SenSonar

SI/SS-300 series ultrasonic sensors for liquid level metering
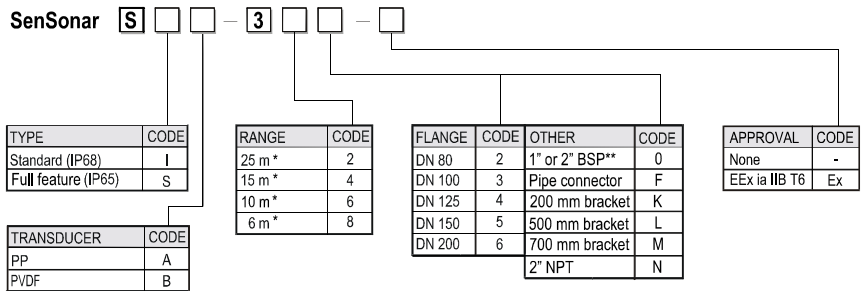
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USER'S MANUAL

APPLICATION

The Ultrasonic Level Meters made by NIVELCO offer you excellent tools for liquid level and volume measurements in tanks or reservoirs and for open channel flow measurement.

The **Two-Part Measurement System** consists of **SenSonar SI/SS-300 Sensor(s)** based on the latest SenSonic™ transducer technology of NIVELCO and a highly sophisticated **SM/SW-300 NIVOSONAR Remote Control Unit**. This powerful system, is capable of measuring the level of practically any liquid, even under most difficult conditions.

TYPE DESIGNATION

SenSonar [S] [ ] [ ] – [3] [ ] [ ] – [ ]

TYPE	CODE
Standard (IP68)	I
Full feature (IP65)	S

TRANSDUCER	CODE
PP	A
PVDF	B

RANGE	CODE
25 m *	2
15 m *	4
10 m *	6
6 m *	8

FLANGE	CODE
DN 80	2
DN 100	3
DN 125	4
DN 150	5
DN 200	6

OTHER	CODE
1" or 2" BSP**	0
Pipe connector	F
200 mm bracket	K
500 mm bracket	L
700 mm bracket	M
2" NPT	N

APPROVAL	CODE
None	-
EEx ia IIB T6	Ex

* Refer to the Technical Data Table for measuring range of Ex versions
** 1" for all SI versions, 2" for S...-38

TECHNICAL DATA

Model		SI-38	SS-38	SI-36	SS-36	SI-34	SS-34	SI-32	SS-32
Range (Non Ex / EEx ia)		0.25 to 6/4 m		0.35 to 10/7 m		0.45 to 15/10 m		0.6 to 25/20 m	
Frequency		80 kHz		60 kHz		40 kHz		20 kHz	
Total beam angle at -3dB		5°						6°	
Transducer material		Polypropylene (PP) or PVDF							
Process temperature	Non Ex	**SSB**: -30°C to 90°C; **SIB**: -30°C to 80°C; **SIA**, **SSA**: -20°C to 80°C							
	EEx ia	**SSB**: -20°C to 80°C; **SIB**: -20°C to 75°C; **SIA**, **SSA**: -20°C to 70°C							
Mechanical protection		**SI**: IP68; **SS**: IP65							
Housing material		**SI**: Same as transducer material; **SS**: Paint coated aluminium							
Pressure (absolute)		0.3 to 6 bar (0.03 to 0.6 MPa), without or with suitable flange							
Output signal/power supply		To/from **NIVOSONAR SM/SW-300** Remote Control Units							
Electrical connections		**SI**: direct cable outlet **SS**: screw terminals in housing with 2 x Pg16							
Signal cable		4-wire shielded cable; wire cross section: 0.5 to 2.5 mm²; max. 50nF, max. 20 Ohm							
Length of signal cable		Advised max. cable length: 300 m; recommended type: LIYCY 4 x 0.75 mm²							
Electrical protection		Class III. with surge protection							
Certificate for Ex versions		EEx ia IIB T6 for use with [EEx ia] certified **NIVOSONAR** Remote Control Units							
Weight		0.4 kg	1.5 kg	0.45kg	1.7 kg	1.4 kg	2.3 kg	2 kg	3.1 kg

DIMENSIONS AND ACCESSORIES

SI-38	SI-36	SI-34	SI-32	Damping gland	Connection gland	When ordered with flange
1" BSP sw=72 154 15 50 2" BSP or 2" NPT	1" BSP 124 86 Ø77	1" BSP 126 88 Ø122	1" BSP 141 103 Ø148	Metal SAA-106	Ø32	

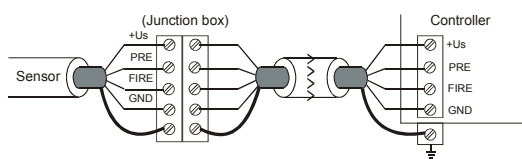| SS-38	SS-36	SS-34	SS-32	Mounting bracket
100x120 152 15 50 sw=72 2" BSP or 2" NPT	100x120 138 30 Ø74	100x120 138 44 Ø122	100x120 156 55 Ø148	

INSTALLATION

- STANDOFF PIPE
The hereby presented dimensions are strongly recommended when using stand-off pipes. The structure is recommended to be rigid, the inner rim where the ultrasonic beam leaves the pipe should be rounded.

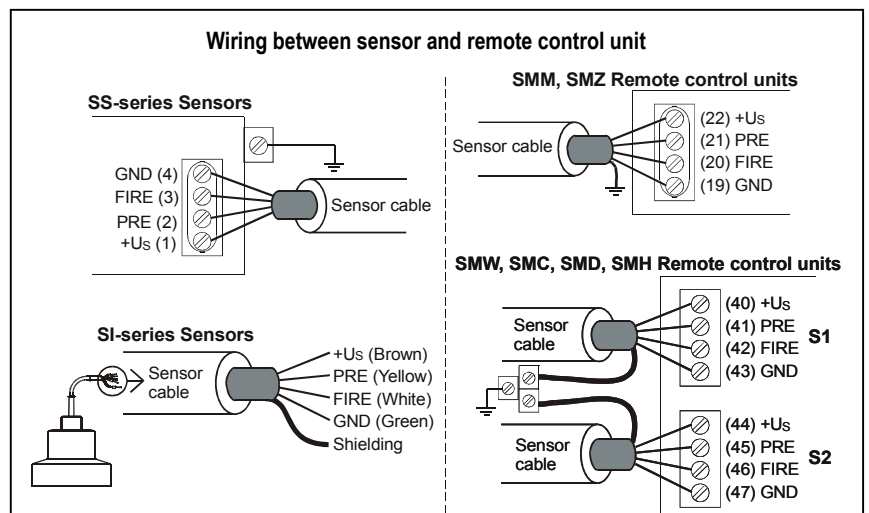| L[mm]	D_minimum[mm]			
	SS/SI38	SS/SI36	SS/SI34	SS/SI32
500	125	150	200	300
300	100	125	175	200
200	85	100	150	175

- FOAM
In case of foaming liquids, the sensor should be mounted as far away from the place of liquid inflow as possible. Eventually a location should be found, where foaming is the smallest, or a stilling well must be adopted.

- AIR MOVEMENT
An intensive moving of the air (gas) in the vicinity of the ultrasonic cone is to be avoided. A strong draft of wind may "blow away" the ultrasound. In case of outdoor applications it is recommended to protect the sensor from strong wing by installing a "shelter ".

- GENERAL
When attaching SI series sensors directly to a thin piece of metal, use SAA-106 damping gland

ELECTRICAL CONNECTIONS

- Use ordinary, 4-wire shielded cables for connecting sensors to controllers. Use type of cable described in the "Technical Data Table".
- Extend sensor cable as shown below:

- To safety ground the metal housing of SS-300 sensors, use grounding screw terminal of housing.
- Signal cables must not be led in common duct with high voltage lines.
- If signal cables of more than one sensor are led in common duct, make sure that they are individually shielded.

Wiring between sensor and remote control unit

SS-series Sensors
GND (4)
FIRE (3)
PRE (2)
+U_S (1)
Sensor cable

SI-series Sensors
Sensor cable
+U_S (Brown)
PRE (Yellow)
FIRE (White)
GND (Green)
Shielding

SMM, SMZ Remote control units
Sensor cable
(22) +U_S
(21) PRE
(20) FIRE
(19) GND

SMW, SMC, SMD, SMH Remote control units
Sensor cable
(40) +U_S
(41) PRE
(42) FIRE
(43) GND
S1

Sensor cable
(44) +U_S
(45) PRE
(46) FIRE
(47) GND
S2

MAINTENANCE AND REPAIRS

The device does not require routine maintenance. In some instances, however, the sensor may need occasional cleaning to remove surface deposits

STORAGE CONDITIONS

Ambient temperature range:	-30 to +80°C
Relative humidity:	up to 98%

WARRANTY

All Nivelco products are warranted free of defects in materials or workmanship for a period of two years from the date of purchase.
Repairs under guarantee are carried out at the Manufacturer's premises. The Purchaser is liable for costs of dismantling and re-installation as well as transport costs.
Nivelco shall not be liable for misapplication, labour claims, direct or consequential damage or expense arising from the installation or use of equipment.