

# NPP «Avtomatica»

Vladimir, Russia

[www.conductometer.com](http://www.conductometer.com)

# Hi-Nuc Engineering Pvt.Ltd.

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**NPP Avtomatica – Established in 1991**

**27** year of design and manufacture of  
measurement devices

**Team:**

- 5% with PhD (Eng.Sc) degree;
- 40% with higher education.

**Licenses, Certificates**

**ISO 9001-2008**

**Licenses of RosAtomNadzor** for design and manufacture of equipment for Nuclear Power Plants.

**License of Federal Agency of Technical Regulation** for production and repair of Measurement Instruments.

**Work organization principles:**

- purchase of components from permanent suppliers certified to ISO-9001;
- check of incoming components;
- quality plan work;
- organization of acceptance testing in conjunction with the customer;
- complete set of documentation for installation, commissioning, operation, maintenance and repair;
- production capacity (per year): more than **6000** devices;
- warranty period of devices operation **24 months**.



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Analysers

Conductometers

ORP/pH-meters

Dissolved oxygen  
meters

Turbidimeters

Sodium meters

Measurment instruments

Temperature transmitters

Pressure transmitters

Transmitters of Liquid  
Level

Controllers

Process Control  
System



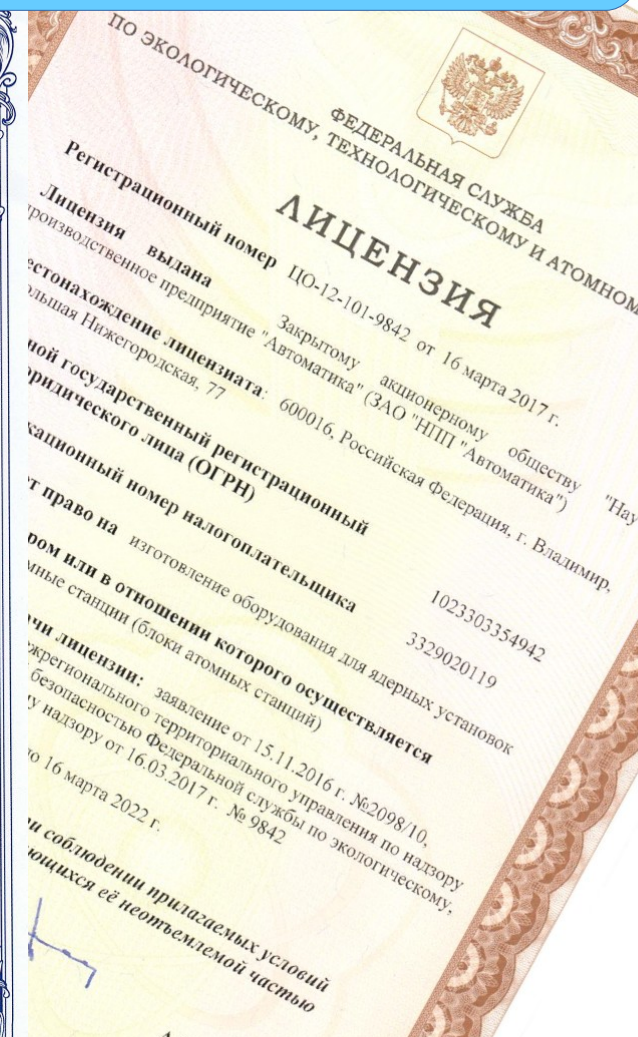
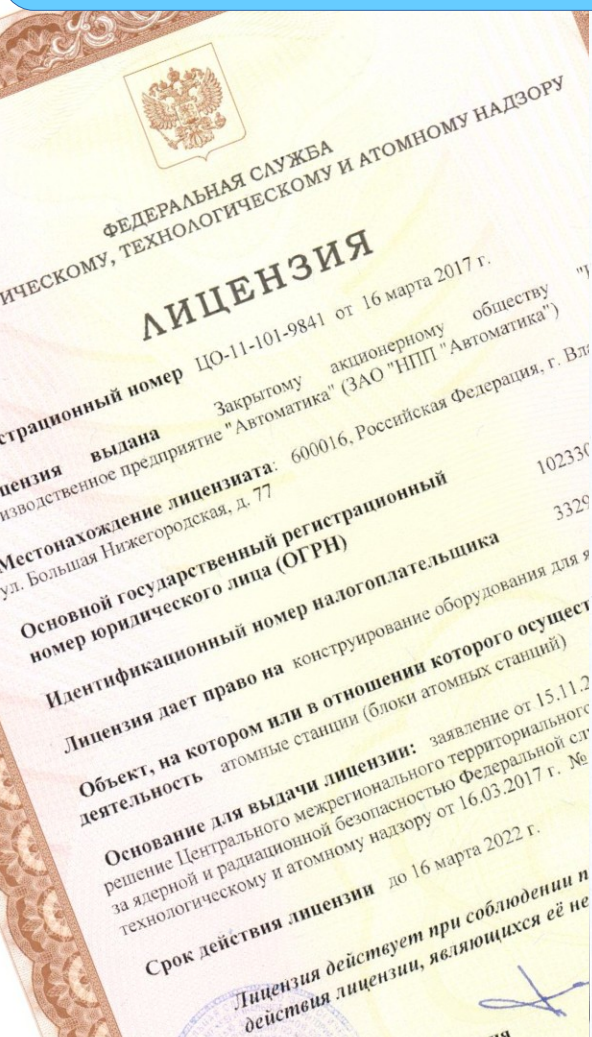


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**Licenses of Rosatomnadzor for design and manufacture of equipment for nuclear power plants.**

**Certificate of the Federal Agency for Technical Regulation and Metrology ISO 9001-2015**





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## Conductometer — concentration meter C-31xx



**With passive primary transducers  
(sensors)**



**C-3122.P**

**C-3122.P.I**

Output signals:  
analog current,  
RS-485,  
relay

**L<10m**

**Transmitters**



**C-3110**



**C-3130**

Output signals:  
analog current,  
or RS-485

**L<800m**

**With active primary transducers  
(sensors)**



**C-3122.x.NP**



**C-3101M.x.NP**



Output signals:  
analog current,  
RS-485 (C-3122.x.NP),  
relay

**L<800m**



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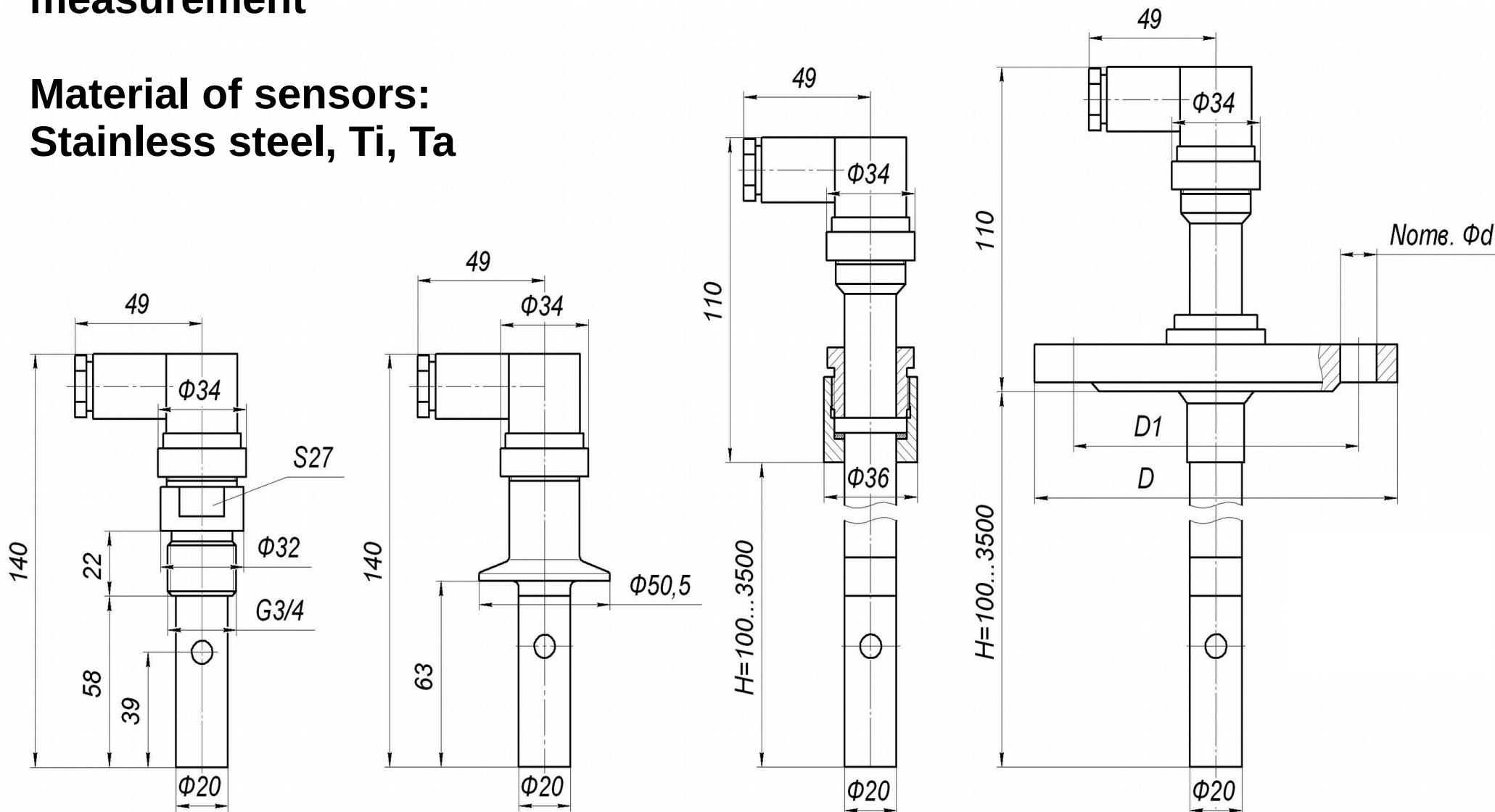
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## Types of installation of immersion contact sensors for SEC measurement

**Material of sensors:**  
Stainless steel, Ti, Ta







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## 4-pole contact SEC sensors

### Benefits.

1. Value of the transient resistance and resistance of the connecting wires do not affect the measurement results.
2. Polarization is completely excluded.
3. Wider measurement range (as down to  $\mu\text{S/cm}$ , and more upper).
4. Less sensitive to contamination and less demanding maintenance.
5. No leakage currents.
6. Can work with contaminated, aggressive fluids.
7. Designed to work in radiation area, remotely from the electronic unit (up to 20 m).

0..10  $\mu\text{S/cm}$ . 1000 mS/cm; P <20 bar; T <110 °C





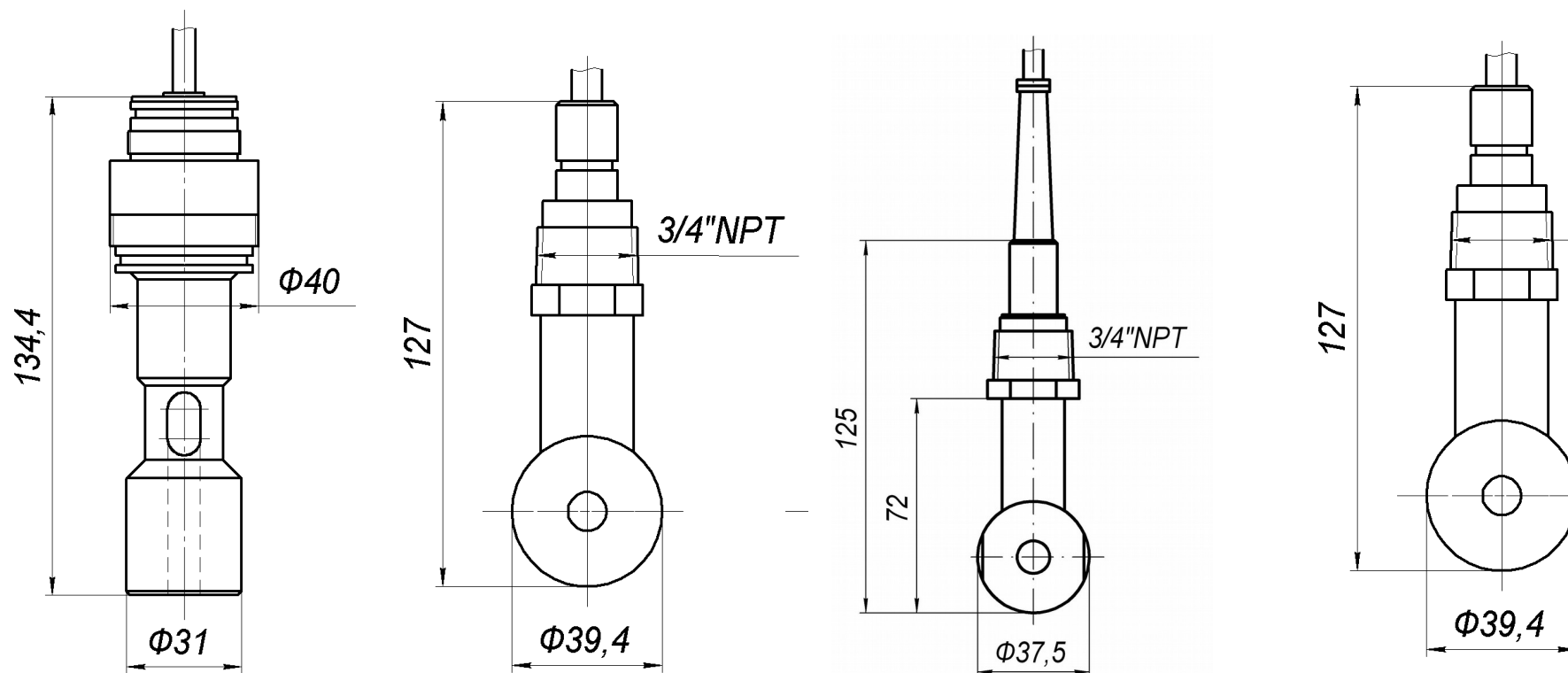
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## Contactless inductive SEC sensors



Model	SI-315	ES-1-A	AST-37HT	DDG-GY
Material	PVDF	PP	PEEK	PFA (Teflon)
Tmax, °C	80	105	150	100
Pmax, MPa	0,3	0,6	1,6	0,6





## Contactless inductive SEC sensors

### Benefits

1. Made of corrosion-resistant materials. Suitable for all acids and alkalis.
2. No polarization effect.
3. Can work with contaminated and “sticking” liquids.
4. Wide measuring range.
5. Distance from measuring device or transmitter up to 50m
6. Tested at absorbed dose of 130,000 Gy

### Limitations

1. Temperature inertia.
2. Cannot measure low SEC
3. Require a distance from a pipe wall of not less than 30mm



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## C-3101.x.NP Conductometer — concentration meter for Nuclear Plants



**C-3101.x.NP** - Conductometer-concentration meter (analyzer) is a single-channel measuring instrument and consists of a primary transducer (PP) and measuring instrument (PI). The analyzer is designed for use in hard environments, namely: for seismic resistance, climatic conditions, radiation resistance, difficult conditions for electromagnetic compatibility (EMC).

<b>Measurement range:</b>	(0...1); (0...10); (0...100); (0..1000) $\mu\text{S/cm}$ (0...1); (0...10); (0...100); (0..1000) $\text{mS/cm}$ concentration of solutions of acids, alkalis, salts
<b>Functions:</b>	Measurement, Indication, Alarm, Thermal compensation, Conversion
<b>Seismic resistance:</b>	Category II for NP-031-01 (Rus)
<b>Electromagnetic compatibility:</b>	IV by GOST 32137 (Rus), criterion A
<b>Radiation resistance:</b>	Sensing PP unit is resistant to Absorbed dose rate of – up to $1,3 \times 10^5$ Gy Electronic PP unit is resistant to Absorbed dose rate of $< 150$ Gy
<b>Safety class:</b>	3, 4 (NP-001-15 Rus)
<b>Output signals:</b>	analog (0..5), (0..20) or (4..20) mA; 2 relay





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## **C-3122.x.NP** Two channel conductometer — concentration meter for Nuclear Plants



**C-3122.x.NP** – is a two-channel measuring instrument and consists of one or two active primary transducers (PP) and one wall mounted measuring device (PI). The analyzer is designed for use in hard environments, namely: seismic, climatic , radiation conditions, difficult conditions for electromagnetic compatibility (EMC).

<b>Measurment range:</b>	(0...1); (0...10); (0...100); (0..1000) $\mu\text{S/cm}$ (0...1); (0...10); (0...100); (0..1000) $\text{mS/cm}$ concentration of solutions of acids, alkalis, salts
<b>Functions:</b>	Measurement, Indication, Alarm, Thermal compensation, Conversion Trends indication, Data logging
<b>Seismic resistance:</b>	Category II for NP-031-01 (Rus)
<b>Electromagnetic compatibility:</b>	IV by GOST 32137 (Rus), criterion A
<b>Radiation resistance:</b>	Sensing PP unit is resistant to Absorbed dose rate of – up to $1,3 \times 10^5$ Gy Electronic PP unit is resistant to Absorbed dose rate of $<150$ Gy
<b>Safety class:</b>	3, 4 (NP-001-15 Rus)
<b>Output signals:</b>	2 analog (0..5), (0..20) or (4..20) mA; RS-485, 4 relay



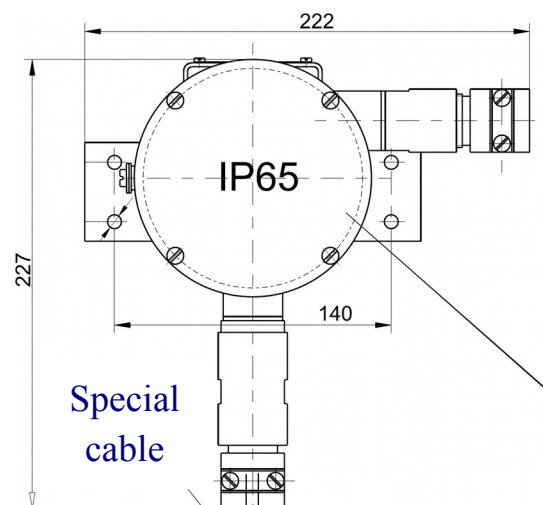
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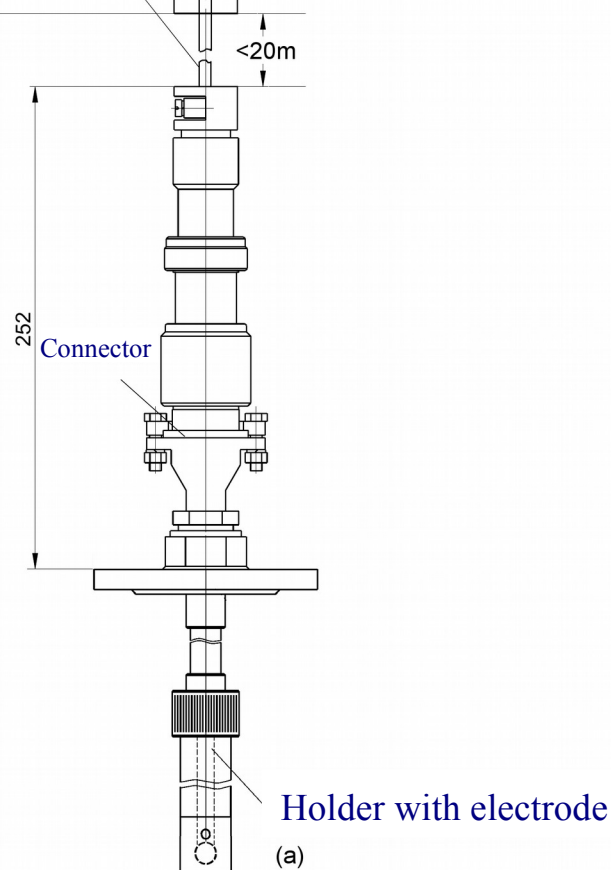
## Types of conductometer primary transducers for nuclear power plants



Transducer

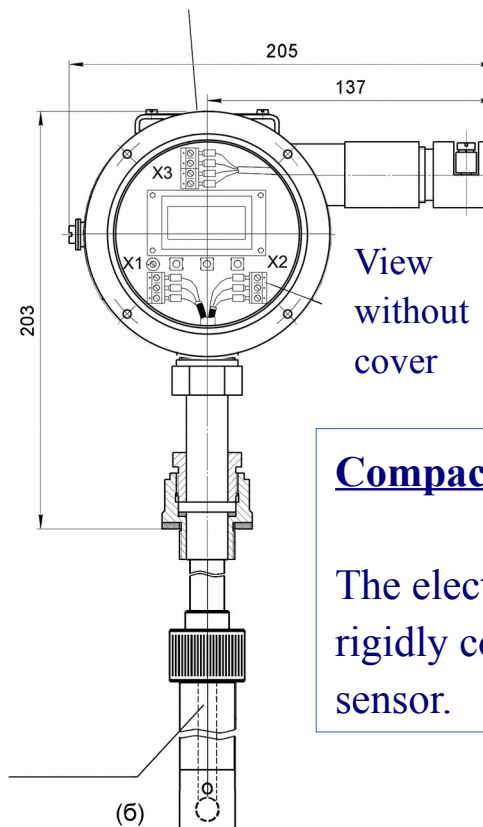
### Split

The electronic unit can be mounted to a distance of 20 m from the sensor using a special non-flammable cable that is resistant to radiation.



Holder with electrode

(a)



View without cover

### Compact

The electronic unit is rigidly connected to the sensor.

(b)





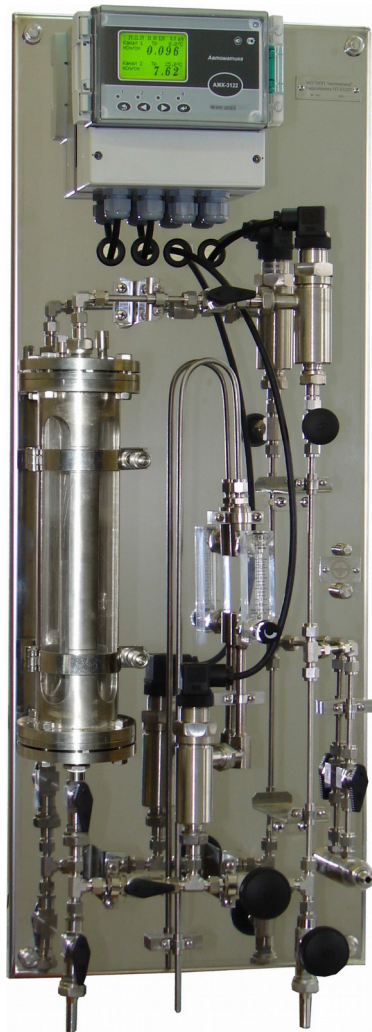
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## Hydropanel HP-3122 with C-3122.P



### Benefits:

#### 1. Automatic Measurement:

- Conductivity1 (C1), Conductivity2 (C2),  
Conductivity's difference  $\Delta C = C1 - C2$ ;
- Temperature (T);
- Flow (F).

#### 2. Control of depletion of ion exchange resin in the filter.

#### 3. Alarms when parameters go beyond setpoints (C1, C2, $\Delta C$ , T, F).

#### 4. Calibration without dismantling.

#### 5. Material – stainless steel.



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## C-3110, C-3110.Ex Conductometer-concentration meter with contact sensor



The conductometer-concentration meter (analyzer) is a transmitter: a monoblock single-channel measuring instrument consisting of an electronic unit and a sensing unit, which is installed directly on the monitored object.

The sensor is rigidly connected to the electronic unit or can be mounted at a up to 5m distance from the electronic unit .

Designed to measure and monitor the specific electrical conductivity (SEC) solutions of salts, alkalis and acids. On the basis of the known dependences between the SEC and the concentration of the analyzed component, the transmitters can be used as salt meters and concentration meters (C — 3110.K).

### **Measurment ranges:**

(0...10); (0...100); (0..1000) mS/cm  
(0...25) %, (95...100) % H<sub>2</sub>SO<sub>4</sub>; (0...17) %;  
(0...20) %, (35...70) % HNO<sub>3</sub>; (0..10) %, (20...40) % NaOH;  
(0...20) %, (0...230) g/l NaCl etc.

### **Functions:**

Measurement, Indication, Thermal Compensation, Transformation

### **Explosion proof:**

**1ExdIICBT6X**

### **Output signals:**

analog (0..5), (0..20) or (4..20) mA or RS-485



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## C-3130, C-3130.I-Ex Conductivity meter with inductive sensor



The conductometer-concentration meter (analyzer) is a transmitter: usually a monoblock single-channel measuring instrument consisting of an electronic unit and a sensor, which is installed directly on the monitored object.

The sensor is rigidly connected to the electronic unit or can be mounted at a up to 20 m distance from the electronic unit.

Sensor of analyzer is inductive, contactless, made of a material having high chemical resistance to acids and alkalis. The robust design and smooth surface of the sensor, as well as a large-diameter flow-through hole, provide low probability of contamination. It also provides the possibility of easy cleaning of the sensor and the ability to work with contaminated liquids.

### **Measurment ranges:**

(0...10); (0...100); (0..1000) mS/cm  
(0...25) %, (95...100) % H<sub>2</sub>SO<sub>4</sub>; (0...17) %, (23...50) % HCl;  
(0...20) %, (35...70) % HNO<sub>3</sub>; (0..10) %, (20...40) % NaOH;  
(0...20) %, (0...230) g/l NaCl etc.

### **Functions:**

Measurement, Indication, Thermal Compensation, Transformation

### **Explosion proof:**

**1ExdIICT6X**

### **Output signals:**

analog (0..5), (0..20) or (4..20) mA or RS-485





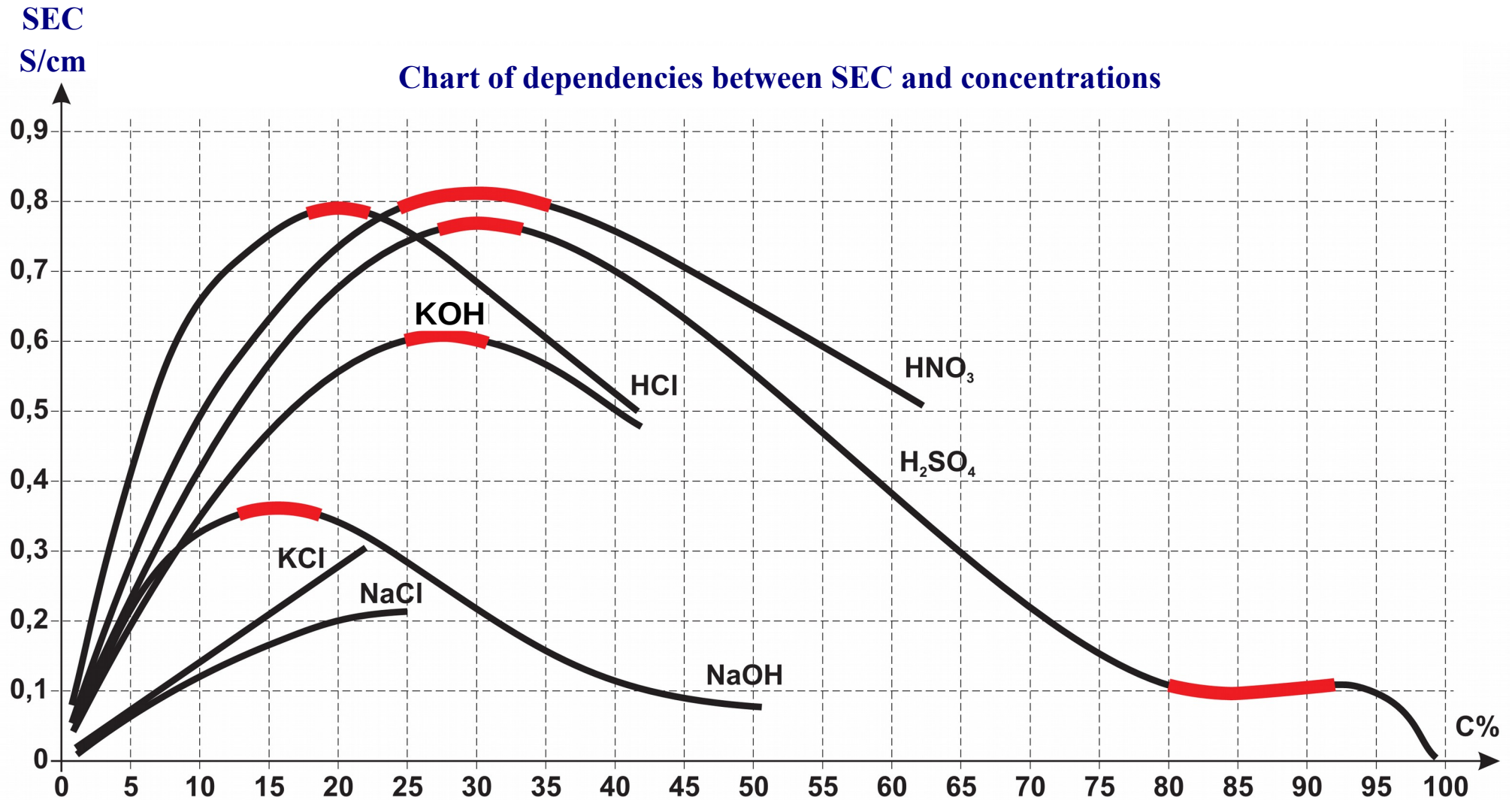
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**Chart of dependencies between SEC and concentrations**





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## Industrial pH/ORP-meters

### With passive primary transducers (sensors)



Output signals:  
analog current,  
RS-485,  
relay

**L<10m**

### Transmitters



**pH-4101**

Output signals:  
analog (0..5), (0..20), (4..20) mA,  
or RS-485

**L<800m**

### With active primary transducers (sensors)



Output signals:  
analog current,  
RS-485 (exclude pH4121),  
relay

**L<800m**



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## pH-4121.NP industrial pH/OPR-meter for Nuclear Plants



**pH-4121.NP** is a single-channel measuring instrument and consists of a primary transducer (PP) and a measuring instrument (PI).

PP consists of an electronic unit and a holder, in which a pH electrode is installed.

The pH meter is intended for use in hard environments, namely: seismic resistance, hard climatic conditions, radiation resistance, difficult environment for electromagnetic compatibility (EMC).

**pH Measurment range:**

(0...14) pH

**ORP Measurment range:**

(-1500...1500) mV

**Functions:**

Measurement pH/ORP, Temperature; Alarming; Thermal compensation, Indication, Signal conversion

**Seismic resistance:**

Category II for NP-031-01 (Rus)

**Electromagnetic compatibility:**

IV by GOST 32137 (Rus), criterion A

**Radiation resistance:**

Sensing PP unit is resistant to Absorbed dose rate of – up to  $1,3 \times 10^5$  Gy

Electronic PP unit is resistant to Absorbed dose rate of  $< 150$  Gy

**Safety class:**

**3H, 4H**

**Output signals:**

analog (0..5), (0..20) or (4..20) mA; 2 relay





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## pH-4122.NP Two channel industrial pH/ORP-meter for Nuclear Power Plants



pH-4122.NP is a two-channel analyzer and consists of one or two primary transducers (PP) and measuring instrument (PI). PP consists of an electronic unit and pH-electrode installed in the holder.

pH meter designed for use in hard environments. **For use in radiation areas, holder with a pH-electrode can be mounted at a up to 20 m distance from the electronic unit of the PP with a special cable .**

Automatic diagnosis of the electrode function is available.

**pH Measurment range :**

(0...14) pH

**ORP Measurment range:**

(-1500...1500) mV

**Functions:**

Measurment of pH/ORP, Temperature; Alarm;  
Thermal compensation, indication, signal conversion

**Seismic resistance:**

Category II for NP-031-01 (Rus)

**Electromagnetic compatibility:**

IV by GOST 32137 (Rus), criterion A

**Radiation resistance:**

Sensing PP unit is resistant to Absorbed dose rate of – up to  $1,3 \times 10^5$  Gy

Electronic PP unit is resistant to Absorbed dose rate of <150 Gy

**Safety class:**

**3H, 4H**

**Output signals:**

analog (0..5), (0..20) or (4..20) mA; RS-485, 4 relay



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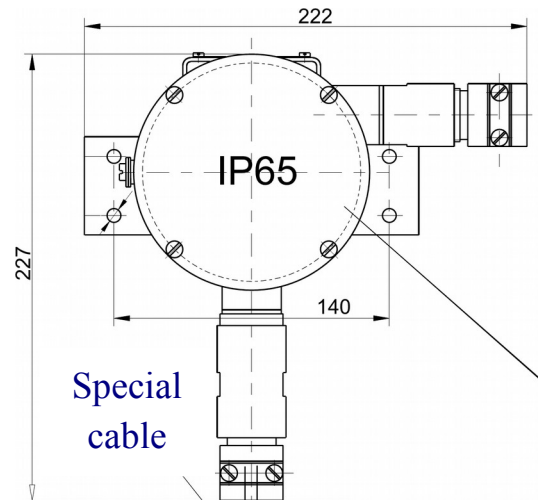
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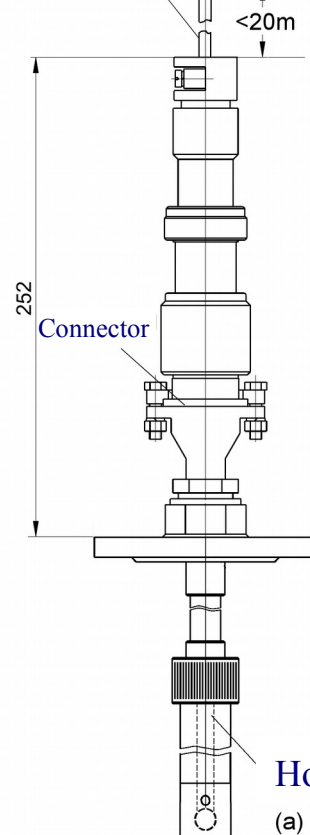
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## Types of pH-meters primary transducers for nuclear power plants



Transducer

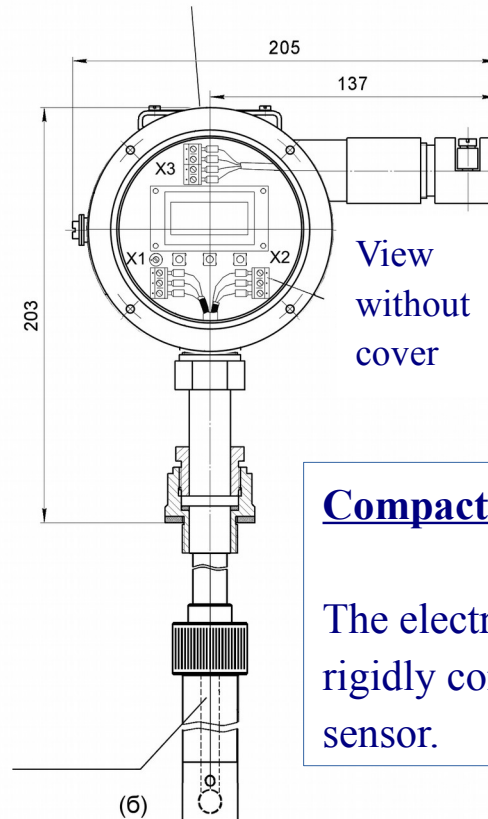


Holder with electrode

(a)

**Split**

The electronic unit can be mounted to a distance of 20 m from the sensor using a special non-flammable cable that is resistant to radiation.



View without cover

### **Compact**

The electronic unit is rigidly connected to the sensor.

(b)



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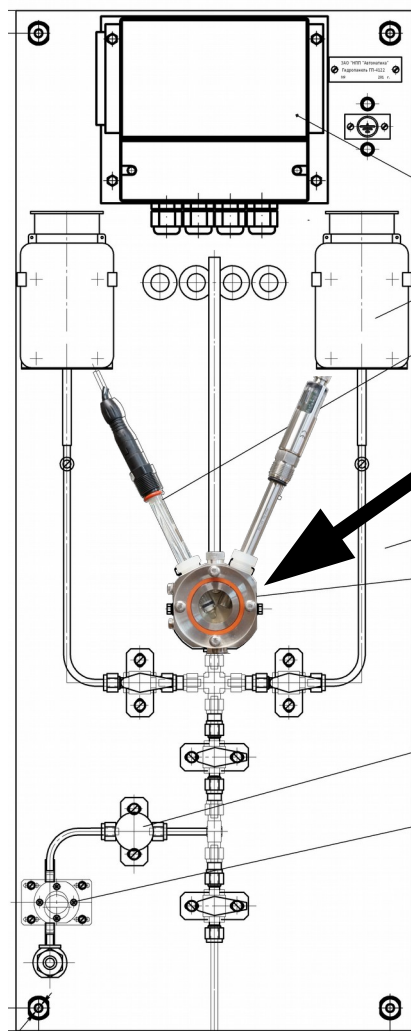
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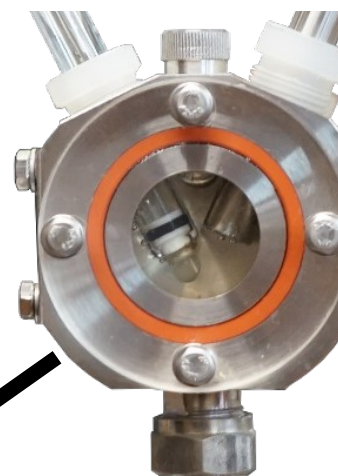
## Hydropanels HP-41xx with pH-4122.P



**HP-4122.1**



**HP-4122.2**



**Innovative stainless steel measuring cell with a transparent window for visual observation.**

### **Benefits:**

1. Automatic Measurement:
  - pH
  - Temperature (T);
  - Flow (F).
2. Thermal compensation
3. Current output (4..20) mA, RS-485 interface.
4. Alarms when parameters go beyond settings (pH, T);
5. Calibration without dismounting
6. Ionotrode Electrode for High Purity Water
7. Data logging, charts



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## pH/ORP meter pH-4101.Ex



«S»



«D»



«I»

pH-4101 is designed to automatically measure the pH/ORP of the analyzed liquid and can be completed with flow type or immersion type holders for the combined electrode.

pH meter-transmitter provides measurement, indication of pH/ORP and fluid temperature, conversion of measured pH/ORP to a unified DC signal (4..20) mA or RS-485 digital signal.

pH meters pH4101.I-Ex (electronic unit of PP in this case "I") have the type of explosion protection "flameproof enclosure" marked "1Ex d IIB T6 X" according to GOST R 52350.1 (Rus).

**pH Measurment ranges:**

(0...14) pH

**ORP Measurment ranges:**

(-1500...1500) mV

**Functions:**

Measurement pH/ORP, Temperature; Signaling; Thermal compensation ,  
Indication, Conversion of signals to (4..20) mA, RS-485

**Resistance to dust and water:**

IP65

**Resistance to vibrations:**

V2

**Output signals:**

analog (0..5), (0..20) or (4..20) mA or RS-485





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Provides maximum accuracy over a long period of time.

Stable measurements in samples with low conductivity of not less than **0.2  $\mu$ S/cm**

Side tap for tube to 3M KCl electrolyte vessel



**IonoTrode**



**InchTrode**



**MS  
Polilyte Plus**



**Polilyte Pro**



### Characteristics

- operating temperature: **0..140 °C**
- pressure: **0..6; 0..50 bar**
- connections
  - MS – contactless
- MemoSens**
  - VP - detachable
  - cable
- Chemical resistance: to HF, CO<sub>2</sub>
- with electrolyte pressurization
- SinglePore technology, triple diaphragm for working in contaminated solutions



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## DO-5101 Dissolved oxygen analyzer

Designed to measure the concentration of dissolved oxygen and the temperature of the analyzed liquid.

Consists of one amperometric sensor, a flow meter (optional) and a wall-mounted measuring instrument.

It is completed with submersible fittings or the HP-5101 hydropanel with a flow measuring cell for the analysis of highly pure water.



### Measurement ranges:

**O<sub>2</sub>:**

(0,0...1999)  $\mu\text{g}/\text{dm}^3$ , (0,0...2000...20000)  $\mu\text{g}/\text{dm}^3$

(0...2,000...19,99)  $\text{mg}/\text{dm}^3$

(0...200) %

**Flow** - (0,9...48) l/h

**Functions:** measurement, charts, thermal compensation, compensation for changes in atmospheric pressure, salinity compensation, calibration to atmospheric air

**Output signals:** two analog (current); RS-485; three relay





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## DO-5102 Two channel dissolved oxygen analyzer

Designed to measure the concentration of dissolved oxygen and the temperature of the analyzed liquid.

Consists of one or two amperometric sensors, a flow meter (optional) and a wall-mounted measuring instrument.

It is completed with submersible fittings or the HP-5101 hydropanel with a flow measuring cell for the analysis of highly pure water.



### Measurement ranges:

**O<sub>2</sub>:**

(0,0...1999) µg/dm<sup>3</sup>, (0,0...2000...20000) µg/dm<sup>3</sup>

(0...2,000...19,99) mg/dm<sup>3</sup>

**(0...200) %**

**Flow - (0,9...48) l/h**

**Functions:** measurement, charts, thermal compensation, compensation for changes in atmospheric pressure, salinity compensation, calibration to atmospheric air

**Output signals:** two analog (current); RS-485; four relay



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## DO-5111 Dissolved oxygen analyzer optical

Designed to measure the dissolved oxygen and the temperature of the analyzed liquid, with digital and graphical indication of the measured parameters.

It consists of a single optical sensor with a fluorescent sensitive surface, and a measuring instrument for switchboard or wall mounting.



### Benefits of optical dissolved oxygen sensors over membrane sensors

- low inertia, fast response;
- independence of measurements from the sample flow rate;
- durable construction - no fragile membrane;
- does not require polarization (unlike membrane sensors);
- high measurement stability;
- weak dependence on contamination and air bubbles;
- does not require permanent maintenance;
- large time interval between calibrations.

### Measurement ranges:

**O<sub>2</sub>** (0..2000,00) µg/dm<sup>3</sup>

**T** (0..85) °C (max 140 °C)

**P** (-1..0..+12) bar

**Response time** 90 c.

**Flow** (0,9...48) l/h

**Functions:** indication of measured values, charts, thermal compensation, compensation for changes in atmospheric pressure, salinity compensation, calibration by atmosphere air

**Output signals:** two analog (current); RS-485; four relays





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## APK-5112 Two channel Dissolved oxygen analyzer optical



Designed to measure the dissolved oxygen and the temperature of the analyzed liquid, with digital and graphical indication of the measured parameters.

It consists of a single optical sensor with a fluorescent sensitive surface, and a measuring instrument for switchboard or wall mounting.

Sensor cleaning by liquid stream is available.

### Measurement range:

$O_2$	(0..20,00) $\mu\text{g}/\text{dm}^3$ ; (0..200) %
T	(-5..50) $^{\circ}\text{C}$
P	manual set
Flow	(0,9...48) l/h

**Functions:** indication of measured values, charts, thermal compensation, compensation for changes in atmospheric pressure, salinity compensation, calibration by atmosphere air

**Output signals:** two analog (current); RS-485; four relays



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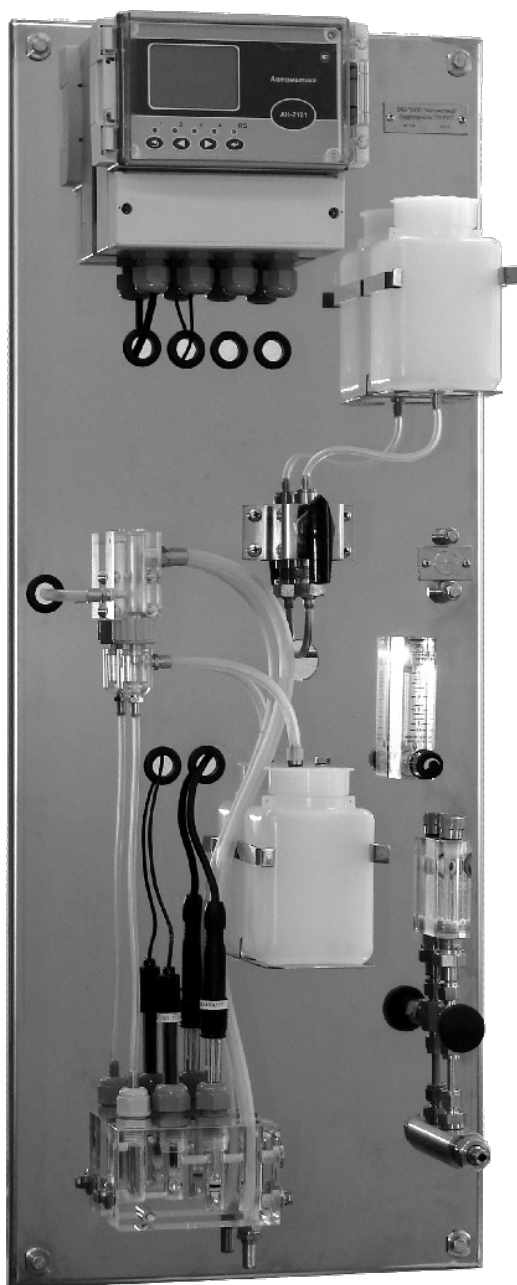
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## SA-7101 Sodim analyzer industrial

Sodium analyzer SA-7101 (analyzer) is designed for measuring activity level (pNa) and mass concentration (cNa) of sodium ions in chemically demineralized water, high pressure boilers, steam condensate and turbines. It also designed to monitor the quality of H<sup>+</sup> cation-exchange filters.

The analyzer provides measurements of temperature of the analyzed fluid and of degree of hydrogen ions (pH) activity.



<b>Measurement range:</b>	<b>pNa</b>	(2,36... 8,36)
	<b>cNa</b>	(0,1...100000) µg/dm <sup>3</sup>
	<b>pH</b>	(0...14) pH
	<b>Flow</b>	(0,9...48) l/h

**Functions:** Measurement, Indication, Alarm, Thermal Compensation, Transformation, Charts, Data logging

**Output signal:** two analog (current); RS-485; eight relays

**Alkalinizing agent:** diethylamine, ammonia



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## TA-8122 Turbidity analyzer



Designed to measure the turbidity of water and water solutions.

Measurement method – nephelometric.

Optical turbidity sensors TU 8355, TU 8555, TU 8325, TU 8525 are connected to the controller TA-8122.

Submersible sensors TU8355, TU8325 have a nozzle for cleaning optical lenses with compressed air.

Flow sensors TU 8555, TU 8525 are installed in a flow measuring cell TU 910 or tee.

**Measurement:  
range**

**turbidity:** sensors TU 8355, 8555 (0...100,0); (0...1000); (0...10000) **FTU**  
**turbidity:** sensors TU 8325, 8525 (0...4,000); (0...40,00); (0...400,0) **NTU**

**Flow:** (0,9...48) l/h

**Functions:**

Measurement, Indication, Alarm, Thermal Compensation, Conversion, Charts, Data logging, Self-diagnosis of lens cleanliness, Checking fluid presence, Checking exterior lighting; Cleaning the sensors with compressed air

**Output signals:**

two analog (current); RS-485; four relays



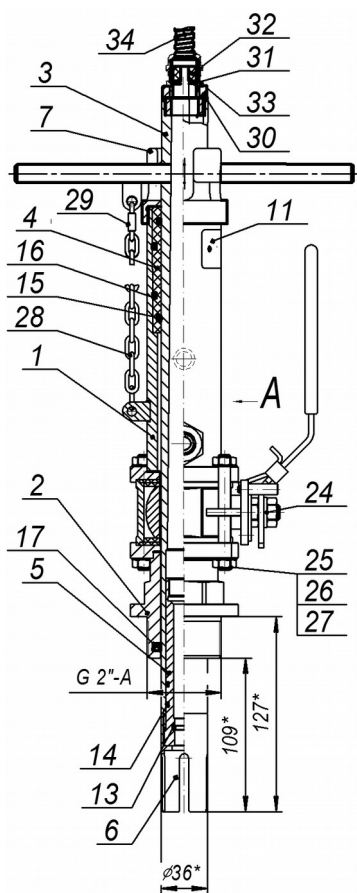
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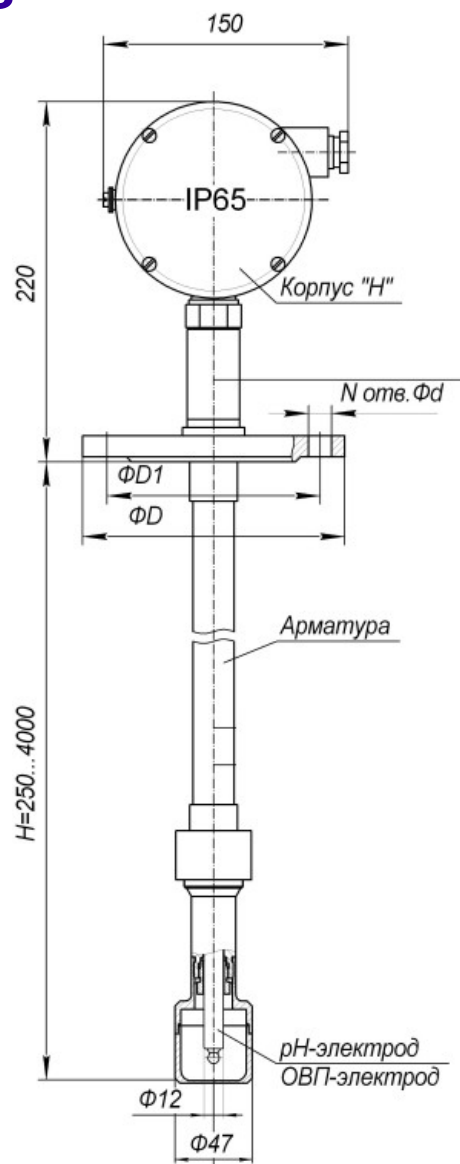
[www.conductometer.com](http://www.conductometer.com)

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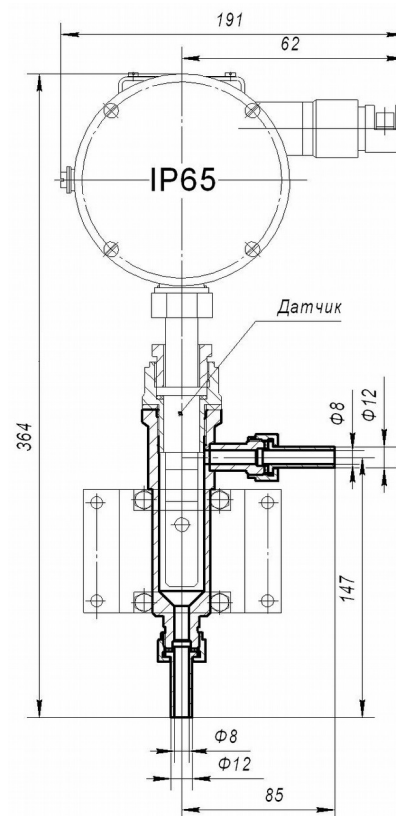
## Holders (fittings) for electrodes and sensors



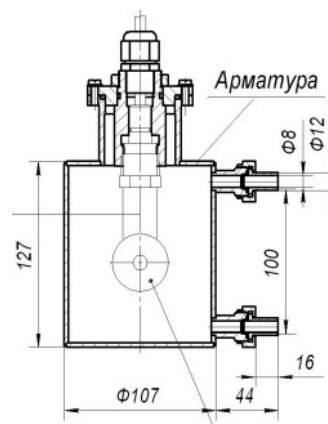
**SHP-4**



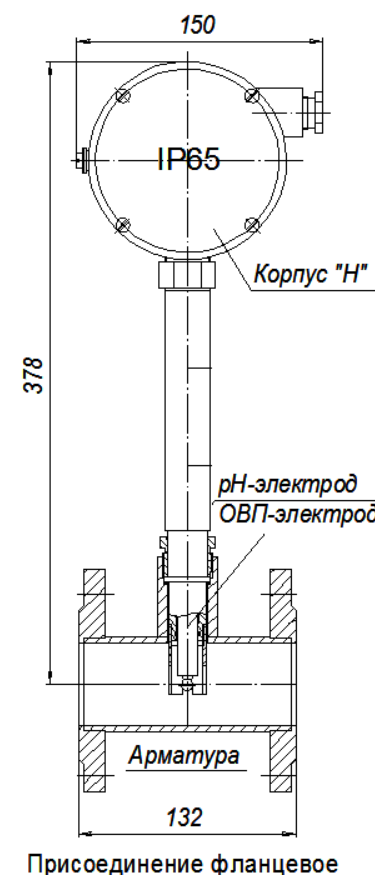
**SHP-1.1**



**SH-1.5**



**SH-1.4**



**LH-1.1**





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## Installation of analyzers in cabinets



**Cab-1 (IP54)**  
ambient temperature  
(+5 .. +50) °C



**Cab-2 (IP54)**  
ambient  
temperature  
(-40 .. +50)°C



**Cab-3 (IP54)**  
ambient temperature  
(-50 .. +50)°C

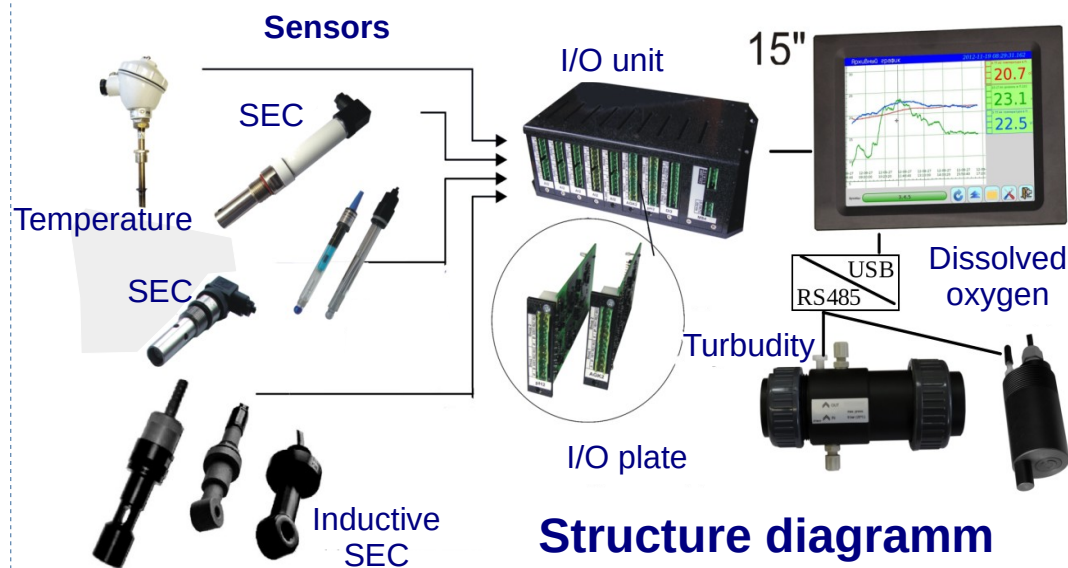
## Multiparameter Fluid Analyzers



**ER-12**  
Main block



**ALM-2.01**  
Analyzer of liquids  
multiparameters  
two channels





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## Sample Preparation Device **SPD**



The sample preparation device is designed to adapt the measured medium for analysis, namely:

- cooling by changing the flow rate of the refrigerant;
- pressure reduction;
- mechanical cleaning;
- stabilization of the flow rate;
- indications of flow rate, temperature, pressure.

Conductometric fluid analyzers, pH meters, and other fluid analyzers are installed on the SPD.

### **SPD characteristics**

Inlet temperature

- **200** °C / 1 heat exchanger (HE)

- **380** °C / 2 HE

- **565** °C / 3 HE

Inlet pressure, max

**40MPa**

Sample flow measurement range

**(10..70) l/h**

Sample temperature at outlet, max

**45 °C**

Sample pressure at outlet, max

**0,02 MPa**

Number of heat exchangers

**1 or 2 or 3**

Refrigerant temperature, max

**40 °C**

Refrigerant pressure, max

**4 MPa**

Number of analyzers

**up to 4**





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## Thermometers, temperature controllers

Inputs: thermometers Cu, Ni, Pt  
thermocouples: A-1, A-2, A-3, B,E,J,K,L,M,N,S,R,T  
Measurement range:  $(-50..+1200) ^\circ\text{C}$   
Accuracy, %: 0.5, 1.0

**Temperature converters**  
Output signal:  $(4..20) \text{ mA}$   
Programmable



### Temperature controllers

Current output:  $(0..5)$ ,  $(0..20)$ ,  $(4..20) \text{ mA}$   
Interface: RS-485 (Modbus),  
Discrete output: 2 dry contacts  
Inputs: thermometers Cu, Ni, Pt  
Thermocouples: A-1, A-2, A-3, B,E,J,K,L,M,N,S,R,T



**Temperature transmitters**  
Current output:  $(4..20) \text{ mA}$ , **HART**  
Interface: RS-485 (Modbus)  
Probe length up to 2m

## Pressure gauges, vacuum gauges



**Pressure transmitters:**  
Output signal:  $(4..20) \text{ mA}$



Inlet pressure

### Controllers

Input: overpressure / rarefaction of non-aggressive and aggressive gases and liquids  
Current output:  $(0..5)$ ,  $(0..20)$ ,  $(4..20) \text{ mA}$   
Interface: RS-485 (Modbus),  
Discrete output: 2 dry contacts

Measurement range:  
Middle:  $(-60..0..4000) \text{ kPa}$   
Small:  $(-125..0..+125) \text{ Pa}$   
Accuracy, %: 0.25; 0.5; 1



**ECM**  
**Electrocontact**  
**manometers**  
**(vibration-resistant)**

Current output:  $(4..20) \text{ mA}$   
Discret output: 2 dry contacts  
Indication: 7segm LED  
Interface: RS-485 ModBus



**Pressure**  
**transmitters**  
**with indication**

Current output:  
 $(4..20) \text{ mA}$ , **HART**  
Indication: 7segm LED  
Interface: RS-485 ModBus



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## Level meters of liquids

**Measurement range:**

(0..0.1) m  
(0..0.5) m  
(0..5.0) m  
(0..10) m  
(0..20) m  
(0..40) m  
(0..60) m

- on request

**Accuracy, %:** 0.5; 1.0



**Level controllers**

Current output:

(0..5), (0..20), (4..20) (mA)

Interface: RS-485 (Modbus),

Discrete output: 2 dry contacts



## Liquid level alarm

**Measuring principle:** conductometric

**Limit of switching by Conductivity (resistance) of fluid (jumper selectable)**

- 1: 8  $\mu$ S / cm (25 kOhm)
- 2: 80  $\mu$ S / cm (2.5 kOhm)
- 3: 800  $\mu$ S / cm (250 Ohm)
- 4: 8000  $\mu$ S / cm (25 Ohms)

**Output signal:** relay

standard: ~ 220V, 7A; = 30V, 7A

reinforced: ~ 250V, 16A; = 24V, 16A

= 50V, 1A; = 300V, 0.3A







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## Supply of analyzers to various enterprises of ROSATOM State Corporation

Safety class 3H, 4H  
Total: **530** analyzers.  
Including 2018 - **120** analyzers

### Customers:

1. Leningrad NPP-2.
2. Belarusian NPP.
3. Kursk NPP.
4. Novovoronezh NPP.
5. Balakovo NPP.
6. Rostov NPP.
7. Bushehr NPP (Iran).
8. "Mayak" (Chelyabinsk).
9. Kudankulam NPP (India).
10. Mining and Chemical Combine (Zheleznogorsk).

## References for analyzers by NPP Automatica, JSC (Russia)

