E+E ELEKTRONIK® Ges.m.b.H.

YOUR PARTNER IN SENSOR TECHNOLOGY

EE364

Compact moisture in oil transmitter

The EE364 is an innovative moisture in oil transmitter, suitable for OEM applications. The high measurement accuracy and excellent long-term stability make the EE364 ideal for online monitoring of moisture in transformer, lubricating and hydraulic oil, as well as diesel fuel.

The compact design and rugged stainless steel housing allow a space-saving installation in the most demanding applications. The EE364 measures water activity (aw), oil temperature (t) and calculates the absolute water content (x). The measured values are available on two 4-20mA outputs and one digital output with MODBUS RTU interface.

The analog outputs can be individually scaled and configured using the optional converter cable and the free EE-PCS Product Configuration software.

EE364

Typical applications

Monitoring of
- Transformer oil
- Lubrication oil
- Hydraulic oil
- Engine oil
- Diesel fuel

Features

Measurement of water activity (a_w), temperature and water content (x) in ppm
Two configurable 4…20 mA outputs
MODBUS-RTU interface
Pressure rating 20 bar
G ½" ISO or ½" NPT process connection

Technical data

Measurands

Water activity

Sensor	HC1000-400	
Measurement range	0...1 a_w	
Accuracy at 20°C[1]	±0.02 a_w (0...0.9 a_w)	±0.03 a_w (0.9...1 a_w)
Response time t_{90}	< 10min. in still oil	

Temperature

Sensor	Pt1000 DIN A
Accuracy at 20°C in oil	±0.2°C (0.36 °F)

Output

2 x analogue output	4 - 20mA (3-wire technology)	R_L < 500 Ohm
(freely selectable and scalable for a_w, T, ppm)		
Digital output	MODBUS RTU	

General

Supply voltage	10*)...28V DC	*) 10V+0.02*R_L
Power consumption at 24V DC	<40mA	
Pressure rating	0...20 bar (0...290 psi)	
Housing / protection rating	Stainless steel 1.4404 / IP65	
Electrical connection	M12x1 8-pin plug	
Sensor protection	Stainless steel filter	
Oil temperature	-40...80°C (-40...176 °F)	
Ambient temperature	-40...60°C (-40...140 °F)	
Storage temperature	-40...60°C (-40...140 °F)	
Electromagnetic compatibility	EN61326-1 EN61326-2-3	
	Industrial environment	

CE

1) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2 x standard deviation).
The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).

Modbus Map

The measured values are 32Bit float values. The factory-set slave ID is 243 as integer 16Bit value. This ID can be customised in the register 0x00 (value range 1 - 247 permitted). For Modbus settings please see Application Note AN0103. Transmission rate factory settings are: baud rate 9600, parity even and stop bit 1.

32Bit FLOAT:

Register address	Protocol address	Parameter name
30052	0x33	Water activity Aw
30054	0x35	Water content Xm or Xk
30026	0x19	Temperature Tx
60101	0x64	Parameter A (write)
60103	0x66	Parameter B (write)

16Bit:

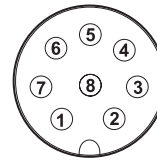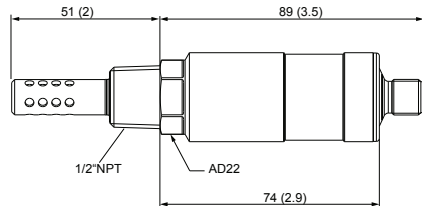| Register address	Protocol address	Parameter name
60001	0x00	Slave-ID
60002	0x01	RS485 Setting

Dimensions in mm (inch)

ISO

NPT

Connection diagram
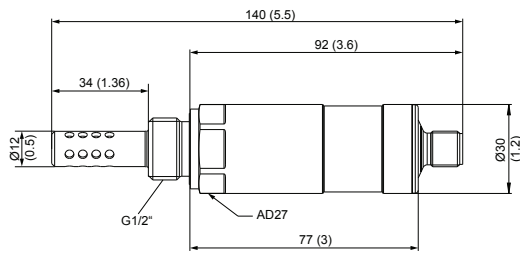
Plug

1...NC
2...RS485 B
3...RS485 A
4...Analogue output 1
5...Analogue output 2
6...GND
7...NC
8...V+

Ordering information

MODEL		ANALOGUE	DIGITAL	PRESSURE RATING	PROCESS CONNECTION	
Transmitter	(T)	4-20mA (6)	MODBUS RTU (RS485) (3)	20bar (E)	G1/2" thread	(A)
					1/2" NPT thread	(C)
EE364-						

OUTPUT 1		SCALING 1 [3)]	OUTPUT 2		SCALING 2		UNIT	
Water activity	(Aw) [1)]	0...100 (001)	Temperature	(T)	-40... 60	(002)	metric	(M)
Water content in mineral transformer oil	(Xm)	0...500 (002)			0... 80	(021)	non-metric	(N)
Water content in customer-specific oil	(Xk) [2)]	0...1000 (003)			-40... 80	(022)		
					-20... 80	(024)		
					-40...180	(052)		
					-40...140	(083)		
					32...132	(096)		

1) Factory setting Aw: 0...1
2) Oil-specific parameters can be determined on request.
3) Valid for Xm and Xk

Accessories (see accessories data sheet)

M12x1 8pin mating plug suitable for customer-specific assembly	HA010704	Stainless steel filter	HA010110
M12x1 8pin connection cable socket/flying leads 1.5m	HA010322	Modbus - USB converter cable	HA011013
M12x1 8pin connection cable socket/flying leads 5m	HA010324		
M12x1 8pin connection cable socket/flying leads 10m	HA010325		
Product Configuration Software	EE-PCS (free download: www.epluse.com/EE364)		

Order example

EE364-T63EA/AwT002M

Model:	Transmitter	Output 1:	Water activity
Analogue output:	4-20mA	Output 2:	Temperature
Digital output:	MODBUS RTU	Scaling 2:	-40...60
Pressure rating:	20bar	Units:	metric [°C]
Process connection:	G1/2" thread		