ENRAF SMART SERVO 954

Industry's Best Servo Gauge Is Now Even Better





INTRODUCING THE SMART SERVO 954

Honeywell Enraf has ensured that the industry's best tank gauging solution is now even better. Designed for measuring varied liquids in any type of storage tank, our new Smart Servo 954 is a reliable, versatile and accurate automatic tank gauge. This instrument advances the art of tank gauging by combining proven technology with enhanced electronics and software, as well as increased intelligence. And, it stands up to the most demanding process conditions.

THE INNOVATIVE DESIGN OF THE SMART SERVO 954 INCORPORATES:

- Patented algorithms for greater precision in all applications
- Adaptive dynamic compensations to improve measurement under adverse conditions
- Unique force transducer technology to optimize stable operation
- Advanced drum calibration for guaranteed accuracy
- "SIL-by-design" features with unique diagnostics for reliable operation (IEC 61508)
- Separate terminal compartment for ease of wiring
- Safety approvals and certifications from legal metrology institutes worldwide
 - NMi approvals
 - OIML R85 and varied liquids compliance

State-of-the-art Features

The Smart Servo 954 was designed to incorporate a host of innovative, best-in-class features.

For example, its unique, fully capable software supports diagnostics on SILrated loops. An option slot for additional functionalities allows the connection of temperature measuring elements for spot/average product and vapor phase temperature, as well as product temperature profiles.

The new gauge is equipped with a Servo Auto Test feature, which increases safety, integrity and diagnostic coverage, and enables usage in overfill protection loops. It can be included in SIL-2 safety loops, and if used in a redundant configuration, is suitable for SIL-3-rated loops.



A FLEXIBLE AND ADAPTABLE SOLUTION

Honeywell Enraf servo gauging systems provide a flexible and adaptable solution for a wide range of terminal operations. They are suitable for:

- Product and gas temperature with spot or average temperature measurement, or temperature profiling
- Product level
- Interface level
- Density measurement and profiling
- Direct water bottom measurement or via capacitive probes
- Average continuous density monitoring connecting one or more HART pressure transmitters
- TUV SIL certified NO/NC alarm relay contact and/or 4-20mA Analog output for direct connection to Safety or Distributed control system
- Easy integration with Honeywell
 Experion DCS system & Safety
 Manager ESD system
- Measurement ranges up to 150 m
- Working pressure up to 40 bar

BENEFITS TO YOUR BOTTOM LINE

Honeywell Enraf Smart Servo 954 is the most reliable, versatile and accurate automatic tank gauge available.

- Accurate measurement in liquids including vaporized applications
- Improve reliability under dynamic conditions
- Maximize storage capacity with lowest safety diagnostic cycle time
- Enhanced safety with SIL certified AO/DO options for overfill prevention
- Modular design for ease of maintenance
- Simple & cost effective migrations for legacy & 3rd party gauge
- One stop integrated gauging solution for all your terminal needs

Technical Specifications

Honeywell Bi-phase mark (Pos 7 = B)	
Baud rate	1200/2400 bps
Cable characteristics	2 wires, twisted pair, Rmax = 200 Ohm / line, Cmax = 1uF; cable length: 10 km (6 miles) or more *
solation voltage	> 1,500 V
Lightning protection	Full galvanic separation via isolating transformers
Protocol	Standard Honeywell fieldbus (Serial, ASCII, GPU protocol)
Common mode rejection	> 150 dB
TRL/2 Communication Protocol TRL/2 Commu	nication Protocol TRL/2 Communication Protocol (Pos 7 = T)
Protocol	Modbus RTU; Communication: TRL/2 100/90 KHz FSK
Baud rate	4800, 8 bits and 1 stop bit.
Lightning protection	Opto-isolators
Cabling	18 AWG (minimum) with shielded twisted pair, max 4 km with max 8 multi drop Gauge connection
Physical layer	Logic 1 is represented by 100kHz and Logic 0 by 90khz:(+/-3%)
Voltage levels	3.6V +/- 10%.
Power rating	At 12V Nominal current drawn by TRL/2 module alone is 40mA (+/- 10%), [power consumption
	is 480mW (+/- 10%)]. The worst case current/power drawn with below mentioned conditions is
	60mA.
HART® Slave – Multidrop and/or 4-20 mA (Pos 7	7 = H)
Protocol	Communications: HART® 7
Analog output loop (non-I.S.)	Active or Passive; selectable by jumper
	– Active: output voltage: 20V ±5%
	– Passive: minimum external supply voltage: 11.5 V
	maximum external supply voltage: 30 V (55 V with serial resistor)
Accuracy	±0.1% of actual measurement
Cable characteristics	2 wires, shielded, twisted pair
ALARM CONTACT OPTIONS	
Hardware alarms (1x SPDT)	125 VAC, 0,5 A (110 VDC, 0.3 A)
Hardware alarms (1x SPDT)	150 VAC, 3 A (40 VDC, 3 A)
Hardware alarms (2x SPDT)	125 VAC, 0,5 A (110 VDC, 0.3 A)
Hardware alarms (2x SPDT)	150 VAC, 3 A (40 VDC, 3 A)
Relay operation	– Normally Open/Normally Closed contact: selectable by jumper
	 Normally Energized / Normally De-energized: configurable by software setting
	 – PV Monitor (any of the measured parameters, configurable by software setting)
	- Remote control (configurable by software setting)
SIL 2/3 SAFETY FUNCTIONS A	LARM CONTACTS OPTIONS
SIL Digital Output	1 x SIL DO contact (1 x SPDT contact, 2 A at 250 Vac or 2 A at 40 Vdc, Pmax = 500 W)
	2 x SIL DO contact (2 x SPDT contact, 2 A at 250 Vac or 2 A at 40 Vdc, Pmax = 500 W)
SIL Analog Output	SILAO NAMUR NE43 compliant
SIL Digital Output + Analog Output	SIL AO + 1 SIL DO contact NAMUR NE43 compliant
	(1 x SPDT contact, 2 A at 250 Vac or 2 A at 40 Vdc, Pmax = 500 W)
	SIL AO + 2 SIL DO contacts NAMUR NE43 compliant
	(2 x SPDT contact, 2 A at 250 Vac or 2 A at 40 Vdc, Pmax = 500 W)

Continued....

Notes:

HART® is a registered trademark of the HART Communications Foundation. *1Distances of more than 10 km possible

depending on amount of field instruments and cabling topology.

 ^{*2} Under reference conditions.
 ^{*3} With VITO temperature probe or Spot (PT100).
 ^{*4} Various generally available types of elements (RTD, MRT) can be selected.
 ^{*5} Under reference conditions *6 Minimum product densit y bet ween layers: 100 kg/m3 (6.25 lb/ft3)

⁺⁷ In ex treme environments the accuracy could be af fected depending on the thermal expansion coef ficient of the wet ted parts.

Technical Specifications (continued)

Connunctations Proprietary MART* (Eu- Cable characteristics Accessed (UE) mass 4 mit Prose 2 (D/Inno Cable characteristics Accessed (UE) mass 4 mit Prose 2 (D/Inno Cable characteristics Accessed (UE) mass 4 mit Prose 2 (D/Inno Accessed (UE) 12 (C) (D (1 * P) - 2, -2) Resolution - Temperature measurement 0.1 mit (O) (D (1 * P) - Value free dimensionement 0.1 mit (O) (D (1 * O)	INPUT	
Cable characteristics Cave, chiedded twiste dair, Cross-1 JE, Lross-OmH (Reac-25.02/Inc Acrusory - Temperature massurement. 10 °C (Chi 18 °F) 2.73 Acrusory - Waster level massurement. 10 m (Chi 27 °F) 3 Removation - Temperature massurement. 10 m (Chi 19 °F) Acrusory - Waster level massurement. 10 m (Chi 19 °F) Sector Temperature massurement. 10 m (Chi 19 °F) - Waster level massurement. 10 m (Chi 19 °F) Sector Temperature massurement. 10 m (Chi 19 °F) - Waster level massurement. 10 m (Chi 19 °F) Sector Temperature massurement. 10 m (Chi 19 °F) - Waster level massurement. 10 m (Chi 19 °F) Cable characteristics Streaded, Inter-1 10 °F (Chi 19 °F) Removation - Off for (Chi 19 °F) Cable characteristics Off for (Chi 19 °F) Acrusor and / or HMM (Finguts and / or HMM (Finguts and / Or HMS density calcutation - VII O sensor and / or HMM (Finguts and / Or HMS density calcutation Acrusor and / or HMM (Finguts and / or HMM (Finguts and / Or HMS density calcutation - VII O sensor and / or HMM (Finguts and / Or HMS density calcutation Acrusor and / or HMM (Finguts and / or HMS density calcutation - VII O sensor and / or HMM (Finguts and / Or HMS density calcutation Acrusor and / or HMM (Finguts and / or HMM (F	VITO Input for Temperature and Water Probe	
Accuracy - Interpenduate measurement 50 1*C (1018 *1)*2, *3 - Wate level measurement 50 1*C (101 *7) Seat RTD Input - Seat RTD Input - Mark Insel measurement 50 1*C (101 *7) Seat RTD Input - Mark Insel measurement 50 1*C (101 *7) Seat RTD Input - Mark Input 5000 / Inp. Seat RTD Input - Mark Input 5000 / Inp. Seat RTD Input Calle characteristics - Mark Input 5000 / Inp. Seat RTD Input 5000 / Inp. Benduation Odd 11*C Seat RTD Input 5000 / Inp. Benduations - SHART Input 5000 / Inp. Benduations - SHART Input 5000 / Inp. Configurations	Communications	Proprietary HART® (Ex-i
• Water level measurement: 21 mm (0.078)*3 Resolution - Immeasurement: 0.01 °C (0.01 °F) • Water level measurement: 0.11 mm (0.01)*3 SpectTopic - Water level measurement: 0.11 mm (0.01)*3 Calle characterization - Shall topic level in the spect measurement of the	Cable characteristics	2 wires, shielded, twisted pair, Cmax = 1 μ F, Lmax = 9 mH, Rmax = 25 Ω / line
Resolution - Temperature measurement: 0.01 °C (0.01 °F) - Version (0.01') Sex HD Ingu- Example resurement: 0.01 °C (0.01 °F) - MPI and Resurements with 2 cammarguand wires ⁴ . Cable characteristics - MPI and RETP) resolutions for - MPI and RETP. Cammarguand wires ⁴ . Cable characteristics - Shielder, Remark - 1 pFI mean demont and the 2 cammarguand wires ⁴ . Cable characteristics - Shielder, Remark - 1 pFI mean demont and the 2 cammarguand wires ⁴ . Cable characteristics - Shielder, Remark - 1 pFI mean demont and the 2 cammarguand wires ⁴ . Cable characteristics Optime - SHIRT* Input, HINS density calculation - VTO ensities and / or HINS density calculation - VTO ensity and / or HINS density - HINS density calc	Accuracy	 Temperature measurement: ±0.1 °C (±0.18 °F) *2, *3
- Water level measurement: 0.1 mm (0.01') Spei RTD Insut Configurations - 3 wire or /4 wire RTD, one elements or two elements *4 - MDT or MRT up to 6 elements with 2 common ground wires *4 Calid characteristics Schilder Bmack 100 0/1 inc. Cmask 1 pE Lmask 10.5 mH Advancements -0.1 *C(Cal SP 5) Resolution 0.01 *C(Cal SP 5) Resolution Options - Griffgurations -5 #ART* inputs and / or HIMS density calculation - VTD sensores and / or 3 HIMS density calculation -VTD sensores and / or 3 HIMS density calculation - VTD sensores and / or 3 HIMS density calculation -VTD sensores and / or 3 HIMS density calculation - Statistic relations - Statistic relation of item of the sensore and / or 3 HIMS density calculation Calids medicing - VTD sensores and / or 3 HIMS density calculation Calids medicing - VTD sensores and / or 3 HIMS density calculation Calids medicing - VTD sensores and / or 3 HIMS density calculation Calids medicing - VTD sensores and / or 3 HIMS density calculation Calids medicing - VTD sensores and / or 3 HIMS density calculation Calids medicing - VTD sensores and / or 3 HIMS densing for the sensore and / or 3 HIMS density calculation<		– Water level measurement: ±2 mm (0.078") *3
Spac HTD Input - 3 wire of NTD, one NTD, one elements with 2 common ground wires 14 Colifie characteristics > Midded, Rmax = 100 G/Line, Cmax = 1 µF, Lmax = 10.8 mH Recursory 001 °C (Col 18°P) Resolution 010 °C (Col 18°P) HART Input - Exclusion 010 °C (Col 18°P) HART Input - Ecclusion - O O O Common ground wires 14 - Common and / Viri S density calculation - - 9 HART* Input - Common actions 5 digitab of an adjo of 10 analog 0 Common actions - - Other Guinas - - INSTRUMENT MEASURING SPECTION - - Eacle entries - - Standard - - - Standard - - - Standard - - - Common actions in the inter of the size cable glands - - NUT Coll 10° Fo - - - Standard - -<	Resolution	– Temperature measurement: 0.01 °C (0.01 °F)
Configurations - Swire of A wire ATD, one elements r two elements r4 MTP ur MRT up ut 50 dimensits with 2 cumman ground wires r4 Cable characteristics Swieded Mrwar - 100 37 Line. Cmax - 1 gL, I max - 10.3 mil Accuracy 20.1 °C (20.1 °F) Resolution 0.0 1 °C (20.1 °F) MRT Input - SHATT "inputs and / or HIMS density calculation - VI 0 expresses and / ur 31 LAR I* inputs - 31 LAR I* inputs - VI 0 expresses and / ur 31 LAR I* inputs - 31 LAR I* inputs - Statistical and interview - 31 LAR I* inputs - Statistical and interview - 31 LAR I* inputs - Statistical and interview - 31 LAR I* inputs - Statistical and interview - 31 LAR I* inputs - Statistical and interview - 31 LAR I* inputs - Statistical and interview - 31 LAR I* inputs - Statistical and interview - 31 LAR I* inputs Cable characteristics 2 wires, shielded twisted pair, Cmax = 1 pE Lmax + 9 mH, Rmax = 20 m/ Ine Cable characteristics 2 wires, shielded twisted pair, Cmax = 1 pE Lmax + 9 mH, Rmax = 20 m/ Ine Cable characteristics 2 m (38 R) Pos 18 - A, B, C Cable characteristics 2 m (18 R) Pos 18 - A, B, C Cable characteristics 3 m (12 L) Pos 18 - L, A, B, C Characteristic and information and in (12 R) Pos 18 - L, B, C Chara		– Water level measurement: 0.1 mm (0.01")
- MPT or MRT up to 6 elements with 2 common ground wires "4 Cable characteristics Sindled, finas - 100 QL/ine, Cmax - 1 µE Lmax - 10.5 mH Auxrunny -0.11°C (C 01 PS) Resolution Options - 5 H4RT1 inputs and / or HIMS density calculation - VTD sensors and / or 3 H4RT1 inputs ond / or HIMS density calculation - VTD sensors and / or 3 H4RT1 inputs ond / or HIMS density calculation - VTD sensors and / or 3 H4RT1 inputs Communications Signity or 1 (anxiog) Communications Signity or 1 (anxiog) Communications Wess, Bridden their density calculation and VTO sensors Communications Adapters available to fill other sizes cable gloreds Use Options - Signity or 1 (anxiog) Communications Adapters available to fill other sizes cable gloreds Use Options - Signity or 1 (anxiog) Contrained Y (any 10 Pos 18 = L, F Use Instantion Y (any 110 Pos 18 = L, F Sim (121 Ft) Pos 18 = L, F - Signity (121 Ft) Pos 18 = L, F View Instantion accuracy inter - 1 mm accuracy or 150 m (402 ft) Pos 18 = N, F Sim (121 Ft) Pos 18 = L, F - Signity (121 Ft) Pos 18 = L, F View Instantin accuracy or 150 m (402 ft) Pos 18 = N,	Spot RTD Input	
Cable characteristicsShelded, Rmax + 100 D/ Line, Cmax + 1µF, Lmax + 10.5 mHAccuracy0.01 * (0.01 %)HART* Input0.01 * (0.01 %)HART* Input- 5HART* inputs and / or HIMS density calculation - VITO sensors and / or 3HART* inputs - 3HART* inputs and / or 3HART* inputs - 3HART* inputs and / or 3HART* inputs - 3HART* inputs density calculation and VITO sensors - 3HART* input timb 3 density calculation and VITO sensors - 3HART* input timb 3 density calculation and VITO sensors - VITO sensors and / or 3HART* inputs - 3HART* inputs - 3HART* inputs density calculation and VITO sensors - SHART* input timb 3 density calculation and VITO sensors <b< td=""><td>Configurations</td><td>– 3 wire or 4 wire RTD, one element or two elements *4</td></b<>	Configurations	– 3 wire or 4 wire RTD, one element or two elements *4
Accuracy ±01*C(±018*F) Besolution 0.01 °C(.0.01*F) HART*Input. Divisions - 91 HART*Input. and / or HIMS density calculation - 91 HART*Input. Configurations Options - 91 HART*Input. HIMS density calculation - 91 HART*Input. Configurations Divisions and / or HIMS density calculation - 91 HART*Input. HIMS density calculation - 91 HART*Input. Communications Divisions Communications Divisions Control 2 writes, shifted(Mediad (Mediad Ches and Ches 1 July, Linax = 9 mit. Henax = 25 GV/Ime Collect characteristics 2 writes, shifted(Mediad (Mediad Ches and Ches 2 July, Linax = 9 mit. Henax = 25 GV/Ime Collect characteristics 2 writes, shifted(Mediad (Mediad Ches and Ches 2 Supple) Level measuring anore 2 writes, shifted(Mediad (Mediad Ches and Ches 2 Supple) Level measuring anore 7 m (121 tr) Po 18 + A, B, C Extended 9 m (121 fr) Po 18 + F, F 40 m (121 fr) Po 18 + K, 3 m (121 fr) Po 18 + K, 30 m (121 fr) Po 18 + K, 3 m (121 tr) Po 18 + K, 30 m (121 tr) tr) Po 18 + M, 9 m (121 tr) tr) Po 18 + M, Measuring accura		– MPT or MRT up to 6 elements with 2 common ground wires *4
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HAR? Input - 5 HAR I* inputs and / or HIMS density calculation - 0 HAR I* inputs and / or HIMS density calculation - UTO sensors and / or 3 HAR? Inputs - 3 HAR I* input. HIMS density calculation - UTO sensors and / or 3 HAR? Inputs - 3 HAR I* input. HIMS density calculation and VITO sensors - UTO sensors and / or 3 HAR? Inputs - 3 HAR I* input. HIMS density calculation and VITO sensors - UTO sensors and / or 3 HAR? Inputs Communications - 2 Wires, shielded twisted pair, Cmax-1 µF, Imax-9 mH, Pmax-25 Ω / Une Cable christics - 2 Wires, shielded twisted pair, Cmax-1 µF, Imax-9 mH, Pmax-25 Ω / Une Cable christics - 2 Tm (B#1P Pos 1B - A, B, C INSTRUMENT MEASURINC SPECIFICATION	Accuracy	±0.1 °C (±0.18 °F)
Configurations Options - 5 HART ⁺ inputs and / or HIMS density calculation - VITO sensors and / or 3 HART ⁺ inputs - 3 HART ⁺ input, HIMS density calculation and VITO sensors Max. instruments per module 5 (digital) or 1 (analog) Communications HART ⁺ (revision 4) Cable characteristics 2 wires. shielded.twissed pair, Cmax - 1 µF, Lmax - 9 mH, Rmax - 25 Ω/ line Other Options Cable others Cable others Adaptors available to fit other sizes cable glands INSTRUMENT MEASURINC SPECIFICATION Sandard Extended 3/ m (121 ft) Pos 18 - A, B, C Extended 3/ m (121 ft) Pos 18 - A, B, C Extended 3/ m (121 ft) Pos 18 - K, 35 m (137 ft) Pos 18 - K, 45 m (137 ft) Pos 12 - K, 45 m (136 ft) (with measuring wire up to 150 m (492 ft)) Pos 18 - M; For longer ranges, please contact factory Measuring accuracy level 40 m (131 2 ft): < (40 4 m ma couracy	Resolution	0.01 °C (0.01 °F)
- 5HART* inputs and / or HIMS density calculation - VIO sensors and / or 3HART* inputs - VIO sensors and / or 3HART* inputs	HART® Input	
-VITO sensors and / or 3 HART* inputs -3 HART* input, HIMS density calculation and VITO sensors Max. instruments per module 5 (digital) or 1 (analog) Cammunications HART* input, HIMS density calculation and VITO sensors Cable characteristics 2 wies, shielded, twisted pair, Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line Other Options Cable of the sizes cable glands INSTRUMENT MEASURING SPECIFICATION View analyze is a valiable to fit other sizes cable glands INSTRUMENT MEASURING SPECIFICATION (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line) Adapters available to fit other sizes cable glands INSTRUMENT MEASURING SPECIFICATION (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line) Adapters available to fit other sizes cable glands INSTRUMENT MEASURING SPECIFICATION (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line) Adapters available to fit other sizes cable glands INSTRUMENT MEASURING SPECIFICATION (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line) Adapters available to fit other sizes cable glands INSTRUMENT MEASURING SPECIFICATION (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line) Adapters available to fit other sizes cable glands INSTRUMENT MEASURING SPECIFICATION (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line) Adapter size (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line) INSTRUMENT MEASURING SPECIFICATION (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/ line) Adapter size (Cmax+1 yE, Lmax+2 B mH, Rmax+25 D/	Configurations	Options
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Max. instruments per module 5 (digital) or 1 (analog) Communications HART* (revision 4) Cable characteristics 2 wires, shielded, twisted pair, Cmax - 1 µF, Lmax - 9 mH, Rmax - 25 Ω/ Line Other Options		– VITO sensors and / or 3 HART® inputs
CommunicationsHART* (revision 4)Cable characteristics2vires, shelded, twisted pair, Cmax -1 pF, Lmax - 9mH, Rmax -25 Q/ lineOther OptionsAdapters available to fit other sizes cable glandsINSTRUMENT MEASURING SPECIFICATIONLevel measuring rangeEvel measuring rangeStandard27 m (88 ft) Pos 18 - A, B, CEvel measuring rangeStandard37 m (121 ft) Pos 18 - F, F40 m (131 ft) Pos 18 - H, 45 m (147 ft) Pos 18 - K, 35 m (115 ft) (with measuring wire up to 150 m (492 ft)) Pos 18 - M; For longer ranges, please contact factoryMeasuring accuracy level40 m (131.2 ft): v10.4 m (n (0.016') *S; 40 m (131.2 ft): v10.4 m (n (0.016') *S; 40 m (131.2 ft): v10.4 m (n (0.016') *S; 40 m (10.016') *S; 40 m (10.004') *SMeasuring accuracy level< 21 mm (±0.08') *6		– 3 HART® input, HIMS density calculation and VITO sensors
Cable characteristics 2 wires, shielded, twisted pair, Cmax+1 µF, Lmax+9 mH, Rmax-25 Q/ line Other Options	Max. instruments per module	5 (digital) or 1 (analog)
Other Options Cable entries Adapters available to fit other sizes cable glands INSTRUMENT MEASURING SPECIFICATION Level measuring range Standard 27 m (88 fi) Pos 18 - A, B, C Extended 37 m (121 ft) Pos 18 - A, B, C Adom (131 ft) Pos 18 - H, 45 m (147 ft) Pos 18 - H, 45 m (147 ft) Pos 18 - H, 45 m (147 ft) Pos 18 - K, 35 m (115 ft) (with measuring wire up to 150 m (492 ft)) Pos 18 - M; For longer ranges, please contact factory Measuring accuracy level 40 m (131.2 ft): <t0 (40.016)*5;<br="" 4="" mm="">40 m (131.2 ft): <t0 (40.016)*5;<br="" 4="" mm="">45 meter with + 1 mm accuracy last 35 meter with + 1 mm accuracy actoracy interface Measuring accuracy level <0.1 ft (0.018*7)*5</t0></t0>	Communications	HART® (revision 4)
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INSTRUMENT MEASURING SPECIFICATION Level measuring range Standard 27 m (88 ft) Pos 18 = A, B, C Standard 37 m (121 ft) Pos 18 = L, F 40 m (131 ft) Pos 18 = H, 45 m (147 ft) Pos 18 = H, 45 m (147 ft) Pos 18 = K, 55 m (115 ft) (with measuring wire up to 150 m (492 ft)) Pos 18 = M; For longer ranges, please contact factory 55 m (115 ft) (with measuring wire up to 150 m (492 ft)) Pos 18 = M; Measuring accuracy level 40 m (131.2 ft): < 0.4 mm (± 0.016') *5;	Other Options	
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Extended37 m (121 ft) Pos 18 = F, F40 m (131 ft) Pos 18 = H, 45 m (147 ft) Pos 18 = K, 35 m (115 ft) (with measuring wire up to 150 m (492 ft)) Pos 18 = M, For longer ranges, please contact factoryMeasuring accuracy level40 m (131.2 ft): <±0.4 mm (±0.015)*5; 40 m (131.2 ft): 01ML R85 certified (Pos 5 = X); 45 meter with +: 1 mm accuracy 145 meter with +: 1 mm accuracy on 150 m wireMeasuring accuracy level<±2 mm (±0.015)*5; 45 meter with +: 1 mm accuracy on 150 m wireMeasuring accuracy temperature<±0 1°C (±0.18°F)*5	Standard	27 m (88 ft) Pos 18 = A. B. C
A S m (147 ft) Pos 18 = K, B m (115 ft) (with measuring wire up to 150 m (492 ft)) Pos 18 - M; For longer ranges, please contact factory Measuring accuracy level 40 m (131.2 ft): <0.4 mm (±0.016")*5;	Extended	
A S m (147 ft) Pos 18 = K, B m (115 ft) (with measuring wire up to 150 m (492 ft)) Pos 18 - M; For longer ranges, please contact factory Measuring accuracy level 40 m (131.2 ft): <0.4 mm (±0.016")*5;		40 m (131 ft) Pos 18 = H.
Bis m (115 fb) (with measuring wire up to 150 m (492 fb)) Pos 18 - M; For longer ranges, please contact factory Measuring accuracy level 40 m (13.2 fb): 40 m (13.2 fb): 40 m (13.2 fb): 40 m (13.2 fb): 40 m (13.2 fb): 40 m (13.2 fb): OIML R85 certified (Pos 5 = X); 45 meter with + 1 mm accuracy on 150 m wire ta 35 meter with + 1 mm accuracy on 150 m wire ta 35 meter with + 1 mm accuracy on 150 m wire ta 35 meter with + 1 mm accuracy on 150 m wire ta 35 meter with + 0004) *5 Measuring accuracy temperature <td></td> <td></td>		
For longer ranges, please contact factory Measuring accuracy level 40 m (13.1.2 t): < ±0.4 mm (±0.016") *5;		
Massuring accuracy level 40 m (131.2 ft): < 0.4 mm (± 0.016')*5;		
40 m (1312 ft): OIML R85 certified (Pos 5 = X); 45 meter with +- 1 mm accuracy Iast 35 meter with +- 1 mm accuracy on 150 m wire Measuring accuracy interface <2 mm (±0.08°)*6		
45 meter with + 1 mm accuracy Ias 35 meter with + 1 mm accuracy on 150 m wire Ias 35 meter with + 1 mm accuracy on 150 m wire Measuring accuracy interface < 2 mm (± 0.08°)*6		
Iast 35 meter with + 1 mm accuracy on 150 m wireMeasuring accuracy interface<± 2 mm (± 0.08")*6		
Measuring accuracy interface <± 2 mm (± 0.08°)*6		-
Measuring accuracy temperature <±0.1 °C (±0.18 °F)*5	Manuring and upon interface	-
Sensitivity \$ 0.1 mm (± 0.004")*5 Repeatability \$ 0.1 mm (± 0.004")*5 Density Measurement With density firmware (Pos 20 = D and density displacer (Pos 19 - E or F) Measuring accuracy servo density \$ 1 kg /m3 (± 0.19 lb/ft3) MECHANICAL See 'Identification Code' Pos 14-16 Dimensions See 'Identification Code' Pos 14-16 Dimensions See 'Dimensional Drawing' Weight If kg (35 lb) Chemical version 16 kg (35 lb) Chemical version 26 kg (57 lb)	, , , , , , , , , , , , , , , , , , ,	
Repeatability ≤ 0.1 mm (± 0.004")*5 Density Measurement With density firmware (Pos 20 = D and density displacer (Pos 19 - E or F) Density measurement With density firmware (Pos 20 = D and density displacer (Pos 19 - E or F) Measuring accuracy servo density < ± 3 kg/m3 (± 0.19 lb/ft3)		
Density Measurement With density firmware (Pos 20 = D and density displacer (Pos 19 - E or F) Measuring accuracy servo density < ± 3 kg/m3 (± 0.19 lb/ft3)		
Density measurementWith density firmware (Pos 20 = D and density displacer (Pos 19 - E or F)Measuring accuracy servo density< ± 3 kg/m3 (± 0.19 lb/ft3)		S0.1 mm (E0.004) 5
Measuring accuracy servo density <± 3 kg/m3 (± 0.19 lb/ft3)	-	With density firmware (Des 20 - D and density displacer (Des 19 - E er E)
MECHANICALFlangeSee 'Identification Code' Pos 14-16DimensionsSee 'Dimensional Drawing'WeightIf kg (35 lb)Chemical version16 kg (35 lb)Ligh pressure version21 kg (46 lb)High pressure version26 kg (57 lb)		· · · ·
FlangeSee 'Identification Code' Pos 14-16DimensionsSee 'Dimensional Drawing'WeightIf kg (35 lb)Chemical version16 kg (46 lb)High pressure version26 kg (57 lb)		
Dimensions See 'Dimensional Drawing' Weight Weight Chemical version 16 kg (35 lb) Chemical version 21 kg (46 lb) High pressure version 26 kg (57 lb)		
Weight I6 kg (35 lb) Medium pressure version 21 kg (46 lb) High pressure version 26 kg (57 lb)	Flange	
Medium pressure version16 kg (35 lb)Chemical version21 kg (46 lb)High pressure version26 kg (57 lb)	Dimensions	See 'Dimensional Drawing'
Chemical version21 kg (46 lb)High pressure version26 kg (57 lb)	Weight	
High pressure version 26 kg (57 lb)	Medium pressure version	
	Chemical version	
Cable entries4 x ¾" NPT threaded (2* I.S. + 2* non-I.S.)	High pressure version	-
	Cable entries	4 x ¾" NPT threaded (2* I.S. + 2* non-I.S.)

Technical Specifications (continued)

PROCESS	
Operating pressure	
M and C versions	Up to 6 bar / 0.6 MPa (90 psi); Pos 14
Hversion	Up to 40 bar / 4 MPa (600 psi) (up to 25 bar / 2.5 MPa in acc. to PED); Pos 14
Temperature	
Max. process temperature	+200 °C (+392 °F), drum housing must be kept below +65 °C (+149 °F) *7
Min. process temperature	-200 °C (-328 °F), drum housing must be kept above -40 °C (-40 °F) *7
PROCESS WETTED MATERIAL	S
Drum compartment	Cast aluminum Int. reg. AA A356 EN1706 AC-AlSi7Mg0.3; Pos 14 = A or M
	Stainless steel ASTM A351, CF-8M, G-X6 CrNiMo 18 10 (1.4408); Pos 14 = H or C
Measuring drum, drum shaft	Stainless steel (1.4401) EN10088 AISI 316
Measuring wire	See 'Identification Code'; Pos 18
Magnet cap	Stainless steel (1.4401) EN10088 AISI 316
0-rings	Drum cover Silicone/FEP; others FPN (Viton®); Special O-ring (Perlas®) available for demanding
	chemical applications (such as Ammonia), part nr. S0854969
ENCLOSURE MATERIALS	
Servo comp. and cover	All types cast aluminum Int. reg. AA A356 EN1706 AC-AlSi7Mg0.3
Finish aluminum parts	Conforms to MIL-DTL-5541F
ENVIRONMENTAL SAFETY	
Ambient temperature	-40 °C to +65 °C (-40 °F to +149 °F)
Storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)
Protection class	IP66 / IP67 accordingto EN 60529 (NEMA 4X)
Safety	Explosion proof
	– II 1/2 G Ex d IIB T6 Ga/Gb or Ex de IIB T6 Ga/Gb or Ex d [ia Ga] IIB T6 Ga/Gb or Ex de [ia Ga] IIB T6
	Ga/Gb; acc. to ATEX KEMA
	– Class I, Division 1, Group C & D; acc. to FM
	– Class I, Group C & D acc. to CSA certificate
	Consult factory for other approvals and updates
ELECTRICAL	
Power supply	Autoselect 65 Vac to 240 Vac, 50/60 Hz and/or 24 Vdc to 65 Vdc
Power rating	11 Wmax continuously
FUNCTIONAL SAFETY	
Configuration	TÜV certified for SIL 2 (single configuration) and SIL 3 (redundant configuration).
Computation	For contact specification, refer to page 5.
	For contact specification, refer to page 5.

Identification Code Pos 1, 2, 3, 4 Instrument code

I.S NON I.S Boards Terminals Terminals

5 Performance and Legal metrology approvals		
Accuracy \pm 0.4 mm Xtreme Performance, Legal Metrology with OIML R85 report and sealing facilities. Only when Pos 7 = B or T 1	-	2
Accuracy ± 0.4 mm Xtreme Performance per OIML R85, with factory calibration report according to OIML	-	2
Accuracy ± 1 mm High Performance, for custody transfer compliant to OIML R85, API 3.1B and ISO 4266 (1 & 3) with	-	
factory calibration report according to OIML Accuracy ± 1 mm High Performance, for custody transfer compliant to API 3.1B and ISO 4266 (1 & 3)	_	
Pos 6 User interface (connector for portable HART SmartView standard for all selections)		
👔 With internal display	-	
B With internal display and terminals for stand-alone HART SmartView	2	
Pos <u>7 Data transmission</u>		
B Enraf Fieldbus Bi-phase Mark (BPM)	-	
HART / 4-20 mA output	-	
TRL/2 field bus	-	
Pos 8 Basic VITO and HART input options		
	-	
VITO temperature and/or water sensor	2	
VITO temperature and/or water sensor and 1 HART input	4	
HART input (up to 3 HART devices)	2	
HART input (up to 3 HART devices) and HIMS density calculations	4	
Pos 9 Additional VITO and HART input options		
None	-	
VITO temperature and/or water sensor	2	
VITO temperature and/or water sensor and 3 HART inputs	8	
VITO temperature and/or water sensor and 3 HART inputs and HIMS density calculations	8	
HART input (5 HART inputs)	4	
HART input (5 HART inputs) and HIMS density calculations	4	
Pos 10 Temperature		
	3	
RTD one spot element 3 wire RTD one spot element 4 wire	4	
	5	
RTD 3 elements MRT / MPT Common return RTD 4 elements MRT / MPT Common return	6	
RTD 5 elements MRT / MPT Common return	7	
	8	
Pos 11 Alarm outputs	0	
	-	
Hardware alarms (1x SPDT) 125 VAC, 0,5 A (110 VDC, 0.3 A)	_	
Hardware alarms (1x SPDT) 150 VAC, 3 A (40 VDC, 3 A)	-	
Hardware alarms (2x SPDT) 125 VAC, 0,5 A (110 VDC, 0.3 A)	_	
Hardware alarms (2x SPDT) 150 VAC, 3 A (40 VDC, 3 A)	_	
Pos 12 -SIL functionality		
None	-	
1 x SIL DO contact (1 x SPDT contact, 2 A at 250 VAC or 2 A at 40 VDC, Pmax = 500 W)		
2 x SIL DO contact (2 x SPDT contact, 2 A at 250 VAC or 2 A at 40 VDC, Pmax = 500 W)		
SIL AO NAMUR NE43 compliant		
SILAO + 1 SIL DO contact NAMUR NE43 compliant (1 x SPDT contact, 2 A at 250 VAC or 2 A		
at 40 VDC, Pmax = 500 W)		
SIL AO + 2 SIL DO contacts NAMUR NE43 compliant (2 x SPDT contact, 2 A at 250 VAC or 2 A		
at 40 VDC, Pmax = 500 W)		
Pos 13 - Additional communication None or Select from Pos 7		0
		0

Identification Code (Continued)

	icat			inued							
				00	۲.				150 FF, Flanges acc. ASI		
				00		emica	Il version, 2	" Class	150 RF, Flanges acc. A	ASME B16.5, (Ra=3	.2-6.3 μm), AISI 316, Up to 6 bar
				0 0	2 <u>Ch</u>	emica	Il version, D)N50, P	N 6, Flanges acc. EN 1	.092-1, (Ra=3.2-12	5 μm), AISI 316, Up to 6 bar
				00	2 Hi	gh pre	ssure, 2" Cla	ass 300	RF, Flanges acc. ASME	E B16.5, (Ra=3.2-6.3	μm), AISI 316, Up to 40 Bar.
				00	3 <u>⊣i</u>	High pressure, DN50, PN 40, Flanges acc. EN 1092-1, (Ra=3.2-12.5 μm), AISI 316, Up to 40 Bar					
					Po	s 17 S	Safety appi	rovals			
					A	ATE	X/IECEx				
					G	FM	USA				
					G		A Canada	1			
					T	Pos	18 Measu	uring ra	ange & wire material *2	2	
						A	27 m (88	3 ft)	AISI 316	0.2 mm	
						B	27 m (88	3 ft)	Hastelloy C22	0.2 mm	
						Ģ	27 m (88	3 ft)	Tantalum	0.2 mm	
						J	27 m (88	3 ft)	Tungsten	0.25 mm	
						ē	37 m (12		AISI 316	0.2 mm	
						ē	37 m (12	21 ft)	Invar	0.2 mm	
						Ğ	37 m (12	21 ft)	Tungsten	0.25 mm	
						Ū	40 m (13	31 ft)	AISI 316	0.2 mm	
						J	40 m (13	31 ft)	Tungsten	0.25 mm	
						0	45 m (13	31 ft)	AISI 316	0.2 mm	Available only with Pos 5 = I or Po 5 = H
						•	45 m (13	31 ft)	Tungsten	0.25 mm	Available only with Pos 5 = I or Po 5 = H
						0	150 m (4	92 ft)	AISI 316 (35 m meas ±1 mm accuracy with wire for cavern install	150 m 0.2 mm	Available only with Pos 5 = I or Pos 5 = H
							Pos 19 [Displa			
							None	-			
							T		/CT/110 Carbon filled P	PTEE Hostaflon™ we	eiaht 223 a · ø 110 mm
							T		/CT/90 Carbon filled PT		-
							Ψ		/CT/45 Carbon filled PT		
							¥				eight 223 g.; ø 25 mm 🛛 Available or
							•		or Pos 5 = H	······································	
							0 <u>U815</u>	5C/260/	/S/90 AISI 316, weight 2	260 g.; ø 90 mm (fo	r density measurement)
							0 U815	5C/260/	/S/45 AISI 316, weight 2	260 g.; ø 45 mm (fo	r density measurement)
							Pos 2	20 Serv	o density measureme	ent	
								No dens	sity option		
								With Se	rvo Density measureme	ent (Select None, E (or F in displacer selection Pos 19)
								Pos 21	Additional options		
								Nor	пе		
								Air a	ourge connection for dr	rum compartment (1/4" BSP entry)
								۳ —	s 22 Tag plate		
									No tag plate		
									Tag plate (Material: C	CuNi allov)	
								ľ	. g prace (motoride o		
	1	1			1 1						
6 4 4				0		A				1	Typical Identification Code

Notes:

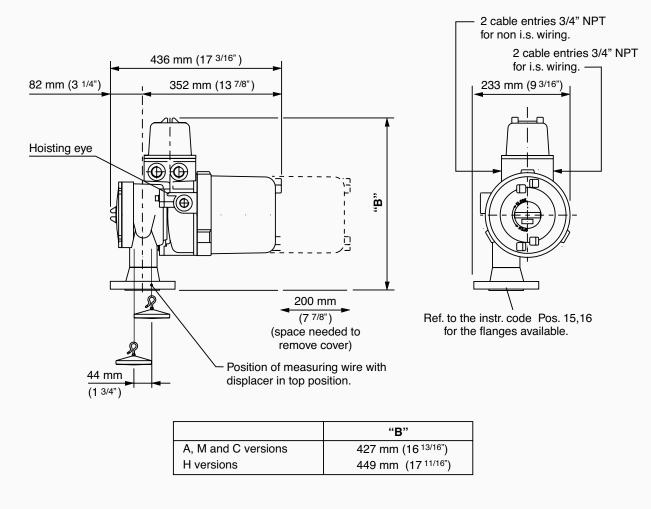
*1 Applicable for compliance to country specific Legal Metrology certificates (Like Netherlands, Germany etc.) For witnessed verification specify authority; for more information please contact factory

 $^{\star 2}$ Contact factory for longer measuring ranges

Restrictions:

Sum of boards - max 5 | Sum of IS terminals - max 12 | Sum of nonIS terminals - max 12

DIMENSIONAL DRAWING



All technical specifications are subject to change without notice.



For More Information

To learn more about Honeywell's Enraf Small Volume Provers, visit www.honeywellenraf.com or contact your Honeywell account manager.

Americas

Honeywell Enraf Americas, Inc. 2000 Northfield Ct. Roswell, GA 30076 USA Phone: +1 770 475 1900 Email: enraf-us@honeywell.com

Europe, Middle East and Africa

Honeywell Enraf Delftechpark 39 2628 XJ Delft The Netherlands Phone: +31 (0)15 2701 100 Email: enraf-nl@honeywell.com

Asia Pacific

Honeywell Pte Ltd. 17 Changi Business Park Central 1 Singapore 486073 Phone: +65 6355 2828 Email: enraf-sg@honeywell.com

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