Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Transmitter for pH-Value

measuring • monitoring • analysing

COMPACT-LINE

- Measuring range pH -1 to 14
- Switchable from pH to ORP
- Display of pH value, mV/ORP (Oxidation Reduction Potential) and temperature
- Simple programming and calibration
- Compact design
- Analogue actual-value output scalable (electrically isolated)
- External setpoint changeover possible
- Two programmable relays for control functions
- Two binary inputs
- One binary output (alarm contact or temperature limit contact)

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Model:
APM-Z

Description

The compact microprocessor operated transmitter/controller measures and controls the pH value in aqueous solutions. It is available as a panel-mounted device according to DIN 43 700 or in a IP 65 field housing.
Its simple operation and user-friendly programming allow universal service in almost all areas of industrial applications.
The transmitter is fitted with two analogue and two binary inputs. The first analogue input is suitable for connecting a pH combined electrode. A Pt 100 resistance thermometer can be connected to the second analogue input.
The device has two 4-digit, 7-segment displays for indicating pH value (red) and temperature (green).
The displays show comments during programming, to facilitate the operation.
The two control relays can be configured as limit value and/or pulse lengths or pulse frequency controllers with P, PI, PD or PID structure. A maximum of two relay contacts, one binary output and one analogue output is available.
To simplify programming and operation, the controller parameters and configuration data have been assigned in different levels.

- Operating level
- Parameter level
- Configuration level

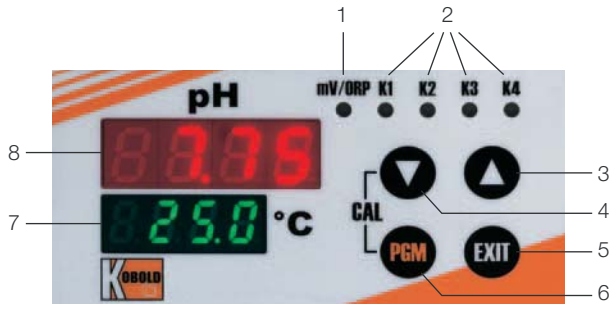
The levels are secured with pass words against unauthorized access. Membrane keys ensure simple and user-friendly operation.
Both LEDs show parameter symbols and values.
The device can be switched from pH to ORP measurement.

A complete measuring device comprises:

- the pH transmitter model APM-Z
- a pH combined electrode model APS-Z
  with integrated or separate temperature sensor
  Pt 100 model AZT-Z
- a suitable pH measuring cable model APK-Z

as well as one of the following:

- transmitter wall (AZM-Z1)
  or pipe mounting (AZM-Z2) accessory.
- flow or immersion assembly for installation and
  protection of the electrodes
  (see accessories)



(1) Display: device has been reconfigured from pH to ORP (when lit)
(2) Status indicators (yellow) for outputs 1 to 4
(3) Increment key for changing parameters and manual operation relay K2
(4) Decrement key for changing parameters and manual operation relay K1
(5) EXIT key to leave the levels
(6) PGM key for selection of parameters and to confirm entries
(7) 4-digit temperature display (LED, green, 8 mm high)
(8) 4-digit actual-value indication (LED, red, 13 mm high)
(4+6) "CAL": start calibration of electrodes (single or two-point calibration)
(3+5) Start hand operation or hold function

Application examples for pH measurements:

Drinking water

- Monitoring parameters

Industrial waste-water treatment:

- Neutralization
- Detoxication
- Precipitation station
- Final inspection

Comunal waste-water treatment plants:

- Inflow/sand-trap
- Activation tanks (for nitrification)
- Run-off
- Digestion tower

Production facilities of the following sectors:

- Chemical pulp/paper
- Paints
- Textiles
- Pharmaceuticals
- Chemical industry
- Food industry

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Technical Data

General

Measuring range:	pH -1.00 ... pH 14.00
Measuring error:	≤ 0.25 % of measuring range
Influence of ambient temperature	≤ 0.15 % / 10 K
Temperature display:	-50...+250 °C
Measuring error:	< 0.25 % of measuring range
Influence of ambient temperature:	< 0.1 % / 10 K
Temperature compensation:	configurable with resistance thermometers at analogue input 2: automatic temperature compensation with Pt 100, Pt 1000 or manual temperature compensation
Compensation range:	-20...+150 °C
Data back-up:	EEPROM

Power supply:	110...240 V_{AC}, +10 %/-15 %, 48...63 Hz or 20...53 $V_{AC/DC}$, 48...63 Hz
Power consumption:	approximately 8 V A
Electrical connection:	with gold-plated flat connector according to DIN 46 244/A; 4.8 mm x 0.8 mm pH combined electrode with BNC socket

Ambient temperature:	0...+50 °C
Ambient temperature:	-10...+55 °C
Allowed storage temperature:	-40...+70 °C
Relative humidity:	≤ 95 % non-condensing

Protection according to EN 60 529:	Panel housing: front IP 65 / rear IP 20 field housing: IP 65
Electrical safety:	according to EN 61 010, clearances in air and creepage distances for -overvoltage category II -pollution degree of soiling 2
Electromagnetic compatibility:	according to NAMUR recommendation NE21, EN 50 081 part 1, EN 50 082 part 2

Housing for panel mounting:	conductive plastic according to DIN 43 700, base material ABS, with pluggable controller insert
Field housing:	aluminium, powder coated with plastic caps
Installation position:	any
Weight:	approximately 320 g (panel-mounted device) approximately 1500 g (in field housing)

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Inputs

Analogue input 1:	input impedance: ≥ 10^{12} Ω insulation resistance of the reference-system to ground > 10^{7} Ω according to DIN 19 265 for all standard pH electrodes
Analogue input 2:	resistance thermometer Pt 100 or Pt 1000, in two or three-wire connection -50 to +250 °C, display in °C
Line balancing of analogue input 2	compensation of line resistance by actual-value correction possible (not required when connecting a resistance thermometer in three-wire circuitry). When connecting a resistance thermometer in three-wire circuitry compensation can also be performed with an external line balancing resistor. Both binary inputs may be operated as floating contacts (relay) or by switches.
Function of binary inputs 1 and 2:	● Keyboard interlock ● Setpoint changeover ● Measured value freezing ● »Hold« ● Alarm stop ● Measured-value expansion (x10)

Outputs

Relay, output 1/2:	N/O contact (N/O contact, can also be configured as a break contact) Switching current: 3 A, 250 V_{AC} Service life of contact with resistive load: >5x10^{5} switching operations at load rating
Binary output 3:	0/5 V R_{LOAD} ≥ 250 Ω (standard)
Actual-value analogue output, output 4:	configurable: 0(2)...10 V R_{LOAD} ≥ 500 Ω or 0(4)...20 mA R_{LOAD} ≥ 500 Ω, electrically isolated to the inputs: ΔU ≤ 30 V_{AC} or ΔU ≤ 50 V_{DC}
Analogue output temperature, output 5: (option)	configurable: 0(2)...10 V R_{LOAD} ≥ 500 Ω or 0(4)...20 mA R_{LOAD} ≥ 500 Ω, electrically isolated to the inputs: ΔU ≤ 30 V_{AC} or ΔU ≤ 50 V_{DC} also programmable as continuous action controller
Deviation from characteristic of the output signal:	< 0.25 % ± 50 ppm/K

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General controller characteristic values

A/D-converter:	resolution >15 Bit
Control modes:	limit controller; pulse length controller, pulse frequency controller
Control response:	210 ms
Measuring circuit monitoring:	input 1: out-of-range, input 2: out-of-range, sensor short-circuit, sensor breakage. The outputs go to a defined (configurable) state.

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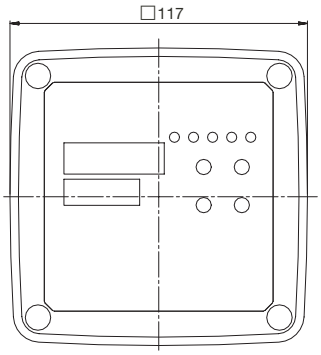
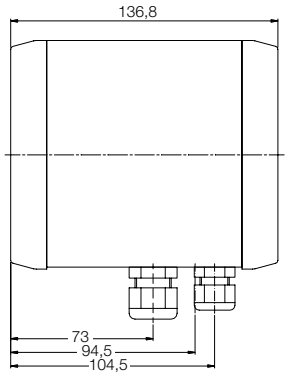
Dimensions

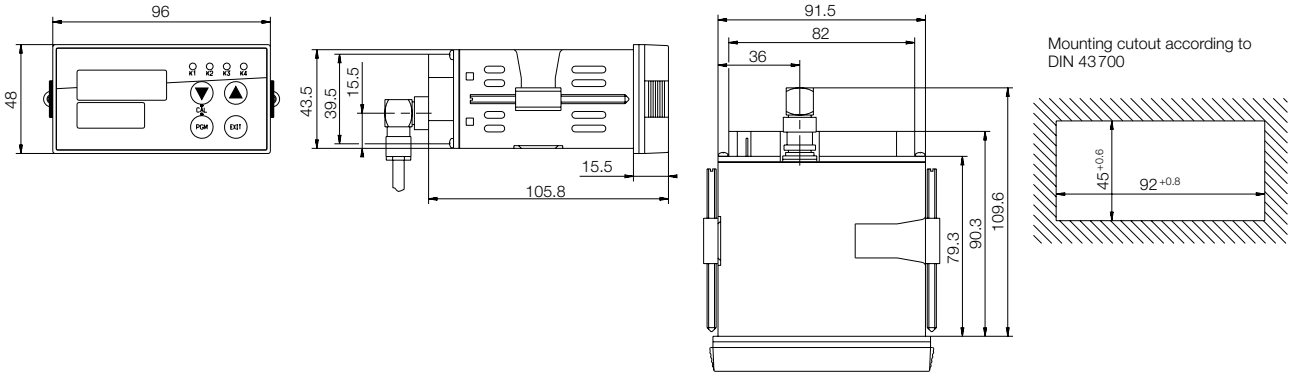
Field housing





Mounting brackets on page 64.

Panel mounting housing



Order Details Transmitter (Example: **APM-Z 1 E 1 A O N**)

Model	Controller	Housing	Power supply	Output	Option	Interface
APM-Z	**1** = presetting of controller: limit controller	**E** = housing for panel mounting **F** = field housing **S** = field housing with wall mounting bracket (360° rotation) **R** = field housing with pipe mounting bracket for pipe 2"	**1** = 110...240 V_{AC} ±10% / -15%, 48...63 Hz **2** = 20...53 $V_{AC/DC}$ ±0%, 48...63 Hz	**A** = 1 analogue output free configurable **B** = 1 analogue output pH or ORP and 1 analogue output temperature or continuous action controller	**O** = without options	**N** = no serial interface

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