

ANALYTICAL INSTRUMENTS



for power engineering and ecology

Product Catalogue



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VZOR LLC – is a Russian enterprise, specializing in engineering, manufacturing and supply of water environment monitoring instruments. The company has 21-year-experience at the instrumentation market.

Up-to-date range includes portable and on-line instruments and support equipment:

- Dissolved oxygen meters
- Dissolved hydrogen meters
- Conductivity- and salinity-meters
- Conductivity- and concentration-meters
- Sodium analyzers
- Ion-exchange columns
- High purity water modules
- Sample preparation units
- Stands for accommodation of analyzers and sample preparation units



The area of priority is manufacturing of instruments and automatic chemical monitoring support equipment for thermal and nuclear power plants.

VZOR LLC offers its customers comprehensive service:

Design and research

Packaged supply of instruments,
accessory equipment, hardware and
software systems

Automatic control systems organization

Mounting, supervising installation,
commissioning and start-up,
service support

Organization of chemical-engineering
monitoring

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DISSOLVED OXYGEN

MARK[®] 302 E

MARK[®] 303 E

MARK[®] 302 T

MARK[®] 303 T

MARK[®] 409

MARK[®] 3010

MARK[®] 409 T

MARK® 302 E

Is a portable meter for measuring dissolved oxygen concentration, DO saturation and temperature of water and aqueous solutions.

Convenience and accuracy of measurement, minimum maintenance

Automatic barometric pressure compensation.
Automatic temperature compensation.
Automatic one-point calibration in air.

3 measuring modes

DO concentration, ppm
Saturation, %.
Temperature, °C.

Long-lived sensor

Lifetime of the oxygen sensor is min. 10 years.

High-contrast LCD display

Low power consumption

Battery lifespan up to 2000 hours of work.

Specification

	Measuring range	Resolution	Accuracy
DO concentration, ppm	0–20	0,001	±(0,05 + 4% of measured value)
Saturation, %	0–200	0,1	±(0,7 + 4% of measured value)
Temperature, °C	0–50*	0,1	±0,3
*automatic temperature compensation range			
	Converting unit	Sensor	
Dimensions, mm	85*155*35	ø 14*115 ø 10*80 ¹	
Weight, g	300	100	
¹ submersible part			
Power supply	battery type AA – 2 pcs.		

Environment requirements

Temperature, °C	0–50
Water flow rate across the sensor membrane, sm/sec, min.	5
Ambient overpressure, bar, max.	2



order information

Basic kit	Converting unit DO sensor with 5 meter cable Electrolyte Spare parts kit Battery type AA – 2 pcs. Operation manual
Optionally	20 meter cable

MARK® 303 E

Is a portable meter for measuring dissolved oxygen concentration, DO saturation and temperature of water and aqueous solutions.

Convenience and accuracy of measurement, minimum maintenance

Automatic temperature and barometric pressure compensation.
Automatic one-point calibration in air.

IP65

Compact waterproof handheld meter allows use in dirty and wet environment.

Scratchpad

Non-volatile memory up to 500 data points.

USB port and related software

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Long-lived sensor

Lifetime of the oxygen sensor is min. 10 years.

Low power consumption

Battery lifespan up to 600 hours of work.

Designed for field measurements

Measurement of DO concentration at a depth of 20 meters.

Introspection system

Specification

	Measuring range	Resolution	Accuracy
DO concentration, ppm	0–20	0,0001	±(0,05 + 4% of measured value)
Saturation, %	0–200	0,01	±(0,7 + 4% of measured value)
Temperature, °C	0–50*	0,1	±0,3
	*automatic temperature compensation range		
	Converting unit	Sensor	
Dimensions, mm	65*130*28	ø 14*115 ø 10*80 ¹	
Weight, g	120	100	
		¹ submersible part	
Port	USB		
Power supply	battery type AA – 2 pcs.		

Environment requirements

Temperature, °C	0–50
Water flow rate across the sensor membrane, sm/sec, min.	5
Ambient overpressure, bar, max.	2



order information

Basic kit	Converting unit DO sensor with 5 meter cable Electrolyte Spare parts kit Battery type AA – 2 pcs. Operation manual
Optionally	20 meter cable

MARK® 302 T

Is a portable meter for measuring dissolved oxygen concentration and temperature of aqueous mediums including deairedated ones (low-level range).

Convenience and accuracy of measurement, minimum maintenance

Automatic temperature and barometric pressure compensation.
Automatic one-point calibration in air.

Long-lived sensor

Lifetime of the oxygen sensor is min. 10 years.

High-contrast LCD display

Low power consumption

Battery lifespan up to 2000 hours of work.

Specification

	Measuring range	Resolution	Accuracy
DO concentration, ppm	0–20	0,001	±(0,003 + 4% of measured value)
Temperature, °C	0–50*	0,1	±0,3
	*automatic temperature compensation range		
	Converting unit	Sensor with a flow-through chamber	
Dimensions, mm	85*155*35	ø 18*40*121	
Weight, g	300	220	
Power supply	battery type AA – 2 pcs.		

Environment requirements

Temperature, °C	0–50
Flow rate of water running through the chamber, dm³/min	0,4–0,8
Ambient overpressure, bar, max.	0,5



order information

Basic kit

- Converting unit
- DO sensor with 2 meter cable
- Flow-through chamber
- Electrolyte
- Spare parts kit
- Battery type AA – 2 pcs.
- Operation manual

MARK® 303 T

Is a portable meter for measuring dissolved oxygen concentration and temperature of aqueous mediums including deairedated ones (low-level range).

Convenience and accuracy of measurement, minimum maintenance

Automatic temperature and barometric pressure compensation.
Automatic one-point calibration in air.

Measuring modes

DO concentration, ppm and temperature, °C.

IP65

Compact waterproof handheld meter allows use in dirty and wet environment.

Scratchpad

Non-volatile memory up to 500 data points.

USB port and related software

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Long-lived sensor

Lifetime of the oxygen sensor is min. 10 years.

Low power consumption

Battery lifespan up to 600 hours of work.

Designed for in-process monitoring

High-speed sensor – measurement time less than 3 minutes. Backlight for work in dark premises.
One-click recording of measured values.

Introspection system

Specification

	Measuring range	Resolution	Accuracy
DO concentration, ppm	0–20	0,0001	±(0,003 + 4% of measured value)
Temperature, °C	0–50*	0,1	±0,3

*automatic temperature compensation range

	Converting unit	Sensor with a flow-through chamber
Dimensions, mm	65*130*28	ø 18*40*121
Weight, g	120	220

Port	USB
Power supply	battery type AA – 2 pcs.

Environment requirements

Temperature, °C	0–50
Flow rate of water running through the chamber, dm³/min	0,4–0,8
Ambient overpressure, bar, max.	0,5



order information

Basic kit

- Converting unit
- DO sensor
- Flow-through chamber
- Electrolyte
- Spare parts kit
- Battery type AA – 2 pcs.
- Operation manual

MARK® 409

Is a dual-channel meter for continuous measurements of low-level (ppb) dissolved oxygen concentration and temperature of water and aqueous solutions.

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Convenience and accuracy of measurement, minimum maintenance

Automatic temperature and barometric pressure compensation.
Automatic one-point calibration in air.

Long-lived sensor

Lifetime of the oxygen sensor is min. 10 years.

Possibility of placing the converting unit on the remote distance from the point of control

Sensor cable length up to 100 m.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.
RS 485 galvanic isolated port.
Programmable setpoints for each channel.

Durable aluminum case IP65

Instrument is protected from dust and moisture.

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Specification

	Measuring range	Resolution	Accuracy
DO concentration, ppm	0–20 ¹	0,0001	±[0,0027 + 3,5% of measured value]
Temperature, °C	0–70*	0,1	±0,3

*automatic temperature compensation range, ¹ programmable

Mounting	Wall	Panel
Dimensions, mm	266*170*95	252*146*100
Weight, kg	2,60	2,60

Power supply	220 V, 50 Hz /10 V·A
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Environment requirements

Temperature, °C	0–70
Sample flow rate through a flow-stabilizing module, dm³/min	0,07–5
Sample flow rate at the hydraulic panel input, dm³/min	0,08–5

Hydraulic panel HP 409 provides stabilization, filtration, indication of the sample flow and temperature protection
Hydraulic panel HP 409 is recommended for use with a large number of impurities, primarily of iron oxides



order information

Basic kit	Converting unit DO sensor DO 409 with 5 meter cable Spare parts kit Electrolyte Hydraulic panel HP 409 or flow-stabilizing module FSM 402 M Operation manual
Optionally	DO sensor DO 409 for the second channel Hydraulic panel HP 409 or flow-stabilizing module FSM 402 M for the second channel Extension cable up to 95 m OPC-server

MARK® 3010

Is a portable meter for measuring dissolved oxygen concentration and temperature of aqueous mediums, including deaired ones.
It can be used for continuous monitoring of chemical water treatment at thermal power and nuclear power industry objects.

Convenience and accuracy of measurement

Automatic temperature and barometric pressure compensation.
Measurement accuracy ±(0,001+1% of measured value) ppm.
Ability to work at small flow rates (min. 25 ml/minute).
Air calibration max. once a month.
Routine maintenance 1 per year.
Universal mechanism for direct attachment to the process.

NEW high-stable sensor

High reaction speed.
Sealed ultra strong water-repellent membrane.
Increased mechanical resistance of the construction.

High-contrast OLED indicator

Durable aluminum case IP65

Instrument is protected from dust and moisture.

Built-in durable battery LiPO4 (min. 1000 cycles of charge / discharge)

Carrying strap

Specification

	Measuring range	Resolution	Accuracy
DO concentration, ppm	0–10	0,0001	±(0,001 + 1% of measured value)
Temperature, °C	0–50*	0,1	±0,3
	*automatic temperature compensation range		
	Converting unit	Sensor	
Dimensions, mm	120*85*80	42*95	
Weight, g	500	300	

Environment requirements

Temperature, °C	0–70
Water flow rate, ml/min, min.	25

NEW PRODUCT



order information

- Basic kit
- Converting unit
DO sensor DO 3010
Flow-through chamber FTC 3010
DO sensor spare parts kit
Electrolyte
Power supply unit with a charger
Operation manual

MARK® 409 T

Measuring of dissolved oxygen concentration and temperature of aqueous mediums, including deairated ones.
Continuous monitoring of chemical water treatment at thermal power and nuclear power industry objects.

Convenience and accuracy of measurement
Measurement accuracy $\pm(0,001+3,5\%$ of measured value) ppm.
Ability to work at small flow rates (min. 25 ml/min).
Routine maintenance 1 per year.

NEW high-stable sensor
High reaction speed.
Sealed ultra strong water-repellent membrane membrane.
The increased mechanical resistance of the construction.
Sleep mode when stored in air.

2 channels
Programmable ranges of measurements for each channel.
Independent measurements in two points.

Possibility of placing the converting unit on the remote distance from the point of control
Sensor cable length up to 100 m.

Communication with external devices
2 galvanic isolated current outputs 0–5/4–20/0–20mA.
RS 485 galvanic isolated port.
Communication protocol MODBUS RTU.

NEW Hydraulic panel HP 409 T
Possibility of placement the measurement system at the sole panel.
Stainles conductive lines.
Regular maintenance and sensor calibration – without flow interruption.

Specification			
	Measuring range	Resolution	Accuracy
DO concentration, ppm	0–10	0,0001	$\pm(0,001 + 3,5\%$ of measured value)
Temperature, °C	0–70*	0,1	$\pm 0,3$
*automatic temperature compensation range			
Environment requirements			
Temperature, °C	0–70		
Water flow rate, ml/min, min.	25		
Ambient overpressure, bar, max.	1		

I NEW PRODUCT I



order information

Basic kit	Converting unit DO sensor DO 409 T Hydraulic panel DO sensor spare parts kit Electrolyte Operation manual
Optionally	DO sensor DO 409 T for the second channel Hydraulic panel for the second channel Extension cable up to 100 m



DISSOLVED HYDROGEN

MARK[®] 501

MARK[®] 509

MARK® 501

Is a portable meter for measuring dissolved hydrogen concentration (including low-level) and temperature of water and aqueous solutions.

Automatic temperature and barometric pressure compensation

3 measuring modes

DH concentration, ppb.
Volume concentration, %.
Temperature, °C.

Long-lived sensor

Lifetime of the hydrogen sensor is min. 10 years.

High-contrast LCD display

Low power consumption

Battery lifespan up to 2000 hours of work.

Specification

	Measuring range	Resolution	Accuracy
DH concentration, ppb	0–2000	0,1	±[1,0 + 3,5% of measured value]
Volume concentration, %	0–100	0,1	±[0,06 + 3,5% of measured value]
Temperature, °C	0–50*	0,1	±0,3
*automatic temperature compensation range			
	Converting unit		Sensor
Dimensions, mm	85*155*35		ø 30*135
Weight, g	300		100
Power supply	battery type AA – 2 pcs.		

Environment requirements

Temperature, °C	5–50
Flow rate of water running through the chamber, dm³/min	0,07–0,6

order information

Basic kit

- Converting unit
- DH sensor
- Flow-through chamber
- Electrolyte
- Spare parts kit
- Calibrator
- Battery type AA – 2 pcs.
- Operation manual



MARK® 509

Is a dual-channel meter for continuous measurements of dissolved hydrogen concentration (including low-level concentrations) and temperature of water and aqueous solutions.

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Convenience and accuracy of measurement, minimum maintenance

Dual automatic temperature and barometric pressure compensation.

Long-lived sensor

Lifetime of the hydrogen sensor is min. 10 years.

Possibility of placing the converting unit on the remote distance from the point of control

Sensor cable length up to 100 m.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.
RS 485 galvanic isolated port.
Programmable setpoints for each channel.

Durable aluminum case IP65

Instrument is protected from dust and moisture

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Specification

	Measuring range	Resolution	Accuracy
DH concentration, ppb	0–2000 ¹	0,1	±(3 + 4% of measured value)
Temperature, °C	0–70 *	0,1	±0,3

*automatic temperature compensation range, ¹ programmable

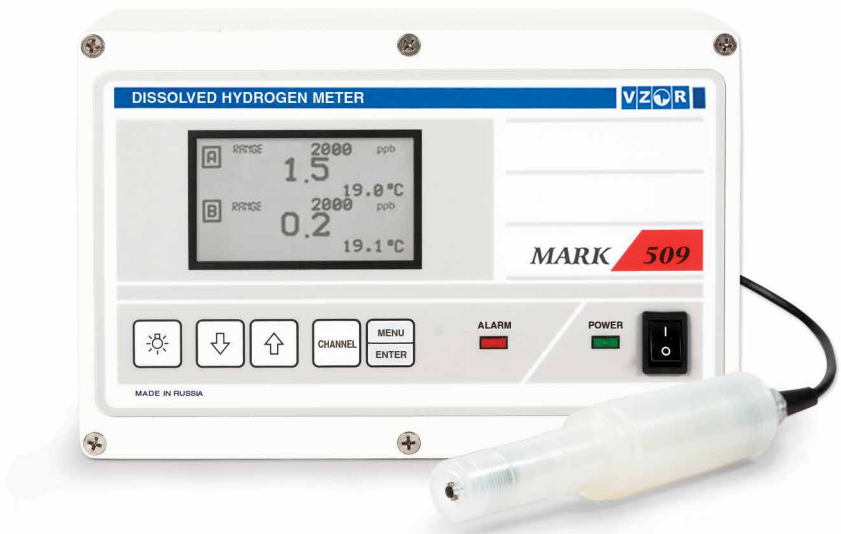
Mounting	Wall	Panel
Dimensions, mm	266*170*95	252*146*100
Weight, kg	2,60	2,60

Power supply	220 V, 50 Hz /10 V·A
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Environment requirements

Temperature, °C	0–70
Sample flow rate through the flow-stabilizing module, dm³/min	0,07–5
Sample flow rate at the hydraulic panel input, dm³/min	0,08–5

Hydraulic panel HP 409 provides stabilization, filtration, indication of the sample flow and temperature protection
Hydraulic panel HP 409 is recommended for use with a large number of impurities, primarily of iron oxides



order information

Basic kit	Converting unit DH sensor Spare parts kit Calibrator Electrolyte Hydraulic panel HP 409 or flow-stabilizing module FSM 402 M Operation manual
Optionally	DH sensor DH 509 for the second channel Hydraulic panel HP 409 or flow-stabilizing module FSM 402 M for the second channel Extension cable up to 95 m

CONDUCTIVITY

MARK[®] 603/1

MARK[®] 603

MARK[®] 602

MARK[®] 602 LD

MARK[®] 602 T

MARK[®] 1102

MARK® 603/1

Is a portable meter for measuring conductivity (absolute and adjusted to 25°C), salinity and temperature of water and aqueous solutions.

IP65
Compact waterproof handheld meter allows use in dirty and wet environment.

Scratchpad
Non-volatile memory up to 100 data points.

Stainless steel dip sensor requires no calibration

Graphic LCD display with backlight
Easy input of all parameters by keypad.

Low power consumption
Battery lifespan up to 600 hours of work.

Specification

	Measuring range	Resolution	Accuracy
Conductivity, μS/cm	0–20000	0,0001	±(0,05 + 2,5% of measured value)
Salinity, mg/L	0–10000	0,001	±(0,06 + 3% of measured value)
Temperature, °C	0–75 *	0,1	±0,3
	*automatic temperature compensation range		
	Converting unit	Sensor	
Dimensions, mm	65*130*28	ø 15*130	
Weight, g	120	80	
Port	USB		
Power supply	battery type AA – 2 pcs.		
Environment requirements			
Temperature, °C	0–75		

order information

- Basic kit
- Converting unit
CS 3 sensor
Battery type AA – 2 pcs.
Operation manual
- Optionally
- Power supply unit
AA rechargeable elements set



MARK® 603

Is a portable meter for measuring conductivity (absolute and adjusted to 25°C), salinity and temperature of water, including low-level conductivity in ultrapure water.

IP65
Compact waterproof handheld meter allows use in dirty and wet environment.

Dual automatic temperature compensation for high purity water, selectable linear coefficient of temperature compensation

Stainless steel flow-dip sensor requires no calibration

Scratchpad
Non-volatile memory up to 100 data points.

Introspection system

Ion-exchange column with a switch of sample current

USB port and related software
The ability to create and manage archive data on a PC.

Graphic LCD display with backlight
Easy input of all parameters by keypad.

Low power consumption
Battery lifespan up to 600 hours of work.

specification

	Measuring range	Resolution	Accuracy
Conductivity, μS/cm	0,000–2000 0,000–20000	0,0001	±{0,003 + 1,5% of measured value} ±{0,05 + 1,5% of measured value}
Salinity, mg/L	0–1000 ¹ 0–10000 ²	0,001	±{0,004 + 2% of measured value} ±{0,06 + 2% of measured value}
Temperature, °C	0–75 *	0,1	±0,3
*automatic temperature compensation range, ¹ with sensor CS 015, ² with sensor CS 15			
	Converting unit	Sensor CS 015	Sensor CS 15
Dimensions, mm	65*130*28	ø 15*130	ø 15*160
Weight, g	120	80	110
Port	USB		
Power supply	battery type AA – 2 pcs.		
Environment requirements			
Temperature, °C	0–75		
Flow rate of water running through the chamber, dm³/min	0,1–1		

order information

Basic kit	Converting unit Sensor CS 015 or CS 15 Flow-through chamber Battery type AA – 2 pcs. Operation manual
Optionally	Sensor CS 015 or CS 15 Ion-exchange column IOC 603 Bearing panel BP 603 Power supply unit AA rechargeable batteries set



MARK® 602

Is a dual-channel meter for continuous measurements of conductivity (absolute and adjusted to 25°C), salinity and temperature of water and aqueous solutions, including deionized and high purity water environmets.

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Convenience and accuracy of measurement, minimum maintenance

Dual automatic temperature compensation.

Possibility of placing the converting unit on the remote distance from the point of control

Sensor cable length up to 100 m.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.

RS 485 galvanic isolated port.

Programmable setpoints for each channel.

Durable aluminum case IP65

Instrument is protected from dust and moisture.

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Specification

	Measuring range	Resolution	Accuracy
Conductivity, µS/cm	0–2000 ¹	0,0001	±(0,004 + 2% of measured value)
	0–20000 ²		±(0,03 + 2% of measured value)
Salinity, mg/L	0–1000 ¹	0,0001	±(0,003 + 2,5% of measured value)
	0–10000 ²		±(0,03 + 2,5% of measured value)
Temperature, °C	5–50*	0,1	±0,3
	*automatic temperature compensation range, ¹ with sensor CS 025 C, ² with sensor CS 2 S		
Mounting	Wall	Panel	
Dimensions, mm	266*170*95	252*146*100	
Weight, kg	2,60	2,60	
Power supply	220 V, 50 Hz /10 V·A		
Environment requirements			
Temperature, °C	5–50		
Sample flow rate, dm³/min	0,05–0,5 (without hydraulic panel) 0,05–5 (with hydraulic panel)		
Ambient overpressure, bar, max.	0		



order information

Basic kit	Converting unit Conductivity sensor CS 025 C or CS 2 C 5 meter connecting cable C 602.5 Operation manual
Optionally	Conductivity sensor CS 025 C or CS 2 C for the second channel Connecting cable C 602.L up to 100 m Hydraulic panel HP 602 OPC-server

MARK® 602 LD

Is a dual-channel meter for continuous measurement of conductivity (absolute and adjusted to 25° C), salinity, specific electrical resistance (adjusted to 20° C and 25° C) and temperature of water and aqueous solutions, including deionized and high purity water.

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Convenience and accuracy of measurement, minimum maintenance

Dual automatic temperature compensation, selectable linear coefficient of compensation.

Possibility of placing the converting unit on the remote distance from the point of control

Sensor cable length up to 100 m.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.

RS 485 galvanic isolated port.

Programmable setpoints for each channel.

Durable aluminum case IP65

Instrument is protected from dust and moisture.

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Specification

	Measuring range	Resolution	Accuracy
Conductivity, µS/cm	0–200 ¹	0,0001	±(0,001 + 2*% of measured value)
Salinity, mg/L	0–100 ¹	0,0001	±(0,001 + 2,5% of measured value)
Temperature, °C	5–50*	0,1	±0,3

*automatic temperature compensation range, ¹ programmable

Mounting	Wall	Panel
Dimensions, mm	266*170*95	252*146*100
Weight, kg	2,60	2,60

Power supply	220 V, 50 Hz /10 V·A
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Environment requirements

Temperature, °C	5–50
The medium rate perpendicular to the sensor axis, sm/sec, min.	5
Ambient overpressure, bar, max.	10



order information

Basic kit	Converting unit Conductivity sensor CS 003 LD 5 meter connecting cable C 602 LD.5 Operation manual
Optionally	Conductivity sensor CS 003 LD for the second channel Connecting cable C 602 LD.L up to 100 m Hydraulic panel HP 602/003 M Flow-through chamber Kit for in-line mounting OPC-server

MARK® 602 T

Is a dual-channel meter for continuous measurement of specific electrical conductivity and resistance (absolute and adjusted to 20° C or 25° C), salinity and temperature of water and aqueous solutions, including deionized and high purity water.

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Convenience and accuracy of measurement, minimum maintenance

Dual automatic temperature compensation, selectable linear coefficient of compensation.

Possibility of placing the converting unit on the remote distance from the point of control

Sensor cable length up to 1000 m.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.

RS 485 galvanic isolated port.

Programmable setpoints for each channel.

Durable aluminum case IP65

Instrument is protected from dust and moisture.

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Specification

	Measuring range		Resolution	Accuracy
Conductivity, µS/cm	CS 3 T	0–20000	0,0001	±{0,03 + 2% of measured value}
	CS 003 T	0–200		±{0,001 + 2% of measured value}
Salinity, mg/L	CS 3 T	0–10000	0,0001	±{0,03 + 2,5% of measured value}
	CS 003 T	0–100		±{0,001 + 2,5% of measured value}
Temperature, °C	0–130*		0,1	±0,3
	*temperature compensation range 0-100 °C			
Mounting	Wall		Panel	
Dimensions, mm	266*170*95		252*146*100	
Weight, kg	2,60		2,60	
Power supply	220 V or 36 V, 50 Hz /15 V·A			

Environment requirements

Temperature, °C	0–130
The medium rate perpendicular to the sensor axis, sm/sec, min.	5
Ambient overpressure, bar, max.	16



order information

Basic kit	Converting unit Amplifier unit Conductivity sensor CS 003 T or CS 3 T 5 meter connecting cable C 602 T.5 Operation manual
Optionally	Conductivity sensor CS 003 T or CS 3 T for the second channel Flow sensor Amplifier unit for the second sensor Connecting cable C 602 T.L up to 1000 m Hydraulic panel HP 602 T

MARK® 1102

Is a dual-channel meter for continuous measurements of conductivity (absolute and adjusted to 25°C), temperature and concentration of aqueous solutions (NaCl, NaOH, HNO3, H2SO4, HCl).

Contactless inductive sensor resistant to aggressive mediums

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Possibility of placing the converting unit on the remote distance from the point of control

Sensor cable length up to 100 m.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.
RS 485 galvanic isolated port.
Programmable setpoints for each channel.

Durable aluminum case IP65

Instrument is protected from dust and moisture.

Graphic LCD display with backlight

Easy input of all parameters by keypad.

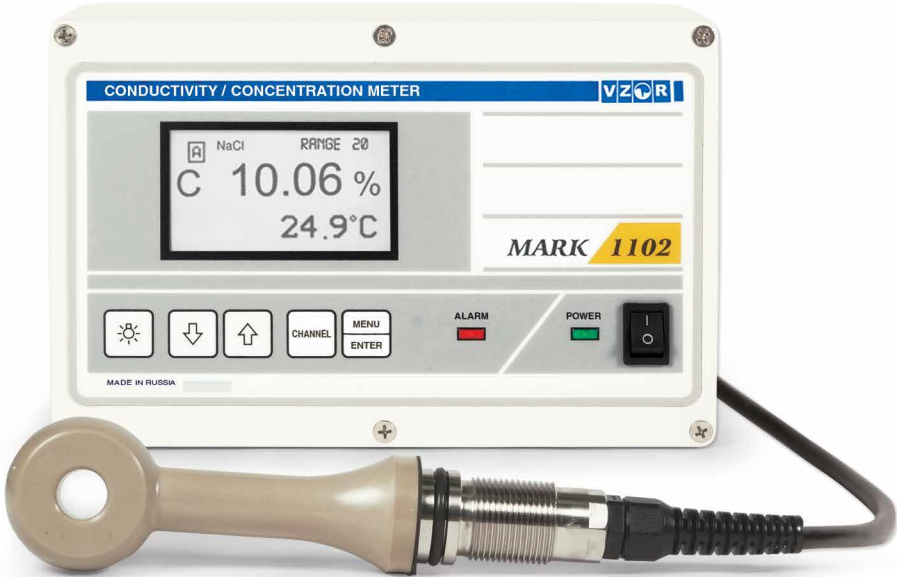
Various types of installation (dip, flow, in-line)

Specification

	Measuring range	Resolution	Accuracy
Conductivity, µS/cm	0–1000	0,1	±(1 + 4% of measured value)
Concentration, %			
NaCl, HNO3, H2SO4	0–15		
NaOH, HCl	0–10	0,01	±(0,03 + 4% of measured value)
Temperature, °C	0–70*	0,1	±0,5
	*automatic temperature compensation range		
Mounting	Wall	Panel	
Dimensions, mm	266*170*95	252*146*100	
Weight, kg	2,60	2,60	
Power supply	220 or 36 V, 50 Hz /10 V·A		

Environment requirements

Temperature, °C	0–70
Ambient overpressure, bar, max.	8



order information

Basic kit	Converting unit Sensor unit SU 1102 5 meter connecting cable C 1102.5 Operation manual
Optionally	Sensor unit SU 1102 for the second channel Connecting cable C 1102.L up to 100 m Dip mounting kit Flow mounting kit In-line mounting kit

pH

MARK[®] 901

MARK[®] 903

MARK[®] 902

MARK[®] 902 LD

MARK[®] 9010

MARK® 901

Is a portable meter for measuring of pH, mV and temperature of water and aqueous solutions.

Convenience and accuracy of measurement
Automatic temperature compensation.
Two-buffers calibration, buffer auto recognition.

3 measuring modes
pH.
mV.
Temperature, °C.

Connection of different types of pH electrodes

High-contrast LCD display

Protective case for electrodes, for safe measuring, store and transportation

Low power consumption
Battery lifespan up to 2000 hours of work.

Specification

	Measuring range	Resolution	Accuracy
pH	0–15 ¹	0,01	±0,02 ¹
	0–12 ²		±0,05 ²
	0–12 ³		±0,1 ³
mV	-1000/+1000	1	±2
Temperature, °C	0–50*	0,1	±0,3

¹ for converting unit, ² for analyzer with separate electrodes, ³ for analyzer with combined electrodes,
*automatic temperature compensation range

	Converting unit
Dimensions, mm	85*170*35
Weight, g	300

Power supply	battery type AA – 2 pcs.
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Environment requirements

Temperature, °C	0–50
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order information

Basic kit	Converting unit with a temperature sensor Combined electrode ESK 10601/7 or separate electrodes ES 10601/7 and ESR 10101/3.0 Battery type AA – 2 pcs. Operation manual
Optionally	Protective case K901 pH electrodes at customer's option



MARK® 903

Is a portable meter for measuring of pH, mV and temperature of water and aqueous solutions.

IP65

Compact waterproof handheld meter allows use in dirty and wet environment.

Convenience and accuracy of measurement

Automatic temperature compensation.

Two-buffers calibration, buffer auto recognition.

Introspection system

Scratchpad

Non-volatile memory up to 500 data points.

USB port and related software

The ability to create and manage archive data on a PC.

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Protective case for electrodes, for safe measuring, store and transportation

Low power consumption

Battery lifespan up to 600 hours of work.

Specification

	Measuring range	Resolution	Accuracy
pH	0–15 ¹	0,001	±0,02 ¹
	0–12 ²		±0,05 ²
mV	-1000/+1000	0,1	±0,5
Temperature, °C	0–70*	0,1	±0,3

¹ for converting unit, ² the pH-meter with the sensor incorporated, *automatic temperature compensation range

	Converting unit
Dimensions, mm	65*130*28
Weight, g	120
Port	USB
Power supply	battery type AA – 2 pcs.

Environment requirements

Temperature, °C	5–50
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order information

Basic kit	Converting unit with a temperature sensor Combined electrode ESK 10601/7 Battery type AA – 2 pcs. Operation manual
Optionally	Protective case K 901



MARK® 902

Is a dual-channel meter for continuous measuring of pH (absolute and adjusted to 25°C), mV and temperature of water and aqueous solutions.

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Convenience and accuracy of measurement, minimum maintenance

Automatic temperature compensation.
Two-buffers calibration, buffer auto recognition.

«Active» sensor unit

Digital communication channel of the sensor with the converting unit – up to 100 m.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.
RS 485 galvanic isolated port.
Programmable setpoints for each channel.

Durable aluminum case IP65

Instrument is protected from dust and moisture.

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Specification

	Measuring range	Resolution	Accuracy
pH	0–15 ¹	0,01	±0,02 ¹
	0–12 ²		±0,05 ²
mV	-1000/+1000	1	±2
Temperature, °C	0–50*	0,1	±0,3

¹ for converting unit, ² the pH-meter with the sensor incorporated, *automatic temperature compensation range

Mounting	Wall	Panel
Dimensions, mm	266*170*95	252*146*100
Weight, kg	2,60	2,60

Power supply	220 V, 50 Hz /10 V · A
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Environment requirements

Water and water solutions free from fluoric-hydrogen acid
or its salts and agents which generate sediments or films on the electrode surface

Temperature, °C	5–50
Water flow rate at work with the hydraulic panel HP 902, dm ³ /min	0,1–2



order information

Basic kit	Converting unit Sensor unit SU 902 comprised of: – amplifier unit – temperature sensor – electrodes ES 10601/7, ESR 10106/3.0 5 meter connecting cable C 902.5 Hydraulic panel HP 902 Operation manual
Optionally	Sensor unit SU 902 for the second unit Hydraulic panel HP 902 for the second channel Connecting cable C 902.L up to 100 m OPC-server

MARK® 902 LD

Is a dual-channel meter for continuous in-line measurements of pH and temperature of water and aqueous solutions.

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Convenience and accuracy of measurement, minimum maintenance

Two-buffers calibration, buffer auto recognition.

General line-dip «active» sensor unit

Digital communication channel of the sensor with the converting unit – up to 100 m.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.
RS 485 galvanic isolated port.
Programmable setpoints for each channel.

Durable aluminum case IP65

Instrument is protected from dust and moisture.

Graphic LCD display with backlight

Easy input of all parameters by keypad.

Specification

	Measuring range	Resolution	Accuracy
pH	0–12	0,01	±0,2
Temperature, °C	0–50*	0,1	±0,3
	*automatic temperature compensation range		
Mounting	Wall	Panel	
Dimensions, mm	266*170*95	252*146*100	
Weight, kg	2,60	2,60	

Power supply 220 V, 50 Hz /10 V·A

Environment requirements

Water and water solutions free from fluoric-hydrogen acid
or its salts and agents which generate sediments or films on the electrode surface

Temperature, °C 5–50

Ambient overpressure, bar, max.
10²

¹ with pH-electrode ESK 10617/7, ² with foreign pH-electrode



order information

Basic kit	Converting unit Sensor unit SU 902 LD comprised of: – amplifier unit – temperature sensor – electrode ES 10601/7 5 meter connecting cable C 902.5 Operation manual
Optionally	Sensor unit SU 902 LD for the second channel Connecting cable C 902 LD.L up to 100 m Foreign pH-electrode (for ambient overpressure up to 10 bar) In-line spare parts kit OPC-server

MARK® 9010

Measuring of hydrogen ions activity (pH, pH 25) of high purity water (including water with adjusted conductivity 0.055 mkSm/sm) and alkaline water, containing ammonia and amines.

Chemical water treatment monitoring at power industry objects.

New patented way of measuring, which does not require calibration.
Absence of elements degrading in «high purity» water.

The sole protecting case, uniting the secondary converter and hydraulic part.
Graphical touch screen 5.7", 262000 colours, 640*480 pixels screen resolution.

Built-in computer on the basis of Cirrus Logic EP 93xx, Windows CE.
Intelligent algorithms of data operation.

Communication with external devices

2 galvanic isolated current outputs 0–5/4–20/0–20mA.
RS 485 galvanic isolated port.
Communication protocol MODBUS RTU.

Specification

	Measuring range	Resolution	Accuracy
pH	5,6–7	0,001	±0,05
	7–7,26		±0,15
	7,26–9,5		±0,05
Conductivity, mkSm/sm	0–10	0,0001	±(0,003 + 2% of measured value)
Temperature, °C	0–50*	0,1	±0,3
	*automatic temperature compensation range		
Mounting	Wall		
Dimensions, mm	800*295*130		
Weight, kg	10		

Environment requirements

Conductivity, mkSm/sm, max.	10
Temperature, °C	10–40
Sample flow rate, dm³/min	0,1–0,5





SODIUM CONCENTRATION

MARK[®] 1002

MARK® 1002

Is a dual-channel analyzer for continuous measuring of sodium concentration as C_{Na} (or P_{Na}) and temperature for high purity water environments.

2 channels

Programmable ranges of measurements for each channel.
Independent measurements in two points.

Convenience and accuracy of measurement, minimum maintenance

Measuring range from 0,01 C_{Na}. Measurement accuracy 6%.
Long inter-calibration period (up to 6 months).
Dual automatic temperature compensation.
Automatic batching device of the alkalizing reagent.
Absence of KCL flask.

1 solution calibration

If necessary, 3-point-calibration is possible.

«Active» sensor unit

Sensor cable length up to 100 m.

Communication with external devices

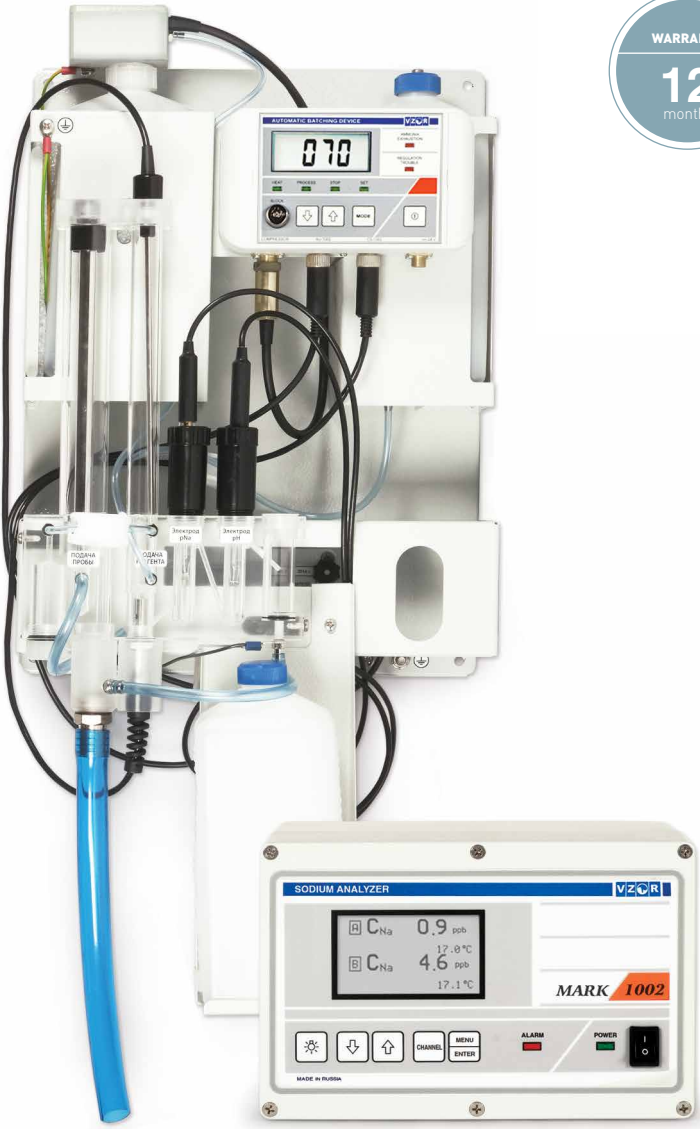
2 galvanic isolated current outputs 0–5/4–20/0–20mA.
RS 485 galvanic isolated port.
Programmable setpoints for each channel.

Specification

		Measuring range	Resolution	Accuracy
C _{Na} , ppb	MAPK 1002	0,7–500 500–2000 ¹	0,1	±[0,5 + 0,12*C _{Na}] ±0,3*C _{Na}
	MAPK 1002 T	0,01–500	0,01	±[0,03 + 0,12*C _{Na}]
pNa	MAPK 1002	4,66–7,52 4,06–7,52 ¹	0,01	
	MAPK 1002 T	4,66–9,36	0,01	
Temperature, °C		0–50*	0,1	±0,3
		¹ only for MARK® 1002 P, *automatic temperature compensation range		
		Converting unit	Hydraulic panel	
Mounting	Wall	Panel		
Dimensions, mm	266*170*95	252*146*100	300*650*200	
Weight, kg	2,60	2,60	4,0	
		Power supply	220 V, 50 Hz /10 V·A	24 V

Environment requirements

Temperature, °C	10–40
Sample flow rate, dm ³ /min	0,05–3
Temperature of ambient air, °C	5–50



order information

- Basic kit
- Converting unit
Hydraulic panel HP 1002 or HP 1002 T
Power supply unit
5 meter connecting cable C 1002.5
Operation manual
- Optionally
- Hydraulic panel and power supply unit for the second channel
Connecting cable C 1002.L up to 100 meters
Sample collecting kit
OPC-server

SUPPORT EQUIPMENT

MARK[®] 01 MK

HP 409 / HP 409 T

HP 602

HP 902

HP 1002

MARK[®] 3101

IEC D / d / L

MARK® 01 MK

Cooling, restriction, filtration and regulation of the sample flow rate.
Temperature, pressure and sample flow rate indication.
Temperature, pressure and cooling water flow rate indication (optionally).
Sample preparation for water chemistry monitoring instruments
at power engineering facilities.

- Continuous monitoring of the sample parameters and data transfer via digital and current outputs.
- Sample stable pressure maintaining.
- Alarm sound and automatic shut off the sample in case of the regime violation.
- Temperature and pressure thresholds for the sample automatic shut-off.
- Blowdown valve of the control line.
- Compact stainless steel panel 350*944 mm.
- One-way service.
- Easy-clean dismountable heat-exchange unit.

Specification

Sample parameters	MARK 01 MK version /					
	7/40	7/250	7/560	32/40	32/250	32/560
Sample temperature at the sample preparation unit input, max, ° C	40	250	560	40	250	560
Sample temperature at the additional heat-transfer unit output, max, ° C	—	—	250	—	—	250
Sample pressure at the sample preparation unit input, max, MPa (kg/cm²)	7 (70)			32 (320)		
Sample pressure at the sample preparation unit output, max, MPa				0,3		
Sample temperature at the sample preparation unit output, max, ° C				50		
Sample flow rate range, dm³/h				0–60		
Weight, kg, max,	14	24	34	14	24	34



order information

Basic kit	MARK 01 MK version /					
	7/40	7/250	7/560	32/40	32/250	32/560
Control unit MARK 01 MK	•	•	•	•	•	•
In-gate and blowdown valve	•	•	•	•	•	•
High/low pressure regulating valve	•	•	•	•	•	•
Main heat-transfer unit	•	•	•	•	•	•
Electric driven shutdown valve	•	•	•	•	•	•
Pressure control unit	•	•	•	•	•	•
Flow meter	•	•	•	•	•	•
Filter	•	•	•	•	•	•
Power-supply unit PS 01 MK	•	•	•	•	•	•
Additional heat-transfer unit	•	•	•	•	•	•
Optionally						
	Cooling water rate display					
	Cooling water thermometer / manometer					

HP 409 / HP 602

- Water flow stabilization.
- Iron oxide, mechanical admixture removal / H-cation exchange of sample.
- Sample flow display.
- Emergency cutoff of sample supply.

WARRANTY

12

months

HP 409 T

- Regulating valve of the sample flow rate.
- Analyzer calibration without sample flow interruption.



Specification	HP 409	HP 409 T/1	HP 409 T/2	HP 602
Analyzed water temperature, °C	In accordance with sensor requirements			
Sample flow rate, dm³/min	0,08–5	0,3–1,5	0,3–1,5	0,05–5
Emergency cutoff of sample supply, °C	90±5	–	–	90±5
Dimensions, mm	280*380*140	280*400*110	280*720*110	280*720*115
Weight, kg	2,5	3,3	4,4	6,0

HP 902

- Water flow stabilization.
- Emergency cutoff of sample supply.

WARRANTY

12

months

HP 1002

- Automatic precision batching of the alkalizing element.
- Alkalizing reagent rate minimization.
- Batching system diagnostics.
- Water flow stabilization.
- Sample flow display.
- Mechanical admixture filtration.



Specification	HP 902	HP 1002
Analyzed water temperature, °C	In accordance with sensor requirements	
Sample flow rate, dm³/min	0,1–2	0,05–3
Emergency cutoff of sample supply, °C	90±5	90±5
Dimensions, mm	240*390*90	300*650*200
Weight, kg	4,0	4,0



MARK® 3101

Preparation of high purity water according to OST 34–70–953.2–88.

- Optimum output 30 dm³/h.
- Air deflation valves.
- Stainless filters.

WARRANTY

12

months



IEC D/d/L

Designed to be filled with ion-exchange resins or filtering materials.
Preliminary preparation of the analyzed water sample, including H-cation exchange, high purity water getting, mechanical filtration.

- Transparent case of the column**
Allows to estimate the filler's state.
- Stainless filter**
Does not get blind.
Does not allow the resin wash-out.
Ensures expiry linear rate – min. 25 m/h.

WARRANTY

12

months



TABLE OF THE COLUMN VERSION'S DIMENSIONS

D	20	30	40	50	60	70
d	16	24	32	44	50	62
L	from 190 to 950					

D/d/L – outer / inner diameter / length, mm

Right choice of instruments is a key condition of successful solution of this or that practical issue. The present table will help you to choose the instrument, corresponding to your requirements. The instruments are designed for particular tasks solution, which allows you not to overpay for other models generality.

WATER ENVIRONMENTS PARAMETERS MONITORING AT FIELD CONDITIONS, WORKFLOW PROCESSES. SURFACE, WASTE WATER, WATER SOLUTIONS			CHEMICAL WATER TREATMENT MONITORING AT THERMAL AND NUCLEAR POWER FACILITIES	
Periodic		Continuous	Periodic	Continuous
DISSOLVED OXYGEN METER	MARK® 302 E MARK® 303 E		MARK® 302 T MARK® 303 T MARK® 3010	MARK® 409 MARK® 409 T
DISSOLVED HYDROGEN METER			MARK® 501	MARK® 509
CONDUCTIVITY I SALINITY CONCENTRATION METER	MARK® 603/1		MAPK® 603	MARK® 602 MARK® 602 LD MARK® 1102
pH METER	MARK® 901 MARK® 903	MARK® 902 LD	MARK® 901 MARK® 903	MARK® 902 MARK® 902 LD MARK® 9010
SODIUM ANALYZER			MARK® 1002 MARK® 1002 T with a sample collecting kit	MARK® 1002 MARK® 1002 T

The company reserves the right to make changes into the products configuration without their performance degradation. All information provided in the catalogue is of advisory / introductory character.

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