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Subject to change.

All dimensions in mm (inches).

All prices in Euro (€) or USD (\$),  
excluding VAT.

All EURO prices are EXW Betzigau,  
all USD prices are EXW Memphis,  
excluding packaging costs.

Valid: From 01.04.2018 until 31.03.2019, 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

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### Features

Continuous level measurement of solids applications

#### Process

- Independent of bulk material properties
- Accurate measurement

#### Service

- Simple installation and commissioning
- Rope and tape version with long service life
- Low maintenance

#### Approvals

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

#### Mechanics

- Measurement range up to 30 m (100 ft)
- 1½" process connection possible
- Aiming flange to be mounted directly on a flat silo roof
- Internal tape cleaner for difficult materials

#### Electronics

- Micro processor controlled measurement
- Diagnostic possibilities
- Output 4-20 mA/ Modbus
- Two programmable Relay  
 (can be used as Counting/ reset pulse output  
 or as Failure/ Upper stop position)



**NB 4100**  
 Rope version  
 Fig. with flange DN100  
 and PVC sensor weight



**NB 4200**  
 Tape version  
 Fig. with thread connection  
 and stainless steel sensor  
 weight



**NB 4100**  
 Rope version  
 Fig. with aiming flange and  
 stainless steel sensor weight  
 with pin

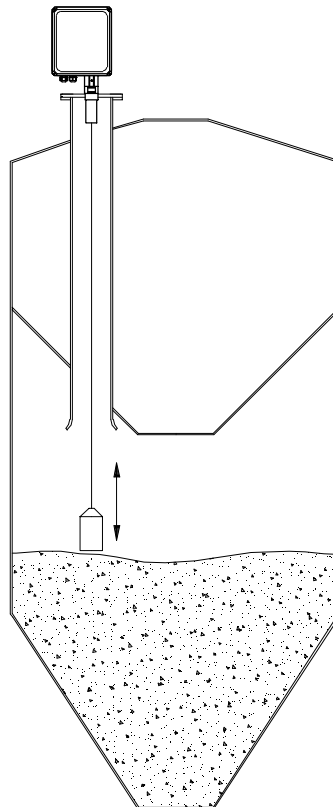
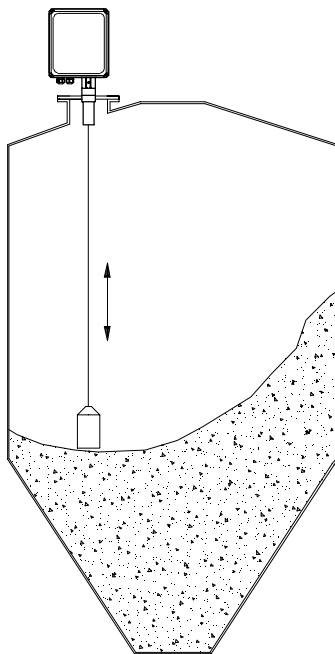
## Specification / application

### Specification

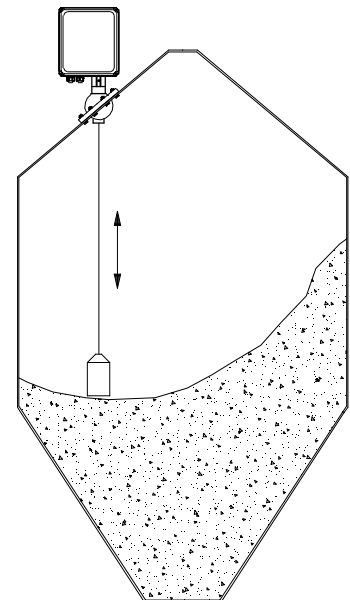
<b>Process</b>	Measurement range	15 m (50 ft) or 30 m (100 ft)
	Process temperature	80°C (176°F)
	Process overpressure	-0.2 .. +0.2 bar (-3.0 .. + 3.0 psi)
	Min. powder density	>300 g/l (18 lb/ft³)
<b>Electronics</b>	Power supply	AC version 115 V or 230 V 50 - 60 Hz DC version 20 .. 28 V
	Output	4-20 mA
		2 relais (optional)
		Modbus RTU
<b>Approvals</b>	Dust Ex	ATEX 1/2D
		FM Cl. II, III Div. 1, TR-CU
	Ordinary Location	CE, FM, TR-CU

### Application

#### Solids measurement



Aiming flange  
screwed directly  
to the silo roof



For measurements through a long pipe  
in a double chamber silo we recommend  
the use of NB 4200 (tape version).

## NB 4000

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### NB 4100

Rope version  
(fig. with flange DN100  
and PVC sensor weight)



### NB 4200

Tape version  
(fig. with thread connection  
and stainless steel sensor  
weight)



#### Cable entries (by default)

Depending on selected version (options see pos.26):

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

FM	Open conduit ANSI B1.20.1: 1x NPT 3/4" and 1x NPT 1/2"
	Blindplug: 1x NPT 3/4" and 1x NPT 1/2"

**Dimensions** see page 7

## NB 4000

pos.1	<b>Basic type</b>								
	C	<b>NB 4100</b>	Rope version	.....					•
	D	<b>NB 4200</b>	Tape version	.....					•
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>Measurement range</b>							
	1	15 m (50 ft)	.....						•
	2	30 m (100 ft)	.....						•
pos.4		<b>Power supply/ Signal output</b>							
	1	230 V 50 - 60Hz	4-20 mA	.....					•
	4	230 V 50 - 60Hz	Modbus	.....					•
	2	115 V 50 - 60Hz	4-20 mA	.....					•
	5	115 V 50 - 60Hz	Modbus	.....					•
	3	20 .. 28 V DC	4-20 mA	.....					•
pos.5		<b>Process connection</b>							
	A	Thread R 1½"	tapered EN 10226-1	.....					•
	B	Thread NPT 1½"	tapered ANSI B1.20.1	.....					•
	X	Flange DN100 PN16 (EN 1092-1) 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)	.....						•
	W	Aiming flange (to be mounted directly to the silo roof) <sup>(5)</sup>	.....						•
pos.6		<b>Sensor weight <sup>(2)</sup></b>							
	Y	without <sup>(3)</sup>	.....						•
	A	PVC <sup>(4)</sup>	.....						•
	C	Stainless steel	.....						•
	E	Folding cover	.....						•

Basic type

<b>NB 4..00</b>						
Position	1	2	3	4	5	6

← **Order code**

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

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

<sup>(2)</sup> 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.

<sup>(3)</sup> Only for tape version. Including mounting set for sensor weight (see page 9: Sensor weights).

<sup>(4)</sup> Does not fit through a 1½" nozzle, must be mounted after fixing the unit to the silo.

<sup>(5)</sup> Mounting without a socket. Including fixing material (screws, sealing etc.).

## Options / Accessories

### Options

- pos.11 x **Guarantee extension to 5 years** ..... •  
 Wear and tear parts rope/ tape and motor not included
  
- pos.21 **Weather protection cover** ..... •  
 For Ex only approved for Zone 22 or Division 2
  
- pos.22 **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, FM Class II or TR-CU on request possible)
  
- pos.23 **Length of socket pipe** ..... •
  - 1 200 mm (7.87") ..... •
  - 2 500 mm (19.7") ..... •
  - 3 1,000 mm (39.4") ..... •
  
- pos.24 **Pin for sensor weight** ..... •  
 POM or stainless steel (in accordance to selected sensor weight material, not for pos.6 E)
  
- pos.25 **Relais output** ..... •  
 Two relais (possible indication; Failure, reset pulse, counting pulse, upper stop position)  
 Nicht für Modbus (pos.4 4,5)
  
- pos.26 **Cable entry** ..... •  
 Selection of the following options only necessary, if a deviation from the default cable gland/ conduit is required:
  - 0 Screwed cable gland 1x M25 x 1.5 + 1x M20 x 1.5 + blindplug 1x M25 x 1.5 + 1x M20 x 1.5 ..... •
  - A Conduit 1x NPT ¾" + 1x NPT ½" + blindplug 1x NPT ¾" + 1x NPT ½" ..... •
  
- pos.27 **Preset fieldbus address (Modbus)** ..... •  
 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. Other addresses possible on request. •

### Accessories

#### Fixing material for mounting the unit on a flange

- zu107000 4 bolts M16 x 60, 8 washers, 4 nuts. Stainless steel. .... •

#### Sealings for mounting the unit on a flange

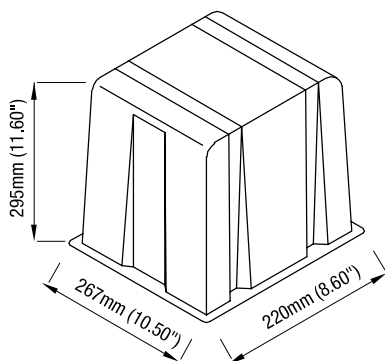
- di300125 Flange sealing for DN100 PN16/ 4" (neoprene) ..... •
- di300127 Flange sealing for 2"/ 3" 150lbs (neoprene) ..... •

#### Adapter NPT 1½" to NPT 3"

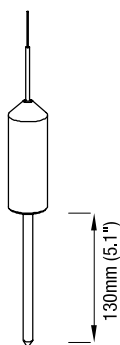
- zu103100 Thread tapered ANSI B1.20.1, aluminium ..... •

#### Cable gland

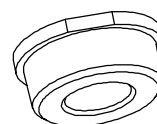
- em400589 Cable gland with 2 inputs. M25 x 1.5, clamping range 2x ø4.5-7 mm, -20 .. +70°C ..... •
- em400573 Cable gland, M20 x 1.5, clamping range ø6-12 mm, -40 .. +70°C. .... •



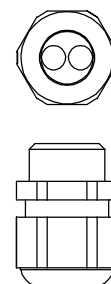
Weather protection cover



Pin for sensor weight  
 POM or 1.4305 (303)



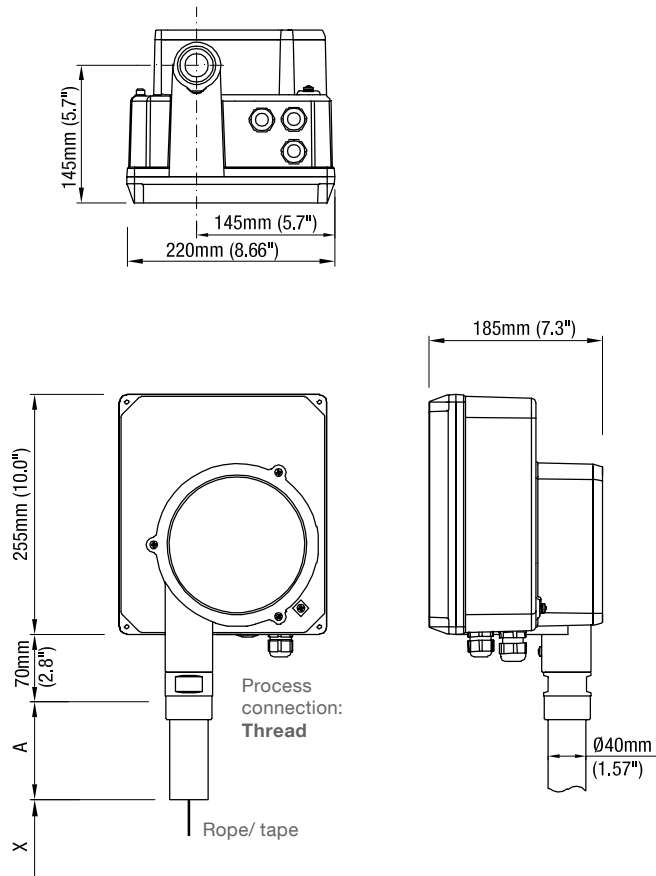
Adapter NPT 1½" to NPT 3"



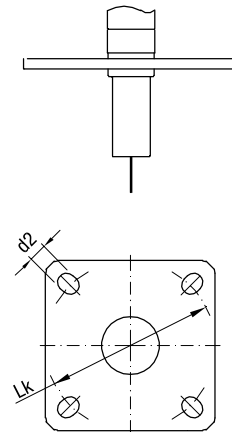
Cable gland  
 with 2 inputs

## Dimensions and materials

### Basic unit

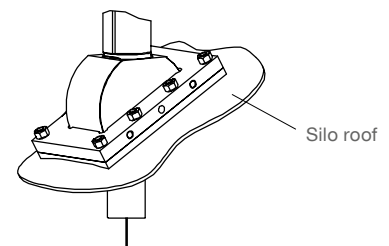


Process connection: **Flange**



Process connection: **Aiming flange**

To be screwed directly to the silo roof  
 0° - 50° adjustable  
 Including screws, nuts and sealing



Flange plate outside dimensions:  
 Width x Height: 120 mm x 180 mm (4.7" x 7.1")

### Dimensions

<b>X</b> = Length to bottom of sensor weight (in upper stop position, see next page)	
<b>A</b> = Length of socket pipe 100 mm (3.9") Optional 200 mm (7.9")/ 500 mm (19.7")/ 1,000 mm (39.4")	
<b>Flanges</b>	
fitting to: DN100 PN16/ 4" 150lbs	Lk = $\phi$ 180 - 190.5 mm ( $\phi$ 7.1 - 7.5") slot d2 = $\phi$ 19 mm ( $\phi$ 0.75")
fitting to: 2"/ 3" 150lbs	Lk = $\phi$ 120.7 - 152.4 mm ( $\phi$ 4.75 - 6.0") slot d2 = $\phi$ 19 mm ( $\phi$ 0.75")
<b>Rope</b>	$\phi$ 1.0 mm ( $\phi$ 0.04")
<b>Tape</b>	12 x 0.2 mm (0.47 x 0.008")

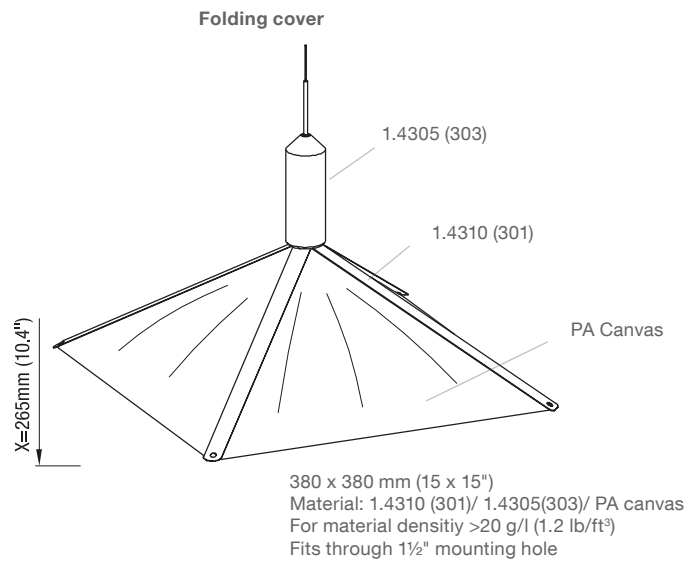
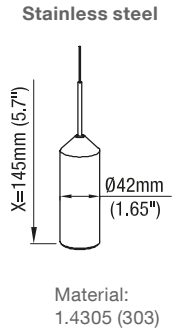
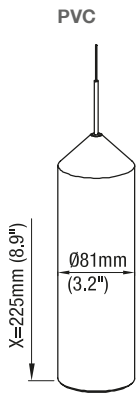
### Materials

<b>Housing outside</b>	Aluminium, powder coated
<b>Housing inside</b>	Aluminium
<b>Thread/ flange</b>	Aluminium
<b>Aiming flange</b>	Aluminium/ 1.4301 (301)
<b>Rope</b>	1.4401 (316)
<b>Tape</b>	1.4310 (301)

## Dimensions and materials

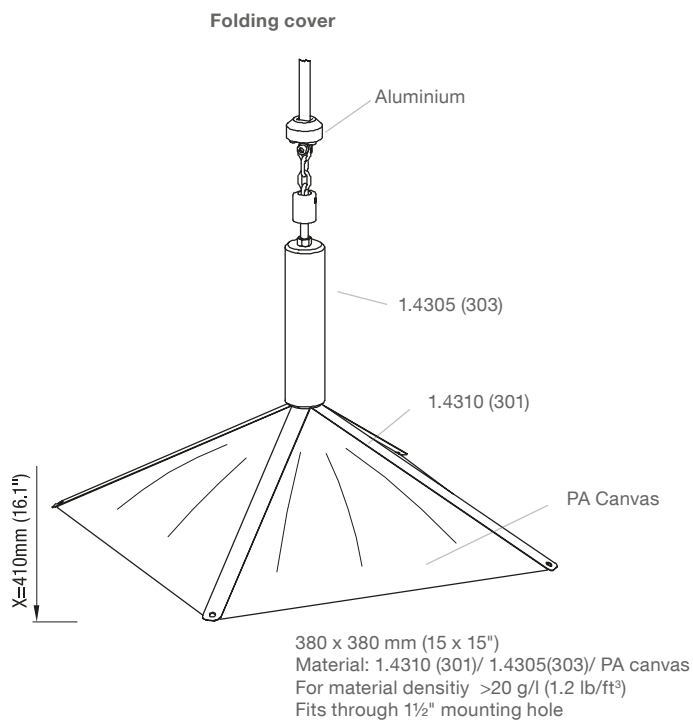
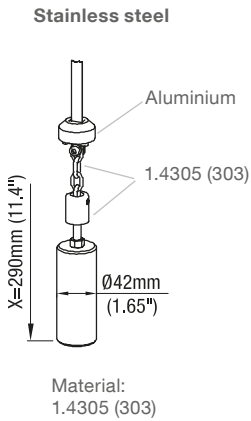
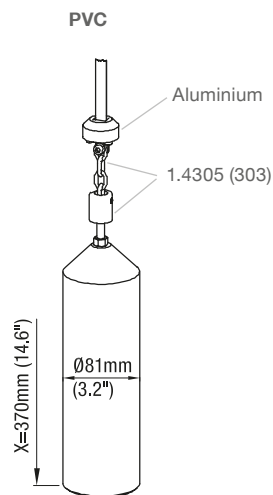
### Sensor weights

#### Rope version



All sensor weights:  
1,6 kg (3.5 lbs)

#### Tape version



Fixing elements between tape and sensor  
weight: aluminium/ 1.4305 (303)

All sensor weights:  
1.6 kg (3.5 lbs)



## Spare parts

### Roller

<b>sl103239</b>	Rope roller with 15 m rope .....	•
<b>sl103240</b>	Rope roller with 30 m rope .....	•
<b>sb103239</b>	Tape roller with 15 m tape .....	•
<b>sb103240</b>	Tape roller with 30 m tape .....	•

### Sensor weights

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

#### For rope version:

<b>sl103231</b>	PVC without pin .....	•
<b>sl103232</b>	PVC with pin .....	•
<b>sl103233</b>	Stainless steel without pin .....	•
<b>sl103234</b>	Stainless steel with pin .....	•
<b>sl103235</b>	Folding cover .....	•

#### For tape version:

<b>sb103231</b>	PVC without pin .....	•
<b>sb103232</b>	PVC with pin .....	•
<b>sb103233</b>	Stainless steel without pin .....	•
<b>sb103234</b>	Stainless steel with pin .....	•
<b>sb103235</b>	Folding cover .....	•

#### Mounting set without sensor weight

<b>sl100280</b>	For rope version .....	•
<b>zu108030</b>	For tape version .....	•

### Motor

<b>gm103202</b>	Motor .....	•
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### Electronics

<b>pl103690</b>	230 V 50 - 60 Hz	4-20 mA	without 2 Relais <sup>(1)</sup> .....	•
<b>pl103691</b>	230 V 50 - 60 Hz	4-20 mA	with 2 Relais <sup>(1)</sup> .....	•
<b>pl103696</b>	230 V 50 - 60 Hz	Modbus	without 2 Relais <sup>(1)</sup> .....	•
<b>pl103692</b>	115 V 50 - 60 Hz	4-20 mA	without 2 Relais <sup>(1)</sup> .....	•
<b>pl103693</b>	115 V 50 - 60 Hz	4-20 mA	with 2 Relais <sup>(1)</sup> .....	•
<b>pl103697</b>	115 V 50 - 60 Hz	Modbus	without 2 Relais <sup>(1)</sup> .....	•
<b>pl103694</b>	20 .. 28 V DC	4-20 mA	without 2 Relais <sup>(1)</sup> .....	•
<b>pl103695</b>	20 .. 28 V DC	4-20 mA	with 2 Relais <sup>(1)</sup> .....	•

Required information: Rope or Tape version; measuring range 15 m or 30 m; evt. further menu presettings.

### Internal Heater <sup>(2)</sup>

<b>em100373</b>	680 Ohms	For power supply 230 V 50 - 60 Hz .....	•
<b>em100374</b>	220 Ohms	For power supply 115 V 50 - 60 Hz .....	•
<b>em100375</b>	8.2 Ohms	For power supply 20 .. 28 V DC .....	•

### Weather protection cover

<b>zu400217</b>	.....	•
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<sup>(1)</sup> Implements the electronic components needed to control the Internal Heater (needed for option pos.22)

<sup>(2)</sup> Used for replacement for already mounted heater.

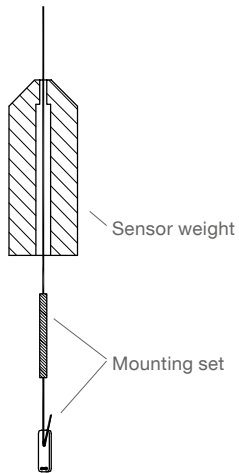
In case of re-fitting the Internal Heater, the electronics must include components for the Internal Heater Control (please contact factory).

## Spare parts

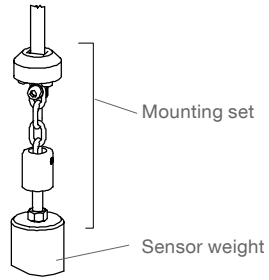
### Sensor weights/ Mounting set

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

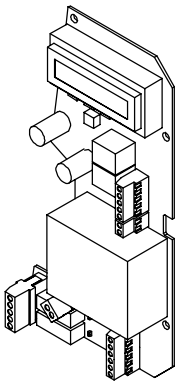
#### Rope version



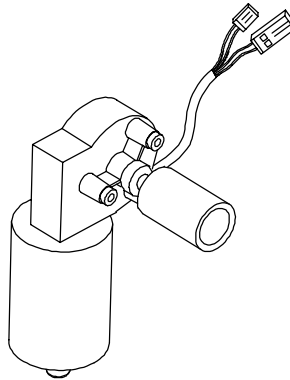
#### Tape version



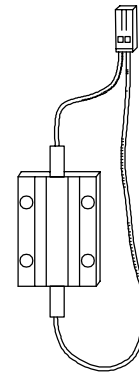
### Electronics



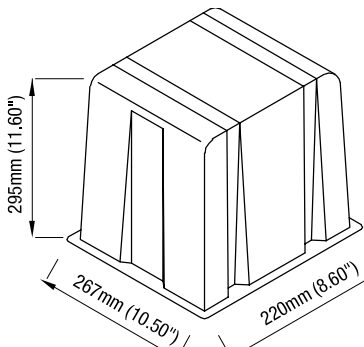
### Motor



### Internal heater



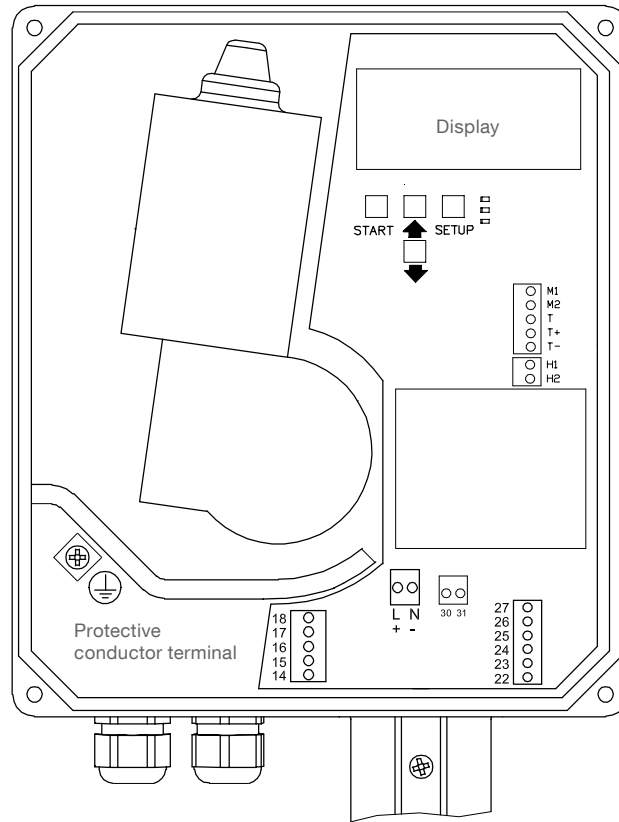
### Weather protection cover



## Electrical installation

Version 4-20 mA

### Terminal location



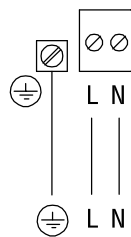
Internal terminals for motor and heater

- Terminals for:
- Power supply
  - Signal input:
    - Start of measurement
    - Measurement interruption
  - Signal output:
    - 4-20 mA
    - Relais

Note: Terminal 30 and 31 not used

### Power supply

#### AC version

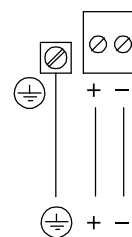


0.75 .. 2.5 mm<sup>2</sup>  
(AWG 18 .. 13)

AC or DC supply  
depending on  
ordered version

230 V or 115 V 50 - 60 Hz

#### DC version



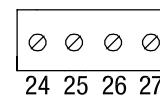
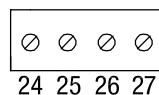
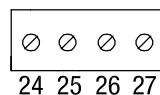
1.5 .. 2.5 mm<sup>2</sup>  
(AWG 15 .. 13)

20 .. 28 V DC

### Signal input:

#### Start of measurement

#### Measurement inter- ruption



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

Start contact

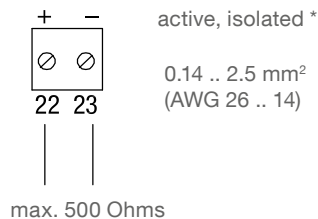
Start +24 V

alternative

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

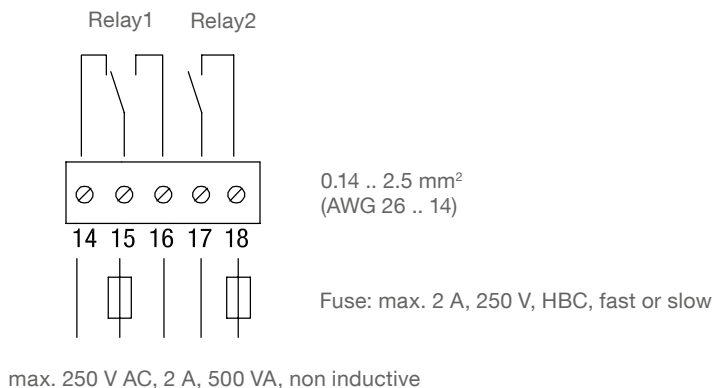
## Electrical installation

**Signal output:**  
 4-20 mA



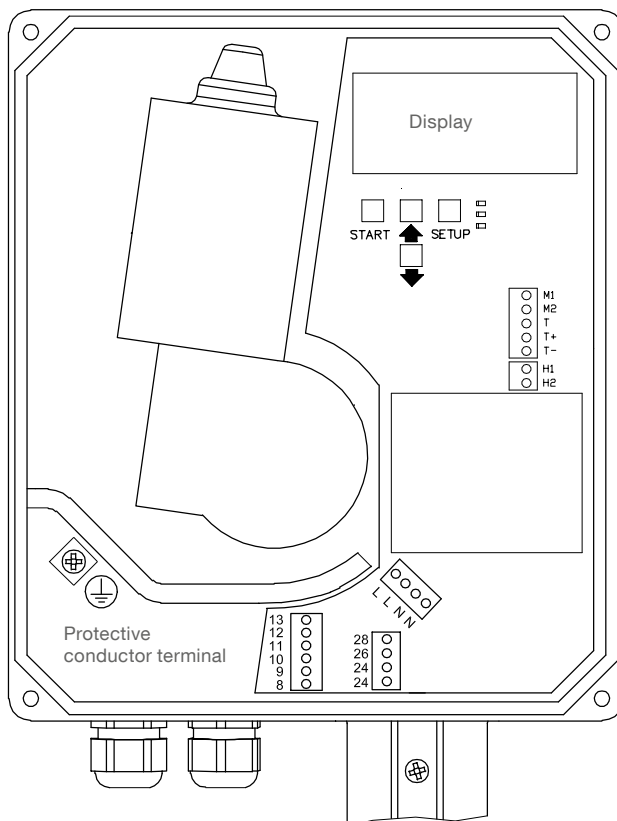
**\* CAUTION:**  
 If connecting to a PLC with isolated (floating) 4-20 mA input, the "-" line must be connected to ground of the PLC. See user manual of the PLC.

**Signal output:**  
**Relais**  
 (optional)



## Version Modbus

### Terminal location

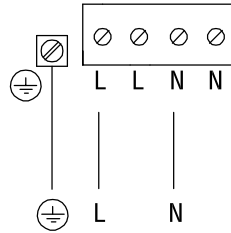


Internal terminals for motor and heater

- Terminals for:
- Power supply
  - Signal input: Measurement interruption
  - Signal output: Modbus

## Electrical installation

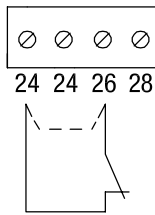
### Power supply



0.75 .. 2.5 mm<sup>2</sup>  
 (AWG 18 .. 13)

230 V or 115 V 50 - 60 Hz

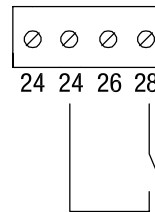
### Signal input: Measurement inter- ruption



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

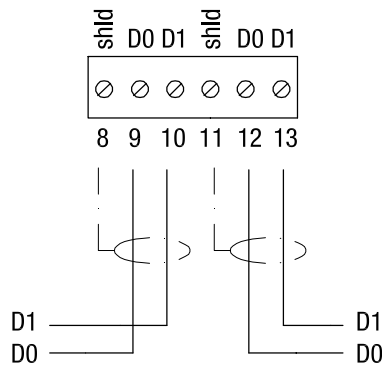
Measurement interruption in case of filling. If used, remove factory provided connection.

### Signal input: Full detector

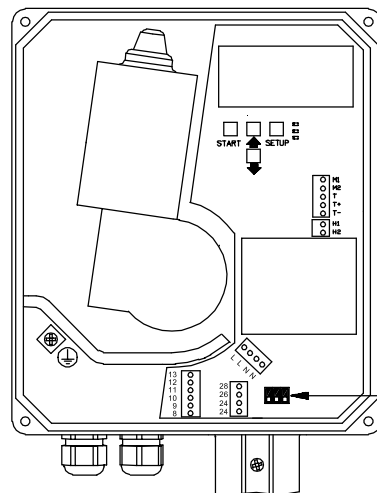


0.14 .. 2.5 mm<sup>2</sup>  
 (AWG 26 .. 14)

### Modbus network



Wiring according to Modbus standards



### Setting Biasing and Termination Resistor

For use of NB 4000 units in a external Modbus network, it is possible to set Biasing and Termination Resistor on each unit as required.

Biasing	OFF*	OFF	ON	ON
Termination Resistor	OFF*	ON	OFF	ON



\*factory provided

DIP Switch position:

Top view Side view