

Trace Moisture Sensor HWR350

Product Description

The uniquely designed moisture sensing probe on the front of the HWR350 moisture content sensor captures changes in the electrical properties of the oil-water mixture in real time, compensates for these changes with a high precision temperature probe, and then uses an optimised algorithm to obtain the moisture content of the oil. The company's patented measurement technology enables accurate monitoring of the moisture content of oil in multiple ranges.

The highly reliable industrial design of the HWR350 allows it to continuously, accurately and quickly measure the water content and temperature changes in all types of oils in harsh environments, and can be widely used for on-line monitoring of water content in lubricating oils, hydraulic oils, gearbox oils, motor oils, fuel oils and many other applications.



Application significance



The presence of moisture is extremely destructive to most fluids, for example: for large-scale continuous operation equipment, heavy machinery and equipment, real-time monitoring of moisture in lubricants and hydraulic fluids plays an irreplaceable role in guaranteeing the normal operation of these critical equipment. Because the presence of moisture will destroy the oil film, causing additive failure, cause corrosion of metal parts, lubricant or hydraulic oil failure, shorten the service life of the fluid, and even serious unplanned stopping of large machinery, resulting in serious safety accidents and economic losses.

For generator sets and transformers, moisture will damage the insulating properties of the oil, posing a threat to the safety of power equipment.

For engines, moisture will reduce the combustion efficiency of the oil, and in serious cases, it will lead to engine stalling, resulting in traffic accidents.

Once these valuable industrial equipment breaks down or is damaged, not only will the economy suffer, but it may also cause major safety accidents.

Therefore, it is of great significance to measure the moisture in oil in real time in industrial production.

Moisture in oil

Two forms of expression of water in oil:

I. Water Activity A_w , English Water Activity.

Refers to the ratio of the actual value of water content in the oil to the saturated water content in the oil at the current temperature, and its range is 0 ... 1 A_w . For example, 0 A_w means that there is no water in the oil, and 1 A_w means that the oil is saturated with water, and free water is precipitated out.

Moisture content ppm, refers to the absolute content of water in the oil (mass ratio or volume ratio), English Parts Per Million, without programmable.

Mass ratio: the mass of water in the oil / mass of oil Common unit mg / kg

Volume ratio: Volume of water in oil/volume of oil Common unit $\mu\text{L/L}$

GB/T7600-2014 describes the unit of water content in oil as mg/L, and the ppm reading of the sensor is converted as follows: Assuming that the sensor reads 58ppm, it is converted to $58 \text{ ppm} \times (0.86 \text{ g/ml}) = 50 \text{ mg/L}$, where 0.86g/ml is the density of oil.

Key Features

Reliably --- Patented product, resistant to all types of oils
 --- Sensor life up to 10 years
 --- Highly energy efficient, operating current less than 5mA@24Vdc
 --- Unique earth protection and signal sampling unit

Precisely---Imported sensitive chip, unique temperature compensation algorithm
 ---Moisture activity measurement up to 2%, temperature up to 0.3°C.
 ---State-level metrological institutions quasi-report traceability

Robustness --- IP66 protection class, full stainless steel body
 ---Anti-reverse power supply design, industrial isolation measures
 --- 9-36VDC wide power output, meet all kinds of applications

Easy use ---G1/2' BSP standard interface, optimal length, easy to install
 ---Local digital output and calibration interface, complete sensor calibration on site
 ---Built-in calibration curves for a wide range of oils



Applications

Oil field, oil refining Wind power, hydropower, thermal power, nuclear power, power transmission
 Engineering machinery and vehicles
 Aviation, navigation Railway, road transport Steel, metallurgy Oil storage warehouses, petrol stations
 Industrial production lines
 Air conditioning and refrigeration
 Laboratory analysis

Applicable oils:

Lubricants
 Hydraulic Oil
 Gearbox oil Motor oil
 Fuel Insulating Oil
 Turbine Oil
 Synthetic grease
 All kinds of light oil, heavy oil, etc.

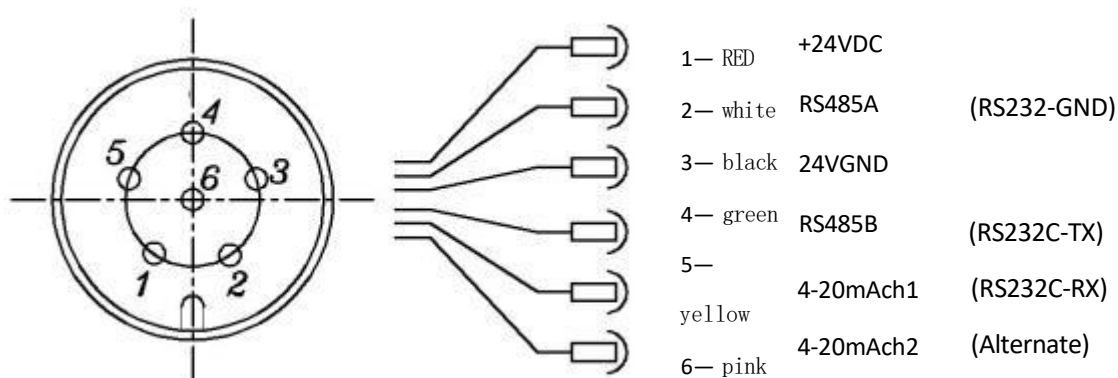


Technical parameters

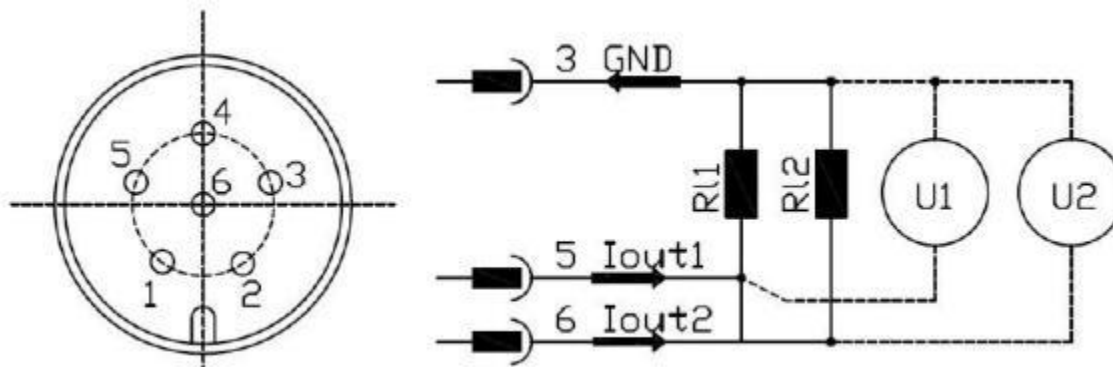
water activity		
Measurement range	0 ... 1 aw	
Measurement accuracy	0 ... 0.6	± 0.02 aw
	0.6 ... 1	± 0.02 aw
resolution	0.001 aw	
Response time (typical)	<1 min	
Moisture content in oil (dissolved water)		
Measurement range	0...100ppm 500 ppm 1000ppm 2000ppm or customised 5000, 10000ppm	
Measurement accuracy	± 10 %	
temp		
Measurement range	-40 ... 120 °C	

accurate (at +25 °C)	± 0.3°C
Operating temperature (ambient)	-40 ... +80 °C
Allowable oil temperature	-40 ... +120 °C
exports	
digital signal	RS485 MODBUS RTU, (RS232 optional)
analogue signal	4... 20 mA load resistance 500Ω
else	
mechanical interface	G 1/2" ISO or 1/2" NPT
Probe allowable working pressure	20bar Other pressure ranges on request
Probe Material	316 & 304 stainless steels
protection class	IP65
Power supply	9V-36V DC (RS485 to communicate) 15V-36V DC (4 ... 20 mA to communicate)
Supply Current	< 5mA+ Load current
Transmitter weight	200 g
Total package weight	270g
Packaging specification	cassette 172×117×53 mm
Cable Specifications	M8*1 6 pole
Cable length	6-pole 2 metre UL20866 6*22AWG
Electromagnetic compatibility standards	CE/ISO EN61326-1 , EN61000-3 , EN61010 Level B

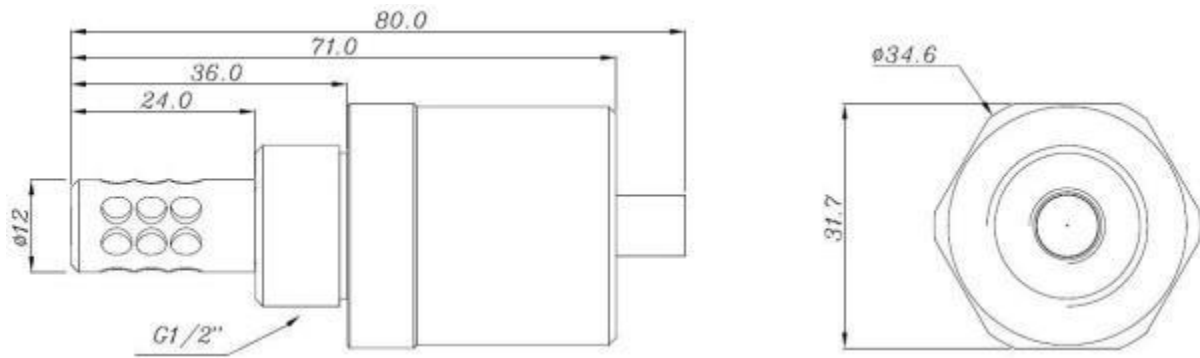
Interface Definition (Sensor M8 Male)



Note: Wiring definitions for RS232 communication are in parentheses 4 ... 20 mA Wiring diagram



Structural dimensions (mm)



HWR350

高性价比油中微量水分和温度变送器

ShangHai LUWATECH Industrial Co.,Ltd.

Address: 2F, South Gate, Building 5, No. 333 Kangqiao East Road, Pudong New Area, Shanghai

TEL: 139173371469 (VX) 021-58073569

E-mail: maorong.long@luowansy.com

<https://luwatech.1688.com>

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