Limited Liability Company
«NPK MORSVYAZAVTOMATICA»

PUBLIC ADDRESS SYSTEM/ COMMAND TALK-BACK SYSTEM TPA-1007 BASED ON CU-10

Operating manual

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TERMS AND ABBREVIATIONS

UU	User unit
LS	Loudspeaker
LSC	Loudspeaker (public address) communication
SPTA	Spare parts, tools and accessories
LFGS	Large fine porous granulated silica gel
IMAS	Integrated Marine Automation Systems
CNF	Conference
CP	Microphone panel
S	Talk-back stations
VDR	Video data recorder
SC	System component
CL	Check list
Z	Zone (broadcasting)
TS	Technical service
TS-1	Semi-annual technical service
TS-2	Annual technical service
CU	Central unit
LIST	General list (all) communication mode
ABANDON	*Abandon ship* alarm
Ethernet	Family of computer networking technologies
GENERAL ALARM	General alarm
ISDN	Integrated Services Digital Network
MANUAL	Manual alarm

INTRODUCTION

This operating manual (hereinafter referred to as OM) describes composition, structure and specifications of Public address system/Command talk-back system TPA-1007 (hereinafter – the System), and the SC. This OM contains instructions required for safe and correct System operation (intended use, technical service, current repair), and disposal information.

Only those who have read and understood this document and those who have had a special training shall be permitted to operate and service the System according to the applicable regulations.

1 DESCRIPTION AND OPERATION OF THE SYSTEM

1.1 DESCRIPTION

The System equipment ensures voice communication transmission, emergency announcement, command and talk-back public address communication on sea- and river-going vessels.

The System consists of different user and peripheral devices for operation in diverse environment, including areas with increased level of noise, humidity and dust.

1.2 TECHNICAL SPECIFICATIONS

Main parameters and technical specifications are shown in Table 1.

Table 1 – Main technical specifications of the System

Parameter	Value	
Number of zones, pcs.	3	
Output power of power amplifier, W	75 (3 zones, 25 W per zone)	
Zone voltage, V	30	
Bandwidth of power amplifier, Hz	50…15000	
Number of ports to connect user substations, pcs.	6	
Number of ports to connect general alarm signaling units, pcs.	1	
Line audio input parameters	0.7 V; 600 Ohm	
Overall dimensions, weight	For more information on dimensions and weight, see Technical description	
Electrical specifications		
Input voltage	24 VDC	
Power consumption	Defined by total power consumed by SC included in the scope of delivery. For more information on power, see Technical description	
Operation limitations		
Protection degree	IP22; IP44	IP56
Operating temperature, °C	–15 ... +55	–40 ... +55

1.3 DESCRIPTION AND OPERATION OF THE SYSTEM

1.3.1 Description

The System operation is based on one central unit (CU) and transmission devices: microphone panels (MP), loudspeakers (LS) and talk-back public address units – user substations (S).

MPs and talk-back user substations are connected to the CU via two-wire communication line (digital devices).

Sample structure of the System based on CU-10 is shown in Figure 1.

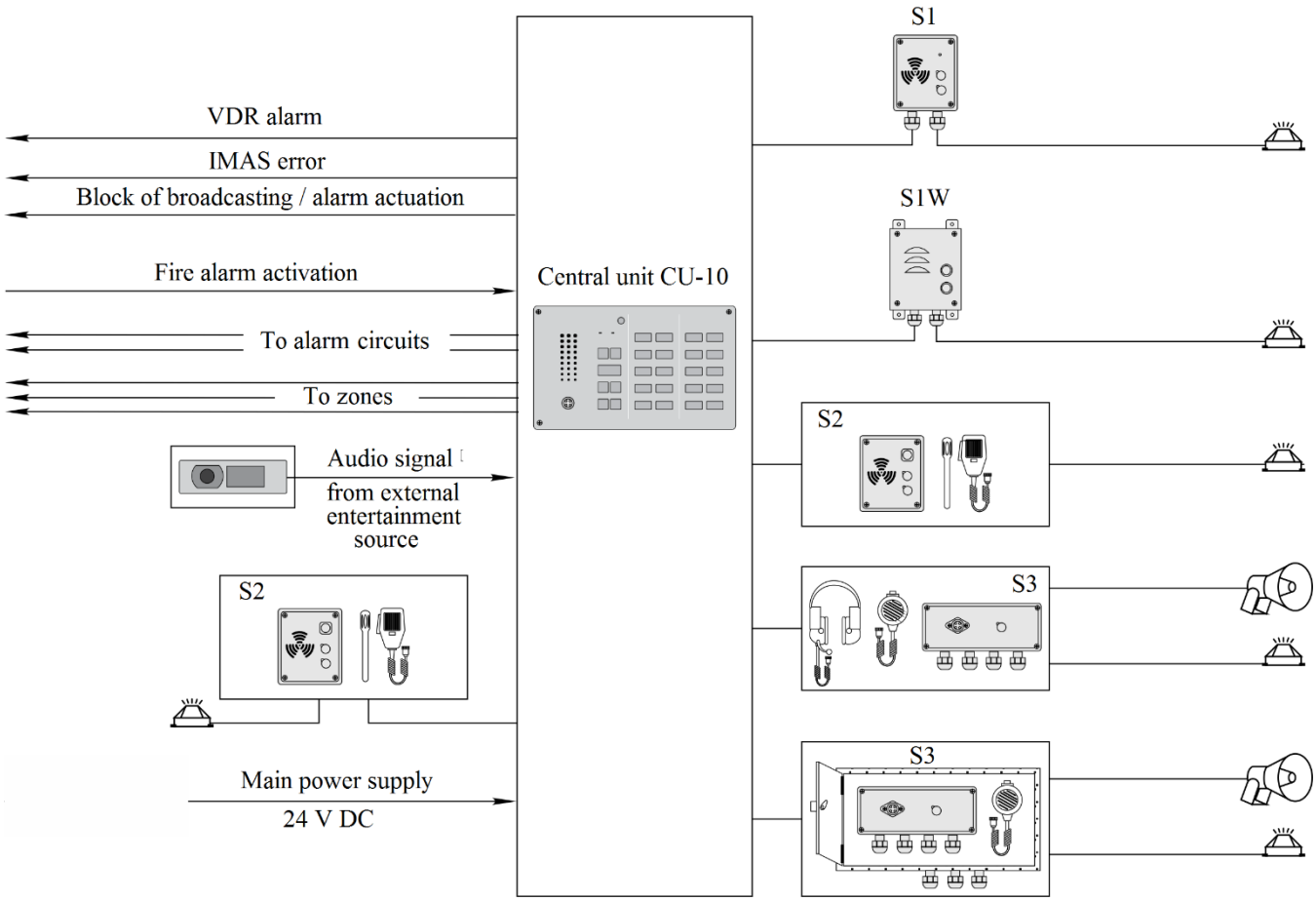


Figure 1 – The System's structural diagram

1.3.2 Functions of the System

1.3.2.1 Functions of the System:

1) operates with 24 V DC;

2) transmits voice communication and entertainment broadcasting to three zones;

3) supplies block signal to the external systems interrupting current alarm signaling with voice communication transmission;

4) transmits voice communication from MPs to the selected zones or to all zones simultaneously;

5) ensures light indication of connected microphone to zones;

ensures general alarm signaling by:

– light signaling units (L-XX, RL-XX, FL-24, RFL-XX);

– sound signaling units (A-XX);

– light-sound signaling units (AL-XX);

6) noise pressure of sound and sound/light signaling units (within 30…105 dB) may be adjusted; tone of signal may be selected;

7) receives and transmits fire alarm signals (0 dB);

8) sends «alarm activation» signal to VDR;

9) transmits voice communication to zones interrupting alarm signaling;

10) sends error signal to IMAS.

1.3.2.2 If a record player (entertainment source) is included in the scope of delivery, the System ensures:

1) broadcasting from external source of entrainment programs to the selected communication devices and zones;

2) voice communication and alarm signaling interrupt entertainment broadcasting.

1.3.2.3 The System ensures the following types of communication, see Table 2.

Table 2 – Communication services

Service	Description
LIST General list (all)	In this mode UU transmits voice communication to all UUs and zones connected to the System
Command public address	In this mode UU transmits voice communication to one or several zones
Selective CNF	In this mode voice communication is transmitted between more than two UUs
Pair communication	In this mode two UUs exchange voice communication

1.3.2.4 The System operates in the following modes:

1) alarm activation;

2) entertainment broadcasting from an external source of entertainment programs.

1.3.2.5 General application of user substations ensures:

1) call to other system users;

2) headset connection (only for S3 type);

3) microphone panels connection;

4) connection of external call signaling units.

1.3.3 Priorities

The System's communication and alarm units (and connected external systems) operate according to their priorities, see Table 3.

Table 3 – The System priorities

Name of priority service	Description
Priority-1	LIST General list (all)
Priority-2	Command public address
Priority-3	Talk-back communication
Priority-4	General alarm (and other alarm types)
Priority-5	Radio and entertainment broadcasting
Note – Priority-1 has the highest priority in the System; Priority-5 – the lowest.	

1.3.4 Alarm and warnings

1.3.4.1 General description

Alarm signaling may be initiated by an integrated alarm generator (using corresponding buttons or dry contacts).

Voice communication transmission to zones interrupts current alarm signaling.

Alarm generator (integrated with CU) controls signaling units, and transmits alarm sound signals to zones and user substations.

Alarm generator actuates alarm signaling. The alarm signals may be changed using software.

Types of signals may be changed on request.

Rules of Register and other normative documents (according to Ship Damage Control Manual of Russia, LSA Code) allow for changing only output signal frequency of conventional alarm signals (w/o changing sound sequence of signal).

Alarm generator, integrated with CU, controls signaling units; it is equipped with service signaling circuits, input and output transmission ports, see 3.3.1.

1.3.4.2 Types of alarm

Alarm generator initiates the following types of alarm:

1) general alarm (GENERAL);

2) alarm «Abandon ship» (ABANDON);

3) manual alarm (MANUAL);

4) other alarms (e.g., MOB).

Other types of alarm may be added to the abovementioned on customer request (according to the ship's muster list).

Alarm generator initiates alarm according to the following regulatory documents:

1) Ship Damage Control Manual of Russia (4.2.2) – for inland navigation vessels;

2) Regulations on Equipment on Seagoing Ships, 6.22.1.4 part II (LSC Code (7.2.1.1) resolution MSC.48(66), SOLAS-74 (III / 6.4)) – for vessels engaged on international voyages.

ATTENTION!

If you a System order includes alarm generator, specify requirements to signals

Use group of buttons ALARM on the front panel of CU to initiate abovementioned alarm types.

1.3.4.3 Alarm priorities

Alarm priorities from the highest to the lowest: General alarm (*GENERAL ALARM*); Abandon ship (*ABANDON*); and manual alarm (*MANUAL*).

Alarm with the highest priority will interrupt alarm with a lower one.

1.3.4.4 Alarm generator starts operation automatically as soon as alarm signal is received from external fire alarm system; signaling is carried out according to the provided settings.

1.4 SYSTEM COMPONENTS

For the SC which might be included in a scope of delivery, see Table 4. For more information on specifications and types of SC, see Technical description.

Table 4 – The System components

Name/Code	Description
Central units	
Central unit CU-10	Main System unit establishes a communication channel, switches audio signals to zones, and functions as an alarm unit on small vessels
Talk-back stations	
Talk-back station S1	To ensure talk-back public address communication with one or several pre-defined user
Talk-back station S1W	
Talk-back station S2	
Talk-back station S3	
Talk-back station S1-3	
Talk-back station S1-5	
Talk-back station S2-3	
Talk-back station S2-5	
Talk-back station PHS1	
Talk-back station PHS3	
Microphone panels	
Microphone panel CP-6	To transmit voice communication to zones
Microphone panel CP-6W	
Microphone panel CP-3	
Microphone panel CP-3W	
Loudspeakers	
Loudspeaker LS-1	To ensure broadcasting, different acoustic signaling, and voice communication in public address systems
Loudspeaker LS-2	
Loudspeaker LS-3/10, LS-3/15	
Loudspeaker LS-5	
Loudspeaker LS-6	
Loudspeaker LS-7	
Loudspeaker LS-8/10, LS-8/25	
Loudspeaker LS-13/10, LS-13/10D	
Power amplifier	
Amplifier TPA-15	To amplify sound signals received from microphone, ISDN line or line sound signal
External communication devices	
Microphone M1	To connect to microphone panels. Microphone MP-3 is connected only to S3 and CPW-6
Microphone M2	
Microphone M3	
Headset HS-4	To ensure talk-back communication in noisy areas. Connected only to S3
Headset HS-6	
Intercom helmet TH-4M	Intercom helmet with a microphone, 3 m cable and manual switch
Intercom helmet TH-4L	Intercom helmet with a throat microphone, 3 m cable and manual switch

Name/Code	Description
Signaling units	
Rotating lamp RL-24	To ensure light alarm signaling on open deck and in noisy areas
Rotating lamp RL-220	
Flashing lamp FL-24	
Rotating flashing lamp RFL-24	
Rotating flashing lamp RFL-220	
Light signaling unit L-24	
Light signaling unit L-220	
Sound signaling unit A-24	To ensure sound alarm signaling on open deck and in noisy areas
Sound signaling unit A-220	
Sound signaling unit A2-24	
Sound signaling unit A2-220	
Howler HW1-24	
Howler HW1-220	
Buzzer-howler BH1-24	
Buzzer-howler BH1-220	
Sound and light signaling unit AL-24	To ensure sound and light alarm signaling on open deck and in noisy areas
Sound and light signaling unit AL-220	
Light signaling unit PGS-VSPYSHKA-24	To ensure light alarm signaling in explosion hazard areas
Light signaling unit PGS-VSPYSHKA-220	
Sound signaling unit BExS110E24DC	To ensure sound alarm signaling in explosion hazard areas
Sound signaling unit BExS110E230AC	
Light signaling unit ORBITA MK S	To ensure light alarm signaling (ORBITA MK S), sound alarm (ORBITA MK Z) and sound light alarm (ORBITA MK SZ) in explosion hazard areas
Sound signaling unit ORBITA MK Z	
Sound and light signaling unit ORBITA MK SZ	

1.5 MEASUREMENT TOOLS, INSTRUMENTS AND APPLIANCES

Control operation of the SC by their controls and LED indicator lights.

Technical service of the System is carried out using tools and consumables represented in Table 5.

Table 5 – Amount of consumables required for the TS

Name and identifier of consumables	Amount of consumables	Note
Cleaning cloth	0.10 kg	1) To clean surfaces and parts of the system – use clean cloth 2) To clean severe contamination – use alcohol-soaked cloth
Rectified hydrolytic technical ethyl alcohol	0.01 l	To soak cloth while removing contamination
Varnish	0.005 kg	To cover surfaces of the unit in case of paint coating damage
Abrasive cloth	0.06 x 0.06 m	To polish surfaces of the unit in case of paint coating damage

1.6 MARKING AND SEALING

The System has a nameplate displaying information on the System's name, serial number, Manufacturer's details. The nameplate is located on the CU casing.

The SC also have nameplates displaying serial number, weight, IP rating, input voltage and power consumption. The nameplate is located on the SC casings.

If the SC casing has small dimensions, information may be reduced.

Sealing of SC is not provided.

1.7 PACKAGING

SC are delivered, transported and stored in corrugated board boxes.

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

Packaging sealing is not provided.

2 DESCRIPTION AND OPERATION OF THE SC

2.1 CENTRAL UNIT CU-10

2.1.1 Description

CU establishes a communication channel, switches audio signals to zones, and functions as an alarm unit on small vessels. CU may be mounted on a bracket.

2.1.2 Controls and indication

Controls and LED indicator lights of CU are shown in Figure 2. For the description of controls and LEDs, see Table 6.

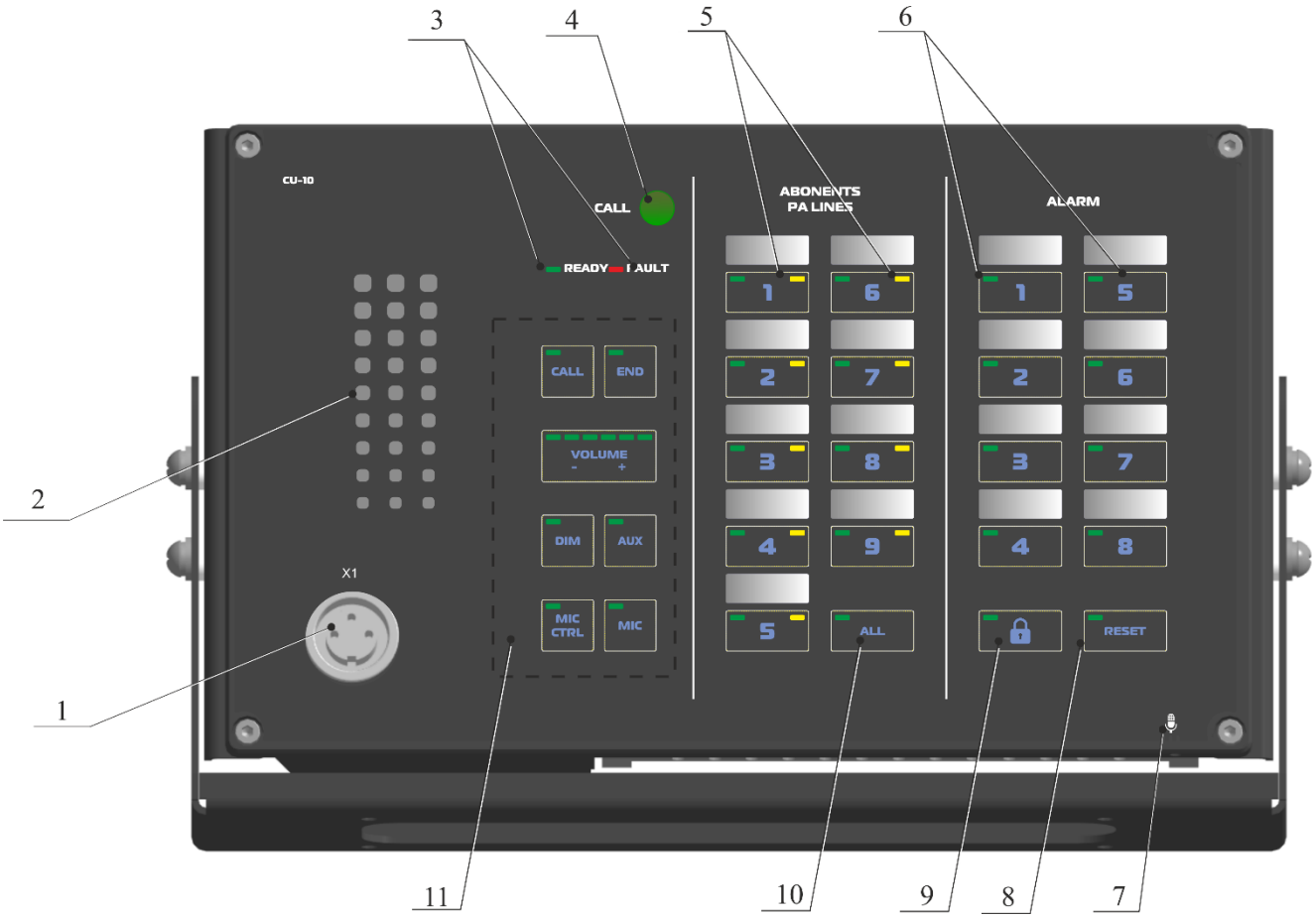


Figure 2 – Appearance of CU controls and LEDs

Table 6 – Description of CU controls and LEDs

№	Controls and LEDs	Description	Identifier
1	Connector	For external microphone	«X1»
2	Speaker	To ensure sound signaling of incoming-outgoing call, transmit voice communication and entertainment broadcasting	—
3	Status LEDs	To display power and operation status	«READY»
			«FAULT»
4	LED «CALL»	To display incoming call	«CALL»

№	Controls and LEDs	Description	Identifier
5	Group of buttons «1»…«9» with LEDs «ABONENTS PA LINES», and transparent pockets for replaceable inserts	To select UU and zone	«1»…«9»
6	Group of buttons «1»…«8» with LEDs «ALARM»	To activate alarm. Button-activated signals are programmed beforehand	«1»…«8»
7	Built-in microphone	To transmit voice communication	
8	«RESET» button	To reset current alarm	«RESET»
9	Lock button	To lock and unlock alarm buttons	
10	«ALL» button	To select (connect to) all connected UUs and zones to CU	«ALL»
Group of buttons			
11	«CALL» button	To initiate a call	«CALL»
	«END» button with LED	To finish up communication	«END»
	«MIC» button with LED	To switch on a microphone	«MIC»
	«AUX» button with LED	To switch on broadcasting from entertainment program source	«AUX»
	«MIC CTRL» button [1)]	—	«MIC CTRL»
	«VOLUME» button with LEDs	To turn up / down the volume	«VOLUME»
	«DIM» button with LED	Button and LEDs backlight dimming	«DIM»

[1)] The button is not in operation at the moment.

2.2 MICROPHONE PANEL CP TYPE

2.2.1 Description

CP transmit voice communication to zones.

Design:

1) single–channel, 3 zones:

– CP-3-PM (panel mounting);

– CP-3-WM (wall mounting);

– CP-3-TM (bracket-mounted);

– CPW-3 (wall mounting, waterproof);

2) single–channel, 6 zones:

– CP-6-PM (panel mounting);

– CP-6-WM (wall mounting);

– CP-6-TM (bracket-mounted);

– CPW-6 (wall mounting, waterproof).

2.2.2 Controls and indication

For the appearance of CPs controls and LEDs, see Figure 3. For the description of MPs controls and LCDs, see Table 7.

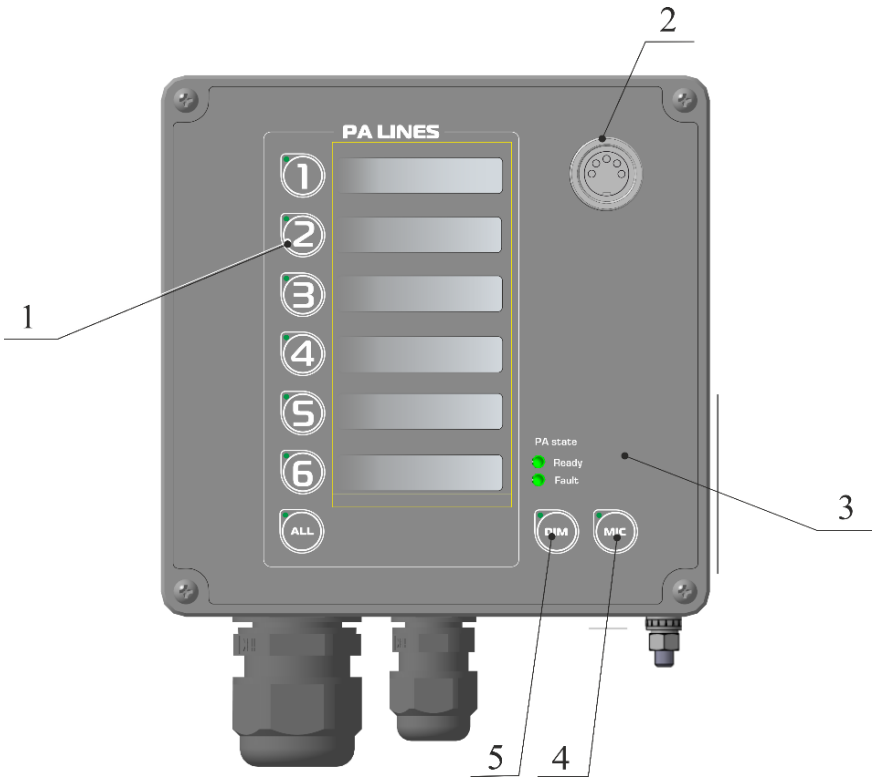


Figure 3 – Sample appearance of CP-6-WM controls and LEDs

Table 7 – Description of CP controls and LEDs

№	Controls and LEDs	Description	Identifier
1	Group of buttons «1»…«6» with LEDs «PA LINES»	«1»…«6»	To select zones. *Constant glowing* – Zone is selected
	«ALL» button with LED	«ALL»	To select all zones
2	Connector	—	For external microphone
3	LED group «PA state»	«Ready»	CP is connected to CU and ready for operation
		«Fault»	CU signal is lost or CP error
4	«MIC» button with LED	«MIC»	To switch on (off) microphone. *Constant glowing* – microphone is on
5	«DIM» button with LED	«DIM»	Backlight brightness dimming

2.3 TALK-BACK STATIONS S TYPE

2.3.1 Description

S ensure talk-back public address communication with one pre-defined user.

Design:

1) equipped with integrated microphone and loudspeaker:

– S1-WM (wall mounting);

– S1-PM (panel mounting);

– S1W (wall mounting, waterproof);

2) equipped with integrated microphone and loudspeaker, 5 subscriber selection buttons:

– S1-5-WM (wall mounting);

– S1-5-PM (panel mounting);

3) equipped with integrated microphone and loudspeaker, 3 subscriber selection buttons:

– S1-3-WM (wall mounting);

– S1-3-PM (panel mounting);

4) equipped with integrated loudspeaker and microphone connector:

– S2-WM (wall mounting);

– S2-PM (panel mounting);

5) equipped with integrated loudspeaker and microphone connector, 5 subscriber selection buttons:

– S2-5-WM (wall mounting);

– S2-5-PM (panel mounting);

6) equipped with integrated loudspeaker and microphone connector, 3 subscriber selection buttons:

– S2-3-WM (wall mounting);

– S2-3-PM (panel mounting);

7) equipped with an external alarm (incoming call) circuit connector and microphone connector, waterproof, wall mounting: S3.

2.3.2 Controls and indication

Controls and LEDs of S are shown in Figures 4–8. For the description of controls and LEDs, see Tables 8–10.

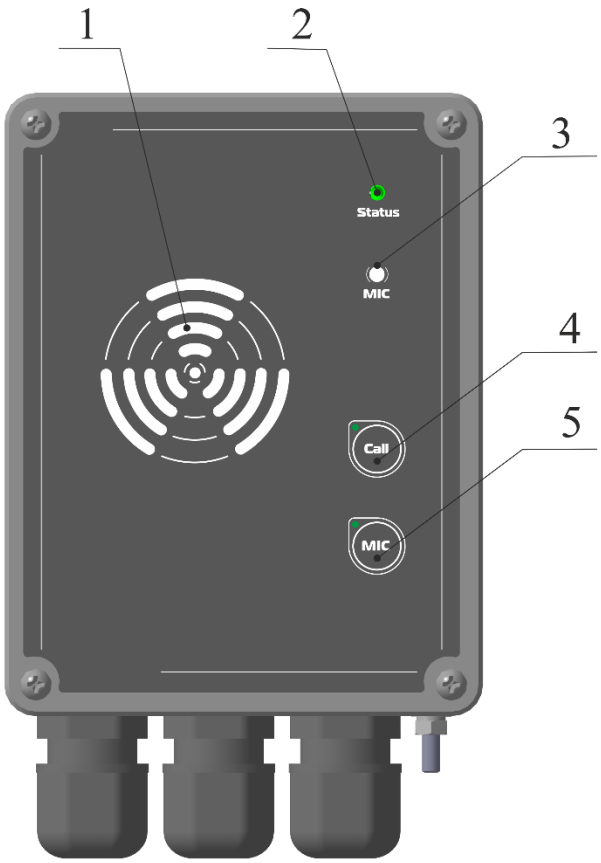


Figure 4 – Appearance of S1-WM controls and LEDs

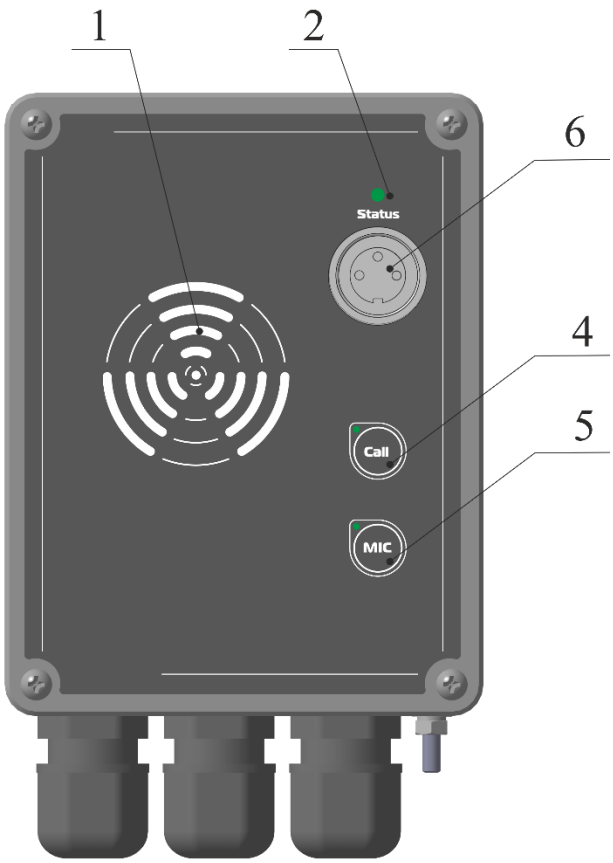


Figure 5 – Appearance of S2-WM controls and LEDs

Table 8 – Controls and LEDs of S1-WM and S2-WM

№	Controls and LEDs	Description	Identifier
1	Built-in speaker	—	To reproduce voice communication and call signal
2	«Status» LED	«Status	*Constant green glowing* – correct functioning and ready for operation. *No glowing* – no power supply, user line error. *Constant red glowing* – loss of connection or error
3	Built-in microphone	—	To transmit voice communication
4	«CALL» button with LED	«CALL»	Ensures a call to assigned UU. Functions of button in LS mode: – *press the button in standard operation mode* – to make a call; – *press the buton second time during outgoing call* – to stop outgoing call; – *press the button in communication mode (during conversation)* – to stop communication; – *press the button during incoming call* – to accept incoming call. Description of LEDs operation modes (next to button): – *constant glowing* – connection to assigned UU is established; – *flashing in mode see Table 11, position 3* – outgoing call to UU assigned to the button; – *flashing in mode see Table 11, position 2* – incoming call from UU assigned to the button
5	«MIC» button with LED	«MIC»	To switch on microphone. *Constant glowing* – microphone is on. *No glowing* – microphone is off
6	Connector	—	To connect external communication device (microphone, headset)

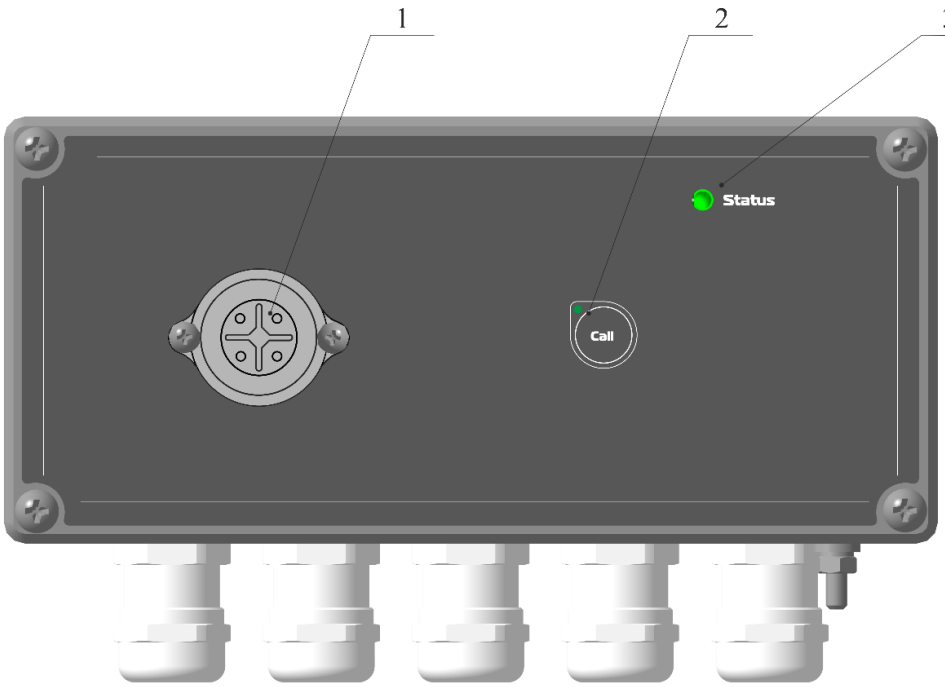


Figure 6 – Appearance of S3 controls and LEDs

Table 9 – Controls and LEDs of S3

№	Controls and LEDs	Description	Identifier
1	Connector	—	To connect external communication device (microphone, headset)
2	«CALL» button with LED	«CALL»	Ensures a call to assigned UU. Functions of button in LS mode: – *press the button in standard operation mode* – to make a call; – *press the buton second time during outgoing call* – to stop outgoing call; – *press the button in communication mode (during conversation)* – to stop communication; – *press the button during incoming call* – to accept incoming call. Description of LEDs operation modes (next to button): – *constant glowing* – connection to assigned UU is established; – *flashing in mode see Table 11, position 3* – outgoing call to UU assigned to the button; – *flashing in mode see Table 11, position 2* – incoming call from UU assigned to the button
3	«Status» LED	«Status	*Constant green glowing* – correct functioning and ready for operation. *No glowing* – no power supply, user line error. *Constant red glowing* – loss of connection or error

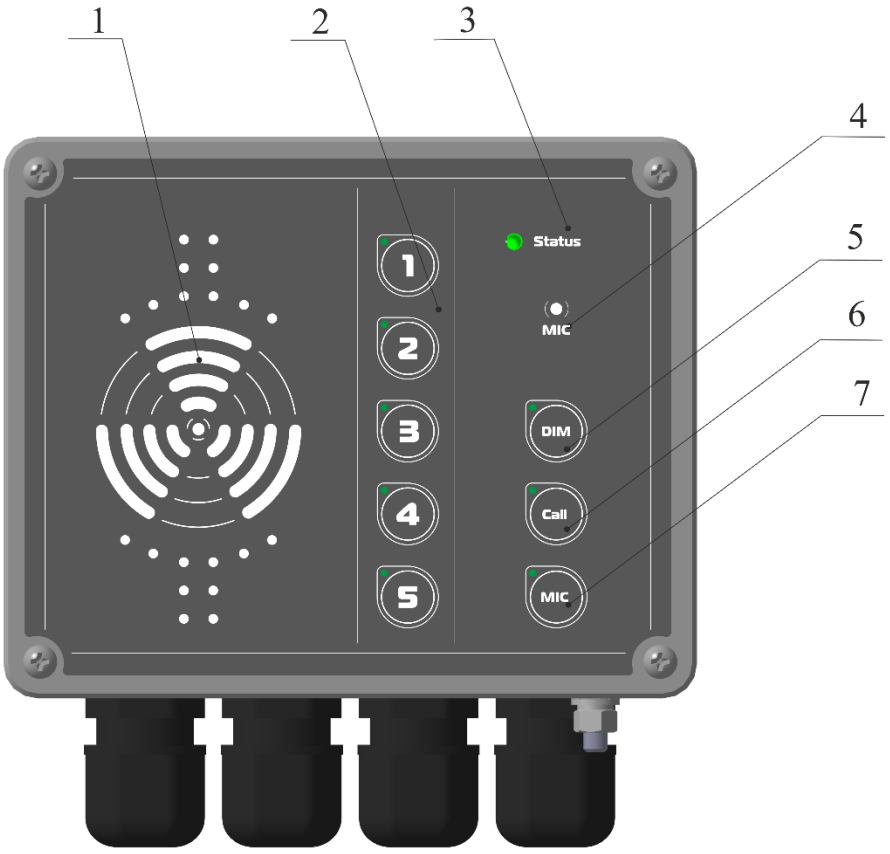


Figure 7 – Appearance of S1-5-WM controls and LEDs

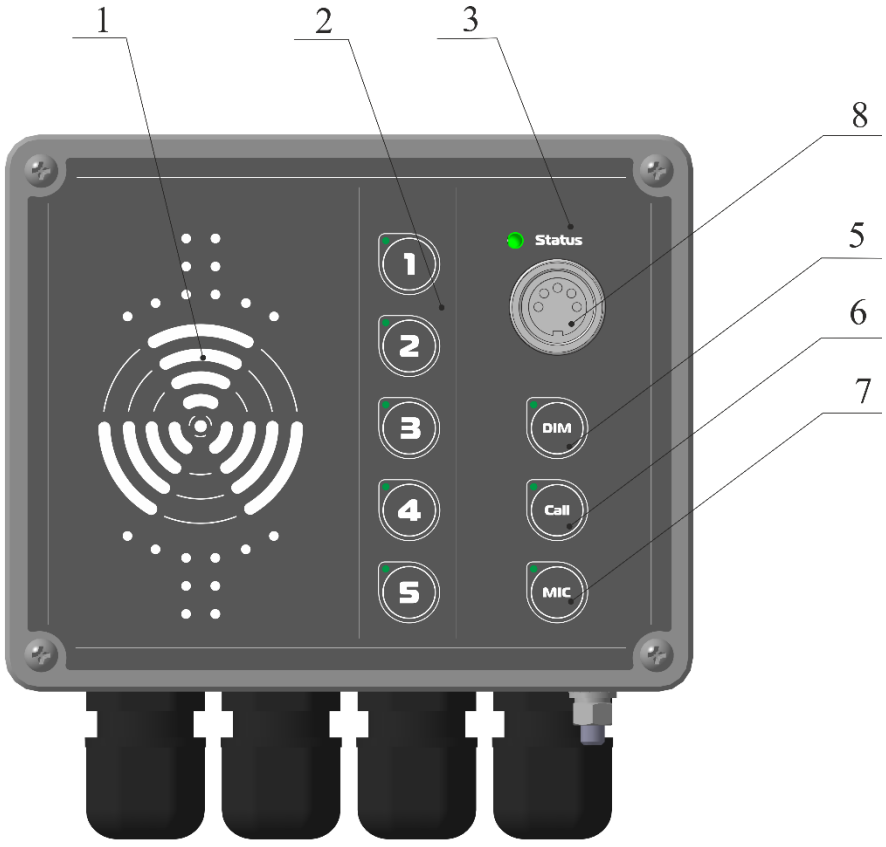


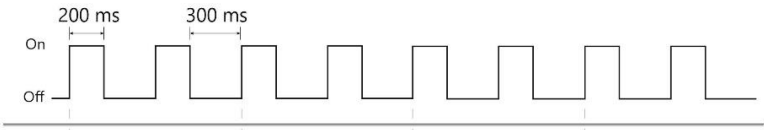
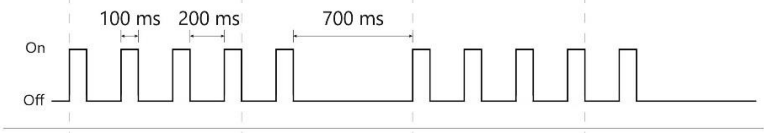
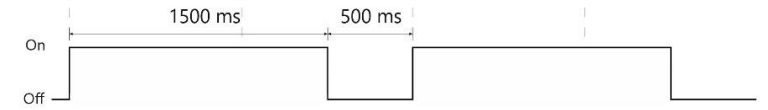
Figure 8 – Appearance of S2-5-WM controls and LEDs

Table 10 – Controls and LEDs of S1-5 and S2-5

№	Controls and LEDs	Description	Identifier
1	Built-in speaker	—	To reproduce voice communication and call signal
2	Group of buttons «1»…«5» with LEDs	«1»…«5»	Select called UU in LS mode. Functions of buttons «1» ... «5» in LS mode: – *press the button in standard operation mode* – to make a call; – *press the button second time during outgoing call* – to stop outgoing call; – *press the button in communication mode (during conversation)* – to stop connection; – *press the button during incoming call* – to accept incoming call. Description of LEDs operation modes (next to button): – *no glowing* – UU is not assigned to the relevant user line, or connection with UU is absent; – *constant glowing* – connection to UU assigned to the relevant user line is established; – *flashing in mode see Table 11, position 1* – loss of connection with UU assigned to the relevant user line; – *flashing in mode see Table 11, position 2* – incoming call from UU assigned to relevant user line; – *flashing in mode see Table 11, position 3* – outgoing call to UU assigned to the relevant user line
3	«Status» LED	«Status	*Constant green glowing* – correct functioning and ready for operation. *No glowing* – no power supply, user line error. *Constant red glowing* – loss of connection or error
4	Built-in microphone	—	To receive voice communication
5	«DIM» button with LED	«DIM»	To change (decrease) button and LEDs stepwise backlight brightness with step 20%
6	«CALL» button with LED	«CALL»	Ensures a call to assigned UU. Functions of button in LS mode: – *press the button in standard operation mode* – to make a call; – *press the buton second time during outgoing call* – to stop outgoing call; – *press the button in communication mode (during conversation)* – to stop communication; – *press the button during incoming call* – to accept incoming call.

№	Controls and LEDs	Description	Identifier
			Description of LEDs operation modes (next to button): – *constant glowing* – connection to assigned UU is established; – *flashing in mode see Table 11, position 3* – outgoing call to UU assigned to the button; – *flashing in mode see Table 11, position 2* – incoming call from UU assigned to the button
7	«MIC» button with LED	«MIC»	To switch on microphone. *Constant glowing* – microphone is on. *No glowing* – microphone is off
8	Connector	—	To connect external communication device (microphone, headset)
* Button «CALL» of talk-back stations S1-3, S1-5 and S2-3, S2-5 ensures only a warning signal supplied to user during current communication.			

Table 11 – Graphical representation of UUs indication

Pos.	Name of mode	Graphical representation of UUs indication
1	Loss of connection	
2	Incoming call from UU	
3	Outgoing call to UU	
Note – «Loss of connection» mode (position 1) is related to «Fault» LED of substation panels and switches on in case of connection loss between CU and one or several UUs; this mode is also related to LEDs of user select buttons, which switches on in case of connection loss with UU assigned to relevant user line.		

2.4 AMPLIFIER TPA-15

2.4.1 Description

TPA-15 amplifies sound signals received from microphone, ISDN line or line sound signal.

2.4.2 Controls and indication

Controls and LEDs of TPA-15 are shown in Figure 9. For the description of controls and LEDs, see Table 12.

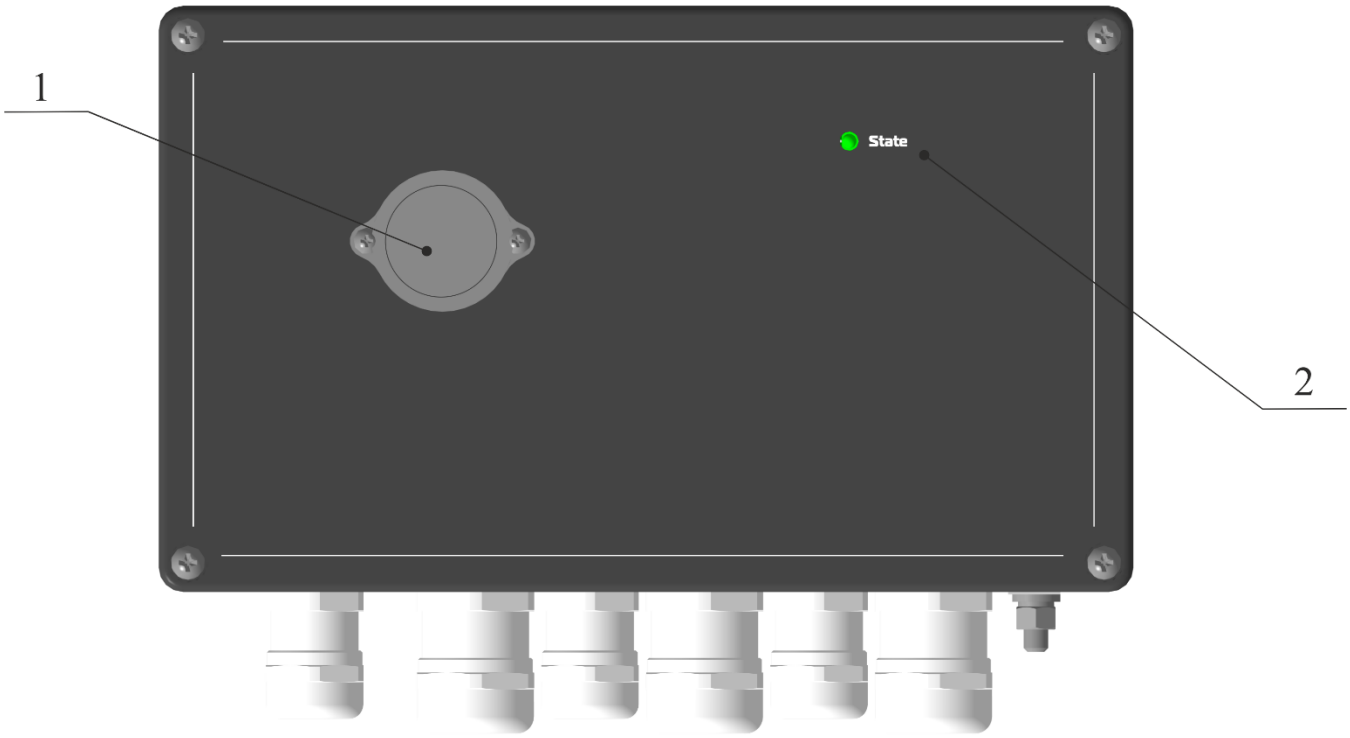


Figure 9 – Appearance of TPA-15 controls and LEDs

Table 12 – Controls and LEDs of TPA-15

№	Controls and LEDs	Description	Identifier
1	Waterproof connector Weipu WA22K4Z2	—	Connector for external microphone
2	«State» LED	«State»	*No glowing* – device or user line error. *Constant glowing* – correct functioning and ready for operation

2.5 LOUDSPEAKERS LS TYPE

LS ensure broadcasting, different acoustic signaling, and voice communication in public address systems.

2.5.1 Loudspeakers LS-1

LS-1 has a metal casing, compact, built into ceiling/side ceiling, only for inside premises.

Design:

– LS-1 (input voltage 30 V, power 6 W);

– LS-1/100 (input voltage 100 V, power 6.0, 3.0, 1.5, 0.5 W).

2.5.2 Loudspeakers LS-2

LS-2 has a metal casing, compact, wall-mounted, only for inside premises, power 6.0; 3.0; 1.5 W.

Design:

– LS-2 (input voltage 30 V);

– LS-2/100 (input voltage 100 V).

2.5.3 Loudspeakers LS-3

LS-3 has a plastic casing, wall-mounted, for deck and inside premises.

Design:

– LS-3/10 (input voltage 30 V, power 10 W);

– LS-3/15 (input voltage 30 V, power 15 W);
– LS-3/100/10 (input voltage 100 V, power 10 W);
– LS-3/100/15 (input voltage 100 V, power 15 W);
– LS-3/100/20 (input voltage 100 V, power 20 W);
– LS-3/100/30 (input voltage 100 V, power 30 W).

2.5.4 Loudspeakers LS-5

LS-5 has a wooden casing with brackets for wall mounting, only for inside premises.

Design:

– LS-5 (input voltage 30 V, power 6 W);

– LS-5/100 (input voltage 100 V, power 6.0; 3.0; 1.5; 0.5 W).

2.5.5 Loudspeakers LS-6

LS-6 has an aluminum casing, waterproof, wall-mounted, for deck and inside premises.

Design:

– LS-6 (input voltage 30 V, power 6 W);

– LS-6/100 (input voltage 100 V, power 6.0; 3.0; 1.5; 0.5 W).

2.5.6 Loudspeakers LS-7

LS-7 has a plastic casing, wall-mounted, compact, for deck and inside premises.

Design:

– LS-7 (input voltage 30 V, power 8 W);

– LS-7/100 (input voltage 100 V, power 8.0; 4.0; 2.0; 1.5; 0.7; 0.4 W).

2.5.7 Loudspeakers LS-8

LS-8 has a metal casing, horn-type on a bracket, wall-mounted, for deck and inside premises.

Design:

– LS-8/10 (input voltage 30 V, power 10.0; 5.0; 2.5 W);

– LS-8/25 (input voltage 30 V, power 25.0; 12.5; 6.0 W).

2.5.8 Loudspeakers LS-13

LS-13 has a plastic all-weather casing in a shape of searchlight with a bracket, wall-mounted or ceiling, for deck and inside premises.

Design:

– LS-13/10 (input voltage 30 V, power 10.0; 5.0; 3.5; 2.5; 1.5; 0.8 W);

– LS-13/10D (input voltage 30 V, power 10.0; 5.0; 3.5; 2.5; 1.5; 0.8 W).

2.6 EXTERNAL COMMUNICATION DEVICES

2.6.1 Microphone M1

M1 has a gooseneck and quick connector. M1 is used with CP or S.

2.6.2 Microphone M2

M2 connect to microphone panels.

M2, manual with PTT switch (splash proof); equipped with a quick connector with cord length 1.5 m (stretched).

2.6.3 Microphone M3-W

M3-W, manual with PTT switch (waterproof); equipped with a quick connector. M3-W is used with CP or S.

Design:

– M3-W (cord length 3 m);

– M3-10W (cord length 10 m).

2.6.4 Headset HS-4

HS-4 ensures talk-back communication in noisy areas. Connected only to S3. HS-4 has two headphones.

Design:

– HS-4 (crimped ends);

– HS-4C (straight plug connector);

– HS-4AC (angle plug connector).

2.6.5 Headset HS-6

HS-6 ensures talk-back communication in noisy areas. Connected only to S3. HS-6 has one headphone.

Design:

– HS-6 (crimped ends);

– HS-6C (straight plug connector);

– HS-6AC (angle plug connector).

2.6.6 Intercom helmet TH-4M

Intercom helmet with a microphone, 3 m cable and manual switch.

Summer design:

– TH-4M-S (crimped ends);

– ТШ-4М-S-C (straight plug connector);

– ТШ-4М-S-CA (angle plug connector).

Winter design:

– TH-4M-W (crimped ends);

– ТШ-4М-W-C (straight plug connector);

– ТШ-4М-W-CA (angle plug connector).

2.6.7 Intercom helmet TH-4L

Intercom helmet with a throat microphone, 3 m cable and manual switch.

Summer design:

– TH-4L-S (crimped ends);

– ТШ-4L-S-C (straight plug connector);

– ТШ-4L-S-CA (angle plug connector).

Winter design:

– TH-4L-W (crimped ends);

– ТШ-4L-W-C (straight plug connector);

– ТШ-4L-W-CA (angle plug connector).

2.7 SIGNALING UNITS

2.7.1 Rotating lamps RL-24, RL-220

RL-24, RL-220 ensure light alarm signaling on open deck and in noisy areas, wall mounting on a bracket, only on vertical plane, orange, blue, red and green globes.

Design:

– RL-24-O (input voltage 24 VDC, orange globe);
– RL-220-O (input voltage 220 VAC, orange globe);
– RL-24-B (input voltage 24 VDC, blue globe);
– RL-220-B (input voltage 220 VAC, blue globe);
– RL-24-R (input voltage 24 VDC, red globe);
– RL-220-R (input voltage 220 VAC, red globe);
– RL-24-G (input voltage 24 VDC, green globe);
– RL-220-G (input voltage 220 VAC, green globe).

2.7.2 Flashing lamp FL-24

FL-24, FL-220 ensure light alarm signaling on open deck and in noisy areas, beacon, wall mounting on a bracket, only on vertical plane with red, orange, white, blue and green globes.

Design:

– FL-24-O (orange globe);
– FL-24-B (blue globe);
– FL-24-R (red globe);
– FL-24-G (green globe);
– FL-24-W (white globe).

2.7.3 Rotating flashing lamp RFL-24, RFL-220

RFL-24, RFL-220 ensure light alarm signaling on open deck and in noisy areas, wall mounting with red, orange, blue and green globes.

Design:

– RFL-24-O (input voltage 24 VDC, orange globe);
– RFL-220-O (input voltage 220 VAC, orange globe);
– RFL-24-B (input voltage 24 VDC, blue globe);
– RFL-220-B (input voltage 220 VAC, blue globe);
– RFL-24-R (input voltage 24 VDC, red globe);
– RFL-220-R (input voltage 220 VAC, red globe);
– RFL-24-G (input voltage 24 VDC, green globe);
– RFL-220-G (input voltage 220 VAC, green globe).

2.7.4 Light signaling unit L-24, L-220

L-24, L-220 ensure light alarm signaling on open deck and in noisy areas, beacons, wall mounting, with red, orange, white, green and blue globes.

Design:

– L-24-O (input voltage 24 VDC, orange globe);
– L-220-O (input voltage 220 VAC, orange globe);
– L-24-B (input voltage 24 VDC, blue globe);
– L-220-B (input voltage 220 VAC, blue globe);
– L-24-R (input voltage 24 VDC, red globe);
– L-220-R (input voltage 220 VAC, red globe);
– L-24-G (input voltage 24 VDC, green globe);
– L-220-G (input voltage 220 VAC, green globe);
– L-24-W (input voltage 24 VDC, white globe);
– L-220-W (input voltage 220 VAC, white globe).

2.7.5 Sound signaling unit A-24, A-220, A2-24, A2-220

A-24, A-220, A2-24, A2-220 ensure sound alarm signaling on open deck and in noisy areas, wall mounting.

Design:

– A-24 (input voltage 24 VDC);
– A-220 (input voltage 220 VAC);
– A2-24 (input voltage 24 VDC);
– A2-220 (input voltage 220 VAC).

2.7.6 Howler HW1-24, HW1-220

HW1-24, HW1-220 ensure sound alarm signaling on open deck and in noisy areas, wall mounting.

Design:

– HW1-24 (input voltage 24 VDC);

– HW1-220 (input voltage 220 VAC).

2.7.7 Buzzer-howler BH1-24, BH1-220

BH1-24, BH1-220 ensure sound alarm signaling on open deck and in noisy areas, wall mounting.

Design:

– BH1-24 (input voltage 24 VDC);

– BH1-220 (input voltage 220 VAC).

2.7.8 Sound and light signaling unit AL-24, AL-220

AL-24, AL-220 ensure sound and light alarm signaling on open deck and in noisy areas, wall mounting.

Design:

– AL-24-O (input voltage 24 VDC, orange globe);
– AL-220-O (input voltage 220 VAC, orange globe);
– AL-24-B (input voltage 24 VDC, blue globe);
– AL-220-B (input voltage 220 VAC, blue globe);
– AL-24-R (input voltage 24 VDC, red globe);
– AL-220-R (input voltage 220 VAC, red globe);
– AL-24-G (input voltage 24 VDC, green globe);
– AL-220-G (input voltage 220 VAC, green globe);
– AL-24-W (input voltage 24 VDC, white globe);
– AL-220-W (input voltage 220 VAC, white globe).

2.7.9 Light signaling unit PGS-VSPYSHKA-24, PGS-VSPYSHKA-220

PGS-VSPYSHKA-24, PGS-VSPYSHKA-220 ensure light alarm signaling in explosion hazard areas, wall mounting.

Design:

– PGS-VSPYSHKA-24 (input voltage 24 VDC);

– PGS-VSPYSHKA-220 (input voltage 220 VAC).

2.7.10 Sound signaling unit BExS110E24DC, BExS110E230AC

BExS110E24DC, BExS110E230AC ensure sound alarm signaling in explosion hazard areas, wall mounting.

Design:

– BExS110E24DC (input voltage 24 VDC);

– BExS110E230AC (input voltage 220 VAC).

2.7.11 Light signaling unit ORBITA MK S, sound signaling unit ORBITA MK Z, sound and light signaling unit ORBITA MK SZ

ORBITA MK S, ORBITA MK Z, ORBITA MK SZ ensure light alarm signaling, sound alarm and sound light alarm in explosion hazard areas, wall mounting.

Design:

– ORBITA MK S (light alarm);

– ORBITA MK SZ (sound light alarm);

– ORBITA MK Z (sound alarm).

3 INTENDED USE

3.1 OPERATION LIMITATIONS

Connect the SC according to connection diagram and table of connections applied for this order. All SC shall have reliable grounding; all cables shall be isolated; make sure there are not any non-isolated cable ends.

Select a place for SC installation considering operation limitations (operating temperature, IP rating and explosion proof rating).

ATTENTION!

Install LS on minimum distance of 3 m from microphones of communication devices and CP in order to avoid self-excitation effect

3.2 USAGE PREPARATIONS

3.2.1 Safety features

Before using the System, provide the following steps:

– train the staff to operate the System, test and control the equipment, and familiarize with occupational safety required for the operation;

– familiarize the staff with all grounding points; check grounding;

– use fuses from SPTA kit;

– de-energize all devices before disconnecting cables, replacing fuses, units and modules;

– the installer shall follow «The technical rules for operation of electric installation» and «Safety rules for operation of electric installation» while testing electrical circuits and insulation resistance.

3.2.2 Visual check procedure

Before switching the SC on, the installer shall:

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

– clean the SC from dust and dirt by clean soft cloth, if necessary;

– check fail-safe cable connections to the SC and their proper grounding.

3.3 USAGE OF THE SYSTEM

3.3.1 Connection

Connect communication units and general alarm units according to CU connection diagram, see ANNEX A.

Layout of boards is shown in Figure 10. For the description of CU boards, see Table 13.

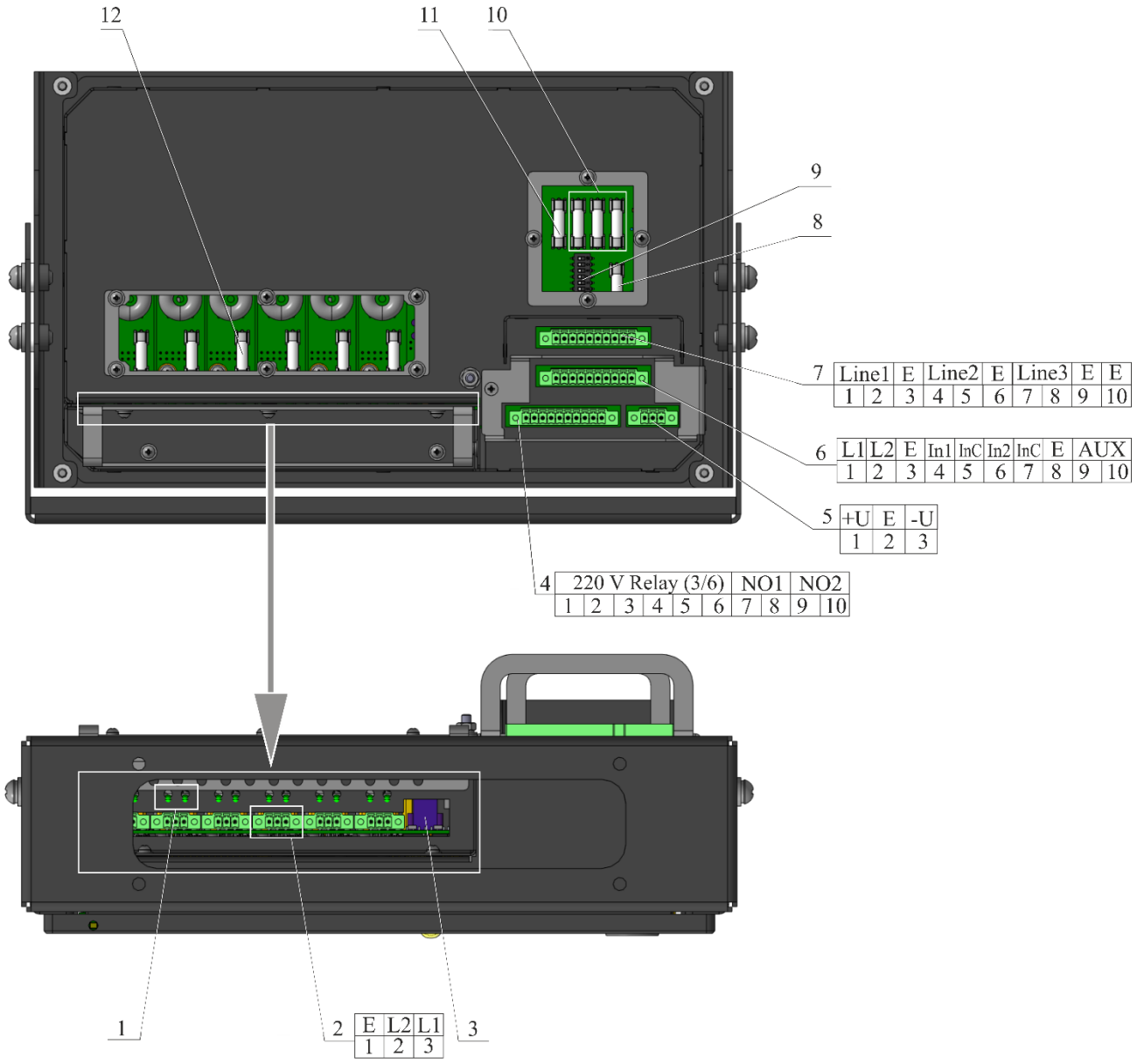


Figure 10 – CU connection

Table 13 – Description of CU boards

№	Name	Description	Identifier
1	LED pair of communication line operation	To display operation of zones	—
2	CU ports	To connect communication devices	X1…X6
3		To connect other CUs or Ethernet network	XS1 «LAN»
5		To connect power to CU	XS5
4		To connect external systems	XS4
6			XS3
7		Zones outputs №1…№3 to connect LS (30 V)	XS2
8	Fuse	To protect input circuit against current overload	F355
9	Switch	CU settings	SW350
10	Fuses	To protect power circuits of ports X1-X6 against current overload	F1…F6
11		To protect power circuits of ports X1-X6 against current overload	F350…F352
12		To protect zones circuits against current overload	F356

Select power source for the System considering total power consumption of all SC in the System's scope of delivery (including CU).

Note – The System composition does not include main / standby power switching units. Use power supply units for this purpose.

3.3.2 System settings

To connect the SC and provide for the System settings, use Tables 14 and 15 and Figure 10.

For more information on SC settings see Settings instructions.

ATTENTION!

Only engineers of «NPK MSA» LLC or their authorized representatives shall carry out the SC settings in order to ensure safe and correct operation of the System

Table 14 – Description of the SC settings and connection

Connector	Contacts	Description
XS4	3, 6	To control external alarm units. Actuated by an incoming call to CU. Position 9 pin SW350 ↑ contacts 2,5-XS4 are closed at incoming call. Position 9 pin SW350 ↓ contacts 2,5-XS4 are closed once manual alarm (CU panel button) or external alarm are actuated
	7, 8, 9, 10	To control external alarm units, see Table 15
XS3	1, 2, 3	To connect external loudspeaker. Repeats operation of built-in CU loudspeaker
	4, 5	To control alarm 1. Once contacts are closed, alarm (assigned to button 1) is actuated
	6, 7	To control alarm 2. Once contacts are closed, alarm (assigned to button 2) is actuated (if contacts of alarm 1 are not closed)
	8, 9, 10	Input to connect external source of entertainment programs
XS2	1, 2, 3	To connect loudspeaker zone1
	4, 5, 6	To connect loudspeaker zone2
	7, 8, 9	To connect loudspeaker zone3
X1…X6	1, 2, 3	To connect public address communication devices
XS1«LAN»	RJ-45	To connect Ethernet network
XS5	1, 2, 3	To connect CU power (24 V DC)

Table 15 – Control external alarm units

Position 5 pin SW350	Contacts status		Description of function
	7, 8	9, 10	
"↑" (on)	–	–	CU in operation
"↓" (off)	closed	–	
"↑" (on)	closed	closed	Zones transmission
"↓" (off)	–	closed	

3.3.3 Cable requirements

To connect SC, apply flame-resistant cables according to part XI of the RMRS Rules, 16.5 and part VI of the RRR Rules, 12.1.1. For the instructions on cables, see Table 16.

Table 16 – Cable instructions

Cable		Cable cross-section
Power supply 24 V DC		Cross section is calculated depending on total power consumption (at least 1 mm^2, shielded)
User substations (ISDN line)		2x0.5 (э) mm^2
Loudspeakers		2x0.75 (э) mm^2
Signaling units (electric power supply)	220 V AC, 50 (60) Hz	2x0.75 (э) mm^2
	24 V DC	Cross section is calculated depending on permissible supply voltage range of signaling unit, power of all signaling units and cable length (at least 0.75 mm^2, shielded)

3.3.4 Operation of the SC

3.3.4.1 Connection between CU and users. Pair communication / Selective CNF communication modes

Initiator:

1) press buttons «1»…«9» on the CU control panel to select one or several UUs (totally six). Selected UU will receive a call signal. Wait for the answer. If CU priority is higher than priority of called UU, connection will be established immediately;

2) to transmit voice communication, press «MIC» button or PTT switch and clearly say a command to microphone;

3) to stop communication, press button of the UU again, or «END» button.

User: to answer the call, press the button of calling user.

Notes

1 To apply selective CNF with all UUs (totally six), and all zones (totally three), use «ALL» button on the CU control panel.

2 Calling user may recall the called user during current communication to draw additional attention (if necessary); recall to the substation using «CALL» button.

3.3.4.2 General list (all) communication mode

Initiator:

1) to apply this mode, press «MIC» button or PTT switch, when there is no current communication or announcements;

2) once the button is pressed, all zones and public address users connect automatically;

3) to transmit command, clearly say it into a microphone;

4) to finish up communication, press «MIC» button, or PTT switch again, or «END» button.

Note – Participants of General list (all) mode are not available for other calls. Calling users will receive *Busy* signal.

Only initiator can disconnect users from this communication mode. Users cannot disconnect independently.

Once General list (all) mode is applied, all current connections will be reset.

3.3.4.3 Communication transmission to zones

Press corresponding buttons of one or several zones on the CU control panel, then press «MIC» button or PTT switch, clearly say a command into a microphone. LEDs of selected buttons will be illuminated.

To finish up communication, switch off a microphone by «MIC» button or PTT switch, and press illuminated buttons of the selected zones again.

3.3.4.4 Alarm activation

To initiate alarm, press corresponding button on the CU control panel. LED of selected alarm (button) will be glowing.

ATTENTION!

CU panel is equipped with lock button, which protects alarm buttons against stray key stroke. To unlock alarm buttons, press  , and then press necessary alarm button

Note – If voice communication interrupts active alarm (for example, from microphone panels), it will be resumed as soon as voice communication finishes.

3.3.4.5 Entertainment broadcasting from external source

Press «AUX» button on the CU control panel to start entertainment broadcasting.

Entertainment source broadcasts programs from a loudspeaker.

Press buttons «1» .. «9» on the CU control panel to select one or several users (six in total) and (or) one or several zones (three in total).

Press button of corresponding user line or zone again to stop broadcasting to this user line or zone; press «END» to stop broadcasting to all selected user lines and zones.

Note – Eo connect all users (six in total) and zones (three in total) to entertainment broadcasting, press button «ALL» on the CU control panel.

3.3.4.6 Connection between Talk-back stations and CU. Pair communication / Selective CNF mode

Initiator:

1) to transmit sound signal from the System UU to user substation, press «CALL» button or button of UU for SX-X and PHS-X. Wait for the answer of called user (if substation priority is higher than priority of called UU, connection will be established immediately);

2) to initiate voice communication, press «MIC» button (if present) or PTT switch and clearly say a command into a microphone;

3) to finish up communication, press «CALL» button or UU button for SX-X and PHS-X, or «END» button.

User:

1) to take a call, press button «CALL» or user button of UU for SX-X and PHS-X;

2) to initiate communication, press «MIC» button (if present) or PTT switch and clearly say a command into microphone.

Note – In other modes devices S-X may perform only user's functions. Connection to initiator's modes is carried out automatically.

4 TECHNICAL SERVICE

4.1 General description

Before performing the TS the staff shall familiarize with the System composition, structure and operation features.

In order to provide safe and reliable operation of the System, the staff shall carry out TS-1 and TS-2.

TS-1 is carried out on equipment in operation. The TS № 1 results are registered in log of operation (duty log).

TS-2 is carried out on equipment in operation.

The TS № 2 results are registered in the System certificate.

4.2 Safety features

While maintaining TS, observe 5.2 of this OM.

4.3 Maintenance routine

The list of works for all types of TS is given in Table 17. Maintenance routine procedure is given in CL, represented in Tables 18 – 21. Amount of consumables required for TS is shown in Table 5.

Table 17 – List of works for the System SC

CL №	Work	Type of TS	
		TS-1	TS-2
1	Visual check of the SC	+	+
2	Operational test of the SC	–	+
3	Testing command public address, general alarm and entertainment broadcasting modes	–	+
4	Checking the scope of delivery, SPTA kit condition and operation documentation	–	+
Note: «+» – work is obligatory. «–» – work is not obligatory.			

Table 18 – CL № 1. Visual check of the SC

To be done	Routine	Man-hours per 1 SC
Visually examine the SC	1) check appearance of the SC; mechanical damage, paint defects must be absent; marking plates shall be present; legends are to be read easily; 2) clean up the SC surfaces with clean cloth; 3) remove severe contamination, parts of corrosion, oil spots: – from front surfaces – using soap foam preventing it against penetration inside the SC, then all surfaces clean dry by clean cloth and dry up; – from other surfaces – using alcohol soaked cloth; 4) if varnish paint coating is damaged, polish it with sand paper, then clean with alcohol-soaked cloth, cover with varnish AK-113 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 19 – CL № 2. Check of the SC operation

To be done	Routine	Man-hours per 1 SC
Check System operation	Check the following: 1) «READY» LED shall be glowing; «FAULT» LED on the CU shall not be glowing; 2) operation condition of user lines – pair of LEDs above connectors «X1»… «X6» on CU; 3) *«Status»* LED glowing on user substation	1 person 10 minutes per 1 SC

Table 20 – CL № 3. Check operation of command transmission, general alarm and entertainment broadcasting

To be done	Routine	Man-hours per 1 SC
Check operation of command transmission, general alarm and entertainment broadcasting	1) transmit commands to zones, control adherence of priorities, see 1.3.3; 2) activate alarm (see 3.3.4.4), control adherence of priorities, see 1.3.3; 3) initiate entertainment broadcasting, control adherence of priorities, see 1.3.3	2 persons 1 hour 2 persons 1 hour 2 persons 15 minutes

Table 21 – CL №4. Check of scope of delivery, SPTA kit condition and operational documentation

To be done	Routine	Man-hours per 1 SC
Check of scope of delivery, SPTA kit condition and operational documentation	1) compare SPTA kit items to those listed in operational documentation, see section 4 «The scope of delivery» of the System Certificate; 2) check storage time and quality of every item in case of SPTA kit use (and was completed again); 3) complete SPTA kit if necessary.	1 person 1 hour

4.4 Instructions on SPTA kit

SPTA kit is delivered together with the System and used to support operating condition of the System by replacing faulty SC. SPTA kit composition shall comply with section 4 «The scope of delivery» of the System Certificate.

4.5 Preservation

The System, SPTA kit and set of operational documents are stored in preserved condition in Manufacturer's packaging boxes.

The preservation is done in full terms, for 2 years, applying protection and packaging.

The preservation may be repeated; it is done in heated rooms in the same order as the first one. The System, SPTA kit and set of operational documents preserved for the second time are placed in package.

5 CURRENT REPAIR OF THE SYSTEM

5.1 GENERAL DESCRIPTION

Complete used up portable SPTA kit using basic SPTA kit.

5.2 SAFETY FEATURES

Any repair works must be provided by qualified personnel.

All SC shall be grounded!

Use rubber rug in front of power supply units.

Replacement of fuse links or defective parts, boards and modules when power is ON is STRICTLY PROHIBITED.

It is PROHIBITED to put a poster «DO NOT switch on! Under Operation!», when power supply switch is in OFF position.

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

5.3 CURRENT REPAIR OF THE SC

5.3.1 Current repair of CU

Control CU operation by LED indicator lights of the SC. The list of CU potential malfunctions and troubleshooting is represented in Table 22.

Replace failed SC from portable SPTA kit.

Table 22 – CU potential malfunctions

Malfunction	Potential reasons	To be done
No glowing of pairs of LEDs above connectors «X1» … «X6» on CU	Failure of power circuit and (or) communication line with UU	If power LED is not glowing, check feed network for short circuit. If short circuit was not detected, replace the fuse of the corresponding feed network
		If right LED (communication line operation) is not glowing, test the communication line. If the line is non-faulty, check the end device. If it is switched off – switch it on. If LED is still not glowing, replace the end device (of similar type)

5.3.2 Current repair of microphone panels

Control operation of MPs by LED indicator lights located on the devices casings.

The list of CP potential malfunctions and troubleshooting is represented in Table 23.

Table 23 – Potential problems of MP

Problem	Potential reasons	To be done
«*Fault*» LED is glowing	CU connection is lost	Check condition of cable, reload the System

5.3.3 Current repair of Talk-back stations

Table 24 – Potential malfunctions of alk-back stations

Problem	Potential reasons	To be done
No connection with CU (READY LED is not glowing on the front panel).	Cable break	Check the cable for damage (break). Replace cable or repair it; isolate repaired (replaced) cable
	Board malfunction	Contact the Manufacturer
	CU port malfunction	Connect device to non-faulty CU port

6 STORAGE

The System must be stored in packaging inside areas complying with the required storage conditions (+5°C…+40°C) without exceeding the concentration of dust, oil, moisture and aggressive impurities in the air 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 enclosed 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 working areas).

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 / fastened.

8 DISPOSAL

New equipment, the parts of the System damaged during operation, and any used up equipment must not be disposed as standard household wastes, since they contain the materials suitable for re-use.

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 used up 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 unit 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 OM. 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 site of «NPK MSA», LLC, section Support.

Address and contacts of the Manufacturer's service centre:

«NPK MSA», LLC
26E, Kibalchicha str., 192174, St Petersburg, Russia
Tel.: + 7 (812) 602-02-64, 8-800-100-67-19
fax: +7 (812) 362-76-36
e-mail: service@unicont.com

ANNEX A
CONNECTION DIAGRAM OF SC AND CU

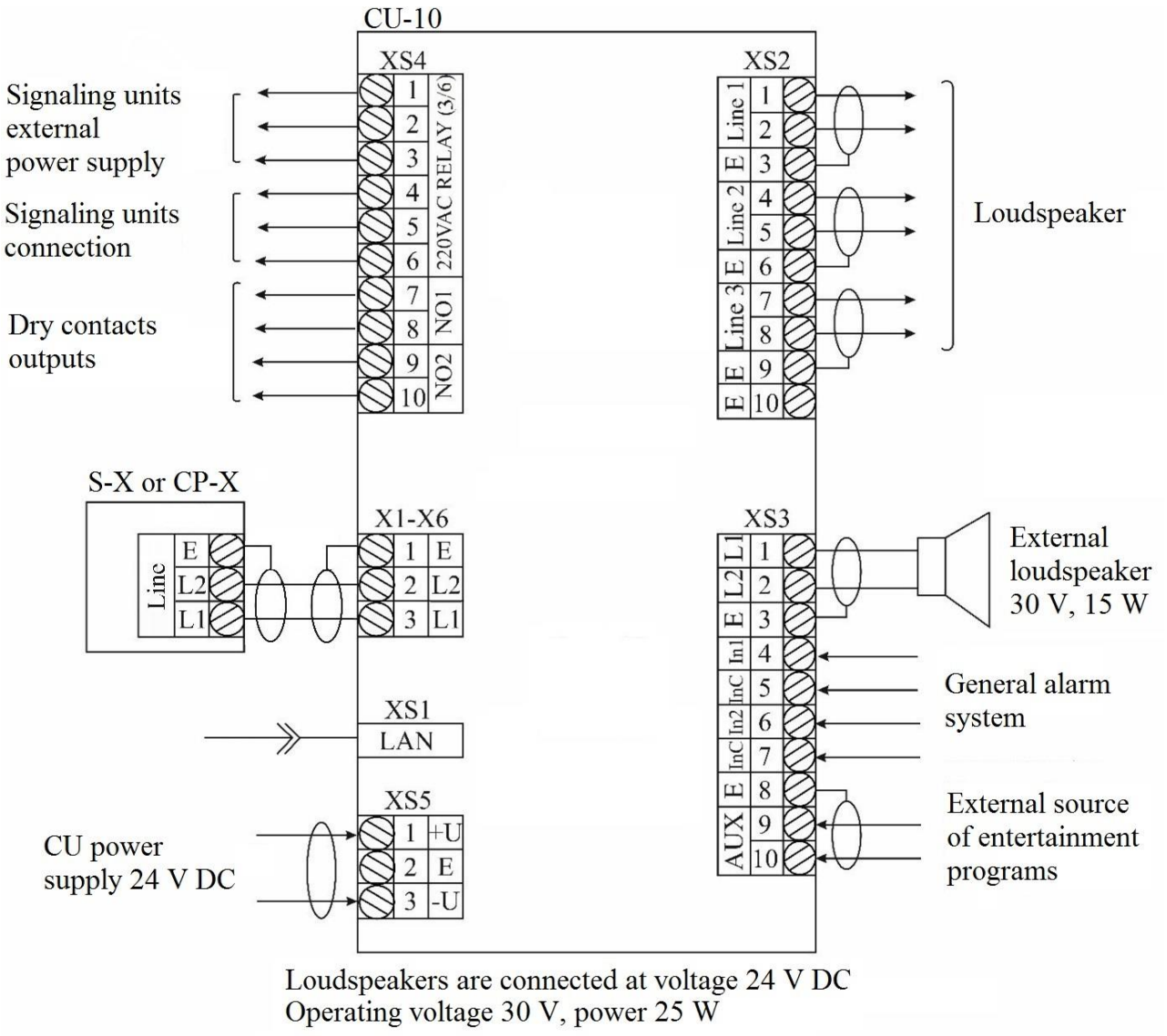


Figure A.1 – Connection diagram of SC and CU

FOR NOTES