

Application

The TrafoStick™ TS G1 (RTU Basic) sensor was specifically designed for online field use and is exclusively used for the precise, repeatable measurement of:

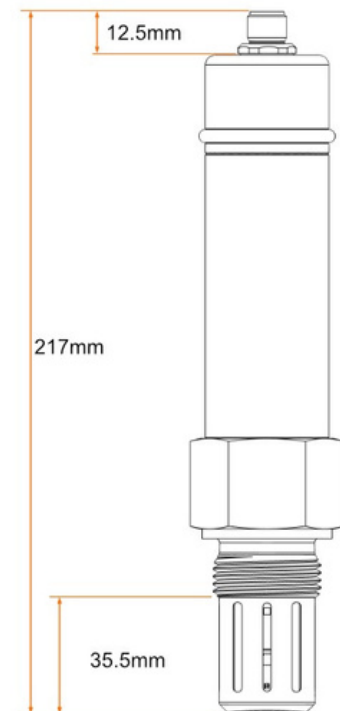
- Oil pressure,
- Humidity (relative saturation),
- Water content,
- Temperature,
- Dissolved gases in mineral transformer oil: H₂ (hydrogen).

Description

The TrafoStick™ TS G1 (RTU Basic) sensor is housed in a rugged, stainless steel 1.4571 enclosure, engineered for extreme environments, including offshore applications, in compliance with DIN EN ISO 12944-9:2018-06. The measurement zone, made from mineral oil-resistant and chemically stable reinforced plastic, features precision-drilled holes that facilitate the direct filling of internal sensor chamber with mineral transformer oil.

Equipped with a G1" EN ISO 228-1 connector, the TrafoStick™ TS G1 integrates seamlessly into your target system—screwing directly into the transformer's threaded flange or tap changer. A mechanical seal with a hydraulic sealing ring (NBR or FKM insert) ensures a leak-proof fit, eliminating the need for additional sealing materials.

The sensor's installation is flexible, though optimal performance requires unobstructed oil flow within the measuring zone. The device features a top-mounted cable socket, facilitating easy integration with your system. Communication with the Modbus RTU master is streamlined via a standard (or custom) RS485 twisted-pair cable and the provided Amphenol/CONEC connector. For optimal data exchange, the device operates at a baud rate of 115200 bps with 8 data bits and 1 stop bit — ensuring fast, reliable communication with your PC or Modbus RTU master.



Physical Address

Unit 5 Edstan Business Park
2 Ibhubesi Rd
Riverhorse Valley
Durban
South Africa

Contact

Tel: +27 31 274 1050
Email: info@a-eberle.co.za

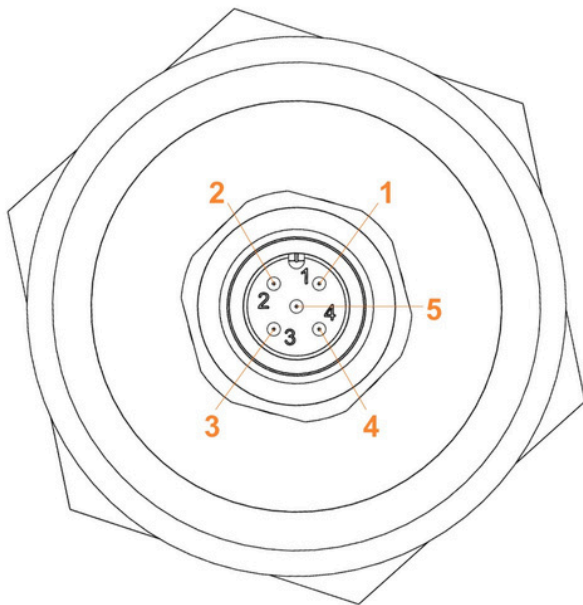
A Eberle Africa (Pty) Ltd

Company reg. 2022/251346/07

Directors

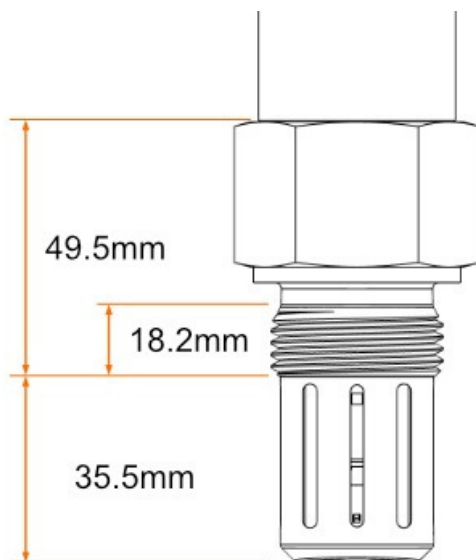
BE Howarth, T Sybel,
N Ramlutchman-Nel

Electrical connector



- 1. +12 V / +24 V DC
- 2. A+ (D+ = positive / high)
- 3. B- (D- = negative / low)
- 4. GND
- 5. GND / Cable shield

Mechanical connector



G1" EN ISO 228-1 connector

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Technical specifications

Performance

Water Content (WC)	2 ppm ÷ 120 ppm (± 2%)*
Temperature (Temp)	-40°C ÷ +120°C (± 0.2°C typical) -40°F ÷ +248°F (± 0.36°F)
Oil Pressure (P)	20kPa ÷ 410kPa (± 0.1kPa) 0.2bar ÷ 4.1bar (± 0.01bar) 2.9PSI ÷ 60PSI (± 0.14PSI)
Hydrogen (H2)	0ppm ÷ 5000ppm (± 10%)**
Internal measurement interval	0.1s
External data output interval	1s

(* The water content (WC) is calculated using standard parameters provided by Mr. Lance Lewand in his document "Understanding Water in Transformer Systems." The document outlines the calculation of WC based on temperature and the relative saturation (RS) value, which is implemented in the TrafoStick software. The parameters, A and B, are accessible via the MODBUS register. In the current version, the parameters are factory set to A = 7.0895 and B = 1567, as specified in Mr. Lewand's document. Customers can later modify these parameters to align with their own laboratory standards and/or company protocols.)

(** on the measured value)

Operating environment

Ambient temperature range	-20°C ÷ +70°C
Oil temperature range	-20°C ÷ +85°C -4°F ÷ +185°F
Operating pressure	up to 700kPa (7bar ; 100PSI)

Inputs and outputs

Power supply	5V DC ÷ 28V DC Preferable 12V DC or 24V DC regarding the system supply voltage
Digital output	Digital protocol - Modbus RTU
PC interface	USB Modbus RTU Adapter
Internal data logging capacity	dynamic latch buffer cache chains (64-512-8192)

General

Modbus	Modbus RTU, baud rate 9600 - 115200 bps, 8 data bits, 1 stop bit
Housing material	Stainless steel 1.4571

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Performance

Mechanical connection	G1" EN ISO 228-1 (Parker RI1EDX3/471-like) connector
Measuring zone material	reinforced chemically stable plastic
Housing classification when assembled	IP68
Control software(Windows 8 or later)	Ver. 2.0

Absolute maximum ratings

Maximum operating voltage	28.0V DC
Operating temperature	-40°C ÷ +100°C -40°F ÷ +212°F
Maximum pressure (never exceed)	900kPa (9bar ; 130PSI)
Storage temperature (without Modbus cable)	-65°C ÷ +150°C (excluding external cable) -85°F ÷ +302°F



Stress above values listed in "Absolute maximum ratings" section may cause permanent damage to the device.

Following power supply systems compliant with EU directives are recommended:

- Wago Kontakttechnik GmbH & Co. KG 2787-2144,
- Mean-Well Enterprises Co., Ltd. – HDR-30-24 or HDR-15-24.

Accreditations

The TrafoStick™ TS G1 has undergone rigorous testing by an accredited body in accordance with EN61326- 1, classed as a Class A measuring instrument, certifying its full compliance with the following regulatory standards:

- EN 61000-4-2:2011,
- EN 61000-4-3:2014,
- EN 61000-4-4:2013,
- EN 61000-4-5:2014,
- EN 61000-4-6:2014,
- EN 61000-4-11:2007,
- EN 50216-1:2002,
- EN 50216-3:2002 + A2:2006,
- CISPR11:2015 + AMD1:2016,
- EN 55011:2016 + A1:2017,
- EN 55011:2016 + A1:2017-06,
- EN 60950-1:2007 + A11:2009 + A1:2011 + A12:2011.

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Patents

A. Eberle Africa's TrafoStick™ system and devices are covered by one or more of the following patents:

- WO002018050499A1,
- WO002018050500A1,
- US020190204289,
- US020190277805,
- EP000003513154,
- EP000003513155,
- CN000109844469.

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