EasyTREK / EchoTREK

ULTRASONIC LEVEL TRANSMITTERS FOR LIQUIDS

5 YEARS WARRANTY

NIVELCO

LEVEL TRANSMITTERS

GENERAL DESCRIPTION

The **EasyTREK** and **EchoTREK** high performance level transmitters are based on **NIVELCO**'s 35 years of experience with ultrasonic level measurement. Whether for liquid level measurement in sumps or tanks, for tank contents measurement, or open channel flow measurement, **EasyTREK** & **EchoTREK** transmitters provide the answer. Installed on the tank roof, or above the liquid surface to be measured, the transmitters give analogue output proportional to liquid level or transmit HART® digital data. The **EchoTREK** is an intelligent compact ultrasonic level transmitter with 4 – 20 mA output offering HART® protocol as option. Local reading is ensured by a plug-in display which can be removed if displaying is not needed. Four keys provide for programming, both display and keys are located under a removable cover. The unit is tank-top mountable only.

The **EasyTREK** high performance level transmitters are IP68 rated units have their transducer and processing electronics incorporated in one single housing. The **EasyTREK** transmitters utilize HART® (HART® 7 in case of SP-500 series) communication so they can be used in multidrop systems connected to **MultiCONT** process controller/display, or to a PC with the help of the **UNICOMM** HART®-USB modem or similar. The transmitters can be connected wirelessly to a PC with the SAT-504 Bluetooth® HART® modem.

The members of the new **EasyTREK** SP-500 series can be recognised from the more compact size, the increased maximum measuring range and the decreased minimum measuring range and can be remotely programmed also with Handheld Field Communicator. Both models can be used in multi-drop systems connected to **NIVELCO**'s **MultiCONT** process controller/display, or to a PC with the help of the **UNICOMM** HART® USB / RS485 modem or similar. **EasyTREK** and **EchoTREK** are available with measurement ranges up to 25 m (82 ft) providing wide application possibilities. Both ultrasonic level transmitters are using **NIVELCO**'s established SenSonic range transducers with a full beam angle of 5 to 7 degrees connected to the intelligent electronics featuring the QUEST+ advanced signal processing algorithm.

MAIN FEATURES

- 2- /4-wire compact and
- 2-wire integrated level transmitters
- Non-contact level measurement
- Maximum 25 m (82 ft) measuring range
- Narrow (5°) beam angle
- Can be powered from 12 V battery (SP-500)
- Full temperature compensation
- IP68 rated integrated (blind) type
- Plug-in display unit for the compact types
- HART® (HART® 7 in case of SP-500) communication
- Ex version
- Handheld compatibility (SP-500)

APPLICATIONS

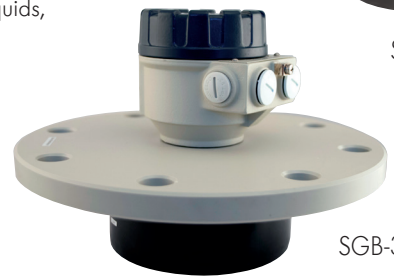
- For most liquids, including flammable liquids
- Open channel flow metering
- Wide application area from wastewater to aggressive chemicals
- Level measurement in basins, wells, sumps, lift-stations
- Suitable for level measurement of hydrocarbons, acids, aggressive liquids, any water based medium

CERTIFICATES:

- ATEX (Ex ia)
- INMETRO

SEA-580

SPA-540



SGB-325

OPERATION

The 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 level to be measured and back. The echoes bounced back from the surface of the medium to be measured reach the sensor surface 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 flow proportional data with the help of the customizable tank dimensions or the pre-programmed flume / weir parameters. The intelligent QUEST+ process adaptive signal processing software system ensures that the electronics identifies and validates the liquid surface signal, giving reliable level monitoring.

TRANSDUCERS

Transducer material	EasyTREK		EchoTREK	
	SP-500	SP-300	SE/SG-300	ST/SB-400
PP (Polypropylene)	■	■	■	■
PVDF (KYNAR)	■	■	■	■
PTFE (Teflon)	–	■	■	■
1.4571 (316Ti) stainless steel	–	–	■	■

Functions	EasyTREK		EchoTREK	
	SP-500	SP-300	SE/SG-300	ST/SB-400
Relay	■	■	■	■
HART®	■	■	■	■
IrDA	–	■	■	■
Logger	■	■	■	■
Intrinsically safe version	–	■	■	–
Display	–	–	SAP-200	

SPA-360

SPA-380

SGP-370

TECHNICAL DATA

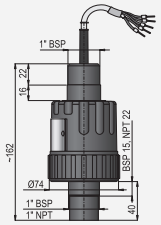
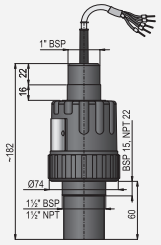
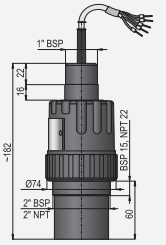
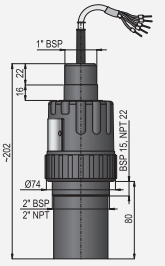
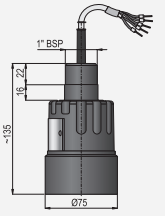
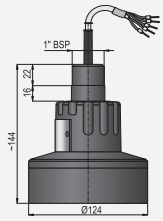
Type		EasyTREK		EchoTREK	
		SP-500	SP-300	SE/SG-300	ST/SB-400
System		2-wire			4-wire
Accuracy[1]		± (0.1% of measured distance +0.025% of range) or ± (0.05% of range), whichever is greater	± (0.2% of measured distance +0.05% of range)	± (0.2% of measured distance +0.05% of range)	
Resolution		Depending on the measured distance: < 2 m (6.5 ft): 1 mm (0.04 in), 2 – 5 m (6.5 – 16.5 ft): 2 mm (0.075 in), 5 – 10 m (16.5 – 33 ft): 5 mm (0.2 in), >10 m (33ft): 10 mm (0.4 in)			
Output	Analogue	4 – 20 mA			
	Relay[2]	SPDT, 30 V DC, 1 A DC			#1 SPDT, 250 V AC, 3 A AC1 #2 SPDT, 30 V DC, 1 A DC
	Display	–		SAP-200: 6-digit plug-in LCD display	
	Digital Communication	HART® 7	HART®		
Ambient temperature		-30 °C … +80 °C (-22 °F … +176 °F)		With plastic housing: -25 °C … +70 °C (-13 °F … +158 °F), with metal housing: -30 °C … +70 °C (-22 °F … +158 °F), with display: -25 °C … +70 °C (-13 °F … +158 °F)	
		–	Ex version: see "Special data for Ex certified models" table		–
Process temperature		PP, PVDF transducers: -30 °C … +90 °C (-22 °F … +194 °F)	See: "Special data of the transducers" table; Ex version: see "Special data for Ex certified models" table		
Pressure (absolute)		0.05 – 0.3 MPa (0.5 – 3 bar; 7.25 – 43.5 psi)		[3]0.05 – 0.3 MPa (0.5 – 3 bar [7.5 – 43.5 psig]), with stainless steel transducer: 0.09 – 0.11 MPa (0.9 – 1.1 bar [13 – 16 psig])	
Power supply		11 – 36 V DC	12 – 36 V DC / 48 – 720 mW	12[4] – 36 V DC / 48 – 720 mW	85 – 255 V AC / 2 VA 20 – 28 V AC/DC / 3 VA / 3 W
Electrical protection		Class III		In case of DC power supply: Class III	
					In case of AC power supply: with metal housing: Class I with plastic housing: Class II
Housing		PP or PVDF same as the transducer material	Polypropylene (PP) or (PVDF) same as the transducer material; In case of Teflon (PTFE) transducer the housing material is PP	Plastic (PBT), paint coated aluminium or stainless steel	Plastic (PBT), paint coated aluminium
Sealing		In case of PP transducer: EPDM; all the other transducers: FPM (Viton®)			
Electrical connection		4x 0.5 mm² (AWG20) (relay version: 7x 0.5 mm² [AWG20]) shielded Ø6 mm (0.25 inch) 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 – 12 mm (Ø0.25 – 0.45 inch), wire cross section: maximum 1.5 mm² (AWG15) Ex version: see: "Special data for Ex certified models" table	
Ingress protection		IP68		Transducer: IP68, Housing: IP67	
Explosion protection		–	See: "Special data for Ex certified models" table		–
Mass		0.8 – 1.2 kg (1.8 – 2.65 lb)	1.2 – 2 kg (2.65 – 4.4 lb)	1.3 – 2.3 kg (2.85 – 5 lb)	

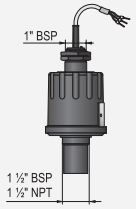
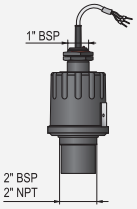
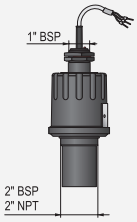
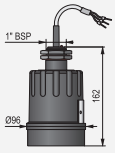
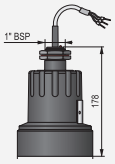
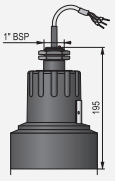
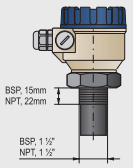
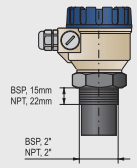
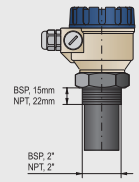
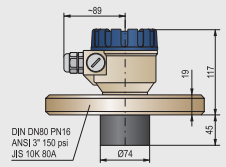
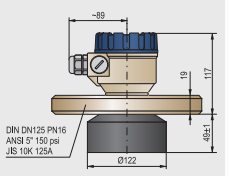
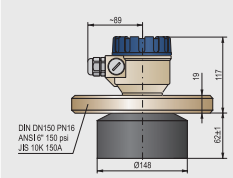
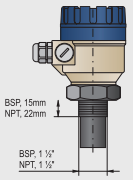
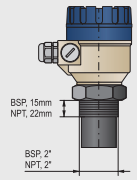
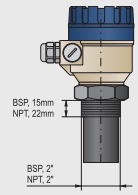
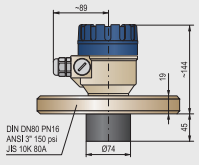
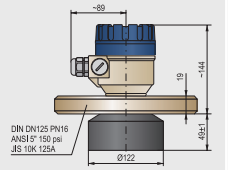
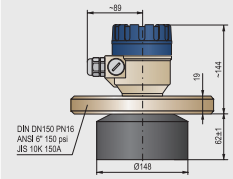
[1] Under optimum conditions and stabilized transducer temperature
[2] The 4-wire EchoTREK transmitters have two parallel operating relays
[3] For pressure less than 0.5 bar (14.5 psig) please consult with your NIVELCO representative
[4] Only partial operation is provided. Reliable operation without any restrictions is guaranteed at >13.4 V terminal voltage.

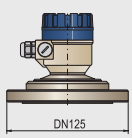
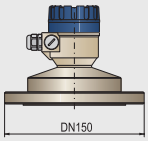
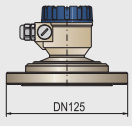
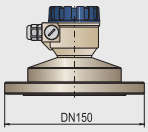
SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	EasyTREK SP-300	EchoTREK SE/SG-300
Protection type	Intrinsically safe	
Ex marking (ATEX)	⟨Ex⟩ II 1 G Ex ia IIB T6…T5 Ga	⟨Ex⟩ II 1 G Ex ia IIB T6…T4 Ga
Intrinsically safe data	Ci ≤ 28 nF, Li ≤ 200 µH, Ui ≤ 30 V, Ii ≤ 140 mA, Pi ≤ 1 W	Ci ≤ 15 nF, Li ≤ 200 µH, Ui ≤ 30 V, Ii ≤ 140 mA, Pi ≤ 1 W
Ambient temperature	-20 °C … +70 °C (-4 °F … +158 °F)	With plastic housing: -20 °C … +70 °C (-4 °F … +158 °F), with metal housing: -30 °C … +70 °C (-22 °F … +158 °F), with display: -25 °C … +70 °C (-13 °F … +158 °F)
Process temperature	With PP transducer: -20 °C … +70 °C (-4 °F … +158 °F), with PVDF transducer: -20 °C … +80 °C (-4 °F … +176 °F) Temperature class T6; with PTFE transducer: -30 °C … +90 °C (-22 °F … +194 °F) Temperature class T5	With PP transducer: -20 °C … +70 °C (-4 °F … +158 °F), with PVDF transducer: -20 °C … +80 °C (-4 °F … +176 °F), with PTFE transducer: -30 °C … +90 °C (-22 °F … +194 °F)
		With stainless steel transducer: -30 °C … +100 °C (-22 °F … +212 °F)
Electrical connection	6 x 0.5 mm² shielded Ø6 mm cable	2x M20x1.5 metal cable glands

SPECIAL DATA OF THE TRANSDUCERS

Transducer type	SP□-5A□-□	SP□-59□-□	SP□-58□-□	SP□-57□-□	SP□-56□-□	SP□-54□-□
Beam angle	5°	6°	5°	7°	5°	
Transducer material	PP or PVDF					
EasyTREK SP 2-wire						
Upper process conn.	1" BSP					
Lower process conn.	1" BSP / NPT	1½" BSP / NPT	2" BSP / NPT		–	
Max. measuring range[1]	3 m (10 ft)	5 m (16 ft)	8 m (26 ft)	10 m (33 ft)	12 m (39 ft)	18 m (59 ft)
Min. measuring range [1]	0.15 m (0.49 ft)	0.18 m (0.59 ft)	0.2 m (0.65 ft)	0.25 m (0.82 ft)		0.35 m (1.2 ft)

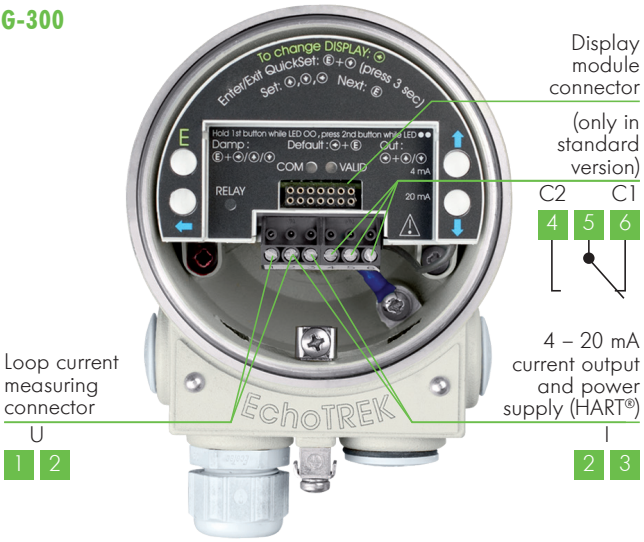
Transducer type	SP□-39/49	SP□-38/48	SP□-37/47	SP□-36/46	SP□-34/44	SP□-32/42
Beam angle	6°	5°	7°	5°		7°
Transducer material	PP or PVDF					
EasyTREK SP 2-wire						
Process connection	1" BSP, 1½" BSP / NPT	1" BSP, 2" BSP / NPT		1" BSP		
EchoTREK SE/SG 2-wire						
EchoTREK ST/SB 4-wire						
Process connection	1½" BSP / NPT	2" BSP / NPT		DN80 flange	DN125 flange	DN150 flange
Max. measuring range[1]	4 m (13 ft)	6 m (20 ft)	8 m (26 ft)	10 m (33 ft)	15 m (50 ft)	25 m (82 ft)
Min. measuring range [1]	0.2 m (0.65 ft)	0.25 m (0.82 ft)	0.35 m (1.15 ft)		0.45 m (1.5 ft)	0.6 m (2 ft)
Medium temperature	-30 °C … +90 °C (-22 °F … +194 °F)					
Recommended applications	Small vessels with 1½" or 2" process connection			Small vessels with flange	Mid-size vessels with flange	Tall vessels with flange

Transducer material	PTFE			Stainless steel		
Max. measuring range[1]	3 m (10 ft)	5 m (16.5 ft)	6 m (20 ft)	7 m (23 ft)	12 m (40 ft)	15 m (50 ft)
Min. measuring range [1]	0.25 m (0.82 ft)		0.35 m (1.15 ft)	0.4 m (1.3 ft)	0.55 m (1.8 ft)	0.65 m (2.15 ft)
Medium temperature	-30 °C … +90 °C (-22 °F … +194 °F)			-30 °C … +100 °C (-22 °F … +212 °F) (CIP 120 °C (248 °F) for max. 2 hours)		
EchoTREK S□S / S□M 4-wire						
EchoTREK S□S / S□M 2-wire						

[1] *Under optimum conditions and stabilized transducer temperature*

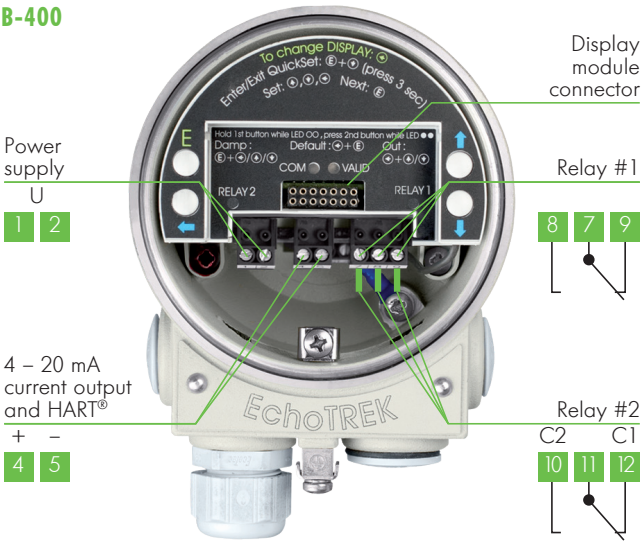
WIRING

SE/SG-300

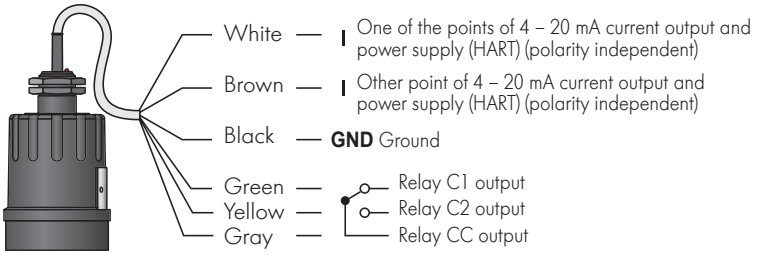


SGP-380

ST/SB-400



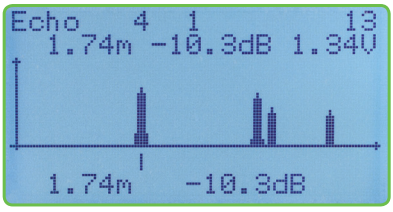
SP-300, SP-500



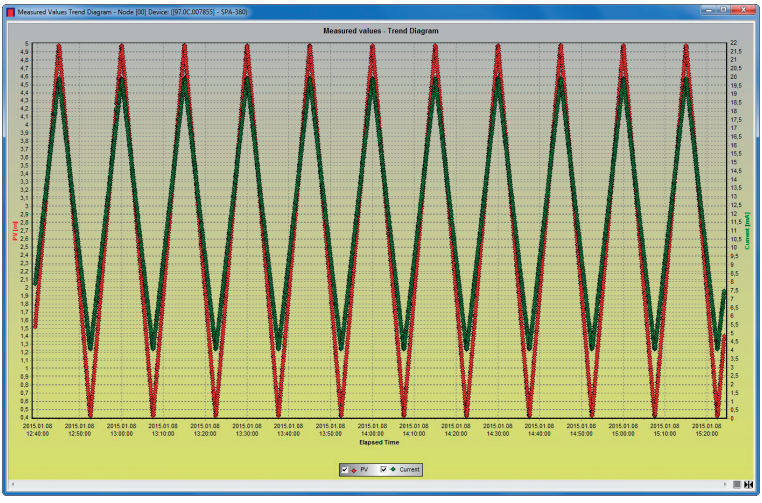
DISPLAY

With the help of the SAP-200 plug-in display a full-parameter programming can be accomplished, the parameters of measurement and output can be set using the alphanumeric display module. The large LCD display displays the measured values in numerical and bar graph form. The display features indication for the infrared communication (IrDA) port which provides possibility for logger readout, diagnostics and software upgrade.

ECHO MAP WITH MultiCONT



TREND MONITORING WITH EView2



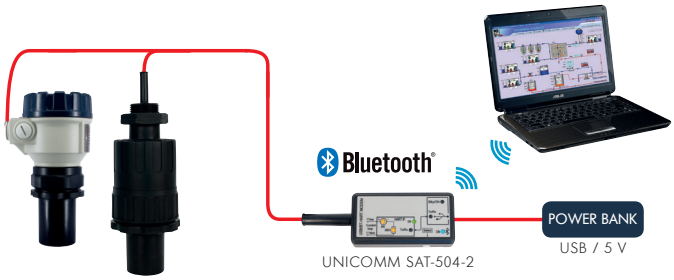
The **MultiCONT** multichannel process controller / display unit is able to visualize the Echo Map. The Echo Map feature helps to detect false reflections and aids the optimization of the measurement configuration.

ULTRASONIC TRANSMITTERS IN SYSTEM WITH A PC

The instruments with HART® output can be connected to a PC using a **UNICOMM** SAK-305 HART®-USB modem. All measured values of the **EasyTREK/EchoTREK** level transmitters can be visualized and/or the instruments can be remotely programmed via digital HART® communication.
Applicable software for PC: **EView2** configuration software or **NIVISION** process visualization software.

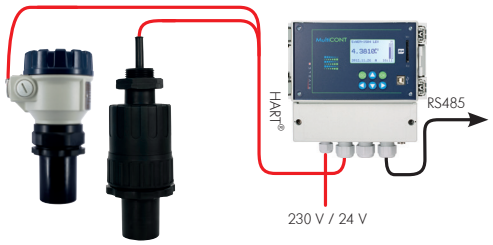
ULTRASONIC TRANSMITTERS IN SYSTEM WITH A PC CONNECTED VIA Bluetooth®

The instruments with HART® output can be connected to a PC via Bluetooth® wireless connection using a **UNICOMM** HART®-USB-Bluetooth® modem (**SAT-504**). We can provide power supply for the system with a USB power bank connected to the **UNICOMM** modem.



ULTRASONIC LEVEL TRANSMITTERS IN HART® MULTIDROP LOOP

The **MultiCONT** multichannel process controller processes and displays measurement data supplied by **NIVELCO**'s HART® equipped transmitters connected to a Multidrop loop. The 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. The visualisation of the data can be done by **NIVISION** process visualization software.
With the help of **MultiCONT** different useful functions can be achieved such as configuring and optimizing the measurement, or displaying the special echo map of the process environment.



ACCESSORIES

Separately orderable PP plastic flanges

SFA-3□□-0

RF ANSI flanges	Code
3" FF 150 psi	A
4" FF 150 psi	B
5" FF 150 psi	C
6" FF 150 psi	D
8" FF 150 psi	E
12" FF 150 psi	Y
JIS flanges	
80A (as per 10K)	G
100A (as per 10K)	H
125A (as per 10K)	P
150A (as per 10K)	R
200A (as per 10K)	S
300A (as per 10K)	Z

DIN flanges	Code
DN80 PN16	2
DN100 PN16	3
DN125 PN16	4
DN150 PN16	5
DN200 PN16	6
DN250 PN16	7
DN300 PN16	8

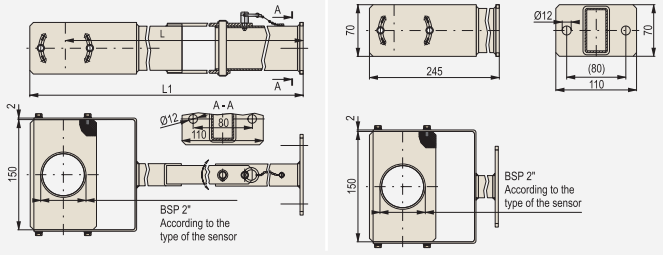
For units with	Code
Ø35 mm hole (for units with 1" BSP process connection)	1
2" BSP thread	3
2" NPT thread	4
For mounting to SAA-102 aiming device	5
1½" BSP thread	6
1½" NPT thread	7

Accessories	Order Code
Plug-in display module	SAP-200
Multichannel process controller and display unit	MultiCONT P-200
24 V DC power supply module, DIN rail mountable	NIPOWER PPK-331
Intrinsically safe isolator power supply module, DIN rail mountable	UNICONT PGK-301Ex
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
HART®-USB / Bluetooth® for remote programming	UNICOMM SAT-504
EView2 – configuration software for remote programming with PC	FREE download!

Accessories			Order Code
Fast connecting gland for pipe mounting, 1", PP			SAA-101
Damping gland for mounting the devices to thin metal roofs, PP			SAA-106
Transparent gland for pipe extension			SAA-110
Separately orderable mounting brackets			
For units with BSP thread process connection	1"	200 mm (7 ⅞ in)	SAA-107-0
		500 mm (1.65 ft)	SAA-108-0
		700 mm (2.3 ft)	SAA-109-0
	2"	200 mm (7 ⅞ in)	SAA-107-3
		500 mm (1.65 ft)	SAA-108-3
		700 mm (2.3 ft)	SAA-109-3
	1½"	200 mm (7 ⅞ in)	SAA-107-4
		500 mm (1.65 ft)	SAA-108-4
		700 mm (2.3 ft)	SAA-109-4

Suitable mounting brackets

Material: Plastic (PP) internal part / paint coated iron bracket



NIVELCO

ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

EasyTREK integrated compact ultrasonic level transmitters for liquids

EasyTREK SP■-5■■-■ [1]

Transducer material	Code
PP	A
PVDF	B

Measuring range	Code
18 m (59 ft)	4
12 m (39 ft)	6
10 m (33 ft)	7
8 m (26 ft)	8
5 m (16 ft)	9
3 m (10 ft)	A

Process connection	Code
1"; 1½"; 2" BSP	0
1"; 1½"; 2" NPT	N

Output	Code
4 – 20 mA / HART®	4
4 – 20 mA / Relay / HART®	N

EasyTREK SP■-3■■-■ [1]

Transducer material	Code
PP	A
PVDF	B
PTFE	T

Measuring range	Code
25 m (82 ft) [2]	2
15 m (50 ft)	4
10 m (33 ft)	6
8 m (26 ft) [3]	7
6 m (20 ft) [4]	8
4 m (13 ft) [5]	9

Process connection	Code
1"; 1½"; 2" BSP tread	0
1½" / 2" NPT, 1" BSP [6]	N

Output / Ex			Code
Without Logger	4 – 20 mA + HART®		4
		Ex	8
		Relay	H
With Logger			3
		Ex	7
		Relay	A

EchoTREK compact ultrasonic level transmitters for liquids

EchoTREK S■■-■■■-■ [1]

Type	Code
2-wire	
Transmitter	E
Transmitter + display	G
4-wire	
Transmitter	T
Transmitter + display	B

Transducer material	Code
With metal housing	
PP	A
PVDF	B
PTFE	T
Stainless steel	S
With plastic housing	
PP	P
PVDF	V
PTFE	F
Stainless steel [2]	M
Stainless steel housing	
PP	K
PVDF	W
PTFE	L
Stainless steel	N

Series	Code
2-wire	3
4-wire	4

Measuring range	Code
25 m (82 ft) [2] [7]	2
15 m (50 ft) [8]	4
10 m (33 ft) [9]	6
8 m (26 ft) [3]	7
6 m (20 ft) [4]	8
4 m (13 ft) [5]	9

Process connection		Code
BSP tread		0
NPT tread		N
PP plastic DIN flanges (PN16)	DN80	2
	DN100	3
	DN125	4
	DN150	5
	DN200	6
PP plastic ANSI flanges (150 psi)	3" FF	A
	4" FF	B
	5" FF	C
	6" FF	D
	8" FF	E
PP plastic JIS flanges (10K)	80A	G
	100A	H
	125A	P
	150A	R
	200A	S
Mounting bracket	200 mm (7 ⅞ in)	K
	500 mm (1.65 ft)	L
	700 mm (2.3 ft)	M

Output / Ex			Code
2-wire			
Logger nélküli	4 – 20 mA		2
		HART®	4
		Ex	6
		HART® / Ex	8
		Relay	R
		HART® + relay	H
	PROFIBUS		P
	PROFIBUS / EX [11]		E
Loggerrel	4 – 20 mA		1
		HART®	3
		Ex	5
		HART® / Ex	7
		Relay	L
		HART® + relay	A

Output / Power supply			Code
4-wire [10]			
85 – 255 V AC	4 – 20 mA + 2x relay		1
		HART®	3
		Logger	K
		HART + Logger	G
24 V AC/DC			2
		HART®	4
		Logger	L
		HART® + Logger	H

[1] *The order code of an Ex version should end in "Ex"*
[2] *Ex version not available*
[3] *With PTFE sensor: 6 m (20 ft)*
[4] *With PTFE sensor: 5 m (16.5 ft)*
[5] *With PTFE sensor: 3 m (10 ft*
[6] *Only with SP-37, SP-38 and SP-39 units*
[7] *With stainless steel sensor: 15 m (50 ft)*
[8] *With stainless steel sensor: 12 m (40 ft)*
[9] *With stainless steel sensor: 7 m (23 ft)*
[10] *Two parallel operating relays*
[11] *Under development*

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