

Tank Level and Density Servo Gauge UVKSZ1 Series

Introduction

The UVKSZ1 is a multi-microprocessor controlled tank gauge, which measures the
liquid level
interface levels
density.

The UVKSZ1 has programmable level alarm outputs, with alarm relay contacts.

The data are transmitted digitally through 2 wire RS 485 bus. The wiring uses standard twisted communication cables.

Remote indication is possible through computer located not farther as 1200 m Local indication and operation is performed by magnetically operated switches, without opening the house of the instrument.

The measuring accuracy of the UVKSz1 is excellent, because of the unique multi- microprocessor system which allows average level measurement to be made during turbulence. Errors caused by change of the measuring circumstances are also compensated.

The UVKSz1 is approved by testing authority as explosion-proof equipment. Special safety has been constructed by lightning protection barriers on inputs and outputs. Electrical circuit is not used inside the drum compartment (closed to tank atmosphere), in accordance with the valid safety, recommendations. (Zone 0).

The level and density measurement accuracy has been approved and certified by Hungarian Authorities for Measures.

The compartments of UVKSZ1 is constructed from stainless steel in two versions:

- low pressure version up to 6 bar
- high pressure version up to 40 bar

The installation of the instrument is easy and inexpensive, it has a DN 40 mounting flange and its weigh is about 19 kg.

The principle of the operation

An electronic silicon force transducer continuously measures the buoyancy of a stainless steel displacer, which is positioned at the surface of the liquid. Very small level change (about 0,1 mm) is detected by the force measuring system, which controls a servo system to raise or lower the displacer until it is correctly positioned again at the surface. The DC servo system moves the displacer continuously and is checked for correct operation.

The displacer can also be positioned at the interface level, enabling to detect various materials in the tank.

The programmable level alarms and the density measurement are optional, upgrading is possible. The computer system collects the data and operates the instrument. Through the computer the UVKSZ1 can not "recalibrate" and it is impossible to operate on any illegal function.

Local operation

A local operation system has been developed for the tank gauging instrument. The technician can operate and read all functions and all data through a magnetic switch system, without opening the instrument and without connecting any separate apparatus onto the wiring system. The menu and data appear on the built in display.

Construction



The UVKSZ1 has two separate parts: the drum compartment and the instrument compartment. The drum compartment contains the calibrated measuring drum, its magnetic coupling to move it the force measuring arm, with its magnetic force coupling and the overload saving system. The construction is gas-tight, preventing product vapours escaping or entering into the instrument compartment.

The instrument compartment includes the force measurement systems, the DC servo system, the incremental optical code transmitter, the multi-processor electronic control circuit and the data transmission unit. In the instrument compartment is situated the magnetic switch unit to serve the local operating possibility and also a window with an alphanumeric display to allow to read all local indications (data and menu).

Installation

UVKSZ 1 has a DN 40 flange for installation onto the tank flange. An adapter also can be used, which has a removable cover for inspection and installation of the displace and has a calibration end stop for simple but reliable recalibration.

Transmission and power supply requires 2 pairs of conductors, which can be connected to 48 V AC power supply and to the main computer. Data transmission without repeater is possible for 1200 m. For longer distance use the repeater system.

Technical data

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| Measuring range | 0-20.000 mm 0-30.000 mm (optional) |
| Accuracy | better as 1 mm |
| Sensitivity | better as 0,1 mm |
| Accuracy of interface line measurement | better as 2 mm |
| Accuracy of density measurement | better as 5 kg/m ³ |
| Temperature limits | -40...+85 C° |
| Power | 48 V 50/60 Hz 25 VA |
| Programmable alarm levels | 4 |
| Data transmission | Serial, RS 485, MODBUS 1200 m without repeater |
| Baudrate | 1200/2400 Baud |
| Wiring | 2 wires twisted pair: 2x1mm ² (RS485) 2x2,5mm ² (48V AC) |
| Cable glande | PG 13,5 (2x) |
| Safety class | Explosion-proof EEx de IIB T6 (-20° ... +55°C) |
| Isolating voltage | >500 V |

Materials

| | |
|----------------|---|
| Housing | SST lost wax casting |
| Measuring drum | SST AISI 316 lost wax casting |
| Measuring wire | SST AISI 316 optional Hasteloy C4, Tantal |