

Photon-K03 designed to measure downhole temperature and pressure. It consists of two devices, a probe for measurements and an interface module for communications with rod pump controller and upper-level systems.

Photon-K03 has following features:

- long-term well monitoring.
- work on a geophysical cable during the descent / ascent and while the device is in the well.
- the ability to control downhole device through an interface module (without a computer).
- the possibility of autonomous operation from a backup power source.
- simultaneous measurement and storage in the nonvolatile memory of the interface module of the values of pressure, temperature and specific electrical conductivity of the fluid in the well.
- data transfer from the interface module to a personal computer for analysis and report printing.
- data transmission from the interface module to the telemetry system via a modem by RS-232 or RS-485 interfaces.
- the ability to periodically read information from the memory of the interface module without interrupting the recording.
- possibility of multiple programming / reading of information without removing the device from the well.
- possibility of selective switching on of sensors and devices.
- long-term storage of the registered research results in the non-volatile memory of the interface unit.
- the design of the downhole tool excludes the opening of the tool body without relieving internal pressure.

For suspending the probe in the well and transmitting sensor signals specialized geophysical load-carrying cable with reinforced sheath is used.

This cable is designed for wells with an aggressive environment. To increase the resistance of the cable to aggressive media, a corrosive stainless wire is used in the cable structure. The cable sheath is a bundle of wires laid with 20-50% overlap and filled with polymer material. The wire is a reinforcement for the polymer sheath material.



Figure. 1 Photon-K03



Figure. 2 Geophysical cable

Photon-K03 Specifications:

Operating temperature, °C	Probe -20 ... +150 Interface module -40 ... +55
Supply voltage, V	220..230
Backup power supply (2 batteries 7 Ah),V	24
Consumption current, mA, less than	Probe 20 Interface module 70
Memory capacity, records	704512
Interval between records, sec.	1... 9999
Recording time at an interval of 1 sec, hour.	196
Pressure measurement range, MPa	0 ... 60 (Optional 40/100 *)
Pressure measurement relative error, %	0.16
Pressure measurement discreteness, MPa	0.001
Temperature measurement range, °C	-40 ... + 150
Temperature measurement absolute error, °C	± 0.5
Temperature measurement discreteness, °C	0.00333
Communication interface	RS232, RS485
Communication protocol	Modbus RTU, ELAM
Dimensions, mm	Probe D28*520 Interface module 320*420*160
Weight, kg	Probe 2 Interface module 0,5
Protection rating	Probe IP68 Interface module IP53

Geophysical cable specifications:

Breaking strength, kN more than	80
Relative extension, m*km*kN	0,4
Outer diameter, mm	14,7
Weight, kg*km (in air)	518,9
Weight, kg*km (in water)	340,7
AWG	18
Resistance, Ohm*km	25,5
Insulation resistance, MOhm*km	20000
Aarmor resistance, Ohm*km	4,5
Operating temperature, °C	Up to 150