



Products catalogue

Automation equipment
and systems for industrial
facilities

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General information about the company



Engineering and Design Departments, Automated Control Systems Department, Implementation and Support Department, Engineering Center, Quality Control Service, Manufacturing Sector, which includes fitting and assembly shops as well as an experimental laboratory. The Company has production facilities, warehouses and maintenance buildings.



The principal activities are development and implementation of research and pilot projects in the field of operating procedures automation and assurance of safe operation of industrial facilities including those located in explosion hazardous areas of oil and gas sector.

Hardware components set of automation system KTS SA



Middle level equipment	
Automation platform	SINKROSS, VYMPEL, Schneider Electric, SIEMENS, HiMAX, Fanuc, Allen Bradley, etc.
I/O pack	KBB-3
I/O pack	KBB-6
Discrete signals input module	K-3201
Discrete signals output module	K-3202
Communication modules	
Managed switches Moxa Industrial Ethernet of the basic series	EDS-400A
Managed switches Moxa Industrial Ethernet of the basic series	EDS-500A
Non-managed switches Moxa Industrial Ethernet of the basic series	EDS-300
Protocol converter Modbus Moxa of the basic series	MGate MB
Converters RS-232/RS-485 in Ethernet Advantech	EKI-1224
Communicational-logic controller	K-3101
Communicational-logic controller	K-3102
Code converter	ПК-004/PTK
Code converter	ПК-004/КН
Code converter	ПК-004/PA
Switches Hirschmann, series	OpenRail, Rail, MICE

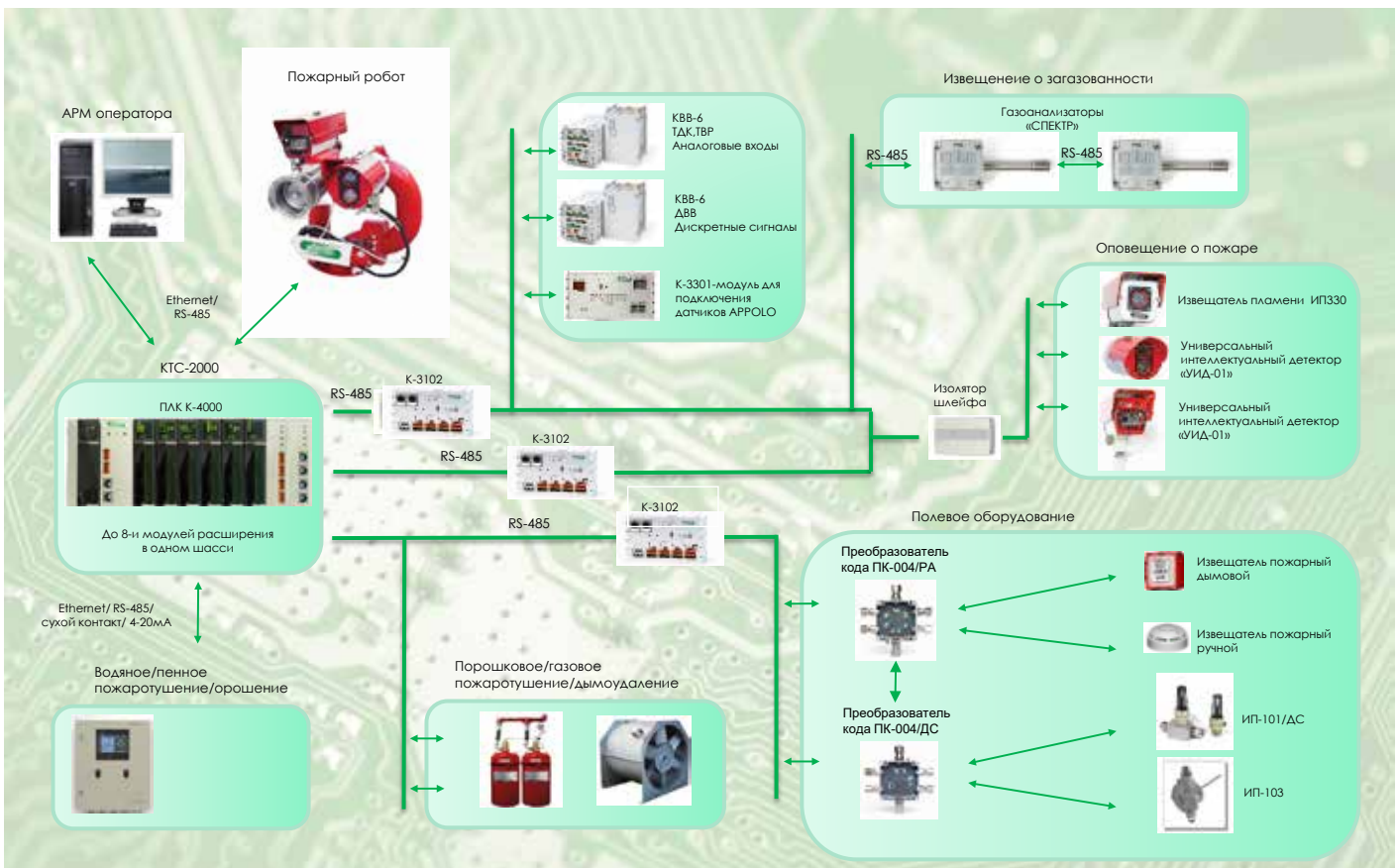
Switches Phoenix contact, series	FL Switch
Bus interface Ethernet/IP Phoenix contact, series	IL ETH BK, ILC
I/O terminal units Phoenix contact, series	IB IL
Power supply modules	
Power-supply sources Traco, series	TSL, TIS, TSP/TSP-WR
Power-supply sources Phoenix contact, series	QUINT UPS-IQ
Power-supply sources Phoenix contact, series	Mini
Insulating interface devices (Intrinsically Safe Barriers) Turck, series	IM, MK, MC, MS, IME, IMC, IMC
Intrinsically safe isolating converter of digital signals, series	ET
Surge Protection Devices Turck, series	IMSP
Surge Protection Devices Wago, series	280, 286, 792, 870
Surge Protection Devices Phoenix contact, series	PT, TT, DT, S-PT
Relay modules	
Actuating relay modules	ARM
Commutation and control relay module	CCRM
Commutation optoisolator module	COM
The actual composition shall be defined by a supply mission	
* Конкретный состав, определяются заданием на поставку.	

Scope of application:

KTS-2000 is used as a part of project-composable integrated safety systems - alarm and security and fire alarm systems (hereinafter - SFA), fire suppression systems of different types and levels of complexity.

STM is designed for use at industrial enterprises, including explosion and fire hazardous facilities of oil, petrochemical, gas, chemical and metallurgical industries, companies of fuel and energy complex, in particular, at the enterprises, carrying out oil and oil products transportation.

Flow diagram of set KTS-2000



Control devices set "Vector"

Technical characteristics:



Automatic control set automatic control system "VECTOR" is intended to maintain the PS intake oil pressure not lower than the permissible value by pumps cavitation conditions and the pressure in the main pipe line at the PS outlet and not higher than the permissible value according to the hydraulic calculation of the line part of the oil pipeline (or on the basis of process pumping mode) by means of throttling of flow at the PS outlet.

Control cabinet of the automatic control system	
Power supply voltage	Single-phase, $\sim 220\text{В} \pm 15\%$, (50 ± 1) Hz;
Power consumption, V*A, not more, than	1500
Running time without external electrical power supply, hours, not less, than	1
Operational conditions	Explosion-proof area
Ingress protection degree by GOST 14254-96, not less, than	IP21
Cabinet mass, kg, not more, than	250
Power cabinet of the automatic control system	
Power supply voltage	Three-phase, $\sim 220/380\text{В} \pm 15\%$, (50 ± 1) Hz;
Power consumption, V*A, not more, than	To be specified according to the type of the actuating mechanism
Operational temperature, C°	From +1 to +40
Operational conditions	Explosion-proof area
Ingress protection degree by GOST 14254-96, not less, than	IP41
Cabinet mass, kg, not more, than	320

Certificates:

The certificate of Conformity of the Customs Union:
No. TS RU S-RU.GB05.V.00050

Automatic Fire Alarm System AFAS SINKROSS-M Maritime Application



Input-output signals parameters:

Maximum number of two-wire addressable alarm loops	– 40 pcs.
Maximum number of addressable devices (fire detectors, addressable relay modules, address marks, fire fighting units control addressable modules) connected to one alarm loop	40 pcs.
Maximum number of addressable devices connected to one FACP	3 840 pcs.
Maximum active resistance of the wire communication line of addressable alarm loop at which FACP retains operability, min.	50 Ohm.
Minimum insulation resistance between alarm loop wires at which FACP retains operability, max. –	kOhm
Maximum length of addressable alarm loop, max.	1000 m
Voltage at addressable alarm loop output terminals, max.	from 20 to 28 V
Maximum current in addressable alarm loop, max.	130 mA
Maximum number of radial non-addressable alarm loops	64 pcs.

AFAS is applied as part of project-linked fire alarm systems and intended for the following:

- equipping of marine vessels of various classes, floating drilling rigs and fixed offshore platforms;
- detection of fire in explosion hazardous areas indoors and outdoors;
- transmission of notifications and service information through RS-232 and RS-485 interfaces, Ethernet, etc. to Upper Level Equipment (hereinafter referred to as ULE) – IBM PC, OPC server, SCADA systems as well as to related systems (ACS, centralized surveillance office, etc.);

AFAS ensures fulfillment of the following functions:

- receipt of signals from manual call points, automatic fire detectors and other automatic fire fighting equipment;
- automatic control of the operability of fire alarm loops and lines of communication between AFAS components;
- record of events and transfer to the relevant operation mode depending on the received signals and FACP (Fire Alarm Control Panel) operation tactics within max.:
 - 10 sec. upon alarm signal generation by fire detector or other fire fighting equipment;
 - 100 sec. upon fault signal generation by fire detector or other fire fighting equipment or communication lines' fault.
- receipt of signals from the devices registering fire protection systems' actuations;
- preferential display of fire alarm in relation to other signals generated by FACP and its transfer to external circuits;
- opportunity to reset Fire and Fault signals from AFAS controls, the time of the FACP return to initial mode after the reset does not exceed 20 sec.;



- temporary switching off (masking) of one fire detector or alarm loop with the status displayed on the AFAS fire alarm. Upon the set time expiry the switched off fire detector or alarm loop is actuated;
- generation of signals from control panel for fireproof doors closing (if the fireproof doors are not waterproof);
- display of the fire location and the actuated fire detector or alarm loop on AFAS fire alarm;
- manual acknowledgment of emergency and fault signals receipt;
- sound alarm acknowledgment;
- AFAS automatic return to initial state after elimination of the causes of emergencies and failures.

Fire flame detector

IP 328 / 330 (UID-01) / IP330

IP 328 / 330 (UID-01)



Technical characteristics:

Sensitivity, m, standard	50,
Viewing angle (in elevation and azimuth)	90°
Output interfaces	Ethernet, current 0-20 mA
Data transfer protocol	Modbus TCP/IP
Video-matrix resolution, pixels	1600x1200
Background illumination, lux	
- - Sun	30000
- - Fluorescent lamps	6000
- - Incandescent lamps	2000
Power supply voltage, nominal (range), V	24 (from 18 to 27,6)
Power consumption, Wt	
- - Non- heated	1,5
- - Heated	4
Galvanic isolation, V, not less, than	500
Insulation resistance, mOhm	20
Operational temperature range, C °	
- - Standard version	- 40 .. +70
- - Special version	- 60 .. +70
Overall dimensions, mm, not more, than	240 x 185 x 120
Mass, kg, not more than	2,4
Type and level of explosion protection	1Ex d e IIB T5 Gb X

Fire flame detectors UID are designed to detect flames of hydrocarbons and other combustible materials in the infrared (IR) and visible spectrum of the electromagnetic radiation of the flame, to generate and send signals to notification equipment, fire alarm and fire suppression control equipment and transfer video frames in real time or in archive to the upper-level equipment.

FEATURES:

The principle of intelligent decision-making;

- Detection of hazards on the basis of video analysis methods;
- Backup infrared channel;
- High noise immunity;
- Software and modular architecture of implementation of video analytics algorithms;
- Multi-purpose with functions of:
 - Flame detector
 - Smoke detector
 - Motion detector
 - Control of process parameters,
 - CCTV with recording of history of events.
- Control and separation of the fire area (simultaneously with multiple foci);
- Automatic diagnostics of glass contamination and objective lens closing;
- The possibility of masking of the controlled area to carry out maintenance;
- Video stream transmission in real time;
- Web-interface;

IP330



Technical characteristics:

Sensitivity, m	60
Viewing angle	90°
Output interfaces	RS-485, current 0-20mA
Data transfer protocol	Modbus RTU
Line length, m, not more, than	1200
Power supply voltage, nominal (range), V	24 (18 to 32)
Power consumption, Wt	
- Non- heated	1,5
- Heated	4
Galvanic isolation, V, not less, than	500
Operational temperature range, C °	
-Basic version (Ex)	- 40 .. +75
-Special earthquake-resistant version (Sp)	- 60 .. +90
-High temperature version (Ht)	- 55 .. +120
Type and level of explosion protection	
-Basicversion(Ex),specialearthquake-resistant version (Sp)	1Ex e mb II T5 Gb X
- High temperature version (Ht)	1Ex e mb II T4 Gb X

Features of the detector:

- Smoke resistance due to operation in IR range
- Detection of remote hydrocarbon flame foci.
- Flame detection in the presence of modulation of source of false triggering.
- Heated glass.
- Automatic monitoring of glass purity and sensitivity elements testing.
- The presence of RS-485 digital interface.
- Ability to change settings, depending on the site of application.
- Insulated current output of 0-20 mA.

- Fire flame detector IP 330 is designed to detect flames of hydrocarbons and other combustible materials in the infrared (IR) spectrum of the electromagnetic radiation of the flame, to generate and send signals to notification equipment, fire alarm and fire suppression control equipment.

- IP 330 contains three sensing elements responsive to flame radiation in different spectral IR sub-bands.

Fire flame detector IP329/330 / Flame detector IP330

IP329/330



FEATURES:

- Ability to use the detector as an element of a safety system to monitor the controlled facility;
- Connection via Ethernet interface;
- Adjustment of the detector via the web-based interface without additional software ;
- Built-in archive of images of actuations (up to 4 archives);
- Adjustable size of archives (number of recorded frames and their maximum frequency).
- Ability to update the detector's software without disassembling

Technical characteristics:

Sensitivity	35 m, 1 grade
Viewing angle	90°
Controlled area of flame spectrum	IR + UV
Output interfaces	Ethernet, RS-485,
Data transmission speed via RS-485 (MODBUS RTU protocol) up to 128 devices	NC / NO dry contact (1A, 60V) current 0-20 mA
Frequency of video frames recording	Up to 5 frames / second
Resolution of the video-matrix	800x600 pixels
Seismic resistance	Intensity 9 on the MSK-64 scale (Incaseofinstallationabovetheordnancedatum of 20 m)
- Background illumination, not more, than	
- - Sun	30000
- - Fluorescent lamps	6000
- - Incandescent lamps	2000
Power supply voltage, nominal (range), V	24 (18 to 32)
Power consumption with video, non-heated	not more, than 5 Wt
Operational temperature range, C °	- 40 .. +75 (- 60 .. +75 – Special version)
Overall dimensions with a bracket, mm, not more, than	330 x 230 x 100
Mass with a bracket, kg, not more than	2,4
Type and level of explosion protection	1Ex e mb II T5 Gb X

The detector is designed to detect fires by the infrared and ultraviolet radiation of the flame, to generate and transmit signals to the notification, fire alarm and fire control equipment and to send archive video frames to the upper-level equipment.

The fire flame detector of explosion-proof version can be used in explosion hazardous areas of 1 and 2 grades according to GOST R IEC 60079-10-1-2008 and GOST R IEC 60079-14-2008.

Marking of explosion protection is 1Ex e mb II T5 Gb X. The level of ingress protection is not below IP65 / IP68 by GOST 14254-96.

Flame detector IP330

Explosion protection class D



- Smoke contamination resistance by means of operation in IR-range.
- Immunity to sun flare;
- High immunity to noise;
- Automatic control of glass cleanliness;
- Possibility to change sensitivity settings;
- Isolated outputs.

Technical characteristics:

Sensitivity, m	60
viewing angle	90°
output interfaces	RS-485, current 0-20 mA dry contact (for Ex disign)
flame spectrum controlled area	IR, three spectral regions
supply voltage, V	24 (from 18 to 32)
Consumed power, W	3
operating temperature range, °C	
- regular design (Ex)	- 60 .. +90
- high temperature design (HT)	- 55 .. +120
weight, not exceeding, kg	2.5
Explosion-proof marking	2 ExdellBT5 X

Flame detector IP329/330 Explosion protection class D / Flame Detector Test Lamp FDTL

Flame detector IP329/330 Explosion protection class D



- Control via IR and UV spectra together with multistage digital signal processing.
- Automatic control of glass cleanliness;
- Isolated outputs.

Technical characteristics:

sensitivity, m	60
viewing angle (vertical and horizontal)	90°
flame spectrum controlled area	IR + UV
output signals	RS-485, current 0-20 mA, NC/NO dry contact (1A, 60V)
background illumination, not more	
- sun	30000
- fluorescent lamp	6000
- incandescent lamp	2000
supply voltage, VDC	24 (from 18 to 32)
consumption power, W	3
operating temperature range, °C	- 60 .. +90
weight, not more, kg	2.5
Explosion-proof marking	2 ExdeIIBT5 X

Detector Test Lamp FDTL



Test Lamp Adjustment.

By rotating the reflector's body make the minimum size of the beam spot at the distance corresponding to the distance to the tested flame detectors.



Technical characteristics:

Coverage range, m, min. *	4 **
FDTL power supply	3 dry elements of D type
Operation time, h, min.*	1
Enclosure Ingress Protection	IP54
Consumed power, W, max.	2
Operating temperature range, °C	-20...+40
Overall dimensions, mm, max.	310x60x60
Weight, kg, max.	0,8

* if newly charged batteries are available

** at flame detector maximum sensitivity

Flame Detector Test Lamp (FDTL) is intended for testing operability of addressable flame detectors IP 329/330-1-1-XXXX and its modifications in-situ.

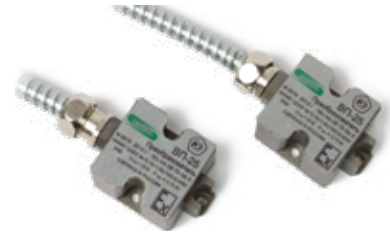
FDTL having an explosion-proof design can be applied in explosion hazardous areas of Classes 1 and 2 according to GOST R IEC 60079-10-1-2008. Explosion-proof type and level – 1Ex ib IIA T5 Gb X to GOST R IEC 60079-0-2011 where the X sign marks special operation conditions.

Vibration inverter VI-25 / Converter of rotors' axial displacement CRAD-2

Technical characteristics:

Vibration inverter VI-25

	модификация «И»	модификация «Т»
Rated power supply voltage (range), V	24 (12-32)	24 (14-30)
Consumption current at the rated power supply voltage, not more, than	30 mA	*40 mA
Frequency range	10...1000 Hz	10...1000 Hz
Parameters of input signals:		
Measured parameter	Vibration acceleration	Vibration acceleration
Number of axes	1	1
Type of conversion	Vibration acceleration to the *root mean square of vibration velocity	Vibration acceleration to the *root mean square of vibration velocity
Data transmission:		
Data transmission channel	digital	analog
Output signal		4-20 mA for T
Data width	16 bit	
Data transmission interface (speed, baud)	RS-485 (maximum 115200)	
Data transmission protocol	Modbus RTU	
Type of transmitted parameters (measurement units)	Root mean square of vibration velocity (mm/s)	
Fixing-compatible with accelerometer	ANS-066	ANS-066
Marking of explosion-proofness of: - vibration inverter - terminal junction box	1Ex mb IIB T5 Gb X 1Ex e IIB T5 Gb X	1Ex mb IIB T5 Gb X 1Ex e IIB T5 Gb X
Operational temperature	-40 .. +75 °C	-40 .. +75 °C
** - Root mean square		



The inverter transfers the following additional information via RS-485 interface:

- The manufacturer's data and the software version;
- Network address and baud rate;
- The calibration factor;
- Codes of errors and status.

Purpose of the device:

Vibration inverter VI-25 is intended for vibration control of industrial equipment to measure root mean square of vibration velocity of non-rotating parts (turbine units, pumps, motors of electric oil pumping and gas compressor stations). Vibration inverter has explosion-proof versions in the following modifications:
«I» - version with galvanically isolated interface RS-485;
«T» - version with the output signal of 4-20 mA.
Vibration inverter measures the vibration acceleration and provides data output, proportional to the mean square value of vibration velocity in a specified frequency range in digital form via RS-485 interface in the protocol ModBus RTU (Version «I») and in analog form via an output signal of 4-20 mA (Version «T»).

For more information, please check the technical documentation or visit the company's website.

Converter of rotors' axial displacement CRAD-2

Technical characteristics:

	модификация «И»	модификация «Т»
Rated power supply voltage (range), V	24 (12-32)	24 (14-30)
Consumption current at the rated power supply voltage, not more, than	30 mA	*40 mA
Data transmission:		
Data transmission channel	digital	analog
Output signal		4-20 mA for T
Data width	16 bit	
Data transmission interface (speed, baud)	RS-485 (maximum 115 200)	
Data transmission protocol	RS-485	
Degree of dust-proofness and water resistance	IP66 by GOST 14254	IP66 by GOST 14254
Operational temperature	-40 .. +75 °C	-40 .. +75 °C
Measurement method	non-contact measurement	non-contact measurement
Nominal installation clearance	2 ± 0,1 mm	2 ± 0,1 mm
Range of measuring the displacement in relation to the nominal installation clearance	2 ± 0,1 mm	2 ± 0,1 mm
Mass, g, not more, than	120	120
Conversion frequency band by decrease of 3 dB	0 – 0,63 Hz	0 – 0,63 Hz
Marking of explosion-proofness of the vibration converter	1Ex mb IIB T5 Gb X	1Ex mb IIB T5 Gb X



Purpose of the device:

The converter is designed for use as part of hardware and software suites, carrying out vibration control of industrial equipment to measure displacement of rotors of a facility under control (turbine units, pumps, motors of electric oil-pumping and gas compressor stations) along the axis of rotation in continuous mode.

The converter has explosion-proof versions in the following modifications:

- «I» - version with galvanically isolated interface RS-485;
- «T» - version with the output signal of 4-20 mA.

The converter measures the static gap between its sensitive plane and the end face of a rotor and displays the result in digital form via RS-485 interface in the protocol ModBus RTU (modification «I»), as well as in analog form via an output signal of 4-20 mA (modification «T»). The converter transfers the following additional information via RS-485 interface:

- The manufacturer's data and the software version;
- Network address and baud rate;
- Approximation parameters;
- The temperature inside the building;
- Codes of errors and status

Programmable Logical Controller K-4000



K-4000 plastic case

The Controller ensures data measurement, transformation, processing and storage as well as generation of control commands or control actions.

The Controller is based on microprocessor equipment and fulfills the functions of specialized supervisory computer control systems for real-time operation in local and distributed control systems.

It is designed as an open-architecture modular platform and consists of 4 main components:

- chassis,
- power supply unit,
- processor modules of various capacities,
- peripheral input/output modules.

K-4000 provides the opportunity of synchronization of modules and separate remote chassis connected through extension modules and supports multiprocessor mode.

Application of K-4000 as part of KTS-2000 and KTS SA software and hardware systems is certified.

Features:

- NTP synchronization time
- freely programmable C++ interface module
- up to 10 remote chassis on Ethernet line, Ethernet backup line and RS-485 line

All CP types are equipped with operating RAM which is divided into program memory and data memory.

All CP types are equipped with a similar set of control and indication elements:

- status / fault indication (operation, error, power);
- network service availability;
- operation mode selection switch Operation-Stop-Programming.

The following communication interfaces are used for data exchange with external devices:

- two Ethernet interfaces (LAN1 – LAN2);
- two RS-485 serial interfaces (COM1-COM2);

K-4000 Performance Data:

programming languages	EC-61131 (IL, ST, LD, FBD,SFC), C/C++
supported industrial protocols	ModbusRTU,ModbusTCP,OPC DA2.0
supported network protocols	TCP, UDP, IP, PPP, NTP, DHCP
CPU frequency	60...80 mHz
memory capacity	RAM - 4 MB and PROM - 2 MB (standard configuration) RAM extension to up to 8 MB and PROM extension to up to 16 MB
Maximum number of inputs/outputs and communication interfaces	
RS-485 ports when using communication module	up to 2 pcs. up to 3*8 = 24 pcs.
number of Ethernet interfaces when using communication modules on CP module	up to 8 pcs 2 pcs.
AI/AO, on one chassis w/o extension	32 pcs.
DI/DO, on one chassis w/o extension	128 pcs.
response time, CP cycle time	1-100 ms
Voltage power	24 VDC or 220 VAC
chassis consumption power	max. 50 W
operating temperature range	-40... 70 °C



K-4000-1 metal case

Controller K-2000/M / (32-channel self-recorder)

Controller K-2000/M

- Controller K-2000/M
- Programmable logical controller K-2000/M is intended for transformation of signals from primary transducers of nonelectrical quantities (temperature, pressure, vibration, etc. located in explosion hazardous areas), signals processing and generation of control actions under the preset algorithm as well as ensuring visualization of current status of input signals from the system components in the form of tables, mimic diagrams, trends, etc.
- The Controller can be used as a recorder of physical quantities of up to 32 channels without additional input-output device and up to 64 channels if using KVV-6 set (I/O set).
- The Controller is intended for operation outside explosion hazardous areas. It can be used autonomously and as a part of control, protection and alarm systems, including fire alarm system, united in a network by means of interfaces.
- Explosion-proof type – intrinsically safe circuit, explosion-proof marking - [Exib]IIA.
- The Controller fulfills the following functions:
 - collection and processing of discrete and analogue data from automation equipment;
 - data display;
 - data archiving and storage on flash-card;
 - automatic regulation - relay, PID;
 - generation of signals controlling actuators (starters, electric valves), drives (frequency converters), etc.;
 - protection and alarm;
 - data input-output with protocols conversion;
 - interfacing with converters and hardware via MicroLAN and RS-485 interfaces in Modbus protocol.



Technical characteristics:

RAM, min.	64 MB
Flash-card	up to 16 GB
USB	available
RS-485 (RS-232) protocol	Modbus RTU
Exchange rate, baud	2400-115200
Information capacity, channels	2048
LCD with resolution, pixel	800×600
Display and keyboard interface	available
Real time timer	1
Lithium battery	available
Watchdog timer and reset device	available
Extension modules support	available
Network adapter	Ethernet TCP/IP
Consumed power, W, max.	100
Overall dimensions (w×d×h), mm, max.	260×260×205
Weight, kg, max.	10

Communication lines parameters:

Valid parameters of communication lines connected to intrinsically safe circuits (for RTV (repeater-transcoder unit), TDK (thermal sensor and compensation unit):

capacity, max.	0.15 mF;
inductivity, max.	0.15 mH;
resistance, max.	25 Ohm.

Communication line - shielded twisted pair.
Maximum remoteness of signal sources (sensors), m, max.:

thermal converters	200
with current output	300m

Valid parameters of RS-485 communication lines:

capacity, max.	50 nF;
resistance, max.	50 Ohm;
insulation resistance, min.	50 kOhm.
communication line length, min.	1200 m

Controller K-2000/M (32-channel self-recorder)



Controller K-2000/M perfectly suits for use as a logical core in minor and medium systems of data collection and processing and operating procedures control.

This Controller has become the basis for Fire and Security Alarm and Fire Suppression Control Hardware and Software System KTS-2000 created by our Company. KTS-2000 has been successfully handling the tasks of operating procedures automation and ensuring safe operation of oil and gas, petrochemical and processing enterprises and the facilities of the RF Ministry of Defense for many years.

Heat Detectors IP-101-DS and IP-101-TS / LED Fire Alarm SDPO-X-X

Heat Detectors IP-101-DS and IP-101-TS

Technical characteristics:

– Detector response temperature set values range, °C	
– for IP 101-TS modification	100—250
– for IP 101-DS modification	54—120
Response time at the rate of temperature rise 30°C/min., sec., max.	60
Detector's maximum remoteness from PK-004 (for IP 101-DS modification), m, max.	240
Direct current source power voltage (as part of the system), V, max.	5
Power consumed by the detector in all modes, W, max.	0,01
Overall dimensions w/o a junction box, mm, max.	40x115
Weight w/o a junction box, kg, max.	0,2
Detector sensitive element (SE):	
– thermal resistance for IP 101-TS modification;	
– digital thermal sensor for IP 101-DS modification.	
Detector is connected in the following ways:	
– IP 101-TS modification -	
– with a two wire loop to PK-004/RA;	
IP 101-DS modification is connected to PK-004/DS or MicroLAN interface through IS barrier with the following parameters: U0: 5 V; I0: 107 mA; L0: 0.15 mH; C0: 0.05 mF.	
In terms of method of person's protection against electric shock detectors refer to Class III according to GOST 12.2.007.0-75.	
Detector's electromagnetic compatibility complies with Severity Level 2 according to Fire Code 57-97.	
Detector's SE case Ingress Protection level is IP10, other elements - IP54 according to GOST 14254.	



The Detector is intended for fire detection when the temperature of the ambient gaseous, chemically non-aggressive medium exceeds the set value.

IP 101-DS Detector modification can be applied in explosion hazardous areas of Classes 1 and 2 according to GOST R 51330.9-99 (IEC 60079-10-95), GOST 30852.9-2002 (IEC 60079-10:1995), GOST R 51330.13-99 (IEC 60079-14-96) and GOST 30852.13-2002 (IEC 60079-14:1996).

Explosion-proof type is intrinsically safe circuit, explosion-proof marking is 1ExibIAT4 X according to GOST R 51330.0-99 (IEC 60079-0-98), GOST 30852.0-2002 (IEC 60079-0:1998), where the X sign marks special installation and operation conditions.

When being part of the system every detector has its own individual address.

LED Fire Alarm SDPO-X-X



Technical characteristics:

Background illumination, lux	100000
Ingress Protection	IP54
Rated power voltage (range), V	24 (+ 18% .. -30%)
Consumed power, W, max.	13
Operating temperature range, °C	-50...+70
Overall dimensions, mm, max.	309x120x59
Weight, kg, max.	2,2

Device Purpose:



LED Fire Alarm SDPO is intended for application as a light alarm, display panel and emergency exit sign in the premises of various purpose.

The Annunciator having an explosion-proof design can be applied in explosion hazardous areas of Classes 1 and 2 at indoors and outdoors industrial facilities including those of gas, oil and their products' transportation, storage and processing.

Annunciator explosion-proof type – 1 Ex e mb II T5 Gb X according to GOST R IEC 60079-0-2011, where the X sign marks special installation and operation conditions.

Robotic Fire Suppression System Based On Flame Detector UID-01



Robotic Fire Suppression System (RFSS) — automatic fire suppression system comprising two or more stationary robotic fire monitors united by a general fire control, detection and suppression system.

Robotic fire monitor (Fire Extinguishing Robot (FER)) is an automatic device manipulating fire monitor in a spherical coordinate system, based on stationary remotely controlled fire monitor, mounted on a fixed or mobile unit, and equipped with a fire detection device and a programmable control device.

Fire Extinguishing Robot (as a separate product) and Robotic Fire Suppression System (RFSS) are intended for fire suppression or confinement, cooling of building and process structures and suppression of clouds of poisonous and nuclear gases, vapors and dust.

RFSS can be applied for protection of industrial facilities and civilian property outdoors as well as indoors. As a rule, those facilities and structures are subject to protection, which have a large area and a significant height, where application of classical automatic fire suppression systems (fire sprinkler systems, water deluge systems) is ineffective or impossible. Water or foam solution are used as a Fire Fighting Agent (FFA).

Robotic Fire Suppression System (RFSS) is manufactured in accordance with the requirements of GOST R 53326-2009 as per TU 4854-005-36937219-2015.

FER:

Parameter	Specification		
	PR-LSD-S20U-IK-TV	PR-LSD-S40U-IK-TV	PR-LSD-S60U-IK-TV
Coordinates system	spherical		
Working body	Fire monitor with variable angle nozzle		
Motion speed, degree per second, minimum: - at no load - during FFA supply	9 6		
Rated pressure, MPa	0,6±0,05		
Operating pressure, MPa	0,4–0,8		
Water flow, l/sec, min	20	40	60
Foam solution flow, l/sec, min	20	35	50
Adjusting flange	Du80	Du80	Du80
Nozzle rotation in degrees, min: -horizontally (special version) -vertically: upward downward	0-330 0-370 +90 -45	0-330 0-370 +90 -45	0-330 0-370 +90 -45
FER path following error	2		
Positioning error, degrees	2		
FER actuators power supply voltage, V	24		
Stream range (by outermost drops), m, min - water stream; - 300 water spray; - foam stream	50 30 35	60 35 40	65 40 45
Spray cone angle, degrees	0 - 100		
Foam expansion ratio, min	7		

RFSS:

Parameter	Specification
Number of connected FERs	2 to 32
Type of control device	Remote I/O (RIO) device with fire source 3D coordinates identification system, network controller
Type of robotic fire suppression system remote control pads	Operator's automated workstation
Coordinates system	rectangular
Types of signals for communication with adjacent systems	discrete, digital - Ethernet, RS485
Interface for communication between RFSS components	Ethernet
Cable type (defined when ordering)	optical, twisted pair
Link configuration	resilient ring

RFSS Structural:

RFSS consists of the following equipment:

- Fire Extinguishing Robot (FER) based on a stationary remotely controlled fire monitor, equipped with a fire detection device, main controller and video surveillance system;
- Electric-driven fire fighting shutoff valve. It is mounted on fire piping preceding each FER and controlled by the FER;
- Pressure sensor.

Pressure sensor with a digital output signal is designed to compensate FFA path change, depending on FFA operating pressure, and mounted preceding each FER of the system;

- Local Control Pad (LCP).

LCP is located in immediate proximity to FER and designed for the FER local control. Each FER has its own control pad;

- Software Driven Control Device, Power Supply Unit (SD CD Cabinet). SD CD supplies power to FER, ensures communication with other RFSS devices as well as light indication of the FER operation modes;

- Remote Control Pad (RCP) is an automated operator's work station based on personal computer. RCP is designed for RFSS remote control and located at a certain distance from FER.

Every fire robot of the system can be controlled with RCP.

The RCP screen shows graphic data on the status of the system and its components, fire robots 3D position with reference to a certain facility, video data from flame detectors mounted on fire monitors, and the data is recorded in the RFSS Status Log;

- Remote I/O device (RIO Cabinet) enabling flame positioning in a 3-dimensional coordinates system with a network controller (RIO Cabinet);

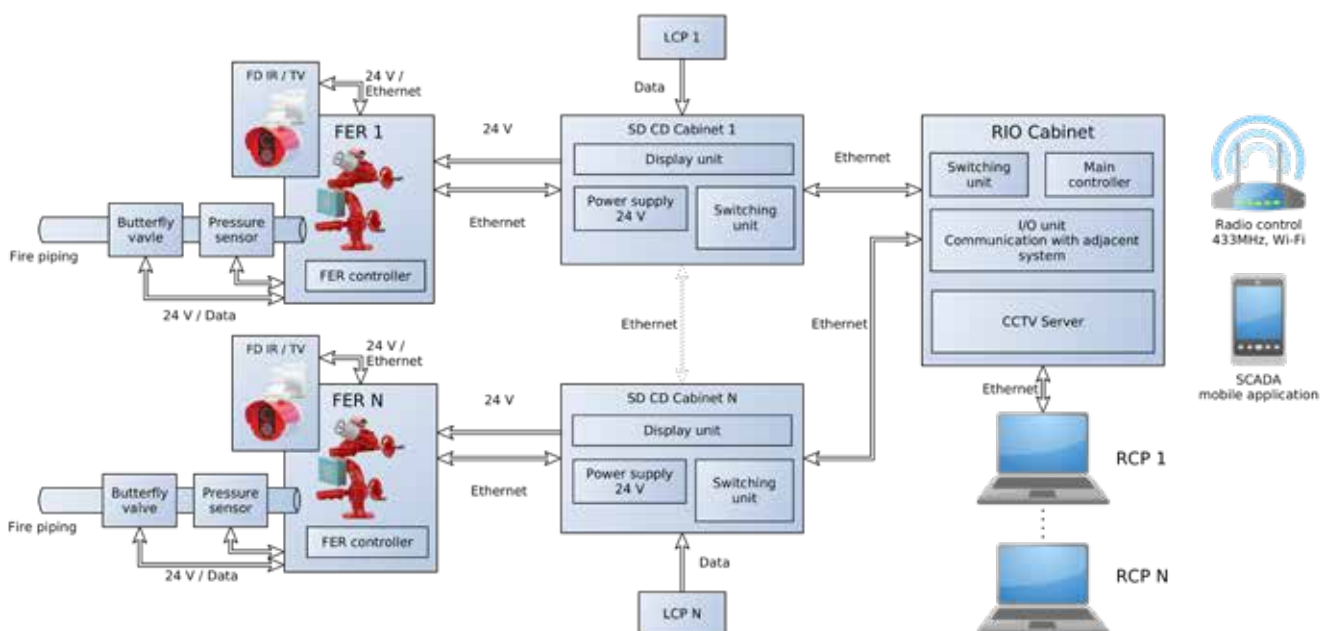
- Depending on the design, RFSS may include a radio control system (433 MHz), as well as SCADA mobile application (Wi-Fi);

- Flame detector FD 328/330 UID-01, based on thermal vision and visible spectrum video cameras, is used as a flame detection device. FD fulfills an aiming function and ensures positioning of the flame source angular coordinates and its angular dimensions. Fire detection and flame source positioning algorithm is based on the principles of combining video analysis and IR region analysis.

FD 328/330 UID-01 design and operation procedure are patented.

Depending on the design, FD 328/330 UID-01 can be mounted directly on the fire monitor as well as stationary mounted along the facility perimeter. In the latter case, flame detectors FD 328/330 UID-01 perform the function of addressable fire alarm flame detectors, and at the same time, they function as fire detectors aiming at the flame source and reporting the fire exact coordinates to RFSS system.

- RFSS includes equipment of communication with adjacent systems. Depending on the design, RFSS can communicate with other systems via interface (RS-485, Ethernet) or "dry contacts".



Our clients

Transneft, Gazprom, Rosneft, LUKOIL, LLC «OGC «Slavneft», CJSC «CPC», TNK-BP, LLC «SpetsTehMashResursy», LLC «Central Research and Manufacturing Association «Nefteavtomatika», LLC «TPC «Neftegazovye systemy», CJSC Research and Production Enterprise «Spets elektromekhanika», GUPNN «Aviatron-Oil», CJSC «Mashprom», CJSC «EleSi», LLC «Systemotekhnika - NN», CJSC «Neftepromavtomatika», LLC «Yugo-Zapad transneftprodukt», CJSC «Avtomatika» and others.

Facilities with our equipment

LLC «Transsibneft»: OPS «Tulun», Linear Operating Dispatcher Station (LODS) «Rybinskaya», LODS «Omskaya»
LLC «Privolzhsknefteprovod»: OPS «Lyubetskaya», OPS «Grachi», OPS «Ternovka», OPS «Sovkhoznaya-2», OPS «Sovkhoznaya-3», OPS «Borodaevka-1», OPS «Borodaevka-2», Crude Oil Delivery and Acceptance Point «915 km», Modular Pumping Station «Buguruslan», Modular Pumping Station «Erzovka», Modular Pumping Station «Komsomolets», Modular Pumping Station «Popovka», OPS «Muhanovo», OPS «Zenzevatka», LODS «Yefimovka», LODS «Kuzmichi», OPS «Tinguta», Modular Pumping Station «Zimovniki», OPS «Krasnoarmeiskaya», etc.
LLC «Baltnefteprovod»: Specialized Oil-Loading Seaport «Primorsk», OPS «Kirishi», Baltic Pipeline System – 2, Specialized Oil-Loading Seaport «Ust-Luga».
LLC «Upper Volga Trunk Oil Pipelines»: OPS «Makariev», OPS «Starolikevo»

LLC «Ural-Siberian Trunk Oil Pipelines»: LODS «Medvedskije», OPS «Chekmagush», OPS «Kaltasy», OPS «Cherkassy», LODS «Nurlino», LODS «Ulu-Telyak», OPS «Trawniki», OPS «Kropachevo», OPS «Berdyaukh», LODS «Leninsk», etc.
LLC «Sibnefteprovod»: LODS «Torgili», LODS «Isetskoe», OPS «Vagai», OPS «Berezovoye», OPS «Yagodnoye», LODS «Urjevskaya», OPS «Kholmogory», OPS «Salym», etc.
LLC «TOP (Trunk Oil Pipeline) «Druzhba»: OPS «Novoselovo», OPS «Aksinino-1», OPS «Aksinino-2», OPS «Novozybkov-1», OPS «Novozybkov-2», OPS «Unecha», OPS «Klin», OPS «Sosedka-1», OPS «Sosedka-2», etc.
LLC «North Trunk Oil Pipelines»: OPS «Mikun», OPS «Ukhta-2»

LLC «Northwest Trunk Oil Pipelines»: OPS «Syumsi», OPS «Lazarevo», OPS «Tingovatovo», OPS «Covali-2», OPS «Covali-3», OPS «Mikhailovka», OPS «Debesy», OPS «Krotovka», OPS «Studenets», OPS «Kamenny Log», OPS «Baytugan», OPS «Kalinovy Kluch», OPS «Naberezhnye Chelny», OPS «Kaleykino-1», OPS «Kaleykino-2», OPS «Kaleykino-4», OPS «Gorky-1», OPS «Gorki-2», OPS «Gorki-3», LODS «Gorki-4», OPS «Druzhba-1», OPS «Druzhba-2», OPS «Aznakaev», OPS «Musiyumovo», OPS «Malaya Purga», OPS-3 Almet'yevsk, OPS «Biser», OPS «Karabash», OPS «Arbatskaya», LODS «Lysva», OPS «Uralskaya», OPS «Kiengop», OPS «Arlet», LODS «Platina», OPS «Yelizavetinka», OPS «Mostovaya», LODS «Perm-3», OPS «Belaya», OPS «Almet'yevsk», OPS «Kholmogory», etc.

Gazprom: Booster Station «Algasovo», Booster Station «Privolzhskaya», Booster Station «Aleksandrov Guy», Booster Station «Pisarevskaya», Booster Station «Voskresenskaya», Booster Station «Davydovskaya», UGSS «Elshanskaya», GPS «Ostrogzhsk», Gas Distributing Network «Borki», Underground Gas Storage Station (UGSS) «Elshanskoe», UGSS «Peschano-Umetskoe»
Water - brine complex of Volgograd UGS, etc.
Ministry of Defence of the Russian Federation: Cosmodrome «Plesetsk», Cosmodrome «Vostochny», LUKOIL: Territorial-Manufacturing Company «Kogalymneftegas», Booster Pump Station – 3, Booster Pump Station – 8
TNK-BP: Saratov Oil Refinery
Rosneft: Tuapse refinery
CJSC «CPC»: OPS «Astrakhan», OPS «Komsomolskaya», OPS «Kropotkin», Marine Terminal



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