

# 6005 Servo Tank Gauge

Intelligent tank gauge with high accuracy liquid level, interface level, density & density profile measurements for bulk liquid storage applications

Software Version 4.27f

# Varec®



## Highlights

- Measures liquid to an accuracy of +/- 0.0275 in (0.7 mm)
- Measures two clear interface levels and specific gravity of up to three liquid phases
- Profiling of liquid density throughout the tank (tank profile) and upper layer (I/F profile)
- Wetted parts are completely separated from the electronic circuit
- Tank top mounting with 3" flange weighing only 12 kg (aluminum version)
- Wide range of output signals, including Sakura V1 RS-485 (MODBUS), Mark Space, Enraf BPM protocol
- Direct connection of spot or average temperature probes
- Built-in calibration window
- FM, CSA and ATEX approved for use in hazardous areas
- NMI approved for custody transfer applications
- SIL2 Certified with maintenance prediction and proactive safety diagnostics output to system operators

## Measuring Principle

The 6005 Servo Tank Gauge operates on the principle of displacement measurement. A small displacer on a measuring wire is unwound from a drum and accurately positioned in the liquid medium using a servo motor. The weight of the displacer is precisely balanced against a magnetic coupling. As the level rises and falls the position of the displacer is automatically adjusted by the motor.

## Product Options

### Pressure Rating

- 0.2 bar, 6 bar, or 25 bar

### Drum Chamber Material

- Aluminum or Stainless Steel

### Approvals

- FM, CSA, or ATEX

### Application

- Level, Tax + Weight, Interface, Bottom and/or Density Profile

### Inputs and Output

- Primary and Secondary Communications, and Alarms

### Measuring Range

- 0 to 154 ft (0 to 47m)

### Cable Entry

- NPT or M class threads

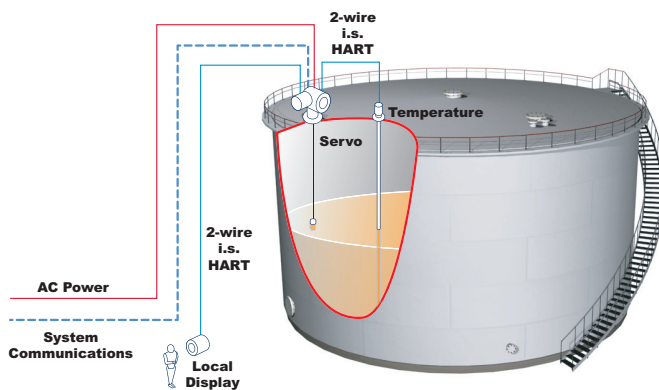
### Process Connection

- ANSI, DIN, and RF

### Power Supply

- AC/DC

Other options including type of Displacer, O-Ring materials, Interior Chamber Finishing, and Accessories



Example Tank Gauging System

## Application

The 6005 STG is an intelligent tank gauge for high accuracy liquid level measurement employing the latest microprocessor technology. In addition to level measurement, the 6005 STG can determine the interfaces between three liquids, specific gravity of these liquids and tank bottom. To enable accurate volume calculation the 6005 STG will accept an input from either an average temperature probe 453x ATC series of temperature devices (via twisted pair cables, HART protocol) or via spot temperature element (via 3-wire Pt. 100 RTD signal). Once installed, all calibration and operating functions can be made via the user friendly Matrix program and touch sensitive keypad. Tank side monitoring and operation can be performed by the 4560 SGM.

## Technical Specifications

### Physical

<b>Net weight</b>	27 kg (59.5 lbs)
<b>Enclosure materials</b>	Electrical compartment :aluminium Drum chamber: aluminium or stainless steel 316 (depending on model) Rated IP67 with closed housing and cable glands of equal protection type
<b>Flange type</b>	ANSI, JIS, DIN or equivalent. Refer to order code for full selection
<b>Wire Material</b>	Stainless steel 316, 0.15mm (std) Hastelloy C. f0.2 mm (max. 16m opt)
<b>Wire protection</b>	PTFE coated St/St 316L, 0.4mm (max 16m)
<b>Diameter</b>	30...50mm (dependent on application), optional 70...110mm
<b>Material (standard)</b>	Stainless steel 316 (Standard) Hastelloy C, PTFE (Optional)
<b>Horizontal movement</b>	1.23 mm /m with standard wire
<b>Speed of movement</b>	0...2500 mm/min.

### Power

<b>Power requirements</b>	High voltage type: 85 ... 264 VAC 50/ 60 Hz Low voltage type: 20 ... 60 VDC / 20 ... 55 VAC 50 / 60Hz
<b>Power consumption</b>	Maximum 50 VA, 50W (cos j=0.5)
<b>Safe electrical isolation</b>	Between power supply and signal output, CPU, RS 485, relay and other electronics

### Input Characteristics

<b>Signal</b>	Multi drop local HART® protocol max. 4 devices
<b>Power supply</b>	DC 24V
<b>Additional units</b>	453x average temperature sensor 4560 Servo Monitor Other compatible HART® devices Spot temperature Pt 100 Ohm ISO standard (3-wire)

### Environmental

<b>Operating (liquid) temperature</b>	-200... +200°C
<b>Ambient temperature</b>	-20... +60°C with ATEX approval -40... +60°C

### Display/Programming

<b>Display (LCD)</b>	Two line, 16 digit, illuminated display
<b>Programming</b>	Three optical keys (touch control)

### Intelligent Functions

- Wire Compensation - Compensation of wire expansion due to temperature and wire weight
- Displacer Compensation - Automatic compensation of displacer weight
- Tank Roof Compensation - for depression and distortion
- Operational Security - A software access code or hardware switch can be enabled to prevent programming changes from the 6005 STG's touch control keypad or a remote system.
- Maintenance Record - The maintenance record can be accessed via the instrument and will provide information of alarm data (e.g. date, time, alarm type). A memo function also allows the user/ service engineer to enter maintenance data manually.
- Proactive Safety Diagnostics - To meet the oil and gas industry's demands for overfill protection the 6005 STG contains a proactive safety diagnostics function. In the event of an abnormal measurement condition the 6005 STG warns of mechanical failure, and outputs a maximum level value, (e.g. 99999.0mm) to the local display and system software, thereby causing an alarm to trigger.

### Performance

<b>Range</b>	28m (optional 36m)
<b>Level accuracy</b>	+/-0.7 mm for L=10 m, D=1 g/cm <sup>3</sup> with 50 mm displacer
<b>Interface level</b>	+/-2.7 mm for L=10m, *D=0.2 g/cm <sup>3</sup> with 50 mm displacer (*D: difference between densities of 2 liquids)
<b>Spot &amp; profile density</b>	+/-5kg/m <sup>3</sup> or better, (at ref. condition)
<b>Tank bottom</b>	+/-2.1 mm (independent from liquid condition)

**Note:** Please complete an Application Data Sheet for this equipment to facilitate proper selection of options for your unique application. Contact your Varec Sales Representative for more information.