







# NaviSonic A-Z

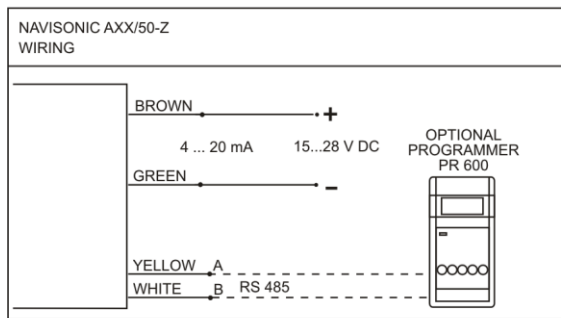
**ULTRASONIC TRANSDUCER with 4-20 mA output, loop powered**  
**NAVISONIC A11-50Z; NAVISONIC A12-50Z; NAVISONIC A13-50Z; NAVISONIC A14-50Z**

## MANUALS

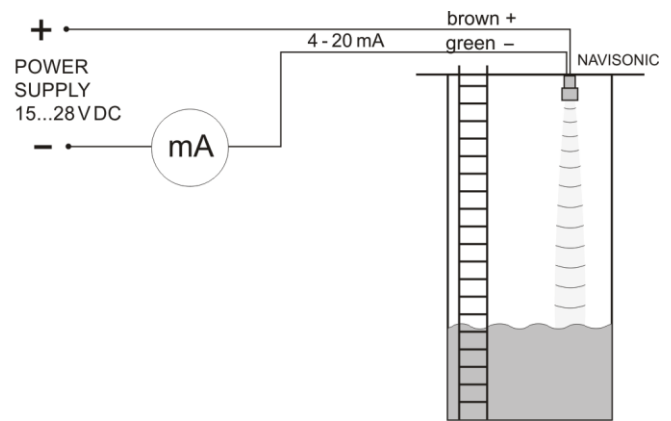
### 1. TECHNICAL DATA

| Output:<br>4-20mA                            | NAVISONIC<br>A11/50Z   | NAVISONIC<br>A12/50Z  | NAVISONIC<br>A13/50Z   | NAVISONIC<br>A14/50Z   |
|--|--|---|--|--|
|  |  |  |  |  |
| Operating range (m): liquids:<br>granulates: | 0,15... 2,5<br>/   | 0,25...5,5<br>0,30...3  | 0,45...9<br>0,6...5  | 0,45...12<br>0,6...8   |
| Connection: cable 4 x 0,34mm <sup>2</sup>    | 3 m<br>(option up to 30 m)   | 3 m<br>(option up to 30 m)  | 3 m<br>(option up to 30 m)   | 3 m<br>(option up to 30 m)   |
| Operating voltage (V DC)                     | 15...28  | 15...28   | 15...28  | 15...28  |
| Max. loop resistance /24V                    | 500 Ω  | 500 Ω   | 500 Ω  | 500 Ω  |
| Output                                       | 4-20 mA  | 4-20 mA   | 4-20 mA  | 4-20 mA  |
| Error state of output and state at power up  | 3,6 4, 20, 22 mA<br>or HOLD  | 3,6 4, 20, 22 mA<br>or HOLD   | 3,6 4, 20, 22 mA<br>or HOLD  | 3,6 4, 20, 22 mA<br>or HOLD  |
| No echo time (error state delay)             | 0...250 s<br>typ. 60s  | 0...250 s<br>typ. 60s   | 0...250 s<br>typ. 60s  | 0...250 s<br>typ. 60s  |
| Averaging period                             | 10 s   | 10 s  | 10 s   | 10 s   |
| Delay at power up                            | 5 s  | 5 s   | 5 s  | 5 s  |
| Reverse polarity protection                  | YES  | YES   | YES  | YES  |
| Resolution of measurement                    | 5 mm   | 5 mm  | 10 mm  | 10 mm  |
| Accuracy                                     | 0,5 %  | 0,5 %   | 0,5 %  | 0,5 %  |
| Temperature range of operation (°C)          | -30...+60  | -30...+60   | -30...+60  | -30...+60  |
| Ultrasonic frequency (KHz)                   | 90   | 60  | 40   | 40   |
| Total beam angle (-3 dB)                     | 6°   | 6°  | 6°   | 6°   |
| Protection                                   | IP 68  | IP 68   | IP 68  | IP 67  |
| Temperature compensation                     | YES  | YES   | YES  | YES  |
| Dimensions (mm)                              | Ø80x100  | Ø80x110   | Ø90x150  | Ø90x150  |
| Montage connection                           | 1"   | 1"  | 1"   | 1"   |
| Material                                     | PE   | PE  | PE   | PE   |

## 2. WIRING



Typical loop connection:



RS485 wires are intended for programming of parameters with PR600 programmer

**Attention!** do not connect RS 485 wires to power supply or analog output

## 3. MOUNTING

Probe must be mounted perpendicular to measured surface. This is specially important for flat and smooth surfaces and liquids. Allowed deviation is  $\pm 3^\circ$ . In case of uneven surfaces like granulates it is necessary to experimentally determine the most satisfactory position.

Because of the impact on the temperature compensation, transducer should not be exposed to direct sunlight.

## 4. ECHO SIGNALIZATION

LED diodes' blinking mark reflection of ultrasound waves from measured object. If there's poor reflection, then LED diode doesn't blink or it blinks with longer interruptions.

For reliable operation the reflection from measured substance has to be constant at all conditions.

## 5. SETTING OF OPERATING PARAMETERS

Operating parameters are changeable with the use of programmer PR 600. Some of parameters are manageable also with the magnetic key. Parameters stay stored in permanent memory until next setting.

### SETTING WITH MAGNET

We can adjust 4 and 20 mA distance and output error state.

For adjusting we need the reflection from the certain distance. If we are adjusting the already installed probe, then we have to change the level of the medium.

**How to set up:** when the magnet is placed to SET tag, then the LED diode starts to blink slowly after three seconds.

Consecutive number of the blink means the certain setting. When the LED diode marks wanted setting, the magnet has to be removed. The setting will be stored in the permanent memory after ten seconds.

Distances 4 and 20 mA are changeable only within the working range of the probe.

Consecutive blink means:

1. blink: set 4 mA distance
2. blink.: set 20 mA distance
3. blink.: error state = 3,6 mA
4. blink.: error state = 4 mA
5. blink.: error state = 20 mA
6. blink.: error state = 22 mA
7. blink.: HOLD (output stay at last measured distance indefinitely)

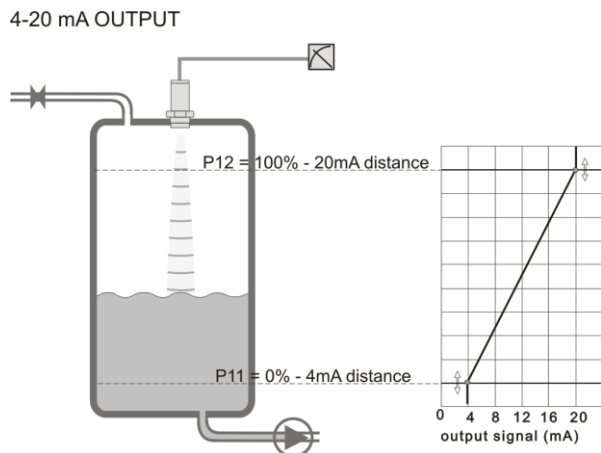
Example:

**Setting up the distance where the output will be 4mA:** the object or the level needs to be placed to the desired distance for point 4mA and then wait 30 seconds until the output reaches the final value. Then place the flat side of the magnet to the SET tag and wait until LED diode starts to blink. Remove the magnet immediately after the first blink.

**Setting up the distance where the output will be 20mA:** the object or the level needs to be placed to (the desired) distance for point 20mA and then wait 30 seconds until the output reaches the final value. Then place the flat side of the magnet to the SET tag and wait until LED diode starts to blink. Remove the magnet immediately after the second blink.

**Setting up the error state:** place the magnet to SET tag and wait until LED diode starts to blink. After certain number of blinks (3, 4, 5, 6 or 7) remove the magnet. Belonging error state is now stored in the permanent memory.

When the magnet is removed, the setting will be stored to the permanent memory after approximately ten seconds and the probe returns to the normal operation. By measuring of the current output check the stored points 4 and 20 mA.



## 6. ECHO PROCESSING

Microprocessor inside the probe continuously measures the distance of the measured level. Acquired data are statistically treated and average values are calculated. Results are transmitted through 12-bit D/A converter to the analogue output at the final stage. When the probe doesn't receive any credible reflection for some time, then the output goes to the error state which was previously set (3,6 4, 20 or 22 mA). Normally we set 3,6 mA or 4 mA (output at Hi distance = LO level)

## 7. MEASURED MATERIALS

The probe detects liquid or granular substances. The maximum measured distance varies with the type of the surface and the angle of the surface regarding to the probe. Reflection of ultrasound waves differs from substance to substance. Granular substances absorb sound waves, so the maximum measured distance is reduced. Foams on the surface of the liquid can prevent reflection of ultrasound and can interfere proper functioning.

## 8. MAINTENANCE

In general, the probe doesn't require any maintenance. In cases where the lower active surface of the probe accumulates dirt or dust, periodical cleaning of the probe is necessary. Certain quantity of dirt or dust on the lower active surface of the probe doesn't interfere with the operation of the probe. If dirt or dust accumulates in the thicker layer, then cleaning of the lower surface of the probe is required. Just wipe the dirt or dust off with cloth.

## LIMITED WARRANTY

This product is guaranteed for one year after date of purchase. During limited warranty period any defective product will be repair or replace with comparable product without charges. The limited warranty does not cover battery and damages of any kind including physical caused accidentally or from misuse. Manufacturer's responsibility is limited to repair or replace the product. Any liability for direct or indirect damage caused by product failure is excluded. The claimed product will be repaired or replaced only when returned to the store where it was purchased together with original invoice.