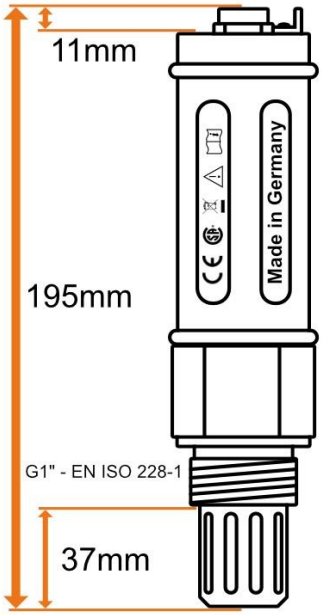
Application

The TrafoStick™ TS5G sensor was specially developed for online use in the field and is used exclusively for the repeatable measurement of:

- breakdown voltage,
- oil pressure,
- water content,
- temperature,
- gases dissolved in mineral transformer oil (H2 and CO).



Description

The main measuring module is located in the robust metal housing made of anodised aluminium. The connection zone consists of stainless steel 1.4571. The holes in the measuring zone made of hard anodized aluminum allow the internal sensors to be filled with mineral transformer oil. The BDVG device is fitted with a G1" EN ISO 228-1 connector for general use. This connection allows the device to be mounted at the target connection - the device is screwed directly onto the threaded flange on the transformer or on-load tap-changer. The installation location of the sensor is almost arbitrary, but a free flow of oil in the measuring zone must be guaranteed. The cable socket is located on the top of the device. The connection between the device and the host is made using the supplied cable with the WEiPU ST1210/S9 connector. The user should connect the device to a computer, router, modem or similar device using the supplied TCP-IP cable.

Technical specifications

Performance

Breakdown voltage (BDV)	10kV – 120kV (± 2.5%)
Water Content (WC)	2 ppm – 80 ppm (± 2%)
Temperature (Temp)	-40 ° C – 120 ° C (± 0.2 ° C typical) -40 ° F - 248 ° F (± 0.36 ° F)
Oil Pressure (P)	20kPa – 550kPa (± 5.3kPa) 0.2bar – 5.5bar (± 0.05bar) 2.9PSI – 80PSI (± 0.7PSI)
Hydrogen (H2)	0ppm - 5000ppm (± 10%)*
Carbon Monoxide (CO)	0ppm - 5000ppm (± 10%)*
Internal measurement interval	0.1s
External data output interval	1s

(* on the measured value)

Operating environment

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

Inputs and outputs

Power supply	4.5V - 7.5V (nominal 5V DC) 24V/DC with 900.AKxx - Cable
Digital output	Digital protocol
PC interface	Modbus TCP, Modbus UDP
Internal data logging capacity	dynamic latch buffer cache chains (64-512-8192)

General

Modbus	cable available separately
Housing material	EN-AW-6063 (anodized)

Performance

Mechanical connection	G1" EN ISO 228-1 (Parker RI1EDX3/471-like) connector
Measuring zone material	EN-AW-6066 (hard anodized)
Housing classification when assembled	IP68
Control software (Windows 8 or later)	Ver. 2.0

Absolute maximum ratings

Maximum operating voltage	9.0V/DC
Operating temperature	-40 ° C to 100 ° C -40 ° F ÷ 212 ° F
Maximum pressure (never exceed)	900kPa (9bar ; 130PSI)
Storage temperature (without Modbus cable)	-65 ° C to 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:

- Passerro 900.AKXX Active Modbus Cable with integrated 24V DC Power Converter,
- Wago Kontakttechnik GmbH & Co. KG 2787-2144,
- Mean-Well Enterprises Co., Ltd. – HDR-30-24 or HDR-15-24.

Accreditations

TrafoStick™ TS5G has been tested by an accredited unit according to EN61326-1, a Class A measuring instrument which confirms the compliance with the following regulatory requirements:

- 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,
- 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.

Patents

Passerro GmbH TrafoStick™ TS5G is covered by one or more of the following patents:

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

Breakdown Voltage Measurement Range Accuracy v. Temperature