



# Product sheet

## Servo Gauge 854ATG

### A compact, intelligent and reliable Advanced Tank Gauge

#### Benefits

Simple Commissioning

Easy to install

Proven reliability

Multi-functional

The series 854ATG servo gauge is a very reliable, versatile and accurate automatic tank gauge with a minimum of moving parts.

The present instrument range is designed for the measurement of all kind of liquids in any type of storage tank. Operating pressures up to 40 bar (4 MPa / 600 psig) and a very wide product temperature range can be handled.

Simple configuration and diagnostics are possible via the Portable Enraf Terminal (PET) connected through a safe infra-red coupling or via Enraf configuration software. The instruments are Explosion proof and certified by the authorities for Weights & Measures.

The multi-functional instrument is modularly constructed. The option slot for additional features allows the connection of temperature measuring elements for spot- and average product temperature, as well as for product temperature profiles.

Other options are full integration in a Hybrid Inventory Management System (HIMS), analog level output, density measurement, product interface and water/product interface measurement.

As tank gauging has evolved, the servo level gauge has become an industrial standard all over the world. A true test of its quality is the dependability and low warranty record that the ATG has maintained for many years.



## Measuring specifications

Measuring range	: Standard 27 m (88 ft) Optional 37 m (121 ft) 35 m (115 ft) (with measuring wire up to 150 m (492 ft))
Measuring accuracy level	: $\leq \pm 0.4 \text{ mm } (\pm 0.016 \text{ ") } ^1$
Measuring accuracy interface	: $\leq \pm 2 \text{ mm } (\pm 0.08 \text{ ") } ^2$
Measuring accuracy density	: $\leq \pm 3 \text{ kg/m}^3 (\pm 0.19 \text{ lb/ft}^3) ^3$
Measuring accuracy temp.	: $\pm 0.1 \text{ }^\circ\text{C } (\pm 0.18 \text{ }^\circ\text{F}) ^1 \text{ } ^4$
Sensitivity	: $\pm 0.1 \text{ mm } (\pm 0.004 \text{ ") } ^1$
Repeatability	: $\pm 0.1 \text{ mm } (\pm 0.004 \text{ ") } ^1$
Wave integration time	: Programmable, three setpoints, between 0.5 s and 10 s

## Mechanical

Flange	: See 'Identification code', Pos 9, 10
Dimensions	: See back page
Weight	: <b>Medium pressure version</b> 16 kg (35 lb) <b>Chemical version</b> 21 kg (46 lb) <b>High pressure version</b> 26kg (57 lb)
Cable entries	: 4 pcs $\frac{3}{4}$ " NPT threaded

## Environmental

Operating pressure	: M and C version : up to 6 bar / 0.6 MPa (90 psi) H version : up to 40 bar / 4 MPa (600 psi) (up to 25 bar / 2.5 MPa in acc. to PED)
Ambient temperature	: -40 °C to +65 °C (-40 °F to +149 °F)
Protection class	: IP 65 according to EN 60529 (NEMA 4)
Safety	: Explosion proof - ATEX II 1/2G EEx d IIB T6 or II 1/2G EEx de IIB T6 or EEx [ia/ib] IIB T6 or EEx de [ia/ib] IIB T4 - Class I, Division 1, Groups B, C and D, in acc. to ANSI / NFPA 70 (FM, USA)

## Materials

Housing servo comp. & cover	: All types cast aluminum Int. reg. AA A356 EN1706 AC-AISI7Mg0,3
Drum compartment	: M version cast aluminum Int. reg. AA A356 EN1706 AC-AISI7Mg0,3 C & H version stainless steel ASTM A351, CF-8M, G-X6 CrNiMo 18 10 (1.4408)
Finish aluminum parts	: Chromatized according to MIL-C-5541C
Measuring drum, drum shaft	: Stainless steel (1.4401) EN10088 $\equiv$ AISI 316
Measuring wire	: See 'Identification code', Pos 12
Magnet cap	: Stainless steel (1.3953)
O-rings	: Drum cover Silicone / FEP (others NBR 70)

## Electrical

Power supply	: 110/130/220/240 V (+10% to -20%), optional 65 V (+10% to -20%) also suitable for 230 V (+6 % to -6 % according to CENELEC)
Frequency variations	: 45 Hz to 65 Hz
Power rating	: 25 VA, $I_{\text{max}} = 2 \text{ A}$

## Transmission

Type	: Serial, ASCII coded, Bi-Phase Mark modulated (BPM)
Isolating voltage	: > 1,500 V
Lightning protection	: Full galvanic separation via isolating transformers
Protocol	: Standard Enraf fieldbus (GPU protocol)
Common mode rejection	: > 150 dB
Cabling	: Two conductors, twisted pair, $R_{\text{max}} = 200 \text{ } \Omega / \text{line}$ , $C_{\text{max}} = 1 \text{ } \mu\text{F}$
Transmission to Portable Enraf Terminal (PET)	: Infra-red, serial

## Options

Alarm relay outputs	: 2x SPDT, galvanically isolated, $V_{\text{max}} = 240 \text{ V}$ , $I_{\text{max}} = 3 \text{ A}$
Density measurement	: See 'Identification code', Pos 15 (with density displacer)
Level output	: 4 - 20 mA (accuracy $\pm 0.1\%$ full scale)
Input boards	: Spot RTD, VITO probes for average temperature and/or water measurement, HART® devices
Data transmission	: Standard Modbus via RS-232C or RS-485 i.s. output for Tank Side Indicator (TSI)
Cable entries	: Adapters available to fit other sizes cable glands

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<sup>1)</sup> Under reference conditions

<sup>2)</sup> Difference product density 100 kg/m<sup>3</sup> (6.25 lb/ft<sup>3</sup>)

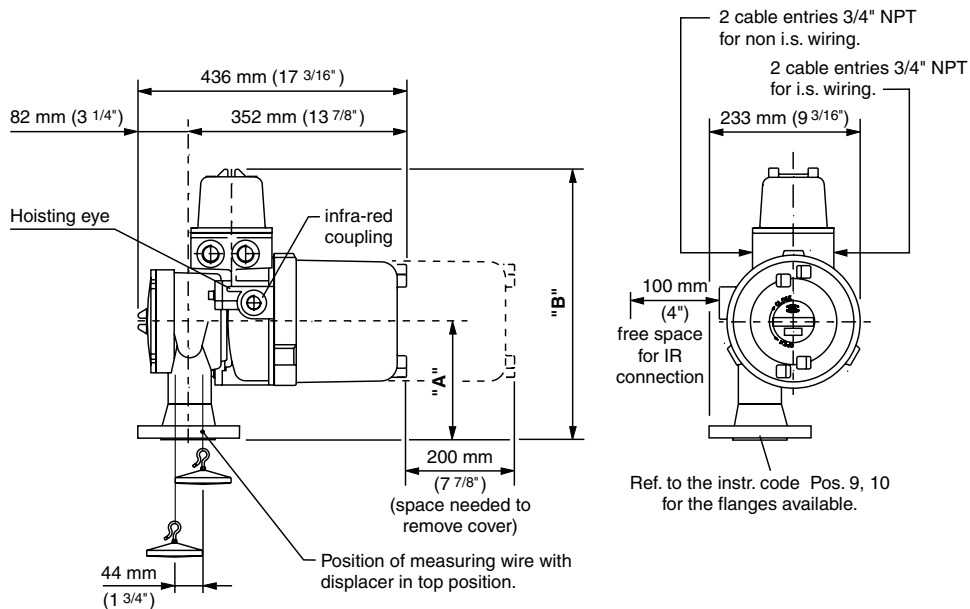
<sup>3)</sup> (optional) with a density displacer and calibrated for density measurement

<sup>4)</sup> With VITO temperature probe

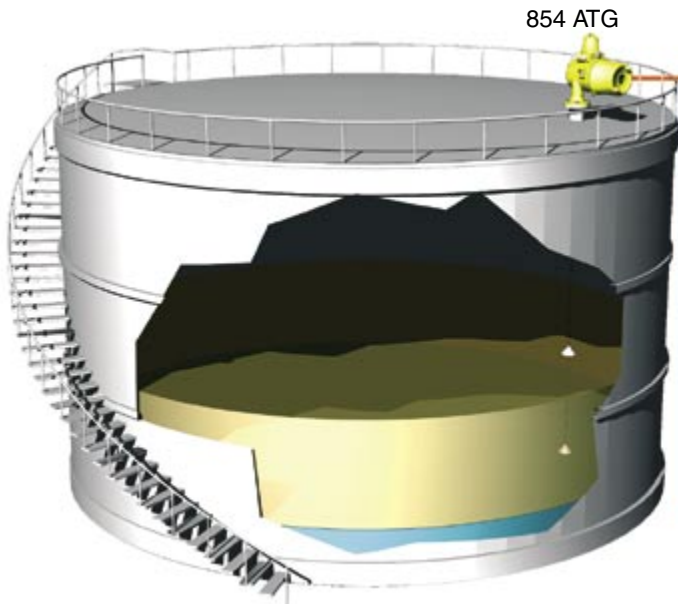
<b>Pos 1 Application</b>							
<b>U</b>	General purpose			<b>X</b>	W&M certified		
<b>Pos 2 Data transmission</b>							
<b>E</b>	Enraf Bi-phase mark protocol (standard)						
<b>I</b>	i.s. Output for Tank Side Indicator (TSI) and Enraf Bi-Phase Mark (BPM) protocol						
<b>R</b>	RS-232C GPU protocol (only when Pos 4 = B, C, J, M, U or Z)						
<b>S</b>	RS-485 GPU protocol (only when Pos 4 = B, C, J, M, U or Z)						
<b>V</b>	RS-232C standard Modbus (only when Pos 4 = B, C, J, M, U or Z)						
<b>W</b>	RS-485 standard Modbus (only when Pos 4 = B, C, J, M, U or Z)						
<b>Pos 3 Display</b>							
<b>A</b>	With display						
<b>Pos 4 I/O options</b>							
<b>B</b>	Spot temperature Pt100			<b>V</b>	Analog level output		
<b>C</b>	VITO temperature and/or water probe			<b>W</b>	Analog level output + VITO temperature and/or water probe		
<b>G</b>	Average temperature MIR interface + HART device(s)			<b>X</b>	Analog level output + VITO temperature probe		
<b>J</b>	VITO temp. and/or water probe + HART device(s)			<b>Y</b>	Analog level output + spot temperature Pt 100 + VITO temp. and/or water probe + HART device(s)		
<b>M</b>	Average temperature MIR interface			<b>Z</b>	None		
<b>N</b>	Average temp. MIR interface + Analog level output						
<b>U</b>	Spot temperature Pt100 + HART device(s)						
<b>Pos 5, 6, 7 Instrument designation</b>							
<b>8</b>	<b>5</b>	<b>4</b>	Servo gauge ATG				
<b>Pos 8 Pressure version</b>							
<b>C</b>	Up to 6 bar 0.6 MPa (90 psi) if Pos 9, 10 = 11, 12 or 13						
<b>M</b>	Up to 6 bar 0.6 MPa (90 psi) if Pos 9, 10 = 21 or 22						
<b>H</b>	Up to 40 bar 4 MPa (600 psi) if Pos 9, 10 = 51, 52, 53 or 54 (25 bar according PED)						
<b>Pos 9, 10 Drum compartment &amp; flange</b>							
		<b>mat. *)</b>	<b>flange</b>	<b>acc. to</b>	<b>finish</b>	<b>compatible with</b>	<b>acc. to</b>
<b>1</b>	<b>1</b>	ss	2" 150 lbs rf	ANSI B16.5	turning, Ra = 3.2 - 12.5 µm	DN50, PN20 rf	ISO 7005-1
<b>1</b>	<b>2</b>	ss	NW50 ND6 form D	DIN 2501 DIN 2526	turning, Rz = max. 40 µm	DN50, PN6 rf	ISO 7005-1
<b>1</b>	<b>3</b>	ss	2" 150 lbs ff	ANSI B16.5	turning, Ra = 3.2 - 12.5 µm	DN50, PN20 ff	ISO 7005-1
<b>2</b>	<b>1</b>	Al	2" 150 lbs ff	ANSI B16.5	turning, Ra = 3.2 - 12.5 µm	DN50, PN20 ff	ISO 7005-1
<b>2</b>	<b>2</b>	Al	NW50 ND6 form B	DIN 2501 DIN 2526	turning, Rz = 40 - 160 µm	DN50, PN6 ff	ISO 7005-1
<b>5</b>	<b>1</b>	ss	2" 300 lbs rf	ANSI B16.5	turning, Ra = 3.2 - 12.5 µm	DN50, PN50 rf	ISO 7005-1
<b>5</b>	<b>2</b>	ss	2" 300 lbs rf	ANSI B16.5	turning, Ra = 3.2 - 6.3 µm	DN50, PN50 rf	ISO 7005-1
<b>5</b>	<b>3</b>	ss	NW50 ND40 form C	DIN 2501 DIN 2526	turning, Rz = 40 - 160 µm	DN50, PN40 rf	ISO 7005-1
<b>5</b>	<b>4</b>	ss	NW50 ND40 form E	DIN 2501 DIN 2526	turning, Rz = max. 16 µm	DN50, PN40 rf	ISO 7005-1 *) see also technical specifications
<b>Pos 11 Safety approvals</b>							
<b>A</b>	ATEX Europe			<b>F</b>	FM USA		
<b>Y</b>	CENELEC Europe			<b>N</b>	None		
<b>Pos 12 Measuring range &amp; wire material</b>							
<b>2</b>	27 m (88 ft) AISI 316			<b>K</b>	37 m (121 ft) Hasteloy C22		
<b>A</b>	27 m (88 ft) Hasteloy C22			<b>L</b>	37 m (121 ft) Tantalum		
<b>B</b>	27 m (88 ft) Tantalum			<b>M</b>	37 m (121 ft) Invar		
<b>C</b>	27 m (88 ft) Invar			<b>N</b>	37 m (121 ft) Platinum / 20% Iridium		
<b>D</b>	27 m (88 ft) Platinum / 20% Iridium			<b>9</b>	35 m (115 ft) AISI 316		
<b>3</b>	37 m (121 ft) AISI 316				with 150 m (492 ft) wire length		
<b>Pos 13 Purge connection</b>							
*	Option not used			<b>L</b>	1/4" BSP entry		
<b>Pos 14 Mains supply</b>							
<b>A</b>	220 V 50/60 Hz			<b>R</b>	130 V 50/60 Hz		
<b>C</b>	110 V 50/60 Hz			<b>S</b>	65 V 50/60 Hz		
<b>K</b>	240 V 50/60 Hz						
<b>Pos 15 Density measurement</b>							
<b>D</b>	With servo density measurement			*	Option not used		
<b>Pos 16 Alarms</b>							
<b>W</b>	With 2 programmable SPDT alarms			<b>Z</b>	No alarms		

**U E A Z 8 5 4 M 2 1 Y 2 \* A \* Z Typical identification code**

**A 8 5 4 Your identification code**



	"A"	"B"
M and C version	184 mm (7 1/4")	427 mm (16 13/16")
H version	206 mm (8 1/8")	449 mm (17 11/16")



854 ATG

#### Cable specifications Serial transmission

Number of wires : 1 twisted pair (pref. shielded)  
 Resistance :  $R_{max} = 200 \Omega / \text{line}$   
 Capacitance :  $C_{max} = 1 \mu\text{F}$

#### Outputs

- 4-20 mA for level
- Two relay level alarms
- i.s. Output for Tank Side Indicator
- Digital transmission to
  - indicators
  - systems

#### Inputs

- HART® devices
- Spot temperature element
- VITO probes for average temp. and/or water bottom measurement



Field interface



Entis system

We at Enraf are committed to excellence.

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WE THINK TANK