

PH485

pH probe with digital output RS485 / Modbus RTU



- **Reliable and accurate pH measurement without additional transducers and other electronics**
- **Basic element for creating RS485 sensor network for PLCs, data loggers and online IoT systems (Lora, Sigfox, NB)**
- **Calibration coefficients stored in the probe**
- **Measuring ranges 1 to 13 pH; -10 to +60 °C**
- **Self-cleaning design of the reference electrode**
- **Service life 2 to 3 years with extended recalibration interval (typically 1 year)**
- **Automatic temperature compensation**
- **Galvanically separated communication and power supply circuits from the pH electrode itself**
- **Wide supply voltage range from 5 to 24 V DC, low current consumption**
- **Low purchase price**

Characteristic properties

The PH485 probe combines in one compact unit a combined pH electrode with partial self-cleaning ability and extended service life with measuring electronics controlled by a microprocessor.

In order not to influence the measured quantity by the action of earth currents and induced interfering potentials, the measuring circuit, including the electrode itself, is galvanically separated from the communication and power supply cable of the probe.

The self-cleaning design of the used electrode ensures a stable and reproducible signal even in the environment of emulsions, suspensions and other adhering impurities of various origins as well as impurities caused by a chemical reaction. The electrode thus largely eliminates, for example, the negative effect of rust, hard water (Ca, Mg compounds in both carbonate and sulfate forms), oil emulsions, adhering organic and inorganic impurities.

Mechanical design

The PH485 probe body contains a G 3/4 "mounting thread on the electrode side (for mounting the probe in the piping system) and on the cable outlet side (mounting the probe in a holder or sensor).

The M12 connector-terminated cable on the PH485-KxM12 probe facilitates mounting of the probe in the TS500 rod sensor (TS1700) and allows for quick probe calibration or easy end-of-life replacement.

Modbus RTU

The probe output signal uses the widely used RS485 bus under the Modbus RTU protocol. Via this bus, the probes can be connected at a distance of up to 500 m directly to the PLC control system or to the data logger. In addition to the temperature-compensated pH value, the electrode voltage in mV and the measured temperature can also be obtained from the probe.

The four-core connection and power cable allows easy creation of a sensor network thanks to the possibility of addressing each probe. Thus, several probes of one type or several similar probes for monitoring several quantities can be connected to one RS485 bus - eg ORP485 probes or ISE485 type probes .

PH485 probes can also be calibrated using the RS485 communication bus. Calibration coefficients stored in the probe allow you to recalibrate the probes in the laboratory and in the field then just connect the probe back to the measuring network.

Examples of use

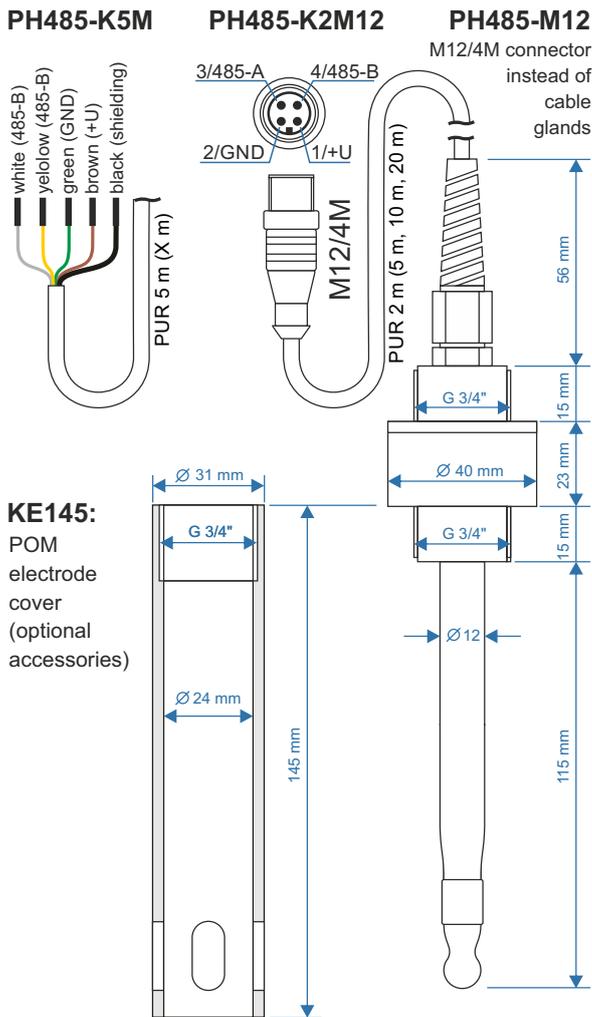
The compact PH485 probe with digital data output and calibration coefficients stored in the probe represents a modern solution for accurate pH measurement in many water supply industries and industries:

- Water treatment plants
- Chemical and food industry
- Agriculture
- Research and development projects
- Environmental monitoring

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Mechanical dimensions and connections



KE145:
POM electrode cover (optional accessories)

Cap KE145

Electrode cap
Length: 145 mm
material: POM
thread: G 3/4"



Holder DE2

Stainless steel holder for tubular TS500 sensors, TS1700, installation on a railing post using stirrups T1.5 or T2

Tube holder TS500 (TS1700)

Holder for PH485 electrode length: 500 mm, dia. 40 mm
material: stainless steel and POM at the lower end female thread G3/4", at the upper end M12/4F connector for the probe PH485-K2M12 or cable gland



Connecting cable M12/4F-xM (-PUR)

PUR or PVC cable in lengths of 2 m, 5 m, 10 m and 20 m is equipped with an M12/4F connector (female), the other end of the cable is free.



Pin konektoru	1	2	3	4
Signal	+Unap	GND	485-A	485-B
3 PUR - black	brown	green	yellow	white
2 PVC - gray	brown	white	blue	black

WE PREPARE:

RS485/4-20 mA converters MAV431, MAV432

Converter of one or two quantities from RS485 (Modbus RTU) to 4-20 mA output. Input and output equipped with M12 connector. Automatic range adjustment. Power supply of the converter and the probe from the analog side output.



Technical parameters

pH electrode:	combined self-cleaning, gel electrolyte, increased mech. endurance
PH measuring range (K1):	0.00 to 13.00 pH
Measurement accuracy:	± 0.1 pH
Measuring range temperature (K2):	-5.0 °C to + 60.0 °C
measurement accuracy:	± 0.7 °C
New probe rise time:	<15 sec
Typical recalibration interval:	1 year
PH485-KxM connection:	shielded PUR cable 4x0.25 length x m, socket end without connector
PH485-KxM12 connection:	PUR cable x m terminated with M12 connector; 4 Pins (male),
Interface:	RS485, Modbus RTU protocol (FINET), com. address 6, 19200 Bd / *
Supply voltage:	5 to 24 V DC / I _{max} <20 mA; galvanic isolation, U _p > 500 V
Shelf life:	2 to 3 years depending on the composition of the measured medium
Storage temperature:	-5 °C to + 60 °C
Maximum working pressure:	1 bar (up to 10 bar in agreement with the manufacturer)
Dimensions:	largest diameter 40 mm, electrode length 115 mm,
Mounting bracket:	G 3/4" thread on the electrode side, G 3/4" on the cable outlet side
Material and protection:	POM, glass / IP68
Weight including cable:	150 g



/* An overview of the Modbus RTU registers for the PH485 probe can be found in the application notes at www.fiedler.company