Limited Liability Company
“NPK Morsvyazavtomatica”

DIGITAL INTEGRATED SHIPBOARD COMMUNICATION SYSTEM
ITS-1010

Operating manual

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TERMS AND ABBREVIATIONS

AM	Amplitude modulation
AUX	Auxiliary connector
DECT/GAP	Digital Enhanced Cordless Telecommunications / Generic access profile
FM	Frequency modulation
IP	Internet protocol
ISDN	Integrated Services Digital Network
LAN	Local area network
LCD	Liquid-crystal display
LED	Light-emitting diode
PA	Public address system
PBX	Private Branch Exchange
PC	Personal computer
PoE	Power over Ethernet
SC	System components
SPTA	Spare parts, tools and accessories
System	Digital integrated shipboard communication system ITS-1010
TS-1	Semi-annual technical service
TS-2	Annual technical service
VAC	Volts of alternating current
VDC	Volts of direct current

This operating manual describes the composition, design and specifications of digital integrated shipboard communication system ITS-1010 (hereinafter – the System), system components (hereinafter – SC) and instructions for the correct and safe operation of the System (intended use, technical service, current repair), and disposal instructions for the SC.

Only those who have read and understood the System's operational documentation shall be permitted to operate with the System.

Only those who have read and understood the System's operational documentation and had general training in the field of electronic engineering shall be permitted to service the System.

1 DESCRIPTION AND OPERATION OF THE SYSTEM

1.1 THE SYSTEM'S PURPOSE

The System provides ship internal public address, telephone and radiotelephone communication, transmission of commands, general alarm and radio broadcasting on sea and river-going vessels of all classes.

The System is capable to operate under harsh environmental conditions including high level of dust and humidity, at explosion hazardous and noisy facilities.

1.2 TECHNICAL SPECIFICATIONS

Table 1 describes the main parameters and technical specifications of the System.

Table 1 – Main technical specifications

Parameter	Value		
	PA	**Telephone communication**	**Radiotelephone communication**
Number of subscribers	180*	1000*	128*
Communication lines	ISDN two-wire	subscriber two-wire, eight-wire Ethernet	wireless
Communication mode	duplex, half-duplex	duplex	half-duplex
Quantity of PA lines	3, min.		
Quantity of alarms, pcs.	6		
Electrical specifications			
Power supply, main, V	220 (180 to 264) VAC		
	24 (18 to 36) VDC		
Power supply, standby, V	24 (18 to 36) VDC		
	220 (180 to 264) VAC		
PA line voltage, V	100 (70, 50 and 30 – at option)		
Power consumption	Defined by the total power of the SC		
Operational limitations			
Protection degree of SC of the rack or enclosure	IP20		
Protection degree of the indoor SC	IP22, IP44		
Protection degree of the open deck SC	IP56		
Protection degree of the explosion-proof SC	IP65, IP66, IP67		
Operating temperature of the indoor SC, °C	–15 to +55		
Operating temperature of the open deck SC, °C	–40 to +55		
* Subscriber capacity may be changed on customer demand.			

1.3 STRUCTURE AND OPERATION OF THE SYSTEM

1.3.1 General description

The System is a network integration of PA, telephone and radiotelephone communication as well as transmission of commands, general alarm and radio broadcasting, which may operate together and independently.

The System structurally consists of the mounting rack or enclosure that houses the System units and connected subscriber equipment. The System functions as a set of rack and subscriber equipment that creates up to three isolated networks (two digital and one analog) and provides switching of voice communication from subscriber equipment via high-speed communication channels.

Figure 1 describes the System components.

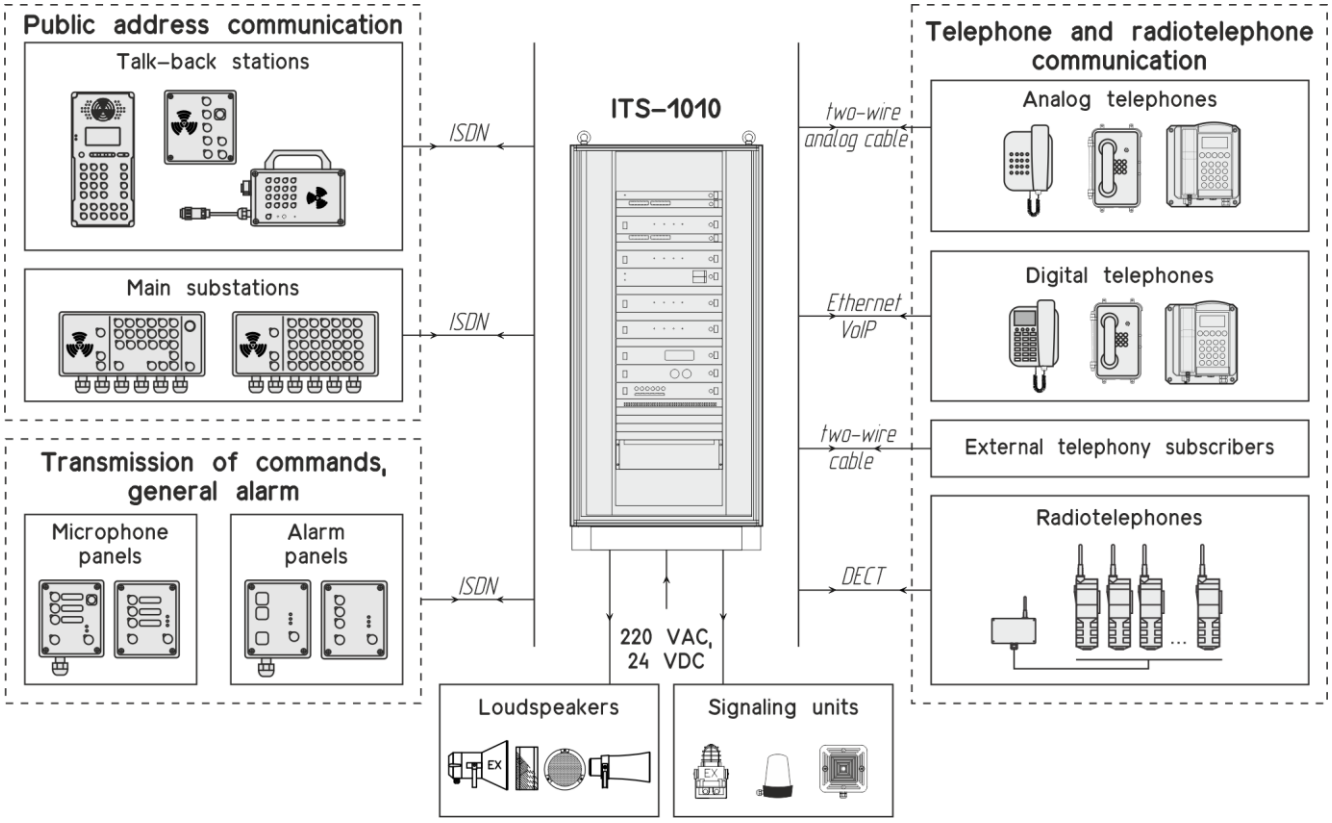


Figure 1 – The System components

1.3.2 The System's functionality

The System ensures:

a) PA with capabilities to make:

– individual call;

– selective call to several subscribers;

– conference call, pre-defined (a group of subscribers or all);

b) telephone communication with:

– standard communication services from every telephone without additional settings;

– value added services enabled and disabled by a user;

– optional communication services that are connected by the Manufacturer in compliance with the order list.

For the list of standard, value added services and optional communication services, see table 2.

Table 2 – Telephone communication services

Standard communication services	Value added services	Optional communication services
– Incoming and outgoing calls to internal and external subscribers; – last number redial; – abbreviated dialing	– Information on number settings; – call forwarding; – incoming calls barring; – automatic recall (auto redial); – call to another subscriber during current connection; – conference call; – alarm clock	– Barring of incoming and outgoing calls to external lines; – subscriber priority status; – settings for a group of subscribers

c) communication with coastal PBX;

d) radiotelephone communication of DECT / GAP standard with other radiotelephones within the operation range of one base station (subscriber line is free);

e) communication between subscribers of PA, telephone and radiotelephone networks;

f) video call in video conference mode with an option to connect additional subscribers;

g) transmission of commands via PA lines;

h) general alarm;

i) entertainment broadcasting;

j) audio quality control of PA line signals;

k) incoming call signaling by light and sound signaling units;

l) automatic recording of voice communication;

m) automatic main / standby power switching to ensure uninterruptible operation of the SC;

n) connection of special automated PC-based working place to administrate, configure and provide diagnostics of the System;

o) 365 / 24 / 7 operation.

1.3.3 Priorities

The System ensures together operation of internal ship networks and alarm systems, as well as external systems considering established priorities, see table 3.

Table 3 – The System's priorities

Priority	PA lines	Subscriber units of PA
	Communication mode	
1	Selective call	
2	Transmission of commands	Individual call, conference call
3	Telephone communication	
4	General alarm	
5	Entertainment broadcasting	Entertainment broadcasting (only for CU-10)
Note – Priority 1 is the highest, priority 7 – the lowest.		

1.4 THE SYSTEM'S COMPOSITION

Table 4 describes the main types of the SC. For more information on specifications and SC types, see section 2.

Table 4 – Main types of the SC

Name	Description
Central units	
Central unit CU-0131	To provide channels for two-way voice communication and switching of connected PA subscribers
Central unit CU-200	To provide channels for two-way voice communication, transmission of commands via PA lines, actuation of alarms, audio control of voice communication
Central unit CU-400	
Central unit CU-10	To create channels for two-way voice communication, transmit commands via PA lines and actuate alarms

Name	Description
Central unit 19-CU	To provide switching of PA subscribers, exchange of digital voice communication with PA extension units and telephone subscriber network
Central unit ITS-CUICB	To switch signals received via PA lines from PA units, transmissions and radio broadcasting
Central unit ITS-CUA	To create isolated telephone network, provide automatic switching of internal subscribers and their connection to shore communication lines
IP PBX Server ITS-CUIP	To provide message routing between telephone communication subscribers and communication interface converters using SIP protocol
Main substations	
Main substation SP-18	To provide PA services with an option to call telephone subscribers
Main substation SP-36	
Main substation SP-18W	To provide PA services with an option to call telephone subscribers. Waterproof
Main substation SP-36W	
Main substation MS-18	To provide talk-back PA with an option to call telephone subscribers and transmit voice communication via PA lines and alarm circuits
Main substation MS-36	
Main substation MS-18A	To provide talk-back PA with an option to call telephone subscribers and transmit voice communication and alarm signaling via PA lines
Main substation MS-36A	
Talk-back station PT-CMIP	To provide PA services and operational telephone communication with value added services
Extension panel EP	To increase number of subscribers for PT-CMIP
Talk-back stations	
Talk-back station S1	To provide two-way PA with one or several pre-defined subscribers
Talk-back station S1W	
Talk-back station S2	
Talk-back station S3	
Talk-back station S4	
Talk-back station S4P	
Talk-back station S1-5	
Talk-back station S2-5	
Talk-back station PHS	
Talk-back station SDP	
Bridge wing substation SW-1	

Name	Description
Microphone panels	
Microphone panel CP-3	To transmit voice communication via PA lines. One-channel
Microphone panel CP-6	
Microphone panel CPW-3	To transmit voice communication via PA lines. One-channel, waterproof
Microphone panel CPW-6	
Microphone panel CP-3-19	To transmit voice communication via PA lines. One-channel, vertical
Microphone panel CP-6-19	
Microphone panel CP2-3	To transmit voice communication via PA lines. Two-channel
Microphone panel CP2-6	
Microphone panel CPW2-3	To transmit voice communication via PA lines. Two-channel, waterproof
Microphone panel CPW2-6	
Microphone panel CP2-3-19	To transmit voice communication via PA lines. Two-channel, vertical
Microphone panel CP2-6-19	
Combine microphone panels	
Combined microphone panel, type CP-3.3	To transmit voice communication and initiate alarm signaling via PA lines and alarm circuits. One-channel
Combined microphone panel, type CP-6.3	
Combined microphone panel, type CP-6.6	
Combined microphone panel, type CPW-3.3	To transmit voice communication and initiate alarm signaling via PA lines and alarm circuits. One-channel, waterproof
Combined microphone panel, type CPW-6.3	
Combined microphone panel, type CPW-6.6	
Combined microphone panel, type CP2-3.3	To transmit voice communication and initiate alarm signaling via PA lines and alarm circuits. Two-channel
Combined microphone panel, type CP2-6.3	
Combined microphone panel, type CP2-6.6	
Combined microphone panel, type CPW2-3.3	To transmit voice communication and initiate alarm signaling via PA lines and alarm circuits. Two-channel, waterproof
Combined microphone panel, type CPW2-6.3	
Combined microphone panel, type CPW2-6.6	
Alarm panels	
Alarm panel AP-3	To initiate alarms via PA lines alarm circuits. One-channel
Alarm panel AP-6	
Alarm panel APW-3	To initiate alarms via PA lines and alarm circuits. One-channel, waterproof
Alarm panel APW-6	
Alarm panel AP-3-19	To initiate alarms via PA lines and alarm circuits. One-channel, vertical
Alarm panel AP-6-19	
Alarm panel AP2-3	To initiate alarms via PA lines and alarm circuits. Two-channel
Alarm panel AP2-6	
Alarm panel APW2-3	To initiate alarms via PA lines and alarm circuits. Two-channel, waterproof
Alarm panel APW2-6	
Alarm panel AP2-3-19	To initiate alarms via PA lines and alarm circuits. Two-channel, vertical
Alarm panel AP2-6-19	

Name	Description
Alarm buttons	
Alarm buttons PSK	To provide alarm signaling via one, two or three alarm circuits. Waterproof
Alarm explosion-proof buttons PKIVA	To provide alarm signaling via one, two or three alarm circuits. Explosion-proof
Power amplifiers	
Amplifier TPA-15	To amplify power of audio signals
Amplifier TPA-200	
Amplifier TPA-400	
Amplifier TPA-200S	
Amplifier 19-TPA	
PA equipment	
PA line control device PACE-1	To send control signal via PA lines
PA line control unit 19-PAC-6	To detect faults in PA lines
PA sound control unit 19-CHSW	To control quality of audio signal transmitted via PA lines
PA control unit 19-CP-6	Ensures message transmission via PA lines
Entertainment broadcast unit, type ENT-P1	To provide radio entertainment broadcasting (FM, AM) or to reproduce programs from AUX, USB connected units
Entertainment broadcast unit 19-P1	
Mixer 19-MIX	To switch entertainment sources
Headphones HP-1	To ensure communication
Antenna ANT	To receive and convert radio signals
Entertainment remote control EC-6	To control entertainment broadcasting to six zones
Selector SELP	To switch the connected loudspeakers between the entertainment sources
Selector SEL-4P	
Volume control DM	To control volume of the connected loudspeakers
Volume control DMP	
Volume control DMO	
Selector with volume control SDP-4	To select programs and control volume of loudspeakers
Selector / Volume control SDP	
PA line commutator 19-COM-4-6	To switch voice communication of central unit and signals of entertainment source
Alarm generator 19-AG	To generate alarm signaling and transmit it via PA lines and alarm circuits

Name	Description
Alarm generator AG-1	To generate alarm signaling and control alarm circuits
Matching transformer T-140	To convert sound signal amplitude within broadband
Digital radio station DRS	Reception and transmission of sound signals by means of radio waves
Mounting racks, enclosures	
Mounting rack 19IR	To house modular SC
Wall-mounted enclosure WME	To house and ensure convenient layout of the SC
Fan unit ITS-FU-4	To cool equipment of rack 19IR
Bezel, ITS-FP	To cover unused space in the rack 19IR
Cable organizer ITS-CM	To lay cables and wires inside the rack 19IR
Wall-mounted metal enclosure BO	To house and protect SC in dry areas and on open deck
Wall-mounted metal enclosure BO-1H	To protect SC against moisture and low temperature by heating of the inside
Telephones	
Analog telephone PT-1A	To provide telephone communication
Analog telephone PT-2A	
Analog telephone PT-3A	
Digital telephone PT-2IP	
Digital telephone PT-3CIP	
Analog telephone PT-2AW	To provide telephone communication on open deck areas and in cargo holds
Analog telephone PT-CMAW	
Digital telephone PT-2IPW	
Digital telephone PT-3CMIPW	
Analog explosion-proof telephone KNEx1 (Ex)	To provide telephone communication in explosion hazardous areas
Analog explosion-proof telephone ExResistTel (Ex)	
Analog explosion-proof telephone JREX106	
Digital explosion-proof telephone Auteldac 6 VoIP	
Digital explosion-proof telephone ExResistTel IP2	
Digital telephone Ferntel	
Digital telephone PT-VC	To provide telephone communication with video
Fax machine PT-FAX	To provide fax communication
Service telephone PT-SYSA	To provide service functions and telephone communication via digital lines
Audio recorder ITS-REC	To record and store voice communication

Name	Description
Radiotelephones	
Radio terminal PT-ADC	To provide services of radiotelephone communication, DECT/GAP standard with an option to call to wire network of shipboard telephone communication
Power supply unit PS-ADC	
Base station / Charger BS/CH-ADC	
Radio terminal PT-ADCW	
Base station BS-ADCW	
Power supply unit PS-ADCW	
Charger CH-ADCW	
Radio terminal PT-DC	To provide services of radiotelephone communication, DECT/GAP standard with value added services, with an option to deploy DECT-network, support roaming, and call to wire network of shipboard telephone communication
Base station BS-DC	
Power supply unit PS-DC	
Charger CH-DC	
Radio terminal DH8-ABAB	
Radio terminal PT-NRTU	
Base station BS-NRTU	
Power supply unit PS-NRTU	
Charger CH-NRTU	
Charger CH6-NRTU	
Switches, Network Equipment and Converters	
Switch SW-16	To ensure operation of the connected units in the single Ethernet network
Switch SW-24	
Base station controller BSC-16	To deploy self-contained radiotelephone communication network, DECT / GAP standard and interconnect it with internal telephone communication network via SIP protocol
Extension unit (analog lines) FXS	To increase capacity of analog telephone network
Extension unit (digital lines) POE-SW	To increase capacity of digital telephone network
Extension unit (Intercom lines) ITS-TBSW	To switch voice communication of PA substations, and to exchange communication with other rack units and PA and telephone communication extension units
Extension unit (coastal lines) FXO	To provide connection of communication lines to shore PBX
Signal converter ST2	To convert Ethernet packet data transmission into signal 0 dB
PoE-Injector POE-JCT	To extend operation distance of PoE line for 100 m
Loudspeakers	
Loudspeaker LS-1	To ensure broadcasting, reproduce signals and voice communication in public address systems
Loudspeaker LS-2	
Loudspeaker LS-3	

Name	Description
Loudspeaker LS-5	
Loudspeaker LS-6	
Loudspeaker LS-7	
Loudspeaker LS-8	
Loudspeaker LS-9	
Loudspeaker LS-10	
Loudspeaker LS-12	
Loudspeaker LS-13	
Loudspeaker SDL	
Loudspeaker DSP-15 (Ex)	
Loudspeaker GVR-Prometey	
Loudspeaker LF-1	
Communication devices and accessories	
Handset with holder H-HS	To ensure convenient talk-back communication
Microphone M1	To receive voice communication
Microphone M2	
Microphone M3-W	
Microphone MD-97	
Microphone DM	Hand-held microphone, dynamic, with an integrated switch and cable connector. For parade systems. Mounting on a microphone holder MH
Microphone holder MH	Ensures mounting of two microphones DM with optional adjustment of height and installation angle. For parade system
Headset HS-4	To provide talk-back communication in noisy areas
Headset HS-6	
Intercom helmet TH-4M	To provide talk-back communication and hearing protection in noisy areas
Intercom helmet TH-4L	
Explosion-proof headset MT53H79B	External intercom device of ExResistTel
Explosion-proof headset FHF11286104	
Explosion-proof headset AG HD-01	External intercom device of JREX
Foot-switch FB1	To activate microphone
Connecting equipment	
Junction box KP-124PW	To split input circuits to several outputs
Junction box KP-124	
Junction box KP-124V	
Junction box KP-16	
Junction box CB-1	To couple external telephone lines with shore telephone lines

Name	Description
Patch-panel PP	To connect network equipment by means of patch cables
Socket SM	To connect external microphones to substations
Socket KP-RJ	To connect analog or digital subscriber terminal through RJ11 connector to analog or digital telephone lines
Socket CBP	To connect portable substations to subscriber lines
Socket HS-CB	To connect external intercom devices to PA devices
Socket SHP-3	To connect headphones to three-wire PA line
Cord CE	To extend standard cord of external intercom devices
Power supply units	
Power supply unit PS-103	To power the equipment with unregulated 24 VDC
Power supply unit PS-103-20	
Power supply unit 19-PS	To power rack-mounted SC from the mains 220 VAC and (or) 24 VDC (switches from one to another) with rated output voltage 48 VDC
Power supply unit ITS-PS	
Standby supply switching unit ITS-CH	To charge external storage battery with rated voltage 24 VDC or power rack-mounted SC from charged storage battery
Power supply unit ITS-PS	To power rack-mounted equipment with 24 VDC from the mains 220 VAC
Uninterruptible power supply unit BPS-114	Uninterruptible power supply, output power 200 W, input voltage 220 VAC and output voltage 12 VDC, integrated accumulator battery (17 A·h). For onshore set of parade system
Uninterruptible power supply unit 19-BPS-1000	Uninterruptible power supply, output power 1000 W, input and output voltage 220 VAC, integrated accumulator battery. For shipboard set of parade system
Power supply switching unit ITS-APS	To provide automatic main/standby switching of power mains
Power input panel PIP	Power input panel is intended to connect 19IR rack to main (or) standby shipboard power mains

Name	Description
Alarm devices	
Howler HW1	To initiate light alarm signaling on open deck and in noisy areas
Buzzer-howler BH1	
Sound signaling unit A	
Sound and light signaling unit AL	To initiate light and sound alarm signaling, waterproof
Light signaling unit L	To initiate light alarm signaling on open deck and in noisy areas
Flashing lamp FL-24	
Rotating flashing lamp RFL	
Rotating lamp RL	
Light signaling unit PGS-VSPYSHKA	To initiate alarm signaling in explosion hazardous zones
Light signaling unit ORBITA MK S	
Sound signaling unit ORBITA MK Z	
Sound and light signaling unit ORBITA MK SZ	
Sound signaling unit BExS110	
Sound signaling unit TB-105	To repeat incoming call signaling on analog telephones
Relay unit RB-139G	To switch external power supply to the connected signaling units
Storage box	For individual installation of accumulator battery

1.5 MEASUREMENT INSTRUMENTS, TOOLS AND APPLIANCES

Control operation of the SC using built-in controls and indication lights. Consumables and instruments required for the technical service are represented in table 5.

Table 5 – Consumables required for the technical service

Name and identifier of consumables	Amount of consumables	Purpose
Cleaning cloth	0.10 kg	To clean surfaces of the SC from dust use clean cloth; to remove severe contamination – use cloth soaked in alcohol
Rectified hydrolytic technical ethyl alcohol	0.01 l[1]	To soak cloth
Varnish	0.05 kg	To cover surfaces of the System in case of paint coating damage
Abrasive cloth	0.06 x 0.06 m	To polish surfaces of the System in case of paint coating damage

[1] Quantity is specified for one SC.

1.6 MARKING AND SEALING

The System has a nameplate displaying: name and serial number, the Manufacturer. The nameplate is located on the rack enclosure.

The SC have nameplates where the following information may be displayed:

– name and code of the SC;

– serial number;

– name and address of the Manufacturer;

– date of manufacturing;

– rated power consumption or net power;

– rated current;

– rated supply voltage or voltage range;

– code of current type if rated frequency is not specified;

– protection degree against penetration of solid particles and humidity, provided by the protective enclosure;

– weight;

– disposal;

– information on conformity assessment.

The nameplates are located on the SC casings. The sealing of the SC is not provided.

Note – If a SC has small size, information on the nameplate may be reduced and display only the name of SC and its serial number.

1.7 PACKAGING

The SC except mounting rack 19IR are packed in corrugated board boxes, ensuring their transportation and storage at the warehouse. Mounting rack 19IR is attached to the tray and wrapped around with stretch film and cardboard or without cardboard.

Transport packaging is also used as returnable packaging for transportation of the SC to the repair location and back.

The sealing of transport packaging is not provided.

2 DESCRIPTION AND OPERATION OF THE SYSTEM COMPONENTS

2.1 CENTRAL UNITS

2.2.1 Central unit CU-0131 type

Central unit CU-0131 type is designed for operation in PA network. It provides channels for two-way voice communication and ensures automatic switching of the network subscribers. Quantity of communication channels and connectors for broadcast units depend on the type of central unit.

There are no controls on the central unit's casing. Figure 2 describes sample layout of connectors and LEDs. Description and assignment of connectors and LEDs are shown in table 6.

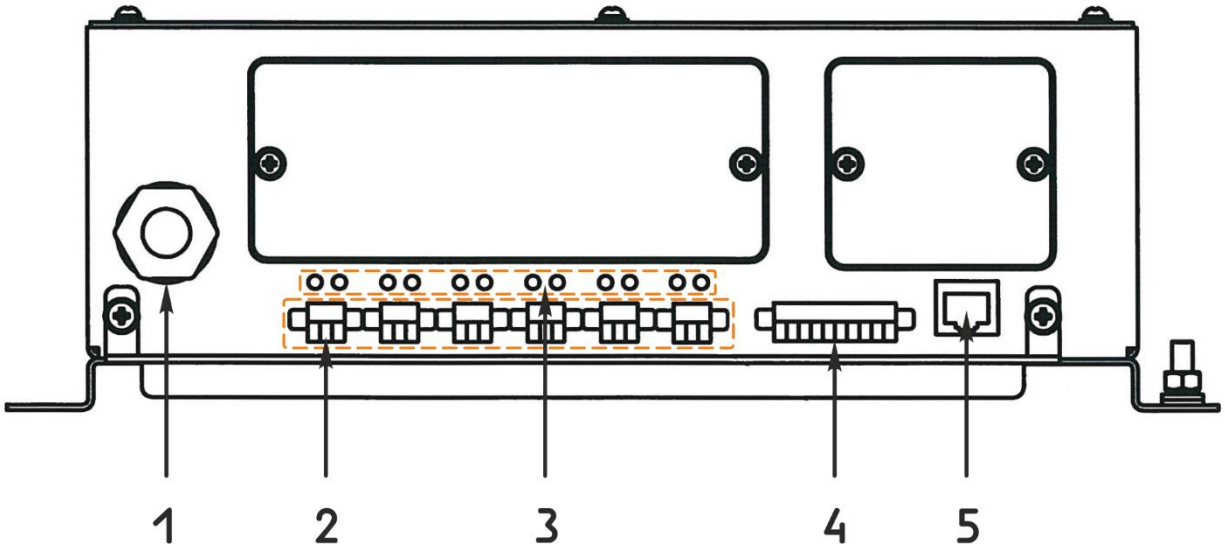


Figure 2 – Layout of connectors and LEDs of CU-0131.6

Table 6 – Description and assignment of connectors and LEDs of CU-0131.6

Position	Name	Description
1	Cable gland MG-20	To fix and seal the cables
2	Group of screw terminals EHC350-03P	To connect main stations and user substations
3	LED pairs of channel status	To display channel status: – constant glowing of the left LED means that channel is ready for data transmission; – flashing of the right LED means that the channel is busy
4	Screw terminal ECH350M-10P	Dry contact connector to connect external units and systems
5	RJ-45 connector	To connect external units and systems via Ethernet

2.2.2 Central units CU-200, CU-400

Central units CU-200 and CU-400 are designed for operation in PA network. They provide channels for two-way voice communication.

Microphone panels, an entertainment source and PA sound control unit may be embedded into the central units on customer demand. Baseline types of central units have different power of a built-in amplifier.

Figure 3 describes sample exterior, layout of controls and LEDs of central unit. Description and assignment of controls and LEDs are represented in table 7.

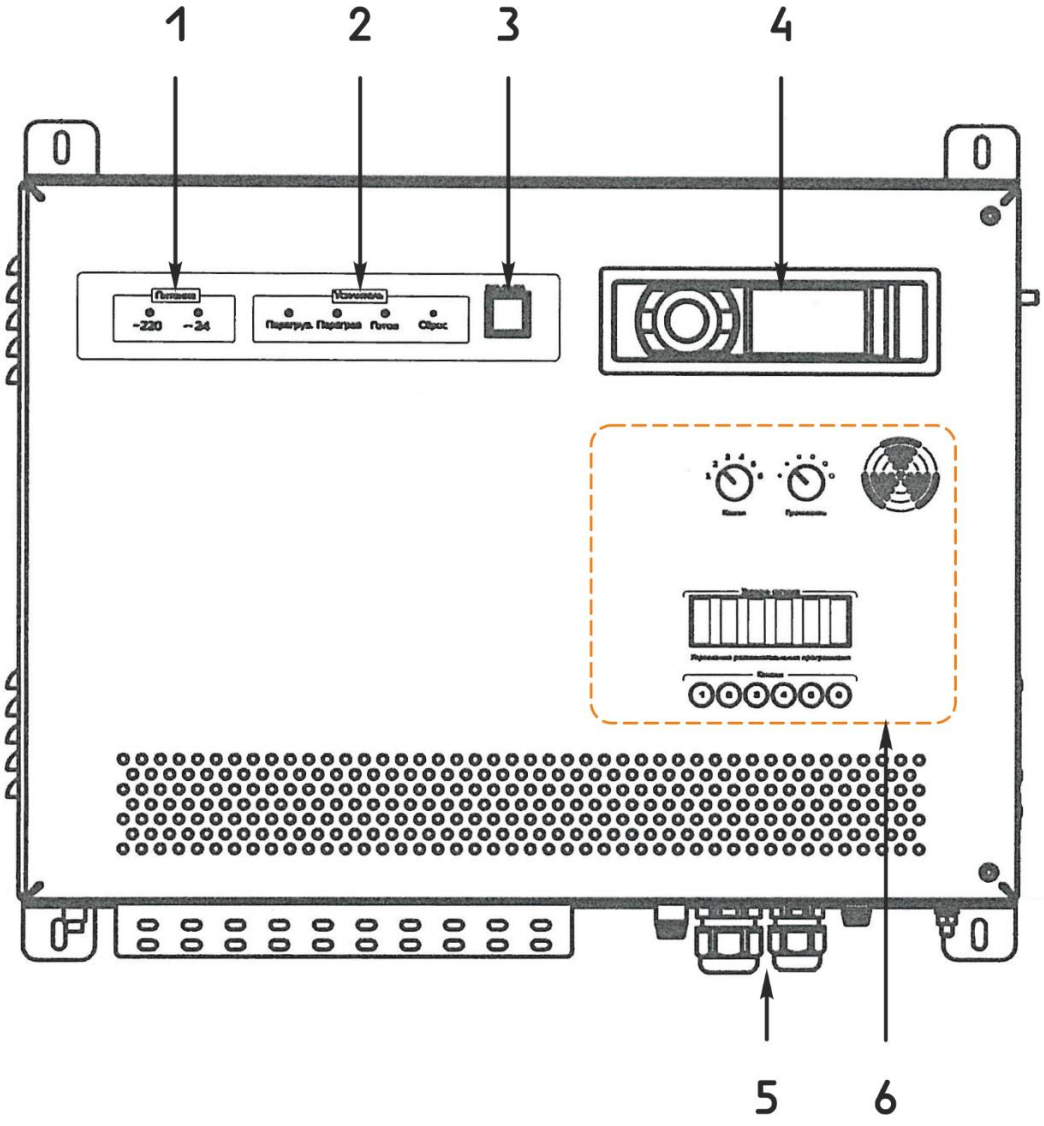


Figure 3 – Layout and designation of controls and LEDs of CU-200 (CU-400)

Table 7 – Description and assignment of connectors and LEDs of CU-200 (CU-400)

Position	Name	Designation	Purpose
1	Power status LEDs	~ 220	Constant glowing means that power mains 220 VAC is available
		⎓ 24	Constant glowing means that power mains 24 VDC is available

Position	Name	Designation	Purpose
2	Amplifier operation LEDs	Overload	Constant glowing with red means that amplifier is overloaded
		Overheat	Constant glowing with orange means that amplifier is overheated
		Ready	Constant glowing with green means that amplifier is non-faulty and ready for operation
	Reset button	Reset	To reset the amplifier. To prevent from accidental keystroke the button is sunken
3	On/Off button	ON/OFF	To start and stop unit's operation
4*	Entertainment broadcast unit	–	To provide radio broadcasting (FM, AM). For more information see 2.7.4
5	Cable glands	–	To fix and seal the cables
6*	PA sound control unit	–	Audio quality control of message transmitted via PA lines. For more information see 2.7.3
***** This SC may be optionally embedded on customer demand.			

2.2.3 Central unit CU-10

Central unit CU-10 type is designed to create channels for two-way voice communication, provide PA, transmission of commands via PA lines, entertainment broadcasting, and initiate alarm. Type of mounting – on a bracket.

Figure 4 describes exterior, layout of controls and LEDs of central unit. Description and assignment of controls and LEDs are represented in table 8.

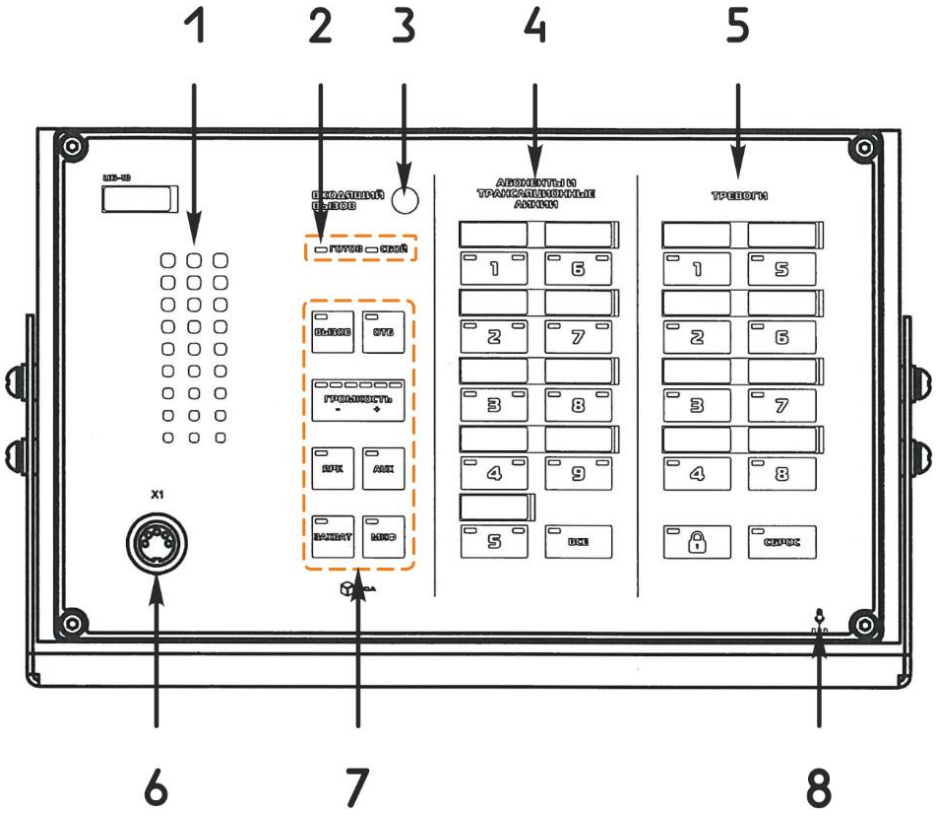


Figure 4 – Layout and designation of controls and LEDs of CU-10

Table 8 – Description and purpose of controls and LEDs of CU -10

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Unit status LEDs	READY	Constant glowing means that power is available, and unit is ready for operation
		FAULT	Constant glowing or flashing means that the unit is malfunctioning (see table 78)
3	Call LED	CALL	Bright frequent flashing indicates an incoming call
4	Group of buttons ABONENTS PA LINES with LEDs and name slots	1 to 9	To select a subscriber
		ALL	To call all connected subscribers
5	Group of buttons ALARM with LEDs and name slots	1 to 8	To initiate alarms. Signals are pre-configured
			To unlock alarm buttons
		RESET	To stop the initiated alarm
6	Connector Lumberg KGV-50	X1	To connect an external microphone or external communication device
7	Group of service buttons with LEDs	CALL	To make a call
		END	To stop communication
		VOLUME	To control volume
		BRT	To control backlight brightness of buttons and LEDs
		AUX	To start broadcasting from the entertainment source
		MIC CTRL	To hold a call
		MIC	To switch on/off the microphone
8	Built-in microphone		To receive audio signals

2.2.4 Central unit 19-CU type

Central unit of 19-CU type is designed to switch signals received from PA and transmission units via PA lines. Quantity of connected subscriber terminals depends on the type of 19-CU.

Figure 5 describes the controls and LEDs of the central unit. Description and assignment of the controls and LEDs are represented in table 9.

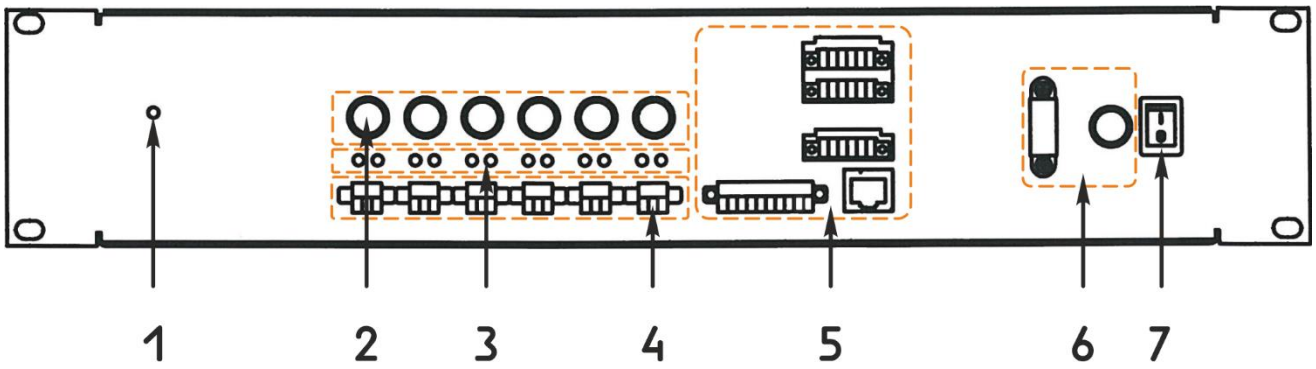


Figure 5 – Layout and designation of controls and LEDs of 19-CU-6

Table 9 – Controls and LEDs of 19-CU-6

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that power is available
2	Fuses 2 A	FU1 to FU6	To protect PA network subscribers against short circuit in subscriber lines
3	LED pairs of channel status	–	To display channel status: – constant glowing of the left LED means that channel is ready for data transmission; – flashing of the right LED means that the channel is busy
4	Group of screw terminals EHC350M-03P	X1 to X6	To connect PA units
5	Connectors for external systems	XS1	Dry contact connector to connect external units and systems
		XS2	To connect external units and systems via Ethernet
		XS3 to XS5	Screw terminals EHC350M-6P to connect SC
6	Power fuses	FU7	To protect subscriber lines and power network against faults
		FU8	To protect hardware components against faults in power mains
7	Piano type switch	On, Off	To start and stop the unit's operation

2.2.5 Central unit ITS-CUICB

Central unit of ITS-CUICB type is designed to operate in PA network. The unit switches digital streams of PA subscriber equipment and their exchange via SIP protocol between PA extension lines and subscribers of telephone network.

Figure 6 describes exterior, layout of controls and LEDs of the central unit. Description and assignment of connectors, description of controls and LEDs are represented in table 10.

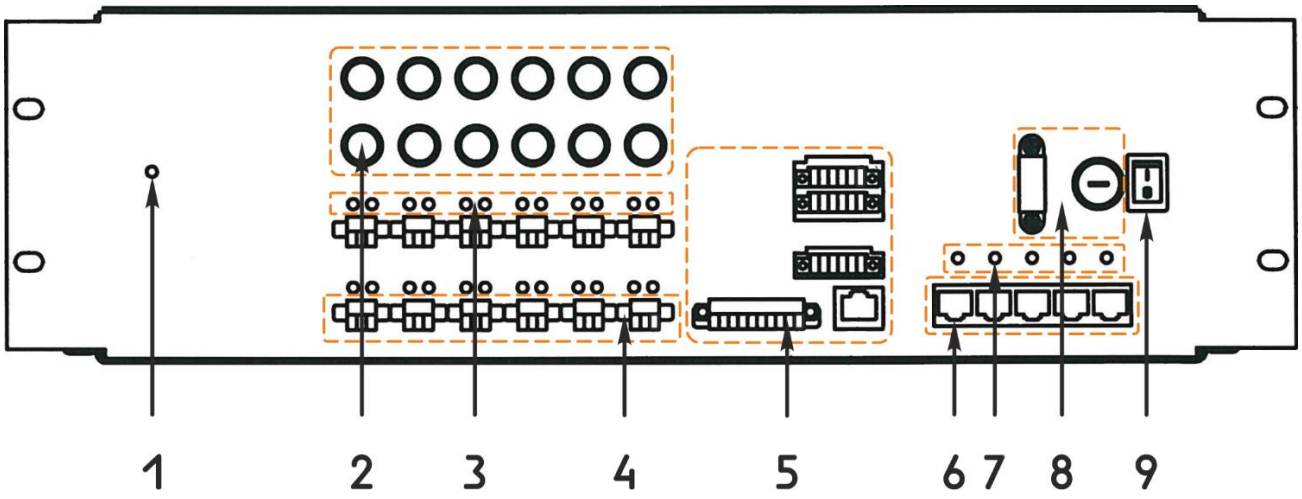


Figure 6 – Layout and designation of controls and LEDs of ITS-CUICB

Table 10 – Description of controls and LEDs of ITS-CUICB

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that power is available
2	Fuses 2 A	FU1 to FU12	To protect PA network subscribers against short circuit in subscriber lines
3	LED pairs of channel status	–	To display channel status: – constant glowing of the left LED means that channel is ready for data transmission; – flashing of the right LED means that the channel is busy
4	Group of screw terminals EHC350M-03P	X1 to X12	To connect PA units
5	Connectors for external systems	XS1	Dry contact connector to connect external units and systems
		XS2	To connect external units and systems via Ethernet
		XS3 to XS5	Screw terminals EHC350M-6P to connect the SC
6	LEDs of Ethernet channels status	1 to 5	To display channel status: – constant glowing of the left LED means that channel is ready for data transmission; – flashing of the right LED means that the channel is busy
7	Group of connectors RJ-45	XS6	To couple with external systems via Ethernet
8	Power fuses	FU13	To protect subscriber lines and power network against faults
		FU14	To protect hardware components against faults in power mains
9	Piano type switch	On, Off	To start and stop the unit's operation

2.2.6 Central unit ITS-CUA

Central unit of ITS-CUA type is designed to create isolated telephone subscriber network, switch the lines of internal subscribers automatically, and connect with coastal PBX. Quantity of internal and external lines depends on the central unit type.

Figure 7 describes exterior of ITS-CUA. The door of the central unit is outfitted with a lock to protect the equipment against any unauthorized access. A power on/off piano type switch is located on the left side (position 2); two LEDs of main and standby power are located on the door (position 1). Type of mounting – wall.

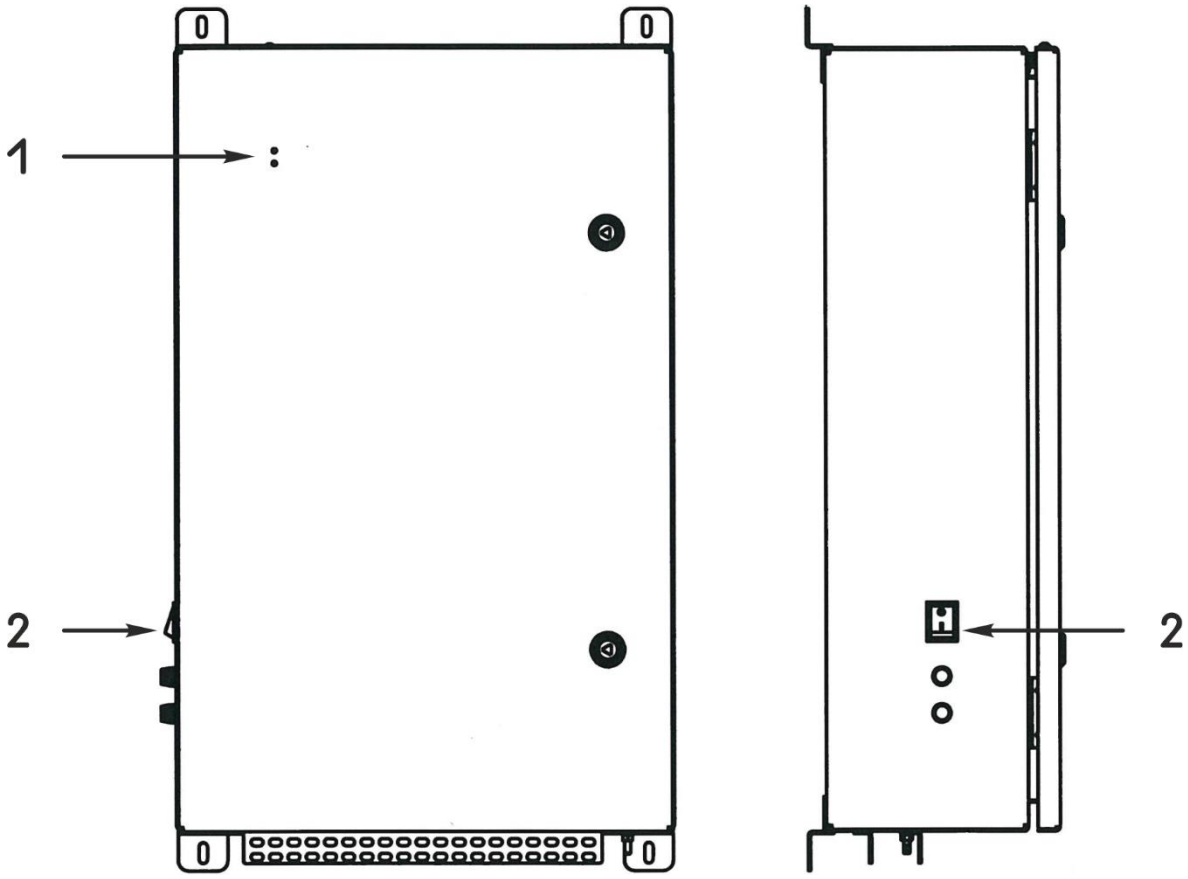


Figure 7 – Layout and designation of controls and LEDs of ITS-CUA

2.2.7 IP PBX Server ITS-CUIP

IP PBX Server ITS-CUIP is designed for voice streams routing in telephone network, as well as external control of PBX extension units via Ethernet.

Figure 8 describes exterior, external systems' connectors, controls and LEDs of ITS-CUIP. Description and assignment of controls and LEDs are represented in table 11.

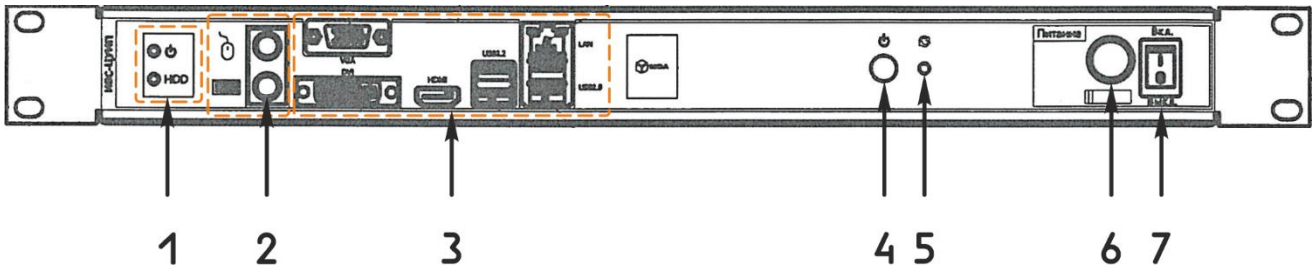


Figure 8 – Layout and designation of controls and LEDs of ITS-CUIP

Table 11 – Description of controls and LEDs of ITS-CUICB

Position	Name	Designation	Purpose
1	Server status LEDs	⏻	Constant glowing means that power is available
		HDD	Uniform flashing means that HDD is non-faulty
2	Connectors for I/O devices		Connector for computer mouse
			Keyboard connector
3	Group of connectors	VGA	Connectors for external systems and units
		DVI-D	
		HDMI	
		USB 3.2	
		LAN	
		USB 2.0	
4	Power on button	⏻	To start HDD operation
5	Reset button		To reboot the server
6	Fuse	–	To protect hardware against faults of power network
7	Piano type switch	On, Off	To start and stop server's operation

2.2 MAIN SUBSTATIONS

2.2.1 Main substations SP and MS type

Main substations are designed to provide two-way PA with a capability to call telephone subscribers. Combined main stations are also capable to send messages via PA lines and initiate alarms. Quantity of PA subscribers, transmission zones, alarms and operation conditions depend on the main substation's type.

Examples of main substations types' exterior, their controls and LEDs are shown in figures 9–10. Description and assignment of controls and LEDs are represented in table 12.

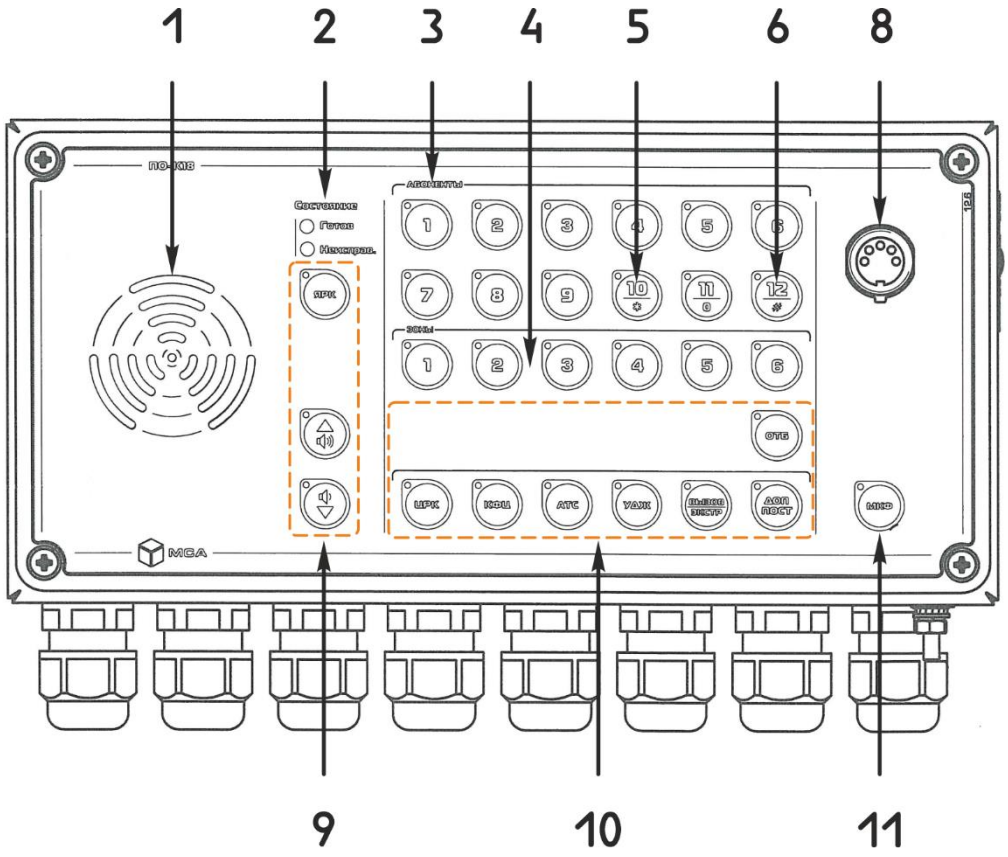


Figure 9 – Layout and designation of controls and LEDs of MS-18.12.6-WM

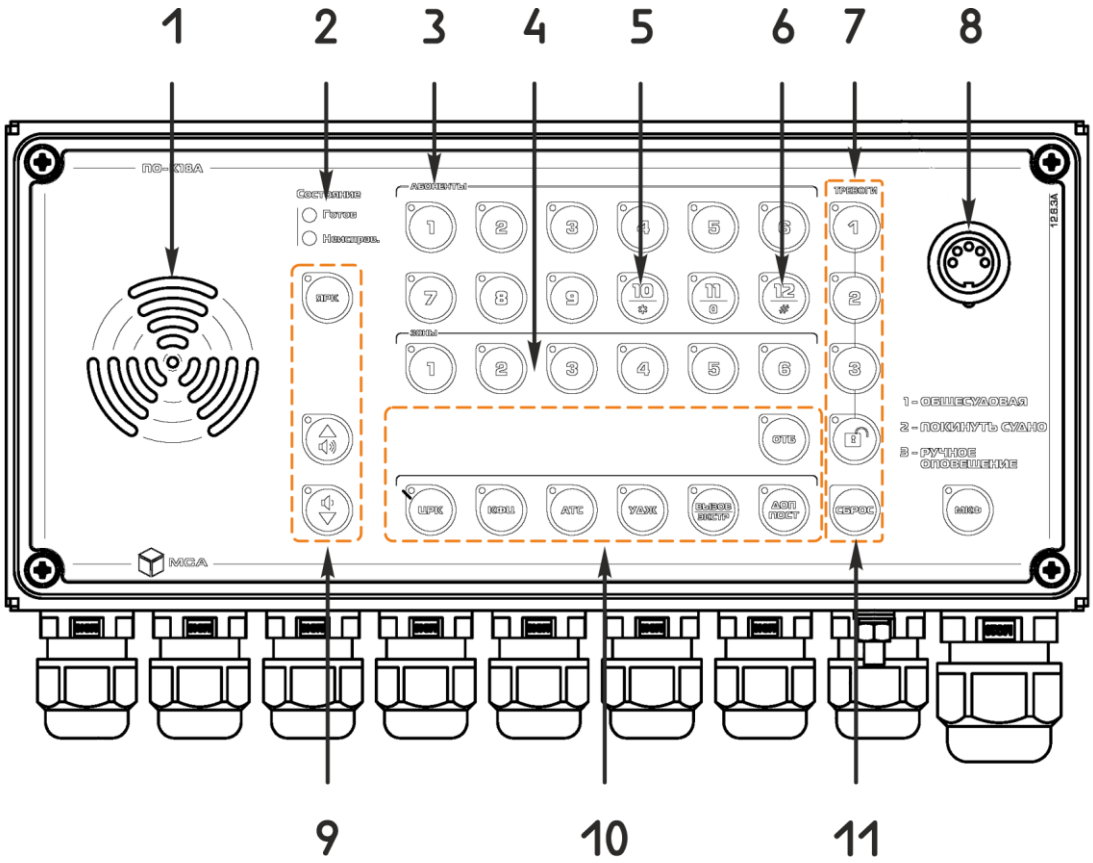


Figure 10 – Layout and designation of controls and LEDs of MS-18A.12.6.3-WM

Table 12 – Description of controls and LEDs of main substations

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Group of LEDs *State*	Ready	Constant glowing means that there are no faults, and power is available
		Fault	Constant glowing or uniform flashing means that main station is malfunctioning (see table 80)
3	Group of buttons *Substations* with LEDs	1 to XX	To call or answer the call in PA mode, or to dial a number in telephone communication mode. LED operation modes: – no glowing means that there is no connection with a subscriber; – constant glowing means that call is connected; – uniform flashing means that communication is lost; – frequent short flashes indicate incoming call; – long-term glowing with short breaks indicates current communication
4	Group of buttons *PA lines* with LEDs	1 to XX	To transmit messages via PA lines. Constant glowing means that call is connected
5	Star key	10 *	To switch between pulse and tone dialing modes during telephone communication
6	Hash key	12 #	To activate value added services during telephone communication
7	Group of buttons *Alarms* with LEDs and protective cover	1 to 3	To initiate alarms. Constant glowing means that alarm is selected and initiated
			To lock alarm buttons. Constant glowing means that buttons from 1 to 3 are locked
		RESET	To cancel the initiated alarm
8	Connector Lumberg KGV50	–	To connect external microphone or external communication device
9	Volume control buttons with LEDs	DIM	Stepwise brightness dimming of keys and LEDs
			To control volume of built-in speaker
10	Functional keys with LEDs	END	To stop active connections
		LIST	Pre-defined conference call
		CONF	Selective call
		PABX	To activate telephone communication mode. Constant glowing means that the mode is active

Position	Name	Designation	Purpose
		HOLD	To hold a call in PA mode
		CALL	To ensure a call
		BW	To call a bridge wing substation. Constant glowing means that call is connected
11	Microphone control button with LED	MIC	To switch on/off the microphone. Constant glowing means that the microphone is on
Notes 1 XX means that quantity of buttons depends on the main station type. 2 Only some types of main stations may include a group of buttons *Alarms*.			

2.2.2 Talk-back station PT-CMIP type

Talk-back station PT-CMIP type is designed to provide two-way PA with an option to connect to telephone subscribers. It allows for connecting bridge wing substation SW-1 and external communication device. Quantity of subscribers depend on the connected extension panels, and mounting depends on the station's type.

Figure 11 describes PT-CMIP exterior, layout and designation of controls and LEDs. Description and assignment of controls and LEDs are represented in table 13.

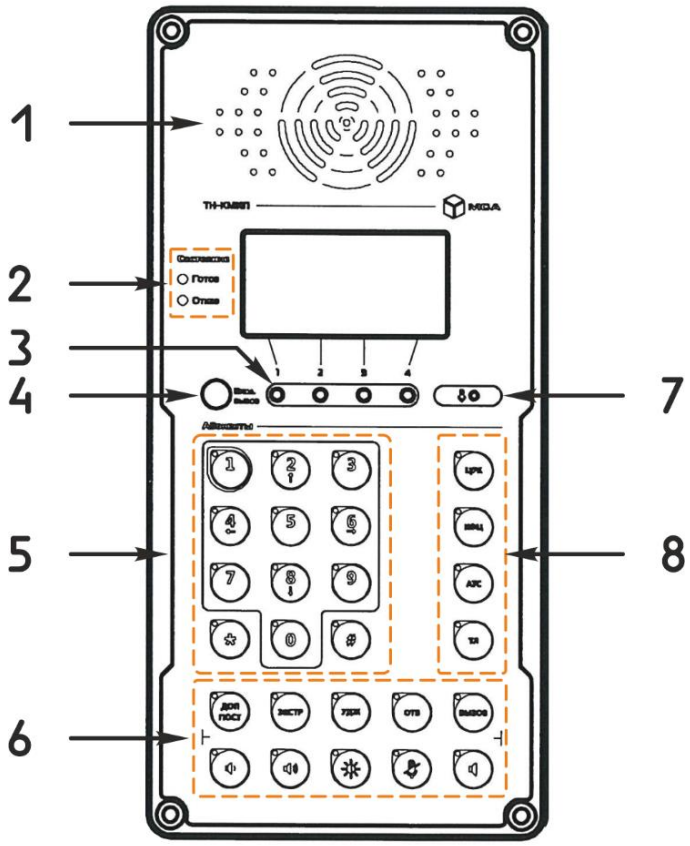


Figure 11 – Layout and designation of controls and LEDs of PT-CMIP

Table 13 – Description of controls and LEDs of PT-CMIP

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Group of LEDs *State*	Ready	Constant glowing means that power is available, and talk-back station is ready for operation
		Fault	Constant glowing or uniform flashing means that talk-back station is malfunctioning (see table 80)
3	Buttons to display data on the screen	1	To display information on connections
		2	To display a list of the last connections
		3	To display saved numbers
		4	To display information on talk-back station's status
4	Call LED	Call	Bright frequent flashes indicate incoming call
5	Dialing keys with LEDs	0 to 9	To call or answer the call in PA mode (only 1 to 9) or to dial a number in telephone communication mode. LED operation modes: – no glowing means that subscriber terminal with the corresponding number is not configured; – constant glowing means that call is connected; – uniform flashing means that communication is lost; – frequent short flashes indicate incoming call; – long-term glowing with short breaks indicates current communication
		*	To switch between pulse and tone dialing modes during telephone communication
		#	To dial value added services code during telephone communication
6	User substation's controls	BW	To call a bridge wing substation. Constant glowing means that call is connected
		EMERG	To initiate emergency call
		HOLD	To hold a call in PA mode
		END	To stop active connections
		CALL	To ensure a call
			To control volume of a built-in speaker
			Stepwise backlight control of buttons and LEDs
			To mute the microphone
			To mute the speaker
7	Built-in microphone		To transmit audio signals
8	User substation's controls	LIST	Pre-defined conference call
		CONF	Selective call
		PABX	To activate telephone communication mode
		PA	To activate transmission mode

2.2.3 Extension panel EP type

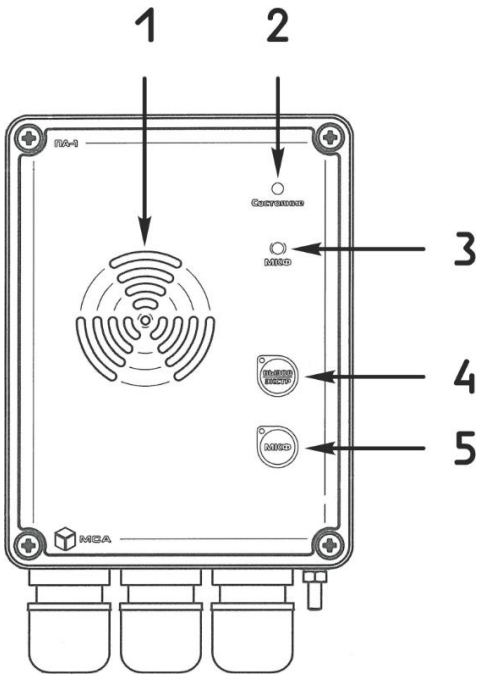
Extension panel EP type is designed to increase subscriber capacity of talk-back station PT-CMIP type. It is a panel with keypad to call subscribers. Quantity of subscribers and mounting type depend on the type of panel.

2.3 TALK-BACK STATIONS

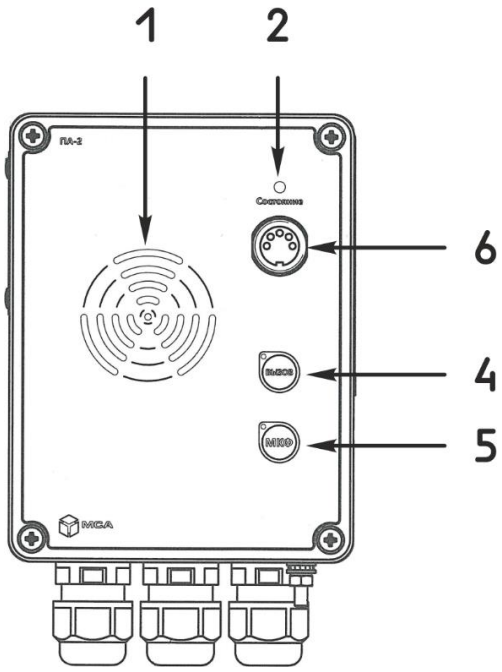
2.3.1 Talk-back stations

Talk-back stations are designed to provide two-way PA with one or several pre-defined subscribers. Quantity of PA subscribers, structure, mounting type and operation conditions depend on the substation type.

Figures 12–14 describe examples of talk-back stations types exterior, layout and designation of controls and LEDs. Description and assignment of controls and LEDs are represented in tables 14–16.



S1-WM



S2-WM

Figure 12 – Layout and designation of controls and LEDs of S1-WM and S2-WM

Table 14 – Description of controls and LEDs of S1-WM and S2-WM

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Status LED	State	Constant glowing with greed means that talk-back station is non-faulty and ready for operation. Constant glowing with red or uniform flashing means that talk-back station is malfunctioning (see table 81)

Position	Name	Designation	Purpose
3	Built-in microphone	MIC	To transmit audio signals
4	Call button with LED	CALL	To call and answer a call. LED operation modes: – constant glowing means that the call is connected; – long-term glowing with short breaks indicates current communication; – short frequent flashes indicate an incoming call
5	Microphone control button with LED	MIC	To switch on/off microphone
6	Connector Lumberg KGV50	–	To connect external microphone or external intercom device

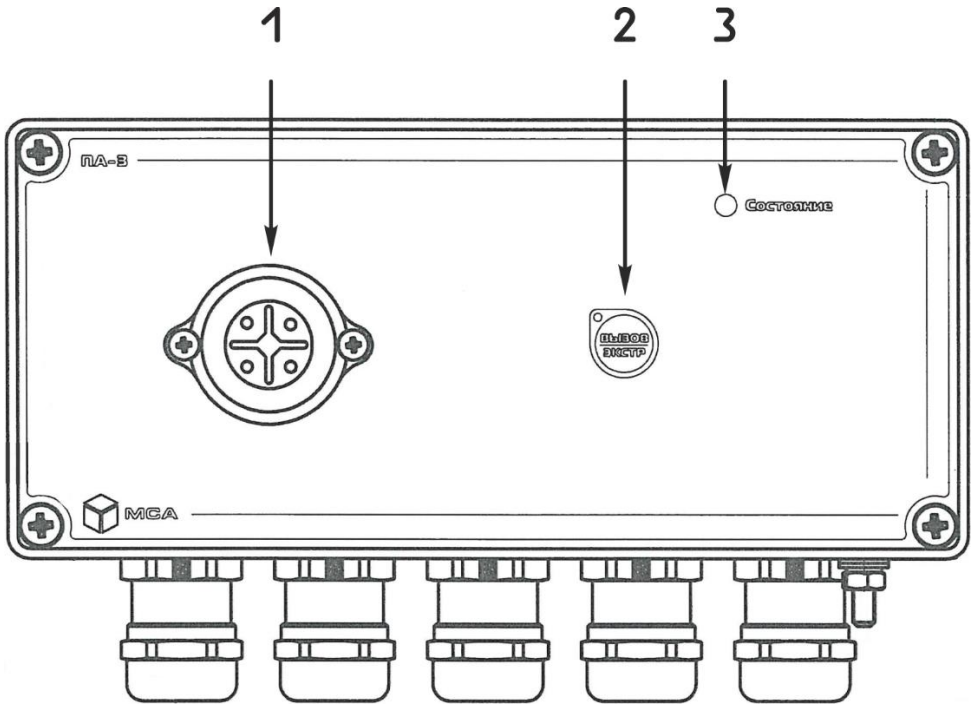
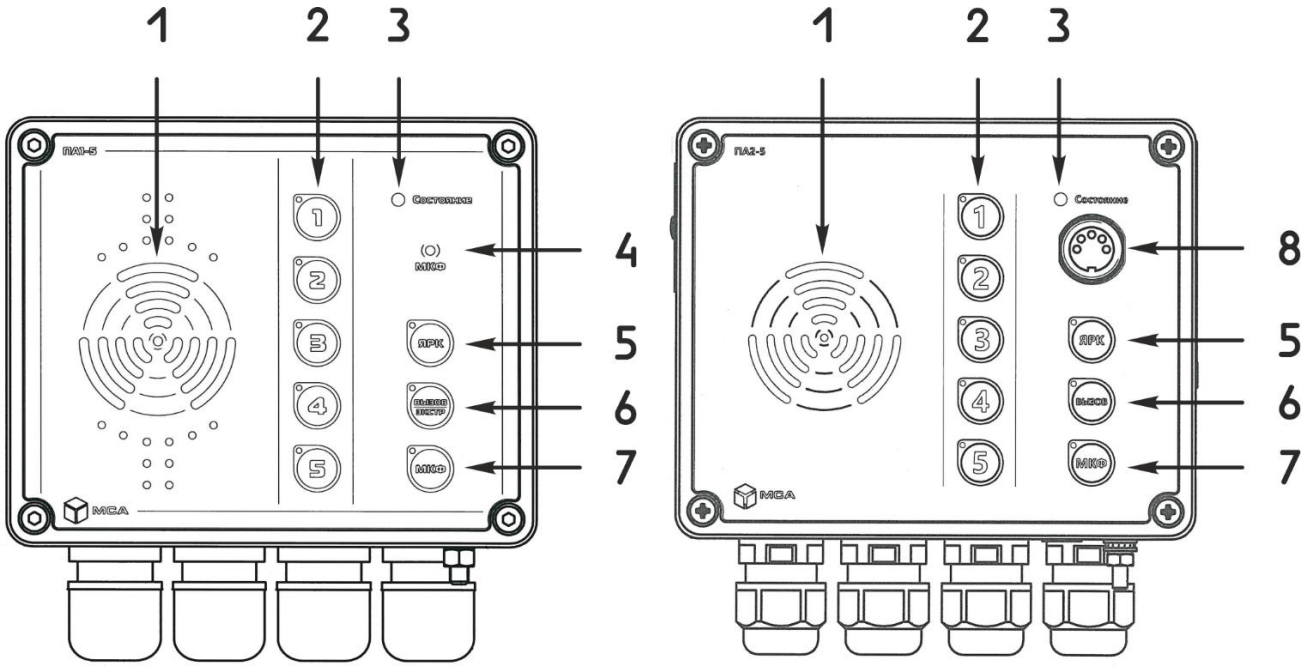


Figure 13 – Layout and designation of controls and LEDs of S3

Table 15 – Description of controls and LEDs of S3

Position	Name	Designation	Purpose
1	Connector Weipu WA22K4Z2	–	To connect external intercom device or microphone
2	Call button with LED	CALL	To call and answer a call. LED operation modes: – constant glowing means that the call is connected; – long-term glowing with short breaks indicates current communication; – short frequent flashes indicate an incoming call
3	Status LED	State	Constant glowing with green means that user substation is non-faulty and ready for operation. Constant glowing with red or uniform flashing means that user substation is malfunctioning (see table 81)



S1-5-WM S2-5-WM

Figure 14 – Layout and designation of controls and LEDs of S1-5-WM and S2-5-WM

Table 16 – Description of controls and LEDs of S1-5-WM and S2-5-WM

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Group of call buttons with LEDs	1 to 5	To call and answer a call. LED operation modes: – no glowing means that subscriber terminal with the corresponding number is not configured;

Position	Name	Designation	Purpose
			– constant glowing means that the call is connected; – uniform flashing indicate connection loss; – short frequent flashing indicates an incoming call; – long-term glowing with short breaks indicates current communication
3	Substation status LED	State	Constant glowing with green means that talk-back station is non-faulty and ready for operation. Constant glowing with red or uniform flashing means that talk-back station is malfunctioning (see table 81)
4	Built-in microphone	–	To transmit voice communication
5	BRT key	BRT	Stepwise backlight control of buttons and LEDs
6	Call button with LED	CALL	To call and answer a call. LED operation modes: – constant glowing means that the call is connected; – long-term glowing with short breaks indicates current communication; – short frequent flashing indicates an incoming call
7	Microphone control button with LED	MIC	To switch on/off microphone
8	Connector Lumberg KGV50	–	To connect external intercom device or microphone

2.3.2 Talk-back station PHS

Talk-back stations PHS type are designed for talk-back PA with an option to call telephone subscribers and transmit messages via PA lines. Some types of PHS are outfitted with a built-in speaker.

Figure 15 describes example of PHS type exterior, layout and designation of controls and LEDs. Description and assignment of controls and LEDs are given in table 17.

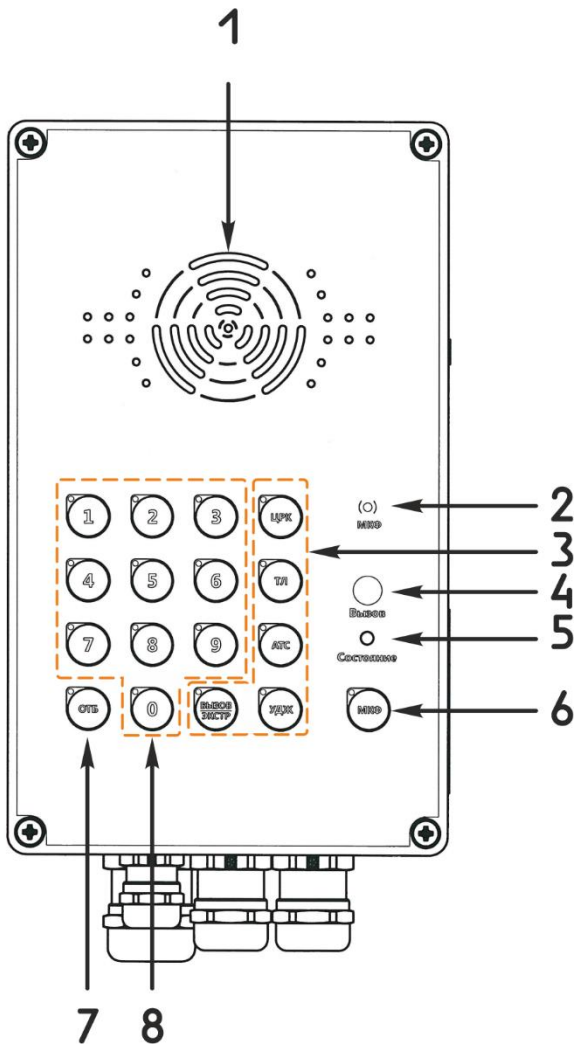


Figure 15 – Layout and designation of controls and LEDs of PHS1

Table 17 – Description of controls and LEDs of PHS1

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Call controls	LIST	Conference call, pre-defined
		PA	To activate transmission mode
		PABX	To activate telephone communication mode. Constant glowing means that the mode is active
		HOLD	To hold a call in PA mode
		CALL	To ensure a call
3	Microphone	MIC	To receive voice communication
4	Substation status LED	State	Constant glowing with green means that the unit is non-faulty and ready for operation. Constant glowing with red or uniform flashing means that user substation is malfunctioning (see table 81)
5	Microphone control button with LED	MIC	To switch on/off microphone. Constant glowing means that the microphone is on. No glowing means that the microphone is off

Position	Name	Designation	Purpose
6	Number dialing buttons with LEDs	0 to 9	To call and answer a call in PA mode (only 1 to 9) or dial a number in telephone communication mode. LED operation modes: – no glowing means that subscriber terminal of the corresponding number is not configured; – constant glowing means that the call is connected; – uniform flashing indicates connection loss; – short frequent flashing indicates an incoming call; – long-term glowing with short breaks indicates current communication
7	Call end button	END	To end active connections

2.4 MICROPHONE PANELS

2.4.1 Microphone panels

Microphone panels are designed to transmit voice communication via PA lines. Quantity of transmission zones, the structure, mounting type and operation conditions depend on the type of microphone panel.

Figure 16 describes example of microphone panel exterior, layout and designation of controls and LEDs. Description and assignment of controls and LEDs are shown in table 18.

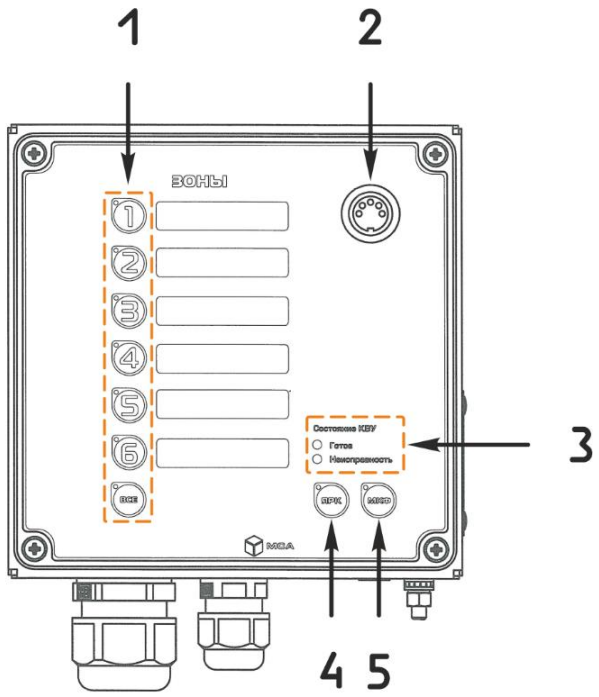


Figure 16 – Layout and designation of controls and LEDs of CP-6-WM

Table 18 – Description of controls and LEDs of CP-6-WM

Position	Name	Designation	Purpose
1	Group of buttons *PA LINES* with LEDs	1 to 6*	To select PA line. Constant glowing means that the PA line is selected
		ALL	To transmit message to all connected PA lines
2	Connector Lumberg KFV-50	–	To connect external microphone or external intercom device
3	Group of LEDs *PA state*	Ready	Constant glowing means that the central unit is connected and ready for operation
		Fault	Constant glowing means that microphone panel is malfunctioning (see table 81)
4	Brightness control button with LED	DIM	Stepwise backlight control of buttons and LEDs
5	Microphone control button with LED	MIC	To switch on/off microphone. Constant glowing means that the microphone is on. No glowing means that the microphone is off
* Quantity of buttons depends on the type of microphone panel.			

2.4.2 Combined microphone panels

Combined microphone panels are designed to transmit voice communication and initiate alarms via PA lines and alarm circuits. Quantity of transmission zones and alarms, the structure, mounting type and operation conditions depend on the combined microphone panel type.

Figure 17 describes example of combined microphone panel's exterior, layout and designation of controls and LEDs. Description and assignment of controls and LEDs are shown in table 19.

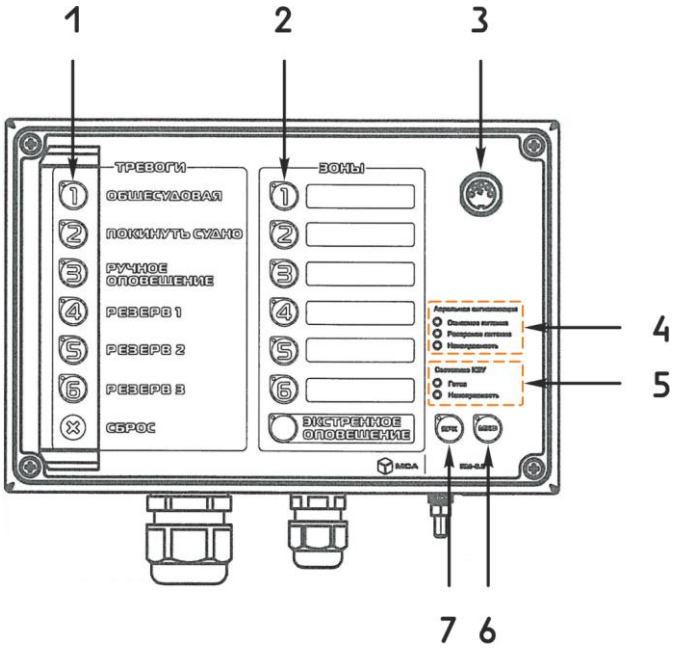


Figure 17 – Layout and designation of controls and LEDs of CP-6.6-WM

Table 19 – Description of controls and LEDs of CP-6.6-WM

Position	Name	Designation	Functionality
1	Group of buttons *ALARMS** with LEDs	1 to 6**	To initiate alarm. Constant glowing indicates the initiated alarm
		RESET	To cancel the initiated alarm
2	Group of buttons *PA LINES* with LEDs	1 to 6**	To select PA lines. Constant glowing indicates the selected PA line
		EMERGENCY PA	To transmit emergency notification to all PA lines
3	Connector Lumberg KFV-50	–	To connect external microphone or external intercom device
4	Group of LEDs *Alarm state*	Main power	Constant glowing means that the microphone panel is powered from the power mains
		Backup power	Constant glowing means that the microphone panel is powered from the standby power
		Fault	Constant glowing means that there is no main or standby power
5	Group of LEDs *PA state*	Ready	Constant glowing means that there is connection with central unit and unit is ready for operation
		Fault	Constant glowing means that microphone panel is malfunctioning (see table 81)
6	Microphone control button with LED	MIC	To switch on/off microphone. Constant glowing means that the microphone is on. No glowing means that the microphone is off
7	Brightness control button with LED	DIM	Stepwise backlight control of buttons and LEDs

* Group of buttons *ALARMS* is covered with protective glass to prevent from accidental keystroke.
** Quantity of buttons *PA LINES* depends on the combined microphone panel type.

2.5 ALARM PANELS

2.5.1 Alarm panels

Alarm panels are designed to initiate alarms via PA lines and alarm circuits. Quantity of alarms, the structure, mounting type and operation conditions depend on the alarm panel type.

Figure 18 describes example of alarm panel exterior, layout and designation of controls and LEDs. Description and assignment of controls and LEDs are shown in table 20.

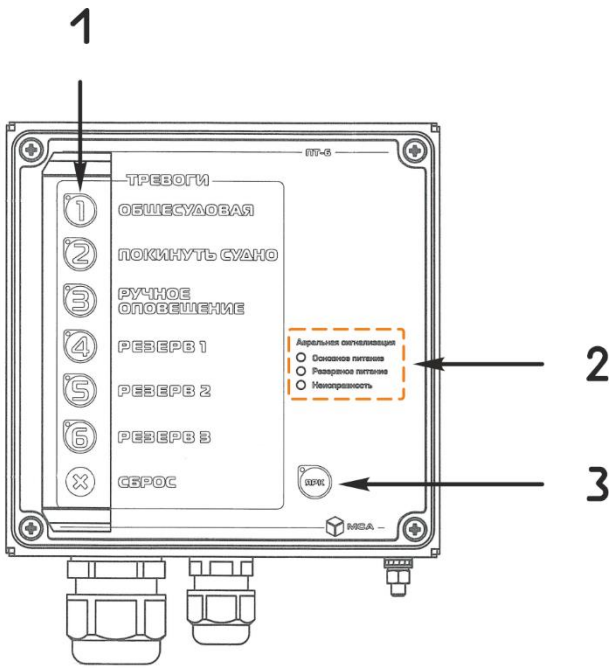


Figure 18 – Layout and designation of controls and LEDs of AP-6-WM

Table 20 – Description of controls and LEDs of AP-6-WM

Position	Name	Designation	Purpose
1	Group of buttons *ALARMS** with LEDs	1 to 6**	To initiate alarm. Constant glowing indicates the initiated alarm
		RESET	To cancel the initiated alarm
2	Group of LEDs *Alarm state*	Main power	Constant glowing means that alarm panel is powered from the power mains
		Backup power	Constant glowing means that alarm panel is powered from the standby power
		Fault	Constant glowing means that there is no main or standby power
3	Brightness control button with LED	DIM	Stepwise backlight control of buttons and LEDs
* Group of buttons *ALARMS* is covered with protective glass to prevent from accidental keystroke. ** Quantity of buttons depends on the alarm panel's type.			

2.5.2 Alarm buttons

Alarm buttons provide alarm signaling via one, two or three alarm circuits. The system includes two types of alarm buttons:

– alarm buttons PSK (waterproof);

– alarm explosion-proof buttons PKIVA.

Both types are equipped with larger buttons of bright colour intended to ensure alarm signaling.

2.6 POWER AMPLIFIERS

2.6.1 Amplifier TPA-15

Amplifier TPA-15 type is designed to amplify sound signals received from the microphone, ISDN lines or linear audio input.

Figure 19 describes TPA-15 exterior, layout and designation of controls and LEDs. Description and assignment of controls and LEDs are shown in table 21.

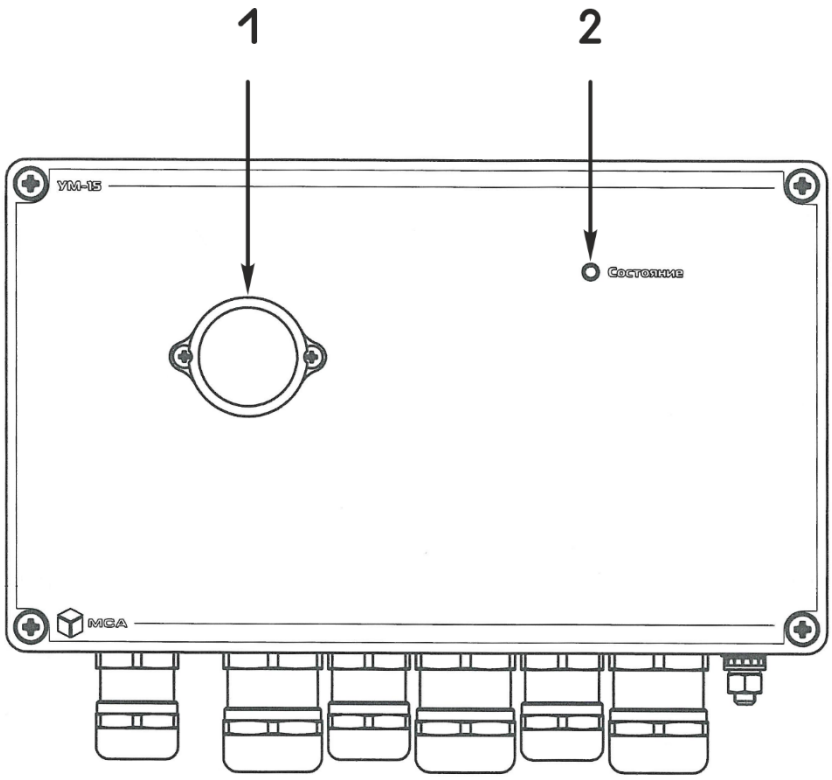


Figure 19 – Layout and designation of controls and LEDs of TPA-15

Table 21 – Description of controls and LEDs of TPA-15

Position	Name	Designation	Purpose
1	Connector Weipu WA22K4Z2	–	To connect external microphone or external intercom device
2	Amplifier status LED	State	Constant glowing means that TPA-15 is non-faulty and ready for operation. Constant glowing with red or uniform flashing means that TPA-15 is malfunctioning (see table 82)

2.6.2 Amplifiers TPA-200, TPA-400, TPA-200S

Amplifiers TPA-200, TPA-400 and TPA-200 types are designed to amplify sound signals received from the microphone, ISDN lines or linear audio input.

Figure 20 describes exterior, layout and designation of controls and LEDs. Description and assignment of controls and LEDs are shown in table 22.

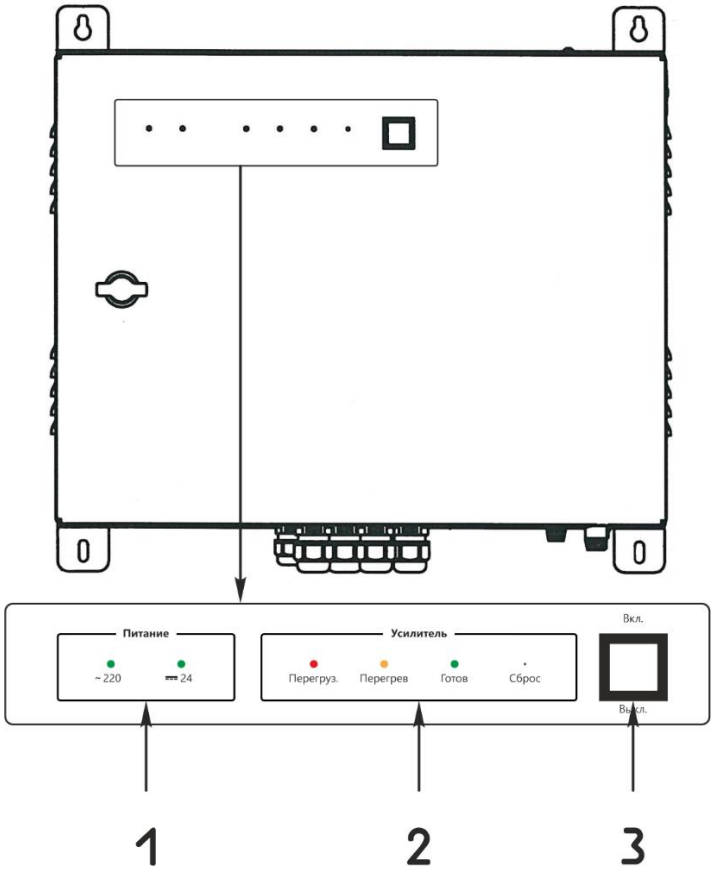


Figure 20 – Layout and designation of controls and LEDs of TPA-200, TPA-400, TPA-200S

Table 22 – Description of controls and LEDs of TPA-200, TPA-400, TPA-200S

Position	Name	Designation	Purpose
1	Power status LEDs	~ 220	Constant glowing means that power mains 220 VAC is available
		⎓ 24	Constant glowing means that power mains 24 VDC is available
2	Amplifier operation LEDs	Overload	Constant glowing with red indicates overload
		Overheat	Constant glowing with orange indicates overheating
		Ready	Constant glowing with green means that the amplifier is non-faulty
	Reset button	Reset	To reboot the amplifier. To prevent against accidental keystroke the button is sunken
3	On/Off button	ON/OFF	To start and stop amplifier' operation

2.6.3 Amplifiers 19-TPA types

Amplifier 19-TPA type is designed to amplify sound signals received from the microphone, ISDN lines or linear audio input. Power of amplifier depends on its type.

Figure 21 describes exterior, layout and designation of controls and LEDs of 19-TPA. Description and assignment of controls and LEDs are shown in table 23.

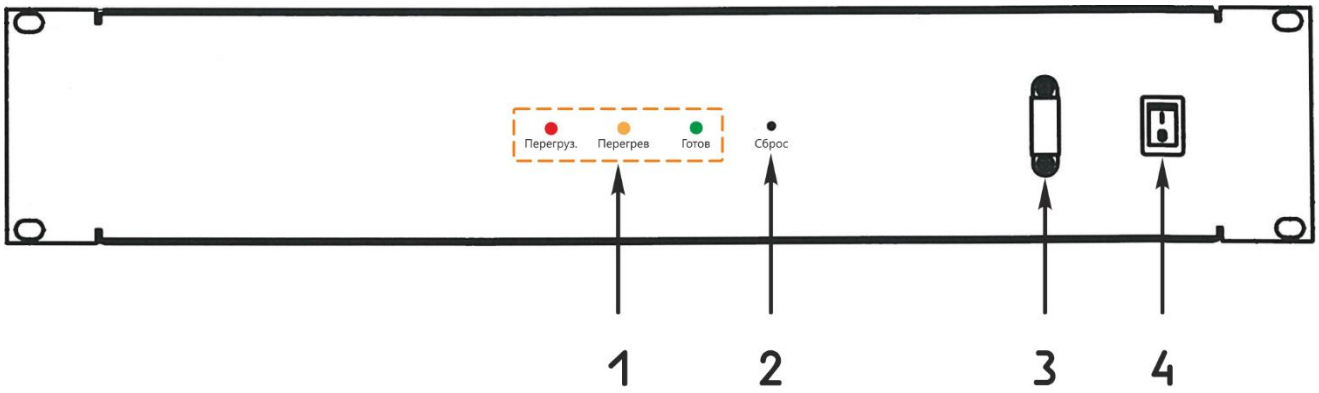


Figure 21 – Layout and designation of controls and LEDs of 19-TPA

Table 23 – Description of controls and LEDs of 19-TPA

Position	Name	Designation	Purpose
1	Amplifier operation LEDs	Overload	Constant glowing with red indicates overload
		Overheat	Constant glowing with orange indicates overheating
		Ready	Constant glowing with green means that the amplifier is non-faulty
2	*Reset* button	Reset	To reboot the amplifier. To prevent against accidental keystroke the button is sunken
3	Power fuse 16 A	FU1	To protect amplifier and power network against malfunctioning
4	Piano type switch	On, Off	To start and stop amplifier' operation

2.7 PA EQUIPMENT

2.7.1 PA line control device PACE-1

PA line control device PACE-1 is designed to transmit control signal via PA lines.

PACE-1 has a rectangular plastic casing with two cable glands located on the opposite sides. There are no controls and LEDs on the casing. PACE-1 does not require connection to the external power network, it is powered directly from PA lines.

2.7.2 PA line control unit 19-PAC-6

PA line control unit 19-PAC-6 is designed to detect faults (circuit rupture or short circuit) in PA lines.

Figure 22 describes exterior, layout and designation of controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 24.

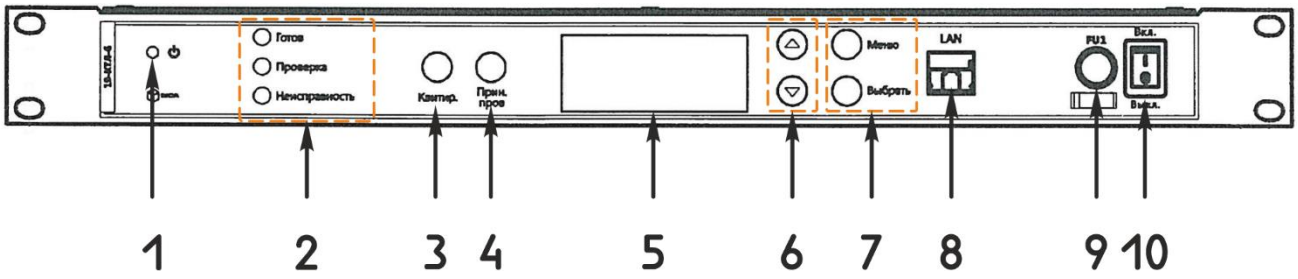


Figure 22 – Layout and designation of controls and LEDs of 19-PAC-6

Table 24 – Description of controls and LEDs of 19-PAC-6

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	PA lines status LEDs	Ready	Constant glowing with green means that PA line is non-faulty
		Test	Constant glowing with yellow means that autotest of PA lines is running
		Fault	Constant glowing with red means that fault is detected (see table 84)
3	Test control keys	Reset	To stop the test
4		Test	To start the test
5	Display	–	To display menu information
6	Navigation keys	△ ▽	To scroll menu pages
7	*Menu* key	Menu	To access the menu
	Actuation key	Select	To confirm the select
8	RJ-45 connector	LAN	To connect external systems via Ethernet
9	Power fuse	FU1	To protect hardware against malfunctions in the power network
10	Piano type switch	On, Off	To start and stop the unit’s operation

2.7.3 PA sound control unit 19-CHSW

PA sound control unit 19-CHSW is designed to control quality of audio messages transmitted via PA lines; a built-in selector enables to control signals from the entertainment source. 19-CHSW is a passive device; it does not require connection to the power network.

Figure 23 describes exterior, layout and designation of controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 25.

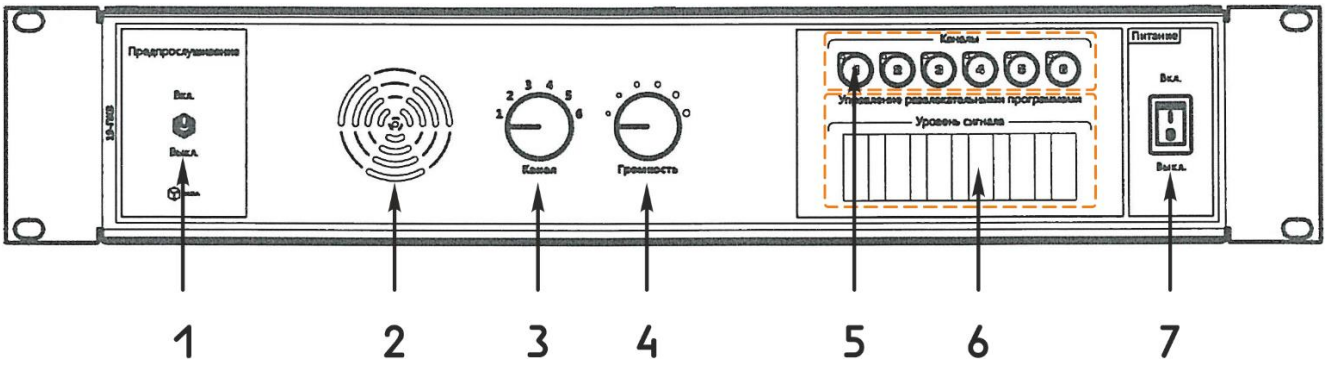


Figure 23 – Layout and designation of controls and LEDs of 19-CHSW

Table 25 – Description of controls and LEDs of 19-CHSW

Position	Name	Designation	Purpose
1	Toggle switch	On, Off	To start and stop PA line audio control
2	Speaker	–	To reproduce audio signals
3	PA switch	Channel	To select PA line
4	Volume control	Volume	To control speaker's volume
5	Group of keys *Channels*	1 to 6	To control entertainment programs
6	Channels LEDs	Signal level	Dynamic display of signal level transmitted via PA line
7	Piano type switch	On, Off	To start and stop amplifier' operation

2.7.4 Entertainment broadcast unit

Entertainment broadcast unit is designed to play radio entertainment programs (AM and FM radio), USB-recorded programs or from external source connected via AUX port.

The System includes two types of entertainment broadcast units: ENT-P1 – embedded into the system units, and 19-P1 – rack-mounted.

Figure 24 describes exterior, layout and designation of controls and LEDs of the entertainment broadcast units. Description and assignment of controls and LEDs are shown in table 26.

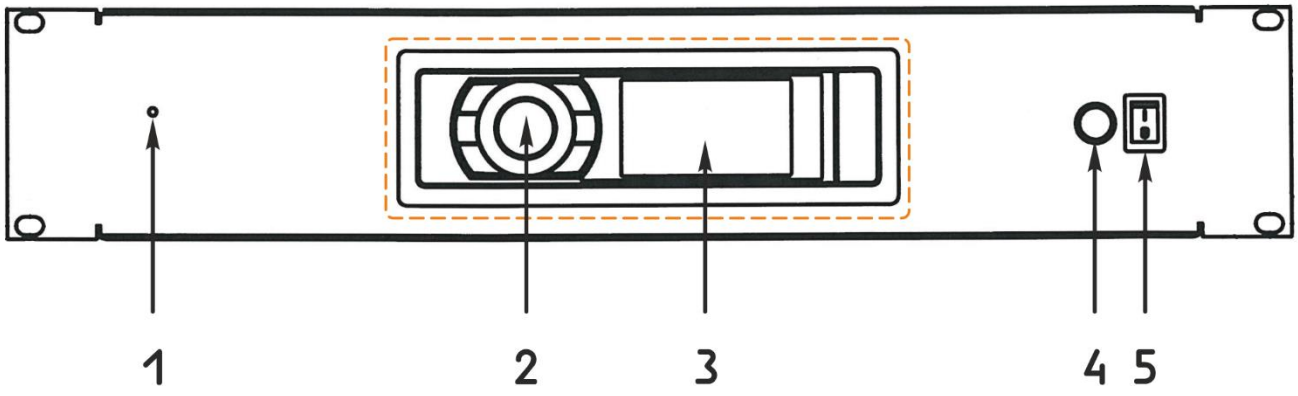


Figure 24 – Layout and designation of controls and LEDs of ENT-P1 and 19-P1

Table 26 – Description of controls and LEDs of ENT-P1 and 19-P1

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	Entertainment source ENT-P1	Control knob	To change programs or broadcast band
3		Display	To display information on the programs being played
4	Power fuse 3 A	FU1	To protect hardware against malfunctions in the power network
5	Piano type switch	On, Off	To start and stop the unit's operation

2.7.5 Mixer 19-MIX

Mixer 19-MIX is designed to select broadcasting channel and switch between zones.

Figure 25 describes exterior, layout and designation of controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 27.

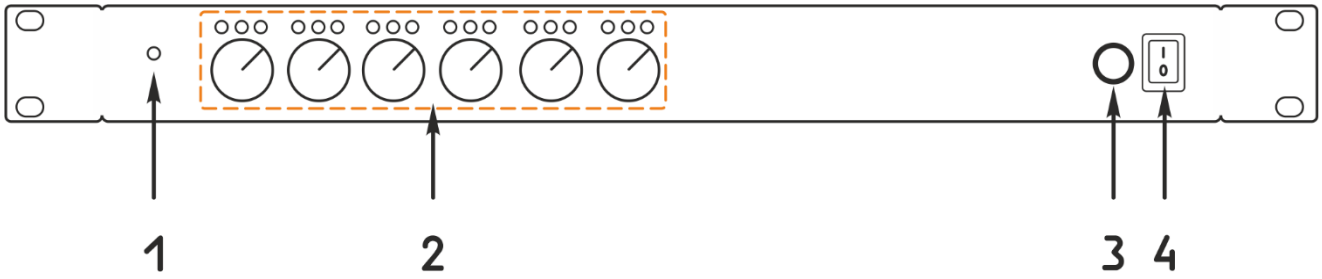


Figure 25 – Layout and designation of controls and LEDs of 19-MIX

Table 27 – Description of controls and LEDs of 19-MIX

Position	Name	Designation	Purpose
1	Power status LEDs	⎓ 24	Constant glowing means that 24 VDC power is available
		~ 220	Constant glowing means that 220 VAC, power is available
2	Selector keys	Channel 1 to Channel 6	To select between three entertainment sources. Constant glowing indicates a source that is working
3	Power fuse 5 A	FU1	To protect hardware against malfunctions in the power network
4	Piano type switch	On, Off	To start and stop the unit's operation

2.7.6 Headphones HP-1

Headphones HP-1 are designed to reproduce commands and entertainment broadcasting transmitted via PA lines.

Headphones are designed as a headband with a speaker on each side; a cord to connect to transmission units is located on the side. Headphones are stored on a bracket (included in the scope of delivery); for dry areas. There are no controls or LEDs on the headphones.

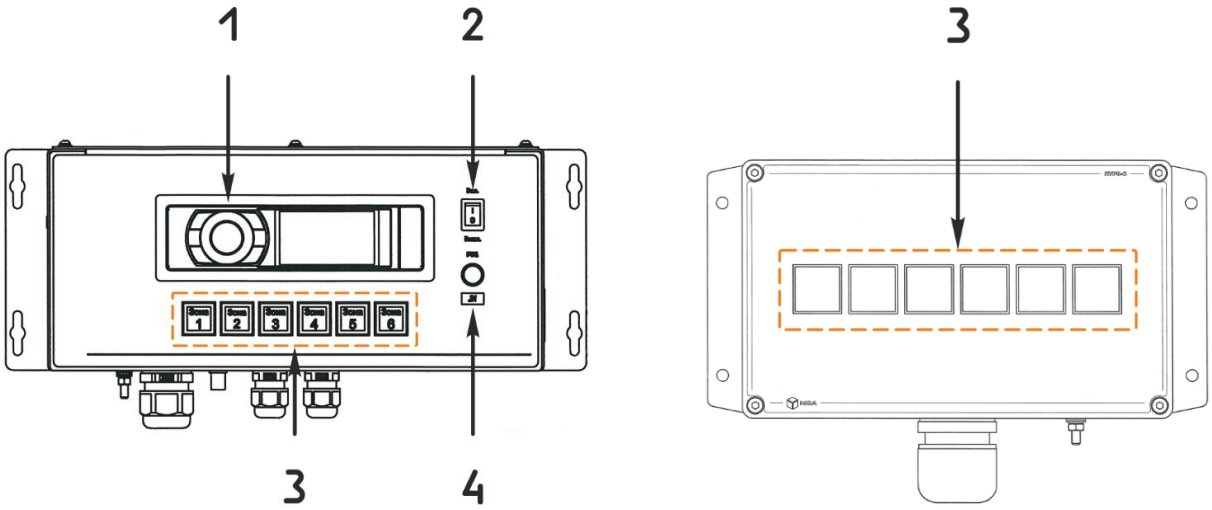
2.7.7 Antenna ANT

Antenna ANT type is designed to receive and convert radio signals, omnidirectional. Wall- or mast-mounted. Antenna power gain depends on the type of antenna.

2.7.8 Entertainment remote control EC-6

Entertainment remote control EC-6 type is designed to control broadcasting for six zones.

Figure 26 describes exterior, layout and designation of controls and LEDs of EC-6. Description and assignment of controls and LEDs are shown in table 28.



EC-6M EC-6

Figure 26 – Layout and designation of controls and LEDs of EC-6

Table 28 – Description of controls and LEDs of EC-6

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	Entertainment source	–	To play radio entertainment programs (AM and FM radio), USB-recorded programs or from external source
3	Piano type switch	On, Off	To start and stop device’s operation
4	Group of keys with LEDs	1 to 6	To select PA line
5	Power fuse 2 A	FU1	To protect hardware against malfunctions in the power network

2.7.9 Selector SELP

Selector SELP type is designed for independent select of sound channels for one or several loudspeakers connected to one zone. It is a panel with a knob rotating clockwise and pointing at the program number. The type of mounting depends on the unit type.

2.7.10 Selector SEL-4P

Selector SEL-4P type is designed to connect a loudspeaker to three-program TL. The unit switches connected loudspeakers between entertainment sources. It is a panel with a knob rotating clockwise. For dry areas. Quantity of channels and the type of mounting depend on the unit's type.

2.7.11 Volume control DM

Volume control DM type is designed to control volume of connected loudspeakers. It is a panel with a knob rotating clockwise. Dual-channel, with volume control override function. The type of mounting, power of the connected loudspeakers and operation conditions depend on the unit's type.

2.7.12 Volume control DMP

Volume control DMP type is designed to control volume of the connected loudspeakers. Volume control override function. The type of mounting and power of the connected loudspeakers depend on the unit's type.

2.7.13 Volume control DMO

Volume control DMO type is designed to control volume of the connected loudspeakers. It is a panel with a knob rotating clockwise. One-channel, with volume control override function. The type of mounting and power of the connected loudspeakers, and open deck application depend on the DMO type.

2.7.14 Selector with volume control SDP-4

Selector with volume control SDP type is designed to connect a loudspeaker to three-program PA line. It ensures automatic switching to command PA line of one or two public address units. Volume control override function. The type of mounting depends on the unit's type.

2.7.15 Selector / Volume control SDP

Selector with volume control SDP type is designed to connect a loudspeaker to three-program PA line. It ensures automatic switching to command PA line of one or two public address units. Volume control override function. The type of mounting depends on the unit's type.

2.7.16 PA line commutator 19-COM-4-6

PA line commutator 19-COM-4-6 is designed to switch amplified voice communication from central unit and entertainment source between six PA lines. Volume control override via three-wire (or four-wire at option) circuit. There are no controls or LEDs on the casing.

2.7.17 Alarm generator 19-AG

Alarm generator 19-AG is designed to generate alarm signals. It may be connected fire alarm system or general alarm, and block the units when alarm is initiated.

Figure 27 describes exterior, layout and designation of controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 29.

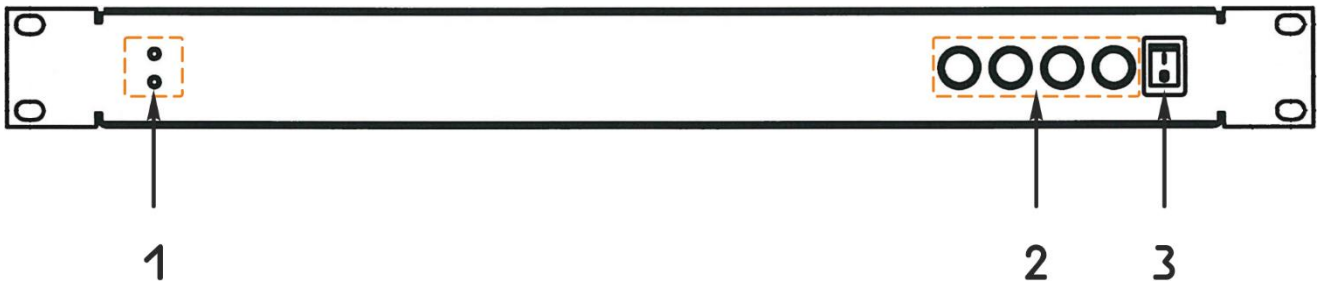


Figure 27 – Layout and designation of controls and LEDs of 19-AG

Table 29 – Description of controls and LEDs of 19-AG

Position	Name	Designation	Purpose
1	Power LEDs	Standby, Main	Constant glowing of one LED means that the corresponding power is available
2	Power fuses 1 A	FU1 to FU4	To protect hardware against malfunctions in the power network
3	Piano type switch	On, Off	To start and stop device's operation

2.7.18 Alarm generator AG-1

Alarm generator AG-1 is designed to initiate general alarm signaling, and other types of alarm, and to control alarm circuits. The unit has a waterproof metal enclosure with seven sealing cable glands. There are no controls or LEDs on the casing.

2.7.19 Matching transformer T-140

Matching transformer T-140 type is designed to convert sound signal amplitude in wide band.

The unit has a waterproof metal casing with five sealing cable glands. There are no controls or LEDs on the casing. Power and operation modes depend on the unit's type.

2.7.20 Digital radio station DRS

Digital radio station DRS ensures half-duplex communication between a coast and ship, as well as receives an audio signal at the system loudspeakers.

The system includes two types of radio stations:

– 19-DRS (mounting into wall-mounted enclosure WME or mounting rack 19IR);

– DRS-WM (wall-mounted).

Figure 28 describes exterior, layout and designation of controls and LEDs of the radio station. Description and assignment of controls and LEDs are shown in table 30.

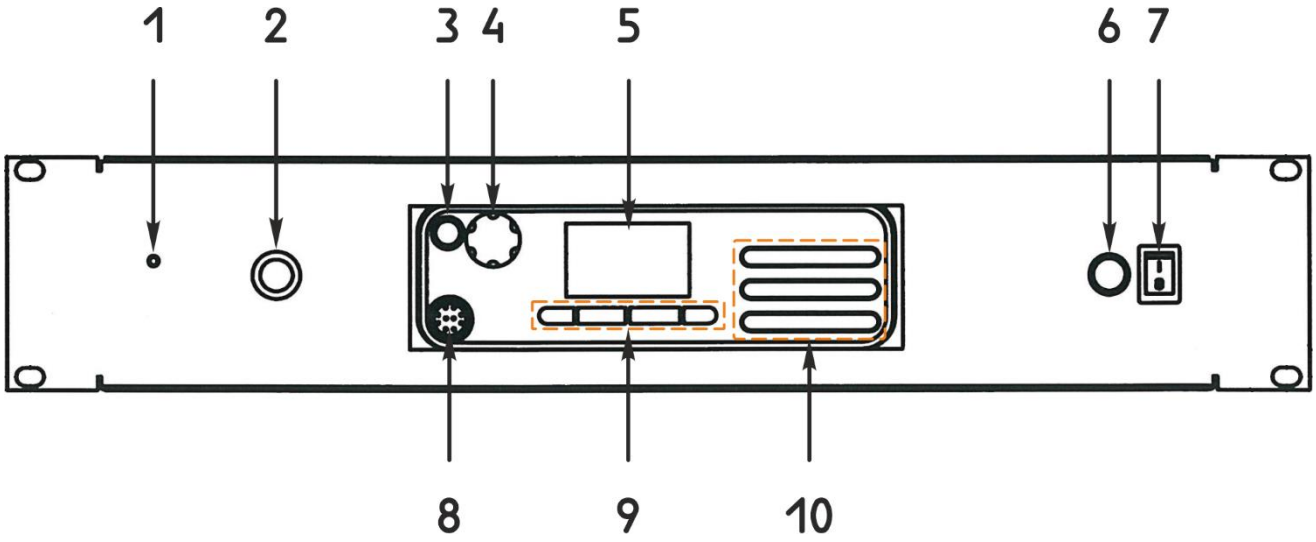


Figure 28 – Layout and designation of controls and LEDs of DRS

Table 30 – Description of controls and LEDs of DRS

Position	Name	Designation	Purpose
1	Power indicator	⏻	Indicator of available power
2	Mode switching button	Transmission	Switching of reception and data transmission modes
3	On/off button	⏻	To switch on/off radio station DRS
4	Volume control knob	–	To change volume
5	LCD	–	To display selected channel, menu settings and notifications
6	Power fuse	«FU1»	To protect hardware against power mains fault
7	Piano-type switch	«On», «Off»	Additional power button
8	Connector	–	To connect microphone, telephone receiver or headset
9	Programmable buttons	«P1», «◄P2», «P3►», «P4»	To switch channels or select additional functions
10	Speaker	–	Reproduction of audio signals

2.8 MOUNTING RACKS, ENCLOSURES

2.8.1 Mounting rack 19IR

Mounting rack 19IR type is designed to house the System's modular equipment.

The rack includes a steel extra strong frame standing on four points, and two brackets – one with a shock absorber at the top to attach to the bulkhead, and one at the bottom. The rack top part is designed as an exhaust duct with a fan unit ensuring hot air outlet from the rack. Side and rear parts are outfitted with detachable metal panels with ventilation louvres. The front part is equipped with a transparent door and a lock against unauthorized access.

The rack equipment is placed inside the rack horizontally, one above another, and fastened by means of screws at the front; at the back it is held and fastened using special rack ears. The units are mounted on special rails; a user may pull the units out when necessary and do not need to take them out of the rack completely. Unit height is measured in units "U". One unit is 1.75" or 44.45 mm. Quantity of units depend on the rack type, see figure 29.

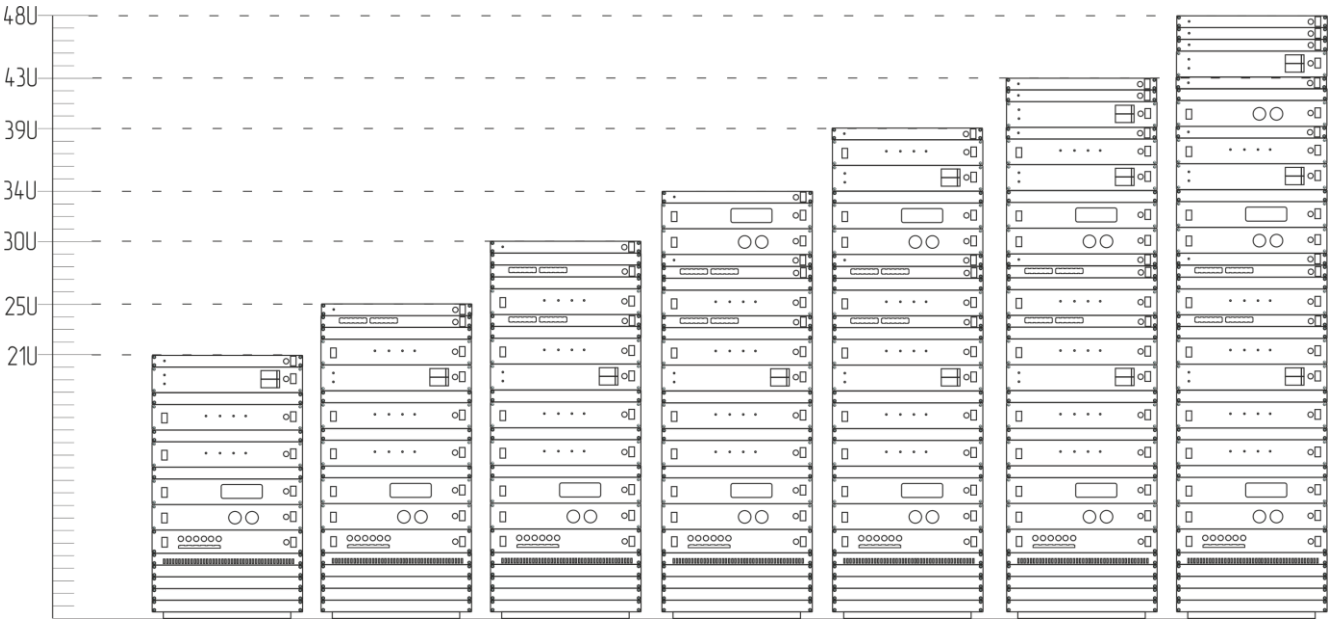


Figure 29 – Types of 19IR rack

2.8.2 Wall-mounted enclosure WME

Wall-mounted enclosure WME type is designed for space-saving housing of modular SC. It has smaller dimensions than the mounting rack, and different type of mounting (wall-mounted). The enclosure is outfitted with six shock absorbers, a bracket for wall mounting and a door to prevent against unauthorized access. The enclosure has cable leads at the top and at the bottom. The types of enclosure have different quantity of units.

2.8.3 Fan unit ITS-FU-4

Fan unit ITS-FU-4 is designed to provide air circulation inside the rack and exhaust hot air through the duct.

Figure 30 describes exterior, layout and designation of controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 31.

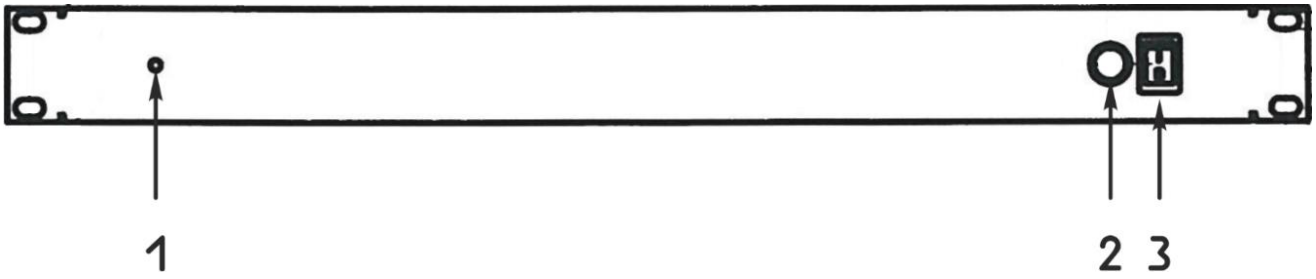


Figure 30 – Layout and designation of controls and LEDs of ITS-FU-4

Table 31 – Description of controls and LEDs of ITS-FU-4

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing of LED means that the power is available
2	Fuse 5 A	–	To protect against malfunctions in the power network
3	Piano type switch	On, Off	To start and stop device's operation

2.8.4 Bezel ITS-FP1

Bezel ITS-FP1 is designed to cover unused space of the mounting rack 19IR.

2.8.5 Cable organizer ITS-CM

Cable organizer ITS-CM is designed to lay cables and wires inside the rack 19IR or enclosure WME.

2.8.6 Wall-mounted metal enclosure BO type

Wall-mounted metal enclosure BO type is designed to protect SC placed on open deck against water, dust and unauthorized access.

Wall-mounted metal enclosure is made of coated steel and outfitted with a door stop. The door has a lock to prevent against unauthorized access. The bottom part of the enclosure is outfitted with cable glands to connect the SC. The type of mounting – wall. The types have various dimensions.

2.8.7 Wall-mounted metal enclosure BO-1H

Wall-mounted metal enclosure BO-1H is designed to house equipment on open deck and to protect the SC against low temperature.

The enclosure is made of stainless steel and outfitted with hinges for wall mounting. The door has a doorstop (opening angle – 105°). The bottom part of the enclosure is outfitted with cable glands to connect the SC. The interior of enclosure is heated automatically when the temperature outside is below than –15 °C.

2.9 TELEPHONES

2.9.1 Analog telephones

Analog telephones provide communication in telephone networks.

The System includes three types of analog telephones: PT-1A, PT-2A and PT-3A, for dry enclosed areas. The telephones have controls and LEDs described in figures 31–33. Description and assignment of controls and LEDs are shown in tables 32–34.

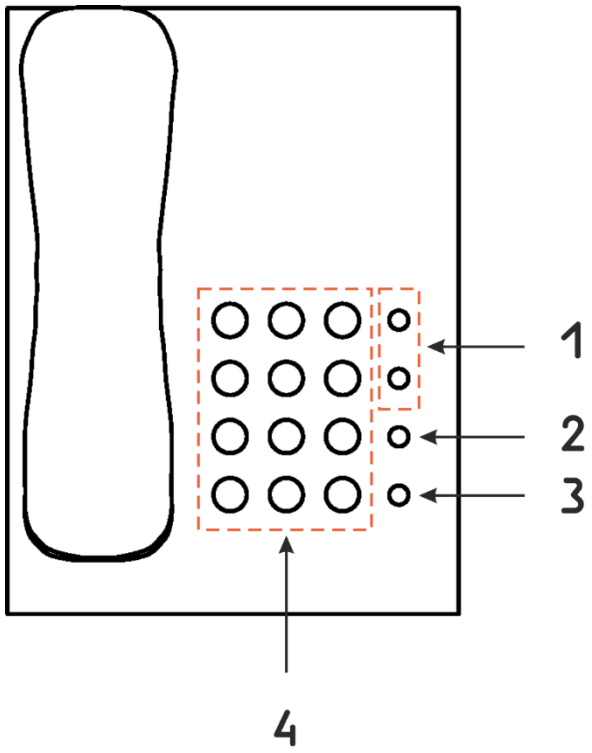


Figure 31 – Layout and designation of controls and LEDs of PT-1A

Table 32 – Description and assignment of controls and LEDs of PT-1A

Position	Name	Designation	Purpose
1	Volume control keys	VOLUME, ^, v	To control volume of telephone handset
2	To hold a call	FLASH	To make a pause during the call
3	Redial	REDIAL	Last number redial
4	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dialing mode
		#	Key to input value added services code

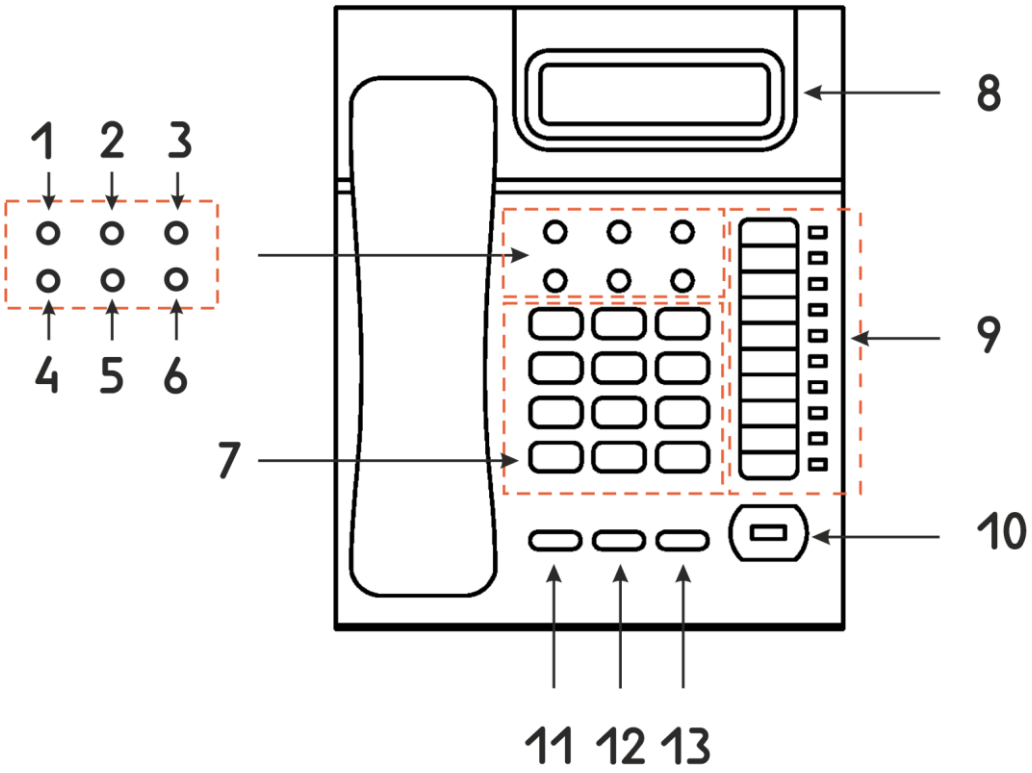


Figure 32 – Layout and designation of controls and LEDs of PT-2A

Table 33 – Description and assignment of controls and LEDs of PT-2A

Position	Name	Designation	Purpose
1	Menu	PROGRAM/EXIT	To access and exit the menu
2	Clear	CLEAR	To delete a number or error
3	Additional key for abbreviated dialing	AUTO/LOWER	To select one of the saved numbers on the abbreviated key (position 9)
4	Call hold	DIAL LOCK/HOLD	To make a pause during call or lock keypad in hold mode
5	Redial	REDIAL	To redial one of the last 20 dialed numbers
6	Pause	PAUSE	To make a pause during the call (for PBX subscribers or long-distance connection services)
7	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dialing mode
		#	Key to input value added services value added services code
8	Display	–	To display information on status, operation mode, calls and settings of subscriber's terminal
9	Abbreviated dialing keys	–	A shortcut dialing for an assigned key

Position	Name	Designation	Purpose
10	Navigation and confirm key	▲ ◄ OK ► ▼	To navigate up, down, left and right in the menu. The central key confirms the select
11	Additional key	FLASH AOH	To receive information on the calling subscriber (a user may assign different functions to the key while configuring the System)
12	To mute microphone	MUTE	To mute the microphone; a user still can hear the dialog partner
13	Speaker mode	SP-PHONE HEADSET	To switch a call from the subscriber's terminal to the speaker, and vice versa

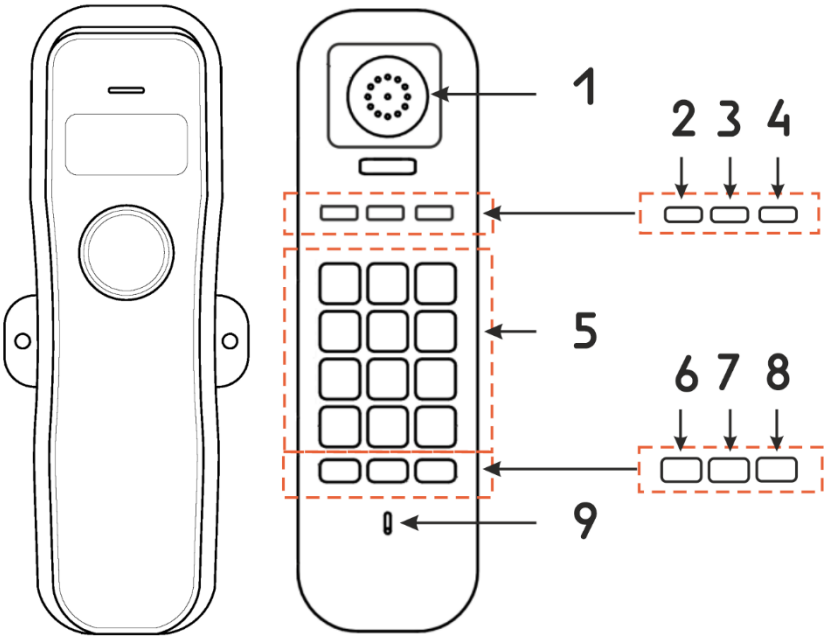


Figure 33 – Layout and designation of controls and LEDs of PT-3A

Table 34 – Description and assignment of controls and LEDs of PT-3A

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Abbreviated dialing key		Key for shortcut dialing
3	Configuration key with LED		Telephone settings mode. LED of microphone mute key is flashing in the configuration mode
4	Microphone mute key with LED		To mute microphone. When the key is pressed, its LED is flashing

Position	Name	Designation	Purpose
5	Dialing keys	0 to 9	Numeric keys to dial the number
		*	Key to input value added services code
		#	
6	Pause	→→ P	To redial the last called number; to make a pause during the call
7	Volume control key	+/-	To control volume of the handset's audio
8	Redial	R	Busy number redial
9	Switch	–	To switch between tone and pulse dialing mode

2.9.2 Digital telephones

Digital telephones are designed for communication in telephone networks.

The System includes the following types of digital telephones:

– PT-3CIP;

– PT-2IP with an option to connect to the network by one or two independent telephone lines;

– PT-VC with an option to provide video calls and connect via digital (PoE) lines.

Use digital telephones in dry areas indoors. For controls and LEDs of the telephones, see figures 34–36. Description and assignment of controls and LEDs are given in tables 35–37.

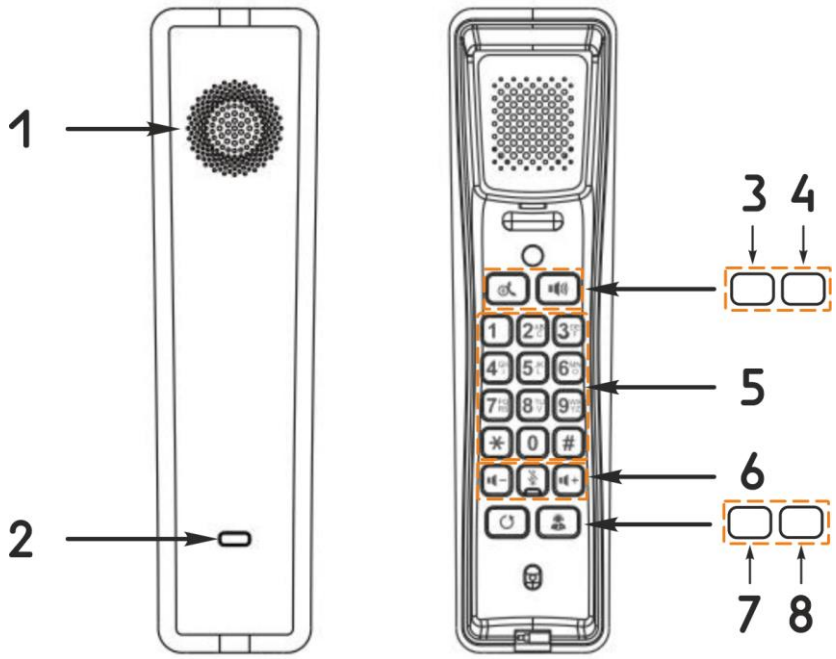


Figure 34 – Layout and designation of controls and LEDs of PT-3CIP

Table 35 – Description and assignment of controls and LEDs of PT-3CIP

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	LED	–	Indication of available power and line status
3	Клавиша удержания вызова		To make a pause during the call
4	Speaker mode		To switch to the speaker mode, and vice versa
5	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dialing mode
		#	Key to input value added services value added services code
6	Volume control keys		To increase volume
			To mute microphone
			To decrease volume
7	Redial		Last number redial
8	Functional key		A key with select of an assigned function

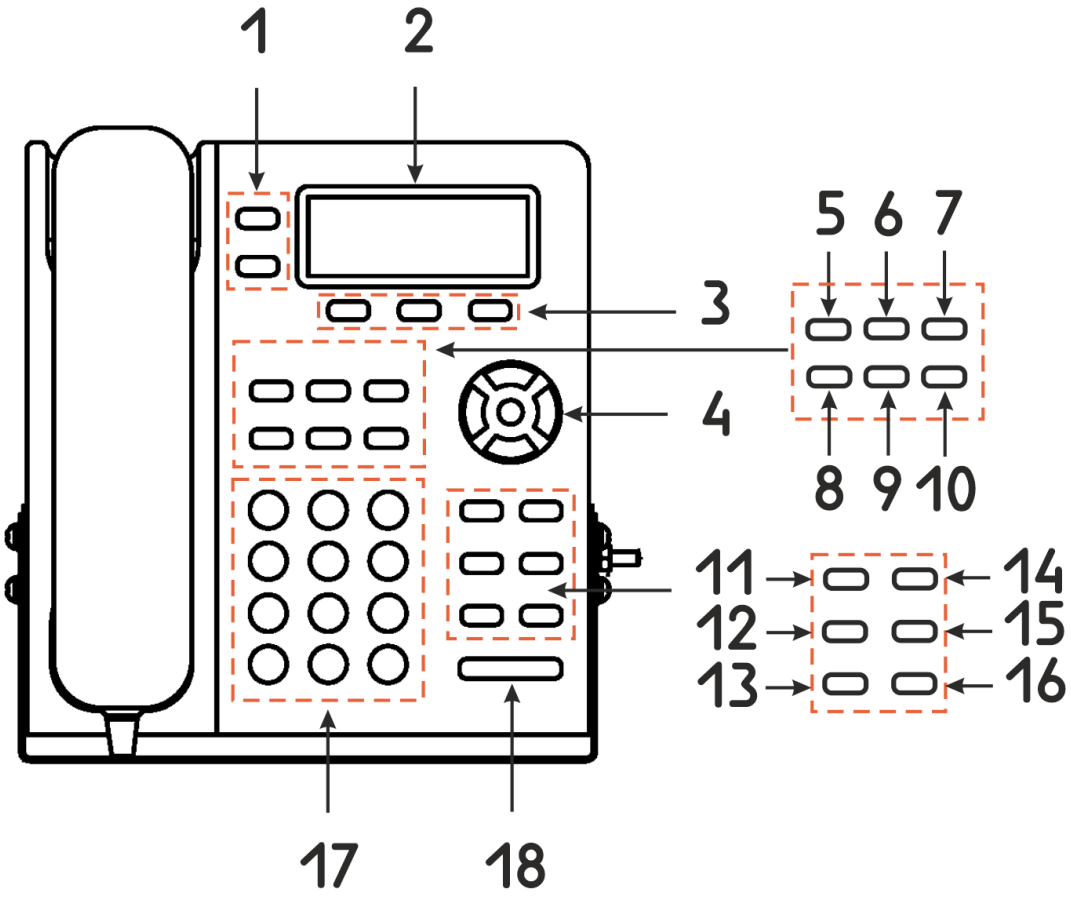
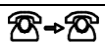


Figure 35 – Layout and designation of controls and LEDs of PT-2IP

Table 36 – Description and assignment of controls and LEDs of PT-2IP

Position	Name	Designation	Purpose
1	Line keys with LEDs	–	To switch between lines, and to indicate call modes. Operation modes of LED: – constant glowing with green – incoming call, conversation mode; – flashing with green – call on hold; – flashing with red – outgoing call
2	Display	–	To display information on status, calls and telephone's settings
3	Program keys	–	To perform assigned functions
4	Navigation keys and keys to confirm	–	To navigate up, down, left, right in the menu. The central key confirms the select
5	HOME		To transfer to the main menu
6	Telephone book		To open the list of saved numbers
7	Message		To open the list of incoming messages
8	Selective call		To call to the assigned internal subscriber
9	Pause		To make a pause during the call
10	Record		To record conversation or conference
11	Microphone mute		To mute and unmute sound during the call; to activate mode "Do not disturb" during the camp-on mode
12	Call forwarding		To forward a call to another number
13	Call		Redial and abbreviated dialing
14	Headset		To switch to the handset mode
15	Conference		To create a conference
16	Speaker mode		To switch to the speaker mode, and vice versa
17	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial mode
		#	Key to input value added services code
18	Volume control	+, –	To control volume of the handset

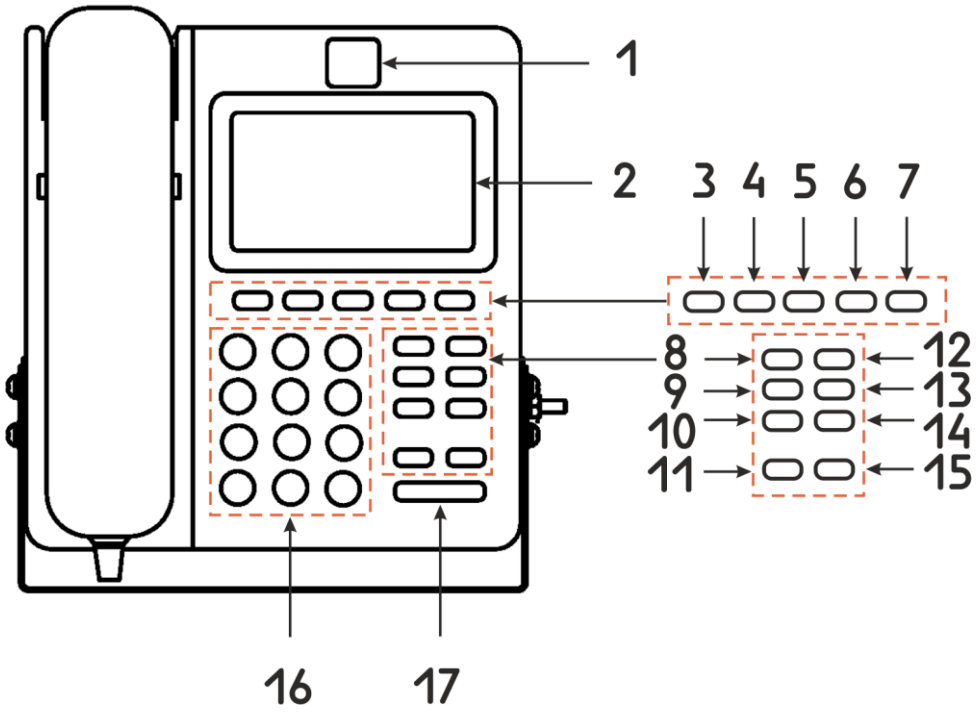


Figure 36 – Layout and designation of controls and LEDs of PT-VC

Table 37 – Description and assignment of controls and LEDs of PT-VC

Position	Name	Designation	Purpose
1	Video camera	–	To provide video calls
2	Display	–	To display information on status, calls, and telephone's configuration
3	Telephone book		To open the list of saved numbers
4	Delete		To delete characters
5	HOME		To transfer to the main menu
6	Menu		To access or exit the menu
7	Return		To return to the previous page
8	Headset		To switch to headset mode
9	Pause		To make a pause during the call
10	Call forwarding		To forward a call to another number
11	Speaker mode		To switch to the speaker mode, and vice versa
12	Mute		To mute or unmute the sound during the call; to activate mode "Do not disturb" during the camp-on mode
13	Message		To open the list of incoming messages
14	Conference		To create a conference
15	Call		Redial and abbreviated dialing

Position	Name	Designation	Purpose
16	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial number
		#	Key to input value added services code
17	Volume control	+, –	To control volume of the handset

2.9.3 Analog waterproof telephones

Analog waterproof telephones are designed for talk-back communication in telephone networks on open deck and in cargo holds.

The System includes the following types of telephones: PT-2AW, PT-CMAW, for their controls and LEDs, see figures 37–38. Description and assignment of controls and LEDs are given in tables 38–39.

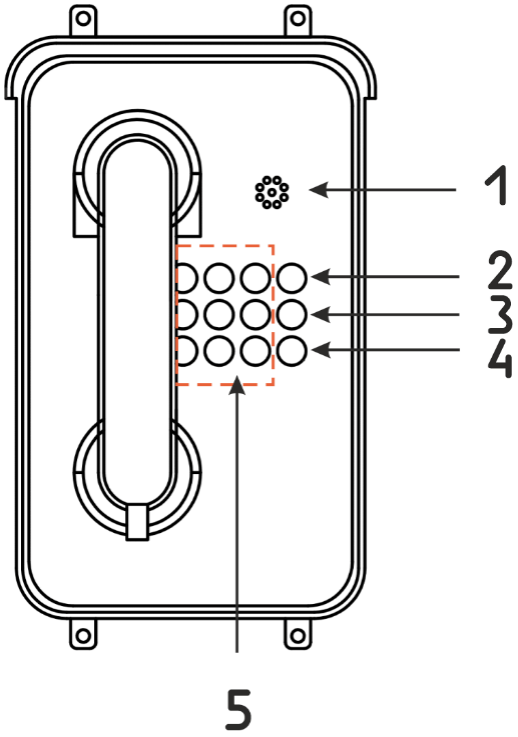


Figure 37 – Layout and designation of controls and LEDs of PT-2AW

Table 38 – Description and assignment of controls and LEDs of PT-2AW

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Save key	STORE	To record a number to the telephone memory
3	Abbreviated dialing key	PICK	Key for abbreviated dialing
4	Redial	REDIAL	To dial the last dialed number
5	Number dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial number
		#	Key to input value added services code

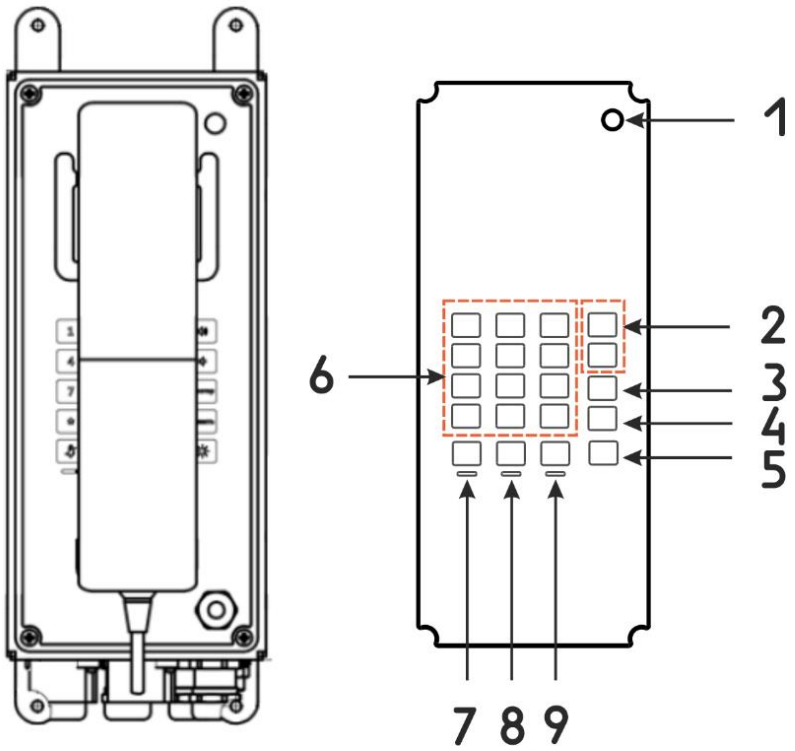


Figure 38 – Layout and designation of controls and LEDs of PT-CMAW

Table 39 – Description and assignment of controls and LEDs of PT-CMAW

Position	Name	Designation	Purpose
1	Incoming call LED	–	Bright frequent flashing indicates an incoming call
2	Volume control		To control volume of the handset
3	Redial	Redial	To dial the last dialed number
4	Memory	Memory	To record a number to the telephone's memory
5	Brightness		To control brightness of LEDs
6	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial mode
		#	To enter special commands and value added services
7	Microphone mute key with LED		To mute the microphone. When the microphone is mute, LED is flashing
8	Speaker mode key with LED		To switch on speaker mode. When the mode is active, the LED is flashing
9	Headset switch with LED		To switch on/off the headset. When the headset is on, the LED is flashing

2.9.4 Digital waterproof telephones

Digital waterproof telephones are designed for communication in telephone networks on open deck and in cargo holds.

The System includes two types of digital waterproof telephones: PT-2IPW and PT-3CMIPW; their controls and LEDs are similar to analog waterproof telephones PT-2AW and PT-CMAW, respectively, see figures 37–38.

2.9.5 Analog explosion-proof telephones

Analog explosion-proof telephones are designed for talk-back communication in telephone networks in explosion hazardous areas.

The System includes three types of explosion-proof telephones: KNEx1 (Ex), ExResistTel (Ex), JREX106-SIP that are outfitted with similar controls and LEDs, see figures 39–40. Description and assignment of controls and LEDs are given in tables 40–41.

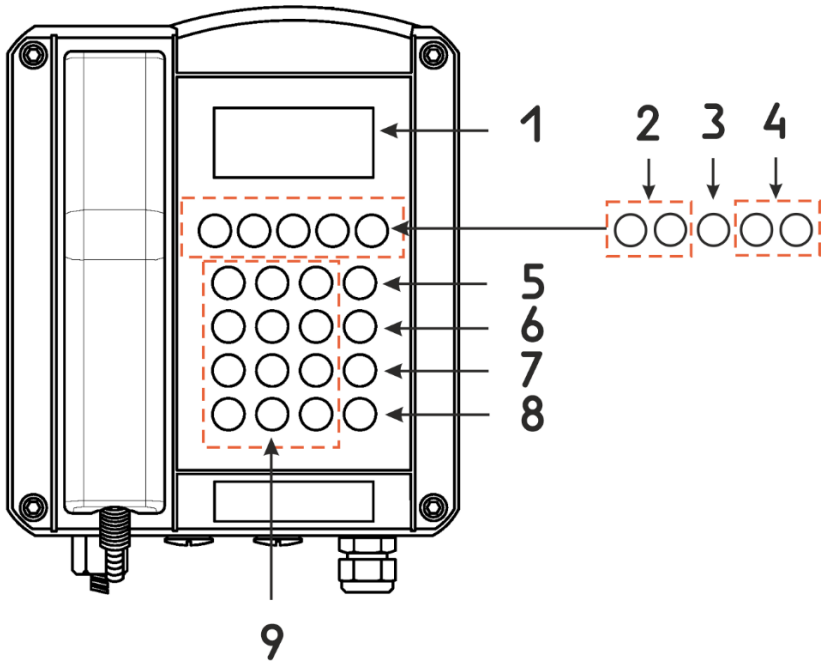


Figure 39 – Layout and designation of controls and LEDs of KNEx1 (Ex), ExResistTel (Ex)

Table 40 – Description and assignment of controls and LEDs of KNEx1 (Ex), ExResistTel (Ex)

Position	Name	Designation	Purpose
1	Display	–	To display information on status, calls and telephone's settings
2	Navigation keys	▼, ▲	To navigate up, down in the menu, and to add or remove the select
3	Reset	C	To delete an error
4	Navigation keys	▶ YES, ◀ NO	To navigate left, right in the menu, and to confirm or cancel the select

Position	Name	Designation	Purpose
5	Redial	R	To call the last dialed number
6	Clear		To end a call
7	Pause		To make a pause during the call
8	Volume control		To control volume of the handset
9	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial mode
		#	Key to input value added services code

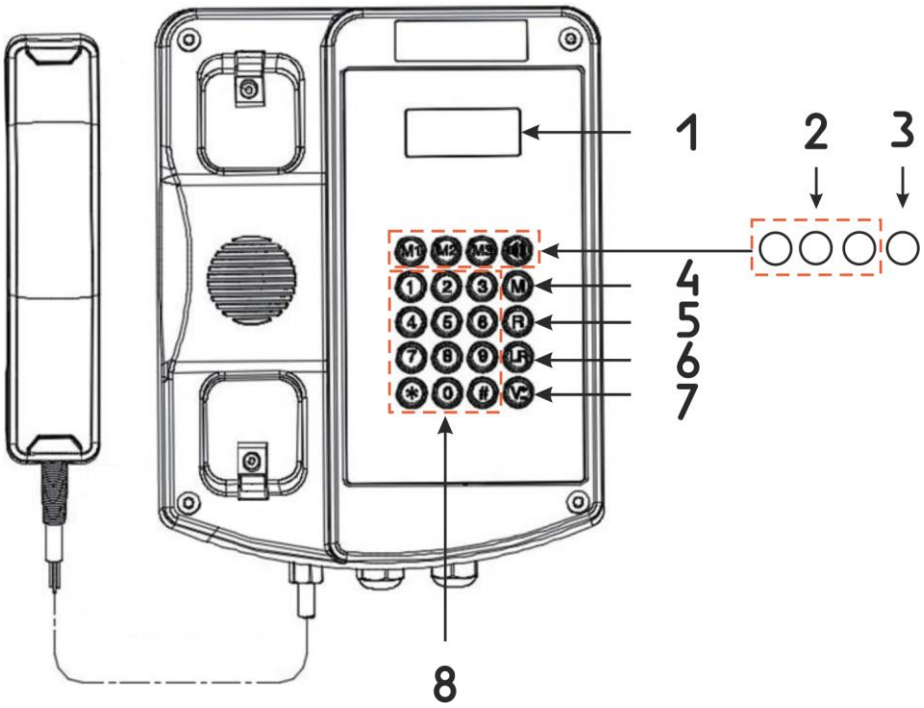


Figure 40 – Layout and designation of controls and LEDs of JREX106-SIP

Table 41 – Description and assignment of controls and LEDs of JREX106-SIP

Position	Name	Designation	Purpose
1	Display	–	To display information on status, calls and telephone's settings
2	Speed dial keys	M1, M2, M3	Speed dial of number assigned to the button
3	Speaker mode key		To switch on speaker mode
4	Microphone mute key	M	To mute the microphone
5	Call forwarding	R	To forward a call to another number
6	Redial	LR	To call the last dialed number
7	Volume control	V ±	To control volume of the handset
8	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial mode
		#	Key to input value added services code

2.9.6 Digital explosion-proof telephones

Digital explosion-proof telephones are designed to provide communication in telephone networks in explosion-hazardous areas.

The System includes two types of digital explosion-proof telephones:

– Auteldac 6 VoIP (for controls and LEDs, see figure 41; for the description and assignment, see table 42);

– ExResistTel IP2, Ferntel (controls and LEDs are similar to the controls and LEDs of analog explosion-proof telephone ExResistTel (Ex) FHF, see figure 40, table 41).

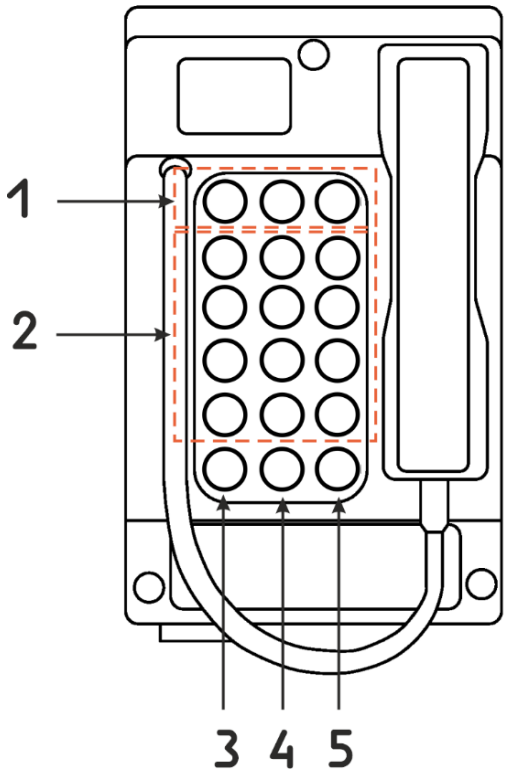


Figure 41 – Layout and designation of controls and LEDs of Auteldac 6 VoIP

Table 42 – Description and assignment of controls and LEDs of Auteldac 6 VoIP

Position	Name	Designation	Purpose
1	Speed dialing keys	M1, M2, M3	To activate list with saved numbers
2	Number dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial mode
		#	Key to input value added services code
3	Microphone mute key	S	To mute microphone during the communication
4	Functional key	R	To perform an assigned function
5	Redial	LR	To make an outgoing call of the last dialed number
Note – The Manufacturer creates the list with the saved numbers and assigns functions to the functional key during the primary configuration.			

2.9.7 Service telephone PT-SYSA

Digital service telephone PT-SYSA is designed to provide service functions and communication in telephone network.

Figure 42 describes controls and LEDs of the telephone. Description and assignment of controls and LEDs are given in table 43.

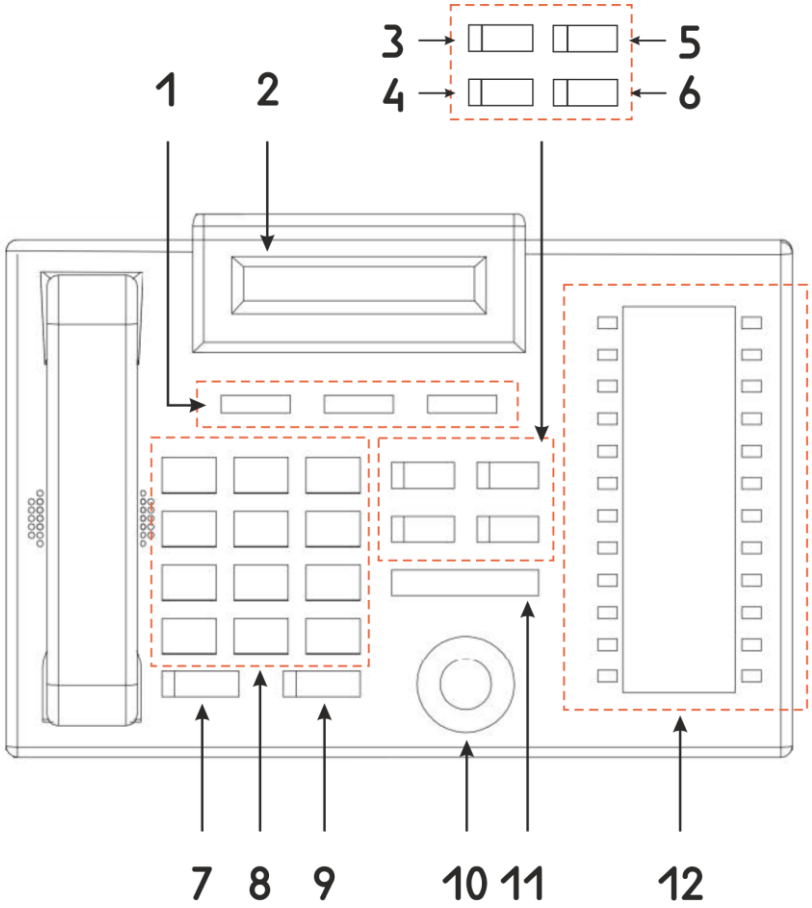


Figure 42 – Layout and designation of controls and LEDs of PT-SYSA

Table 43 – Description and assignment of controls and LEDs of PT-SYSA

Position	Name	Designation	Purpose
1	Control keys	–	To select functions on the display
2	Display	–	To display information on the status, calls and configuration of the telephone
3	Speed dialing	Speed	To save short-cut number
4	Do not disturb and call forwarding	DND/FWD	Incoming calls barring. To forward a call to another number. If forwarding function is active, the LED is flashing
5	Call transfer	Trans/PGM	To transfer a call or to switch to the programming mode
6	Call back key	Call back	To call back to the missed number because the line was busy

Position	Name	Designation	Purpose
7	Speaker mode	Speaker	To switch on the speaker mode. If the mode is active, the LED is glowing with red
8	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial
		#	Key to input value added services code
9	Hold and save keys	Hold/Save	To make a pause during the call, or to save the provided settings
10	Navigation keys and key to confirm	Menu ▲ ◄ OK ► ▼ Phonebook	To navigate up, down, left, right in the menu. The central key confirms the select
11	Volume control	Volume	To control volume of the handset
12	Abbreviated dialing keys	–	For speed dialing of the number assigned to the key

2.9.1 Fax machine PT-FAX

Analog fax machine PT-FAX is designed to provide fax and telephone communication with value added services.

Figure 43 describes controls and LEDs of the fax. Description and assignment of controls and LEDs are given in table 44.

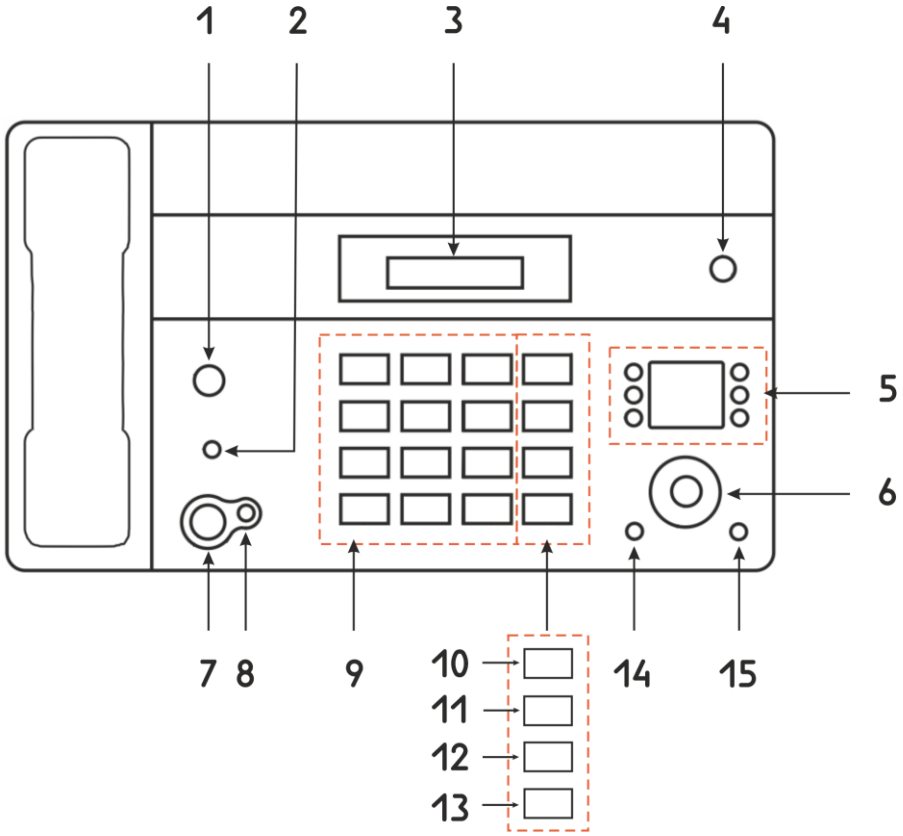


Figure 43 – Layout and designation of controls and LEDs of PT-FAX

Table 44 – Description and assignment of controls and LEDs of PT-FAX

Position	Name	Designation	Purpose
1	Automatic Number Identification	ANI	To identify the calling number
2	Stop	STOP	To stop operation or delete characters
3	Display	–	To display information on the status, calls and configuration of the telephone
4	Automatic answer phone	AUTO ANSWER	To switch on/off answer phone mode
5	Abbreviated dialing keys	ONE-TOUCH DIAL	To provide speed dial of the number assigned to the key
6	Navigation key and key to confirm the select	▲ ◄ SET ► ▼	To navigate up, down, left, right in the menu. The central key confirms the select
7	Start	FAX/START	To send or receive fax messages
8	Copy	COPY	To start the copying
9	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial mode
		#	Key to input value added services code
10	Additional key	FLASH	To forward a call or to enter a hyphen
11	Redial	REDIAL/ PAUSE	To call the last dialed number or to make a pause during the call
12	Microphone	HANDSET MUTE	To mute/unmute the microphone during the conversation
13	Call button	MONITOR	To make or answer the call (without picking up the handset)
14	Group	BROADCAST	To send a message to group of subscribers
15	Menu	MENU	To access the menu to program the unit

2.9.2 Audio recorder ITS-REC

Audio recorder ITS-REC is designed to record and store voice communication on the memory card.

Memory slot SDHC type and two FXO ports for analog lines are located on the opposite sides of the audio recorder’s casing. There are no controls or LEDs on the unit’s casing.

2.10 RADIOTELEPHONES

2.10.1 Radiotelephones PT-ADC

Radiotelephones PT-ADC include:

– radio terminal PT-ADC is designed to provide communication in radiotelephone networks, DECT/GAP standard with an option to call to internal shipboard wired telephone network;

– base station / charger BS/CH-ADC is designed to organize radio channel and charge one radio terminal PT-ADC;

– power supply unit PS-ADC is designed to power the base station / charger BS/CH-ADC.

Figure 44 describes controls and LEDs of the radio terminal. Description and assignment of controls and LEDs of PT-ADC are shown in table 45.

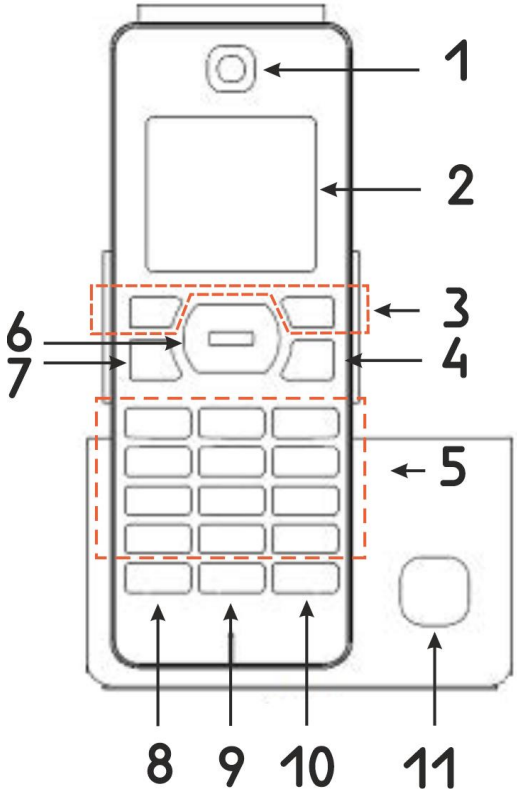


Figure 44 – Layout and designation of controls and LEDs of PT-ADC

Table 45 – Description and assignment of controls and LEDs of PT-ADC

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Display	–	To display information on the status, calls and configuration of the radio terminal
3	Control keys	–	To select functions displayed above the key

Position	Name	Designation	Purpose
4	Clear		To end the call, to switch on/off radio terminal
5	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dial mode
		#	Key to input value added services code
6	Navigation keys and keys to confirm		▲, ▼, ◄, ► – to navigate up, down, left and right in the menu
			▲, ▼ – to control volume of the speaker or loudspeaker during the conversation
			▼ – to open the list of the last incoming calls
			◄ – to view the list of the saved subscribers
7	Answer		To answer an incoming call
8	Speaker mode		To switch on the speaker mode
9	Quick access		To answer a call, turn off alarm clock signaling, listen to new messages and view missed calls, and to activate noise-canceling mode
10	Call back	R/ECO	To call the last dialed number or to transfer to eco mode (radio signal level of the base station is set to “low”)
11	Search		To call (search) a unit within internal network

2.10.2 Radiotelephones PT-ADCW

Radiotelephones PT-ADCW include:

– radio terminal PT-ADCW is designed to provide communication in radiotelephone networks, DECT/GAP standard with an option to call to internal shipboard telephone network;

– base station BS-ADCW is designed to organize radio channel;

– power supply unit PS-ADCW is designed to power the base station BS-ADCW;

– charger CH-ADCW is designed to charge radio terminal PT-ADCW.

Figure 45 describes controls and LEDs of the radio terminal. Description and assignment of controls and LEDs of PT-ADCW are shown in table 46.

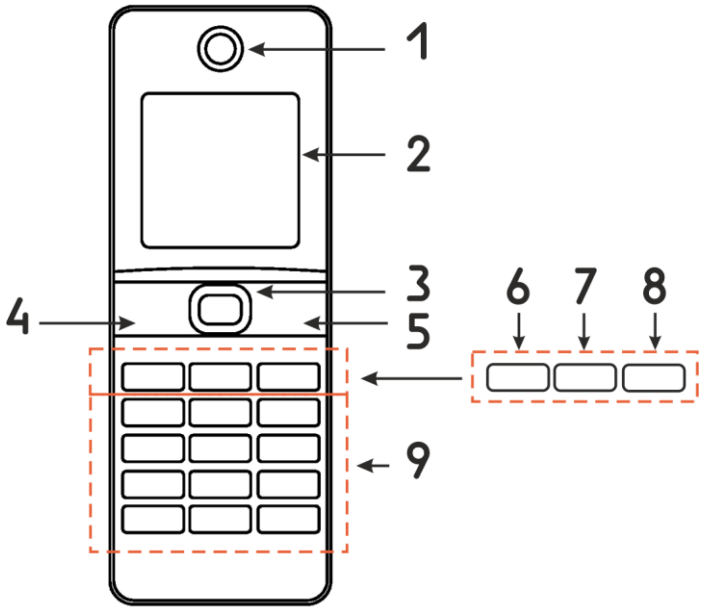


Figure 45 – Layout and designation of controls and LEDs of PT-ADCW

Table 46 – Description and assignment of controls and LEDs of PT-ADCW

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Display	–	To display information on status, calls and settings of the telephone
3	Navigation key and key to confirm		A key to move down, up, left and right in the menu. The central key confirms the select. In hold mode, press the left key to open the list of the last calls; press the lower key to open the list of the saved numbers; press the right button to mute the microphone
4	Answer		To answer an incoming call; to switch to speaker mode during the call
5	Clear		To end a call; to switch on/off radio terminal
6	Redial	R	To call the last dialed number
7	Sound profiles		To provide settings of sound profiles
8	Messages		To provide quick access to the lists of messages and calls. The illuminated key indicates a new message or missed call
9	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dialing mode
		#	Key to input value added services code

2.10.3 Radiotelephones PT-DC

Radiotelephones PT-DC include:

– radio terminal PT-DC is designed to provide communication in radiotelephone networks, DECT/GAP standard with SIP-telephony support;

– base station BS-DC is designed to organize radio channel;

– power supply unit PS-DC is designed to power the base station BS-DC;

– charger CH-DC is designed to charge radio terminal PT-DC.

Figure 46 describes controls and LEDs of the radio terminal. Description and assignment of controls and LEDs of PT-ADC are shown in table 47.

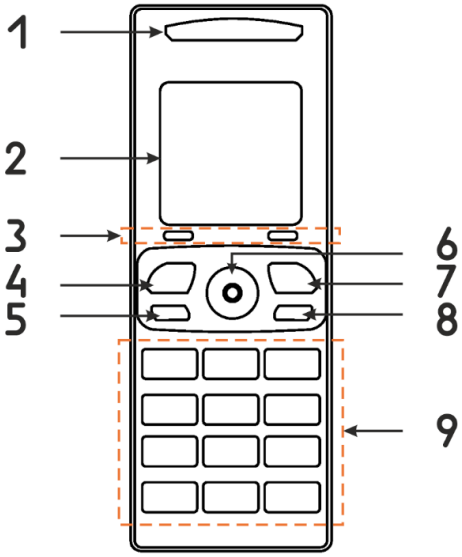


Figure 46 – Layout and designation of controls and LEDs of PT-DC

Table 47 – Description and assignment of controls and LEDs of PT-DC

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce audio signals
2	Program keys	–	To select function displayed above the program key
3	Answer		To answer a call
4	Speaker mode		To switch on a loudspeaker
5	Navigation key or key to confirm the select	–	To move up and down, left and right in the menu, and to control volume
6	Clear		To end a call; to switch on/off radio terminal
7	Redial		To call the last dialed number; to make a 3.5 sec pause during conversation
8	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dialing mode
		#	Key to input value added services code

2.10.4 Radiotelephones PT-NRTU

Radiotelephones PT-NRTU include:

– radio terminal PT-NRTU is designed to provide communication in radiotelephone networks with an option to deploy DECT-network, and roaming support. The unit is capable of calling the wired shipboard telephone network. Waterproof;

– radio terminal DH8-ABAB is designed to provide communication in radiotelephone networks, DECT/GAP standard with an option to deploy DECT-network, and roaming support. The unit is capable of calling the wired shipboard telephone. Explosion-proof.

– base station BS-NRTU is designed to organize radio channel nd operate with a base stations controller BSC-16. Outfitted with integrated antennae;

– power supply unit PS-NRTU is designed to power the base station CH-NRTU;

– chargers CH-NRTU and CH6-NRTU are designed to charge radio terminals PT-NRTU and DH8-ABAB, respectively.

PT-NRTU and DH8-ABAB are outfitted with similar controls and LEDs, see figure 47. Description and assignment of controls and LEDs are given in table 48.

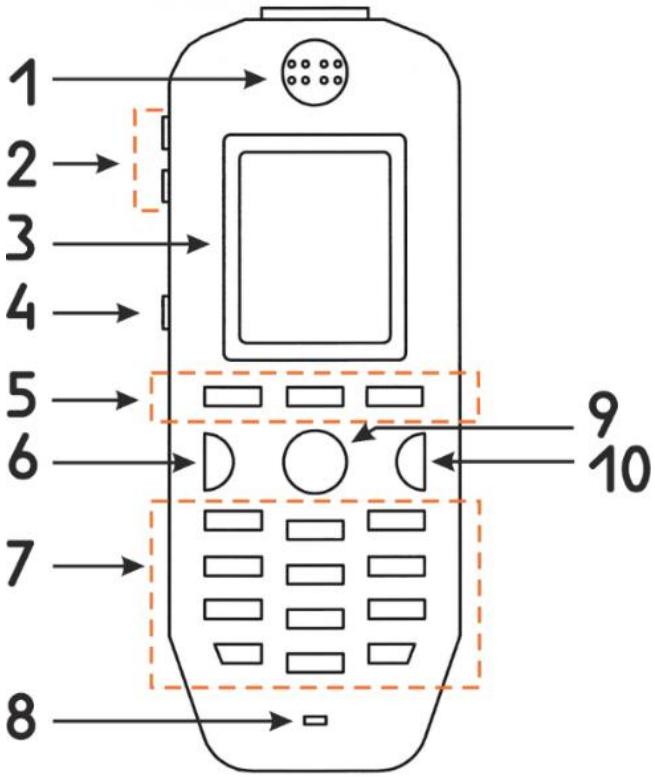


Figure 47 – Layout and designation of controls and LEDs of PT-NRTU (DH8-ABAB)

Table 48 – Description and assignment of controls and LEDs of PT-NRTU (DH8-ABAB)

Position	Name	Designation	Purpose
1	Speaker	–	To reproduce call signaling and voice communication
2	Volume control		To control the speaker or loudspeaker's volume
3	Display	–	To display information on status, calls and settings of the radio terminal
4	Mute	–	To mute/unmute sound signals in camp-on mode, mute incoming call signaling, and the sound during communication
5	Program keys		To select a function displayed above the program key; to perform actions assigned during configuration
6	Ответ		To answer a call
7	Dialing keys	0 to 9	Numeric keys to dial a number
		*	To switch to tone dialing mode
		#	Key to input value added services code
8	Microphone	–	To receive voice communication
9	Navigation key or key to confirm the select		To move up and down, left and right in the list; to control volume of loudspeaker or speaker during communication
10	Clear		To end a call; to switch on/off radio terminal

2.11 SWITCHES, NETWORK EQUIPMENT AND CONVERTERS

2.11.1 Switch SW type

Switch SW type is designed to link the connected SC into single network via Ethernet. Quantity of connectors, input voltage and type of mounting depend on the switch type.

Figures 48–49 describe exterior, controls and LEDs of the switch. Description and assignment of controls and LEDs are shown in table 49.

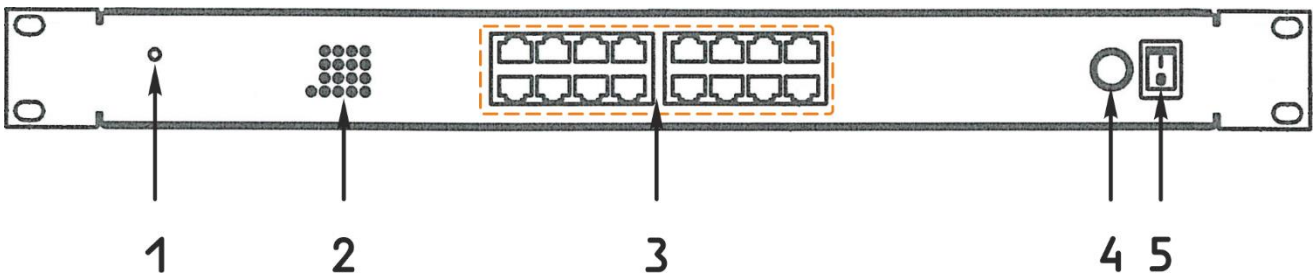


Figure 48 – Layout and designation of controls and LEDs of SW-16

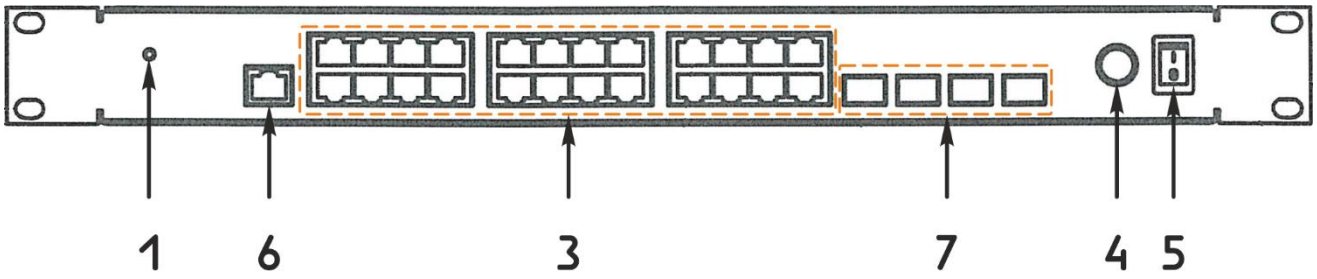


Figure 49 – Layout and designation of controls and LEDs of SW-24

Table 49 – Description and assignment of controls and LEDs of switches SW type

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	Channel status LEDs	1 to 16	Constant glowing means that SC is connected to the corresponding connector, and channel is ready for data transmission
3	Group of ports 10/100/1000Base-T	1 to 16*	To connect the SC to Ethernet line
4	Power fuse 5 A	FU1	To protect against faults in power circuit
5	Piano type switch	On, Off	To start and stop unit's operation
6	Group of connectors RJ-45	Service	Connector for service equipment
7	Group of ports 1000Base-X SFP	25 to 28	To connect external systems and units
* Quantity of ports depends on the switch type.			

2.11.2 Base station controller BSC-16

Base station controller BSC-16 is designed to deploy standalone radiotelephone network, DECT/GAP standard by connecting radio sets PT-NRTU, and to link subscriber network with internal telephone subscriber network via SIP protocol.

Figure 50 describes exterior, controls and LEDs of the controller. Description and assignment of controls and LEDs are shown in table 50.

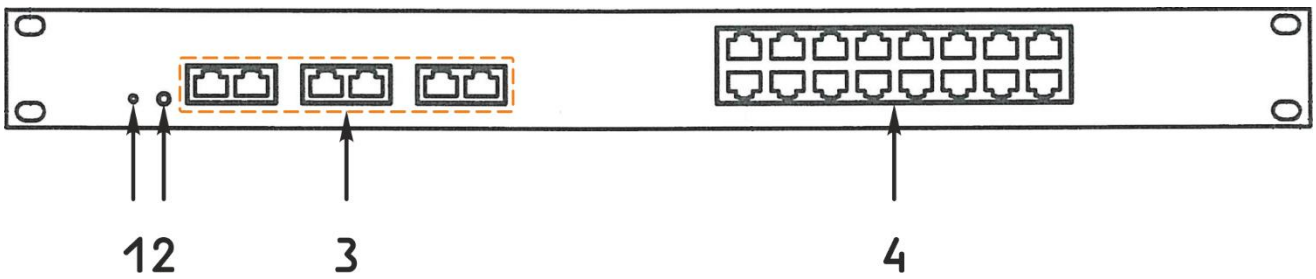


Figure 50 – Layout and designation of controls and LEDs of BSC-16

Table 50 – Description and assignment of controls and LEDs of BSC-16

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	Reboot LED	⟳	Constant glowing means that the unit is rebooting
3	Channel status LED	Status	Constant glowing means that the lines are non-faulty
4	Group of connectors RJ-45	LAN	To connect external systems and units
		Synchronization	
		Signal synch	
5	Group of connectors RJ-45	Base stations	To connect base stations
6	Power fuse 3 A	FU1	To protect against faults in the power circuit
7	Piano type switch	On, Off	To start and stop unit's operation

2.11.3 Extension unit (analog lines) FXS type

Extension unit (analog lines) FXS type is designed to increase capacity of telephone network (analog lines). The unit provides wire communication lines to couple with analog telephones. Quantity of subscriber lines depends on the unit's type.

Figure 51 describes exterior, controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 51.

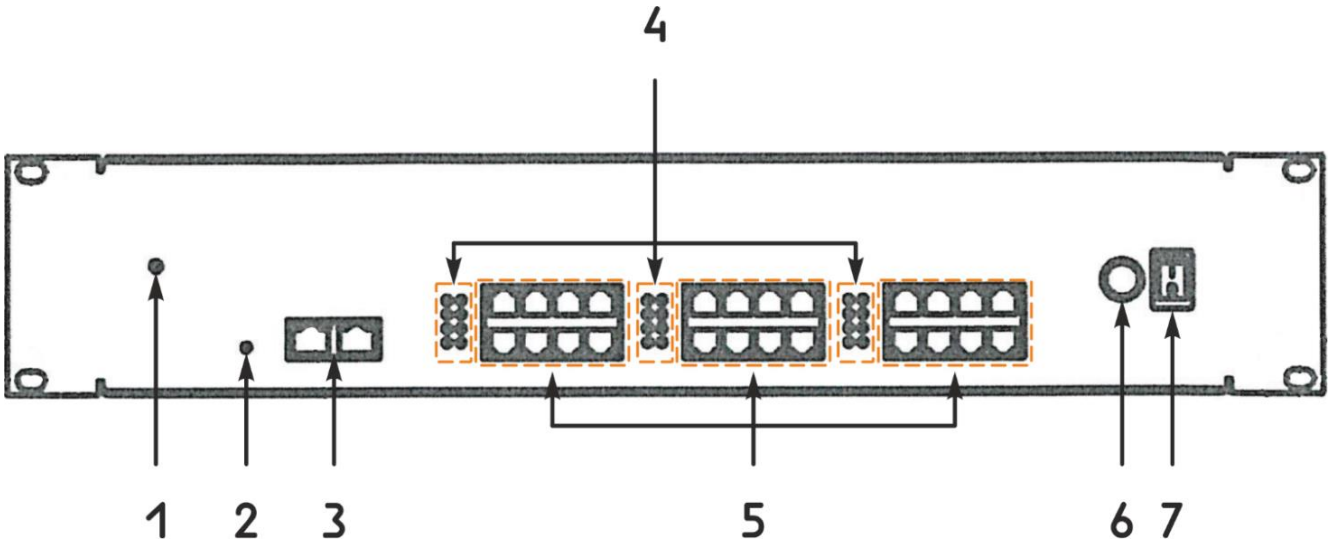


Figure 51 – Layout and designation of controls and LEDs of FXS-24

Table 51 – Description and assignment of controls and LEDs of FXS-24

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	Channel status LEDs	1 to 24*	Constant glowing means that the channel with the corresponding number is ready for data transmission
3	Group of connectors RJ-45	–	To connect external systems and units
4	Display	–	To display information on the unit's operation
5	Navigation keys and key to confirm the select	▼	To move between the items on the display
		OK	To confirm the select
6	Power fuse 10 A	FU1	To protect against faults in the power circuit
7	Piano type switch	On, Off	To start and stop unit's operation

2.11.4 Extension unit (digital lines) POE-SW type

Extension unit (digital lines) POE-SW type is designed to increase capacity of telephone network. The unit provides wire channels to exchange PoE or Ethernet standard data (10 Mbit/s, 100 Mbit/s, 1 Gbit/s). Max. quantity of subscriber lines depends on the unit's type.

Figure 52 describes exterior, controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 52.

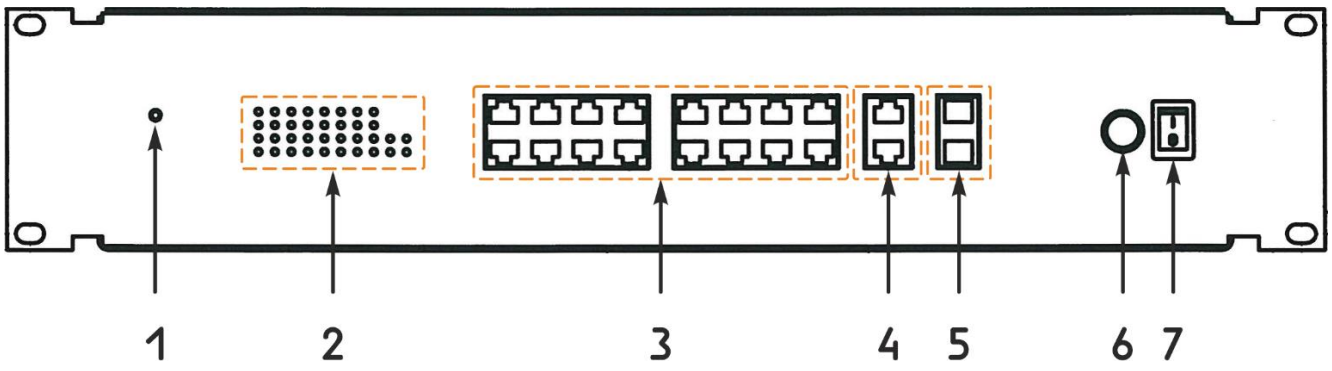


Figure 52 – Layout and designation of controls and LEDs of POE-SW-16-WM

Table 52 – Description and assignment of controls and LEDs of POE-SW-16-WM

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	LED pairs of 10/100Base-T ports' groups	–	Constant glowing of the top LEDs 1 to 16 means that the corresponding port is connected. Uniform flashing of the LEDs 1 to 16 means that data transmission is active on the corresponding port. Constant glowing of the top LEDs 1 to 16 means that power is available via PoE line on the corresponding port. Constant glowing with green of the LEDs 17T, 18T means that corresponding ports operate under 1000 Mbit/s rate. Constant glowing with orange of the LEDs 17T, 18T means that corresponding ports operate under 100 or 10 Mbit/s rate. Constant glowing with green of the LEDs 17F, 18F means that corresponding ports are connected
3	Group of connectors RJ-45	1 to 16	To connect digital telephones. Ports support PoE line power supply
4	Group of connectors RJ-45	17T, 18T	To connect external systems and units. Ports do not support PoE line power supply
5	Connectors for fiber optic cables	17F, 18F	To connect external systems and units by means of fiber optics
6	Power fuse	FU1	To protect against faults in the power circuit
7	Piano type switch	On, Off	To start and stop unit's operation

2.11.5 Extension unit (Intercom lines) ITS-TBSW

Extension unit ITS-TBSW is designed to switch subscribers of PA network off-line (without control by external server), and to link and exchange streams with other rack modules and extension units of PA and telephone lines. Quantity of connected subscribers depends on the unit's type.

Figure 53 describes exterior, controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 53.

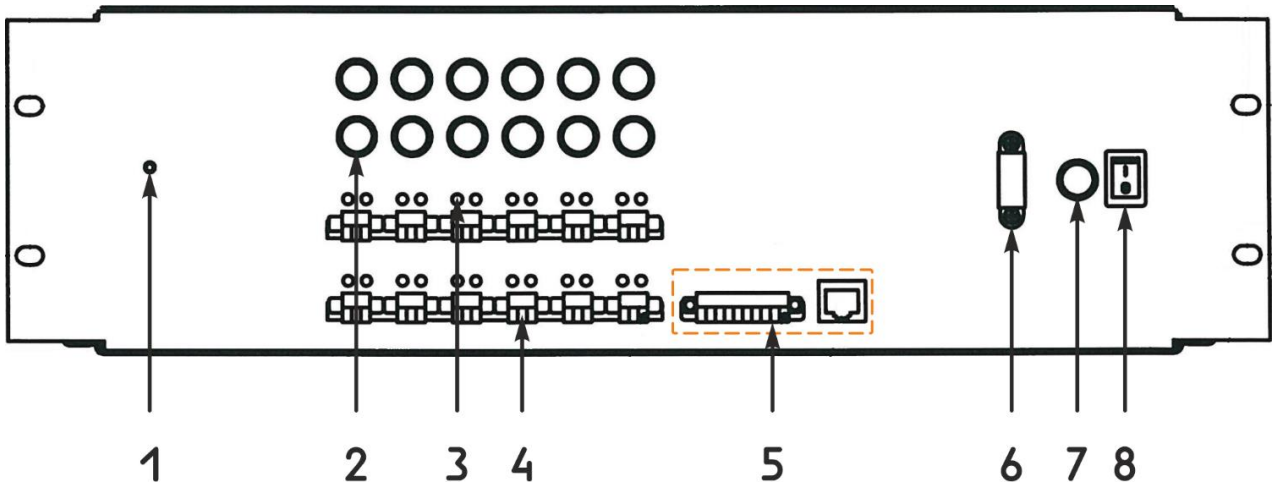


Figure 53 – Layout and designation of controls and LEDs of ITS-TBSW

Table 53 – Description and assignment of controls and LEDs of ITS-TBSW

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that power is available
2	Group of fuses	FU1 to FU12	To protect PA subscribers against short circuit in subscriber line
3	LED pairs of channels status	–	To display channel status: – constant glowing of the left LED means that channel is ready for data transmission; – flashing of the right LED means that the channel is busy
4	Group of screw terminals EHC350M-03P	X1 to X12	To connect PA devices
5	Connectors for external systems	XS1	Dry contact connector for external systems and units
		XS2	To connect external systems and units via Ethernet
6	Power fuse 30 A	FU13	General protection of unit's subscriber line and power network against faults
7	Power fuse 2 A	FU14	To protect against faults in power circuit
8	Piano type switch	On, Off	To start and stop unit's operation

2.11.6 Extension units (coastal lines) FXO type

Extension units (coastal lines) FXO type are designed to connect to shore communication lines via SIP protocol. Quantity of connected lines depends on the unit's type.

Figure 54 exterior, controls and LEDs of the unit. Description and assignment of controls and LEDs are shown in table 54.

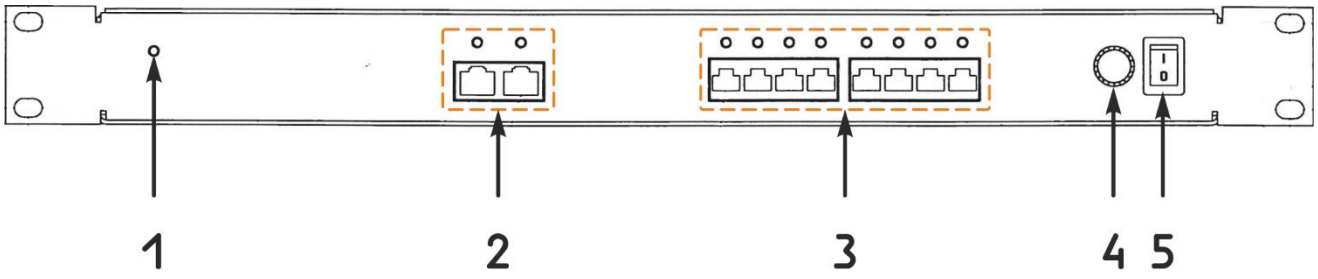


Figure 54 – Layout and designation of controls and LEDs of FXO-8

Table 54 – Description and assignment of controls and LEDs of FXO-8

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	RJ-45 ports with LEDs	LAN, WAN	To connect external systems via Ethernet. Constant glowing means that connection is available
3	Group of ports FXO with LEDs	FXO1 to FXO8	To connect subscriber's terminals. Constant glowing means that connection is available
4	Power fuse	FU1	To protect against faults in power circuit
5	Piano type switch	On, Off	To start and stop unit's operation

2.11.7 Signal converter ST-2

Signal converter ST-2 is designed to convert Ethernet packet data transmission into signal 0 dB. There are no controls or other functional elements on the converter's casing.

2.11.8 PoE-injector POE-JCT

PoE-injector POE-JCT is designed to extend PoE-line by 100 m. The unit receives and supplies local power and data to the communication line or subscriber's terminal of PoE-type with standard or off-standard voltage.

The unit has a metal casing; it is outfitted with ports 10/100Base-TX type and cable glands to connect power supply. There are no controls or other functional elements on the unit's casing.

2.12 LOUDSPEAKERS

Loudspeakers are designed to convert electric signals into acoustic ones, amplify them and reproduce in noisy environment, on open decks, in cargo holds and explosion hazardous areas.

The System includes the following types of loudspeakers:

a) LS-1 with input voltage 30 V, and LS-1/100 with input voltage 100 V, metal casing, small-sized, flush-mounted, only for internal areas, ceiling-mounted;

b) LS-2 with input voltage 30 V, and LS-2/100 with input voltage 100 V, metal casing, small-sized, only for application inside the premises, wall-mounted;

c) LS-3 with input voltage 30 V, and LS-3/100 with input voltage 100 V, plastic casing, horn-type, for application on deck or inside the premises, waterproof, mounting on a bracket;

d) LS-5 with input voltage 30 V, and LS-5/100 with input voltage 100 V, wooden casing with brackets for wall mounting, only for internal areas;

e) LS-6 with input voltage 30 V, and LS-6/100 with input voltage 100 V, aluminum casing, for application on deck or inside the premises, waterproof, wall-mounted;

f) LS-7 with input voltage 30 V, and LS-7/100 with input voltage 100 V, plastic casing, compact, for application on deck or inside the premises, waterproof, wall or flush mounting;

g) LS-8 with input voltage 30 V, and LS-8/100 with input voltage 100 V, metal casing, horn-type, for application on deck or inside the premises, waterproof, wall mounting or on a bracket;

h) LS-9 with input voltage 100 V, plastic casing, for application on deck or inside the premises, waterproof, wall mounting or on a bracket;

i) LS-10 with input voltage 100 V, plastic casing, for application on deck or inside the premises, waterproof, wall mounting or on a bracket;

j) LS-12 with input voltage 100 V, aluminum casing, for application on deck or inside the premises, waterproof, wall mounting or on a bracket;

k) LS-13 with input voltage 30 V, and LS-13/100 with input voltage 100 V, plastic casing, for application on deck or inside the premises, wall mounting or on a bracket;

l) loudspeakers SDL type with input voltage 100 V, volume control, plastic casing, only for application inside the premises, wall-mounted;

m) DSP-15 (Ex) with input voltage 100 V, made of all-weather explosion-proof plastic, horn-type, with a bracket, explosion-proof;

n) GVR-Exd-Prometey with input voltage 100 V, made of aluminum alloy, horn-type, with a bracket, for explosion hazardous premises.

o) LF-1 with input voltage 100 V, plastic casing, horn-type with a bracket, for application on deck and inside the premises.

2.13 COMMUNICATION DEVICES AND ACCESSORIES

Intercom devices and accessories are designed for convenient communication in the noisy environment, on open deck, in cargo holds and explosion hazardous zones.

2.13.1 Handset with holder H-HS

Handset with holder H-HS is designed for talk-back communication as an additional device. Console- or wall-mounted.

2.13.2 Microphones

Microphones are intended to convert acoustic signals into electric ones, and transmit them to communication devices (user substations, microphone panels, main stations) or amplifiers. The System includes electret and dynamic microphones that are wall- or desk-top-mounted, or connected to the device's connector, with an external holder.

2.13.3 Headset HS type

Headset is designed for talk-back communication in noisy environment, free motion around the workplace and hearing protection of a user. Type – passive monophonic. Bandwidth, quantity of speakers, connectors, etc. depend on the type of headset.

2.13.4 Intercom helmets TH-4M and TH-4L types

Intercom helmets are designed for talk-back communication under various climate conditions, and hearing protection of a user. Intercom helmets are outfitted with a microphone or throat microphone, 3 m cable and manual PTT switch.

2.13.5 Explosion-proof headset

Headset is designed for talk-back communication in explosion hazardous areas:

– MT53H79B connected to ExResistTel (Ex);

– FHF11286104 connected to ExResistTel (Ex);

– AG HD-01 connected to JREX.

2.13.6 Foot-switch FB-1

Foot-switch FB-1 is designed to actuate microphone. Connected to all main stations. Floor-mounted.

2.14 CONNECTING EQUIPMENT

2.14.1 Junction boxes

Junction boxes are designed to split input circuits to several outputs. All boxes are hinged and may be mounted on open deck. Quantity of outputs and max. passing current depend on the type.

2.14.2 Junction box CB-1

Junction box CB-1 is designed to connect external lines of central unit to shore PBX.

2.14.3 Sockets

The System includes the following types of sockets:

– SM – to connect external microphones and intercom devices to substations;

– KP-RJ – to connect analog or digital subscriber's terminals to analog or digital telephone lines via RJ11 connector;

– CBP – to connect portable substations to subscriber lines;

– HS-CB – to connect external communication devices to PA devices, wall-mounted, waterproof.

– SHP-3 – to connect headsets to PA lines with an option to select programs and control volume, hinged mounting or console, for dry areas;

– patch panel PP – to connect digital telephone lines (PoE type) to RJ-45 connector with 24 or 48 sockets.

2.14.4 Cord CE type

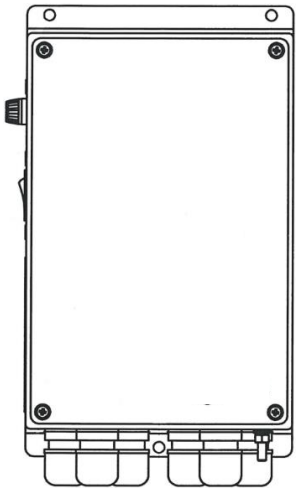
Cord CE type is designed to extend standard cord of external intercom device. Waterproof. Length and type of the end depend on the type of CE.

2.15 POWER SUPPLY UNITS

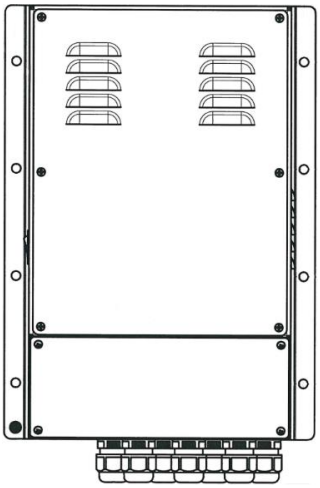
2.15.1 Power supply unit PS-103

Power supply unit PS-103 type is designed to power ship and industrial equipment with unregulated power 24 V DC from the mains 220 V or 110 V.

Figure 55 describes exterior of the unit's types. Piano type power switch and two fuses are located on the left side of the casing. Wall mounting.



PS-103



PS-103-20

Figure 55 – Layout and designation of controls and LEDs of PS-103

2.15.2 Power supply unit 19-PS

Power supply unit 19-PS is designed to power rack equipment with uninterruptible regulated voltage from the mains 220 VAC or standby mains 24 VDC. Output voltage and power depend on the unit's type. For more information on technical specifications and types of 19-PS.

Figure 56 describes exterior, controls and LEDs of the unit's types. Description and assignment of controls and LEDs are shown in table 55.

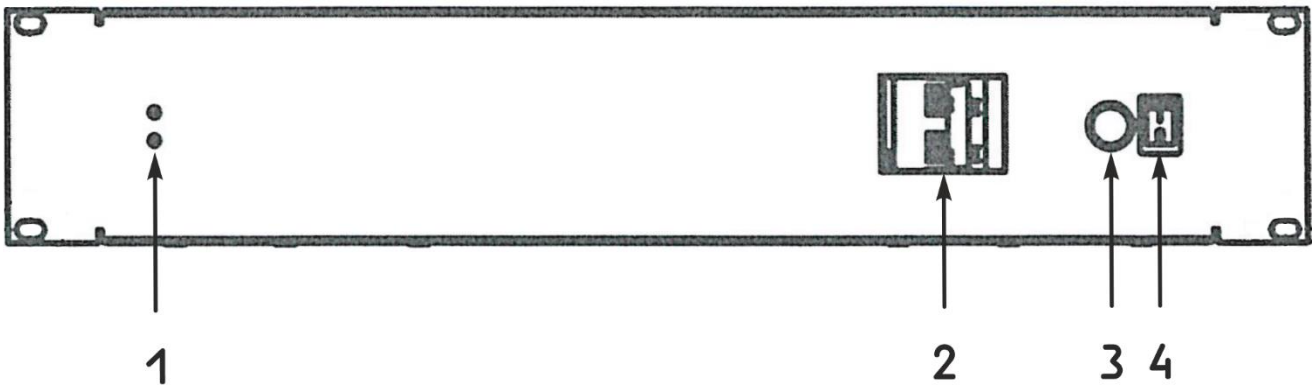


Figure 56 – Layout and designation of controls and LEDs of 19-PS

Table 55 – Description and assignment of controls and LEDs of 19-PS

Position	Name	Designation	Purpose
1	Power LEDs	Standby, Main	Constant glowing means that the corresponding power is available
2	Automatic circuit-breaker	Standby, On, Off	To switch from the main to standby power
3	Fuse 15 A	FU1	To protect against faults in the power circuit
4	Piano type switch	On, Off	To start and stop the unit's operation

2.15.3 Power supply unit ITS-PS

Power supply unit ITS-PS type to power rack equipment with regulated voltage from the power mains 220 VAC, 50 Hz. Output voltage and power depend on the unit's type. For more information on technical specifications and types of ITS-PS.

Figure 57 describes exterior, controls and LEDs of the unit's types. Description and assignment of controls and LEDs are shown in table 56.

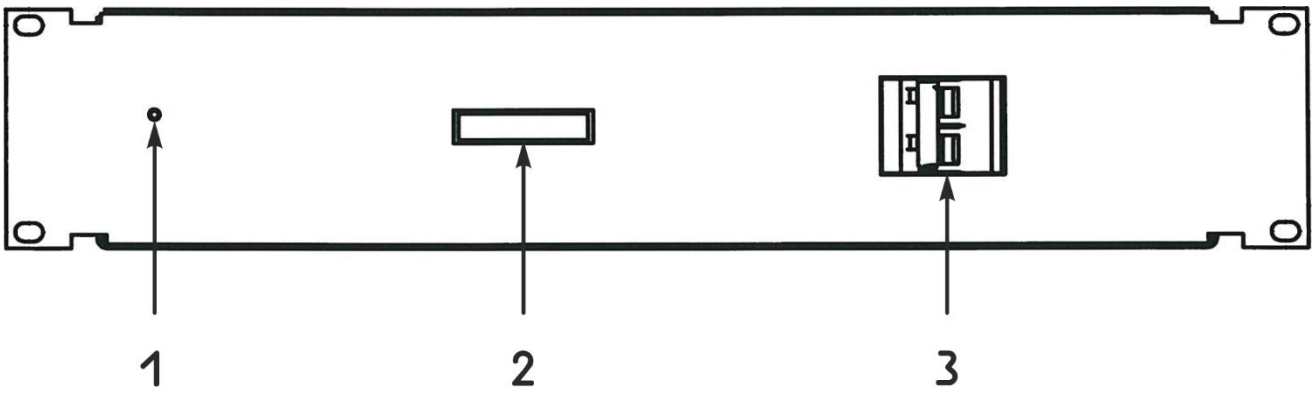


Figure 57 – Layout and designation of controls and LEDs of ITS-PS

Table 56 – Description and assignment of controls and LEDs of ITS-PS

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	Display	–	To display current and voltage values
3	Reboot	⟳	To reboot the unit
4	Automatic circuit-breaker	On, Off	To switch from the main to standby power

2.15.4 Power supply unit ITS-CH

Standby power supply unit ITS-CH is designed to charge external battery with rated voltage 24 VDC and power rack-mounted SC from the rechargeable battery.

Figure 58 describes exterior, controls and LEDs of the unit's types. Description and assignment of controls and LEDs are shown in table 57.

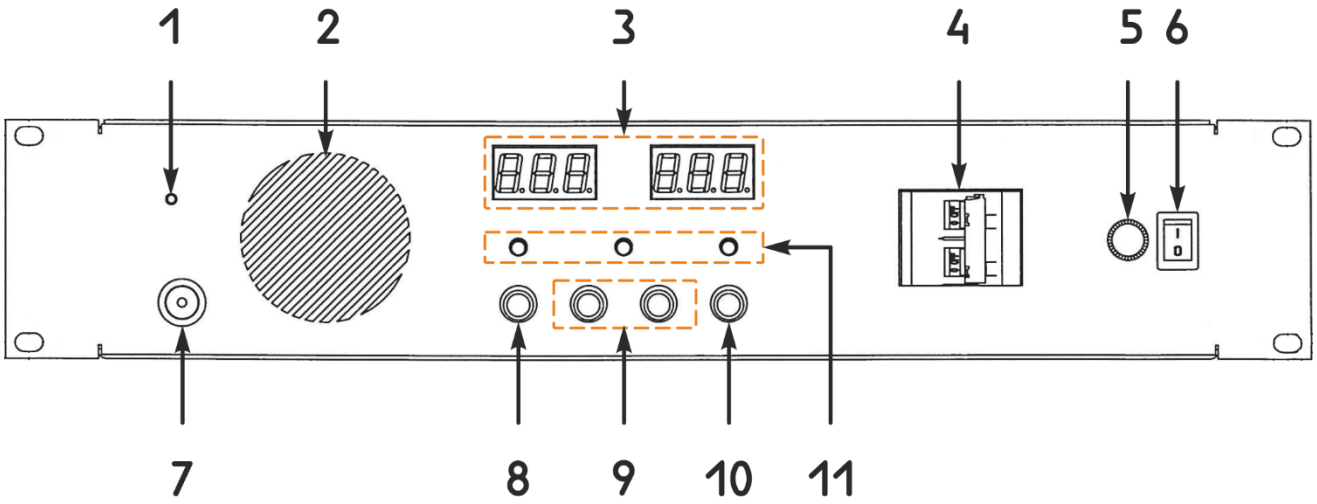


Figure 58 – Layout and designation of controls and LEDs of ITS-CH

Table 57 – Description and assignment of controls and LEDs of ITS-CH

Position	Name	Designation	Purpose
1	Power status LED	⏻	Constant glowing means that the power is available
2	Fan	–	To cool the unit
3	7-segment LED	Voltage, V, Current, A	To display current and voltage values of the battery
4	Automatic circuit-breaker	⎓ 24 V to storage battery, On, Off	To switch from the main to standby power
5	Power fuse 5 A	FU1	To protect against faults in the power circuit
6	Piano type switch	On, Off	To start and stop the unit's operation
7	Charge key	Force battery charge	To start battery charge
8	Controls of 7-segment LEDs	SELECT	To switch between current and voltage values
9		△ ▽	To change current and voltage values
10		SET/RESET	To confirm or reset the selected values of current and voltage
11	Status LEDs	Normal	Constant glowing with green means that the unit is non-faulty and ready for operation
		Charge	Constant glowing with yellow means that the battery is being charged
		Fault	Constant glowing with red means that battery connection is faulty

2.15.5 Power supply unit ITS-PS

Power supply unit ITS-PS powers SC from shipboard power mains 220 VAC or 24 VDC (switching of one network to another) or from integrated accumulator battery 18 A·h, rated voltage 27 VDC and power 350 W.

Figure 59 describes exterior, controls and LEDs of the unit's types. Description and assignment of controls and LEDs are shown in table 58.

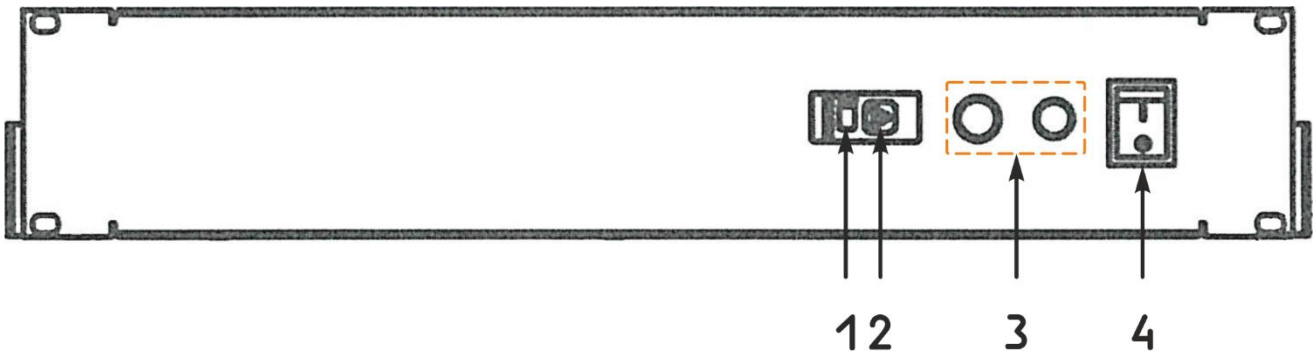


Figure 59 – Layout and designation of controls and LEDs of ITS-PS

Table 58 – Description and assignment of controls and LEDs of ITS-PS

Position	Name	Designation	Purpose
1, 2	Battery charge indicator	–	To indicate battery charge level
3	Fuses	FU1, FU2	To protect against faults in the power circuit
4	Piano type switch	On, Off	To start and stop the unit's operation

2.15.6 Uninterruptible power supply unit BPS-114

Uninterruptible power supply unit BPS-114 powers SC of the onshore set from shipboard power mains 220 VAC or from integrated accumulator battery 17 A·h, rated voltage 12 VDC and power up to 200 W.

Power button is located on the unit's panel. Power circuits are outfitted with a fuse 3 A.

2.15.7 Uninterruptible power supply unit 19-BPS-1000

Uninterruptible power supply unit 19-BPS-1000 powers SC from shipboard power mains 220 VAC or integrated accumulator batteries (4 pcs, 9 A·h each), rated voltage 12 VDC and power up to 200 W.

Figure 60 describes exterior, controls and LEDs of the unit's types. Description and assignment of controls and LEDs are shown in table 59.

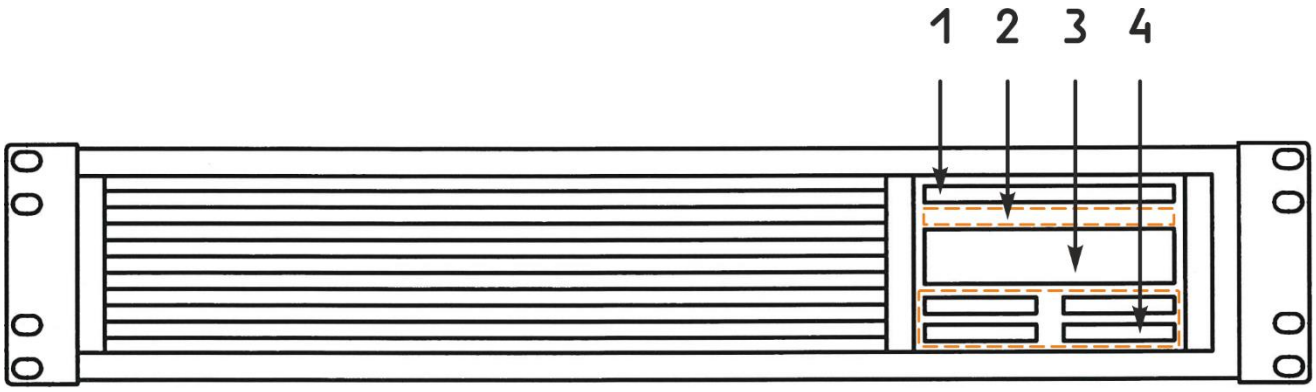


Figure 60 – Layout and designation of controls and LEDs of 19-BPS-1000

Table 59 – Description and assignment of controls and LEDs of 19-BPS-1000

Position	Name	Designation	Purpose
1	On/off button	⏻	To start and stop unit operation
2	Panel of unit's indicators		To indicate operation from external mains
			To indicate operation from accumulator battery
			To indicate a fault
			Battery replacement indication
3	Display	–	To display present values of voltage and current
4	Menu navigation buttons	**Esc**	To exit submenu, return to the main menu
		↵	To enter submenu
		∧	Navigation up and down in the menu
		∨	

2.15.8 Automatic power switch ITS-APS

Automatic power switch ITS-APS is designed for main/standby automatic power switching.

Figure 61 describes exterior, controls and LEDs of the unit's types. Description and assignment of controls and LEDs are shown in table 60.

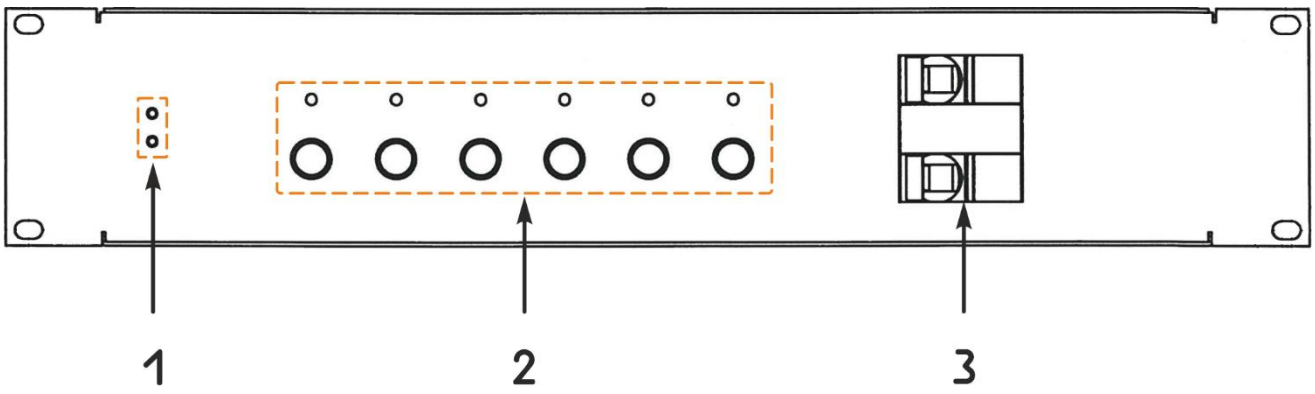


Figure 61 – Layout and designation of controls and LEDs of ITS-APS

Table 60 – Description and assignment of controls and LEDs of ITS-APS

Position	Name	Designation	Purpose
1	Power LEDs	Main, Standby	Constant glowing means that the corresponding power is available
2	Group of fuses with LEDs	FU1 to FU6	To protect connected SC against faults in the power network. Constant glowing means that operation is non-faulty
3	Automatic circuit-breaker	Main power, Standby power, On, Off	To switch from the main to standby power

2.15.9 Power input panel PIP

Power input panel PIP is intended for connection of mounting rack 19IR to the main and (or standby) shipboard power networks. Rack-mounted.

Depending on the type, a panel may be connected only to the main, only to the standby or to the main and standby power networks simultaneously.

Figure 62 describes exterior, controls and LEDs of the unit's types. Description and assignment of controls and LEDs are shown in table 61.

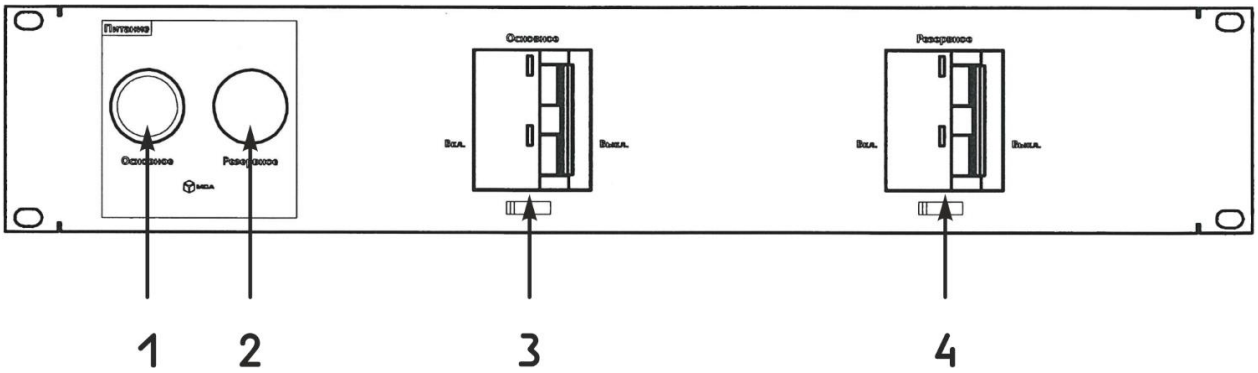


Figure 62 – Layout and designation of controls and LEDs of PIP

Table 61 – Description and assignment of controls and LEDs of PIP

Position	Name	Designation	Purpose
1	Main power indicator	Main	Continuous glowing of indicator displays power available from the main power supply
2	Standby power indicator	Standby	Continuous glowing of indicator displays power available from a standby power supply
3	Automatic switch	Main, On, Off	Connection to the main power supply
4	Automatic switch	Standby, On, Off	Connection to a standby power supply

2.16 SIGNALING UNITS (ALARM DEVICES)

Signaling units (alarm devices) are designed to provide light and (or) sound signaling when general alarm or other alarms are actuated, and to repeat incoming call signaling. The signaling units are powered from the System rack with 24 VDC or 220 VAC.

2.16.1 Rotating lamp RL type

Rotating lamp RL type is designed to provide bright light signaling to attract attention on the open deck, from the long distance and in noisy areas. A customer may choose from the wide range of globe colours and supply voltage available for the unit's types. Wall-mounted, or mounted on a bracket only vertically.

2.16.2 Flashing lamp FL type

Flashing lamp FL type is designed for intermittent light signaling to attract attention on the open deck, and in noisy areas. A customer may choose from the wide range of globe colours available for the unit's types. Wall-mounted, or mounted only on a vertical surface, input voltage 24 VDC.

2.16.3 Rotating flashing lamp RFL type

Rotating flashing lamp RFL type to provide bright light signaling to attract attention on the open deck, from the long distance and in noisy areas. A customer may choose from the wide range of globe colours and supply voltage available for the unit's types. Wall-mounted, or mounted only on a vertical surface.

2.16.4 Light signaling unit L type

Light signaling unit L type is designed for intermittent light signaling to attract attention on the open deck, and in noisy areas. A customer may choose from the wide range of globe colours and supply voltage available for the unit's types. Wall-mounted.

2.16.5 Sound signaling unit A type

Sound signaling unit A type is designed for sound alarm signaling on the open deck and in noisy areas. A customer may choose quantity of channels and globe colours available for the unit's types. Wall-mounted.

2.16.6 Sound and light signaling unit AL type

Sound and light signaling unit AL type is designed for sound and light alarm signaling on the open deck and in noisy areas. A customer may choose from the wide range of globe colours and supply voltage available for the unit's types. Wall-mounted.

2.16.7 Howler HW1 type

Howler HW1 type is designed for sound alarm signaling on the open deck and in noisy areas. A customer may choose from power supply range available for the unit's types. Wall-mounted.

2.16.8 Buzzer-howler BH1 type

Buzzer-howler BH1 type is designed for sound alarm signaling on the open deck and in noisy areas. A customer may choose from power supply range available for the unit's types. Wall-mounted.

2.16.9 Light signaling unit PGS-VSPYSHKA type

Light signaling unit PGS-VSPYSHKA type is designed for light alarm signaling in explosion hazardous areas. A customer may choose from power supply range available for the unit's types. Wall-mounted.

2.16.10 Sound signaling unit BExS110 type

Sound signaling unit BExS110 type is designed for sound alarm signaling in explosion hazardous areas. A customer may choose from power supply range available for the unit's types. Wall-mounted.

2.16.11 Signaling units ORBITA MK type

Signaling units ORBITA MK type are designed for sound, light and sound-light alarm signaling in explosion hazardous areas. Wall-mounted.

2.16.12 Sound signaling unit TB-105

Sound signaling unit TB-105 is designed for sound alarm signaling when connected to a telephone. Wall-mounted.

2.16.13 Relay unit RB-139 type

Relay unit RB-139 type is designed to switch external power supply to the connected SC of external alarm. Waterproof, wall-mounted.

2.16.14 Storage box

For individual installation of accumulator battery. Floor mounting.

3 INTENDED USE

3.1 OPERATIONAL LIMITATIONS

Select the place for installation of the SC in compliance with operational limitations, see table 1.

Install the SC according to the outline and installation dimensions.

To prevent from self-excitation effect, we recommend installing a loudspeaker at min. distance of 3 m from microphones, user substations and main stations.

Caution! Distance between the SC's installation site and magnetic compass shall not be less than 1 m!

All connections of the SC shall comply with the order's table of connections (wiring) and electrical connections diagram, All SC must be grounded; bare (non-isolated) ends must be absent.

3.2 PREPARATIONS TO USE

3.2.1 Safety features

While preparing the System for operation, a user shall:

– check fastening and insulation of electric cables, any damage and bare ends shall be absent; all SC shall be grounded;

– switch off the power of the SC before disconnecting cables, replacement of fuses, units or modules.

3.2.2 Visual check procedure

Before switching the SC on:

– observe visually integrity and initial position of the controls on the front panels of the SC;

– check the absence of dust and dirt on the front panels of the SC, clean them with a soft cloth if necessary;

– check that cable connectors are securely connected to the SC.

3.3 USAGE OF THE SYSTEM

3.3.1 PA network

To call a subscriber in PA network, a user may use main stations, user substations and CU-10; the Manufacturer's representative assigns to them individual numbers. Figures 63–64 describe instructions on how to make a call in PA network.

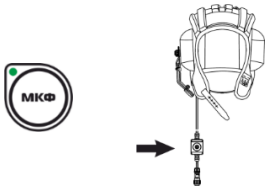
Outgoing call	
CU-10, main stations, talk-back stations types: PT-CMIP, PH, SDP, S1-3, S1-5, S2-3, S2-5	 Press the key with a number of subscriber
Talk-back stations type: S1, S2, S3, S4	 Press the call button
To answer a call	
CU-10, main stations, talk-back stations types: PT-CMIP, PH, SDP, S1-3, S1-5, S2-3, S2-5	 Press the key with the flashing LED and subscriber's number
Talk-back stations types: S1, S2, S3, S4	 Press the call button
To transmit a message	
	 Press and hold microphone key or PTT switch of external intercom device
To end the call	
	 Press the same key that you used to make a call, or END button

Figure 63 – Individual call in PA network

Selective call

CU-10, main stations, talk-back stations types: PT-CMIP, PH, SDP, S1-3, S1-5, S2-3, S2-5

Press the keys with the numbers of selected subscribers one by one

To connect additional subscriber during communication

CU-10, main stations, talk-back stations types: PT-CMIP, PH, SDP, S1-3, S1-5, S2-3, S2-5

Press the key with the number of subscriber during communication

Conference call, pre-defined

Talk-back stations types: PT-CMIP, PH, SDP

Press LIST button and then, press the key with the number of subscriber group

Note – Subscriber groups are formed during the System's primary settings; quantity of groups depends on the quantity of numeric keys on a subscriber's terminal.

Call hold

Talk-back stations types: PT-CMIP, PH, SDP

Press the HOLD key

If you need to call another subscriber, press the key with its number

How to use bridge wing substation SW-1

Once the call is connected, press the BW key on the main station.

Use the connected microphone of the wing substation to transmit voice communication.

Once the communication is finished, go back to the main station and press the control key for the second time to disconnect the bridge wing substation.

Figure 64 – How to call in PA network

3.3.2 Telephone network

3.3.2.1 Standard communication services

To call a subscriber in telephone network, use a telephone; the Manufacturer's representative assigns an individual number to each telephone during configuration. Table 62 describes instructions on how to use telephones.

Table 62 – Incoming and outgoing calls

To call a subscriber	To do
Outgoing call	Pick up the handset and dial a number
Outgoing call to external subscriber	Pick up the handset, press "9", dial a number of external line, then, dial a subscriber's number
To answer a call	Pick up the handset or use PTT switch of external intercom device
To call subscribers of PA and radiotelephone network	Pick up the handset or dial a number of PA or radiotelephone subscriber
Speed dial of the last number	Pick up the handset or press redial key

3.3.2.2 Value added services

Value added services are activated by pressing a combination of service code and number of telephone, hereinafter referred as "NUMBER". Figures 65–67 describe procedure of access to value added services or its suspension.

Information on NUMBER settings		
	*#809NUMBER#	
	Unconditional call forwarding	**Conditional call forwarding**
	all incoming calls are forwarded to NUMBER	incoming calls are forwarded to NUMBER if no answer
on	*21*NUMBER#	*22*NUMBER#
off	#21#	#22#
Note – One type of forwarding cancels the other, and function of barring incoming calls.		

Figure 65 – Procedure of call forwarding connection/suspension

	Temporary barring of incoming calls	**Selective barring of incoming calls**
	Barring of incoming calls from NUMBER until the time specified at order, or unless the service is off	Barring of incoming calls from all subscribers of internal network except NUMBER, specified during connection of the service
on	*26*PASSWORD*NUMBER#	*35*PASSWORD*NUMBER#
off	#26*PASSWORD#	#35*PASSWORD#

Notes

1 PASSWORD – is a password assigned by the Manufacturer's representative during the System configuration and given to the customer.
2 One barring type cancels the other, and call forwarding function.

Auto redial	
NUMBER	Last dialed number
*36*NUMBER#	*36#

Order is followed by the automatic voice confirmation. Then, the telephone makes 50 calls for 30 seconds each with a 30-second pause.

Note – The service is available only for internal network.

To call NUMBER during communication	
on	**NUMBER
off	*1
switch between subscribers	*2
to connect a subscriber on hold	*3
to connect a current subscriber with the one on hold	*4

Notes

1 During the call, current subscriber is transferred to hold mode.
2 When one subscriber disconnects, other two are connected automatically.

Figure 66 – Procedure of incoming calls barring and auto redial

Conference, parallel add-on NUMBER1, NUMBER2, NNUMBER3 … NUMBER		
*71*NUMBER1*NUMBER2*NUMBER3*…*NUMBER#		
Note – The service allows the initiator to create a conference with 2 – 10 participants.		
Pre-defined conference call		
Note – The list number (C) is selected by dial keys (0 … 9).		
to add NUMBER to the conference list	*11*C*NUMBER#	
to delete NUMBER	*12*C*NUMBER#	
Name announce	*#11*C# or *#12*C#	
to start the conference call	*70*C#	
to add-on NUMBER	*13*NUMBER#	
to disconnect a participant	*14*NUMBER#	
Alarm clock		
	one-time	daily
on	*55*HHMM#	*56*HHMM#
off	#55*HHMM#	#56*HHMM#
off all alarm clocks	#55*9999#	#56*9999#
Note – If the telephone was switched off, missed alarm will go off once you switch on the telephone.		
Value added services reset (call forwarding, incoming calls barring, alarm clock)		
#50*PASSWORD#		
Note – PASSWORD – code-password, see figure 66.		
Code-password change		
*30*PASSWORD $_{old}$*PASSWORD $_{new}$#		
Note – PASSWORD $_{old}$ – old password, PASSWORD $_{new}$ – new password.		

Figure 67 – Procedure of conference call, to on/off alarm clock, reset settings, and change code-password

3.3.2.3 Optional communication services

The Manufacturer's representative enables optional communication services while configuring the System in compliance with the order list. To activate optional services, no special actions are needed.

3.3.2.4 Video communication

Use telephone PT-VC type for video communication. Table 63 describes how to use PT-VC.

Table 63 – How to use PT-VC

PT-VC functions	**To do**
Video call	Pick up the handset, dial a number or select one from the saved numbers. Press  on the screen and wait for the answer. Note – signal is reproduced through the speaker during the video call
To answer a video call with video	To answer a video call, select *Video answer*
Video conference	Video conference may be created in both waiting mode and call mode. To create a video conference, press  . A menu will open on the screen. Press "+" on the screen to create group call. Input a telephone number into a search box, or select a number from *Contacts*, and press *Video call*. Repeat to add necessary participants. To remove a participant from the conference, press × in the right top corner of the participant's icon. To end video conference, press *End* in the right bottom corner of the screen

3.3.3 Radiotelephone network

To call in radiotelephone network, use radio terminals PT-ADC, PT-ADCW, PT-DC, DH8-ABAB and PT-NRTU. The Manufacturer's representative assigns an individual number to each unit during the System configuration.

Calls in radiotelephone network are carried out similarly to telephone network, see table 62.

3.3.4 Alarms

The System generally operates with alarms represented in table 64. For the procedure of alarm actuation, see table 65.

Table 64 – Types of alarms

Types of alarms			
GENERAL 	**ABANDON** 	**MANUAL** 	**Other alarms actuated by backup button** 
priority-1	priority -2	priority -3	priority -4
Note – Priority-1 is the highest, priority-4 – the lowest.			

Attention!

Alarms actuation buttons are protected against accidental keystroke by a safety cover or special lock button. To reach the buttons, open the cover, or unlock alarm buttons by pressing and holding “unlock” button (If no further actions are taken, the buttons will get locked automatically in 30 seconds).

Table 65 – Alarms actuation

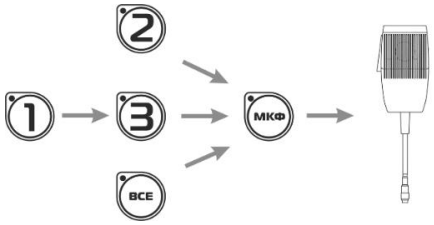
Subscriber’s equipment	**Procedure**
Alarm panels **Combined microphone panels** **Combined main stations** **CU-10**	 To initiate alarm, reach the buttons and press the corresponding alarm button
	 To reset an actuated alarm, press the button of the actuated alarm or “Reset”

Along with the general alarm, emergency voice communication may be transmitted from combined microphone panels, see table 67; during the voice transmission, alarm signaling will be interrupted.

3.3.5 Transmission of voice communication and radio broadcasting

Voice communication is transmitted by microphone panels, CU-10, telephones, CU-200 and CU-400 (if they are outfitted with integrated microphone panel). Procedure of voice communication transmission, audio control of PA lines and broadcasting are described in tables 66–69.

Table 66 – Transmission of commands via PA lines

Subscriber's equipment	Procedure
Microphone panels, CU-10	 Select one, several or all zones by pressing the corresponding buttons in the group *PA LINES*, press *MIC* button to switch on the microphone, and say the command. To end transmission, press *MIC* button to switch off the microphone, and press the corresponding zones buttons again
Telephone	Pick up the handset, dial the assigned number by pressing a numeric key, wait for the connection and say the command. To end the call, put the handset down

Attention!

Transmission of voice commands to zones will interrupt alarm signaling and (or) radio broadcast. They will resume once the transmission finishes.

Table 67 – Transmission of emergency messages via PA lines

Subscriber's equipment	Procedure
CP-3-19, CP2-3-19, CP-6-19, CP2-6-19, Combined microphone panels	 Press *EMERGENCY PA*, press *MIC* to switch on the microphone and say the command to the microphone. To end emergency transmission, press *MIC* to switch off the microphone and press *EMERGENCY PA* again

Attention!

Emergency notifications have the highest priority; therefore, any messages, commands, alarms and broadcasting will be switched off automatically during emergency broadcasting, and resumed after its end.

Emergency commands will be transmitted to all zones at the same time.

Table 68 – PA lines audio control

Subscriber's equipment	Procedure
19-CHSW **CU-200, CU-400** (with an integrated audio control unit)	Using selector *Channel* select PA line; set up the required volume by means of *Volume* knob

Table 69 – Entertainment broadcasting

Subscriber's equipment	Procedure
P1, **19-P1,** **CU-200, CU-400** (with an integrated entertainment source)	Switch on the device; use control buttons to select AUX mode and type of broadcasting. To end broadcasting, press power button for the second time

If the System with one or several single-channel PA lines to broadcast includes several entertainment sources, a user shall switch on all entertainment sources and connect the selected source to the corresponding PA line by one of the selectors *Channel 1 – Channel 6* on the mixer 19-MIX.

If the System includes three-program PA line to provide broadcasting, a user shall switch on all sources and select a broadcasting program. Entertainment programs will be broadcasted via corresponding three-program PA line.

Provide corresponding settings on the System's central unit boards to limit (or extend) broadcasting of musical programs.

4 TECHNICAL SERVICE

4.1 GENERAL DESCRIPTION

The System's technical service shall be performed by the staff familiarized with its composition, structure and operational features.

In order to provide safe and reliable operation of the System, the staff shall maintain the following types of technical service:

– TS-1 – semi-annual technical service;

– TS-2 – annual technical service.

TS-1 is organized and controlled by a person in charge, and performed by own personnel on the running System. The results of TS-1 are registered in the operator's log book.

TS-2 is organized and controlled by a person in charge, and performed by own personnel. The results of TS-2 are registered in the System's certificate.

4.2 SAFETY FEATURES

While maintaining the technical service, observe instructions in 3.2.1 and 5.2 of this operating manual.

4.3 MAINTENANCE ROUTINE

The list of works for all types of technical services types is represented in table 70. Maintenance routine procedure is given in checklists, represented in tables 71–74.

Table 70 – List of works by technical services types

Checklist No.	Work	TS-1	TS-2
1	Visual check of the System	+	+
2	Operation test of the System	+	+
3	Test of PA, radiotelephone and telephone networks, value added services	–	+
4	Check of completeness, condition of single SPTA and operational documentation	–	+
Notes 1 «+» – work is obligatory; 2 «–» – work is not obligatory.			

Table 71 – Checklist No 1. Visual check of the SC

To be done	Routine	Man-hours per 1 SC
Visually examine the SC	Check completeness and appearance of the SC; mechanical damage, paint defects must be absent; marking plates shall be present; legends are to be read easily. Clean up the SC surfaces with clean cloth; Remove severe contamination, parts of corrosion, oil spots from the metal surfaces: – using soap foam remove contamination from front surfaces avoiding its penetration inside; all surfaces clean dry by clean cloth and dry up; – using alcohol soaked cloth clean other surfaces. If varnish paint coating is damaged, polish it with sand paper, then clean with alcohol-soaked cloth, cover with varnish and dry up	1 person 5 minutes
Check reliability of cable and bus connection to the SC	Check that connectors and attaching screws are fastened tight; provide further fastening if needed	1 person 5 minutes

Table 72 – Checklist No 2. Operability check of the SC

To be done	Routine	Man-hours per 1 SC
Check operation of the System	Check that the following LED are glowing: – LEDs above the connectors for subscriber's terminals, on the units of CU-0131 type; – power status LEDs and amplifier of the units CU-200 and CU-400, and amplifiers TPA-200, TPA-400, TPA-200, 19-TPA, as well as LEDs of embedded panels, if any; – LEDs on the units 19-CU-6, 19-CU-12, ITS-CUICB, ITS-TBSW; – status LEDs of Ethernet connectors of units ITS-CUICB, POE-SW type, FXO type, switch SW type; – LEDs of ITS-CUA; – LEDs *CALL*, *READY*, *FAULT*, and buttons LEDs on the unit CU-10; – LEDs of server ITS-CUIP; – group LEDs *State* (or single LED *State*) and buttons LEDs of main substations, talk-back stations, amplifier TPA-15;	1 person 10 minutes per 1 SC

To be done	Routine	Man-hours per 1 SC
	– group LEDs *State* of external intercom device and buttons of microphone panels, combined microphone panels; – group LEDs *ALARMS*, and buttons of combined microphone panels, and alarm panels; – group LEDs *Signal level* of 19-CHSW; – LEDs of PA lines status on 19-PAC-6; – LEDs of regulators on 19-MIX; – LEDs and working displays of telephones and radiotelephone units; – reboot button LEDs and channel status LED *State* on controller BSC-16; – LEDs of channel status and operation of FXS; – LEDs of FXO ports on the unit FXO; – status LEDs and 7-segment LEDs of ITS-CH; – LEDs above the fuses on ITS-APS; – power status LEDs of 19-CU, ITS-CUICB, 19-PAC-6, 19-MIX, ITS-FU-4, FXS, POE-SW, ITS-TBSW, FXO, 19-PS, ITS-PS, ITS-APS, ITS-CH, 19-P1, EC-6M, 19-AG, switch SW type, BSC-16	

Table 73 – Checklist № 3. Check of PA, telephone and radiotelephone networks, value added services

To be done	Routine	Man-hours per 1 SC
To test operation of PA, telephone and radiotelephone networks, command public address, general alarm, and entertainment broadcasting	To provide test setup of PA modes on each subscriber's terminal in compliance with 3.3.1 of this operating manual	2 people 1 hour
	Make control phone calls from every telephone according to the lists of subscribers numbers, control connection and intelligibility of voice communication	2 people 1 hour
	Check availability of value added services, access each service from the telephone one by one in compliance with 3.3.2.2	2 people 0.5 hour
	Check availability of radiotelephone service, establish communication according to 3.3.3	2 people 0.5 hour
	Broadcast commands to PA lines according to 3.3.5, control priorities at the same time, see 1.3.3	2 people 0.5 hour

To be done	Routine	Man-hours per 1 SC
	Broadcast emergency command to PA lines according to 3.3.5 of this operating manual, control priorities at the same time, see 1.3.3	2 people 1 hour
	Initiate alarms according to 3.3.4 of this operating manual, control priorities at the same time, see 1.3.3	2 people 1 hour
	Start entertainment broadcasting according to 3.3.5 of this operating manual, control priorities at the same time, see 1.3.3	2 people 1 hour

Table 74 – Checklist № 4. Check of completeness, condition of single SPTA kit and operational documentation

To be done	Routine	Man-hours per 1 SC
Check completeness and condition of SPTA kit and operational documentation	Check completeness of SPTA kit and operational documentation. Check condition of each item, storage terms and make sure that SPTA kit was re-completed in case of use	1 person 1 hour

4.4 SINGLE SPTA KIT INSTRUCTIONS

Portable SPTA kit is delivered together with the System. It is used to maintain operation of the System and replace faulty elements during operation.

Composition of portable SPTA kit shall comply with the SPTA kit list.

4.5 PRESERVATION

The SC, SPTA kit and set of operational documents are stored in preserved condition in Manufacturer's packaging boxes. The time of re-preservation – 2 years from the Manufacturer's commissioning.

The preservation is done in full terms, for 2 years, applying protection and packaging materials (polyethylene film covers) with further dehumidification of air in isolated volume using dehydrating agent (silica gel).

Re-preservation (second-time preservation) is done by company responsible for System storage.

The SC re-preservation is done in heated rooms in the same order as the preservation.

The re-preserved SC and documents are placed in package.

Storage time of re-preserved System is 2 years.

5 CURRENT REPAIR OF THE SYSTEM

5.1 GENERAL INSTRUCTIONS

Re-complete portable SPTA kit using baseline SPTA kit.

5.2 SAFETY FEATURES

Any repair works must be performed by personnel examined and received proper qualifications in the area of the occupational safety.

All SC shall be grounded!

Use a rubber rug in front of power supply units.

During repair works, personnel must put a poster “DO NOT switch ON! Under Operation!” on the de-energized power supply circuit breaker (breaker in OFF position).

Replacing damaged parts, boards, modules is PROHIBITED if power supply of the repaired unit is on.

Installation, aligning and repair works are PROHIBITED in the room, where less than 2 people are present.

5.3 CURRENT REPAIR OF THE SC

5.3.1 Current repair of the central units

Control central units operation by LEDs located on the front panels or next to the connectors. Replacement of faulty parts is performed by own personnel using parts from portable SPTA kit.

Tables 75-79 describe potential malfunctions and troubleshooting.

Table 75 – Potential malfunctions of CU-0131

Malfunction	Potential reasons	To be done
The left LED of channel status is not glowing	Power circuit failure	Check the power circuit for potential short circuit. If it was not detected, replace the faulty fuse on the corresponding power circuit. Check the connection; check that power supply unit is not faulty (see table 87)
The right LED of channel status is not flashing	Communication line is faulty	Perform a signaling test. If short circuit was detected, replace the cable. If there are no faults, replace the subscriber’s equipment

Table 76 – Potential malfunctions of CU-200, CU-400

Malfunction	Potential reasons	To be done
No glowing of power status LED after the unit is switched on	Power circuit failure	Check power circuits for short circuits. If short circuit was not detected, replace the blown fuse on the corresponding power circuit. Check the connection and power supply unit for malfunctions (see table 87)
No glowing of *Ready* LED after the unit is switched on	Blown fuse of power circuit	Replace the fuse using parts from SPTA kit
	Amplifier's power supply unit is faulty	Check the power supply unit (see table 87) or contact the Manufacturer
Constant glowing of *Overload* LED; central unit's amplifier is constantly rebooting	Total power of the load connected to the amplifier exceeds amplifier's power	Disconnect excess load
	Short circuit in PA line	Disconnect central unit's power supply; check cables and loudspeakers connected to PA lines for short circuit
	Amplifier's power supply unit is faulty	See above
Constant glowing of *Overheat* LED	Temperature operation mode of amplifier is broken	Switch central unit off to cool it down. If after cooling the fault remains, one of the coolers might be malfunctioning. In this case, contact the Manufacturer

Table 77 – Potential malfunctions of 19-CU, ITS-CUICB, ITS-CUA

Malfunction	Potential reasons	To be done
No glowing of power status LED after the unit is switched on	Power circuit failure	Check the power circuit for short circuits. If short circuit was not detected, replace the blown fuse on the corresponding power circuit. Check the connection and power supply unit for malfunctions (see table 87)
The left LED of channel status is not glowing		
The right LED of channel status is not flashing	Communication line is faulty	Perform a signaling test. Replace the cable, if short circuit is detected. If there are no faults, replace the subscriber's equipment

Table 78 – Potential malfunctions of CU-10

Malfunction	Potential reasons	To be done
Constant glowing of status LED *FAULT*	Configuration error	If PC-based working place is available, check configuration by means of software, or contact the Manufacturer
Uniform flashing of status LED *FAULT*, and LED's flashing of button group *ABONENTS PA LINES* and *ALARMS*	Communication line is faulty	Perform a signaling test. Replace the cable, if short circuit is detected. If there are no faults, replace the subscriber's equipment
No glowing of keys indicators	Power circuit failure	Check the power circuit for short circuits. If short circuit was not detected, replace the blown fuse on the corresponding power circuit. Check the connection and power supply unit for malfunctions (see table 87)
Called subscriber cannot hear the message during communication	Microphone is faulty	Replace the microphone
	Line is faulty	Check the line for short circuit; if it is detected, replace the cable

Table 79 – Potential malfunctions of ITS-CUIP

Malfunction	Potential reasons	To be done
No glowing of power status LED after the unit is switched on	Power circuit failure	Check the power circuit for short circuits. If short circuit was not detected, replace the blown fuse on the corresponding power circuit. Check the connection and power supply unit for malfunctions (see table 87)
No glowing of *HDD* LED	Hard disk failure	Press HDD reset button

5.3.2 Current repair of main substations, talk-back stations, microphone panels and alarm panels

Control operation of subscriber equipment in PA system by backlight brightness and glowing of status LED (Ready, Status, etc.). Troubleshooting of subscriber terminals is carried out by own personnel using portable SPTA kit.

Tables 80-81 describe the potential malfunctions and troubleshooting.

Table 80 – Potential malfunctions of main substations and PT-CMIP

Malfunction	Potential reasons	To be done
No glowing of *Ready* LED and constant glowing of *Fault* LED	Cable rupture	Check the cable visually for any damage. Replace the cable, or restore the connection twisting the wires (soldering) and insulate the damaged area
	The System's configuration error	If PC-based working place is available, check configuration by means of software, or contact the Manufacturer
	A connector on central unit is damaged	Connect subscriber's equipment into another connector
Uniform flashing of *Fault* LED and simultaneous flashing of one or several LEDs of *SUBSCRIBERS* or *PA LINES*	No connection with one or several subscriber terminals	Perform a signaling test. Replace the cable, if the short circuit was detected. If there are no faults, replace the subscriber's terminal. If the problem remains, check the System's configuration for errors
Called subscriber cannot hear the message during communication	Microphone is faulty	To replace faulty parts, contact the Manufacturer
PT-CMIP does not display information or displays it poorly	Display is damaged	

Table 81 – Potential malfunctions of talk-back stations, microphone panels and alarm panels

Malfunction	Potential reasons	To be done
No glowing or constant glowing with red of the following LEDs: – *State* – on talk-back stations; – *Ready* – on microphone panels; – *Main power* and *Standby power* – on alarm panels	Power circuit failure	Check the power circuit for short circuits. If short circuit was not detected, replace the blown fuse on the corresponding power circuit. Check the connection and power supply unit for malfunctions (see table 87)
	Subscriber line is faulty	Perform a signaling test; if fault is found, replace the cable
Uniform flashing of *Fault* LED on microphone panels and alarm panels, and flashing of one or several LEDs of button group *PA LINES*	Connection is lost with one or several zones	Restart the System. If the fault remains, check the cable for rupture. If the fault remains, check the System configuration for errors

Malfunction	Potential reasons	To be done
Called subscriber cannot hear the message during communication	Microphone is faulty	Replace the microphone
	Subscriber line is faulty	See above

5.3.3 Current repair of the System's amplifiers

Control operation of amplifiers by LEDs located on the front panels. Troubleshooting is carried out by own personnel using portable SPTA kit.

Tables 82-83 describe the list of potential malfunctions and troubleshooting.

Table 82 – Potential malfunctions of TPA-15

Malfunction	Potential reasons	To be done
No glowing of *State* LED on the front panel	Cable damage or rupture	Check the cable visually for any damage. Replace the cable, or restore the connection twisting the wires (soldering) and insulate the damaged area

Table 83 – Potential malfunctions of TPA-200, TPA-400, TPA-200, 19-TPA

Malfunction	Potential reasons	To be done
No glowing of power status LED after the unit is switched on (except 19-TPA)	Power circuit failure	Check power circuit for short circuit. If it is found, replace the blown fuse on the corresponding power circuit
Amplifier does not switch on; no glowing of *Ready* LED	Power circuit fuse is blown	Replace the fuse from SPTA kit (consider the rated value)
	Amplifier's power supply unit is faulty	Check the power supply unit (see table 87) or contact the Manufacturer
Amplifier is constantly rebooting; *Overload* LED is glowing	Total power of the connected load is higher than amplifier's power	Disconnect excess load. If the malfunction remains, amplifier is faulty, then, contact the Manufacturer
Amplifier is working, but *Overheat* LED is glowing at the same time	Temperature operation regime is broken	Switch amplifier off to cool it down. If after cooling the fault remains, one of the coolers might be faulty. In this case, contact the Manufacturer

5.3.4 Current repair of the System's PA equipment

Control operation of PA equipment by LEDs located on the front panels. Troubleshooting is carried out by own personnel using portable SPTA kit.

Table 84 describes the list of potential malfunctions and troubleshooting.

Table 84 – Potential malfunctions of PA equipment

Malfunction	Potential reasons	To be done
19-CHSW does not display the signal level	The unit is faulty and cannot receive the signal	To replace the unit, contact the Manufacturer
No glowing of power status LED after the units - 19-PAC-6, 19-P1, 19-MIX, EC-6M, 19-AG, 19-DRS, DRS-WM - are switched on	Power circuit failure	Check the power circuit for the short circuit. If there is no short circuit, replace the power network fuse
	Power supply unit is faulty	Check the power supply unit (see table 87), or contact the Manufacturer
Constant glowing with red of *Fault* LED on the units 19-PAC-6	No connection with central unit	Reboot the System. Check that the cable is not damaged before the central unit connection; replace it if any damage or rupture is found; perform a signaling test to detect the short circuit
No glowing of selector LEDs on 19-MIX	No signal from the 19-P1	Check 19-P1 (see above)

5.3.5 Current repair of telephones and radiotelephones

Table 85 describes the list of potential malfunctions and troubleshooting of telephones and radiotelephones.

Table 85 – Potential malfunctions of telephones and radiotelephones

Malfunction	Potential reasons	To be done
No tone signal after the handset is picked up or after pressing call button	Cable rupture	Check the cable visually for any damage. Replace the cable, or restore the connection twisting the wires (soldering) and insulate the damaged area
No backlight of keys and display	Power supply unit is faulty (no voltage from power supply unit)	Replace the fuse (power network shall be de-energized) from the SPTA kit. See table 87
	Blown fuse	Replace the fuse
Radio terminals do not emit readiness signal or no power	No connection between handset and base station	Move closer to the base station and retry. Take out AC adapter of the base station to reset the settings of the unit. Put the adapter in again and retry. If *No connection* is displayed, put the radio terminal on the base station to provide power

5.3.6 Current repair of switches, network equipment, converters and fan unit

Control operation of switches, network equipment, converters and fan unit by LEDs located on the front panels of the units. Troubleshooting is carried out by own personnel using portable SPTA kit.

Table 86 describes the list of potential malfunctions and troubleshooting of switches, network equipment, converters and fan unit.

Table 86 – Potential malfunctions of switches, network equipment, converters and fan unit

Malfunction	Potential reasons	To be done
No glowing of power status LEDs on switches SW type, base station controller BSC-16, units FXS, FXO, POE-SW, ITS-TBSW, ITS-FU-4	Power circuit is faulty	Check the power circuit for short circuit. If it is not found, replace the blown fuse of the corresponding power circuit
	Power supply unit is faulty	Check power supply unit (see table 87), or contact the Manufacturer
No glowing of channel status LEDs on switches SW type, units FXS, and POE-SW	Communication line of this channel is faulty	Replace subscriber's equipment
No glowing of *State* LED on BSC-16	Radiotelephones are faulty	Check the radiotelephones (see table 85)
No indication of RJ-45 ports and FXO units	No glowing of *LAN* port indicates that internal network is not available. No glowing of *WAN* port indicates no connection with shore communication line	Check the cable visually for any damage. Replace the cable, or restore the connection twisting the wires (soldering) and insulate the damaged area

5.3.7 Current repair of the System's power supply units

Control operation of power supply units by LEDs located on the front panels. Troubleshooting is carried out by own personnel using portable SPTA kit.

Table 87 describes the list of potential malfunctions and troubleshooting of power supply units.

Table 87 – Potential malfunctions of power supply units

Malfunction	Potential reasons	To be done
No glowing of power LED after the unit is switched on	No input power	Replace the fuse on the corresponding output
	No voltage	Provide power supply from external mains
No glowing of LEDs above the fuses of ITS-APS unit	Fault in power circuit on the output	Check the power circuit for short circuit. If it is not found, replace the blown fuse of the corresponding power circuit
Constant glowing of *Fault* LED on ITS-CH	No connection with battery	Check that cable is not damaged, and terminals are fastened tight. If the cable is damaged, replace it, or restore the connection twisting the wires (soldering) and insulate the damaged area
No output voltage when Power LEDs of PS-103 are glowing	Fuse is blown	Replace the fuse
No output voltage when power mains fails (the unit does not switch to standby mains) of units PS-103	No voltage of standby mains	Provide power supply from standby mains
	Switching circuit on the board is faulty	Replace the board
19-BPS-1000 does not switch on or output voltage is absent	Input automatic switch has actuated	Return the automatic switch to the initial position
	19-BPS-1000 has detected internal fault	Do not attempt to use 19-BPS-1000. Disconnect it from electricity network and contact the manufacturer to provide repair
Indicator ⊠ is glowing on 19-BPS-1000	Battery is discharged	Charge the battery for at least 4 hours. Then, switch on 19-BPS-1000 and wait until the end of self-diagnostics. If the fault remains after the battery charge, replace the battery

5.3.8 Current repair of signaling units

Table 88 describes the list of potential malfunctions and troubleshooting of signaling units.

Table 88 – Potential malfunctions of signaling units

Malfunction	Potential reasons	To be done
No signaling of incoming call	No power of signaling units	Provide power to the signaling units (switch on mains power)
	Faulty connection of signaling unit connection circuit	Check connection circuit of the signaling unit, restore the connection. Replace the unit
	Signaling unit is faulty	Replace a bulb or a signaling unit

6 STORAGE

The System must be stored in packaging inside heated and ventilated premises with air-conditioning at temperature + 5 °C to + 40 °C and relative humidity no more than 80 % at + 25 °C, with the concentration of dust, oil, moisture and aggressive impurities in the air within the required limits for the working areas of production facilities.

After storage or transportation of the System below + 10 °C, it must be unpacked only in heated premises and left in normal climate conditions for 12 hours beforehand.

7 TRANSPORTATION

The System must be transported in the Manufacturer's transportation package in closed means of transport.

Types of shipment:

−motor vehicle and railroad transportation in closed means of transport (covered cars, multipurpose containers);

−air transportation (in sealed and heated compartments);

−sea transportation (in dry service premises).

The System must be transported in compliance with transportation rules applicable for each means of transport.

During loading (unloading) operations and transportation, the requirements indicated on warning labels on the boxes, packaging must be observed, and no impacts are permitted since they can affect the safety and performance of the System.

Inside the means of transport, the packed device must be firmly secured or fastened.

8 DISPOSAL

Packaging material, SC damaged during operation, and any overage equipment must not be disposed as standard household wastes, since they contain the materials suitable for reuse.

Decommissioned and non-used components of the System must be delivered to a special waste disposal center licensed by local authorities. You can also send an overage equipment / unit to the manufacturer for its further disposal.

Proper disposal of the System components allows avoiding possible negative environmental and health impacts, and it also allows for proper restoration of components with substantial energy and resources saving.

During operation and upon completion of its service life, the equipment is not hazardous for health and environment.

This System must be disposed according to the rules applied to electronic devices.

Any products marked with a crossed trash bin must be disposed separately from standard household wastes.

9 WARRANTY

The Manufacturer is under warranty obligations in case of correct System exploitation according to the operating manual. The Manufacturer will not consider damage claims in case of case violation of operating conditions.

More information about warranty terms you can find on the official website of NPK MSA, LLC, section Support.

Address and contacts of the Manufacturer's service centre:

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