

# Measuring Amplifier for pH and Redox Type M3720

- ✓ 0 to 14pH
- ✓ -1000 to 1000mV
- ✓ 4...20mA, 2-Wire-Technics
- ✓ 24VDC Power Supply
- ✓ Galvanically Isolated
- ✓ Modbus
- ✓ Hold Function



IP67

## Technical description:

The very small measuring amplifier for pH and Redox type M3720 converts the electrode signal to a 4...20mA 2-wire signal.

The electrode may be calibrated at the amplifier by a push button. Two LEDs indicate the calibration status.

The hold function can freeze and release the output signal at any time.

The M3720 works with a resolution of 12 bit, is pre-calibrated and connected between the electrode and the signal acquisition instrument (e. g. PLC).

Process control systems or any other control electronics may be connected to the amplifiers output.

Sensor input and output are galvanically isolated from the output and power supply.

The robust housing fulfills the protected class IP67 and allows application in rough environments.

Optionally a 2-wire temperature compensation up to 100°C is available. pH/mV-electrodes with build-in temperature sensors are accepted by the amplifier.

All settings and measured values may be read out and changed by the Modbus protocol.

## Technical Data:

Measuring ranges:	0.00 to 14.00pH -1000 to +1000mV
Sensor inputs:	Analog sensor, digital "Mettler Toledo" sensor on request
Accuracy:	0.1% @ 25°C
Stability:	0.003% per °C
Reproducibility:	0.1%
Linearity:	0.05%
Input impedance:	1000GΩ (10 <sup>12</sup> Ω)
Output rate:	10-90%: Typ. 10s, adjustable from 2s – 9min
Signal output:	4...20mA, adjustable over full range, others on request
- Max load:	500Ω @ 24V, 100Ω @ < 24V
- Output impedance	Typ. >1MΩ
Calibration buffer solutions:	Typical 4.00pH, 7.00pH, 10.00pH, others on request, Modbus programmable
Hold function:	By double-clicking on the "Cal" button, the hold function for the current output can be turned on or off.
Temperature:	0...100°C without compensation or wire break: 25°C Automatically with an external transmitter. (PT100/PT1000/NTC30K) Types: NTC30k B = 3480, optional: NTC30k B = 4143
Operating temperature:	-10°C ... +40°C
Max. working temperature:	-25°C ... +65°C
Storage temperature:	-40°C ... +85°C
Power supply range:	15 ... 30VDC
Insulation resistance:	> 5000MΩ @ 50VDC
Test isolation voltage:	500VAC/1 minute (input -> output & power supply)
CE-Conformity:	confirmed
EMV-Conformity:	In accordance with EN61000-6-2, EN61000-6-4 und EN61326-1
Weight:	≈ 50g
Warranty:	2 years
Material:	anodized aluminum, IP67, others on request

Connection 2-wire signal:	Cable ends, red = +24VDC, black = 4...20mA, shield
Connection Modbus:	Cable ends, brown = RS485A, orange = RS485B
Connection electrode:	Coax core = pH, Coax shield = reference
Cable length 2-wire signal:	<300m, 3m factory-made
Cable length electrode:	60cm, factory-made, connected
Options:	Customer specified functions/cable connection Modbus Connection for Mettler Toledo digital sensors
Ordering example:	1x M3720-pH 0...14pH = 4...20mA 1x M3720-mV -1000mV...+1000mV = 4...20mA 1x M3720-Modbus

### Hold function:

Note: A double click on the "Cal" key triggers the hold function. When the hold function is activated, the green LED flashes twice followed by the red LED once. Now all measurements and the signal current output are frozen. To deactivate the hold function, press the "Cal" key twice. Then the red LED flashes twice followed by the green LED once. If you forget to switch off the hold function, the function is deactivated automatically after 15 min.

## Calibration:

Note: The measuring amplifier automatically detects the existing buffer solution. The buffer solution may be a maximum of 0.70 off pH from the calibration, for automatic detection. In the 2-wire version, the calibration points can only be set by the factory and must therefore be specified when ordering. In the Modbus version, the customer can set the calibration points themselves. The calibration points for the gain can be set between 0.00 and 5.00pH as well as between 9.00 and 14.00pH. The offset calibration point can be set between 6.50 und 7.50pH.

To ensure a successful calibration, the offset have to be calibrated first before gain calibration.

Examples of buffer solutions: 7.00pH, 4.00pH, 10.00pH etc.

Calibration: Calibrate 7.00pH

1. Put the electrode in a buffer solution 7.00 pH for at least 1 minute.
2. After 1 minute, press the "Cal" key until both LEDs flashes, then release the key.
3. The measuring amplifier begins calibration of the electrode. During calibration, the green LED flashes at 1 Hz. If the calibration of the 7.00 pH buffer solution is completed, both LEDs flash at a frequency of 2Hz five times.

Calibrate 4.00pH

1. Put the electrode in the buffer solution 4.00 pH for at least 1 minute.
2. After 1 minute, press the "Cal" key until both LEDs flashes, then release the key.
3. The measuring amplifier begins calibration of the electrode. During calibration, the green LED flashes at 0.5 Hz. If the calibration of the 4.00 pH buffer solution is completed, both LEDs flash at a frequency of 2Hz five times.

Calibration error:

An error indication occurs if the measuring amplifier can not detect a valid buffer solution or the buffer solution is unstable. The electrode must not be more than 35mV away from the neutral solution during the offset adjustment. If an error occurs, the red LED flashes 10x with 2 Hz, please check the buffer solution and the electrode.

## Electrode connection:



Low noise coaxial cable with AK9 connector



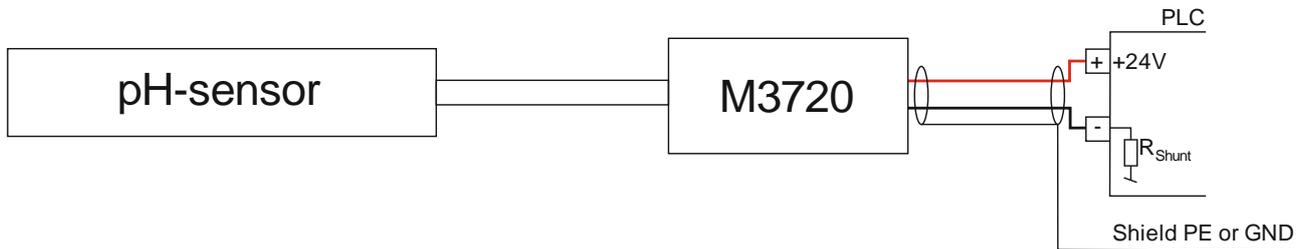
Low noise coaxial cable with cable ends



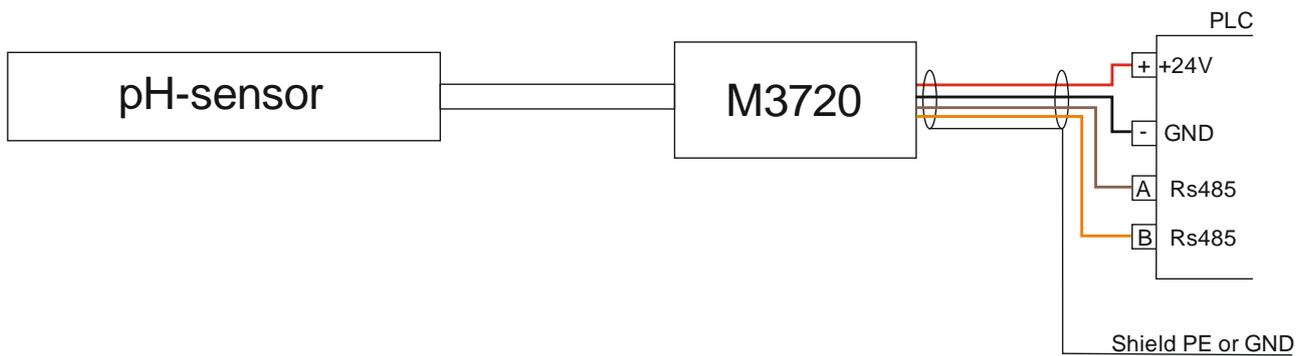
VP6 cable for probes with temperature sensors

## Wiring:

2-wire version:



Modbus version:



**Dimensions:**

