

Insulating oil testing

Breakdown Voltage and Dissolved Gas Sensor

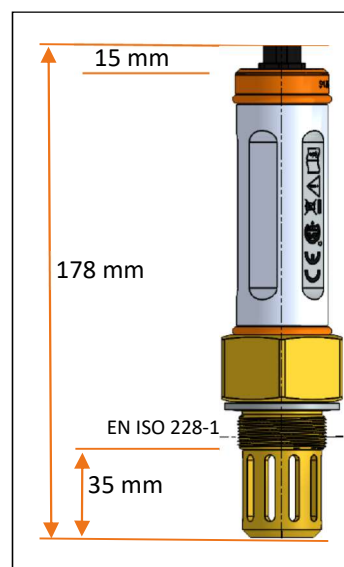
BDVG Oil-Stick TS5x

1. Application

The BDVG Oil-Stick TS5x sensor is developed especially for on-line use in the field and exclusively designed to repeatedly measure the breakdown voltage, water content and temperature as well as in oil dissolved gases as Hydrogen H₂ and Carbon Monoxide CO in a mineral transformer oil.

2. Description

The main measuring module is located in the robust anodized aluminum metal housing. The measuring and connection zone is made of brass / gunmetal. The holes in the measuring zone allow the internal sensors to be filled with mineral transformer oil. The BDVG device is equipped with a G1 pin connection according to EN ISO 228-1 for general use. This connection enables the device to be installed at the destination port - the unit is screwed directly onto the threaded flange. The sensor can be installed in almost any position, but a free flow of oil in the measuring zone must be guaranteed. The cable socket is on the top of the device. The link between the device and the host is provided by the delivered cable with the WEIPU ST1210/S9 connector. The user should connect the device to a computer, router, modem or a similar device, via provided TCP-IP Cable.



3. Technical specifications

Performance	
Breakdown voltage (BDV)	10kV to 120kV (± 2.5%)
Water Content (W _c)	2 ppm – 80 ppm (± 2%)
Temperature measurement range	-40°C to 120°C (±0,2°C typical)
Hydrogen (H ₂)	0 ppm – 5000 ppm (± 10%)*
Carbon Monoxide (CO)	0 ppm – 5000 ppm (± 15%)* <small>(* on the measured value)</small>
Measurement interval (selectable)	0.1s (via MODBUS)
Operating environment	
Ambient temperature range	-20°C to 70°C
Oil temperature range	-20°C to 85°C
Operating pressure	Up to 3bar
Inputs and outputs	
Power supply	4.5V-7.5V (5.0V recommended) 24V/DC with 900.AKxx - Cable
Digital output	Digital protocol

Performance	
PC interface	MODBUS TCP/IP
Internal data logging capacity	dynamic latch buffer cache chains (64-256-1024)
General	
MODBUS cable	available separately
Housing material	EN-AW-6063
Mechanical connection	G1" EN ISO 228-1 Brass
Measuring zone material	Brass / gunmetal
Housing classification when assembled	IP68
Control software (Windows 8 or later)	Ver. 2.0
Absolute maximum ratings	
Maximum operating voltage	9.0V
Operating temperature	-40°C to 100°C
Maximum pressure	5bar
Storage temperature (without MODBUS cable)	-65°C to 150°C

When not an Passerro 900.AKXX Cable is used, we recommend the use the power supply system 787-1020 - WAGO Kontakttechnik GmbH & Co. KG. to keep the compliance with EU directives. Alternatively Mean Well Enterprises Co., Ltd. - DR-30-5 or HDR-15-5 can be used.



Stress above those listed under "Absolute maximum ratings" may cause permanent damage to the device.

BDVB Oil-Stick Basic has been tested by an accredited unit according to EN61326-1, a Class A measuring instrument. The accredited unit confirm the complies 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, EN55011: 2016 + A1: 2017, EN55011: 2016 + A1: 2017-06
- EN 60950-1: 2007 + A11: 2009 + A1: 2011 + A12: 2011

[kV]											
100			+/- 4%						+/- 5%		>5%
90											
80			+/- 2%								
70											
60											
50								+/- 3%			
40			+/- 1%								
30											
20											
10											
	10	20	30	40	50	60	70	80	90	100	[°C]

Table 1 Breakdown Voltage Measurement Range Accuracy v. Temperature