ABS HOLDINGS

ABS ZEiM Automation

Nomenclature products

ABS Holdings

ABOUT THE COMPANY

Open Joint Stock Company ABS ZEiM AUTOMATION – is one of the leading enterprises of the electrical industry in Russia. It is involved in the development and turnkey introduction of automated process control systems, production of a wide range of control devices for industrial automation systems.

ABS ZEiM AUTOMATION is one of the basic structures of the International holding company ABS-Holdings, which unites eleven enterprises on the territory of Russia and Western Europe. ABS-Holdings over 50 years renders services in electrical power engineering, oil, gas, metallurgy, mineral resource and other system forming branches of industry.

ABS ZEiM AUTOMATION develops, produces, delivers and maintains the following types of products:
- KPOCC-500, P-130 industrial controllers;
- process control and monitoring devices;
- process facilities measuring and automation devices;
- electric actuators for piping and shutoff and control valves in industrial, dust-ignition-proof versions and version for nuclear power plants;
- low-voltage complete devices for mechanisms and electric motors control.

ABS ZEiM AUTOMATION work is based on the effective production and control. Considerable sums of money are invested in technical reequipment and introduction of the most up-to-date technologies. Devices with high degree of automation produced by the world best manufacturers are of priority.

The key factor that helps to increase the productive efficiency is the operating ERP-system providing informational support for solving operational, tactical and strategic control problems. Active cooperation with the domestic leading research, Design institutes and design offices enables to maintain high level of development and process designs.

Compliance with the quality control system ISO 9001:2000 requirements is proved by the certificates TUV Hessen CERT and EUROCART (Germany). All the products are certified and comply with the regulating documents of the Federal Service Technological Supervision and GosAtomNadzor. Testing laboratory and metrological service are accredited by the Federal Agency for Technical Regulation and Metrology.

The catalogue includes a list of the manufactured products and their specifications and engineering services. Detailed descriptions of design features and operating characteristics, overall and connecting dimensions, electrical diagrams are given in our website www.abs-zeim.ru and also in the following catalogues:
- Single-turn fitting electric actuators
- Multiturn fitting electric actuators
- Straight running Valves electric actuators
- Intellectual electric actuators;
- Pipeline Valves sets with electric actuators of ABS ZEiM AUTOMATION;
- Microcontrollers;
- Engineering.

CONTENT

SECTION 1. ENGINEERING

ABS Holdings is the international holding, which over 50 years renders services to EPCM in electrical power engineering, oil, gas, metallurgy, mineral resource and other system forming branches of industry. ABS unites eleven enterprises on the territory of Russia and Western Europe and is engaged in developing turnkey power systems.
The Holding enterprises have a rich base for equipment and components production and specialize in production process automation, electrical energy transmission and distribution control, engineering.

Open Joint Stock Company ABS ZEiM AUTOMATION (member of ABS Holdings) – is one of the leading enterprises of the electrical industry in Russia. The company has a many years' experience in energy-saving. One of the company's activities is connected with the development and turnkey introduction of automated process control systems, production of a wide range of control devices for industrial automation systems.

ACSTP engineering department is the structural subdivision of the plant that develops and introduces automated process control systems (ACSTP), supervisor control and data acquisition systems (SCADA), automated power supply monitoring and control system (APSMCS) and other industrial automation systems.

COMPANY PROFILES

Heat and Power Engineering
Realization of the projects of automation, processes supervision, creation of monitoring and control systems in heat and power engineering objects (heat and power plants, GRES power plants, district heating plants, boiler plants, heat networks).
Development of automated control systems for:
- steam, hot-water, power boilers;
- turbounits, steam turbines, exhaust-heat boilers;
- gas-turbine units;
- common (plant) boiler units;
- independent boilers;
- heat points (central and individual).

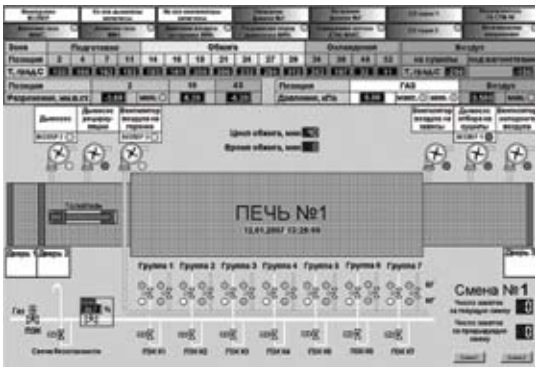
Electric Power Engineering
Realization of the projects of "APSMCS" automation, supervision and introduction in electrical power engineering objects (hydropower plants, heat and power plants, electric networks, substations, etc.).

Industry
Realization of the projects of processes modernization and reconstruction, also automation, supervision and "ASKUE" introduction in different industries.
Development of automated control systems for:
- technological processes in food, chemical, petrochemical, oil-producing, oil/gas refining metallurgy and construction materials industries;
- heating in food, oil-producing, oil-refining industries (etc.)
Production of automated systems for technical and commercial power supply and other energy resources control.

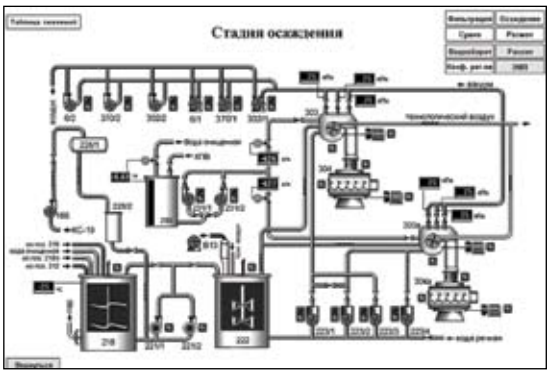
Residential Component, Utilities
Realization of the projects of creating automated control, supervision systems in the objects of residential component and in small motors sector:
- houses "SCADA" (one-house and one-flat power supply control, room access control, etc.);
- intellectual buildings (central heating, ventilation, conditioning, hot and cold water supply, lightning systems control, etc.).

Water Supply and Water Discharge
Realization of the projects of water supply and water discharge distributed objects automation and supervision. Development and introduction of complex projects on modernization water supply systems with the use of modern technologies (including full automation).

Gas Supply.
Realization of the projects of gas supply and distribution systems automation and supervision (gas-distributing points, gas-distributing stations, etc.).



Symbolic circuit of a tunnel oven



Symbolic circuit of the chemical process

Software and Hardware Complexes (SHC)

- **"ZEiM ACSTP"** SHC are used to develop or modernize automated process control systems ("ACSTP") in heat and power engineering, food, chemical, petrochemical, oil-producing, oil/gas refining metallurgy and construction materials and other industries;

- **"ZEiM SCADA"** SHC are applied to develop supervisor control and data acquisition systems ("SCADA") for distributed engineering heat supply objects (independent boilers, central and individual heat points), power supply objects (distribution points, transformer substations, lead-in distributors), water supply and water discharge objects (step-up pumping stations and sewage pumping stations), gas supply and distribution objects (gas-distributing points, gas-distributing stations, gas-distributing department), and also plumbing installation (office buildings, dwellings, hydraulic facilities and hydropower plants), and other objects.

- **"ZEiM APSMCS"** SHC are used to develop automated power supply monitoring and control system ("APSMCS") for generating organizations and industrial enterprises (technical and commercial control) and

"ZEiM ACSTP", "ZEiM SCADA" and "ZEiM APSMCS" SHC are made on the basis of up-to-date microprocessor equipment and software, produced in Russia and abroad:
- KROSS-500 controllers (ABS AUTOMATION, OJSC);
- RCS INDUSTRIAL IT 800xA, Freelance 800F (ABB);
- RCS Experion RKS (Honeywell);
Simatic S7 controllers, SCADA-system WinCC (Siemens);
- OVEN PLK controllers ("OVEN");
- Controllers I-7188, I-8000, WinCon-8000 (ICP DAS);
- SCADA SoftLogic- system TRACE MODE (ADAstrA Research Group).

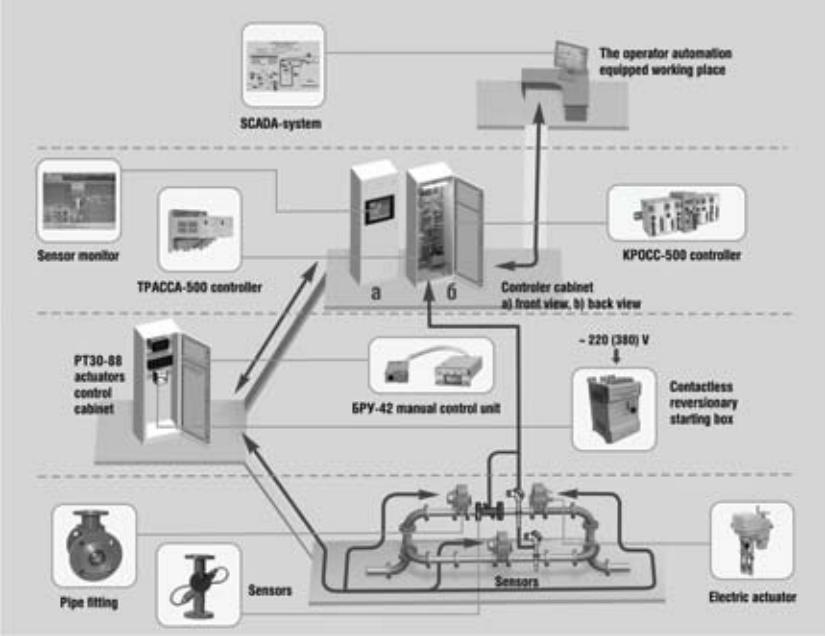
Control cabinets.

Control cabinets are highly compatible purpose products, including modern microprocessor and other devices components. They are intended for a wide range of automation and supervision tasks. Control cabinets are developed on the basis of the control devices produced by ABS AUTOMATION, OJSC and other manufacturers and software for our product.

Typical control cabinet

Open Joint Stock Company ABS ZEiM AUTOMATION produces a wide range of automation devices, therefore 70% of the automated process control systems components are our products. So it makes easier post-warranty service spare parts delivery during operation life. Devices of other produces are supplied optionally. Installation contractors or the Customer traffic department are to install the equipment.

List of automation equipment produced by ABS ZEiM AUTOMATION:
- actuators (single-turn, single-turn flange, multiturn, straight-running, single-turn shut-off electric actuator)
- electric power Valves ;
- process control and regulation devices;
- process facilities automation and measurement devices;
- microcontrollers aimed at automating objects of various complexity;
- project configurable control cabinets.



Supervision system based on the ABS ZEiM AUTOMATION equipment

EXAMPLES OF THE REALIZED POGRAMMES

Description of the project	Object	Year of realization	Results
Heat power engineering			
ACSTP E-50-3.9-440ГМ st. №1 boiler unit	Branch of the public JSC "Volga TGC" "Satatovskaya GRES", Saratov	2005	Enforcement of safety rules and other practices in gas supply facility
SCADA modular boiler room (2 Ferroli boilers and boiler equipment)	"ChuvashSetGas" JSC, Cheboksary, boiling house, Franko Street	2005	Enforcement of safety rules and other practices in gas supply facility, signaling to the dispatcher point
Full-scale ACSTP ПТВМ-50 st. №1 boiler unit of boiler room №3	Branch "Rostovskaya Gorodskaya Generatsiya", TGK № 8 JSC, Rostov-na-Donu	2004-2006	Enforcement of safety rules and other practices in gas supply facility
ACSTP district heating station "Peredelkino"	District heating station "Peredelkino"	2005-2006	Plant equipment control, technical-and-economic index calculation
ACSTP district heating station "Zelenograd"	District heating station-3 "Zelenograd"	2005-2006	Plant equipment and two boiler-utilizers control, technical-and-economic index calculation
ACSTP ПГУ-ТЭС district heating station "Strogino"	District heating station "Strogino"	2004-2006	Control and regulation for boiler-utilizers, common plant equipment, booster gas compressors, steam turbines. Connection with automatic regulating system gas turbine units.
БКЗ-210 boiler unit automatic control system	"Khabarovskenergo", Khabarovsk	2006	Enforcement of safety rules and other practices in gas supply facility
Regulating system of boilers № 3Б (ТПЕ-429) gas burners of Kirovskoi TPP-5	ОСП "Kirovskaya TPP-5" Kirovsky branch of the TGK-5 JSC'	2006-2007	Enforcement of safety rules and other practices in gas supply facility; design
SCADA boiler room Kommunalnye Technologii, Ltd. (3 independent boiler houses, 2 hot water boilers in each)	Kommunalnye Technologii, Ltd. , Cheboksary	2006-2007	Enforcement of safety rules and other practices in gas supply facility
ACSTP E-75-3.9-440ГМ-2 St. №3 boiler unit	Branch of the public JSC "Volga TGC" "Satatovskaya GRES", Saratov	2007	Enforcement of safety rules and other practices in gas supply facility: design
Two ДКВР-10/13 boiler units, full-scale ACSTP	JSC Saranovskaya mine "Rudnaya", Sarany settlement, Permsky Krai	2007-2008	Automatic firing of boiler units with automatic with process safeguards automatic input/output, automatic regulation of the basic characteristics and other automatic process control system functions.
Electrical power engineering			
SCADA of the city electric network: subsystems of dispatcher panel control, communication, burglar alarm, telesignalization and telemetry of distributing points	JSC "Cheboksarskiye Gorodskiye Electricheskiye Seti", Cheboksary	2003-2005	On-line display of the city power supply diagram, burglar alarm in all the 33 distributing points, telesignalization and telemetry of distributing points
Automated Informational-Measuring System of Hydraulic engineering structures engineering data control	JSC "Cheboksary power plant", Cheboksary	2005	Distributing system of on-line control, alarm and the station bipper condition registration. Connection with station ACSTP.
APSMCS of the Kazan State Technical University named after A.N.Tupolev distributed objects	Kazan State Technical University named after A.N.Tupolev, Kazan	2006	General contractor – "MELT, Ltd., Kazan. Control of electric energy and power
Telemechanics system and Valaam diesel power station APSMCS	Valaam, Leningradskaya Oblast Industrial ACSTP	2006-2007	General contractor – ИСБ, Ltd., Saint-Petersburg. Control cabinets design, assembly and the system delivery

Продолжение таблицы

Description of the project	Object	Year of realization	Results
ACSTP of sodium percarbonate of the first and the second queue production.	"Percarbonate" JSC, Novocheboksarsk	2000-2004	All scope of manufacturing automation activities
ACSTP for diphenylguanidine of the first and the second queue production., APSMCS	Joint venture "Pronova, Ltd.", Novocheboksarsk	2001-2004	All scope of manufacturing automation activities, power consumption data transmission to the level of EPR-system (CAM system KHIMPROM JSC)
Development of ACSTP for boiler room (boiler unit ДКВР-6.3/13, ДЕ-6.3/13, common boiler equipment) and the plant central thermal point	"ZEiM" JSC, Cheboksary	2003	Regulatory requirements implementation, improvement of the work safety, energy saving
Full-scale ACSTP for ДЕ-6,56-14 two boiler units of the boiler room, pump station "Chetyrmanovo" oil-and-gas production department "Krasnokholmsk Neft"	ANC "BashNeft JSC", "BashNeft – Yanaul", Bashkortostan	2004	Enforcement of safety rules and other practices in gas supply facility
Tunnel oven №1 ACSTP	"Davlekanovsky Brick Plant", Ltd., Davlekanovo, Bashkortostan	2006	Brick production process control.
ACSTP of the oil gathering park "Krasnokholmsky", PIC "Krasnokholmsk Neft"	Branch of AHK "BashNeft JSC", "BashNeft – Yanaul", Yanaul, Bashkortostan	2006-2007	All the technological objects control and regulation
SCADA of oil wells – resumption of the Oil and gas production workshop-5 telemechanics system, Ishimbaisky Oil and gas production department	Branch of AHK "BashNeft JSC", "BashNeft – Ishimbai", Ishimbai, Bashkortostan	2006-2007	Design, Assembly, supply of the system: 57 control cabinets in Group Metering Station, "Sputnik" type and others (wireless)
Modernization of the oil refinery working fire and gas safety system - middle distillates hydrotreater	Nizhnekamsky Oil Refinery TAIF NK JSC, Nizhnekamsk, Tatarstan	2007	In cooperation with ABB-AUTOMATION, LLC– replacement of the outmoded ABB production system (August) by the recent ABB development – Industrial IT 800xA system, data transmission to the working distributed control system (DCS) based on Advant MOD 300. Design, delivery of server, controller, input-output unit cabinets on the basis of the Industrial IT 800xA software and hardware complex, erection supervision work and start-up works, putting the system into operation.
Modernization of the upper level of the distributed control system (DCS) INFI-90, Zaikinsky gas-processing plant	Zaikinsky gas-processing plant ORENBURG NEFT JSC, Tuylpan settlement, Orenburgskaya oblast	2007-2008	Smooth retrofit of the outdated INFI-90 system-replacement of the upper level equipment, controllers, input-output system expansion. Design, delivery of Automation equipped working place together with servers and INFI-90 package, erection supervision work and start-up works.
Automated energy-intensive equipment telecontrol system	PROMTRACTOR-PROMLIT, Ltd., Cheboksary	2007-2008	Control and supervisory control of outdoor lighting and overhead illumination system, power supply, ventilation system and supervisory heat-treating and electric arc furnaces interlock
Residential Component, Utilities			
Automated heat energy supply and heat carrier control system in the city residential area (31 object)	Microdistricts 12-13 of the Novoyuzhny district, Cheboksary	2003-2004	Heat energy and hot water saving is 10-15% (as per postproject audit)

Description of the project	Object	Year of realization	Results
Automated administration building utilities supervisory control system	Administration building of the Chuvash Republic executive authorities, Cheboksarry	2005-2007	Dispatching of all the main building and block "B" utilities (conditioning and ventilation system, hot and cold water supply, heating system; outdoor lighting, power facilities; power supply, smoke control system, sprinkler)
Automated dwelling houses supervisory control system	Novocheboksarsk	2005-2007	The project of dispatching and door-to-door dwelling houses costing. Cold water supply costing in 11 houses
Water Supply and Water Discharge			
City water supply SCADA (relay pumping stations, terminal pump stations, water control chambers, city central control station)	MUE VODOKANAL, Novocheboksarsk	2005-2006	City water supply utilities operation control
Joint project of workshop on electric welding pipes №3 upgrade. Heat strengthening area formation. Local recovery circuit. Treatment facilities	VYKSA STEEL WORKS JSC, Vyksa, Nizhegorodsky Region	2006	City water supply utilities operation control
Joint project of workshop on electric welding pipes №3 upgrade. Heat strengthening area formation. Local recovery circuit. Treatment facilities	VYKSA STEEL WORKS JSC, Vyksa, Nizhegorodsky Region	2006	Treatment facilities: design, supply with equipment
Gas Supply			
Design works on gas metering station refurbishment in 22 boiler houses of the Chuvash Republic in order to develop an automated gas fiscal metering system Design works on gas metering station refurbishment in 22 boiler houses of the Chuvash Republic in order to develop an automated gas fiscal metering system	CHUVASHREGIONGAS, Ltd., Cheboksary	2006	Detailed design of gas metering station refurbishment in 22 boiler houses of the Chuvash Republic are worked out (in accordance with GAZPROM JSC programme)

LICENSES AND CERTIFICATES

Licenses of the Federal Agency for Construction, Housing and Public Utilities №№ ГС-4-21-02-26-0-21280006240-004274- 1 (to 12. 09. 2010)
and ГС-4-21-02-27-0-21280006240-004273- 2 (to 0.10. 2012) for design and construction of buildings and facilities at building criticality rating 1 and 2 in compliance with the State Standard.

ROSTECHNADZOR (Federal Service for Ecological, Technological and Atomic Supervision) permit for design, installation and start-up of the gas distribution and consumption facility hazardous equipment (to 26.05.2009).

Voluntary certification system conformity certificate in electrical power engineering EnSERTICO №№ ПР1599290208ПР1600290208 and ПР1601290208 (to 29.02.2011) for production, installation, start up, initial investigation, development of industrial and energy facilities: devices, apparatus, SHC automated process control system, automated informative electric power accounting system and SCADA.

Training certificates AdAstra Research Group (TRACE MODE 6 Advanced course), SIEMENS (courses ST-7PRO1 and ST-7PRO2 on SIMATIC S7 controllers programming), programming ABB AUTOMATION (training courses M202 Composer Engineering Software Tools and M203 Conductor NT, a special training course "Migration of MOD300, Advant/MOD300 to 800xA System"), Honeywell (course "Experion PKS Server Engineering and Configuration").

SECTOR 2. MICROCONTROLLERS
Thin Route Multifunctional Regulating Remikont P-130, P-130ISa Microcontroller

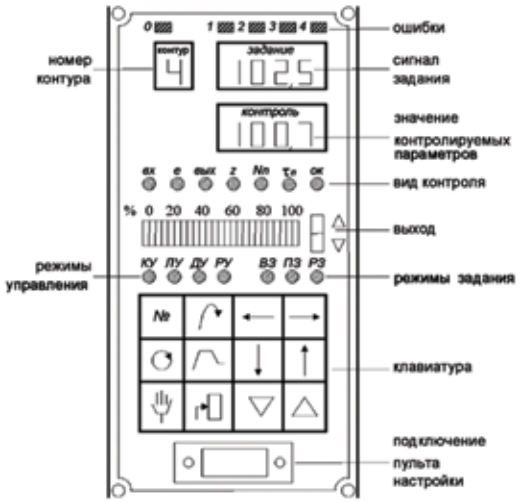
Code in Russian Classification of Products (RCP code)
RCP Code 42 1841

ТУ 25-7504.0064-91
Certificate of Conformity РОСС RU.АЯ15.Н00814
Federal Engineering Supervision Agency Permit -
№ РРС 00-14470

Configurations:
P-130 – Rremokont –130 with БК-1 controller unit
P-130ISa – Rremokont –130 with БК-1 М/01 controller unit

Purpose
The controller is used for automatic regulation and logical control of technological processes in electrical, power, chemical, metallurgy, food, cement, glass, and other industries.
Effectively solves both easy and difficult problems of control. The multifunctional controller enables to control a small apparatus on the one hand, and provides large control systems high survivability.

Design Features
Complex autodiagnostics, warning and fault identification tools are built in the controller, including components faults, signal output beyond the permitted range, RAM failure, circled net exchange failure, etc. Special quantized outputs are provided for remote failure signaling.



БК face panel (Regulating model)

Controllers configuration

P-130 and P-130ISa controllers are a complex of technical equipment.

Controllers consist of the following units:
• P-130 controller unit БК-1* (models: regulating 01, logical 02),
• P-130ISa controller unit БК-1 М/01 (model regulating 01),
• ПН-1* tuning board,
• РН-1 conditioning resistors,
• БП-1, БП-4 power unit,
• БУТ-10 low-level signals amplifier unit,
• БУС-10 resistive transducers signals amplifier unit,
• БУМ-10 power amplifier unit,
• БПР-10 shift unit,
• БШ-1* gateway unit,
• БСТ-1* Canceling unit,
• МБС instrumental circuits interlock connector
• КСБ-0 terminal and block connector (for common points propagation),
• КСБ-1 terminal and block connector (for БП-1, БУТ-10, БУС-10, БУМ-10),
• КБС-2 terminal and block connector,
• КБС-3 terminal and block connector (for the БК-1, БК-1М/01 and БПР-10 I/O discrete chains).

* - the units are a part of P-130 only and are not a part of P-130ISa

БК-1, БК-1М/01 controller units are central, the rest are auxiliary.
The central unit digitizes analog and discrete information, processes digital information and yields controls.
The auxiliary units are intended for thermocouples and resistance thermometers signal multiplication, forming discrete output signals of 220V, managing external switching and interlock, etc.
P-130 and P-130ISa controllers' layout enables the user to choose the required module and unit set in compliance with the I/O signals number and type.

Functions
Control loops number:
Up to 4 for P-130;
Up to 8 for P-130ISa.

Each loop functional characteristics:
• Regulator type – analogue, impulse;
• Mode – local, cascade, remote, manual;
• Task type – manual, programme, outer (supervisory);
• Law of control - Proportional/Integral/Derivative, Proportional/Integral, Proportional/Derivative, Proportional;
• Controlled parameters – task, input, discrepancy, output, arbitrary parameter value, programme parameter value, loop error,

Controllers' architecture provides manual or automatic control loops turn on, turn off, switch and reconfiguration. These operations are bumpless, irrespective of control structure complexity. In combination with analog signal processing the controller enables signals logical conversion and analog, impulse and discrete control commands production.

Two plug-in I/O computer-process interface modules are inserted into the controllers. The modules are chosen by customers from 7 computer-process interface module types (see table). Appliance of 7 computer-process interface module types' combinations creates 35 controllers configurations.

CPI interface module name and code		Number of input/output signals			
		Analog		Discrete	
Name	Code	Input	Output	Input	Output
Analog signal module	1	8	2	-	-
Discrete-analog module	2	8	-	-	4
Discrete signal module	3	-	-	-	16
Discrete signal module	4	-	-	4	12
Discrete signal module	5	-	-	8	8
Discrete signal module	6	-	-	12	4
Discrete signal module	7			16	-

Key specifications

Unified analog input signals		
Unified	0- 5 mA, Rвх=400 Om; 0 - 20 mA, Rвх=100 Om; 4 - 20 mA, Rвх=100 Om; 0- 10 В, Rвх=27 kOm	
Thermocouples	Chromel/alumel, chromel/copel, platinum-platinum-rhodium, platinum-rhodium, tungsten-rhenium as per GOST 3044-84	
Resistance thermometers	Copper RT, platinum RT as per GOST 6651-84	
Galvanic isolation	Each input is galvanically isolated from the other inputs and other circuits	
ATS conversion error	±0,4%	
Discrete input signals		
Space	0-7V	
Mark	16-30V	
Input current	7mA	
Galvanic isolation	The inputs are coupled in groups of 16; each group is isolated from other circuits	
Unified analog output signals		
Unified	0- 5 mA, Rн =2 kOм; 0- 20 mA, Rн =0. 5 kOm; 4- 20 mA, Rн =0. 5 kOm	
Galvanic isolation	The outputs are coupled in pairs; each pair is isolated from the neighboring pair and other circuits	
DAC conversion error	±0,5%	
Discrete impulse output signals		
Transistor output:		
Max. commutation voltage	40V	
Max. load current output	0,3A	
Galvanic isolation	The outputs are coupled in groups of 16; each group is isolated from other circuits	
Output:	High-current relay output	Low current relay output and abend exit
Max. commutation AC (rms) or DC voltage	AC 220V; DC 100V	AC 220V; DC 100V
Max. load current output	2A	0,1A
Galvanic isolation	The outputs are coupled in pairs; each pair is isolated from other circuits	Commutation parameters correspond to the РЭС-54А relay parameters

Software
The controllers are to be programmed by the specialists familiar with traditional automatic process control system control and management facilities, no programmers involved. Programmed information is not violated when switching off with the help of nonvolatile power supply.
Embedded software enables the controllers' performance check and setting.

P-130 Controller
Programming is fulfilled by extracting the required algorithms from the controllers' library. It has 76 embedded discrete and continuous information data processing algorithms, up to 99 algorithmical blocks to be filled with any algorithms from the library and their configuration with each other and the controllers' I/O.
Interface channels are Current Loop (ИРПС) or RS-232C.
Rate of exchange – 1.2; 2.4; 4.8; 9.6 Kbit/s.

P-130ISa Controller
The controllers have the embedded ISaGRAF target kernel executive that provides running programs written in the programming languages supported by the ISaGRAF system (IEC 61131-3 standard) in all languages. ISaGRAF is a public system produced by the company ICS Triplex. The system demands no professional knowledge in programming.
Supplied with RTOS.
The controllers have RS-485, RS-232, Modbus, TCP/IP (Ethernet) communication ports.
Rate of exchange – up to 115.2 Kbit/s (RS-232C), up to 10 Mbit/s (Ethernet).

Operating characteristics
Climatic version - УХЛ4.2, ambient temperature 1 – 50^{0}C, relative air humidity – 30 – 80 %.
Power supply – 220–240 V, frequency 50 Hz, 24V DC (with the absence of the БП-1 unit).
Power input - up to 15 Wt.

Controller KROSS-500

Code in Russian Classification of Products (RCP code)
RCP Code 42 1710

Specification ЯЛБИ.421457.045 ТУ
Certificate of Conformance – РОСС RU.АЯ15.НО1208
EnCERTICO Certificate of Conformance – СП0416310308.
State Instrument Register Registration No 28849-05
Certificate of Instrument Conformance – RU.C.34.004.A No 20186.
Application Permit PPC00-17527 issued by RosTechNadzor

Purpose
Controllers KROSS-500 are intended for construction of automation systems for a wide range of technological processes, i.e. continuous and discrete, simple, average and complex, slow and fast, concentrated and distributed in space. Controllers may be used in ACSTP of different levels of complexity from micro systems (8-16 channels) to macro systems (10240 channels).

KROSS-500 comprises all the TRASSA-500 controller modules.
Basic design characteristics
• Maximum number of analog (discrete) inputs-outputs – 1920;
• Basic reduced error limit - ± 0.2 %; ± 0.1 %;
• Galvanic isolation - 500, 1500 V.

The KROSS-500 controller possesses a powerful central processor and an extended combination of modules and units.
All the components of the controller work parallel and independently: the input-output channels in modules; the modules controlling the input-output processes and data preprocessing (filtering, linearization, calibration); four inside buses for data exchange between the modules and the central processor; the central processor, which executes the controller's technological program.
The KROSS-500 controller provides for backing of the controllers' central processor unit CPU (CPU2), input-output devices, field networks.

Structure of KROSS-500 controller
The KROSS-500 controller has a design-composable structure. Generally the KROSS-500 controller consists of the following:
1. Central processor units БЦП, БЦП2;
2. Microcontroller МК1;
3. Microcontroller Т-МК1;
4. Fixed structure input-output modules;
5. Input-output modules and units of design-composable structure: ADIO1 and AIO2, T-DIO1 and T-ADIO1;
6. Terminal units;
7. Switching unit ПБР-10;
8. Tuning board Рп1;
9. Power supply modules and units;
10. Software;
11. Flexible joints.

Input-output modules
The input-output modules in groups of up to 30 are connected with the CPU central unit through the RS 485 interface. The number of modules does not exceed 120. Each controller module has a built-in microprocessor, which performs relative to the central processor different functions in signal processing and hardware diagnostics independently and asynchronously.
Each module has its own RS-232 interface for connection of the computer or the tuning board. It enables one to perform configuration and checkup of the module separate from the controller.

Terminal units
Terminal units, connected to the modules with flexible joints, are used for connection of external circuits to the input-output modules and MC1 microcontroller through the terminal blocks, as well as for level conversion, galvanic isolation and discrete signal amplification.
Discrete input-output: ~220 V, =220 V, ~110 V, =110 V, ~24 V, =24 V.
Maximum switching current is 1F at the maximum switching voltage of ~220 V.

Controller features:
• Well-developed backbone characteristics;
• Design-composable structure and wide range of input-output modules;
• Extended programming capabilities, well-developed embedded and tool software;
• Functionally decentralized architecture;
• Maintenance staff servicing at setup, programming, maintenance and checkup of the controller's technical state distantly (computer-based engineering station and IDE-systems) and/or locally (portable tuning board);
• Self-testing and diagnostics of all controller devices in continuous and discontinuous duties, display of information of the controller's technical state for the maintenance staff;
• Functionally decentralized architecture of the controller;
• Well-developed network facilities;
• Fine object adjustment (zero redundancy);
• Design composition of field controller (up to 4 field circuits connected to the host-controller, up to 30 field units in one circuit section);
• Design composition of field units by signal input-output channels;
•Standard programming and tuning aids.

Cells of ADIO1, AIO2 design-composable modules and MK1 microcontroller

Cell Purpose	Cell parameters
AI1	1 signal input channel: (0-10), ±(0-10) V; (0-5), ±(0-5), (0-20), ±(0-20), (4-20) mA Conversion time 60 ms. Basic reduced error limit ± 0.1% (capacity 15 bit)
AI2	1 signal input channel: (0-10) V; (0-5), (0-20), (4-20) mA Conversion time 2 mcs. Basic reduced error limit ± 0.1% (capacity 12 bit)
AI3	4 signal input channels: (0-10), ±(0-10) V; (0-5), ±(0-5), (0-20), ±(0-20), (4-20) mA Conversion time 240 ms. Basic reduced error limit ± 0.1% (capacity 15 bit)
AO1	1 signal output channel: (0-5), (0-20), (4-20) mA Conversion time 20 mcs. Basic reduced error limit ± 0.1%
AO2	2 signal output channels: (0-5), (0-20), (4-20) mA Conversion time 20 mcs. Basic reduced error limit ± 0.1%
TC1	1 voltage signal input channel: ±(0-35), ±(0-70), ±(0-140), ±(0-280), ±(0-560), ±(0-2240) mV; signals from thermo-couples: ±(0-35), ±(0-70) mV. Basic reduced error limit ± 0.1% (capacity 15 bit)
TR1	1 resistance signal input channel: (0-50), (0-100), (0-200), (0-400) Ohm; signals from resistance thermometer: (0-100), (0-200), (0-400) Ohm. Three-wire switching circuit. Basic reduced error limit ± 0.1% (capacity 15 bit)
TR2	1 resistance signal input channel: (0-50), (0-100), (0-200), (0-400) Ohm; signals from resistance thermometer: (0-100), (0-200), (0-400) Ohm. Four-wire switching circuit. Basic reduced error limit ± 0.1% (capacity 15 bit)
TR3	2 resistance signal input channels: (0-50), (0-100), (0-200), (0-400) Ohm; signals from resistance thermometer: (0-100), (0-200), (0-400) Ohm. Four-wire switching circuit. Basic reduced error limit ± 0.1% (capacity 15 bit)
FI1	2 frequency input channels (2-2000) Hz. Basic reduced error limit ± 0.1%. Amplitude: 5, 12, 24 V. Frequency signal measurement
FI2	4 frequency input channels up to 2000 Hz. Basic reduced error limit ± 1%. Amplitude: 5, 12, 24 V. Pulse counting up to (232-1)

Analog signal input-output modules

Input-output module	Number and type of channels	Signals		Basic reduced error limit	Power consumed by circuit 24V, max
		At input	At output		
TC1-7	7 inputs	-5 up to 65 mV from thermo-couples	13 bit	± 0.2%	1.3
	1 input	(39-100) Ohm			
TR1-8	8 inputs	(39-100), (78-200) Ohm from thermometer resistance	13 bit	± 0.2%	1.2
AI1-8	8 inputs	Analog signal: - voltage (0-10) V - direct current (0-5), (0-20), (4-20) mA	13 bit	± 0.2%	0.92
AIO1-8/4	8 inputs	Analog signal: - voltage (0-10) V - direct current (0-5), (0-20), (4-20) mA	13 bit	± 0.2%	0.5
	4 outputs	12 bit	Analog signal: - direct current (0-5), (0-20), (4-20) mA		
AIO1-8/0	8 inputs	Analog signal: - voltage (0-10) V - direct current (0-5), (0-20), (4-20) mA	13 bit	± 0.2%	0.44
AIO1-0/4	4 outputs	12 bit	Analog signal: - direct current (0-5), (0-20), (4-20) mA	± 0.2%	0.10

Discrete signal input-output modules

Input-output module	Type and number of channels	Input/output signal	Power consumed by circuit 24 V, W, max
DI1-16	2 groups of 8 inputs	Discrete signal – direct current voltage: (0-7) V logic “0”, (24±6) V logic “1”	0.24
DIO1-8/8	1 group of 8 inputs	Discrete signal – direct current voltage: (0-7) V logic “0”, (24±6) V logic “1”	0.4
	1 group of 8 outputs	Discrete signal – contactless key: switched direct voltage – up to 40 V, current – 0.3 A, total current – up to 2 A	
DO1-16	2 groups of 8 outputs	Discrete signal – contactless key: switched direct voltage – up to 40 V, current – 0.3 A, total current – up to 2 A	0.55

Cells of design-composable units T-DIO1

Cell Purpose	Cell parameters
DI1	2 discrete signal input channels
DI3/220 DI3/110 DI3/24	1 discrete signal input channel ~220V ~110V ~24V
DI4/220 DI4/110 DI4/24	1 discrete signal input channel =220V =110V =24V

Cell Purpose	Cell parameters
DO1	2 discrete signal input channels =24 V (0.3A)
DO3	1 discrete signal input channel Circuit based on relay. =220 V (0.01-10 A)
DO4	1 discrete signal input channel. =250 V (1 A)
DO5/220 DO5/110 DO5/24	1 discrete signal input channel. Power supply voltage (maximum switched current) ~=220V (0.12 A) ~=110V (0.17 A) ~=24V (1.00 A)

Structure of embedded and tool software

1. The system of development of technological user programs for ISaGRAF Workbench controllers, including six types of technological languages: the language of serial functional circuits SFC; the language of flow circuits FC; the language of functional blocks FBD, extended by the P-130 algorithms library and other algorithms; the language of relay diagrams LD, the language of structured text ST, the instruction language IL – for CPU (CPU2), MC1/
2. Program package CONFIGURATOR
3. Software tools for communication with the upper level:
- OPC-server for controller interfacing with SCADA-systems, tested with the SCADA-systems Citect (CiTechnologies), InTouch (Wonderware), Trace Mode (AdAstra), FIX (Indasoft), Master SCADA (InSAT Company), Cascade (Cascade-ASU, Ltd.);
- libraries of subprograms for communication of the upper level with the input-output modules and microcontrollers.
To provide for the output of information and control functions to the operator’s level or other level according to the task to be solved, controllers are supplied with such communication channels as Ethernet, RS-485, RS-232. The data exchange both with the upper level system, and with other equipment, is provided by means of the protocols TCP/IP, Telnet, FTP, ModBus.

Controller mounting
All the controller modules and terminal blocks, except the switching unit SU-10 in KROSS-500, are designed to be installed on a DIN-rail; the modules are interconnected with the help of a flexible harness. Controllers can be mounted in any structural casing with the depth of at least 200 mm. The module dimensions are as follows: height – 130 mm, length (depth) – 100 mm, width – 30 mm or 45 mm or 60 mm, depending on the type of the module. Each module has three connectors, i.e. for connection of external signals, RS-485 and RS-232 interfaces. The terminal blocks’ dimensions: width – 85 mm, length is determined by the block type and can vary from 62 to 115 mm. The modules are installed on the DIN-rail with their narrow side, while the terminal blocks – with their wide side.

Electrical power supply
The power supply of controllers is determined by order:
- from single-phase alternating current mains with the voltage from 90 to 264 V, the frequency of 50 Hz and the higher harmonic factor of up to 5%;
- from external unstabilized source of direct current with the voltage from 18 to 36 V (24 V).
To provide for power supply, the controller is equipped with different power units and modules, including the power modules for redundant power supply.

Performance characteristics
The range of operating temperature is from +5 ^{0}C up to +50 ^{0}C, the humidity is up to 98% at the temperature of 35 ^{0}C.
Within the range of operating temperatures the devices do not require forced ventilation.
Warranty period – 18 months from the day of commissioning, maintenance – 10 years.

SECTION 3. TECHNOLOGICAL OBJECT MEASUREMENT AND AUTOMATION FACILITIES

Reliability and efficiency of equipment considerably depend on the measurement and automation facilities used in automation systems.

The manufacturer's goal is to equip new and updated automation systems of any level with the Package of Technological Object Automation Facilities (PTOAF), comprising the following:

1. Measurement and automation facilities for technological parameters

Ultrasonic flowmeters

Ultrasonic flowmeters are intended for commercial and technological assessment of water and heat resources, non-aggressive and aggressive liquids, oil products, flowing in pressure pipelines and fully filled pipelines.

Ultrasonic flowmeters for water metering UFM are designed for measurement of the consumption and volume of different liquids, including cold and hot water in heating and water supply systems. UFM001 ExiaIIC meters (explosionproof version with spark-safe input circuits) are used for commercial and technological assessment of explosive liquids, such as reservoir water, crude oil, fuel oil, gasoline, diesel fuel, etc. The UFM001 meters have the certificates of Belarus and Kazakhstan.

Technical characteristics

Version	UFM001	UFM 001 ExiaIIC
RCP code	421381	421399
Certificate of Instrument Conformance	RU.C.29.000.A No 7805	RU.C.29.000.A No 7805
Application Permit of RosTechNadzor	--	No PPC 04-10664
Specification	TU 4213-007-05784911-94	TU 4213-ПД1.007-05784911-99
Inner diameter of pipeline	50…1600 mm	50…1600 mm
Liquid pressure in pipeline, max	1.6 MPa (2.5 MPa – for pipeless version)	
Liquid temperature	+4...+150 ^{0}C	+4...+150 ^{0}C
Content of solid and gaseous matter, % of volume, max	1.0 %	1.0 %
Kinematic viscosity of liquid	0.198…30 m^2/10-6	0.198…30 m^2/10-6
Consumption metering range	1.3…87000 m^3/h	1.3…87000 m^3/h
Output signals proportionate to liquid consumption: - current - frequency	 0-5, 0-20, 4-20 mA 0-2, 0-20, 0-100, 0…1000 Hz	 0-5, 0-20, 4-20 mA 0…1000 Hz
Measurement error**	+1.7 (1.0)	+1.7 (1.0)
Calibration interval	2 years	
Power consumed, max	10 W	10 W
Supply voltage	220 V, 50 Hz	
Mass of electronic module, max	3.8 kg	3.8 kg
Dimensions of electronic module, max	330x200x110 mm	

* - for high-temperature version the maximum temperature of the measured matter – 290 ^{0}C (rated), 250 ^{0}C (operating).

** - error values at testing.

Flowmeter survey and energy resource flowmeters (GEOLINK CONSULTING JSC, URALTEKHNOLOGIA NPP, Ltd., CENTRPRIBOR JSC)
Electromagnetic (induction) flowmeters:
- SIMAG 11 flowmeter;
- SIMAT 61 heat meter;
- SIMATEST portable meter;
- SIMASTER software;
Ultrasonic flowmeters and heat meters:
- Karat-PC, UFM-005 flowmeters;
- KARAT-Kompact, UFEC-005, Goboy-4 heat meters;
- ELF, Centrosonic-M meters;
- KARAT series heat recorders.

Temperature sensors (POINT, Ltd.)
- Platinum resistance thermometers;
-Thermoelectric sensors (thermocouples).

Pressure and level sensors (BD SENSORSRUS, Ltd.)
- Industrial sensors:
of absolute, redundant and differential pressure and other;
- Industrial sensors submersible and mortise liquid level sensors;
- Intelligent high-precision sensors of pressure and level;
- Multifunctional sensors-relays of pressure with indication;
- Programmable electronic pressure relays;
- Special sensors for measuring pressure and level of aggressive, viscous and high-temperature mediums;
- Auxiliary devices for sensors (dampers of hydroblows, indicators, valve units, etc.)

KSATO 361H ultrasonic flowmeter (modernized UFM-001M)

Flowmeters are designed for measuring and commercial metering of liquid consumption (heat-carrier) in closed and open water- and heat supply systems, as well as for application in automated systems of metering, monitoring and control of technological processes. Flowmeters are used in water-supply, drainage and heat supply systems in all fields of industry, as well as in technological lines of food and petrochemical industries.

Flowmeters measure the speed of liquid (heat-carrier) flow at measuring sections of the delivery and return pipelines, transforming it into the instant and volume flow. Depending on modification, they also can measure temperature and pressure.

The device has the following features:
- total absence of setting and adjustment elements;
- self-calibration of the meter after its installation;
- adaptive change of measuring period and averaging constant (dynamic averaging), depending on the liquid flow dynamics;
- broad dynamic range of flow metering;
- absence of resistance to the liquid flow, insensibility to hydroblows.

Technical characteristics

Parameter	KSATO 361H
Internal diameter, mm	From 6 to 3000
Speed of flow in pipeline, m/s	From 0.07 to 20.0
Kinematic viscosity, cCt	Up to 1.5
Volume flow measuring range	1:250
Flow measuring precision, %	Up to 1.0
Maximum pressure, MPa	2.5
Temperature of measured medium, ^{0}C	From 0 to 150
Ambient air temperature, ^{0}C	From -5 to 50
Dust and moisture protection	IP 54
Transducer output signal	RS 485, RS 232 current output 4-20 mA
Mechanical impurity content, g/l	Up to 5
Explosion protection	According to order
Calibration interval, years	3
Transducer power supply	3.6 V 18 Ah, 6-9 V const.
Recorder unit power supply, V	3.6 V 18 Ah, 6-9 V const.
Mass of unit, kg	2
Nonvolatile archives	available
Indication modes	Flow, volume, progressive total volume, survival time, device condition, archives
Communication cable length between the sensor and the indication unit, m	Up to 150

KSATO 361B ultrasonic high-pressure flowmeter

The ultrasonic liquid flowmeter is intended for measuring of volume flow and monitoring of flowing mediums in high-voltage pressure pipelines.

The Flowmeters can be used in the systems of reservoir pressure maintenance (RPMS) in oil industry and in the objects communal facilities, in water-supply systems in chemical, metallurgic and light industry.
Measured medium: mineralized water with hydrogen sulfide, aggressive, under high pressure including different gaseous and solid impurities.

Technical characteristics

Parameter	KSATO 361B
Internal diameter, mm	From 40 to 300
Speed of flow in pipeline, m/s	From 0.015 to 20.0
Kinematic viscosity, cCt	Up to 1.5
Volume flow measuring range	1:100
Flow measuring precision, %	Up to 1.5
Maximum pressure, MPa	20
Temperature of measured medium, ^{0}C	From -4 to 65
Ambient air temperature, ^{0}C	From -45 to 50
Dust and moisture protection	IP 67
Transducer output signal	RS 485 frequency output up to 5000 Hz
Mechanical impurity content, g/l	Up to 20
Explosion protection	1ElibIIBT5
Calibration interval, years	3
Transducer power supply	10-16 V
Recorder unit power supply, V	220, 50 Hz ± 10%
Mass of unit, kg	2
Nonvolatile archives	available
Indication modes	Flow, volume, progressive total volume, survival time, device condition, archives
Communication cable length between the sensor and the indication unit, m	Up to 350

Signal Transducers
Measuring Transducers ИП-10

RCP code 42 2710

Versions	ИП-Т10, ИП-С10	ИП-Т10И, ИП-С10И Explosionproof version with "ia" level spark-safe input circuits, explosion safety marking "Exiall in complete set with БП-24И"
Specification	ТУ 4227-005-00229837-93	ТУ 4227-006-00229837-93
Instrument conformance certificate number	RU.C.34.000.A № 18042	
Certificate of conformance	РОСС RU.АЯ15.Н00636	РОСС RU.ГБ04.В00685
Purpose: ИП-Т10, ИП-Т10И ИП-С10, ИП-С10И	Transducing of the thermocouples' signals into a unified direct current analog signal. Transducing of the signals of resistive temperature transducers into a unified direct current analog signal.	
Temperature transformation range	From -200 °С to +1800 °С (table 1, 2)	
Sensor types: Thermoelectric transducers; Resistive temperature transducers	ТХК, ТХА, ТПП, ТВР (А-1, А-2, А-3), ТПР(В) as per GOST P50342-92 ТСП (10П, 50П, 100П), ТСМ (50М, 100М) as per GOST 6651-94	
Accuracy rating	0.5; 1.0	
Number of signal transducing channels	1	
Output signal	0-5, 0-20, 4-20 mA or 0-10 V	
Load resistance	From 0 to 2.5 kOhm for output signal of 0-5 mA; from 0 to 1.0 kOhm for output signals of 0-20, 4-20 mA; over 2 kOhm for output signal of 0-10 V	
Protection rating	IP40	
Power supply	From direct current power source with the voltage of 24 V	From alternating current mains of 220 (240) V, 50 (60) Hz through БП-24И unit
Power consumption, max	3.5 W	
Overall dimensions, max	40x162x173 mm	
Mass, max	0.7 kg	
Climatic version	УХЛ4.2, 04.2 – for operation at the temperature from 0 to 50 °С and relative humidity of up to 80% for the УХЛ version and up to 98% for the О version at t=35 °С and lower	
Structural version	Wall-mounted, cabinet	
Galvanic isolation of input and output circuits	none	

The order should contain the following data:
Purpose of the transducer modification and type, Purpose of the rated statistical characteristic of transducing for ИП-С10 and ИП-С10И, the rated value of W100 (only for ИП-С10 and ИП-С10И, intended for operation with the resistive temperature transducers with W100 = 1.385), the temperature transformation range, the output signal transformation limits, the accuracy rating, the mains voltage and frequency (for the export version ИП-Т10И, ИП-С10И), climatic version, requirement for the power supply unit БП-24.

Measuring Transducers ИП-20

Versions	ИП-Т20, ИП-С20	ИП-Т20И, ИП-С20И Explosionproof version with "ia" level spark-safe input circuits, explosion safety marking "ExiallC in complete set with БП-24И"
Specification	ЯЛБИ.405524.001ТУ	ЯЛБИ.405524.002ТУ
Instrument conformance certificate number	--	RU.C.34.004.A No 8621
Purpose: ИП-Т20, ИП-Т20И ИП-С20, ИП-С20И	Transducing of the thermocouples' signals into a serial binary code, transmitted by interface communication line. Transducing of the signals of resistive temperature transducers into a serial binary code, transmitted by interface communication line.	
Temperature transformation range	From -200 °С to +1800 °С (table 1, 2)	
Sensor types: Thermoelectric transducers; Resistive temperature transducers	ТХК, ТХА, ТПП, ТВР (А-1, А-2, А-3), ТПР(В) as per GOST P50342-92 ТСП (10П, 50П, 100П), ТСМ (50М, 100М) as per GOST 6651-94	
Accuracy rating	0.5	
Output signal	Message in the form of a serial binary code with the range of change of transducing result code from 0 to 1000 low-order position (l.o.p.)	
Interface for communication with external devices	RS-485	

Versions	ИП-Т20, ИП-С20	ИП-Т20И, ИП-С20И Explosionproof version with “ia” level spark-safe input circuits, explosion safety marking “ExiaIIC in complete set with БП-24И”
Number of signal transducing channels	4	
Speed of information transmission by interface	4.8, 9.6, 19.2 kBaud	
Time of one signal transducing cycle	0.15 s, max	
Protection rating	IP40	
Power supply	From direct current power source with the voltage of 24 V	From alternating current mains of 220 (240) V, 50 (60) Hz through БП-24И unit
Power consumption, max	3.5 W, max	
Overall dimensions, max	80x16x176 mm	
Mass, max	1.5 kg	
Climatic version	УХЛ4.2, 04.2 – for operation at the temperature from 0 to 50 ^{0}C and relative humidity of up to 80% for the УХЛ version and up to 98% for the О version at t=35 ^{0}C and lower	
Structural version	Wall-mounted, cabinet	
Galvanic isolation of input and output circuits	none	

The order should contain the following data:
Purpose of the transducer modification and type (sensor type) and the range of temperature change for each channel, Purpose of the rated statistical characteristic of transducing for ИП-С20 and ИП-С20И, the rated value of W100 (only for ИП-С20 and ИП-С20И, intended for operation with the resistive temperature transducers with W100 = 1.385), the output signal transformation limits, the accuracy rating, the mains voltage and frequency (for the export version), climatic version, requirement for the power supply unit БП-24, structural version.

Temperature transformation ranges

Types of resistive temperature transducers (ИП-С10, ИП-С20)

Type of TT	Purpose of rated statistical characteristic of transducing	Temperature transformation range, ^{0}C	Type of TT	Purpose of rated statistical characteristic of transducing	Temperature transformation range, ^{0}C
ТСП	10П (Pt10)	0…+300	ТСП	100П (Pt100)	- 200…-70
		0…+400			-200…+50
		0…+500			-120…+30
		0…+650			-90…+50
		+300…+650			-70…+180
ТСП	50П (Pt50)	- 200…-70			-25…+25
		-120…+30			0…+50
		-70…+180			0…+100
		0…+100			0…+150
		0…+150			0…+200
		0…+200			0…+300
		0…+300			0…+400
		0…+400			0…+500
		0…+500			+200…+500
		+200…+500			
ТСМ	50М (Cu50)	-50…0	ТСМ	100М (Cu100)	-50…0
		-50…+50			-50…+50
		-50…+100			-50…+100
		0…+50			-25…+25
		0…+100			0…+25
		0…+150			0…+50
		0…+180			0…+100
		+50…+100			0…+150
		0…+60.4			+50…+100
					0…+180

Types of thermoelectric transducers (ИП-Т10, ИП-Т20)

Type of TT	Temperature transformation range, °C	Type of TT	Temperature transformation range, °C	Type of TT	Temperature transformation range, °C
ТХК (L)	-50…+100	ТХА (К)	0…+400	ТПП(S)	0…+1300
	-50…+150		0…+600		0…+1600
	-50…+200		0…+800		500…+1400
	0…+100		0…+900		1000…+1600
	0…+150		0…+1100	ТВР(А-1)	200…+1800
	0…+200		0…+1300		1000…+1800
	0…+300		+200…+600	ТВР(А-2)	200…+1800
	0…+400		+200…+1200		1000…+1800
	0…+600		+400…+900	ТВР(А-3)	200…+1800
	+200…+600		+600…+1100		1000…+1800
	+200…+800		+700…+1300	ТПР(В)	300…+1000
					300…+1600
					1000…+1600
					1000…+1800

Power Supply Units БП-24

RCP code 43 6241

Versions	БП-24	БП-24И
Specification	ТU 4362-010-00229837-93	ТU 4362-009-00229837-93
Purpose	Power supply of measuring transducers ИП-Т10 and ИП-С10 and normalizing transducers НП-Н10 and НП-Р10 with unstabilized direct current voltage from single-phase AC mains.	Power supply of explosionproof measuring transducers ИП-Т10И and ИП-С10И and normalizing transducers НП-Н10 and НП-Р10 with unstabilized direct current voltage from single-phase AC mains.
Rated output voltage	24 V	
Rated load current	0.24 A	0.12 A
Maximum safe load current	0.3 A	
Climatic version	УХЛ4.2, О4.2	
Power consumption, max	11 V•A	7 V•A
Mass, max	1.2 kg	1.1 kg
Protection rating	IP40	
Power supply	220 V, 50 Hz; 240 V, 60 Hz	
Overall dimensions, max	60x162x174 mm – cabinet-type; 60x162x164 mm – wall-mounted	60x162x174 mm – cabinet-type; 60x162x172 mm – wall-mounted

One БП-24 power supply unit provides power for the following:
-2 transducers with output signals of 0-20, 4-20 mA;
-3 transducers with output signals of 0-5 mA, 0-10 V.
One БП-24 power supply unit provides power for 1 transducer and is delivered in complete set with transducers.

Normalizing Transducers НП-10

RCP code 42 1833

Versions	НП-П10	НП-Н10	НП-Р10
Specification	TU 4218-015-00229837-94	TU 4218-016-00229837-94	TU 4218-016-00229837-94
Purpose	Transformation of mutual inductance sensor's signal into a unified signal of force or DC voltage. It is used for joint operation with one of the instruments: manometer, vacuummeter, mono-vacuummeter, head gage, draft gage, head-and-draft gage, differential manometer, rotameter	Amplification and transformation of low level DC voltage signals from different sensors, including thermocouples (TC) of the ТХК (L), ТХА (K), ТПП (S), ТВР (A-1, A-2, A-3), ТПР (B) types, into a unified output signal of force or DC voltage	Amplification and transformation of low level DC voltage signals from potentiometric sensors (PS), including rheochords of automatic potentiom-eters and bridges, into a unified output signal of force or DC voltage
Instrument conformance certificate	RU.C.34.004.A No 1569	--	--
Conformance Certificate	РОСС RU.АЯ15.Н00621	РОСС RU.АЯ15.Н00637	
Input signal	0-10 mH; -10-0 -+10 mH	Rated value from minus 20 to plus 50 mV. Rated range of transformation from 5 to 150 mV	0.091-10 kOhm by row E24, from 1kOhm to 10 kOhm the arbitrary value of the rated impedance of PS is permitted
Output signal	0-5, 0-20, 4-20 mA; 0-10 V There is linear dependence of the output signal from the input signal; the output signal from the changed temperature (non-linear dependence is for НП-П10)		
Load resistance	- from 0 to 2.5 kOhm for the output signal (0-5) mA; - from 0 to 1 kOhm for the output signals (0-20), (4-20) mA; - over 2 kOhm for the output signal (0-10) V.		
Basic error	±0.8 % with linear static transducing function; ±1.0 % with non-linear static transducing function;	±0.5 %, ±1.0 %	
Galvanic isolation of input and output circuits	available	available	
Power supply	220 V, 50 Hz	- from DC power source with the voltage of 24 V; - from AC mains of 220 (240) V, 50 (60) Hz through the БП-24 unit - from AC mains of 220 (240) V, 50 (60) Hz through the БП-24 unit	
Power consumption	10 V•A, max	3.5 W, max	
Mass, max	2.0 kg	0.7 kg	
Climatic version	УХЛ4.2, О4.2	УХЛ4.2, О4.2	
Overall dimensions, max	80x162x171 mm – cabinet-type; 80x162x171 mm – wall-mounted	40x162x170 mm – cabinet-type; 40x162x168 mm – wall-mounted	

* The НП-П10 transducer with non-linear static transducing function is intended for joint operation with differential manometer, measuring consumption by the method of drop of pressure on the restriction, and provides linear dependence between the flow rate and the unit's output signal.
The order should contain the following data: the gage type and modification, the output signal, the structural and climatic versions, requirement for the БП-24 power supply unit, as well as:
- for НП-П10 – transducing function and the input signal range;
- for НП-Р10 – the rated sensor impedance.
- for НП-Н10 – type of sensor, initial value and the input signal range.

2. MEASURING AND AUTOMATION AIDS FOR ELECTRICAL PARAMETERS

Three- and single-phase electricity meters (ACTARIS)
- Single-phase electronic active energy meters:
ACE1000 type;
- Single-phase electronic active energy meters:
ACE2000 type;
- Three-phase electronic active energy meters:
ACE3000 type;
- Multifunction industrial electronic energy meter:
ACE7000 type (accuracy rating 0.2 s);
- Multifunction industrial electronic energy meter:
ACE7000 type (accuracy rating 0.5 s);

-Electronic prepayment attachment
Payguard type for application with ACE1000/2000/3000 type meters;
- Integrated single-phase prepayment meter ACE9000 SXD;
- Integrated three-phase prepayment meter ACE9000 PXD.

3. LOCAL AUTOMATION DEVICES FOR TECHNOLOGICAL EQUIPMENT

- Local automation devices (control, monitoring);
- Monitoring aids and systems.

SECTION 4. DEVICES FOR MONITORING AND CONTROL OF TECHNOLOGICAL PROCESSES

Panel gages

Manual control devices РЗД

RCP code 42 1821

Version	РЗД -12	РЗД -22
Specification	TU 25-02.120207-82	
Conformance Certificate	РОСС RU.АЯ15.Н00655	
Purpose	Manual setting of assignment signals for stabilizing controllers and ratio controllers	Manual setting of assignment signals for stabilizing controllers and ratio controllers; transducing of one type of unified DC signal or voltage into another one
Input signals		DC signals: -current 0-5 mA, R_{in}≤500 Ohm; current 0-20 mA, R_{in}≤100 Ohm; -current 4-20 mA, R_{in}≤100 Ohm; voltage 0-10 V, R_{in}≤10 kOhm
Output signals	Gradual change of potentiometer's division factor with the resistance of 10 or 2.2 kOhm, depending on version	DC signals: -current 0-5 mA, R≤2.5 kOhm; current 0-20 mA, R≤1 kOhm; -current 4-20 mA, R≤1 kOhm; voltage 0-10 V, R≥2 kOhm
Resolution	5 % of the maximum signal value	
Errors: setting of assignment values according to the scale of the indicating device; input signal transducing		±2.5 % of the maximum output signal value ±1.5 % of the maximum output signal value
Output ripple, max		±3.0 % of the maximum output signal value
Power consumption, max	--	4 V•A
Mass, max	0.2 kg	0.7 kg
Overall dimensions, max	40x40x136 mm	80x40x202 mm
Power supply	--	220 V, 240 V or 24 V, frequency 50 Hz or 60 Hz
Climatic version	УХЛ4.2, О4.1 – for operation at the temperature within 0 to 50 ºС and relative humidity of up to 90 % at t=35 ºС and lower	

Manual control units БРУ

RCP code 42 1821

Version	БРУ -22	БРУ -32	БРУ -42
Specification	TU 25-02.120146-82		
Conformance Certificate	РОСС RU.АЯ15.Н00654		
Purpose	Switching of control circuits with the help of actuating devices; indication of control circuits' positions in ACSTP.		
	- manual or remote switching of control circuits in two positions; -actuator control; - light indication of the state of control circuits	- manual switching from automatic control mode to manual and back; -actuator control with the help of "more-less" buttons; - light indication of the state of control circuits; - Indication of the position of the actuator's output shaft with the help of milliamperemeter	- manual or remote switching from automatic control mode to manual and back; -actuator control with the help of "more-less" buttons; - light indication of control modes and the state of control circuits; - Indication of the position of the actuator's output shaft with the help of milliamperemeter
Input signals of pointer indicator		Current 0-5 mA, Rin≤500 Ohm; Voltage 0-10 V, Rin≥10 kOhm (versions: 00, -01, -02, -06, -07)	Current 0-5 mA, Rin≤500 Ohm; Voltage 0-10 V, Rin≥10 kOhm (versions: 00, -01, -02, -06, -07)
		Current 4-20 mA, Rin≤200 Ohm; (versions: 03, 04, -05, -08, -09)	Current 4-20 mA, Rin≤200 Ohm; (versions: 03, 04, -05, -08, -09)
Power supply	Single-phase alternating current with the voltage of 24 V, frequency of 50 or 60 Hz БРУ-32 and БРУ-42 (versions 06…09) have a D-SUB25 connector instead of harness with a terminal set		
Power consumption, max	2.5 V•A		
Climatic version	УХЛ4.2, О4.1 – for operation at the temperature within 0 to 50 ºС and relative humidity of up to 90 % at t=35 ºС and lower		
Overall dimensions, max	40x40x550 mm	80x40x550 mm (MCU-32-00…-05) 80x40x160 mm (MCU-32-06…-09)	80x40x550 mm (MCU-42-00…-05) 80x40x160 mm (MCU-42-06…-09)
Mass, max	0.5 kg	0.7 kg	0.8 kg

Indicator unit B12
RCP code 42 1821

Specification	TU 25.02.1676-74
Purpose	Visual monitoring of the current signal 0-5 mA and the error signal at the input of control units
Range of controlled DC signal change	From 0 to 5 mA
Basic error:	
- of current signal indicator from the upper measuring limit	±4 %, max
- of error signal indicator	±4 %, max
Overall dimensions, max	60x80x155 mm
Mass, max	0.35 kg
Climatic version	УХЛ4.2 – for operation at the temperature within 0 to 50 ºC and relative humidity of up to 90 % at t=35 C and lower

Remote position indicator ДУП-М
RCP code 42 1898

Specification	TU 25-02.190722-78
Purpose	Remote positioning of the output shaft of the electrical actuator, supplied with rheostat or inductive sensor.
Power supply	220 V, 50 Hz
Power consumption, max	3 V•A
Overall dimensions, max	80x120x105 mm
Mass, max	0.6 kg
Climatic version	УХЛ4.2, Т3 – for operation at the temperature from minus 10 to plus 55 ºC and relative humidity of up to 90 % for the УХЛ version and up to 98 % - for the Т version at t=35 ºC and lower

Control device РП4-М1
RCP code 42 1811

Version	РП4-У-М1	РП4-Т-М1	РП4-П-М1
Specification	TU 25-7504.0040-87		
Conformance certificate		РОСС RU.АЯ15.Н00622	
Purpose	Formation of P-, PI- control strategies in ACSTP, containing constant-speed electric actuators, as well as formation of PID-control strategies with application of the external differentiator.		
Sensor type	DC unified transducers	Thermocouple transducers ТХК, ТХА, ТПП, ТПР; resistive temperature transducers ТСМ, ТСП; DC unified transducers	Differential transformer transducers, ferrodynamic transducers ПФ2Б ПФ4, inductive, DC unified.
Input signals	DC analog 0-5 mA; unscalable ; 0-5, 0-20, 4-20 mA scalable; analog with DC voltage 0-10V; discrete – external contacts closing; analog, signal of the external rheostat control device ± 5 %.	Analog, change of resistance of the resistive thermometer 0-20 Ohm; analog, e.m.f. of thermoelectrical transducers 0-50 mV; discrete, external contact closing 50 V, 0.03 A; analog – DC voltage – 0-10 V; analog DC 0-5 mA; analog, signal of the external rheostat control device ± 5 %.	Analog, change of mutual inductance 10-0-10 mH, AC voltage 1-0-1 V, 0-2 V; discrete, external contact closing 50 V, 0.03 A; analog – DC voltage – 0-10 V; analog, signal of external rheostat control device ± 5 %.

Продолжение таблицы

Version	РП4-У-М1	РП4-Т-М1	РП4-П-М1
Output signals	Discrete output: rated voltage – 0-24 V, current - up to 0.3 A, type – unstabilized direct current; Discrete output: logic condition of contactless keys “closed” (“0”), “open” (“1”); Analog output of current control device: 0-5 mA of direct current – for РП4-У-М1; 0-50 mV of DC voltage – for РП4-Т-М1; Analog output of assignment signal 0-50 mV – for РП4-Т-М; analog output of error signal – 0-10 V for РП4-У-М1; AC voltage 12 V sensor power supply in РП4-П-М1.		
Power consumption	Up to 15 V•A		Up to 25 V•A
Mass	Up to 4.8 kg		Up to 5.5 kg
Overall dimensions, max	80x160x526 mm		
Power supply	220 V, frequency 50 Hz		
Sensor supply voltage	12 V, 0.125 A of direct current		
Versions	Without remote tuning, with discrete tuning, with analog tuning		
Rated ranges of gradual setting	Integration time constant – from 5 to 500 s, from 20 to 2000 s; damping time constant – from 0 to 10 s; minimum pulse duration constant – from 0.1 to 1 s		
Climatic versions	УХЛ4.2, О4.1 – for operation at the temperature from 5 to 50 °С and relative humidity of up to 90 % for the УХЛ version and up to 98 % - for the О version at t=35 °С and lower		

The РП4-М1 order should contain the following data:
- input signals 0-5 mA, 0-10 V or 0-20 mA, 4-20 mA – for РП4-У-М1;
- availability and type of remote parameter tuning;
- integration time constant – 5-500 s or 20-2000 s;
- supply voltage value – 220 V or 240 V.

Amplifying devices

Contactless intelligent reversing-type starters ПБР-И

RCP code 42 1898

Version	ПБР-2И	ПБР-3И
		
ПБР versions	ПБР-2И-10, ПБР-2И-5	ПБР-3И-9, ПБР-3И-16
Specification	ЯЛБИ.421235.009 ТU	
Conformance certificate	РОСС RU АЯ15.Н00644	
Purpose	Contactless control of open-close and control actuators of pipeline valves, wherein synchronous and asynchronous motors are used	
Functions	Single-phase electric motor control	Three-phase electric motor control
	- control of the actuator’s motor (switching the motor in the direction of opening or closing of the controlled valves); - stopping the motor in extreme positions of the actuator by the signals of limit or torque switches); - pressing up by short pulses when closing or opening by torque - blocking of the motor control by the disable discrete signal at the input; - braking the motor by reverse switching; - execution of commands of setting, control, state monitoring from the external tuning board PN1, connected through the RS-232 interface or from the computer with the Board Emulator software, connected through the RS-232 or RS-485 interface; - execution of control commands from the controller, connected through the RS-485 interface by the MODBUS protocol; - positioner – according to the analog assignment signal from the control system and the feedback signal from the position sensor; - control of the average speed of the motor operation; - performing of the emergency control function: performs the predetermined action (close, open, stop) according to a discrete or network command. - generation of the output signal “AVAILABILITY”; - protective stopping of the motor, generation of the output signal “FAULT” and failure indication.	
Versions by functions	- with auxiliary power key;	
	- with heat protection of the actuator’s motor - with one RS-485 interface; - with two RS-485 interfaces; - with the outputs of internal power sources isolated from other circuits; - analog control (positioner).	

Продолжение таблицы

Version	ПБР-2И		ПБР-3И	
ПБР versions	ПБР-2И-10, ПБР-2И-5		ПБР-3И-9, ПБР-3И-16	
Versions by functions	- with auxiliary power key;			
	- with heat protection of the actuator's motor - with one RS-485 interface; - with two RS-485 interfaces; - with the outputs of internal power sources isolated from other circuits; - analog control (positioner).			
Input signal	- discrete (direct or full-wave rectified sinusoidal voltage with mean value: logic "0" (0-8) V, logic "1" (18-30) V) - analog assignment signal (0-5, 0-20, 4-20 mA, 0-10 V. - analog feedback signal (0-5, 0-20, 4-20 mA) - mains (RS-485)			
Output signal	Change of state of the output contactless keys			
Maximum switching current -in continuous switching duty; -in intermittent reverse duty with switching speed up to 630 times per hour and duty rating up to 25%	ПБР-2И-10	ПБР-2И-5	ПБР-3И-9	ПБР-3И-16
	5 A 10 A	2,5 A 5 A	5 A 19 A	10 A 106A
Operation speed (output current delay time at injection and removal of control signal)	40 ms, max			
Difference between input and output signal duration	20 ms, max			
Voltage of control circuits power supply source	Unstabilized full-wave rectified voltage of 24 V (mean value)			
Protection rating	IP20			
Power supply	220 V, 50 or 60 Hz, 230, 240 V, 50 or 60 Hz		220/380 V, 50 or 60 Hz, 230/400, 240/415 V, 50 or 60 Hz	
Power consumption, max	From 5 to 8 W, depending on version			
Mass, max	1.8 kg - ПБР-2И-5; 2 kg – other types		2 kg	
Overall dimensions, max	65x182x128 mm - ПБР-2И-5, 113x162x108 mm – other types		113x162x108 mm	
Climatic version	УХЛ3.1 – for operation at the temperature from -10 to +55 ºС and relative humidity of up to 98 % at t=25 ºС Т3 - for operation at the temperature from -10 to +55 ºС and up to 98 % at t=35 ºС and lower			
Type of mounting	On a DIN-rail, on a wall			

Note: ПБР-И has two galvanically isolated unstabilized DC power sources with the rated voltage of 24 V and the current of up to 30 mA.

Contactless reversing-type starters ПБР

RCP code 42 1898

Version	 ПБР-2М	 ПБР-3А
NPP versions	ПБР-2МА, ПБР-2М2А	ПБР-3АА
Specification	ТУ 25.02.120123-81	ТУ 25.02.120760-78
Conformance certificate	РОСС RU АЯ15.Н01393	РОСС RU АЯ15.Н01393
Purpose	Contactless control of electric actuators, manufactured by ABS Automation JSC and other manufacturers, as well as for starting and reversing of any synchronous and asynchronous motors with the power of up to 1.1 kW	
Functions	ПБР-2М, ПБР-2М2.1 –control of electric actuators with single-phase capacitor motors. ПБР-2М1, ПБР-2М2.2 – for the actuators with mechanical braking system. ПБР-2МА – for the actuators designed for NPP	ПБР-3А, ПБР-3АА –control of electric actuators with three-phase synchronous and asynchronous motors (ДСР, ДСТР, АОЛ, 4А, АИР). Protection of asynchronous motor against overload. ПБР-3АА – for the actuators designed for NPP
Input signal	- pulses of full-wave rectified sinusoidal voltage (24±6) V; - change of contactless keys' state	

Продолжение таблицы

Version	ПБР-2М	ПБР-3А
Output signal	change of contactless keys' state	
Input resistance of starter	750 Ohm	
Maximum switching current	4 A	3 A
Operation speed (output current delay time at injection and removal of control signal)	25 ms, max	
Difference between input and output signal duration	20 s, max	
Voltage of control circuits power supply source	Unstabilized full-wave rectified voltage of 24 V (mean value)	
Operation duty	Intermittent reversing duty with switching speed up to 630 times per hour and duty rating up to 25%	
Protection rating	IP20	
Power supply	220 V, 50 or 60 Hz, 230, 240 V, 50 Hz	220/380 V, 50 or 60 Hz, 230/400, 240/415 V, 50 Hz
Power consumption, max	7 V•A	5 W
Mass, max	4 kg - ПБР-2М; 2 kg – ПБР-2М2.1	3.5 kg - ПБР-3А, ПБР-3АА
Overall dimensions, max	240x90x196 mm - ПБР-2М, 240x90x114 mm - ПБР-2М2.1	240x90x196 mm - ПБР-3А, ПБР-3АА
Climatic version	УХЛ4.2– for operation at the temperature from 5 to 50 °С and relative humidity of up to 90 % at t=35 °С and lower; Т3 version- for operation at the temperature from minus 10 to plus 55 °С and relative humidity of up to 98 % at t=35 °С and lower	

Three-position thyristor amplifiers ФЦ

RCP code 42 1821

Version	ФЦ-0610, ФЦ-0611	ФЦ-0620, ФЦ-0621	ФЦ-0650
Specification	TU 25-7504.0053-88		TU 25-7551.003-89
Conformance certificate	РОСС RU АЯ15.Н00657		
Purpose	Contactless control of electric actuators and valves with three-phase electric motors		
Functions	Starting, reversing and braking at removing the input signal and protection of the asynchronous motor (with short-circuited rotor) against overload; signaling of voltage drop or the input and output signal mismatch; the settings of protection and braking length are adjustable	Starting and reversing of synchronous motor. Overload protection is unavailable	Starting, reversing and overload protection of the asynchronous motor at removing the input signal; signaling of the input and output signal mismatch; the settings of protection and braking length are adjustable. Designed for operation at NPP
Input signal	- pulses of full-wave rectified sinusoidal voltage (24±1) V; - change of contactless keys' state		
Input resistance	750 Ohm		
Maximum switching current	4 A		
Operation speed, max	50 ms, max		
Difference between input and output signal duration	20 ms, max		
Voltage of control circuits power supply source	Unstabilized full-wave rectified voltage of 24 V (mean value)		
Operation duty	Intermittent reversing duty with switching speed up to 630 times per hour and duty rating up to 25%		
Total service life	10 years		
Protection rating	IP20 - ФЦ-0610, ФЦ-0620; IP54 - ФЦ-0611, ФЦ-0621		IP44
Power supply	220/380 V, 50 or 60 Hz; 230/400, 240/415 V, 50 Hz		
Power consumption, max	10 W, max		
Mass, max	7 kg, max		5 kg, max
Overall dimensions, max	117x195x302 mm	106x195x302 mm	117x195x302 mm
Climatic version	УХЛ4– for operation at the temperature from 5 to 50 °С and relative humidity of up to 90 % at t=35 °С and lower; УХЛ3.1– for operation at the temperature from minus 10 to plus 55 °С and relative humidity of up to 95 % at t=35 °С and lower; О4– for operation at the temperature from 5 to 50 °С; Т3 - for operation at the temperature from minus 10 to plus 55 °С; For О4 and Т3 the relative humidity should be up to 98 % at t=35 °С and lower		

Functional units

RCP code 42 1821

This group of devices has been out of series production since October, 1, 2003.
Special order delivery is available.
Functional units are intended for application in the systems of automatic control of technological processes.
The devices are designed for recessed panel mounting and are installed on the control board.

Item #	Unit, specification (TU)	Main functions
1	Integrating master unit TU 25-02.120252-83	Integration of pulse signal duration; integral transformation into a unified DC signal; memorizing the integral value; limiting the output signal's minimum and maximum values by signaling when reaching the indicated levels.
2	Dynamic communication unit TU 25-02.122227-79	Algebraic summation of up to four unified DC signals, damping and dynamic transducing of the resultant signal by functional characteristics of real differentiating, integrating, inertial, integro-differentiating (damping or forcing) proportional-and-integral link with shockless remote adjustment of dynamic parameters; dynamic transducing of output signals РП4-М1.
3	Summation and signaling unit TU 25-02.122229-79	Algebraic summation of up to three unified DC signals, receiving the signal from the internal master control, or from the external potentiometric master control; sum damping and generation of the output relay signal.
4	Summation and damping unit TU 25-02.122228-79	Algebraic summation of up to four unified DC signals, comparing them to the assignment signal, damping of the sum.
5	Nonlinear transducing unit TU 25-02.120305-84	Damping and non-linear transducing of the analog input signal, approximated using the piecewise-linear method
6	Selection unit TU 25-02.120308-84	Receiving of up to four unified signals with galvanic isolation between them and the output, scaling, damping them, determination of the largest and the smallest signal, signaling of the number transmitted to the signal output.
7	Computing operations unit TU 25-02.120306-84	Algebraic summation at each unified signal input (X and Y) with scaling and galvanic isolation between them and the output; damping of the resultant signal at each input; execution of one of the operations between the resultant signals: addition, multiplication, division, squaring, square-rooting.

The input signals: 0-5 or 0-20 or 4-20 mA, 1-10 V of direct current, or the signals from thermoelectric transducers, or from resistive thermometers and differential-transformer sensors.
Supply voltage – 220 V or 240 V of alternating current with the frequency of 50 or 60 Hz.
Climatic version – УХЛ4.2, О4.1.
Overall dimensions of the units – 80x160x537 mm.
Operation conditions: ambient air temperature – 5-50 ºС, relative humidity for the whole temperature range – 30-90 %.

SECTION 5. ELECTRIC ACTUATORS

Electric Actuators Types

- Single-turn constant speed actuators (МЭО),
- Single-turn constant speed flange actuators (МЭОФ),
- Multi-turn constant speed actuators (МЭМ),
- Straight-running constant speed actuators (МЭП),
- Straight-running variable speed crank actuators (МЭПК),
- Position signaling actuators (МСП),
- Single-turn shut-off actuators (ПЭОЗ),
- Multi-turn actuators (ПЭМ),
- Straight-running actuators (ПЭП).

By the types of coupling with Valves the actuators are divided into two groups:
I. Single-turn constant speed actuators – remote, coupled with the Valves with the help of coupling rods and levers.
II. МЭОФ, МЭП, МЭПК, МЭМ, МСП actuators and ПЭОЗ, ПЭМ, ПЭП actuators are built-in, fixed in the Valves directly.

Purpose

The actuators and actuators are intended for shifting regulator (locking) parts of the Valves in automated process control systems in compliance with the regulating and control devices command signals.

Electric Actuators Types	Functions	Valves type
МЭО, МЭОФ	Regulating part-slewing Valves movable elements displacement	Ball and plug cocks, butterfly-type valves, gate
ПЭОЗ	Shut-off part-slewing Valves movable elements displacement	
МЭМ	Regulating multi-turn Valves movable elements displacement	Shut-off-and-regulating Valves
ПЭМ	Shut-off multi-turn Valves movable elements displacement	Shut-off Valves, slide valves
МЭП, МЭПК, ПЭП	Shut-off-and-regulating Valves regulating elements translational displacement	Shut-off and shut-off-and-regulating valves, etc.

Position Signaling Unit

The actuators position signaling unit aims at arranging output position feedback. The position signaling unit consists of the limit switch assembly and the actuator output element position sensor.

The output element position sensor type determines the presence of one of the following position signaling units: inductive position signaling units, rheostat position signaling units (range 0 – 120 Om), current position signaling units (0 – 5, 0-20, 4-20 mA). If the output element position sensor is not necessary the actuators and actuators are completed with the limit switch assembly. The limit switch assembly type is determined by the customer

Industrial version actuators are completed with limit switch assemblies or current position signaling units.

Explosion-proof actuators are completed with one of the following position signaling units: current position signaling units IIBT-6, rheostat position signaling units IIBT-6 without feedback sensor.
БП-24 power supply unit is not completed in the position signaling units IIBT-6 electric actuators delivery set and shall be supplied in separate order.

Actuators Operation Control

The control is fulfilled with the help of contactor starting box (solenoid starter-type) or reversionary starting boxes or thyristor amplifiers contactless keys. Control by means of reversionary starting boxes or thyristor amplifiers contactless keys is considered the safest for automated control systems.
Type of control device is determined by the Customer.

Climatic Versions of Actuators

Groups of Electric actuators	Climatic Versions as per GOST 15150	Environmental Parameters	
		Working Temperature	Relative Air Humidity at t = 35°C and lower
МЭО-6.3-99; МЭОФ-6,3-98	У3.1	from -10 to+ 50 “С	to 95 % without moisture condensation
	Т3.1		to 100 % with moisture condensation
МЭО-16-93; МЭО-16-01; МЭОФ-16-02	У3.1	from -10 to+50 °С	to 95 % without moisture condensation
	Т3		to 100 % with moisture condensation
МЭО-40-99К; МЭО-250-99; -99К; МЭО-87Б; МЭО-92К; МЭО-97К	У2	from -30 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
МЭО-16-А (for Nuclear power plant)	У3	from -5 to +50 °С	to 98 % without moisture condensation
	Т3		to 100 % with moisture condensation
МЭО for Nuclear power plant	У2	from -5 to +50 °С	to 98 % without moisture condensation
	Т2		to 100 % with moisture condensation
All МЭОФ (except МЭОФ-6,3-98 and МЭОФ-16-02)	У2	from -40 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
МЭОФ-1000-01КА	У2	from -30 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
	М3	from -30 to +40 °С	to 98 % without moisture condensation at ambient temperature 25 °С and lower
МЭОФ-40-96КА	У2	from -40 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
	М3	from -18 to +55 °С	to 98 % without moisture condensation at ambient temperature 25 °С and lower
МЭОФ-А others	У2	from -30 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
МЭО-IIВТ4; МЭОФ-IIВТ4	У2	from -40 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
	УХЛ2	from -50 to +50 °С	to 95 % without moisture condensation
МЭМ-100АО	У2	from -10 to +50 °С	to 98 % without moisture condensation at ambient temperature 35 °С and lower
	М3	from +15 to +60 °С	-
МЭМ-100АП	М3	from -40 to +40 °С	to 98 % without moisture condensation at ambient temperature 25 °С and lower
	У2	from -30 to +50 °С	to 98 % without moisture condensation
	Т3	from+15 to +60 °С	to 98 % without moisture condensation at ambient temperature 35 °С and lower
МЭМ-100-02К	У2	from -40 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
МЭПК-2500-99	У3.1	from -10 to+50 °С	to 95 % without moisture condensation
	Т3	from +5 to +50 °С	to 100 % with moisture condensation
МЭПК-6300-99; МЭП	У2	from -40 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
МЭПК-IIВТ4-00 МЭП-IIВТ4-00	У2	from -40 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation
МСП	У2	from -30 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +60 °С	to 100 % with moisture condensation
МСП-1А	У3	from +5 to +40 °С	to 98 % without moisture condensation
	Т3		to 100 % with moisture condensation
ПЭОЗ	У2	from -40 to +50 °С	to 95 % without moisture condensation
	Т2	from -10 to +50 °С	to 100 % with moisture condensation

Продолжение таблицы

Groups of Electric actuators	Climatic Versions as per GOST 15150	Environmental Parameters	
		Working Temperature	Relative Air Humidity at t = 35°C and lower
ПЭО3	У2	from -40 to +50 °C	to 95 % without moisture condensation
	Т2	from -10 to +50 °C	to 100 % with moisture condensation
ПЭМ-IIВТ4 ПЭМ2-IIВТ4	У2	from -50 to +50 °C	to 98 % without moisture condensation
ПЭМ	У2	from -40 to +50 °C	to 95 % without moisture condensation
МЭОФ-6.3-IIВТ5	У2	from -30 to +50 °C	to 95 % without moisture condensation
	Т2	from -10 to +50 °C	to 100 % with moisture condensation
ПЭП-4000	У3.1	from -10 to +50 °C	to 95 % without moisture condensation

Actuators Ordering

When ordering specify the actuators types and general engineering data, determining their dimension type:

- output torque for МЭО, МЭОФ, ПЭО3, МЭМ; nominal coupling rod force for МЭП, МЭПК; maximum force for ПЭП;
- output element full stroke nominal time for МЭО, МЭОФ, ПЭО3, МЭМ, МЭП, МЭПК;
- output shaft full stroke nominal time for МЭО, МЭОФ, ПЭО3, МЭМ and coupling rod full stroke nominal time for МЭП, МЭПК;
- dimension type and dimension type version number for ПЭМ;
- output element position signaling unit type;
- climatic version.

Also specify the following additional information, not given in the electric actuator reference designation:

- voltage and supply frequency (for export version);
- necessity of coupling bar for МЭО (except for МЭО-6.3 and МЭО-16);
- shaft output end type (square or cams) for МЭМ and ПЭМ;
- necessity of attachment sections to set on the Valves (for МЭОФ. ПЭО3).

Actuators concrete types reference designation peculiarities are shown in the corresponding sections of the catalogue. Examples of the actuators reference designation when ordering (without additional information) are given further:

Example 1.

Single-turn flange electric actuator, nominal output shaft torque -40Nm, full stroke nominal time – 25s, full stroke nominal value – 0.25 revolutions, with the output element inductive position signaling unit; year of development – 1996; supply voltage – 380 V, 50 Hz, climatic version “У2”.
Reference designation: “МЭОФ-40/25-0.25И-96К У2 actuator”

Example 2.

Single-turn electric actuator, nominal output shaft torque -40Nm, full stroke nominal time – 10s, full stroke nominal value – 0,25 revolutions, with the output element current position signaling unit; year of development – 1999; supply voltage – 220 V, 50 Hz, climatic version “У2”.
Reference designation: “МЭО-40/10-0,25У-99 У2 actuator”

Example 3.

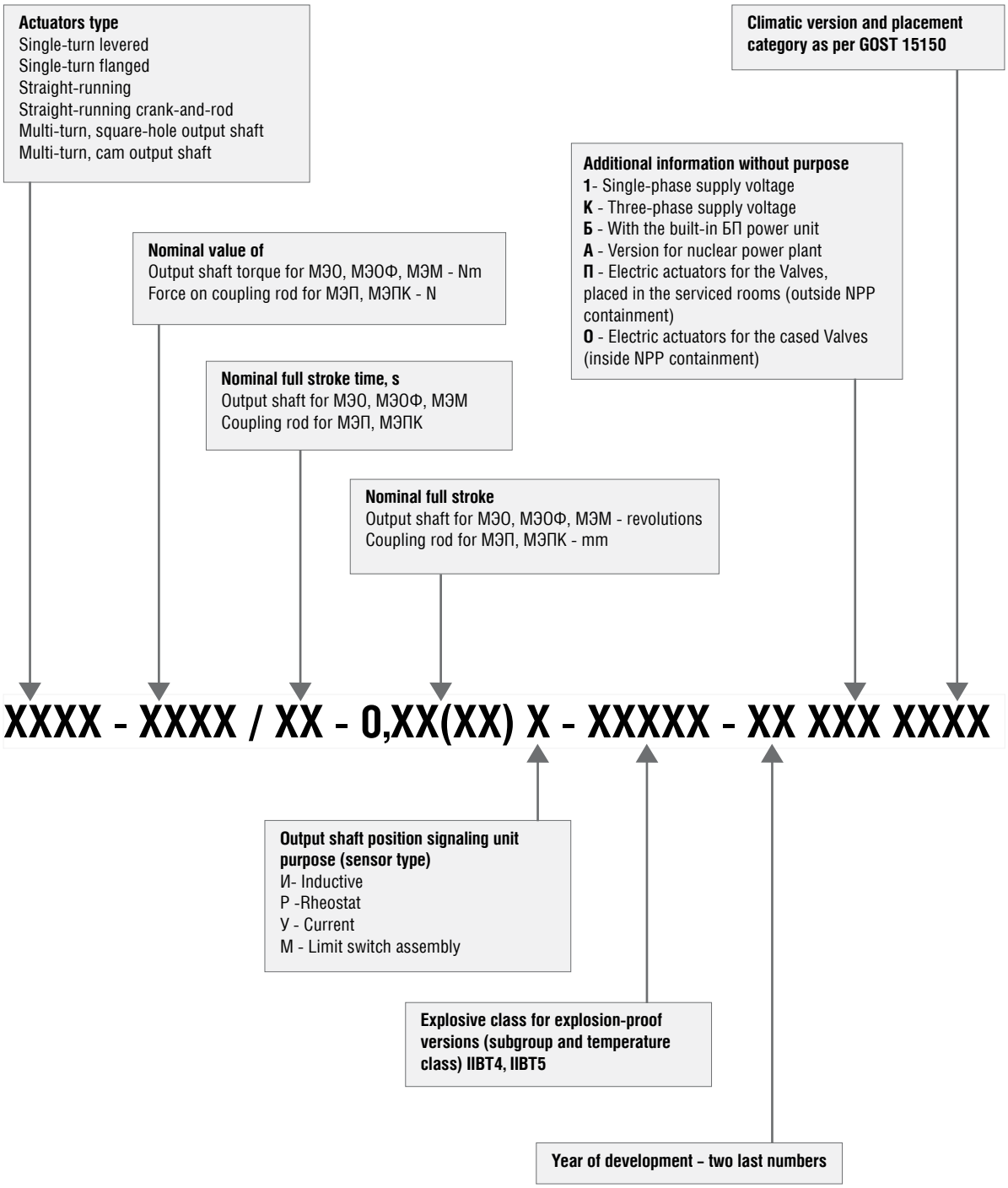
Single-turn flange explosion-proof electric actuator, nominal output shaft torque -40Nm, full stroke nominal time – 25s, full stroke nominal value – 0.25 revolutions, with the БСПР-IIВТ6 position signaling unit; year of development – 2000; supply voltage – 380 V, 50 Hz, climatic version “УХЛ2”.
Reference designation: “МЭОФ-40/25-0.25Р- IIВТ4-00 УХЛ2 actuator”
The same completed with the unit БСПТ- IIВТ6 –“МЭОФ-40/25-0.25У- IIВТ4-00 УХЛ2 actuator”

Example 4.

Straight-running electric actuator, output coupling rod nominal force-25000 Н, coupling rod full stroke nominal time – 100s, coupling rod full stroke nominal value – 50mm, with the output coupling rod rheostat position signaling unit; year of development – 1999; supply voltage – 220/380 V, 50 Hz, climatic version “У2”.

Reference designation: “МЭП-25000/100-50Р-00К У2 actuator”

Structure of the actuators reference designation



Note: Actuators concrete types reference designation peculiarities are shown in the corresponding sections of the catalogue
Reference designation structure of the intellectual electric actuators supplied with КИМ 1 actuator controller is on page 44.

Single-Turn Electric Actuators МЭО, Standard Version (Single-Phase Power Supply)

RCP code 42 1851

Actuators group	 МЭО-6,3-99	 МЭО-16-93	МЭО-16-01	 МЭО-250-99
Specification	ЯЛБИ.42321.035ТУ			
ROCC RU conformity certificate №	АЯ15.Н00582	АЯ15.Н00163	АЯ15.Н00582	АЯ 15.Н00137
Nominal output shaft torque	6.3; 12,5; 16; 25 Nm	16; 40 Nm	6,3; 16; 40 Nm	40, 100, 250 Nm
Nominal output shaft full stroke time	12.5; 25; 30; 63 s	10, 25, 63 s	10, 25, 63, 160 s	10, 25, 63, 160 s
Nominal output shaft full stroke value	0.25 rev. (90°)	0.25 rev (90°); 0.63 rev (225°)	0.25 rev (90°); 0.63 rev (225°)	0.25 rev (90°); 0.63 rev (225°)
Voltage and power frequency	220, 230, 240, V, frequency 50 Hz, 220 V, frequency 60 Hz			
Power consumption, less	43 (36) Wt	110 Wt	43 Wt	240 Wt
Mass , less	3.9kg	7.6 kg	7.0 kg,	27.0 kg
Dimensions, less	195x175x114 mm	230x200x185 mm	230x200x185 mm	440x315x305 mm
Noise limits, less	80 dBA			
Position signaling unit type	БСПР, БКВ	БСПИ, БСПР, БСПТ, БКВ		
Electric motor type	ДСОР-68	ДСОР-110	ДСОР-68	ЗДСОР-135
Control device type, contactless control	ПБР-2И-5С, ПБР-2М1 or ПБР-2М2.2			
Protection rating	IP65	IP54		
Climatic version	У3.1; Т3	У3.1; Т3	У2; Т3	У2; Т2
Versions	МЭО-6.3/12.5-0.25-99 МЭО-12.5/25-0.25-99 МЭО-16/30-0.25-99 МЭО-25/63-0.25-99	МЭО-16/10-0.25-93 МЭО-16/25-0.63-93 МЭО-40/25-0.25-93 МЭО-40/63-0.63-93	МЭО-6,3/10-0,25-01 МЭО-6,3/25-0,63-01 МЭО-16/25-0,25-01 МЭО-16/63-0,63-01 МЭО-16/63-025-01 МЭО-16/160-0,63-01	МЭО-40/10-0,25-99 МЭО-40/25-0,63-99 МЭО-40/63-0,25-01 МЭО-40/160-0,63-01 МЭО-100/25-0,25-99 МЭО-100/63-0,63-99 МЭО-250/63-0,25-99 МЭО-250/160-0,63-99

Single-Turn Electric Actuators МЭО, Standard Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 МЭО-40-99К	 МЭО-87Б	МЭО-250-99К
Specification	ЯЛБИ.421321.035ТУ	ТУ 25-7504.014-86	ЯЛБИ.421321.035ТУ
ROCC RU conformity certificate №	АЯ15.Н00361	-	АЯ15.Н00314
Nominal output shaft torque	16, 40 Nm	40, 100, 250 Nm	100, 250 Nm
Nominal output shaft full stroke time	10, 25, 63 s	10, 25, 63, 160 s	
Nominal output shaft full stroke value	0.25 rev (90°); 0.63 rev (225°)		
Voltage and power frequency	380, 400 ,415 В (50 Hz) 380 В (60 Hz)		
Power consumption, less	95, 160 Wt	260, 430 Wt	170, 250 Wt
Mass , less	8.0; 8.5 kg	30.5 kg	27.5kg
Dimensions, less	245x200x185mm	315x305x500mm	440x315x305mm
Noise limits, less	80 dBA		
Position signaling unit type	БСПР, БСПИ, БСПТ, БКВ	БСПТ	БСПР, БСПИ, БСПТ, БКВ
Electric motor type	ДСТР-110	ЗДСТР-135	
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-061(0620)		
Protection rating	IP54		
Climatic version	У2, Т2, Т3	У2, Т2	У2, Т2
Additional information		БСПТ is fed through the embedded БП-20 power unit	
Versions	МЭО-16/10-0.25-99К МЭО-16/25-0.63-99К МЭО-40/25-0.25-99К МЭО-40/63-0.63-99К МЭО-40/25-0.63-99К МЭО-40/10-0.25-99К	МЭО-40/10-0.25У-87Б МЭО-40/25-0.63У-87Б МЭО-100/10-0.25У-87Б МЭО-100/25-0.63У-87Б МЭО-100/25-0.25У-87Б МЭО-100/63-0.63У-87Б МЭО-250/25-0.25У-87Б МЭО-250/63-0.63У-87Б МЭО-250/63-0.25У-87Б МЭО-250/160-0.63У-87Б	МЭО-100/10-0.25-99К МЭО-100/25-0.63-99К МЭО-100/25-0.25-99К МЭО-100/63-0.63-99К МЭО-250/25-0.25-99К МЭО-250/63-0.63-99К МЭО-250/63-0.25-99К МЭО-250/160-0.63-99К

Single-Turn Electric Actuators МЭО, Standard Version (Single-Phase Power Supply)

RCP code 42 1851

Actuators group	 **МЭО-630-92К МЭО-630-92К**	 **МЭО-1600-92К МЭО-1600-92К**	 **МЭО-4000-97К**	 **МЭО-10000-97К**
Specification	ЯЛБИ.421321.035ТУ			
РОСС RU conformity certificate №	АЯ15.Н00164	АЯ15.Н00006	АЯ15.Н00197	-
Nominal output shaft torque	250, 630 Нм	630, 1600 Нм	4000 Nm	10000 Nm
Nominal output shaft full stroke time	10, 25, 63, 160 s		63, 160 s	
Nominal output shaft full stroke value	0.25 rev (90°); 0.63 rev (225°)			
Voltage and power frequency	220/380, 230/400, 240/415 В frequency 50 Гц 220/380 В frequency 60 Гц			
Power consumption, less	200 Wt	290, 300 Wt	310 Wt	590 Wt
Mass , less	74 kg	135 kg	270 kg	580 kg
Dimensions, less	445x452x402 mm	495x515x467 mm	590x670x605 mm	990x850x600 mm
Noise limits, less	80 dBA			
Position signaling unit type	БСПР, БСПИ, БСПТ (БСПТ-for МЭО-92КБ)		БСПР, БСПИ, БСПТ	
Electric motor type	АИР-56А4	АИР-56А4, АИР-56В4	АИР-56В4	АИС-71В4
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-061(0620)			
Protection rating	IP54			
Climatic version	У2, Т2, Т3			
Additional information	МЭО-92КБ БСПТ is fed through the embedded БП-20 power unit			
Versions	МЭО-250/10-0,25-92К(92КБ) МЭО-250/25-0,63-92К (92КБ) МЭО-630/25-0.25-92К (92КБ) МЭО-630/63-0,63-92К (92КБ) МЭО-630/63-0.25-92К (92КБ) МЭО-630/160-0.63-92К (92КБ)	МЭО-630/10-0,25-92К(92КБ) МЭО-630/25-0,63-92К (92КБ) МЭО-1600/25-0.25-92К (92КБ) МЭО-1600/63-0.63-92К (92КБ) МЭО-1600/63-0.25-92К (92КБ) МЭО-1600/160-0.63-92К (92КБ)	МЭО-4000/63-0.25-97К МЭО-4000/160-0.63-97К	МЭО-10000/63-0.25-97К МЭО-10000/160-0.63-97К

Single-Turn Electric Actuators МЭО, Explosion-Proof Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 **МЭО-16-IIВТ4-00**	 **МЭО-250-IIВТ4-01**	 **МЭО-630-IIВТ4-01**
Specification	ЯЛБИ.421311.021 ТУ		
ROCC RU conformity certificate №	ГБ04.В01084		
Nominal output shaft torque	10, 16, 32, 40 Nm	100,250 Nm	630 Nm
Nominal output shaft full stroke time	10, 15, 25 s	10, 25, 63 s	63 s
Nominal output shaft full stroke value	0.25 rev (90°)		
Voltage and power frequency	380, 400, 415 V frequency 50 Hz; 380 V frequency 60 Hz		
Power consumption, less	95, 100, 160 Wt	170, 250 Wt	250 Wt
Mass , less	14 kg	35 kg	50 kg
Dimensions, less	410x265x305 mm	575x395x305 mm	544x472x426 mm
Noise limits, less	80 dBA		
Position signaling unit type	*БСПТ-IIВТ6, БСПР-IIВТ6, БСПМ-IIВТ6		
Electric motor type	ДСТР-116-IIВТ6	ДСТР-140-IIВТ6	ДСТР-140-IIВТ6
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-062		
Protection rating	IP54	IP65	
Climatic version	У2, Т2	Т2, УХЛ2	
Explosion protection rate	Explosion proof, explosion protection type “Explosion-proof casing”, certified flameproof “1ExdIIBT4”		
Versions	МЭО-10/10-0.25-IIВТ4-00 МЭО-16/10-0.25-IIВТ4-00 МЭО-32/15-0.25-IIВТ4-00 МЭО-40/10-0.25-IIВТ4-00 МЭО-40/25-0.25-IIВТ4-00	МЭО-100/10-0,25-IIВТ4-01 МЭО-100/25-0.25-IIВТ4-01 МЭО-250/25-0.25-IIВТ4-01 МЭО-250/63-0.25-IIВТ4-01	МЭО-630/63-0.25-IIВТ4-01

* БСПТ-IIВТ6 actuators delivery set is not completed with the БП-24 power supply unit. It is to be ordered separately

Single-Turn Electric Actuators МЭО, NPP Version (Single-Phase Power Supply)

RCP code 42 1851

Actuators group	 МЭО-16-93А	МЭО-16-01А	 МЭО-250-99А
Specification	ЯЛБИ.421321.035ТУ		
Nominal output shaft torque	16;40 Nm	6.3; 16; 40 Nm	40,100, 250 Nm
Nominal output shaft full stroke time	10, 25, 63 s	10, 25, 63, 160 s	10, 25, 63,160 s
Nominal output shaft full stroke value	0.25 об. (90°); 0.63 об. (225°)	0.25 rev (90°); 0.63 rev (225°)	0.25 rev (90°); 0.63 rev (225°)
Voltage and power frequency	220, 230, 240 V frequency 50 Hz; 220V frequency 60 Hz		
Power consumption, less	100 Wt	43 Wt	240 Wt
Mass , less	7.6 kg	7.0 kg	27.0 kg
Dimensions, less	237x200x185 mm	237x200x185 mm	440x315x305 mm
Noise limits, less	80dBA		
Position signaling unit type	БСПТ by the Customers' order БСПИ, БСПР		
Electric motor type	ДСОР-110	ДСОР -68	3 ДСОР-135
Control device type, contactless control	ПБР-2ИС, ПБР-2М А		
Protection rating	IP54		
Climatic version	У2, Т3		У2, Т2
Versions	МЭО-16/10-0.25У-93А МЭО-16/25-0.63У-93А МЭО-40/25-0.25У-93А МЭО-40/63-0.63У-93А	МЭО-6.3/10-0.25У-0.1А МЭО-6.3/25-0.63У-0.1А МЭО-16/25-0.25У-0.1А МЭО-16/63-0.63У-0.1А МЭО-16/63-0.25У-0.1А МЭО-16/160-0.63У-0.1А МЭО-40/63-0.25У-0.1А МЭО-40/160-0.63У-0.1А	МЭО-40/10-0.25У-99А МЭО-40/25-0.63У-99А МЭО-100/25-0.25У-99А МЭО-100/63-0.63У-99А МЭО-250/63-0.25У-99А МЭО-250/160-0.63У-99А

Single-Turn Electric Actuators МЭО, NPP Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 МЭО-250-99КА	 МЭО-92КА	 МЭО-4000-97КА	 МЭО-10000-97КА
Specification	ЯЛБИ.421321.035ТУ			
Nominal output shaft torque	100, 250 Nm	250, 630, 1600 Nm	4000 Nm	10000 Nm
Nominal output shaft full stroke time	10, 25, 63, 160 s		63, 160 s	
Nominal output shaft full stroke value	0,25 rev (90°); 0,63 rev (225°)			
Voltage and power frequency	380, 400, 415 V (50 Hz) 380 V (60 Hz)	220/380, 230/400, 240/415 V (50Hz) 220/380 V (60 Hz)		
Power consumption, less	170,250 Wt	200, 225, 320 Wt	320 Wt	590 Wt
Mass , less	27.5 kg	74; 135 kg	270 kg	580 kg
Dimensions, less	440x315x305 mm	445x452x402 mm 495x515x467 mm	590x670x605 mm	990x850x600 mm
Noise limits, less	80dBA			
Position signaling unit type	БСПТ by the Customers' order БСПИ, БСПР			
Electric motor type	ЗДСТР-135	АИР-56А4, АИР-56В4	АИР-56В4	АИС-71В4
Control device type, contact-less control	ПБР-3ИС, ПБР-3АА or ФЦ-0650			
Protection rating	IP54			
Climatic version	У2, Т2			
Versions	МЭО-100/10-0.25У-99КА МЭО-100/25-0.63У-99КА МЭО-100/25-0.25У-99КА МЭО-100/63-0.63У-99КА МЭО-250/25-0.25У-99КА МЭО-250/63-0.63У-99КА МЭО-250/63-0.25У-99КА МЭО-250/160-0.63У-99КА МЭО-250/10-0.25У-92КА	МЭО-250/25-0.63У-92КА МЭО-630/25-0.25У-92КА МЭО-630/63-0.25У-92КА МЭО-630/63-0.63У-92КА МЭО-630/160-0.63У-92КА МЭО-630/10-0.25У-92КА МЭО-630/25-0.63У-92КА МЭО-1600/25-0.25У-92КА МЭО-1600/63-0.63У-92КА МЭО-1600/63-0.25У-92КА МЭО-1600/160-0.63У-92КА	МЭО-4000/63-0.25У-97КА МЭО-4000/160-0.63У-97КА	МЭО-10000/63-0.25У-97КА МЭО-10000/160-0.63У-97КА

Single-Turn Flanged Electric Actuators МЭОФ, Standard Version (Single-Phase Power Supply)

RCP code 42 1851

Actuators group	 МЭОФ-6,3-98	 МЭОФ-16-02	МЭОФ-16-96	 МЭОФ-250-99
Specification	ЯЛБИ.421321.035ТУ			
ROCC RU conformity certificate №	АЯ15.Н00583	АЯ15.Н00339	АЯ15.Н00416	АЯ15.Н00212
Nominal output shaft torque	6.3, 12.5, 16,25 Nm	6.3, 16, 40 Nm	16, 40 Nm	40, 100, 250 Nm
Nominal output shaft full stroke time	12.5, 25, 30, 63 s	10, 25, 63, 160 s	10, 25, 63 s	10, 25, 63, 160 s
Nominal output shaft full stroke value	0,25 rev (90°)	0,25 rev (90°); 0,63 rev (225°)		
Voltage and power frequency	220, 230, 240 V frequency 50 Hz; 220 V frequency 60 Hz			
Power consumption, less	45 Wt	36, 43 Wt	110 Wt	240 Wt
Mass , less	4.0 kg	7.0 kg	8.0 kg	27.0 kg
Dimensions, less	220x160x114 mm	245x200x185 mm	245x200x185 mm	443x295x280 mm
Noise limits, less	80dBA			
Position signaling unit type	БСПР, БКВ	БСПР, БСПИ, БСПТ, БКВ		
Electric motor type	ДСОР-68	ДСОР-68	ДСОР-110	ЗДСОР-135
Control device type, contactless control	ПБР-2ИС, ПБР-2М 1 или ПБР-2М2.2			
Protection rating	IP65	IP54		
Climatic version	У3.1; Т3	У3.1; Т3	У2; Т2	
Versions	МЭОФ-6.3/12.5-0.25-98 МЭОФ-12.5/25-0.25-98 МЭОФ-16/30-0.25-98 МЭОФ-25/63-0.25-98	МЭОФ-6.3/10-0.25-02 МЭОФ-6.3/25-0.63-02 МЭОФ-16/25-0.25-02 МЭОФ-16/63-0.63-02 МЭОФ-16/63-0.25-02 МЭОФ-16/160-0.63-02 МЭОФ-40/63-0.25-02 МЭОФ-40/160-0.63-02	МЭОФ-16/10-0.25-96 МЭОФ-16/25-0.63-96 МЭОФ-40/25-0.25-96 МЭОФ-40/63-0.63-96	МЭОФ-40/10-0.25-99 МЭОФ-40/25-0.63-99 МЭОФ-100/25-0.25-99 МЭОФ-100/63-0.63-99 МЭОФ-250/63-0.25-99 МЭОФ-250/160-0.63-99

Single-Turn Flanged Electric Actuators МЭОФ, Standard Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 **МЭОФ-16-96К**	**МЭОФ-16-99К**	 **МЭОФ-250-99К**
Specification	ЯЛБИ.421321.035ТУ		
ROCC RU conformity certificate №	АЯ15.Н00157	АЯ15.Н00157	АЯ15.Н00452
Nominal output shaft torque	16, 32, 40 Nm	40 Nm	100, 250 Nm
Nominal output shaft full stroke time	10, 15,25, 37, 63 s	10, 25 s	10, 25, 63, 160 s
Nominal output shaft full stroke value	0,25 rev (90°); 0,63 rev (225°)		
Voltage and power frequency	380, 400, 415 V (50 Hz) 380 V (60 Hz)	220/380, 230/400, 240/415V (50 Hz); 220/380 V (60 Hz)	380, 400, 415 V (50 Hz) 380 V (60 Hz)
Power consumption, less	100 Wt	160 Wt	170, 250 Wt
Mass , less	8.0 kg	8.0 kg	28.5 kg
Dimensions, less	245x200x185 mm	245x200x185 mm	443x295x280 mm
Shaft output end version	□14,17 mm	□ 17 mm	□ 24 mm
Noise limits, less	80 dBA		
Position signaling unit type	БСПР, БСПИ, БСПТ, БКВ		
Electric motor type	ДСТР-110	ДСТР-110	ЗДСТР-135
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-0610(0620)		
Protection rating	IP54		
Climatic version	У2.Т2		
Versions	МЭОФ-16/10-0.25-96К МЭОФ-16/25-0.63-96К МЭОФ-32/15-0.25-96К МЭОФ-32/37-0.63-96К МЭОФ-40/25-0.25-96К МЭОФ-40/63-0.63-96К	МЭОФ-40/10-0.25-99К МЭОФ-40/25-0.63-99К	МЭОФ-100/10-0.25-99К МЭОФ-100/25-0.63-99К МЭОФ-250/25-0.25-99К МЭОФ-250/63-0.63-99К МЭОФ-100/25-0.25-99К МЭОФ-100/63-0.63-99К МЭОФ-250/63-0.25-99К МЭОФ-250/160-0.63-99К

Single-Turn Flanged Electric Actuators МЭОФ, Standard Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 МЭОФ-1600-04К	 МЭОФ-630-97К	МЭОФ-1600-96К	 МЭОФ-4000-99К
Specification	ЯЛБИ.421321 035ТУ			
ROCC RU conformity certificate №	-	-	АЯ15.Н00162	-
Nominal output shaft torque	1600 Nm	320,630,1000 Nm	630,1000,1600, 2500 Nm	4000 Nm
Nominal output shaft full stroke time	30 s	10, 15, 25, 37, 63, 160 s		63 s
Nominal output shaft full stroke value	0,25 rev (90°)	0,25 rev (90°); 0,63 rev (225°)		0,25 rev (90°)
Voltage and power frequency	220/380, 230/400, 240/415 V frequency 50 Hz; 220/380 V frequency 60 Hz			
Power consumption, less	490 Wt	200 Wt	300 Wt	300 Wt
Mass , less	56 kg	67 kg	124 kg	265 kg
Shaft output end version	Inner or outer □ 32, 36, 42 mm	exterior □ 36 mm	exterior □ 42 mm	exterior □ 60 mm
Dimensions, less	520x347x595 mm	472x400x405 mm	535x450x467 mm	830x640x630 mm
Noise limits, less	80 dBA			
Position signaling unit type	БСПР, БСПИ, БСПТ			
Electric motor type	АИР63В6	АИР-56А4, АИС-56А4	АИР-56В4	АИР-56В4
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-0610(0620)			
Protection rating	IP55	IP54		
Climatic version	У2	У2, Т2		
Limit torque stopping device	Available	-		
Versions	МЭОФ-1600/30-0.25-04К	МЭОФ-320/10-0.25-97К МЭОФ-320/25-0.63-97К МЭОФ-630/15-0.25-97К МЭОФ-630/37-0.63-97К МЭОФ-1000/25-0.25-97К МЭОФ-1000/63-0.63-97К МЭОФ-1000/63-0.25-97К МЭОФ-1000/160-0.63-97К	МЭОФ-630/10-0.25-96К МЭОФ-630/25-0.63-96К МЭОФ-1000/15-0.25-96К МЭОФ-1000/37-0.63-96К МЭОФ-1600/25-0.25-96К МЭОФ-1600/63-0.63-96К МЭОФ-2500/63-0.25-96К МЭОФ-2500/160-0.63-96К	МЭОФ-4000/63-0.25-99К

Single-Turn Flanged Electric Actuators МЭОФ, Explosion-Proof Version (Single-Phase and Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 ***МЭОФ-6,3-IIВТ5-03 **МЭОФ-6,3-IIВТ-05**	 ***МЭОФ-16-IIВТ4-00**	 ***МЭОФ-250-IIВТ4-01**
Specification	ЯЛБИ.421311.021ТУ		
РОСС RU conformity certificate №	ГБ04.В01084		
Nominal output shaft torque	6,3; 16; 25 Nm	10; 16; 32; 40 Nm	100; 250 Nm
Nominal output shaft full stroke time	12,5, 25, 30, 63 s	10, 15, 25 s	10, 25, 63 s
Nominal output shaft full stroke value	0,25 rev (90°)	0,25 rev (90°); 0,63 rev (225°)	
Voltage and power frequency	*Three-Phase Power Supply 380, 400, 415 V frequency 50 Hz; 380 V frequency 60 Hz **Single-Phase Power Supply 220, 230, 240 V frequency 50 Hz; 220 V frequency 60 Hz		
Power consumption, less	60 Wt	95, 100, 160 Wt	170, 250 Wt
Mass , less	7.5 kg	14 kg	35 kg
Dimensions, less	320x155x210 mm	410x265x305 mm	575x395x305 mm
Shaft output end version	□ 14mm	□ 14, 17 mm	□ 24 mm
Noise limits, less	80 dBA		
Position signaling unit type	БСПР-12-1, БКВ	***БСПТ-IIВТ6, БСПР-IIВТ6, БСПМ-IIВТ6,	
Electric motor type	ДСТР-68	ДСТР-116-IIВТ6	ДСТР-140-IIВТ6
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-0610(0620)		
Protection rating	IP65	IP54	IP65
Climatic version	У2, Т2	Т2, УХЛ2	
Explosion protection rate	Explosion proof, explosion protection type “Explosion-proof casing”, certified flameproof “1ExdIIBT5”	Explosion proof, explosion protection type “Explosion-proof casing”, certified flameproof “1ExdIIBT4”	
Versions	МЭОФ-6.3/12.5-0.25-IIВТ5-О3 МЭОФ-16/30-0.25-IIВТ5-03 МЭОФ-25/63-0.25-IIВТ5-03 МЭОФ-6.3/12.5-0.25-IIВТ5-05 МЭОФ-16/30-0.25-IIВТ5-05 МЭОФ-25/63-0.25-IIWT5-05	МЭОФ-10/10-0.25-IIВТ4-00 МЭОФ-16/10-0.25-IIВТ4-00 МЭОФ-32/15-0.25-IIВТ4-00 МЭОФ-40/10-0.25-IIВТ4-00 МЭОФ-40/25-0.25-IIВТ4-00 МЭОФ-40/63-0.63-IIВТ4-00	МЭОФ-100/10-0.25-IIВТ4-01 МЭОФ-100/25-0.25-IIВТ4-01 МЭОФ-100/63-0.63У-11ВТ4-01 МЭОФ-250/25-0.25-IIВТ4-01 МЭОФ-250/63-0.25-IIВТ4-01

***БСПТ-IIВТ6 actuators delivery set is not completed with the БП-24 power supply unit. It is to be ordered separately.

Single-Turn Flanged Electric Actuators МЭОФ, Explosion-Proof Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 **МЭОФ-630-IIВТ4-01**	 **МЭОФ-1000-IIВТ4-00**
Specification	ЯЛБИ.421311.021ТУ	
РОСС RU conformity certificate №	ГБ04.В01084	ГБ04.В004127
Nominal output shaft torque	630 Nm	1000 Nm
Nominal output shaft full stroke time	63 s	10 s
Nominal output shaft full stroke value	0,25 rev (90°); 0,63 rev (225°)	0,25 rev (90°)
Voltage and power frequency	380, 400, 415 V frequency 50 Hz; 380 V frequency 60 Hz	380 V frequency 50 Hz
Power consumption, less	250 Wt	400 Wt
Mass , less	45 kg	80 kg
Dimensions, less	544x472x426 mm	
Shaft output end version	□ 36 mm	
Noise limits, less	80 dBA	
Position signaling unit type	*БСПТ-IIВТ6, БСПР-IIВТ6, БСПМ-IIВТ6	
Electric motor type	ДСТР-140-IIВТ6	АИМЛ-М63А4
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-0620	ПБР-3ИС, ПБР-3А or ФЦ-0610
Protection rating	IP65	IP54
Climatic version	Т2, УХЛ2	
Explosion protection rate	Explosion proof, explosion protection type “Explosion-proof casing”, certified flameproof “1 ExdIIBT4”	Explosion proof, explosion protection type “Explosion-proof casing”, certified flameproof “1 ExedIIBT4”
Versions	МЭОФ-630/63-0.25-IIВТ4-01	МЭОФ-1000/10-0.25-IIВТ4-00

***БСПТ-IIВТ6 actuators delivery set is not completed with the БП-24 power supply unit. It is to be ordered separately.

Single-Turn Electric Actuators МЭОФ, NPP Version (Single-Phase and Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 МЭОФ-16-96А	МЭОФ-16-96КА	 МЭОФ-250-97КА
Specification	ЯЛБИ.421321.035ТУ		
Nominal output shaft torque	16; 40Nm	32; 40 Nm	100; 250 Nm
Nominal output shaft full stroke time	10, 25 s	15, 25 s	10, 25 s
Nominal output shaft full stroke value	0,25 rev (90°)	0,25 rev (90°)	
Voltage and power frequency	Single-phase - 220, 230, 240 V (50 Hz); 220 V (60 Hz)	Three-phase - : 380, 400, 415V (50 Hz) 380 V (60 Hz)	
Power consumption, less	100 Wt	110 Wt	170, 250 Wt
Mass , less	8.0 kg	8.0 kg	25.6; 26.3 kg
Dimensions, less	245x200x185 mm	242x200x185 mm	295x442x280 mm
Shaft output end version	□ 14,17mm	□ 17mm	□ 24mm
Noise limits, less	80 dBA		
Position signaling unit type	БСПТ; by the Customers' order БСПИ, БСПР		
Electric motor type	ДСОР-110	ДСТР-110	ДСТР-135
Control device type, contactless control	ПБР-2ИС, ПБР-2МА	ПБР-3ИС, ПБР-3АА or ФЦ-0650	
Protection rating	IP 54		
Climatic version	У2, Т2	М3	У2, Т2
Versions	МЭОФ-16/10-0.25У-96А МЭОФ-40/25-0.25У-96А	МЭОФ-32/15-0.25У-96КА МЭОФ-40/25-0.25У-96КА	МЭОФ-100/10-0.25У-97КА МЭОФ-250/25-0.25У-97КА МЭОФ-100/25-0.25У-97КА

Single-Turn Electric Actuators МЭОФ, NPP Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	**МЭОФ-630-01КА** 	**МЭОФ-1600-01КА**
Specification	ЯЛБИ.421321.035ТУ	
Nominal output shaft torque	320; 630; 1000 Nm	630; 1000; 1600; 2500 Nm
Nominal output shaft full stroke time	10,15, 25,63 s	
Nominal output shaft full stroke value	0,25 rev (90°)	
Voltage and power frequency	220/380, 230/400,240/415 V (50 Hz) 220/380 V (60 Hz)	
Power consumption, less	200 Wt	200/300 Wt
Mass , less	67 kg	124 kg
Dimensions, less	472x400x405 mm	535x450x467 mm
Shaft output end version	□ 36 mm	□ 42 mm
Noise limits, less	80dBA	
Position signaling unit type	БСПТ; by the Customers' order БСПИ, БСПР	
Electric motor type	АИР-56В4, АИР-56А4	
Control device type, contactless control	ПБР-3ИС, ПБР-3АА or ФЦ-0650	
Protection rating	IP 54	
Climatic version	У2, Т2	
Versions	МЭОФ-320/10-0.25У-01 КА МЭОФ-630/15-0.25У-01 КА МЭОФ-1000/25-0.25У-01 КА МЭОФ-1000/63-0.25У-01КА	МЭОФ-630/10-0.25У-01КА МЭОФ-1000/15-0.25У-01 КА МЭОФ-1600/25-0.25У-01 КА МЭОФ-2500/63-0.25У-01КА

Multi-Turn Electric Actuators МЭМ, Standard Version and NPP Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 МЭМ-100-02К	МЭМ2-100-02К	 МЭМ-100-01АП For work out of containment	МЭМ-100-01АО For work in containment
Specification	ЯЛБИ.421312.001 ТУ		ЯЛБИ.421312.006ТУ	
Nominal output shaft torque	100 Nm		60, 100 Nm	
Nominal output shaft full stroke time	160, 400 s		64, 160, 400 s	
Nominal output shaft full stroke value	25, 63 rev.		10, 25, 63 rev	
Voltage and power frequency	220/380, 220/400, 220/415 V frequency 50 Hz; 220/380 V frequency 60 Hz		380, 415 V frequency 50 Hz 380 V frequency 60 Hz	
Power consumption, less	430 Wt			
Mass , less	21 kg			
Dimensions, less	510x380x330 mm		475x415x350 mm	
Shaft output end version	□ 19 mm	Cam half coupling	□ 19 mm or cam half coupling (designated by the number 2)	
Noise limits, less	80dBA			
Position signaling unit type	БСПР, БСПИ, БСПТ, БКВ		Built-in БСПТ 10 КШ (М3) built-in БД 10АКК sensor (У2, Т3). Sensors output signal, DC 4-20 mA	Built-in БСПР and НП-12А normalizing transducer for signal, DC 4-20 mA
Electric motor type	АИРВ4	ДАТ 56В4АП	ДАТ56В4АО	
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-062		ПБР-3ИС, ПБР-3А А	
Protection rating	IP55			
Climatic version	У2, Т2	У2, Т2	See note	
Versions	МЭМ-100/160-25-02К МЭМ-100/400-63-02К	МЭМ2-100/160-25-02К МЭМ2-100/400-63-02К	**МЭМ-100/160-25У-01АП **МЭМ-100/400-63У-01АП *****МЭМ-60/64-10У-01АП ****МЭМ2-100/160-25У-01АП ****МЭМ2-100/400-63У-01 АП ****МЭМ-100/64-10У-01АП	*МЭМ-100/160-25Р-01 АО *МЭМ-100/400-63Р-01АО ***МЭМ-100/45-7Р-01АО

Note:
*Actuators of climatic versions У2, М3.
**Actuators of climatic versions У2, М 3, Т3
***Actuators of climatic versions М3.
****Actuators of climatic versions Т3.
*****Actuators of climatic versions М 3, Т3

Straight-Running Crank Electric Actuators МЭПК, Standard Version (Single-Phase Power Supply)

RCP code 42 1851

Actuators group	 **МЭПК-2500-99**			 **МЭПК-6300-99**			
Specification	ЯЛБИ.431323.002ТУ						
РОСС RU conformity certificate №	АЯ15.Н00211						
Coupling rod final position force	800 N	1600 N	2500 N	6300 N			
Coupling rod medium position force	365 N	730 N	1440 N	960 N	2450 N	2000 N	1250 N
Nominal output coupling rod full stroke time	25, 63, 125 s			20 s	50 s		
Nominal output coupling rod full stroke value	20, 40 mm			30 mm	30 mm	40 mm	60 mm
Voltage and power frequency	220, 230, 240 V frequency 50 Hz						
Power consumption, less	49 Wt			110 Wt			
Mass , less	5.2 kg			10 kg			
Dimensions, less	200x230x355 mm			240x240x474 mm			
Noise limits, less	80dBA						
Position signaling unit type	БСПР-12, БКВ			БСПР, БСПИ, БСПТ, БКВ			
Electric motor type	ДСОР-68			ДСОР-110			
Control device type, contactless control	ПБР-2М1 or ПБР-2М2.2						
Protection rating	IP65			IP54			
Climatic version	У3.1, Т3			У2, Т2			
Versions	МЭПК-800/25-20-99 МЭПК-800/63-40-99 МЭПК-1600/63-20-99 МЭПК-1600/125-40-99 МЭПК-2500/125-20-99			МЭПК-6300/20-30-99 МЭПК-6300/50-30-99 МЭПК-6300/50-40-99 МЭПК-6300/50-60-99			

Straight-Running Electric Actuators МЭП, Standard Version (Single-Phase and Three-Phase Power Supply)

RCP code 42 1851

Actuators group	**МЭП-25000-99**	**МЭП-25000-00** 	**МЭП-25000-00К**	**МЭП-18000-02К**
Specification	ЯЛБИ.421323.005 ТУ			
ROCC RU conformity certificate №	АЯ15.Н0278			
Coupling rod final position force	25000 N	20000, 25000 N	25000 N	18000 N
Nominal output coupling rod full stroke time	60, 100 s	200, 240, 340 s	50, 100 s	170 s
Nominal output coupling rod full stroke value	30, 50 mm	100, 120, 170 mm	25, 50 mm	170 mm
Voltage and power frequency	Single-phase: 220,230,240 V frequency 50 Hz 220 V frequency 60 Hz		Three-phase: 220/380, 230/400, 240/415 V frequency 50 Hz 220/380V frequency 60 Hz	
Power consumption, less	300 Wt		200 Wt	
Mass , less	20 kg	30 kg	30 kg	30 kg
Dimensions, less	325x330x720 mm	325x330x825 mm, 325x330x840 mm, 325x330x940 mm	326,5x377x750 mm	326,5x377x750 mm
Noise limits, less	80dBA			
Position signaling unit type	БСПР, БСПТ, БКВ		БСПР, БСПТ, БКВ	
Electric motor type	АИР56В4			
Control device type, contactless control	ПБР-2ИС, ПБР-2М 1 or ПБР-2М		ПБР-3ИС, ПБР-3А	
Protection rating	IP55			
Climatic version	У2, Т2			
Peak force stop	Single-acting closing		Double-acting	Single-acting closing
Versions	МЭП-25 000/100-50-99 МЭП-25 000/60-30-99	МЭП-20 000/200-100-00 МЭП-20 000/240-120-00 МЭП-25 000/340-170-00	МЭП-25 000/100-50-00К МЭП-25 000/50-25-00К	МЭП-18 000/170-170-02К

Single-Turn Electric Actuators МЭП, МЭПК, Explosion-Proof Version (Three-Phase Power Supply)

RCP code 42 1851

Actuators group	 **МЭПК-25000-IIВТ4-02**	 **МЭПК-6300-IIВТ4-00 (01-02-03)***
Specification	ЯЛБИ.421313.001 ТУ	ЯЛБИ.421323.006 ТУ
ROCC RU conformity certificate №	ГБ04.В00187	ГБ04.В00128
Coupling rod final position force	10000, 16000 ,18000, 20000, 25000 N	6300 N
Nominal output coupling rod full stroke time	50, 60, 100, 170, 200, 240, 340 s	50 s
Nominal output coupling rod full stroke value	30,50,100,120,170 mm	30, 40, 60 mm
Voltage and power frequency	380,400,415 V frequency 50 Hz; 380 V frequency 60 Hz	
Power consumption, less	250 Wt	110 Wt
Mass , less	38 (34) kg	17 kg
Dimensions, less	390x370x995, 390x370x820, 390x370x880, 390x370x895, 390x370x945 mm	372x306x555 mm - (ver. -00), 372x306x473 mm - (ver.-01), 372x306x570 mm - (ver.-02), 372x306x500 mm - (ver.-03)
Noise limits, less	80dBA	
Position signaling unit type	**БСПТ-ИВТ6, БСПМ-ИВТ6	**БСПТ-ИВТ6, БСПР-ИВТ6, БСПМ-ИВТ6
Electric motor type	ДСТР-140-ИВТ4	ДСТР-116-IIВТ4
Control device type, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-0620	ПБР-3ИС, ПБР-3А or ФЦ-061(0620)
Protection rating	IP65	IP54
Climatic version	У2, Т2	У2, Т2
Explosion protection rate	Explosion proof, explosion protection type “Explosion-proof casing” and “Nonsparking electric circuit”, certified flameproof “1 ExiadIIBT4”	Explosion proof, explosion protection type “Explosion-proof casing” - certified flameproof “1ExdIIBT4” or “1ExedIIBT4”
Versions	МЭП-10000/60-30-IIВТ4-02 МЭП-16000/60-30-IIВТ4-02 МЭП-16 000/50-50-IIВТ4-02 ***МЭП-18 000/170-170-IIВТ4-02 МЭП-20 000/200-100-IIВТ4-02 МЭП-20 000/240-120-IIВТ4-02 МЭП-25 000/60-30-IIВТ4-02 МЭП-25000/100-50-IIВТ4-02 МЭП-25 000/340-170-IIВТ4-02	МЭПК-6300/50-30-IIВТ4-00 МЭПК-6300/50-30-IIВТ4-01 МЭПК-6300/50-30-IIВТ4-02 МЭПК-6300/50-30-IIВТ4-03 МЭПК-6300/50-40-IIВТ4-00 МЭПК-6300/50-40-IIВТ4-01 МЭПК-6300/50-40-IIВТ4-02 МЭПК-6300/50-40-IIВТ4-03 МЭПК-6300/50-60-IIВТ4-00 МЭПК-6300/50-60-IIВТ4-01 МЭПК-6300/50-60-IIВТ4-02 МЭПК-6300/50-40-IIВТ4-03

* -00, -01, -02, -03 versions differ only in the straight-running attachment form-factor and dimensions respectively.
** БСПТ-IIВТ6 actuators delivery set is not completed with the БП-24 power supply unit. It is to be ordered separately.
*** Version without support

Position Signaling Actuators МСП-1

Actuators group	МСП-1 	МСП-1А для АЭС
Specifications	TU 25-02.120391-84	
Purpose	Multiturn shaft rotation transformation into proportional DC signal, signaling and blocking the output element end and intermediate position, local Purpose of the output element position. Applied to complete control valves actuators, used in automated control systems in power and other industries	
Joint with the actuator	МСП-1-1, МСП-1-2, МСП-1-3 install on the actuator with the help of flange, the others – immediately on the actuator	Install on the actuator with the help of flange
Input signal	Input shaft rotation	
Input shaft full stroke	МСП-1-1 -35 rev. МСП-1-2, МСП-1-5 -18.8 rev. МСП-1-3, МСП-1-6 -7.5 rev. МСП-1-4 - 0.63 rev.	МСП-1 А-1 -35 rev. МСП-1 А-2 -18.8 rev. МСП-1 А-3 -7,5 rev.
	Input shaft full stroke value corresponds to the current sensor cam curve 225° rotation (work on the 0 – 225 ° profile). Full stroke may reduce by 2,5 times (work on the 0 – 90 ° profile).	
Output signal	DC signal -0-5 mA , load resistance up to 2,5 kOm; 0-20 mA or 4-20 mA load resistance up to 1,0 kOm	
Position signaling unit	БСПТ-10М, *БСПИ	БСПТ-10МШ
Voltage and power frequency	220, 230, 240 В, 50 Hz or 220 В, 60 Hz	
Power consumption, less	9В_А	9В_А
Mass , less	МСП-1-1, МСП-1-2, МСП-1-3 – 3.8kg; МСП-1-4, МСП-1-5, МСП-1-6-3.6 kg	3.8 kg
Dimensions, less	125x175x225 mm	125x175x225 mm
Protection rating	IP54	
Climatic version	У2, Т2	У3, Т3
Versions	МСП-1-1; МСП-1-2; МСП-1-3; МСП-1-4; МСП-1-5; МСП-1-6	МСП-1А-1; МСП-1 А-2; МСП-1А-3

* МСП1 with БСПИ delivery set is completed with the БУ30М amplifier unit

Single-Turn Shut-Off Electric Actuators ПЭО3, Standard Version (Three-Phase Power Supply)

Actuators group	 ПЭО3 - 030К		 ПЭО3-04К
Actuator type	ПЭО3-100	ПЭО3-250	
Specification	ЯЛБИ.421321.093ТУ		
ROCC RU conformity certificate №	АЯ45.В03463		
Min (max) output shaft torque	100 (140) Nm	250 (330) Nm	1500 (2500) Nm
Output shaft rotation nominal speed	0.6; 1.5 rev/min.	0.6 rev/min	0.5 rev/min
90° Output shaft rotation time	10, 25 s	25 s	30 s
Output shaft full stroke value	0.25 rev. (0-90°); 0.63 rev. (0-225°)		0.25 rev.(0-90°)
Voltage and power frequency	380, 400, 415 V frequency 50 Hz; 380 V frequency 60 Hz		
Power consumption, less	135,220 Wt	235 ВтWt	490 Wt
Mass , less	14.5 kg	15.5 kg	58 kg
Shaft output end version	350x250x320 mm	300x250x320 mm	520x347x595 mm
Dimensions, less	□ 24 mm		Inner or outer □ 32, 36, 42 mm
Noise limits, less	80dBA		
Position signaling unit type	БКВ		
Limit torque stopping device	Available		Present
Electric motor type	ДСТР 110	ЗДСТР-135	АИР63В6
Control device, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-061(0620)		ПБР-3ИС, ПБР-3А or ФЦ-0610
Protection rating	IP65		IP55
Climatic version	У2, Т2		У2
Versions	ПЭО3-100-1,5-03К ПЭО3-100-0.6-03К	ПЭО3-250-0.6-03К	ПЭО3-2500-0.5-04К

ПЭО3-ХХХ actuators reference designation:
1. Actuator type.
2. Output shaft rotation nominal speed, rev/min.
3. Year of development (two last numbers).
4. Supply voltage: letter “К” – three-phase; no letter – single-phase.
5. Climatic version and placement category.

Part -Slewing Shut-Off Electric Actuator KSATO 6 H3M 52/20-0,25, Standard Version (Single-Phase Power Supply)

Actuators group	 **КСАТО 6 Н3М 52/20-0,25 (аналог МЭОФ-40)**
Actuator type	КСАТО 6 Н3М 5/2-0, 25 (analog МЭОФ-40/ 25-0, 25М)
Specification	ЯЛБИ.421321. 098.Т У
ROCC RU conformity certificate №	АЯ45.В05336
Output shaft torque rating	52 Nm
Max output shaft torque	68 Nm
90° Output shaft rotation time	20 s
Output shaft full stroke value	0,25 rev. (0-90°); 0,92 rev. (0-30)
Voltage and power frequency	20 V frequency 50Hz
Power consumption, less	45 Wt
Mass , less	3 kg
Dimensions, less	10x 150x 160 mm
Shaft output end version	квадрат 14 mm
Noise limits, less	65 dBA
Position signaling unit type	БКВ
Protection rating	IP 65
Climatic version	У3
Coupling size	F03, F05, F07
Actuator mode	S3, duration up to 160sec , purely working cycles “open-closed” should not exceed 10 per hour
Peculiarities	Anticondensate heating element (2Wt) is applied in the electric actuator

Multi-Turn Electric actuators ПЭМ, Standard Version (Three-Phase Power Supply)

RCP Code 37 9110

Actuators group	ПЭМ-А	ПЭМ-Б	ПЭМ-В
Specification	ЯЛБИ.421312.014ТУ		
ROCC RU conformity certificate №	АЯ45.В04060		
Output shaft speed	12 rev/min. (ПЭМ-А20 - ПЭМ-А35) 24 rev/min. (ПЭМ-А0 - ПЭМ-А15),	25 rev/min..(ПЭМ-Б0 - ПЭМ-Б2, ПЭМ-Б6), 50 rev/min. (ПЭМ-Б3 - ПЭМ-Б5, ПЭМ-Б7-Б8)	24 rev/min. (ПЭМ-В00 - ПЭМ-В07, ПЭМ-В16 - ПЭМ-В23, ПЭМ-В32 - ПЭМ-В39, ПЭМ-В48-ПЭМ-В55) 48 rev/min. (ПЭМ-В08 - ПЭМ-В15, ПЭМ-В24 - ПЭМ-В31, ПЭМ-В40 - ПЭМ-В47, ПЭМ-В56-ПЭМ-В63)
Voltage and power frequency	380 В частотой 50 Гц		
Mass , less	22 kg	41 kg (ПЭМ-Б0-ПЭМ-Б5), 45 kg (ПЭМ-Б6-ПЭМ-Б8)	83 kg (ПЭМ-В0О - ПЭМ-В07, ПЭМ-В16 - ПЭМ-В23, ПЭМ-В32 - ПЭМ-В39, ПЭМ-В48 ПЭМ-В55) 92 kg (ПЭМ-В08 - ПЭМ-В15, ПЭМВ-24 - ПЭМ-В31, ПЭМ-В40 - ПЭМ-В47, ПЭМ-В56 - ПЭМ-В63)
Position signaling unit type	БКВ, optional - БСПТ		
Electric motor type	АИР63А6 (ПЭМ-А0 - ПЭМ-А7, ПЭМ-А20 - ПЭМ-А35), АИР63В6 (ПЭМ-А8-ПЭМ-А15)	АИР71А4 (ПЭМ-Б0 - ПЭМ-Б2, ПЭМ-Б6), АИР80А4(ПЭМ-Б3-ПЭМ Б5,ПЭМ-Б7, ПЭМ-Б8)	АМР90L4 (ПЭМ-В0О - ПЭМ-В07, ПЭМЧ332 - ПЭМЧ339); АИРКХШ (ПЭМ-В08 - ПЭМЯ15, ПЭМН340 - ПЭМН347); ДАТ901.4 (ПЭМ-В16 - ПЭМ-В23, ПЭМЯ48 - ПЭМ-В55); ДАЛ 00L4 (ПЭМВ24 - ПЭМ-В31, ПЭМ-В56 - ПЭНШ3)
Control device, contactless control	ПБР-3ИС, ПБР-3А or ФЦ-0610		
Noise limits, less	80 dBA		
Protection rating	IP55	IP54 (ПЭМ-В0О - ПЭМ-В15, ПЭМ-В32 - ПЭМ-В47) IP67 (ПЭМ-В16-ПЭМ-В31, ПЭМ-В48-ПЭМ-В63)	
Climatic version	У2	У2 (ПЭМ-В0О - ПЭМ-В15, ПЭМ-В32 - ПЭМ-В47) У1 (ПЭМ-В16 - ПЭМ-В31, ПЭМ-В48 - ПЭМ-В63)	
Peculiarities	Double-acting torque limiter with individual adjustment is available		

ПЭМ-А version:

Actuators version	Adjustment range of the output shaft torque	Output shaft rotary speed		Electric actuator power, Not over	* Output shaft speed	Overall dimensions, not over	** Shaft output end version	Actuator version by the type of installment on the valves
	N,m	min, rev.	max, rev.	Wt	Rev/min	mm	mm	
ПЭМ-А0(А20)	25-70	1	10	180	24(12)	375x332x578	□19	rod-end flange
ПЭМ-А1(А21)							ø44	
ПЭМ-А2(А22)		10	45				□19	
ПЭМ-А3(А23)							ø44	
ПЭМ-А4(А24)		1	10			375x332x527	□19	studded flange
ПЭМ-А5(А25)							ø44	
ПЭМ-А6(А26)		10	45				□19	
ПЭМ-А7(А27)							ø44	
ПЭМ-А8(А28)	70-110	1	10	250 (180)	24 (12)	375x332x578	□19	rod-end flange
ПЭМ-А9(А29)							ø44	
ПЭМ-А10(А30)		10	45				□19	
ПЭМ-А11(А31)							ø44	
ПЭМ-А12(А32)		1	10			375x332x527	□19	studded flange
ПЭМ-А13(А33)							ø44	
ПЭМ-А14(А34)		10	45				□19	
ПЭМ-А15(А35)							ø44	

* ПЭМ-А0…ПЭМ-А15 versions output speed is 24 Rev/min; исполнения ПЭМ-А20...ПЭМ-А35 versions output speed is 12 rev/min.
**ø - shaft output end – cam; □- shaft output end – square

ПЭМ-Б version:

Actuators version	Adjustment range of the output shaft torque	Output shaft rotary speed		Electric actuator power, Not over	* Output shaft speed	Overall dimensions, not over	** Shaft output end version	Actuator version by the type of installment on the valves
	N,m	min, rev.	max, rev.	Wt	Rev/min	mm	mm	
ПЭМ-Б0	100-300	1	6	550	25	325x415x647	□19	rod-end flange
ПЭМ-Б1						325x415x725	ø44	
ПЭМ-Б2		6	45			325x415x802	□19	
ПЭМ-Б3		1	6	1100	50	325x415x647	ø44	
ПЭМ-Б4						325x415x725	□19	studded flange
ПЭМ-Б5		6	45			325x415x802	ø44	
ПЭМ-Б6		35	60	550	25	325x415x802	□19	
ПЭМ-Б7				1100	50	325x415x802	ø44	
ПЭМ-Б8		60	200			325x415x647	□19	rod-end flange

*ø - shaft output end. Diameter hole in shaft output 45 mm

ПЭМ actuator reference designation includes:

1. Actuator type
2. Actuators standard series by maximum torque (letters “А”, “Б”)
3. Version number in standard series (0, 1, 2….35)
4. Climatic version (У2)

ПЭМ-В versions:

Version	Output shaft torque	Output shaft rotary speed, necessary to close (open) the valves*		Electric actuator power	Version of the shaft output end	Actuator version by the type of installment on the valves	Local console avaliability	Analogs, produced in Russia
	Nm	min, rev.	max, rev.	Wt	mm			
ПЭМ-В00	250-630	6	36	2200	ø85	studded flange	C	Н-В02
ПЭМ-В01	250-630	6	36	2200	ø85	studded flange	C	Н-В02
ПЭМ-В02	250-630	6	36	2200	ø85	studded flange	-	Н-В02
ПЭМ-В03	250-630	6	36	2200	ø85	studded flange	-	Н-В02
ПЭМ-В04	250-630	36	216	2200	ø85	studded flange	C	Н-ВО3
ПЭМ-В05	250-630	36	216	2200	ø85	studded flange	C	Н-ВО3
ПЭМ-В06	250-630	36	216	2200	ø85	studded flange	-	Н-ВО3
ПЭМ-В07	250-630	36	216	2200	ø85	studded flange	-	Н-ВО3
ПЭМ-В08	250-630	6	36	4000	ø85	studded flange	C	Н-В05
ПЭМ-В09	250-630	6	36	4000	ø85	studded flange	C	Н-В05
ПЭМ-В10	250-630	6	36	4000	ø85	studded flange	-	Н-В05
ПЭМ-В11	250-630	6	36	4000	ø85	studded flange	-	Н-В05
ПЭМ-В12	250-630	36	216	4000	ø85	studded flange	C	Н-В06
ПЭМ-В13	250-630	36	216	4000	ø85	studded flange	C	Н-В06
ПЭМ-В14	250-630	36	216	4000	ø85	studded flange	-	Н-В06
ПЭМ-В15	250-630	36	216	4000	ø85	studded flange	-	Н-В06
ПЭМ-В16	250-630	6	36	2200	ø85	studded flange	C	-
ПЭМ-В17	250-630	6	36	2200	ø85	studded flange	C	-
ПЭМ-В18	250-630	6	36	2200	ø85	studded flange	-	-
ПЭМ-В19	250-630	6	36	2200	ø85	studded flange	-	-
ПЭМ-В20	250-630	36	216	2200	ø85	studded flange	C	-
ПЭМ-В21	250-630	36	216	2200	ø85	studded flange	C	-
ПЭМ-В22	250-630	36	216	2200	ø85	studded flange	-	-
ПЭМ-В23	250-630	36	216	2200	ø85	studded flange	-	-
ПЭМ-В24	250-630	6	36	4000	ø85	studded flange	C	-

Version	Output shaft torque	Output shaft rotary speed, necessary to close (open) the valves*		Electric actuator power	Version of the shaft output end	Actuator version by the type of installment on the valves	Local console availability	Analogs, produced in Russia
	Nm	min, rev.	max, rev.	Wt	mm			
ПЭМ-В25	250-630	6	36	4000	ø85	studded flange	C	-
ПЭМ-В26	250-630	6	36	4000	ø85	studded flange	-	-
ПЭМ-В27	250-630	6	36	4000	ø85	studded flange	-	-
ПЭМ-В28	250-630	36	216	4000	ø85	studded flange	C	-
ПЭМ-В29	250-630	36	216	4000	ø85	studded flange	C	-
ПЭМ-В30	250-630	36	216	4000	ø85	studded flange	-	-
ПЭМ-В31	250-630	36	216	4000	ø85	studded flange	-	-
ПЭМ-В32	500-1000	6	36	2200	ø85	studded flange	C	Н-В15
ПЭМ-В33	500-1000	6	36	2200	ø85	studded flange	C	Н-В15
ПЭМ-В34	500-1000	6	36	2200	ø85	studded flange	-	Н-В15
ПЭМ-В35	500-1000	6	36	2200	ø85	studded flange	-	Н-В15
ПЭМ-В36	500-1000	36	216	2200	ø85	studded flange	C	Н-В16
ПЭМ-В37	500-1000	36	216	2200	ø85	studded flange	C	Н-В16
ПЭМ-В38	500-1000	36	216	2200	ø85	studded flange	-	Н-В16
ПЭМ-В39	500-1000	36	216	2200	ø85	studded flange	-	Н-В16
ПЭМ-В40	500-1000	6	36	4000	ø85	studded flange	C	Н-В18
ПЭМ-В41	500-1000	6	36	4000	ø85	studded flange	C	Н-В18
ПЭМ-В42	500-1000	6	36	4000	ø85	studded flange	-	Н-В18
ПЭМ-В43	500-1000	6	36	4000	ø85	studded flange	-	Н-В18
ПЭМ-В44	500-1000	36	216	4000	ø85	studded flange	C	Н-В19
ПЭМ-В45	500-1000	36	216	4000	ø85	studded flange	C	Н-В19
ПЭМ-В46	500-1000	36	216	4000	ø85	studded flange	-	Н-В19
ПЭМ-В47	500-1000	36	216	4000	ø85	studded flange	-	Н-В19
ПЭМ-В48	500-1000	6	36	2200	ø85	studded flange	C	-
ПЭМ-В49	500-1000	6	36	2200	ø85	studded flange	C	-
ПЭМ-В50	500-1000	6	36	2200	ø85	studded flange	-	-
ПЭМ-В51	500-1000	6	36	2200	ø85	studded flange	-	-
ПЭМ-В52	500-1000	36	216	2200	ø85	studded flange	C	-
ПЭМ-В53	500-1000	36	216	2200	ø85	studded flange	C	-
ПЭМ-В54	500-1000	36	216	2200	ø85	studded flange	-	-
ПЭМ-В55	500-1000	36	216	2200	ø85	studded flange	-	-
ПЭМ-В56	500-1000	6	36	4000	ø85	studded flange	C	-
ПЭМ-В57	500-1000	6	36	4000	ø85	studded flange	C	-
ПЭМ-В58	500-1000	6	36	4000	ø85	studded flange	-	-
ПЭМ-В59	500-1000	6	36	4000	ø85	studded flange	-	-
ПЭМ-В60	500-1000	36	216	4000	ø85	studded flange	C	-
ПЭМ-В61	500-1000	36	216	4000	ø85	studded flange	C	-
ПЭМ-В62	500-1000	36	216	4000	ø85	studded flange	-	-
ПЭМ-В63	500-1000	36	216	4000	ar85	studded flange	-	-

ПЭМ - В20 630 24 216 МГМР67
Example of the complete reference designation, ПЭМ-В actuators, standard version.
fix the parameters in the following order:
1.Actuator type ПЭМ
2. Actuator version (В18)
4. Max torque,Nm (630)
5. Output shaft output speed, rev/min (24)
6. Max output shaft revolution number, necessary to close (open) the valves, rev (36)
7. Output shaft position signaling unit type (М)
8. Local console 1vailability (П)
9. Version of case protection against dust and water exposure (IP67 for more detals see p. 9)

*output shaft rotary speed may be divided into the following ranges:
from 1 to 3
from 3 to 6
from 6 to 18
from 18 to 36
from 36 to 108
from 108 to 216

Multi-Turn Electric actuators ПЭМ, Explosion-Proof Version (Three-Phase Power Supply)

RCP Code 37 9110

Actuators group	 ПЭМ-А-IIВТ4	 ПЭМ-Б-IIВТ4	 ПЭМ2-В-IIВТ4
ROCC RU conformity certificate №	АЯ45.В03975, ГБ04.В00295		
Specifications	ЯЛБИ.421312.019ТУ		
Output shaft speed	12 rev/min (ПЭМ-А20-IIВТ4 - ПЭМ-А35-IIВТ4) 24 rev/min (ПЭМ-А0-IIВТ4 - ПЭМ-А15-IIВТ4),	25 rev/min (ПЭМ-Б0-IIВТ4 - ПЭМ-Б2-IIВТ4), 50 rev/min (ПЭМ-Б3-IIВТ4- ПЭМ-Б5-IIВТ4)	25 rev/min (ПЭМ2-В1-IIВТ4, ПЭМ2-В3-IIВТ4, ПЭМ2-В9-IIВТ4, ПЭМ2-В11-IIВТ4) 50 rev/min (ПЭМ2-В5-IВТ4, ПЭМ2-В7-IВТ4, ПЭМ2-В13-IВТ4, ПЭМ2-В15-IВТ4)
Voltage and power frequency	380 V, 50Hz		
Mass , less	28 kg	42, 45 kg	85, 95 kg
Position signaling unit type	* БСПТ-НВТ6, БСПМ-МВТ6		
Electric motor type	ДАТ 63А6-IIВТ4 (ПЭМ-А0-IIВТ4 - ПЭМ-А7-IIВТ4, ПЭМ-А20-IIВТ4 - ПЭМ-А35-IIВТ4), ДАТ 63В6-IIВТ4 (ПЭМ-А8-IIВТ4 - ПЭМ-А15-IIВТ4)	АНМ-А80S4 (ПЭМ-Б0-IIВТ4 - ПЭМ-Б2-IIВТ4, ПЭМ-Б6-IIВТ4), АИМ-А801-4 (ПЭМ-Б3-IIВТ4 - ПЭМ-Б5-IIВТ4, ПЭМ-Б7-IIВТ4)	ДАТ90L4-II ВТ4 ДАТ100L4-II ВТ4
Certified flameproof	1 ExiadIIBT4		
Control device, contactless control	ПБР-3А or ФЦ-0610		
Noise limits, less	80 dBa	85 dBa	80 dBa
Protection rating	IP55		IP 67
Climatic version	У2, УХЛ2		
Peculiarities	** Double-acting torque limiter with individual adjustment is available		

* БСПТIIВТ6 electric actuator delivery set is completed with the БП-24 power supply unit. Order separately if necessary.
** Microswitches are fed from the MS1-12ExO single-channel amplifiers, produced by the company TVRCK with nonsparking electric circuit.
The delivery set is completed with one amplifier, if necessary, order the second amplifier separately.

ПЭМ-А-IIВТ4 version:

Actuators version	Adjustment range of the output shaft torque	Output shaft rotation speed		Electric actuator power,	* Output speed	Overall dimensions, not over	** Shaft output end version	Actuator version by the type of installment on the fitting
	N,m	min, rev.	max, rev.	Wt	Rev/min.	mm	mm	
ПЭМ-А0(А20)-IIВТ4	25-70	1	10	180	24 (12)	567x370x393	□19	rod-end flange
ПЭМ-А1(А21)-IIВТ4							ø44	
ПЭМ-А2(А22)-IIВТ4		10	45				□19	
ПЭМ-А3(А23)-IIВТ4							ø44	
ПЭМ-А4(А24)-IIВТ4		1	10			508x370x393	□19	studded flange
ПЭМ-А5(А25)-IIВТ4							ø44	
ПЭМ-А6(А26)-IIВТ4		10	45				□19	
ПЭМ-А7(А27)-IIВТ4							ø44	
ПЭМ-А8(А28)-IIВТ4	70-110	1	10	250 (180)	24 (12)	567x370x393	□19	rod-end flange
ПЭМ-А9(А29)-IIВТ4							ø44	
ПЭМ-10(А30)-IIВТ4		10	45				□19	
ПЭМ-11(А31)-IIВТ4							ø44	
ПЭМ-12(А32)-IIВТ4		1	10			508x370x393	□19	studded flange
ПЭМ-13(А33)-IIВТ4							ø44	
ПЭМ-14(А34)-IIВТ4		10	45				□19	
ПЭМ-15(А35)-IIВТ4							ø44	

* ПЭМ-А0-IIВТ4...ПЭМ-А15-IIВТ4 versions output speed is 24 Rev/min; исполнения ПЭМ-А20-IIВТ4...ПЭМ-А35-IIВТ4 versions output speed is 12 rev/min.
**ø - shaft output end – cam; □- shaft output end – square

ПЭМ-Б-IIВТ4 version:

Actuators version	Adjustment range of the output shaft torque	Output shaft rotation speed		Electric actuator power, not over	Output speed	Overall dimensions, not over	* Shaft output end version	Output shaft hole depth	Actuator version by the type of installment on the fitting
	N, m	min, rev.	max, rev.	Wt	Rev/min.	mm	mm	mm	
ПЭМ-Б0- IIВТ4	100-300	1	6	550	25	340x500x590	ø 58	142	studded flange
ПЭМ-Б1- IIВТ4						340x500x668		220	rod-end flange
ПЭМ-Б2- IIВТ4		6	45			340x500x743		295	studded flange
ПЭМ-Б3- IIВТ4		1	6	1100	50	340x500x605		142	
ПЭМ-Б4- IIВТ4						340x500x683		220	rod-end flange
ПЭМ-Б5- IIВТ4		6	45			340x500x758		295	
ПЭМ-Б6- IIВТ4		35	60	550	2550	340x500x790		340	
ПЭМ-Б7- IIВТ4				1100		340x500x810		340	

**□ - shaft output end. Diameter hole in shaft output 45 mm.

ПЭМ actuators reference designation, explosion-proof version, includes:
1. Actuator type, Actuators standard series by maximum torque (letters “А”, “Б”)
2. Version number in standard series (0, 1, 2….35)
3. Explosion-proof actuator subgroup and temperature class
4. Climatic version (У2)

ПЭМ2-В-IIВТ4 version:

Actuators version	**Adjustment range of the output shaft torque**	**Output shaft rotation speed**		**Electric actuator power, not over**	**Output speed**	**Overall dimensions, not over**	*** Shaft output end version**	**Output shaft hole depth**	**Actuator version by the type of installment on the fitting**
	N, m	**min, rev**	**max, rev**	**Wt**	**Rev/min.**	**mm**	**mm**	**mm**	
ПЭМ2-В1- IIВТ4	250-630	6	36	2200	25	585x221x440	ø 85	through hole	studded flange
ПЭМ2-В3- IIВТ4		36	6						
ПЭМ2-В5- IIВТ4		6	36	4000	50	585x265x440			
ПЭМ2-В7- IIВТ4		36	6						
ПЭМ2-В9-IIВТ4	50-1000	6	36	2200	25	585x221x440			
ПЭМ2-В11-IIВТ4		36	6						
ПЭМ2-В13- IIВТ4		6	36	4000	50	585x265x440			
ПЭМ2-В15- IIВТ4		36	6						

Straight-running Electric actuators ПЭП, Standard Version

RCP Code 37 9110

Actuators group	
Specifications	ЯЛБИ.421323.012ТУ
ROCC RU conformity certificate №	АЯ45.В04059
Output coupling rod force agjustment range from min to max value	2000-4000 N
Coupling rod full stroke nominal time	80,125 sec
Output coupling rod nominal full stroke	16.25 mm
Voltage and power frequency	220 В, 50 Hz
Power consumption, not over	45 Wt
Mass , less	7.1 kg
Dimensions, not over	166x275x420 mm
Noise limits, less	50 dBA
Position signaling unit type	БКВ, БСПР
Electric motor type	ДСОР-68
Control device, contactless control	ПБР-2М
Protection rating	IP65
Climatic version	У3.1
Peculiarities	Max force limiter is available
Versions	ПЭП-4000/80-16-04 ПЭП-4000/125-25-04

ПЭП actuators reference designation:
1. Actuator type
2. Output coupling rod maximum force, N
3. Nominal output coupling rod full stroke time, sec
4. Output coupling rod nominal full stroke, mm
5. Position signaling unit type:
   the letter “Р” - БСПР (БКВ + rheostat sensor); “
   М” – only limit switch assembly (БКВ)
6. Year of development (two last letters)
7. Climatic version and category of placement

Electrified Shut-Off and Control Pipeline Valves with ABS ZEiM AUTOMATION Electric actuators

The company offers power Valves delivery (“actuator+ high availability pipeline Valves, and also power Valves all-inclusive service.

All-inclusive service includes:
• help in the equipment selection and interface;
• development;
• installation and checkout work;
• testing;
• warranty service.

The pipeline valves kit may be selected and ordered by the cataloque “Pipeline Valves Set with Electric actuators produced by ABS ZEiM AUTOMATION”. Products of more than 30 famous Russian and foreign fitting plants are presented in the catalogue. A specialist may choose in the catalogue a required set and get high compatible equipment: Valves of optimal type and size with electric actuators of the reqiored modification produced by ABS AUTOMATION, ready-to-install and to-operate.

The Catalogue “Pipeline Valves Sets with the Electric actuators produced by ABS ZEiM AUTOMATION” is available either in paper form or in electronic form in the ABS AUTOMATION offices or on the website www.abs-zeim.ru.

Ball cocks

Nominal diameter	15-30
Working medium nominal pressure, MPa	16, 25, 40, 63, 100, 160
Working medium temperature, °C	от - 40°С до +30°С
Working medium	Oil,natural and associated gas, indifferent gas, air, water, abrasive mediums , etc.
Case material	Carbon steel, stainless steel 12Х 18Н 10Т
Ball material	Carbon steel, stainless steel 12Х 18Н 10Т
Sealing	Fluoroplastic, metal
Control actuator	Manual, electric actuator МЭОФ-16, 250, 1600, 4000 against diameter and pressure
Application	As shut-off valves, and also to regulate fluids and gases flows in automated control systems, including the systems with linear and equal percentage characteristics.

Disk shutter

Nominal diameter	3-20
Working medium nominal pressure, MPa	6, 10, 16, 25
Working medium temperature, ^{0}C	от - 40° С до +150°С ; special versions up to +560 °С
Working medium	Oil,natural and associated gas, indifferent gas, air, water, abrasive mediums , etc.
Case material	Cast iron, carbon steel, stainless steel
Ball material	Cast iron with protective coating, carbon steel, stainless steel
Bush	Different rubbers, for concrete operating conditions
Control actuator	Manual, reducer, МЭОФ , ПЭО3, КСАТО, pneumatic actuator, hydraulic actuator
Application	To regulate fluids and gases flows in automated control systems

Gates

Gates type	Spade gates	Cast wedge gates and built-up steel gates
Nominal diameter, mm	50-800	50-800
Working medium nominal pressure, MPa	0.6-1.6	1.6-6.4
Working medium temperature, ºC	From +5° C to +250°C	From - 60° C to +425°C
Working medium	Water, granulated solids, slime, sewage waste	Water, fume, oil, gas, petrochemicals, synthetic oils and other explosive mediums
Valve hermeticity	Class A, B	Class A, B
Case material	Carbon steel, 09Г 2С cast iron	Cast iron, steel, 35L, st20, 09Г 2С
Control type	Manual, reducer, electric actuator	
Application	Water, slime, granulated solids, hydrocarbon oils transportation	In pipelines handling water, fumes, oil, petrochemicals, gas, fluid mediums

Valves

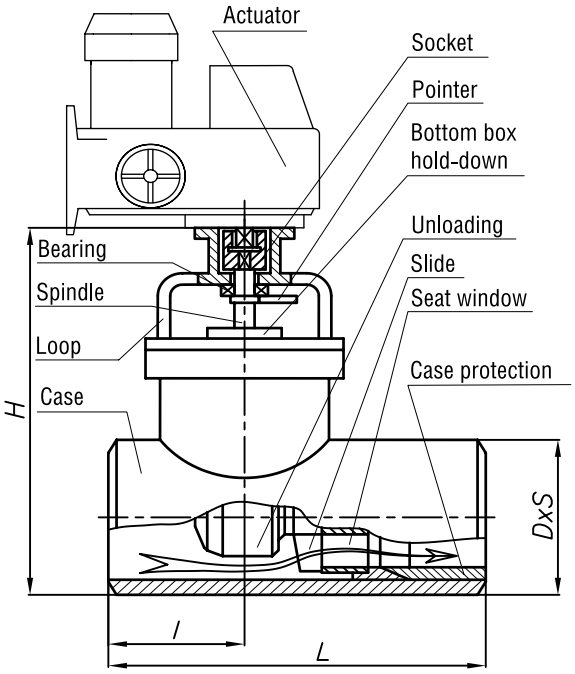
Valve type	Mixing valve (27ч908нж)	Regulating valve (multipurpose valve)
Nominal diameter, mm	50-125	15-300
Working medium nominal pressure, MPa	1.6	1.6-6.3
Working medium temperature, ºC	From - 15° C to +180°C	From - 30° C to +300°C
Working medium	Water and other mediums, neutral to the details contacting the medium	Liquid or gas medium, neutral to the details contacting the medium
Case material	Cast iron, СЧ20	Steel 25L, 12х18Н9ТЛ
Control type	Electric actuator МЭПК, МЭП, ПЭП	
Application	For mixing two working medium flows and continuous regulation of compound flow parameters	To apply in process control systems of chemical and other productions for continuous regulation of working medium parameters

REGULATING SHUT-OFF DISK AXIAL VALVE КРЗДо

Straight flow wide-range multipurpose rotary high pressure valve КРЗДо with interior unloading is intended for good, linear-like working medium parameters regulation: fume, water, hostile environment and other mediums with the working temperature up to 650ºС.

The slide is lobe-shaped, the lobes revolve round its axis and open in the disk seat shaped holes, letting in the working medium.

“DISK”-type valves are safer and more durable than flow cage type valves, needle valves and gate valves. Working surfaces self-purify thus no burrs or seizures are observed when working with particulate pollutant meduims. The valves are erosion-resistant.



Valve structure

Unlike other valves “DISK”-type valves have self-unloading hard slide valve with inner feedback, which dampens vibration. The slide also has a slight force of pressing to the seat at any rate of passes opening and any pressure drop. No friction is observed even at small pressure drops, thus the valve works almost fatigue-free, actuators of less power are used.
КРЗДо is an improved construction of the “DISK”-type regulating valve РПС АЭ, СКА produced in the plant ATOMMASH; capacity increased Kv, reliability of the operation under significant pressure drop improved. The valve possesses the parameters required for the operation under continuous blow-down, provides smooth linear regulation of pressure and medium flow from the beginning to the complete opening without bypass valves. When in closed position leakage is impossible.

As a result of no spindle translation graphlex seal life is increased and comprises over 10 thousand hours. The spindle and cover airtightness at operation is provided with the help of self-sealing. The first maintenance inspection - after 6-8 years of operation, life time – over 30 years.

Stainless steel or carbon steel case, welded or flanged (in compliance with the Customer’s order). Shutter (Slide, seat), spindle and all the in-case components are of high-alloyed stainless steel.

КРЗДо – is a rotary valve, developed specially for the systems requiring continuous regulation under significant pressure drops (up to 25 MPa). For example it provides regulation of feed water or as a back pressure valve for flows distribution before economizers and desuperheater operates under continuous blow-down. The valve speed is not limited by the construction and is determined by the Customer.

Quick removal flat seat and a slide make the valve extremely easy to maintain and repair in a small work shop.
Application permit by ROSTECHNADZOR, certified. Corresponds to TU 3742- 003- 57B997- 20M.

Regulating shut-off disk axial valve КРЗДо 800.01

Regulating shut-off disk axial valve КРЗДо 400.01

CUT-OFF DIRECT- ADMISSION VALVES WITH REMOTE CONTROL

Cut-off direct-admission valves with remote control are intended for automatic working product shut off (gas, fume, oxygen, etc.) in case of process upset and are the executive element of the equipment failure control automatic devices.

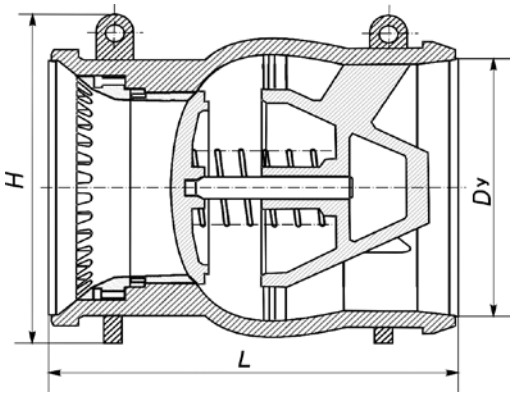
General characteristics.

- working medium temperature: 90° C and 250°C ;
- joint type: flanged or welded (in compliance with the Customer's order);

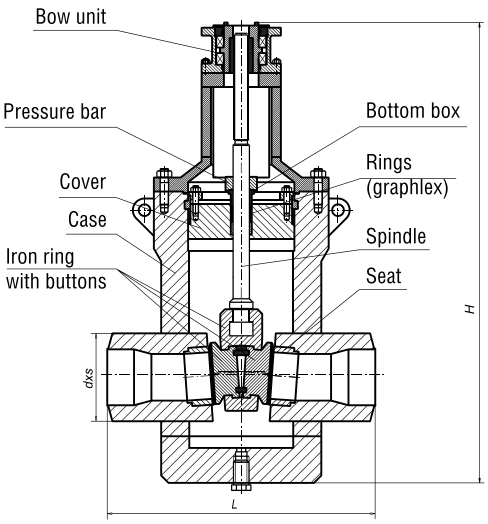
airtightness as per GOST 9544 class "A";

- valve closing time: less 1 sec.;
- by the Customers' order the valves in the explosion-proof version are produced (protection rate as per GOST 14254-80 IP 65), certified flameproof IIBT4;
- optionally produced for moderately and highly hostile environment as per safety regulations 03- 585- 03, hazard class - 3, 4as per GOST 12.1.07;
- complies with TU 3742-002- 46578997-2006.

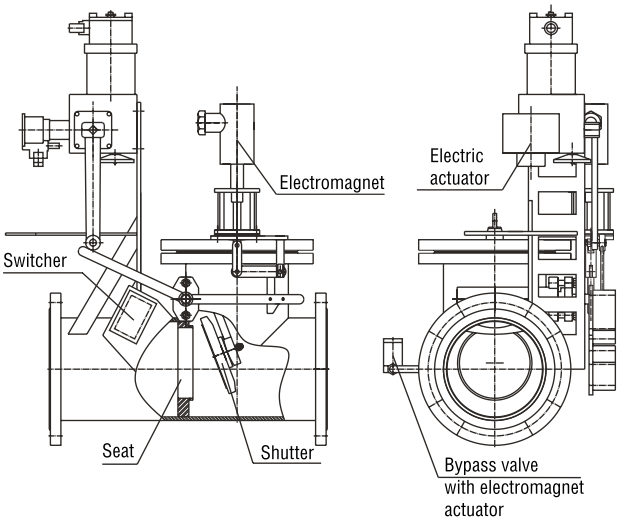
The valve is all-positional and opens manually directly by the valve rocker. For remote opening the actuator МЭО is adjusted.



Steel Axial Return Closing Valve Structure



Wedge gate valve structure



Cut-off Direct-Admission Valve with remote Control

STEEL AXIAL RETURN CLOSING VALVES

The valves are intended to stop blackflow of fume, condensate, water, gas, etc. the closing valve opens and closes in case of 0.01 MPa pressure drop. In comparison with return valves with rotary gate (disk), axial valves are easier. They have higher response speed, their air-gas channels are more streamline, that lowers stream turbulence and the valves operation noise. The valves have less hydrodynamical resistance, are more reliable, are analogs of the valves producesd by the company MOKVELD (Holland). Life time – over 30 years. Welded or flanged pipeline joint, climatic version in compliance with the Customeer's order. Fully airtight. Gate airtightness as per GOST 9544, class "A".

WEDGE GATE

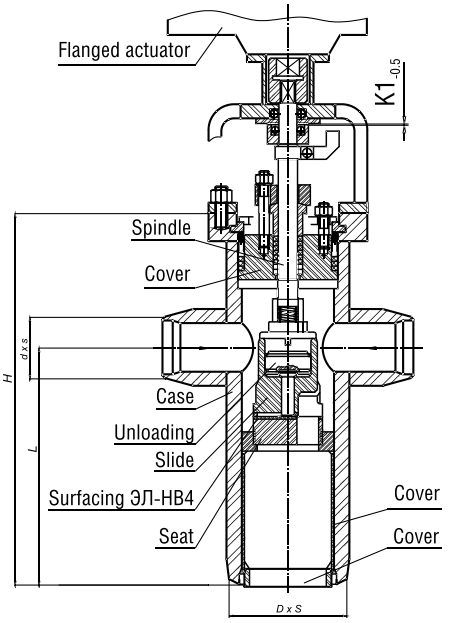
Gate airtightness of class А, Б (GOST 9544-93). The case is made by forging, pipeline joint - welded. For durability the coupling rod is made of stainless steel and is connected to two moving buttons through the iron ring. Between the buttons in a special seat bore a spacer is placed, which allows the buttons to self-center on the response wedge seats face. Outer seal buttons and seats faces are welded with abrasion resistant surfaing ЭЛ3-НВ4, the buttons step up and down in a guide along the case. The spindle and the moving cover airtightness is provided by graphlex self-sealing. To pemove pressure and pressing force before opening the gate a bypass valve is provided from the buttons to the seats.

REGULATING ROTARY DISC VALVE

Wide-ranged multipurpose КРЗД throttle disk valves КРЗД-4 of “DISK”- type with interior unloading are intended for good linear-like working medium parameters regulation in technological systems of thermal stations, heating plants, heat supply networks, etc.

Unlike other valves “DISK”-type valves have self-unloading slide valve with interior feedback, which at any opening degree of the passes and any pressure drop support the minimum force of pressing the slide to the seat. It lessens friction and provides almost fatigue-free operation even under significant pressure drops, In this case actuators of less power are used.

Moreover the surface self-purifies in the cycle “Open-close” that prevents seizures working with particulate pollutant meduims; the slide does not vibrate under the influence of the working enviromnebt, providing better gland life seal - over 10 thousand hours, as the spindle translational displacement is not observed. The valve life time – over 30 years.The first maintenance inspection - after 6-8 years of operation.



КРЗД 4 Valve

	КРЗД4.100/150.26-3	КРЗД4.150/ 250.26-3	КРЗД4.200/250.26-3
Py, MPa	26		
TC	45		
KV t/h	195	520	630
Q steam cons t/h, при ΔP =2MPa	280	850	120
L1, mm	600	730	780
L2, mm	450	585	630
H, mm	1480	1815	
DxS input	172 x 36	255 x 49	273 x 38
DxS output	255 x 42	325 x 38	
Mass ,kg	600	1000	1500
МЭОФ .../25-0,25	250	630	

The case is steel, wedged.The barrel, slide and seat are of stainless steel 08Х 18Н 10Т. Abrasion-resistanst steel ЦН6Л is welded on the slide and seat working surfaces.

КРЗД4 and КРЗД valves have smooth linear control characteristic from the beginning to the complete opening without bypass valves. if closed leakage is impossible.

Capacity Kv, connecting dimensions differ in compliance with the Customer’s order. The device is permitted for usage, certified and complies with TU 3742- 003- 46578997-2006

Regulating Rotary Disc Valves for Feed Water

Regulating axile closing disk valve	Dy, mm	Py, mm	KV, m3/hour Linear characteristic	T, oC	L, mm	H, mm	DxS	Mass without actuator, kg	Moment МЭОФ . /25-0, 25- 9к
КРЗД 100.26	10	26	60	280	440	580	13 x 1	4 150	250
КРЗД 125.26	125	26	10	280	540	620	159 x 1	6 180	250
КРЗД 150.26	150	26	130	280	620	70	194 x 2	0 20	630
КРЗД 175.26	175	26	180	280	680	80	219 x 2	4 480	630
КРЗД 200.26	20	26	270	280	720	820	273 x 3	6 520	630
КРЗД 225.26	25	26	320	280	770	850	273 x 2	4 570	630
КРЗД 250.26	250	26	374	280	870	90	325 x 3	5 740	630

Appliance of Electric actuators and Valves of Different Producers

Pipeline Valves		Electric actuators
Producer	**Reference designation, range DN, mm; range RN, MPa**	
Ball cocks		
AUTOMATIKA-INVEST, Tula	Shut-off and control ball cock15-200 mm; 2.5-4.0 MPa	МЭОФ-12.5, 25,40,100, 250
HYDROGAS, Voronezh	Shut-off ball cock25-100 mm; 1,6 MPa	МЭОФ-40, 100, 250
GIRAS, Khimki	Shut-off ball cock15-100 mm; 16-40 MPa	МЭОФ-40, 100, 250
KVO ARM, Schelkovo	Ball cock 10-600 mm; 1.6-4.0 MPa	МЭОФ-40,100,250, 320, 630,1000,1600,2500,4000
NAVAL, Finland	Ball cock control 50-500 mm; 16, 25, 40 MPa	МЭОФ-6.3, 12.5, 25, 32, 40, 100, 250, 630,1000,1600
PRIS, Nizhnekamsk	Ball cock 15-100 mm; 4.0 MPa	МЭОФ-6.3, 40,100, 250
FOBOS, Rybinsk	Shut-off ball cock 15-200 mm; 16-40 MPa	МЭОФ-40,100, 250, 320
STROMMASH, Ulyanovsk	Shut-off ball cock 50-100 mm; 1.6 MPa	МЭОФ-40
ENERPRED-ARDOS, Zelenograd	Shut-off ball cock 15-150 mm; 1.6-25 MPa	МЭОФ-40, 100, 250,1000,1600
Disc Shutters		
ADL-GROUP, Moscow	Shut-off and control Disc shutter 32-500 mm; 1.0-1,6 MPa	МЭОФ-40, 100, 250,1000, 25000
ARMATEC, Saint-Petersburg	Control Disc shutter 32-600 mm; 0,6-1,6 MPa	МЭОФ-40, 100, 250, 2500
WATS, Holland	Rotary Disc shutter 50-500 mm; 1,0-1,6 MPa	МЭОФ-32, 40, 100, 125, 250, 320, 630, 1000, 1600, 2500
HYDROGAS, Voronezh	Shut-off and control Disc shutter 50-400 mm; 1,0; 1,6 MPa	
INTERARM, Moscow	Shut-off and control Disc shutter 40-750 mm; 2,5 MPa	МЭОФ-32, 40,100, 250, 630,1000, 2500
PROMARMATURA, Saint-Petersburg	Shut-off and control Disc shutter 32-300 mm; 1,0-1,6 MPa	МЭОФ-25, 32, 40,100, 250
SAUTER, Sweden	Control Disc shutter 25-200 mm; 0,6-1,6 MPa	МЭОФ-6.3, 40, 100, 250
TTiCOR, France	Disc shutter 40-500 mm; 0,5-1,6 MPa	МЭОФ-32, 40,100, 250, 630, 1000, 1600, 2500
Valves		
HC AMAKS, Moscow	Cut-off Valve 100-600 mm; 1,2 MPa	МЭОФ-16, 250
	Throttle valve 50-400 mm; 0,1; 1,2 MPa	
ATEK, Moscow	Valve control 50-300 mm; 1,6 MPa	МЭОФ-40,100
IMPULSE, Volgodonsk	Closing control Valve 80-700 mm; 6-40 MPa	МЭОФ-100, 250, 320, 630, 1000, 1600, 2500
SPA FLAME, Saint-Petersburg	Valve disc control 50-150 mm; 9,7 MPa	МЭОФ-250
	Valve control 100-250 mm; 6,3 MPa	МЭОФ-250,1000
	Temperature regulating Valve 20-80 mm; up to 37,3 MPa	МЭОФ-250
	Disc-type regulating feeding Valve 100-250 mm; 23,3-37,3 MPa	
AMARGUS, Gus-Khrustalny	Control Valve 25-100mm; 1,6;4,0;6,3 MPa	МЭПК-2500, МЭПК-6300, МЭП-250000, ПЭП-4000

Pipeline Valves		Electric actuators
Producer	**Reference designation, range DN, mm; range RN, MPa**	
Valves		
LG AUTOMATIKA, Moscow	Control Valve 10-200 mm; 1,6; 40 MPa	МЭПК-6300
KOTELNIKOVSKY FITTING AND ACCESSORIES PLANT, Kotelnikovo	Control Valve 25-200 mm; 1,6-6,3 MPa	МЭП, МЭПК
Gates		
AMARGUS, Gus-Khrustalny	Gate 100-150 mm; 1,6 MPa	МЭПК-6300 МЭП-20000
BALTPROMARMATURA, Saint-Petersburg	Gate hose 50-200 mm; 0,6; 1,6 MPa	МЭМ-100, ПЭМ
GUSAR, Moscow	Wedge gate valve with feed-out spindle 50-300 mm; 1,6 MPa	ПЭМ
IKAR, Kurgan	Wedge gate valve with feed-out spindle 200-500 mm; 1,6; 2,5; 4,0 MPa	ПЭМ
YUGO-KAMSKY VALVE AND TUBE FITTING PLANT, Yugo-Kamsky settlement	Gate 50-300 mm; 1,6-4,0 MPa	ПЭМ
BLAGOVESCHENSK VALVES PLANT, Blagoveschensk	Gate 50-200 mm; 1,6-16 MPa	ПЭМ
NZITO, Nizhny Novgorod	Gate 50-250 mm; 1,6-4,0 MPa	ПЭМ
PENZATYAZHPROMARMATURA, Penza	Wedge gate valve 80 mm; 1,6 MPa	ПЭМ
MUROMSKY PIPELINES PLANT, Murom	Gates	ПЭМ
PENZATYAZHPROMARMATURA, Penza; **TYAZHPROMARMATURA**, Apeksi; **IKAR**, Kurgan; **GUSAR**, Moscow, etc.	Gates , Valves, cocks	ПЭМ

SECTION 6. INTELLECTUAL ELECTRIC ACTUATORS

ABS ZEiM AUTOMATION is constantly working at developing the new and improving the manufacturing production. The enterprise specialists have worked out the actuator controler КИМ1 – an electronic module, which provides the actuators and actuators with new qualities and makes them intellectual. КИМ 1 is completed with industrial version electric actuators, has setting and overall dimensions of commercial position sensor and takes its place in the actuator.

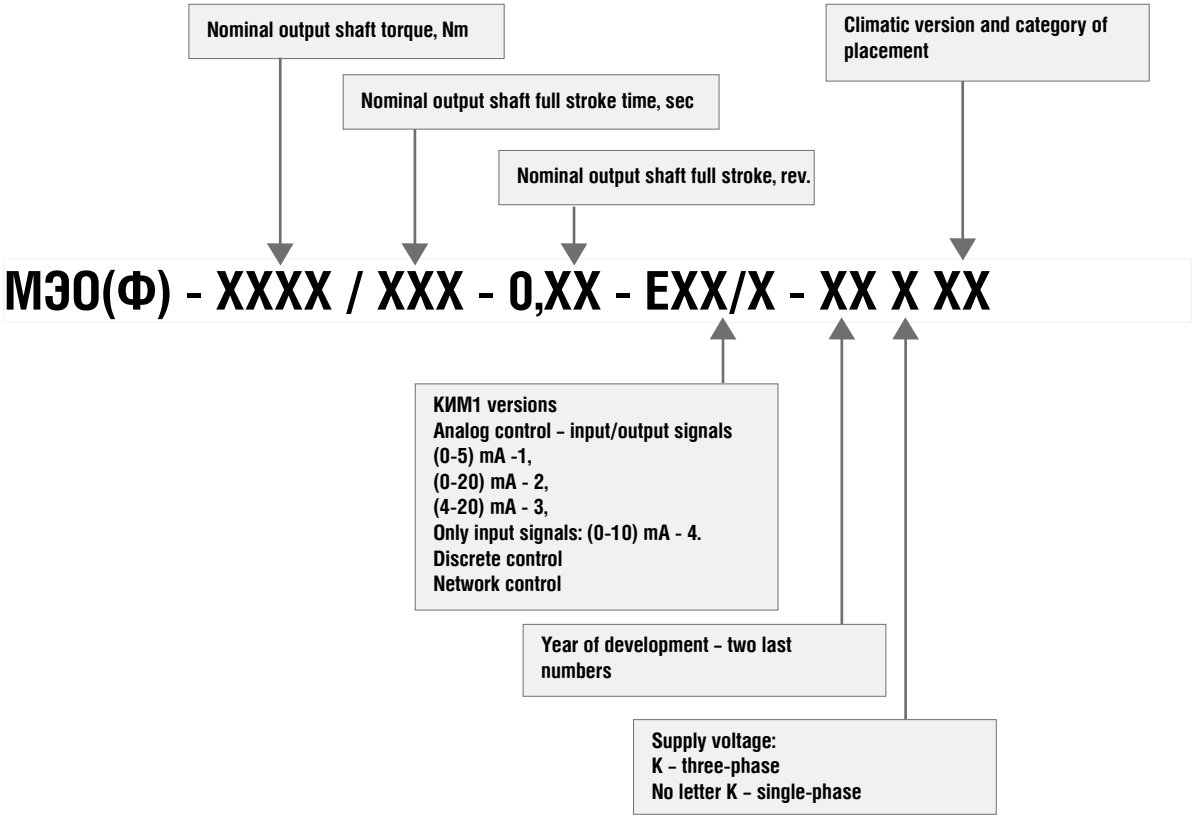
Functual characteristics of the intellectual electric actuators, supplied with КИМ1:

• Electric actuator control by:
  - discrete signals;
  - over RS- 485 network, protocol MODBUS;
  - analog signal;
  - independent infrared console;
  - local console.
• Remote parameters setting by:
  - independent infrared console;
  - over RS- 485 network.
• Different protection types:
  - from electric actuator current excess;
  - from electric actuator operation time excess;
  - from lack of the command issuing;
  - from the motor overtemperature.
• Easy actuator setting on the Valves.
• Preprogrammed position setting in response to the discrete or “ALARM” signal.
• Positioning agjustment. When positioning КИМ 1 switches off the motor beforehand, taking into consideration the electric actuator inertia. Error value is constantly analised to correct the lead time.
• The electric actuator output shaft overtorque control (if torque meter is available).
• Generic signal “Malfunction”.
• Power backup battery, providing sensors and indication work within 24 hours.
• Electronic motion, end positions, overtorque, malfunction, battery change indication.
• Mechanical indicator of the Valves working element current position.
• Signaling of the Valves working element end and interposition.
• Overtorque signaling.
• Setting the Valves working element in the position “Закрыто” (”Closed”) and “Открыто” (“Opened”) with or without sealing.
• Electronic moule anticondensate heater control in relation totemperature.
• Working temperature - from - 40 to +60 °C .
• Built-in starter.

КИМ 1 has a number of control-related versions:

- discrete control. Control by means of the commands “OPEN” (ОТКРЫТЬ),
”CLOSE” (ЗАКРЫ ТЬ), issued to the discrete inputs;
- analog control. Analog signal control (0.5 mA, 0. 20 mA, 4. 20 mA, 0…10В);
- control over RS- 485 network, protocol MODBUS.

Information to order Intellectual Electric actuators

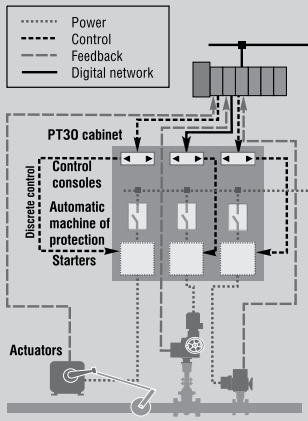


Actuators and Actuators, Delivered with the КИМ1 Actuator Controller

	Single-turn electric actuators			
	Torque, Nm	Nominal full stroke time, sec	Nominal full stroke value, rev.	Supply voltage
МЭО(Ф) - 40	16; 40	10; 25; 63	0, 25; 0, 63	220 V or 380 V
МЭО(Ф) - 250	40; 10; 250	10; 25; 63; 160	0, 25; 0, 63	380 V
МЭО(Ф) - 10	320; 630; 1000	10; 15; 25; 37; 63; 160	0, 25; 0, 63	380 V
МЭО(Ф) - 160	630; 1000; 1600	10; 15; 25; 37; 63; 160	0, 25; 0, 63	380 V

Standard and Intellectual ABS ZEiM AUTOMATION Equipment in Automated ACSTP

Centralized system



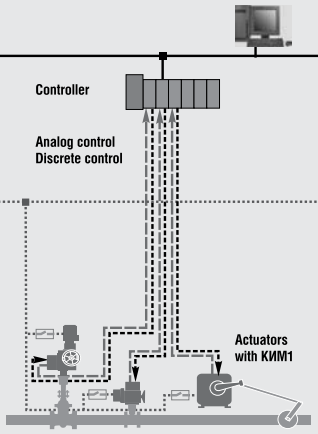
Control by means of exernal device (PT3O cabinet)

To connect wires to external control devices:
- provide enough space in the cabinet for starters (ПБР and ФЦ), manual control units (БРУ).
- lay multicore cables to transfer signal from the actuator to the PT3O cabinets and from PT3O cabinets to the controller.
- if required for local console lay additional cables.

For reception, transmission, transformation of process state signals consoles, control and regulation panels are required.

Decentralized system

Radial control

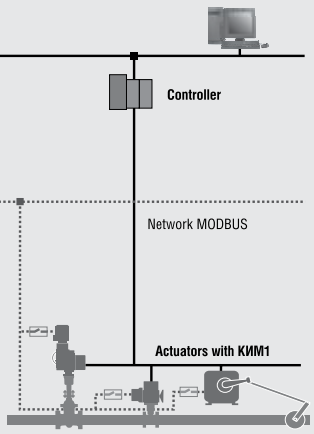


Radial control – control by means of built-in КИМ1 controller.

Actuator control functions are transferred to КИМ1, fixed on the actuator. The actuator is connected to the regulation system by a wire, which transfers discrete or analog commands. Across the same wire limit torque switches and position sensor signals are transferred to the system. Each signal goes to a separate controller's input. A number of wires may be connected to the power cable.

At the expense of some controller's fnctions transfer to the actuator the total number of contacts in the system reduces. Radial control by means of built-in КИМ1 controller increases the control system survivability and dynamics.

Network control



Network control – control by means of built-in КИМ1 controller over MODBUS network.

Control commands and the actuator condition information is transferred over RS-485 field network, protocol MODBUS RTU is used. To control actuators (up to 239 devices) duplex cable is enough. No external starter is required. The minimum number of wires used.

Thus, saving is possible not only at the extent of no cabinets used, but also due to connecting cables, as a few electric actuators may be connected to one cable.

Digital signals are less jammed than analog signals, regulation reliability is high. Network control enables connecting on all the levels: from field devices to controllers that provides a powerful communication network for modern automation systems.

Additional advantages:
No switches mechanical setting is required: adjust the electric actuator with the help of portable console through infrared communication channel; for network control – by means of remote access (operator's console, PC).

SECTION 7. LOW-VOLTAGE COMPLETE DEVICES FOR ACTUATORS AND ELECTRIC MOTORS CONTROL

Devices of the following types are produced:
- Low-voltage complete devices of РТЗО-88 series to control actuators and electric motors;
- Low-voltage complete devices for synchronous and asynchronous motors control;
- Input low-voltage complete devices, including reserve switching device for current up to 630 A and up to 1600A;
- Low-voltage complete devices for energy distributing with automatic draw-out breakers, of cellular construction, КТП-type, also to be applied in power facilities and gas-compression stations;
- Low-voltage complete devices for energy distribution and control of electric actuators of auxiliary electrostations and substations, protection panel, including those with automatic draw-out breakers;
- Low-voltage complete devices for substations AC distribution;- Control, protection, signaling, and automation low-voltage complete devices;
- Intellectual low-voltage complete devices with appliance of microprocessor devices to work as part of ACSTP:
- Low-voltage complete devices for AC and DC current distributions in substations;
- Distribution points;
- ЯОУ boxes for electrical energy distribution in three-phase AC power and lightning networks.

Low-voltage complete devices are intended to regulate actuators and electric actuators with the power up to 10 kWt and shut-off and regulating armature electric actuators of 14- 28 kWt. Low-voltage complete devices enable forming informational signals for control system. Signals and requirements to them are required by the Customer.

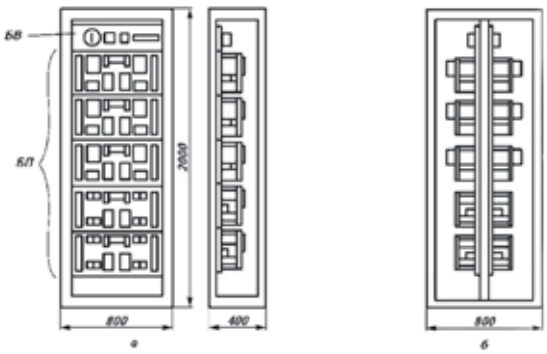
Low-voltage complete devices are produced in cabinet versions, with the use of instrumental in-house production (ПБР, intellectual devices ПБР-3И, ПБР-2И, ФЦ, БРУ, ДУП-М and others), and production of the leading Russian and foreign enterprises.

Operating conditions

Temperature of surroundings	0-40°С
Altitude above sea level	Not over 2000 m
Seismic stability level	Up to 8 points
Envoriment	non-explosive, no aggressive gases and fumes
Protection rate	IP31, IP41 as per GOST 14254-96
Group of mechanical version M1	as per GOST 17516.1-190
Working position in space	vertical, 5°vertical deviation to any side
Cabinets position	In dry room conditions

LOW-VOLTAGE COMPLETE РТЗО 88 DEVICE РТЗО-8 Cabinet characteristics

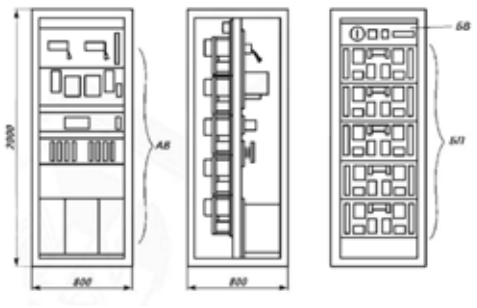
The cabinet is a unified metal casing, on power-supply racks of it electric actuators protection and control cubicles are placed (DSB). To meet the customers needs ABS AUTOMATION assemblies low-voltage complete device of РТЗО series, using not only in-house components, but also foreign components (SCHNEIDER ELECTRIC, ABB, GENERAL ELECTRIC).



Units arrangement inside the РТЗО connection cabinet
БВ – input unit,
БП – connection unit,
а- one-side access,
б – two-side access.

LOW-VOLTAGE COMPLETE DEVICE FOR AC AND DC DISTRIBUTION IN SUBSTATIONS

ШСЭ-8700 cabinets are intended for DC distribution in nuclear stations, ШТЭ-870 cabinets - for DC distribution in thermal plants, ШСН cabinets – in electric substations.
ШСЭ-870, ШТЭ-870 and ШСН cabinets structure is based on two-side access ШДЗ cabinets, overall dimensions 20x80x80 mm. the equipment arrangement inside the cabinets is given in the picture.

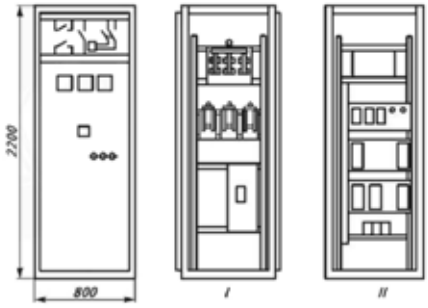


Units and equipment arrangement inside the РТЗО input cabinet
АВ – input equipment,
БП – connection unit,
БВ – input unit

Input cabinets dimension type

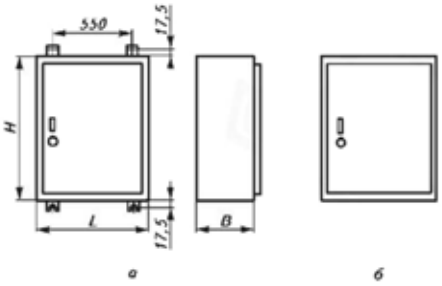
Item №	Cabinet type	Height, mm	Width, mm	Depth, mm
1.	Single-depth cabinet without cable assembly	2000	800	400
2.	Single-depth cabinet with cable assembly		1200	
3.	Double-depth cabinet, also with cable assembly	2200	800	800

Today ABS ZEiM AUTOMATION also produces cabinets with overall dimensions 20x80x40 mm, which allow controlling 16 mechanisms.



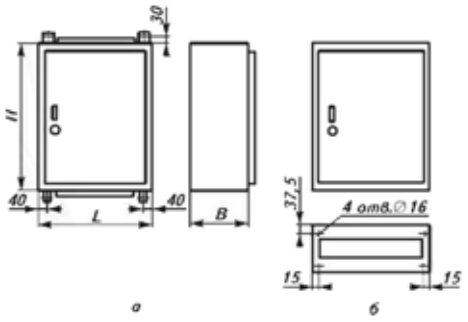
General view, overall dimensions of ШСН, ШСЭ, ШТЭ cabinets
I, II – view without door in front and at the back respectively

DISTRIBUTION POINTS
Distribution point are intended for electric power distribution and for electrical facilities overload and short circuit protection, and also electric circuits and induction motor starts rare switch on and switch off protection.



General view, overall dimensions of ПР8501, ПР8503, ПР8701, ПР8703 distribution points
a – add-on
b – floor

Dimensions, mm			Mass, kg not over
B	H	L	
160	400	750	35
	600		
200	800	65	
160; 200; 250	1000		80
200;250		850	85
	1200	750	90
		850	
	1400	750	110
		850	

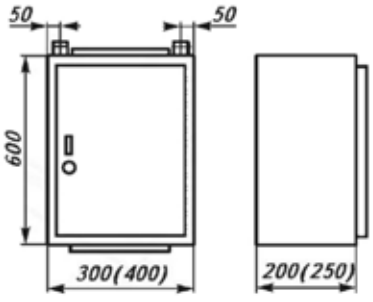


General view, overall dimensions of ПР11 distribution points
a – add-on
b – floor

Dimensions, mm			Mass, kg not over
B	H	L	
170	300	650	30
	500		
	600		
	700	800	
170; 270	800	650	100
		800	
	900		
	1000	650	
		800	
	1200	650	
		800	
	1500		

ЯОУ BOXES FOR ELECTRICAL ENERGY DISTRIBUTION IN THREE-PHASE AC POWER AND LIGHTNING NETWORKS

ЯОУ boxes are intended to distribute electrical energy and are used in three-phase AC power and lightning networks. Each series boxes are supplied with the correspondinfg number of single pole circuit-breakers against the number of outgoing multiples and input packet switch. ЯВЗ boxes are intended for AC and DC circuits nonautomatic closing and interruption and for short-circuit current and overload current protection.



ЯОУ (ЯВЗ) boxes general view, overall dimensions

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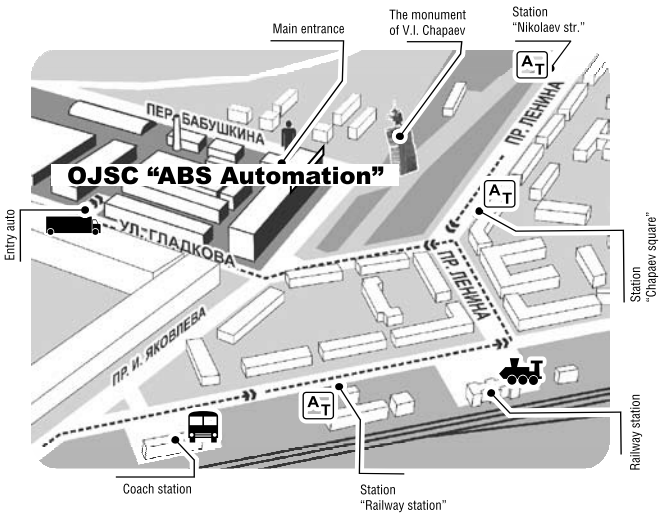
ABS AUTOMATION OJSC LOCATION PLAN



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