

FOR SOLIDS

# EasyTREK/EchoTREK

ULTRASONIC LEVEL TRANSMITTERS



3 YEARS WARRANTY @ NIVELCO - WHERE ELSE?

# NIVELCO

LEVEL TRANSMITTERS

## EasyTREK / EchoTREK ULTRASONIC LEVEL TRANSMITTERS FOR SOLIDS

### MAIN FEATURES

- Non-contact level measurement
- 4-wire compact and integrated (blind) level transmitters
- Maximum 60 m (200 ft) measuring range
- Narrow (5°) beam angle
- Full temperature compensation
- Plug-in display unit for the compact types
- HART communication
- Dust Ex version

### APPLICATIONS

- Level, volume and weight calculation
- Wide application range: light powders to coarse bulk solid materials
- Reliable measurement in challenging applications such as dusting during filling



### GENERAL DESCRIPTION

The 4-wire **EasyTREK** and **EchoTREK** compact ultrasonic level transmitters are offered for solids level monitoring tasks where previously only more complex, two part systems have performed adequately. **NIVELCO**'s high efficiency **SenSonic** narrow beam angle transducers, giving superb signal transmission, make possible that the **EasyTREK** and **EchoTREK** units overcome filling noise, dusting and irregular surface formations in most cases to give a high performance, compact, powder and solids level measurement transmitter. This is provided by the **QUEST+** software, using advanced process adaptive signal processing for reliable echo monitoring, offering a best-in-class solution.

### OPERATION

Ultrasonic level metering technology is based on the principle of measuring the time required for the ultrasound pulses to cover the distance from the sensor to the surface of the medium and back. The echoes bounced back from the surface reach the face of the sensor after the time of flight of the ultrasonic impulse. The time of flight of the reflected signal is measured and processed by the electronics, and then this is converted to distance, level, volume or mass proportional data with the help of the customizable tank shape and dimensions. The intelligent **QUEST+** process adaptive signal processing software system ensures that the electronics identifies and validates the solids surface signal, giving reliable level monitoring.

Coning or arching caused by the filling / emptying process can result in an adversely weak echo when the transducer is installed vertically. The joystick aiming device, an important part of the **EasyTREK** and **EchoTREK** level transmitters offers a suitable solution to minimize most of these unfavourable effects. The optimal tilting position can be adjusted during operation and recommended to be checked at multiple levels during the filling / emptying process. As a general rule, best result is obtained by the transducer aimed towards the centre of the tank bottom.

### TRANSDUCERS

Transducer material	EasyTREK	EchoTREK
	SCD-300	STD/SBD-300
PP (Standard version)	■	■
Aluminium (Ex version)	■	■

### PROPERTIES

Functions	EasyTREK	EchoTREK
	SCD-300	STD/SBD-300
Relay	■	■
HART	■	■
Dust Ex version	■	■
Display	-	SAP-100



## TECHNICAL DATA

Type	EasyTREK SCD-300	EchoTREK S□D-300
System	4-wire	
Accuracy (1)	± (0.2% of measured distance + 0.1 % of range)	
Resolution	10 mm (0.4 inch)	
Output	Analogue	4-20 mA
	Relay	SPDT, 48 V AC / 5 A, AC12
	Display	–
	Digital Communication	4-20 mA + HART
Ambient temperature	-30 °C ... +60 °C (-22 °F ... +140 °F)	-30 °C ... +60 °C (-22 °F ... +140 °F), with display: -25 °C ... +60 °C (-13 °F ... +140 °F)
Medium temperature	-30 °C ... +75 °C (-22 °F ... +167 °F)	
Process pressure	0.07 ... 0.11 MPa (0.7 ... 1.1 bar / 10 ... 16 psi g) P <sub>absolute</sub> ±0.01 MPa (0.1 bar / 1.45 psi g) difference between ambient and tank pressure	
Power supply	11.4 ... 40 V DC / 4.7 W and 11.4 ... 28 V AC / 5.2 VA	I. version: 85 .. 255 V AC / 6,8 VA II. version: 11.4 ... 40 V DC / 4.7 W and 11.4 ... 28 V AC / 5.2 VA
Electrical protection	Class III.	I. version: Class I. II. version: Class III.
Housing	Same as the transducer housing material	Paint coated aluminium
Electrical connection	LiYCY type 7x 0.5 mm <sup>2</sup> (AWG20) shielded Ø 7.5 mm (0.3 in) cable; standard cable length: 5 m (16.5 ft) (can be ordered up to 30 m (100 ft))	2x M20x1.5 cable glands + internal thread for 2x ½" NPT cable protective pipe, cable outer diameter: Ø6...Ø12 mm (0.25...0.45 inch), wire cross section: max.1.5 mm <sup>2</sup> (AWG15) Ex version: See „Special data for Ex certified models" table
Ingress protection	IP65	Transducer: IP65, Housing: IP67
Explosion protection	See „Special data for Ex certified models" table	
Mass	3 – 3.5 kg (6.6 – 7.7 lb)	5 kg (11 lb)

(1) Under optimum conditions and stabilized transducer temperature

## SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	EasyTREK SCD-300	EchoTREK S□D-300
Protection type	Dust Ex	
Ex marking	⊕ II 1 D IP68 T130°C	⊕ II 1/2 D IP65 T130°C
Ambient temperature	-20 °C ... +60 °C (-4 °F ... + 140 °F)	-30 °C ... +60 °C (-22 °F ... +140 °F), with display: -25 °C ... +60 °C (-13 °F ... +140 °F)
Medium temperature	-30 °C ... +75 °C (-22 °F ... +167 °F)	
Electrical connection	LiYCY type 7x 0.5 mm <sup>2</sup> (AWG20) shielded Ø 7.5 mm (0.3 in) cable; standard cable length: 5 m (16.5 ft)	2x M20x1.5 metal cable glands



### ULTRASONIC LEVEL TRANSMITTERS IN SYSTEM WITH A PC

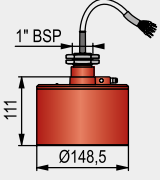
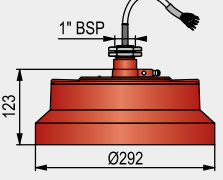
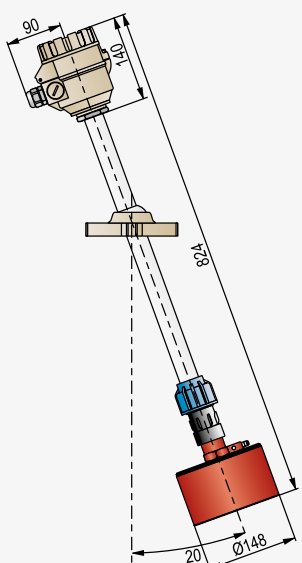
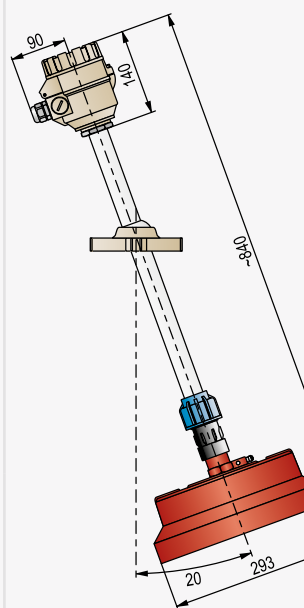
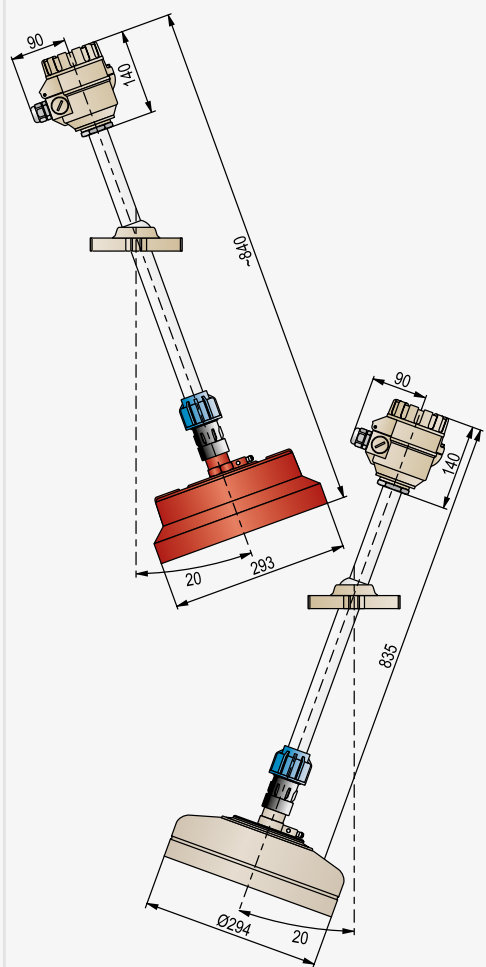
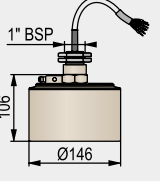
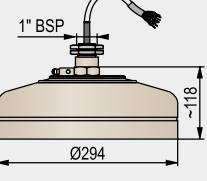
Instruments with HART output can be connected to a PC interfaced by a **UNICOMM** HART-USB modem. A HART multidrop loop can consist of a maximum of 15 transmitters. All measured values can be visualized and/or the **EasyTREK / EchoTREK** transmitters can be remote programmed by the PC. Applicable software: **EView2** configuration software or **NIVISION** process visualization software.

### ULTRASONIC LEVEL TRANSMITTERS IN HART MULTIDROP LOOP

The **MultiCONT** processes and displays measurement data supplied by **NIVELCO's** HART equipped transmitters connected to a Multidrop loop. Up to 15 transmitters (also mixed models) can be connected and remote programming can be also performed through the **MultiCONT**. Re-transmission of the data is possible via RS485 communication line to a PC or PLC when needed.



## TRANSDUCER DATA AND DIMENSIONS

Transducer type	S□D-34	S□D-33	S□D-31
Recommended applications	Small tanks, hoppers, conveyor belts. Both powders and granules.	Medium sized silos containing all kinds of bulk solids.	Larger silos containing all kinds of bulk solids. Due to its power and low frequency recommended if dust generation is significant.
EasyTREK (normal type)	 <p>1" BSP 111 Ø148,5</p>		 <p>1" BSP 123 Ø292</p>
EchoTREK (normal type)	 <p>90 140 Ø148 20 808</p>	 <p>90 140 Ø146 20 805</p>	 <p>90 140 Ø294 20 835</p>
EchoTREK (Ex type)		 <p>1" BSP 106 Ø146</p>	 <p>1" BSP ~118 Ø294</p>
Transducer material	Normal type: PP and aluminium, Ex type: Paint coated aluminium		
Surface of the transducer	Closed cell Polyurethane foam sensor face (PUR)		
Beam angle	5°		
Max. measuring range <sup>(1)</sup>	15 m (50 feet)	30 m (100 feet)	60 m (200 feet)
Min. measuring range <sup>(1)</sup>	0.6 m (2 feet)		1 m (3.3 feet)

<sup>(1)</sup> Under optimum conditions and stabilized transducer temperature

## WIRING

4-20 mA current output (HART)

7 6

Relay output

5 4 3

Power supply

L1 N  
2 1

ST/SB-300

Brown — Power supply  
Green — (Polarity independent)  
Yellow — Relay  
Pink — Relay  
Grey — Current output  
White — GND / Current output  
Black — Shielding to be connected to the ground  
Blue — Test

SCD-300

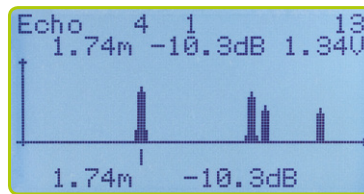
SAA-102

SAA-101

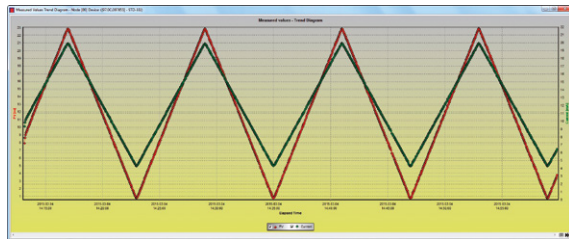
## DISPLAY



## ECHO MAP WITH MultiCONT



## DISPLAY MEASUREMENT VALUE WITH EView2

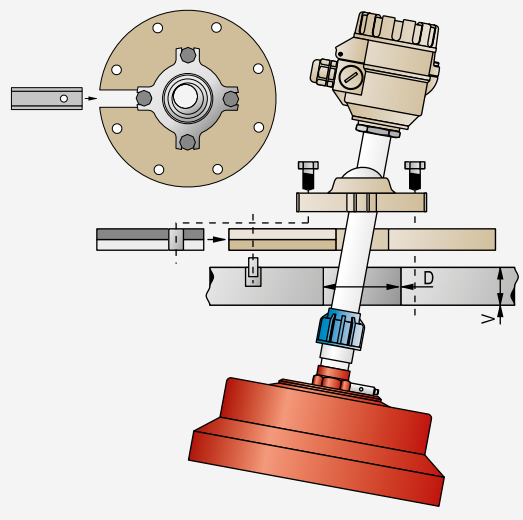


## MOUNTING

Coning or arching is a general feature of solid material storage is caused by the filling / emptying process. Optimising the aiming by the SAA-102 joystick (part of the EchoTREK units) is recommended in these situations. The drawing on the right shows a special SFA-3□5 type flange providing easy and fast mounting on the silo top. In case the entire tilting range of the aiming arm is required, the diameter of the opening "D" and the thickness of the roof "V" is to be taken into account.

The chart below aids the design of the proper mounting position for the EasyTREK / EchoTREK units.

Diameter of the opening "D"	Max. thickness of the roof "V"
160 mm (6.3 inch)	110 mm (4.3 inch)
190 mm (7.5 inch)	150 mm (5.9 inch)
230 mm (9.0 inch)	200 mm (7.8 inch)
300 mm (11.8 inch)	280 mm (11.0 inch)
340 mm (13.4 inch)	300 mm (11.8 inch)



## ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

### EasyTREK 4-wire integrated compact ultrasonic level transmitters for solids

EasyTREK S ■ D-3 ■ ■ ■ ■ (1)

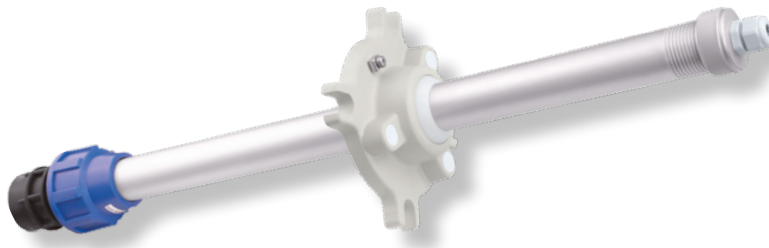
Type	Code	Measuring range	Code	Process connection	Code	Output / Ex	Code
Integrated	C	60 m (200 feet)	1	1" BSP thread	0	4-20 mA + HART + relay	4
		30 m (100 feet)	3			4-20 mA + HART + relay / Ex	8
		15 m (50 feet)	4			With aiming device	J

### EchoTREK 4-wire compact ultrasonic level transmitters for solids

EchoTREK S ■ D-3 ■ ■ ■ ■ (1)

Type	Code	Measuring range	Code	Process connection	Code	Output / Ex	Code			
Transmitter	T	60 m (200 feet)	1	With aiming device	J	85-255 V AC power supply	4-20 mA + relay	1		
		Transmitter + display	B				30 m (100 feet)	3	HART	3
							15 m (50 feet)	4	Ex	5
							4-20 mA + relay	HART Ex	7	

(1) The order code of an Ex version should end in "Ex"



## ACCESSORIES TO ORDER

### Separately orderable PP plastic flanges

SFA-3 ■ ■ ■ -0

DIN flanges	Code	FF ANSI flanges	Code	JIS flanges	Code	For units with	Code
DN80 PN16	2	3" FF 150 psi	A	10K 80A	G	1" BSP thread	1
DN100 PN16	3	4" FF 150 psi	B	10K 100A	H	2" BSP thread	2
DN125 PN16	4	5" FF 150 psi	C	10K 125A	P	2" NPT thread	4
DN150 PN16	5	6" FF 150 psi	D	10K 150A	R	SAA-102 aiming device	5
DN200 PN16	6	8" FF 150 psi	E	10K 200A	S	1 1/2" BSP thread	6
DN250 PN16	7	12" FF 150 psi	Y	10K 300A	Z	1 1/2" NPT thread	7
DN300 PN16	8						

Accessories	Order Code
Fast connecting gland for pipe mounting, 1", PP	SAA-101-0
Aiming device, L=500 mm, Aluminium, Pg9, drilled as DN50 PN16	SAA-102-0
Damping gland for mounting the devices to thin metal roofs, PP	SAA-106-0

Other accessories	Order Code
Plug-in display module	SAP-100
Multichannel process controller and display unit	MultiCONT P-200
24V DC power supply module, DIN rail mountable	NIPOWER PPK-331
HART- USB/RS485 modem for remote programming with PC, DIN rail mountable	UNICOMM SAK-305
HART- USB modem for remote programming with PC	UNICOMM SAT-304
EView2 configuration software for remote programming with PC	FREE download!

