FEATURES

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 Relays (can be used as level limit switch outputs)
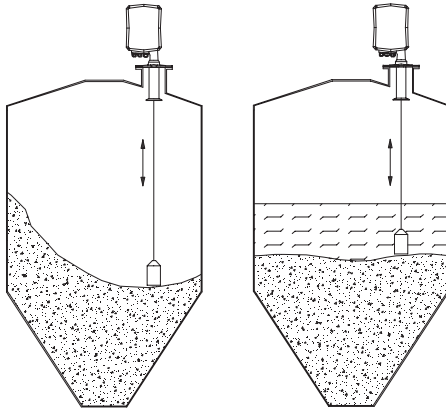
SoliTrak™ Rope Version

SoliTrak™ Tape Version
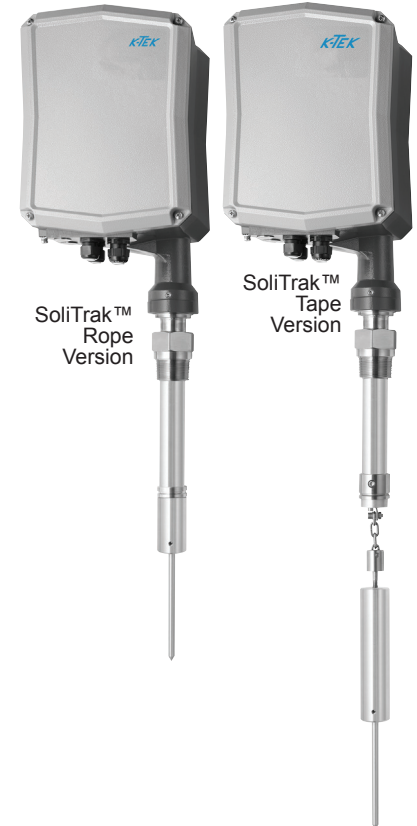
The SoliTrak™ is an electro-mechanic level measuring instrument for the continuous measuring of level in hoppers, silos or tanks. This top mounted system is used for monitoring the level in applications such as powders, small grain bulk materials or coarse grain bulk materials. A bob weight is mounted at the end of a measuring rope or tape, which is wrapped on a motor driven rope roller. Upon contact with the bulk material, the bob weight returns and is drawn back to its upper stop position.

The housing is divided into two independent chambers (the rope chamber and the electronic chamber, seen below), which are sealed to each other to isolate electronics from the process. Only the rope chamber is in contact to the inside of the silo during the measurement. If the bob weight is in the upper stop position, it seals the opening between the unit and the silo. Pulses are generated during downward movement and the number of pulses can be processed directly in a PLC (programmable logic controller) or a counter.

SPECIFICATIONS

Process			SoliTrak Solids Measurement	SoliTrak Interface Measurement
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 relays	•	•
		Modbus RTU	•	•
		Profibus DP	•	•
Certificate				
General purpose		CE, FM	•	•

max.
10
units

Solids measurement

Interface measurement (solids in water)
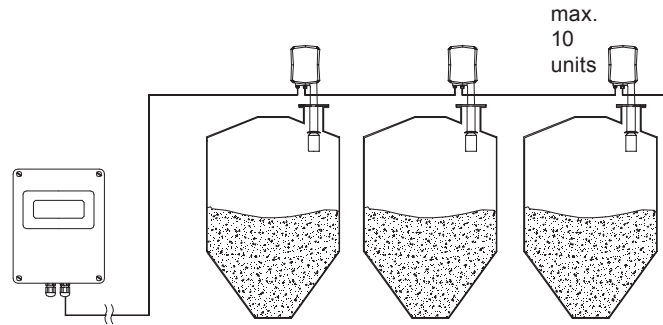
Remote box SoliTrak
Connecting SoliTrak units
with Modbus RTU network

Features:
• Programming of the SoliTrak units
• Display of level
• Start of measurement
• Display of diagnostics information

Sensor weight guide (solids measurement)

Sensor weight	Application				Note	Fits through mounting hole				
						Thread		Flange		
	* Material densitiy g/l (lb/ft³)	Material consistence	Angle of repose	Max. process temp.		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).
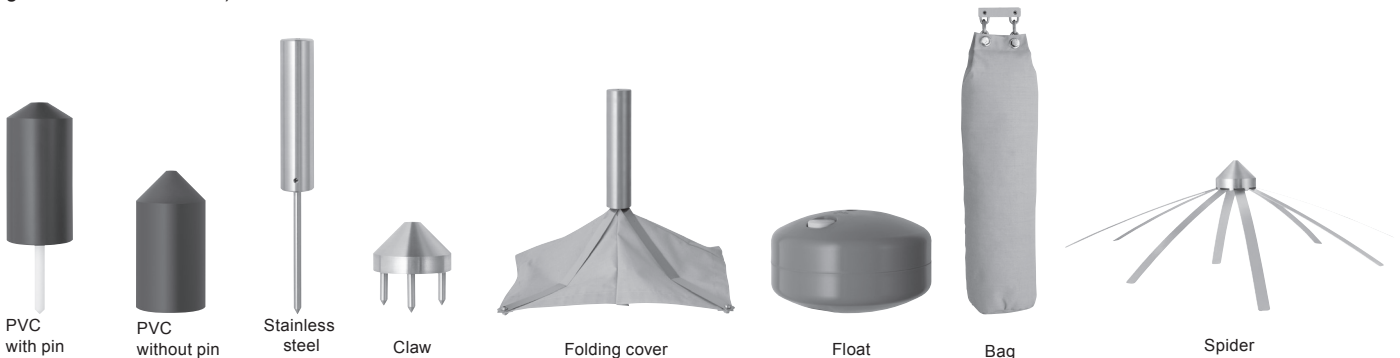
PVC with pin

PVC without pin

Stainless steel
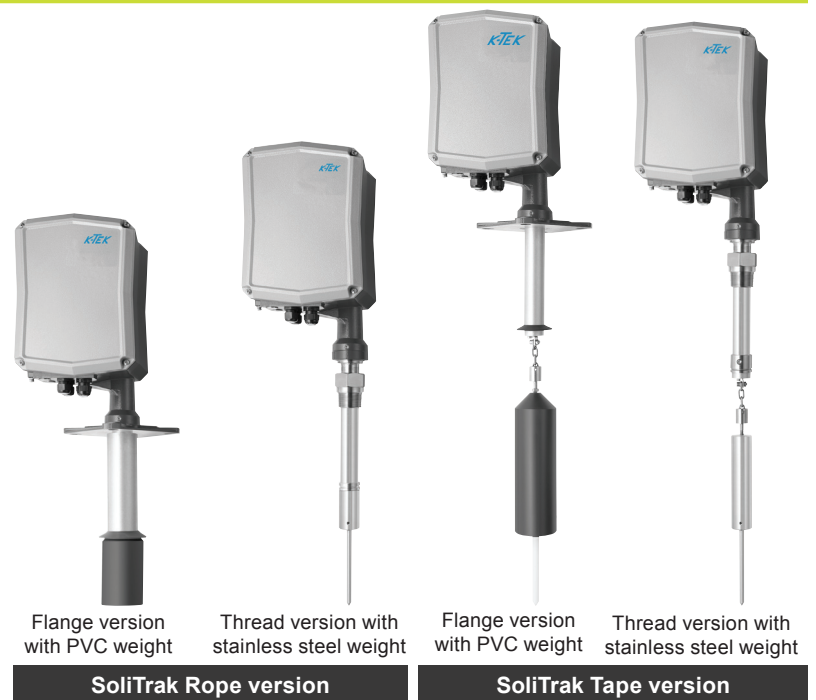
Claw

Folding cover

Float

Bag

Spider

SOLIDS MEASUREMENT

Cable entries

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

CE	Screwed cable gland: 2x M20x1.5 and
ATEX	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

Flange version with PVC weight	Thread version with stainless steel weight	Flange version with PVC weight	Thread version with stainless steel weight
SoliTrak Rope version		**SoliTrak Tape version**	

Pos.1	Basic Type		
	C	SoliTrak	Rope version (30m)
	D	SoliTrak	Tape version (40m)
Pos.2	**Certificate**		
	0	CE	
	M	FM General purpose	
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 10 cm / 1/6ft 1/3 ft)
	B	0/4-20mA	Modbus	Electronic counting pulse (1cm 2.5 cm 1/20ft 1/10ft)
	E	0/4-20mA	Profibus DP	Relay counting pulse (5cm 10 cm 1/6ft 1/3ft)
Pos. 6	**Process Connection**		
	X	Flange DN100 PN16 (EN1092 - 1) and flange 4" 150 lbs ANSI B16.5 (unit is fitting to this flange)	
	Y	Flange 2" and flange 3" 150 lbs ANSI B16.5 (unit is fitting to this flange)	
	A	Thread R 1-1/2 inch	tapered DIN2999
	B	Thread NPT 1-1/2 inch	tapered ANSI B1.20.1
	C	Thread NPT 3 inch	tapered ANSI B1.20.1
Pos.7	**Motor for high measurement frequency** [1]		
	1	Standard	
	2	Brushless motor	
Pos.8	**Sensor weight** [2,3]		
	Y	without[4]	
	A	PBC without pin	only with rope version pos.1 C, max. 80°C
	B	PVC with pin	Max. 80°C
	C	Stainless 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
SLT 3..00								

All positions are available in special design (use code "2").
1 Motor with increased service life
2 For use in Hazardous Locations (Dust Ex): It must be ensureed, 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)

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 500 mm (19.7 in)
	B 1000 mm (39.4 in)
Pos. 28	Compressed air connector
	Quick coupling including counter part, for house 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 general purpose. (Pos.2 0,M), 80°C (Pos.3 A), PVC weight (Pos.8 A,B)
Pos.30	Increased process overpressure
	-0.5 to 1.7 bar (-7.3 to 25 psi) (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 SoliTrak
	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)

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	Screwed cable gland: 2x M20x1.5 and 1x M25x1.5
ATEX	
	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

SoliTrak
Rope version

SoliTrak
Tape version

For applications with soft/muddy or compact material surface

For applications with compact material surface

INTERFACE MEASUREMENT (SOLIDS IN WATER)

Pos.1	Basic Type			
	E	SoliTrak	Rope version (30m) including sensor weight	
	F	SoliTrak	Tape version (40m) including 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 - 20 mA	Modbus	Relay counting pulse (5cm 10 cm 1/6ft 1/3ft)
	B	0/4 - 20 mA	Modbus	Electronic counting pulse (1cm 2.5cm 1/20ft 1/10ft)
	E	0/4 - 20 mA	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		

Order Code

Basic type	1	2	3	4	5	6	7	8
SLT			A			X		1

All positions are available in special design (use code "2").
[1]Motor with increased service life.

Options

Pos.25	Window in lid and external start button	
Pos.27	Length of socket pipe	
	A	500 mm (19.7")
	B	1000 mm (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 1.7 bar (-7.3 to 25 psi) (only with CE Pos.2 0)	
Pos.31	Preset fieldbus address (Modbus)	
	Enables easy commissioning with Remote Box 9000	
	Preset from address = "1" to "amount of ordered units." Address label on enclosure.	
	Termination resistor set on unit with highest address.	

ACCESSORIES

SoliTrak 9000 Remote Box
Connecting up to 10 units with Modbus RTU network.

Features:
- Programming of the SoliTrak units
- Display of level
- Start of measurement
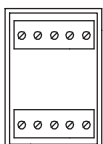- Display of diagnostics information
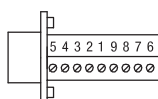
SoliTrak 9000 Remote Box
Panel mounting

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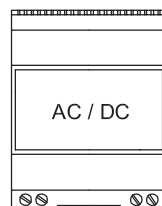For easy installation and proper functioning of the
Modbus network

Pos.1	Basic Type	
	A	SoliTrak
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	24VDC
	2	85 .. 264V 50-60Hz

SoliTrak 9000
Panel mounting

SoliTrak Wall mounting

Biasing network
(with Termination
resistor)

Terminal Plug
Supplies screwing
terminals for connection
between SoliTrak panel
and Biasing network
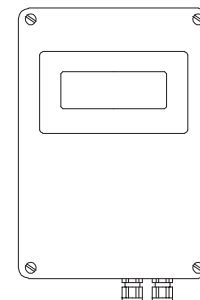
5 4 3 2 1 9 8 7 6

AC/DC converter
(for pos.4 2)

AC / DC

Material: PC (fibre glas reinforced)

Biasing network implemented.
AC/DC converter (for pos.4 2)
implemented

ACCESSORIES

Extension Cables
For connecting the SoliTrak 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 Modubs calbe in ATEX Zone 21
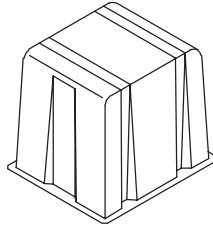   em300529   pricemeter
Threaded hose coupling
With thread M20 x 1.5. Fitting with protection hose em300529. Applicable for ATEX Zone 21.
      em100530   price/pcs

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
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" 150 lbs	+85°C (185°F)	zu107000
di300128	2"/3" 150 lbs	+250°C (482°F)	zu107000

Basic type

Flange version

Thread version

205mm (8.07")

52mm (2.0")

220mm (8.66")

64mm (2,5")

305mm (12.0")

C

A

X

Housing

Housing extension

Flange

Socket pipe

B

Rope / tape

C

A

X

Housing

Housing extension

Thread

Socket pipe

B

Rope / tape

Flange version, bottom view

d2

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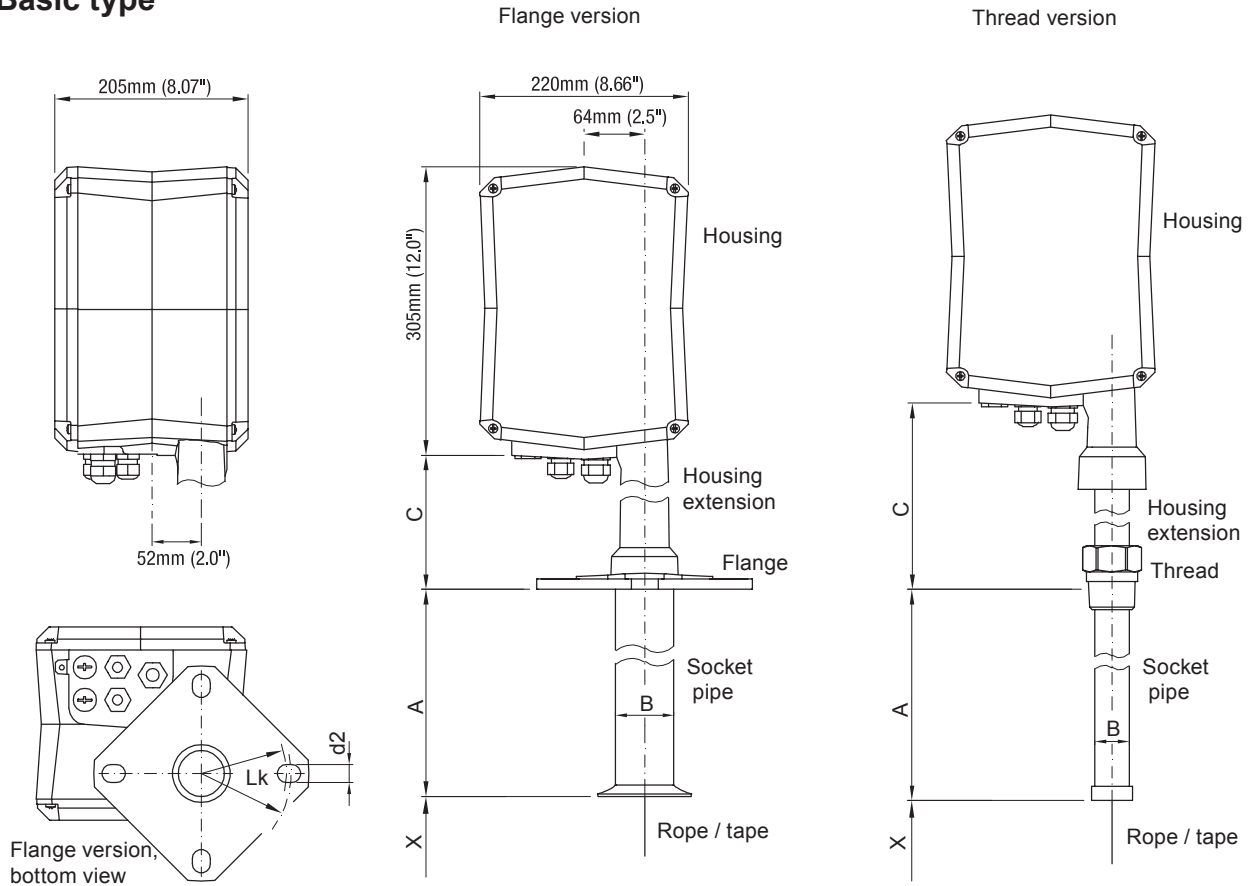
X = Length to bottom of sensor weight (in upper stop position): see next page

A = Lenght 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 = ø90 .. 95.3mm (3.54 .. 3.75") slot d2 = ø19mm (0.75")
fitting to: 2" / 3" 150lbs	Lk = ø60.4 .. 76.2mm (2.38 .. 3.0") 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
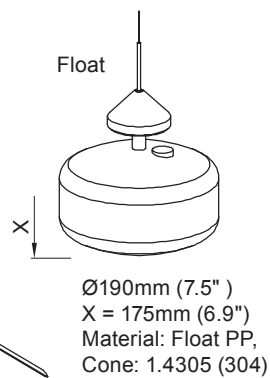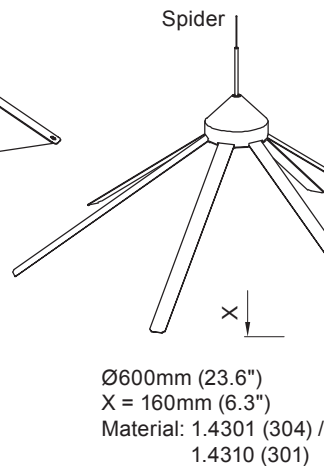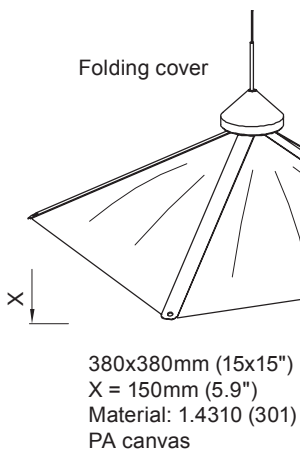Window in lid and
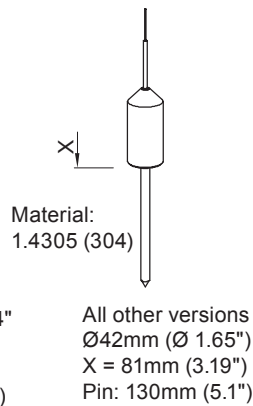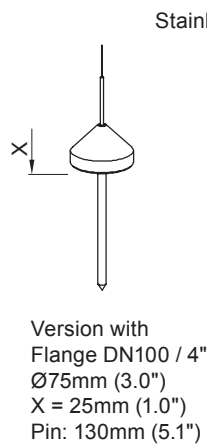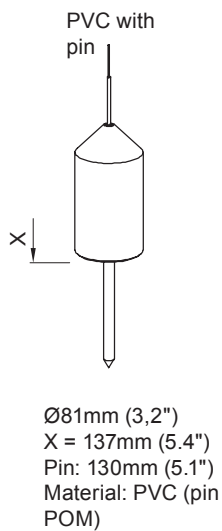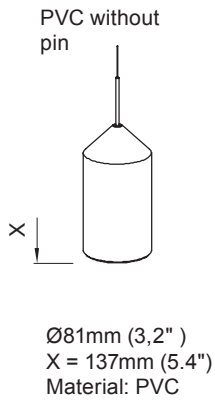outside start button

Window in lid

Outside
start button

Pos. 28
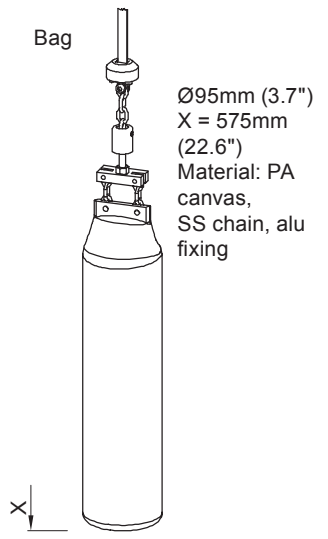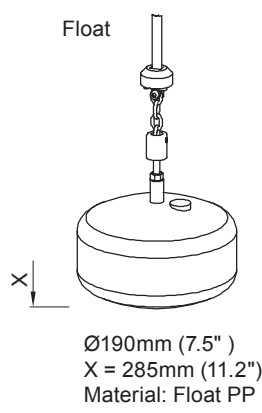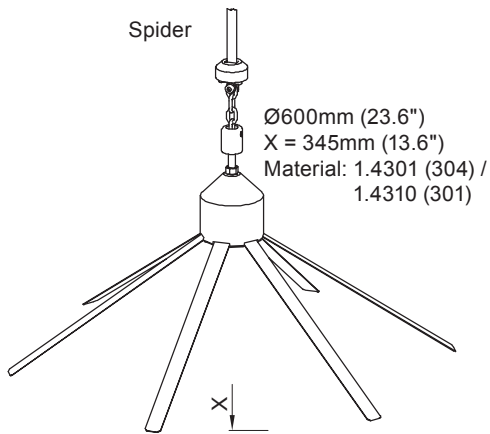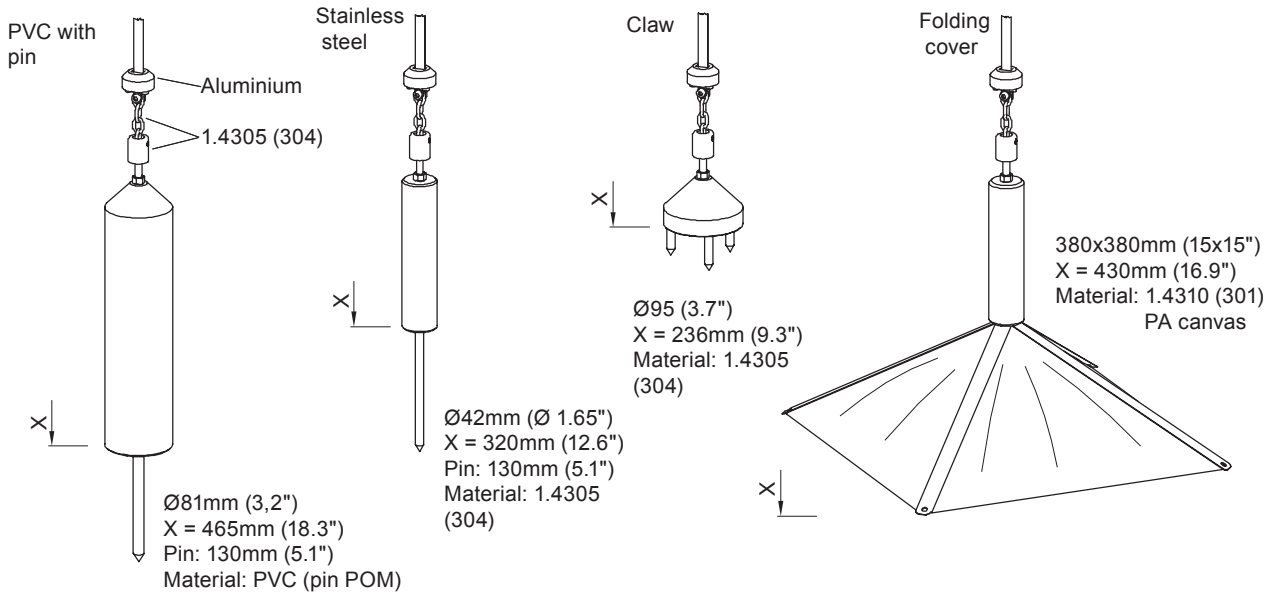Compressed air
connector
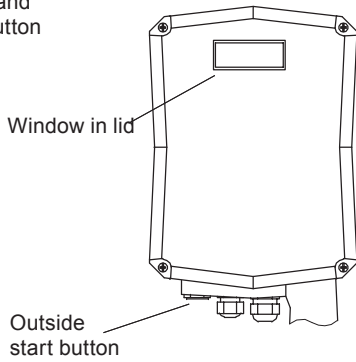
Compressed
air connector
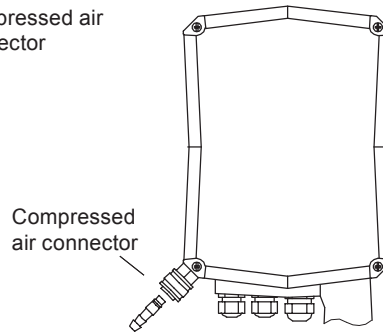
Sensor weights

Solids measurement: Rope version
All weights ca. 1,0kg (2.2lbs)

PVC without
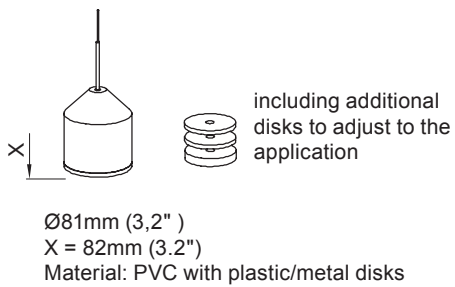pin

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)

PVC with pin

Aluminium

1.4305 (304)

Ø81mm (3,2")
X = 465mm (18.3")
Pin: 130mm (5.1")
Material: PVC (pin POM)

Stainless steel

X

Ø42mm (Ø 1.65")
X = 320mm (12.6")
Pin: 130mm (5.1")
Material: 1.4305 (304)

Claw

X

Ø95 (3.7")
X = 236mm (9.3")
Material: 1.4305 (304)

Folding cover

380x380mm (15x15")
X = 430mm (16.9")
Material: 1.4310 (301)
PA canvas

X

Spider

Ø600mm (23.6")
X = 345mm (13.6")
Material: 1.4301 (304) /
1.4310 (301)

X

Float

X

Ø190mm (7.5")
X = 285mm (11.2")
Material: Float PP

Bag

Ø95mm (3.7")
X = 575mm (22.6")
Material: PA canvas,
SS chain, alu fixing

X

Interface measurement: Rope version
Weight ca. 1,0kg (2.2lbs)

X

including additional disks to adjust to the application

Ø81mm (3,2")
X = 82mm (3.2")
Material: PVC with plastic/metal disks

Interface measurement: Tape version
Weight ca. 2.1kg (4.6lbs)

X

Ø42mm (Ø 1.65")
X = 320mm (12.6")
Pin: 130mm (5.1")
Material: 1.4305 (304)
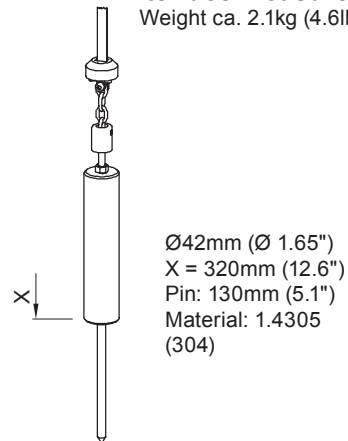
DIMENSIONS

SoliTrak Remote Box

SoliTrak Panel mounting

130mm (5.12")

68mm (2.68")

32mm (1.26")

77mm (3.03")

140mm (5.51")

Biasing network

45mm (1.8")

65mm (2.6")
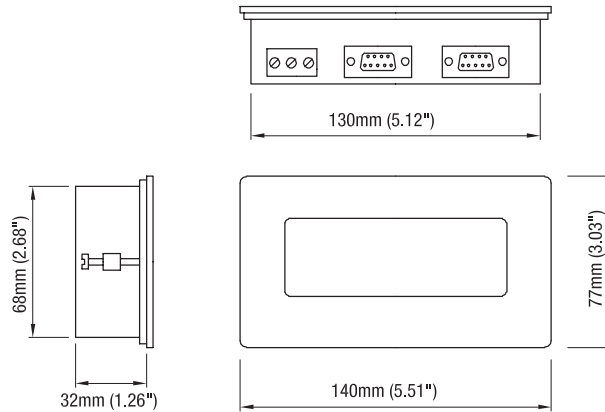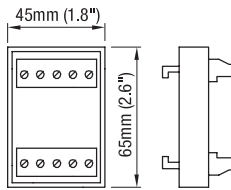
Mounting: DIN rail 35

Terminal plug

5 4 3 2 1 9 8 7 6

AC/DC converter

AC / DC

90mm (3.54")

70mm (2.76")

60mm (2.36")
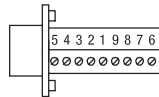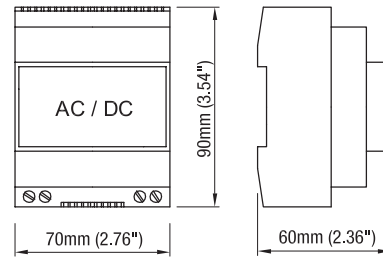
Mounting: DIN rail 35

SoliTrak Wall Mounting

Depth 90mm (35.4")

255mm (10.0")

180mm (7.09")

120mm (4.72")

Mounting holes

190mm (7.48")

239mm (9.41")

165mm (6.50")
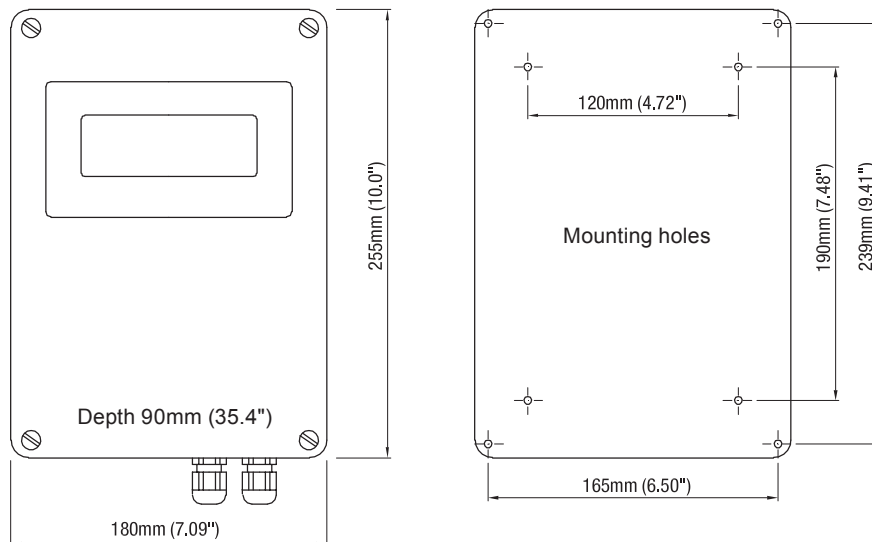
SPARE PARTS

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

Sensor weights

All sensor weights are delivered including mounting set for proper fixing to the rope/tape and excluding 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..28VDC; 0/4-20mA; Modbus, Relay counting pulse (5cm 10cm 1/6ft 1/3ft)
pl102695	Electronics 20..28VDC; 0/4-20mA; Modbus, Electronic counting pulse (1cm 2.5cm 1/20 ft 1/10ft)
pl102697	Electronics 20..28VDC; 0/4-20mA; Relay counting pulse (5cm 10cm 1/6 ft 1/3ft)

Internal Heater
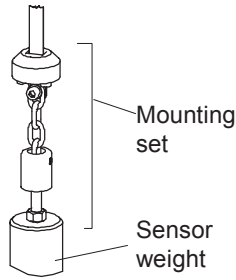|		
em100372	220 Ohms	For power supply 98..253V 50-60Hz
em100371	8 Ohms	For power supply 20..28VDC

Remote Box SoliTrak
em100910	Panel	24 VDC

Sensor weights

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

Sensor weight

Mounting set

Mounting set

Sensor weight

Sensor weight with discs

Mounting set

Extra discs
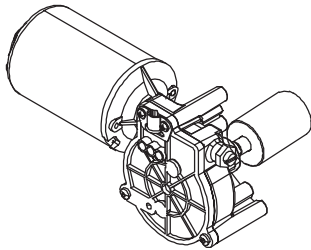
Lid

Solids measurement: rope version

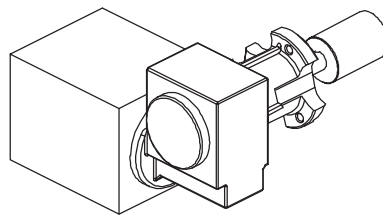Solids measurement: tape version
Interface measurement: tape version
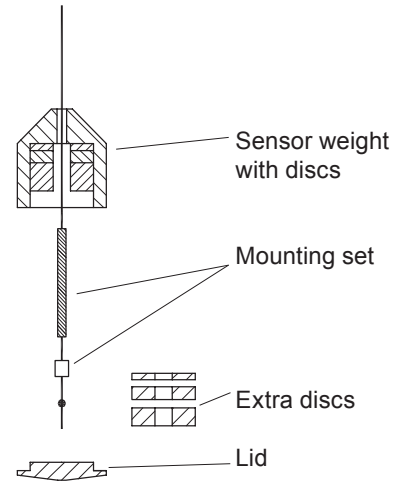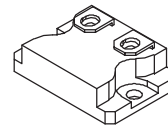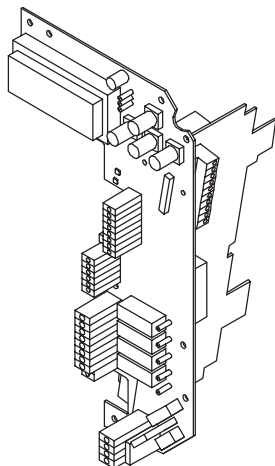
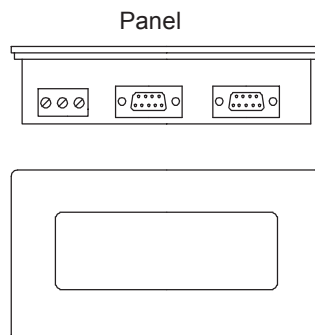Interface measurement: rope version

Motor

Standard

Brushless motor

Heater

Delivery including cable and plug

Electronics

Delivery including: cable, plug, sealing, mounting tools

Remote Box SoliTrak

Panel

SLT-0202-1 Rev g (03-2011)
DCN0418
For the latest version of this data sheet,
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