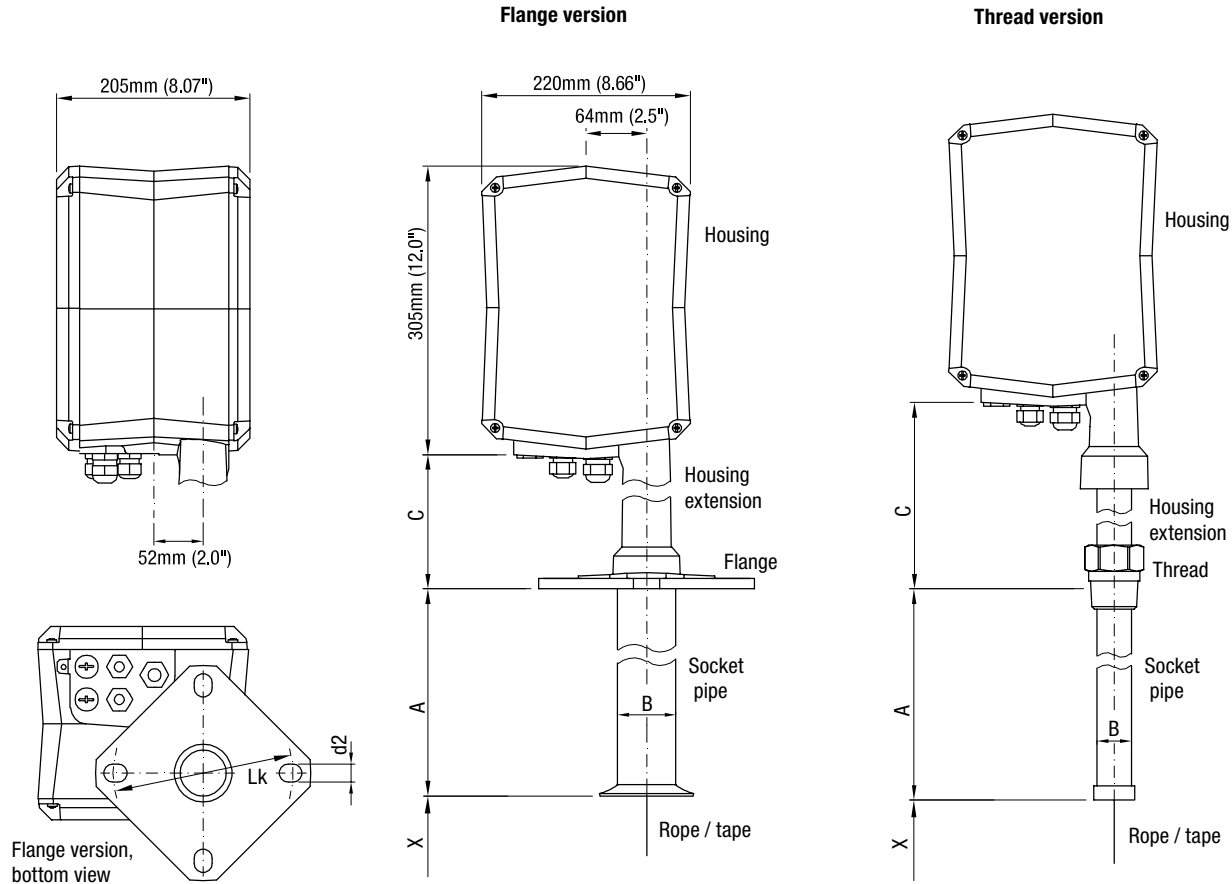
Sealings for mounting the unit on a flange.

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

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

C = 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")

Rope	ø1,25mm (0.49")
Tape	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

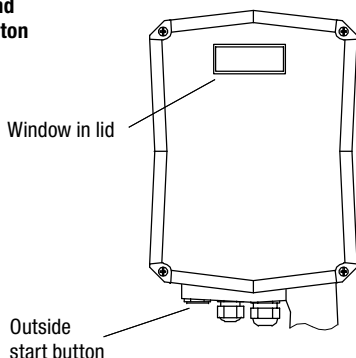
Housing outside	Aluminium, powder coated
Housing inside	Aluminium
Housing extension	Aluminium, powder coated or 1.4305 (303)
Flange	80°C / 150°C: Aluminium, powder coated 250°C: 1.4305 (303)
Thread	1.4301 (304)
Socket pipe	Flange version 80°C / 150°C: Aluminium All other versions: 1.4301 (304)
Rope	1.4301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

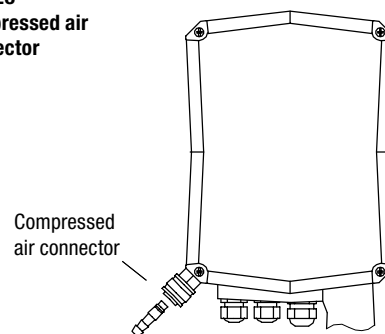
Dimensions

Options and Accessories

Pos. 25
 Window in lid and
 outside start button



Pos. 28
 Compressed air
 connector

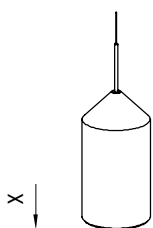


Sensor weights

Solids measurement: Rope version

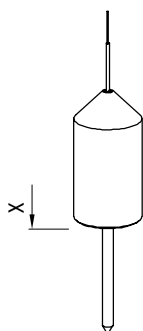
All weights ca. 1,0kg (2.2lbs)

PVC without pin



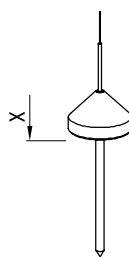
Ø81mm (3,2")
 X = 137mm (5.4")
 Material: PVC

PVC with pin

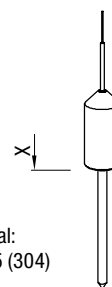


Ø81mm (3,2")
 X = 137mm (5.4")
 Pin: 130mm (5.1")
 Material: PVC (pin POM)

Stainless steel



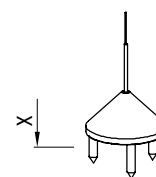
Version with
 Flange DN100 / 4"
 Ø75mm (3.0")
 X = 25mm (1.0")
 Pin: 130mm (5.1")



Material:
 1.4305 (304)

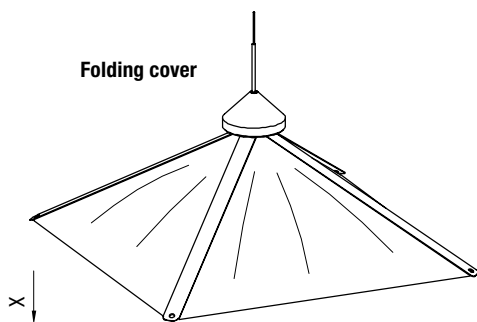
All other versions
 Ø42mm (Ø 1.65")
 X = 81mm (3.19")
 Pin: 130mm (5.1")

Claw



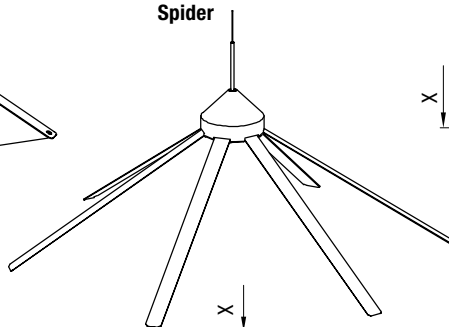
Ø95 (3.7")
 X = 71mm (2.80")
 Material: 1.4305 (304)

Folding cover



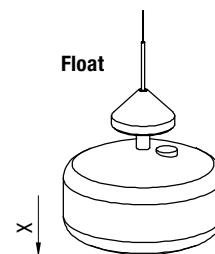
380x380mm (15x15")
 X = 150mm (5.9")
 Material: 1.4310 (301)
 PA canvas

Spider



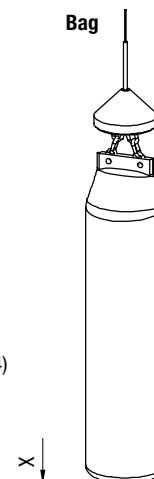
Ø600mm (23.6")
 X = 160mm (6.3")
 Material: 1.4301 (304) /
 1.4310 (301)

Float



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

Bag

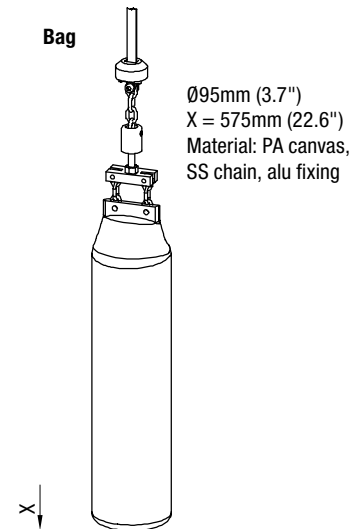
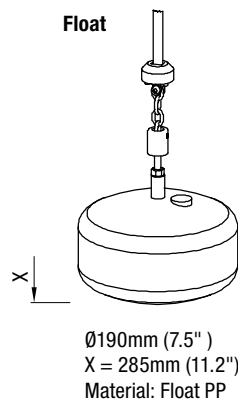
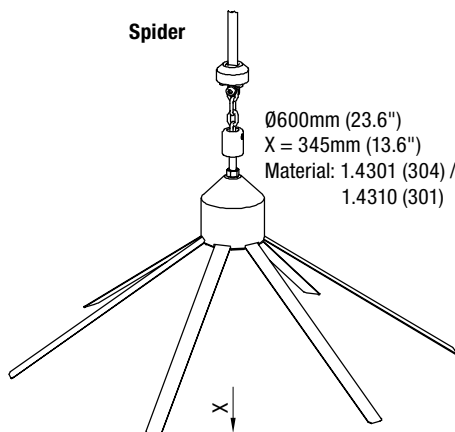
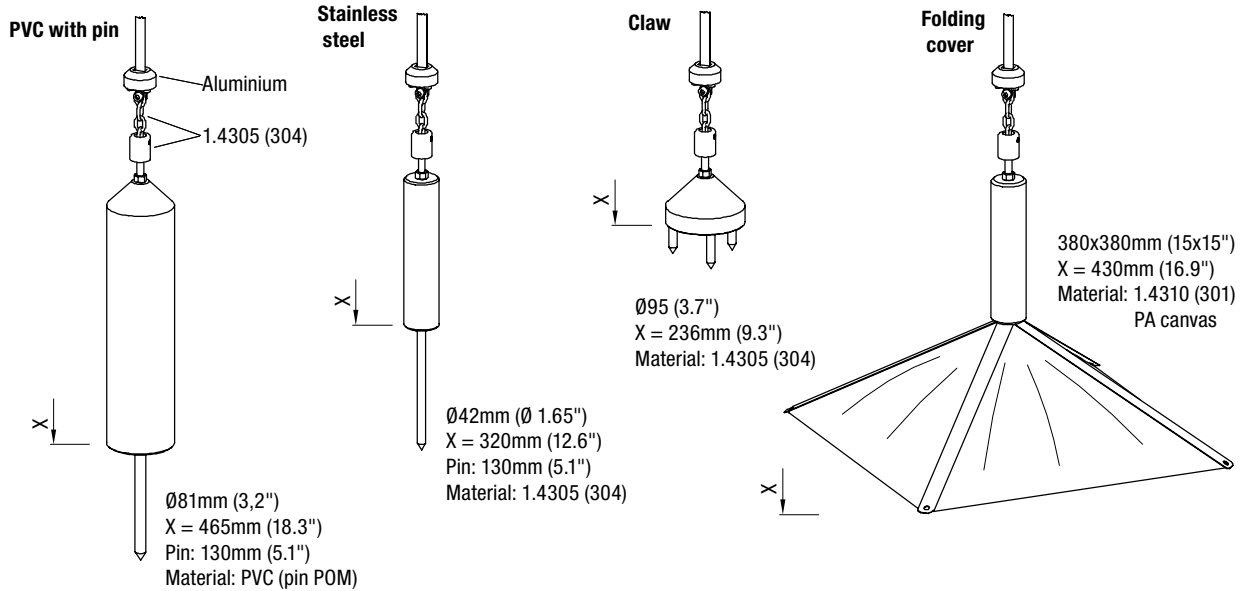


Ø95mm (3.7")
 X = 460mm (18.1")
 Material: PA canvas,
 SS chain, alu cone

Dimensions

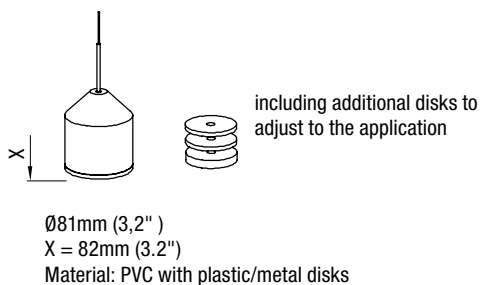
Solids measurement: Tape version

All weights ca. 2.1kg (4.6lbs)



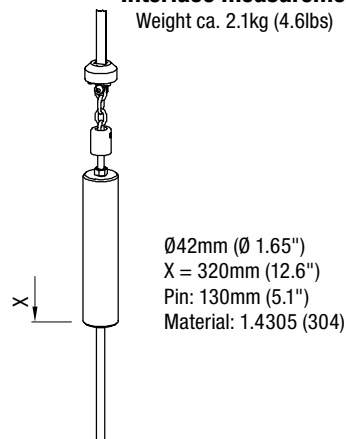
Interface measurement: Rope version

Weight ca. 1,0kg (2.2lbs)



Interface measurement: Tape version

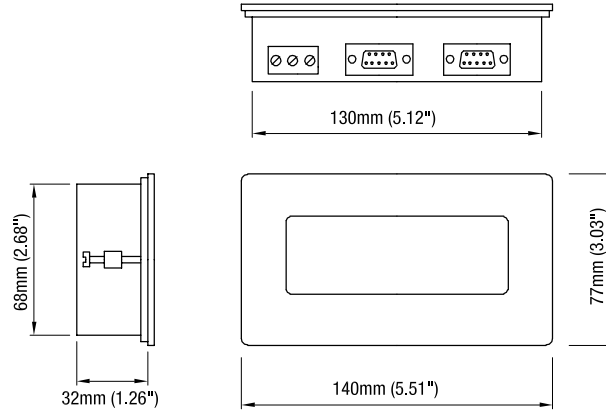
Weight ca. 2.1kg (4.6lbs)



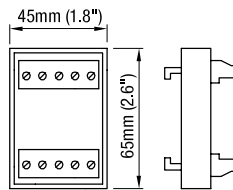
Dimensions

NB 9000 Remote Box

NB 9000
 Panel mounting

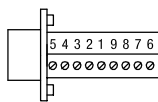


Biassing network

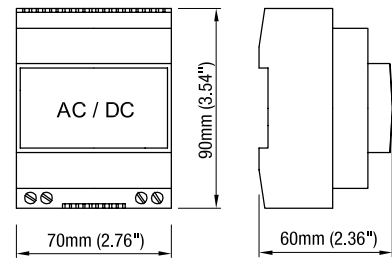


Mounting: DIN rail 35

Terminal plug

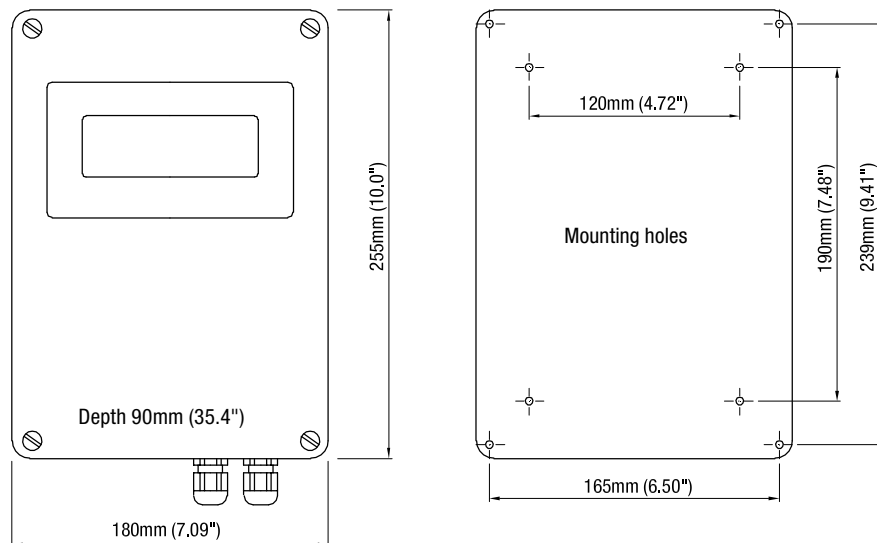


AC/DC converter



Mounting: DIN rail 35

NB 9000
 Wall mounting



Spare parts

Rope roller

sl102240	Rope roller with 30m rope
sl102242	Rope roller with 30m rope for increased corrosion resistance (plastic coated)

Tape roller

sb102240	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

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

Interface measurement

sl102230	Sensor weight for rope	PVC with metal core
sb102230	Sensor weight for tape	Stainless steel

Motor

gm102202	Motor standard version
gm102211	Motor brushless version

Electronics

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

Internal Heater

em100372	220 Ohms	For power supply 98 .. 253V 50–60Hz
em100371	8 Ohms	For power supply 20 .. 28V DC

Remote Box NB 9000

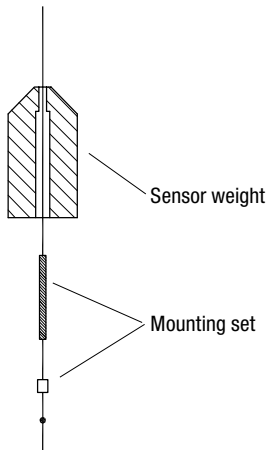
em100910	Panel	24V DC
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Spare parts

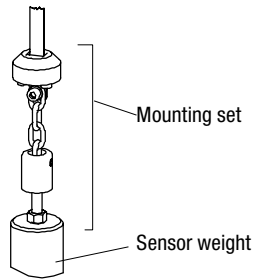
Sensor weights

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

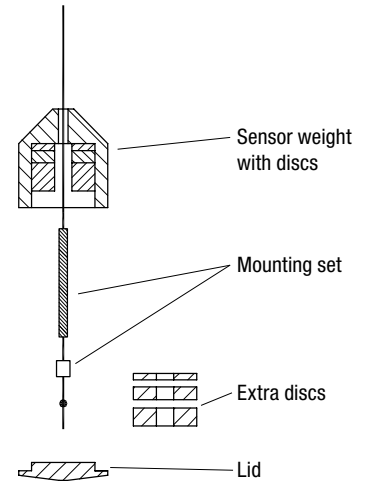
Solids measurement: rope version



Solids measurement: tape version Interface measurement: tape version

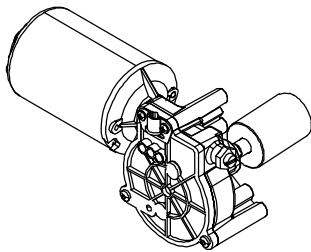


Interface measurement: rope version

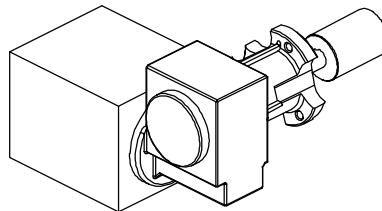


Motor

Standard

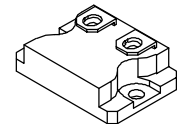


Brushless motor



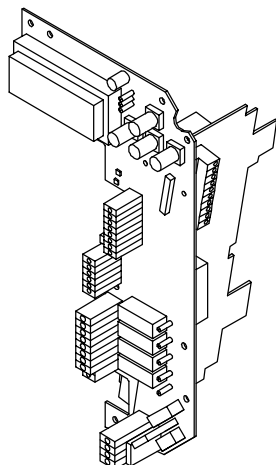
Delivery including: cable, plug, sealing, mounting tools

Heater



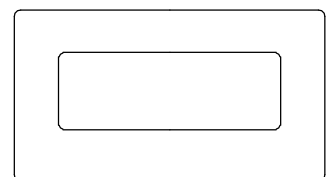
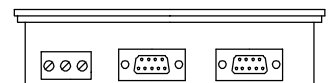
Delivery including cable and plug

Electronics



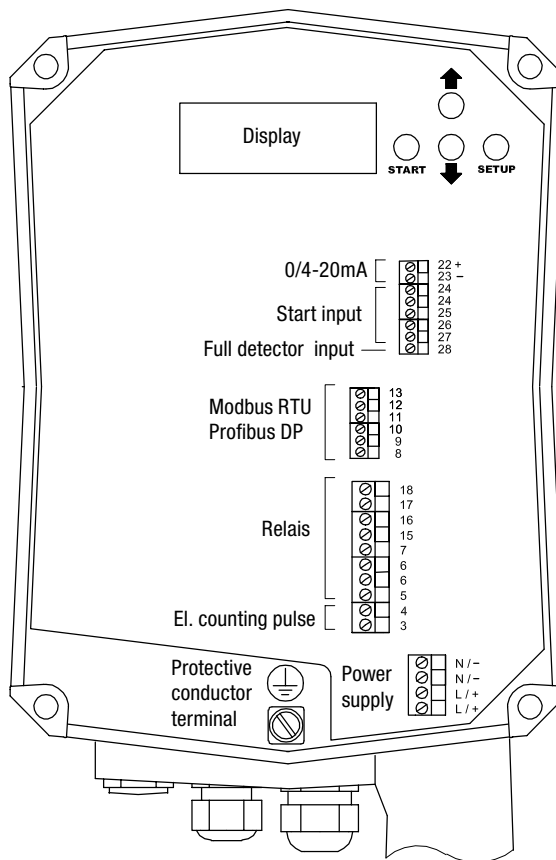
Remote Box NB 9000

Panel



Electrical installation

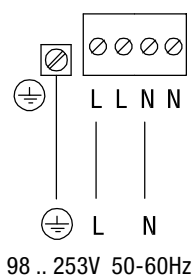
Terminal location



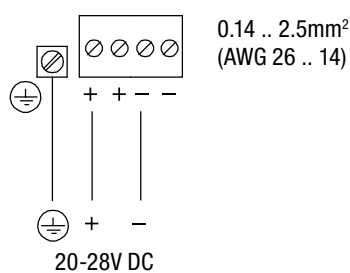
NB 3000 - Power supply and Signal input /output

Power supply

AC version



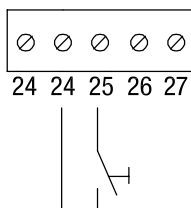
DC version



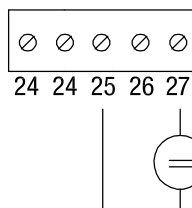
AC or DC supply depending on ordered version

Signal input:

Start of measurement

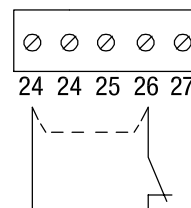


Start contact



Start +24V

alternative

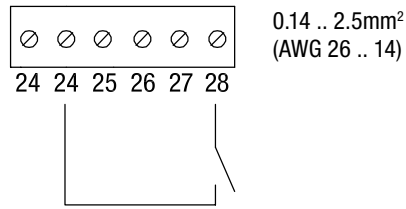


Measurement interruption in case of filling. If used, remove factory provided connection.

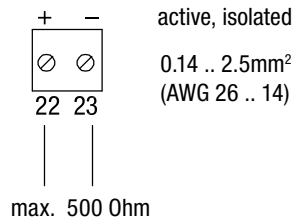
0.14 .. 2.5mm²
(AWG 26 .. 14)

Electrical installation

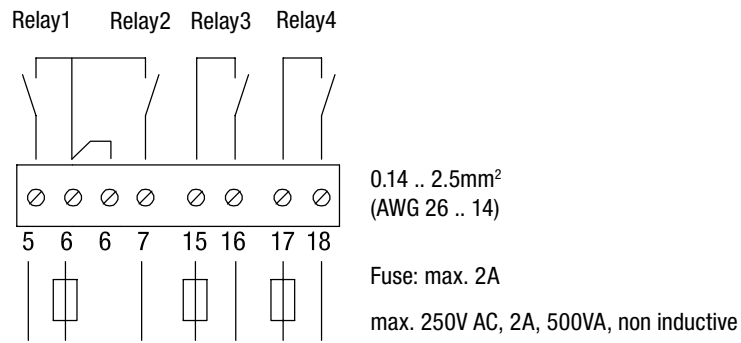
Signal input:
Full detector



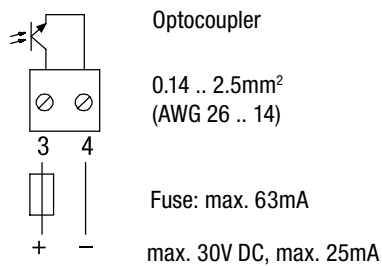
Signal output:
0/4-20mA



Signal output:
Relay



Signal output:
Electronic counting pulse



Note:
 Reset pulse is done with Relay 2

