



# PUBLIC ADDRESS SYSTEM/GENERAL ALARM SYSTEM TPA-1907

Operating manual



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# **TERMS AND ABBREVIATIONS**

| Amplitude modulation                |  |
|-------------------------------------|--|
| Auxiliary connector                 |  |
| Central unit                        |  |
| Frequency modulation                |  |
| Integrated Services Digital Network |  |
| Local area network                  |  |
| Liquid-crystal display              |  |
| Light-emitting diode                |  |
| Public address communication        |  |
| Public address lines                |  |
| Private Branch Exchange             |  |
| Personal computer                   |  |
| Power over Ethernet                 |  |
| Storage battery                     |  |
| System components                   |  |
| Spare parts, tools and accessories  |  |
| Technical service                   |  |
| Semi-annual technical service       |  |
| Annual technical service            |  |
| Volts of alternating current        |  |
| Volts of direct current             |  |
| Voyage data recorder                |  |
|                                     |  |



Engineering the future

This operating manual covers the composition, design and specifications of Public address system/General alarm system TPA-1907 (hereinafter – the System), SC and instructions for the correct and safe operation of the System (intended use, technical service, current repair), and disposal instructions for the SCs.

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 ASSIGNMENT

The System is designed to provide PAC, emergency notification and entertainment broadcasting on sea and river-going vessels of all classes.

The System is outfitted with various subscriber and peripheral components designed to work in various environmental conditions including noisy areas and areas with a high level of dust and humidity.

## **1.2 TECHNICAL SPECIFICATIONS**

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

| Table 1 – Main | technical | specifications |
|----------------|-----------|----------------|
|----------------|-----------|----------------|

| Parameter                                      | Value  |  |
|--|--|--|
| Quantity of PA lines                           | 3, min.                                      |  |
| Ports to connect microphone panels             | 6 or 12                                      |  |
| Ports to connect alarm panels                  | 2 (6 at option)                              |  |
| Quantity of general alarm circuits             | 5 independent ports                          |  |
| Power amplifier bandwidth, Hz                  | 50 to 15 000                                 |  |
| Electrical sp                                  | ecifications                                 |  |
| PA lines voltage, V                            | 100 (70, 50 and 30 – at option)              |  |
| Power of amplifiers, W                         | 15, 200 or 400 (200 x 2)                     |  |
| Bower supply main V                            | 220 (180 to 264) VAC or                      |  |
| Power suppry, main, v                          | 24 (18 to 36) VDC                            |  |
| Power supply standby V                         | 220 (180 to 264) VAC or                      |  |
| i ower suppry, standby, v                      | 24 (18 to 36) VDC                            |  |
| Linear audio input                             | 0.7 V; 10 kOhm                               |  |
|  | Defined by the total power of the SC, see    |  |
| Power consumption                              | technical description, min. 200 W for a base |  |
|  | configuration                                |  |
| <b>Operational limitations</b>                 |  |  |
| IP rating of the indoor SCs                    | IP22, IP44                                   |  |
| IP rating of the open deck SCs                 | IP56   |  |
| IP rating of the explosion-proof SCs           | IP65, IP66, IP67                             |  |
| Operating temperature of the indoor SCs, °C    | - 15 to + 55                                 |  |
| Operating temperature of the open deck SCs, °C | -40  to + 55                                 |  |



# **1.3.1 General description**

the future

The base configuration of the System functions as an Intercom command system and enables to transmit voice communication via PA lines. The alarm generator initiates an alarm, and the source of entertainment broadcasting plays back radio signals.

The System consists of the mounting rack 19IR or metal cabinet WME with a set of modules for the proper functionality and connected units (microphone panels, loudspeakers, etc.), general alarm units (alarm panels and signaling units) and other peripheral devices.

SC of the following systems manufactured by NPK MSA LLC may be added to the System: digital talk-back system ICB-131, marine automatic telephone system ITS-1004, sound reception system NS-201 if it includes an alarm generator with VDR and fire alarm system.

Figure 1 describes an example of the System composition.



Figure 1 – The System's structural diagram



# 1.3.2 The System's functionality

The System's functionality:

- to transmit communication via PA lines, selective or pre-defined, at max. distance of 700 m without quality loss;

 to sound general and other types of alarm signaling (including manual and fire alarm) via PA lines and signaling units; the alarms are initiated by an integrated alarm generator or external general alarm system;

- to broadcast entertainment programs via pre-selected PA lines from one or several integrated entertainment sources on local loudspeakers or headphones; volume may be controlled manually on the local loudspeaker or headphone; entertainment source may be selected by a local selector;

- to output signals to external systems (VDR, Integrated Marine Automation Systems or external PBX);

- to operate with two independent general alarm systems, split amplifiers or broadcasting units;

- the system may be controlled from a local or remote microphone panel independently of the controls status on other microphone panels (if microphone panels have the same priorities);

- voice communication, alarm signaling and external signals from external ship systems will interrupt entertainment broadcasting,

- to control audio quality of transmitted voice communication on each PA lines;

- to control sound pressure of sound signaling units; signal tones - at option;

- volume control override of loudspeakers (set to *min*. or *Off* position) and program selectors by alarm signal;

- to control operation of PA lines (to detect short circuit or rupture);

 to provide visual indication of the power status and connection of a subscriber unit to PA lines;

- to switch automatically to standby power in the event of the main power failure or loss.

## **1.3.3** Priorities

The System supports the following priorities during operation with external systems, see table 2.



# Table 2 – The System's priorities

| Name   | Description                      |  |
|--|----------------------------------|--|
| Priority-1   | Emergency PAC                    |  |
| Priority-2   | Two-way communication            |  |
| Priority-3   | - Command PAC                    |  |
| Priority-4   |                                  |  |
| Priority-5   | External PBX                     |  |
| Priority-6   | General alarm (and other alarms) |  |
| Priority-7 Entertainment and radio broadcasting            |                                  |  |
| Note – Priority-1 is the highest, priority-7 – the lowest. |                                  |  |

### **1.4 THE SYSTEM'S COMPOSITION**

Table 3 describes the main types of the SC. For more information on specifications and SC types, see section 2 and technical description.

| Table  | 3 _ | Main  | types | of the | System | compone | onts  |
|--------|-----|-------|-------|--------|--------|---------|-------|
| I able | 5 - | Iviam | types | or the | System | compone | SIIIS |

| Name  | Description  |  |
|---|--|--|
| Central units   |  |  |
| Central unit 19-CU  | The modules switch voice streams of the microphone panels, main substations, talk-back stations and entertainment sources. Volume control override via three-wire or four-wire (at option) circuit |  |
| Main su   | bstations  |  |
| Main substation MS-18Main substation MS-36Main substation MS-18AMain substation MS-36A  | The units provide two-way PAC, voice<br>communication and alarm signaling via PA lines<br>and alarm circuits (depending on the type)   |  |
| Talk-bac  | k stations   |  |
| Talk-back station S1Talk-back station S2Talk-back station S3Talk-back station S4Talk-back station S1-3Talk-back station S1-5Talk-back station S2-3Talk-back station S2-5Talk-back station PHSTalk-back station SDPBridge wing substation SW-1 | The units provide two-way PAC with one or several pre-selected PAC subscribers   |  |



| Name                               | Description                                      |  |  |  |
|------------------------------------|--|--|--|--|
| Microphone panels                  |  |  |  |  |
| Microphone panel CP-6              |  |  |  |  |
| Microphone panel CP-3              |  |  |  |  |
| Microphone panel CP-6-19           |  |  |  |  |
| Microphone panel CP-3-19           |  |  |  |  |
| Microphone panel CPW-6             |  |  |  |  |
| Microphone panel CPW-3             | The units transmit voice communication via       |  |  |  |
| Microphone panel CP2-6             | PA lines   |  |  |  |
| Microphone panel CP2-3             |  |  |  |  |
| Microphone panel CP2-6-19          |  |  |  |  |
| Microphone panel CP2-3-19          |  |  |  |  |
| Microphone panel CPW2-6            |  |  |  |  |
| Microphone panel CPW2-3            |  |  |  |  |
| Combined mic                       | rophone panels                                   |  |  |  |
| Combined microphone panel CP-6.6   |  |  |  |  |
| Combined microphone panel CP-6.3   |  |  |  |  |
| Combined microphone panel CP-3.3   |  |  |  |  |
| Combined microphone panel CPW-6.6  |  |  |  |  |
| Combined microphone panel CPW-6.3  |  |  |  |  |
| Combined microphone panel CPW-3.3  | The units provide voice communication and        |  |  |  |
| Combined microphone panel CP2-6.6  | alarm signaling via PA lines and alarm circuits  |  |  |  |
| Combined microphone panel CP2-6.3  |  |  |  |  |
| Combined microphone panel CP2-3.3  |  |  |  |  |
| Combined microphone panel CPW2-6.6 |  |  |  |  |
| Combined microphone panel CPW2-6.3 |  |  |  |  |
| Combined microphone panel CPW2-3.3 |  |  |  |  |
| Alarm                              | panels   |  |  |  |
| Alarm panel AP-6                   |  |  |  |  |
| Alarm panel AP-3                   |  |  |  |  |
| Alarm panel AP-6-19                |  |  |  |  |
| Alarm panel AP-3-19                |  |  |  |  |
| Alarm panel APW-6                  |  |  |  |  |
| Alarm panel APW-3                  | The units initiate alarms via PA lines and alarm |  |  |  |
| Alarm panel AP2-6                  | circuits   |  |  |  |
| Alarm panel AP2-3                  |  |  |  |  |
| Alarm panel AP2-6-19               |  |  |  |  |
| Alarm panel AP2-3-19               |  |  |  |  |
| Alarm panel APW2-6                 |  |  |  |  |
| Alarm panel APW2-3                 |  |  |  |  |



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| Name                               | Description  |  |
|------------------------------------|--|--|
| Power amplifiers                   |  |  |
| Amplifier TPA-15                   | The units amplify audio signals from   |  |
| Amplifier 19-TPA                   | microphones, ISDN line or linear audio input   |  |
| Broadcast units                    |  |  |
| PA line control device PACE-1      | The unit sends a control signal via PA lines   |  |
| PA line control unit 19-PAC-6      | The unit monitors non-faulty operation of<br>PA lines and detects faults, ruptures, short circuit<br>and overload by control signals from the end<br>device  |  |
| PA sound control unit 19-CHSW      | The unit controls quality of audio signals transmitted via PA lines  |  |
| Entertainment broadcast unit 19-P1 | The unit provides entertainment broadcasting (AM and FM radio, AUX, USB)   |  |
| Mixer 19-MIX                       | The unit switches entertainment sources  |  |
| Headphones HP-1                    | The unit reproduces commands, entertainment and broadband programs   |  |
| Antenna ANT                        | The unit receives and converts radio signals   |  |
| Entertainment remote control EC-6  | The unit controls entertainment broadcasting   |  |
| Selector SEL                       | The unit connects a loudspeaker to three-program PA line with an option of shutoff and program select  |  |
| Volume control DM                  | The unit controls volume of the connected<br>loudspeakers, dual-channel, volume control<br>override  |  |
| Volume control DMO                 | The unit controls volume of the connected loudspeakers, single-channel, volume control override  |  |
| Selector/Volume control SDP        | The unit connects loudspeakers to three-program<br>PA line; volume control override  |  |
| PA line commutator 19-COM-4-6      | The unit switches CU's amplified voice<br>communication and signals of entertainment<br>source to six zones; volume control override via<br>three-wire circuit   |  |
| Alarm generator 19-AG              | The unit generates general alarm signaling (and other alarms) and outputs as 0 dB signals (audio signal) and dry contact (5 circuits to control signaling units, and 3 circuits – to stop broadcasting, and signal to VDR) |  |



| Name                                     | Description   |  |  |
|--|---|--|--|
| Matching transformer T-140               | The unit converts sound signal amplitude within broadband   |  |  |
| Racks, cabinets, enclosures              |   |  |  |
| Mounting rack 19IR                       | The unit encloses modular SCs   |  |  |
| Wall-mounted enclosure WME               | The unit encloses the SCs providing a convenient layout   |  |  |
| Fan unit ITS-FU-4                        | The unit cools down the equipment of the mounting rack 19IR   |  |  |
| Bezel, ITS-FP1                           | The unit covers unused space in the mounting rack 19IR  |  |  |
| Cable organizer ITS-CM                   | The unit is used to lay cables and wires inside the mounting rack 19IR  |  |  |
| Wall-mounted metal enclosure BO          | The unit houses and protects the SCs in dry areas and on open deck  |  |  |
| Wall-mounted metal enclosure BO-1H       | The unit houses and protects the SCs in dry areas and on open deck; heated  |  |  |
| Switching units, network d               | evices and signal converters  |  |  |
| Switch SW-16                             | The units ensure operation of the connected units   |  |  |
| Switch SW-24                             | in Ethernet network   |  |  |
| Extension unit (Intercom lines) ITS-TBSW | The unit switches voice communication of PAC substations in autonomous mode, links and exchanges streams with other rack modules and extension units of PAC and PBX |  |  |
| Signal converter ST-2                    | The unit converts Ethernet packet data transmission into signal 0 dB  |  |  |
| Loudspeakers                             |   |  |  |
| Loudspeaker LS-1                         |   |  |  |
| Loudspeaker LS-2                         |   |  |  |
| Loudspeaker LS-3                         |   |  |  |
| Loudspeaker LS-5                         |   |  |  |
| Loudspeaker LS-6                         | The units ensure broadcasting, reproduce signals  |  |  |
| Loudspeaker LS-7                         | and voice communication in public address   |  |  |
| Loudspeaker LS-8                         | systems   |  |  |
| Loudspeaker LS-9                         |   |  |  |
| Loudspeaker LS-10                        |   |  |  |
| Loudspeaker LS-12                        |   |  |  |
| Loudspeaker LS-13                        |   |  |  |



| Name                                     | Description  |
|--|--|
| Loudspeaker SDL                          |  |
| Loudspeaker LF-1                         |  |
| Loudspeaker DSP-15 (Ex)                  |  |
| Loudspeaker GVR-Prometey (Ex)            |  |
| Intercom equipme                         | ent and accessories  |
| Microphone M1                            | The write receive vision communication.  |
| Microphone M2                            | The units receive voice communication;   |
| Microphone M3-W                          | substations and some talk-back stations  |
| Microphone MD-97                         | Substations and some tark back stations  |
| Headset HS-4                             |  |
| Headset HS-6                             | The units provide talk-back communication in   |
| Intercom helmet TH-4M                    | noisy areas  |
| Intercom helmet TH-4L                    |  |
| Foot-switch FB1                          | The unit activates a microphone  |
| Connecting                               | g equipment  |
| Junction box KP-124PW                    |  |
| Junction box KP-124                      | The unit splits input circuits to several outputs  |
| Junction box KP-124V                     |  |
| Socket SM                                | The unit connects external microphones to the substations  |
| Socket CBP                               | The unit connects portable substations to the subscriber lines; waterproof                                       |
| Socket HS-CB                             | The unit connects external intercom devices to PAC devices; waterproof   |
| Socket SHP-3                             | The unit connects headphones to three-wire PA line   |
| Cord CE                                  | The unit extends a standard cord of intercom devices   |
| Power su                                 | pply units   |
| Power supply unit 19-PS                  | The units power rack-mounted SCs from the  |
| Power supply unit ITS-PS-1500            | to another) with rated output voltage 48 VDC   |
| Power supply unit ITS-PS-350             | The unit powers rack-mounted equipment with 24 VDC from the mains 220 VAC  |
| Standby supply switching unit ITS-CH-105 | The unit charges external storage battery with 24 VDC and powers rack-mounted SCs from a charged storage battery |
| Power supply switching unit ITS-APS      | The unit automatically switches main or standby power  |



| Name   | Description   |
|--|---|
| Signal units (A                                  | Alarm devices)  |
| Rotating lamp RL                                 |   |
| Flashing lamp FL                                 | The units initiate light alarm signaling on open  |
| Light signaling unit L                           | deck and in noisy areas   |
| Rotating flashing lamp RFL                       |   |
| Sound and light signaling unit AL                | The unit initiates light and sound alarm signaling<br>on open deck and in noisy areas   |
| Sound signaling unit A                           | The units initiate sound alarm signaling on open  |
| Howler HW1                                       | <ul> <li>The units initiate light alarm signaling on open deck and in noisy areas</li> <li>The unit initiates light and sound alarm signaling on open deck and in noisy areas</li> <li>The units initiate sound alarm signaling on open deck and in noisy areas</li> <li>The units initiates alarm signaling in explosion hazardous zones</li> <li>The units initiate light alarm signaling in explosion hazardous zones</li> <li>The unit initiates sound alarm signaling in explosion hazardous zones</li> <li>The unit initiates sound alarm signaling in explosion hazardous zones</li> </ul> |
| Buzzer-howler BH1                                | deek and in horsy areas   |
| Sound signaling unit BExS110 (Ex)                | The unit initiates alarm signaling in explosion hazardous zones   |
| Light signaling unit PGS-VSPYSHKA (Ex)           | The units initiate light alarm signaling in   |
| Light signaling unit Orbita MK S (Ex)            | explosion hazardous zones   |
| Sound signaling unit Orbita MK Z (Ex)            | The unit initiates sound alarm signaling in explosion hazardous zones   |
| Light and sound signaling unit Orbita MK SZ (Ex) | The unit initiates sound and light alarm signaling<br>in explosion hazardous zones  |
| Relay unit RB-139G                               | The unit switches external power supply to the connected signaling units  |

# **1.5** Measurement instruments, tools and appliances

Control operation of the SCs using built-in controls and indication lights (LEDs). Table 4 describes the consumables and instruments required for the TS.

| Table $4 - 0$ | Consumables | required | for the | TS |
|---------------|-------------|----------|---------|----|
|---------------|-------------|----------|---------|----|

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

<sup>&</sup>lt;sup>1</sup> Quantity is specified for one SC.



# **1.6 MARKING AND SEALING**

The System has a nameplate that identifies: the name and serial number, the Manufacturer, date of manufacturing. The nameplate is attached to the rack enclosure.

The SCs have nameplates identifying the following:

- the 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;
- IP rating;
- weight;
- a disposal type;
- information on conformity assessment.

The nameplates are attached to the SC casings. The SCs are not sealed.

Note – If a SC is small, information on the nameplate may be reduced and identify only the name of SC and its serial number. More information is given in the technical description.

# **1.7 PACKAGING**

The SCs except the mounting rack 19IR are packed in corrugated board boxes, ensuring their transportation and storage at the warehouse. The 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 SCs to the repair location and back.

The transport packaging is not sealed.



# **2 DESCRIPTION AND OPERATION OF THE SYSTEM COMPONENTS**

### 2.1 CENTRAL UNITS 19-CU TYPE

CU is the main component designed to create communication channels and transmit commands to PA lines.

The types of CUs:

- 19-CU-6 (6 voice streams);
- 19-CU-12 (12 voice streams).

Figure 2 describes the controls and LEDs of CU. Description and assignment of the controls and LEDs are represented in table 5.



Figure 2- The controls and LEDs of CU

| Table 5 – | Functionality | of the | controls and | 1 LEDs | of CU |
|-----------|---------------|--------|--------------|--------|-------|
| 1 4010 5  | 1 unotionunty | or the | controls and |        | 01 00 |

| Position  | Name                           | Designation | Functionality   |  |
|---|--------------------------------|-------------|---|--|
| 1   | Power LED                      |             | To indicate power status  |  |
| 2   | Fuses 2 A                      | FU1 to FU6* | To protect PAC devices circuits   |  |
| 3   | Channels LEDs                  | _           | To indicate channels' status  |  |
| 4   | Ports for PAC subscriber units | X1 to X6*   | To connect PAC subscriber units   |  |
| 5   | Ports for external systems     | XS1 to XS5  | To connect SCs  |  |
| 6   | Power supply fuse 30 A         | FU7         | To protect the subscriber lines and<br>power supply network against<br>malfunctions |  |
| 0   | Power supply fuse 2 A          | FU8         | To protect the hardware against<br>malfunctions in the power supply<br>network      |  |
| 7   | Piano type switch              | On, Off     | To switch power on (off)  |  |
| Note – * means that number of positions depends on CU type. |                                |             |   |  |



# 2.2 MAIN SUBSTATIONS MS TYPE

The main substations are designed to provide two-way PAC, transmit commands and alarm signaling via PA lines (depending on the type).

The System includes the following types of the main substations:

- MS-18 and MS-36 (two-way PAC, transmission of commands);

– MS-18A and MS-36A (two-way PAC, transmission of commands and alarm signaling).

Figure 3 describes controls and LEDs of the main substations. Description and assignment of the controls and LEDs are represented in table 6.



Figure 3 – The controls and LEDs of main substation by the example of MS-18A Table 6 – Functionality of the controls and LEDs of the main substation

| Position           | Name          | Designation   | Functionality   |
|--------------------|---------------|---|---|
| 1                  | Speaker       | -   | To provide sound signaling of incoming and outgoing calls; to reproduce voice communication |
|                    |               | Ready   | <i>Steady light</i> – the station is ready for operation                                    |
| 2                  | Group of LEDs |   | Steady light – no connection with CU.   |
| identifying status | Fault         | FunctionalityTo provide sound signaling of incoming and<br>outgoing calls; to reproduce voice communicationSteady light – the station is ready for operationSteady light – the station is ready for operationSteady light – no connection with CU.Flashing light (mode 1, see table 7): CU lost<br>connection with one or several subscriber units; |   |
|                    |               |   | connection with one or several subscriber units;  |



| Position | Name  | Designation    | Functionality  |
|----------|---|----------------|--|
|          |   |                | one or several LEDs of the corresponding ports will be flashing  |
|          |   |                | To call a subscriber unit (PAC mode) or to dial a phone number (PBX mode).   |
|          |   |                | <ul> <li>Functionality in PAC mode:</li> <li><i>press a key:</i> to call a subscriber;</li> <li><i>press a key during the incoming call:</i> to answer the call;</li> <li><i>press a key during the outgoing call:</i> to end an outgoing call.</li> </ul>   |
| 3        | Group of keys<br>Substations with<br>LEDs         | 1 to 12*       | Description of LED's operation:<br>- no light: a subscriber unit was not assigned to the<br>corresponding subscriber line, or connection is<br>lost;<br>- steady light: the subscriber unit (assigned to the<br>corresponding subscriber line) is connected;<br>- flashing mode 1 (see table 7): no connection with<br>the subscriber unit assigned to the corresponding<br>subscriber line;<br>- flashing mode 2 (see table 7): an incoming call<br>from the subscriber unit assigned to the<br>corresponding subscriber line;<br>- flashing mode 3 (see table 7): an outgoing call to<br>the subscriber unit assigned to the corresponding |
| 4        | Group of keys <i>PA</i><br><i>lines</i> with LEDs | 1 to 6*        | To select PA line.<br>Steady light – PA line is selected.<br>No light – connection is lost   |
| 5        | Star button with<br>LED                           | <u>10</u><br>* | To switch to tone dial mode and return to pulse<br>mode (PBX mode)   |
| 6        | Hash button with LED                              | <u>12</u><br># | To access service commands (PBX mode)  |
|          | Group of keys                                     | 1 to 3         | To initiate alarm  |
| 7        | and a protective                                  | 1              | To unlock the alarm keys   |
|          |   | RESET          | To reset the initiated alarm   |
| 8        | Connector<br>Lumberg KGV50                        | _              | To connect an external microphone  |
| 9        | Setup buttons with LEDs                           | DIM            | To control backlight brightness of the keys and LEDs   |



| Position   | Name   | Designation | Functionality   |  |
|------------|--|-------------|---|--|
|            |  |             | To control volume of a built-in speaker during communication            |  |
|            |  | END         | To end active connections   |  |
|            | 10 Additional buttons  | LIST        | To create a list of pre-defined conference participants                 |  |
|            |  | CONF        | Conference call   |  |
| 10         |  | PBX         | To activate PBX mode  |  |
|            |  | HOLD        | To put a subscriber on hold in PAC mode                                 |  |
|            |  | CALL        | To call to the connected subscriber units during the current connection |  |
|            |  | BW          | To connect to a wing substation   |  |
|            | MIC button with  |             | To switch on the microphone.  |  |
| 11         | LED  | MIC         | <i>Steady light</i> – the microphone is on.                             |  |
| LED        |  |             | <i>No light</i> – the microphone is off                                 |  |
| Note – * n | Note $-*$ means that number of buttons depends on the type of the main substation. |             |   |  |

Table 7 – Graphic presentation of the indication modes

| Mode | Name            | Graphic presentation  |
|------|-----------------|---|
| 1    | Connection loss | 200 ms 300 ms<br>on the state of t |
| 2    | Incoming call   | on 100 ms 200 ms 700 ms<br>off ff  |
| 3    | Outgoing call   | on500 ms  |

#### 2.3 TALK-BACK STATIONS S AND PHS TYPES

Talk-back stations are designed for talk-back PAC with one or several pre-selected PAC subscribers.

The types of substations:

- a) with a built-in microphone and speaker:
- S1-PM (panel mounting);
- S1-WM (wall mounting);
- S1W (wall mounting, waterproof);



- b) with a built-in speaker and connector for an external microphone:
- S2-PM (panel mounting);
- S2-WM (wall mounting);

c) with a relay unit and connector for a microphone or headset, waterproof, wall mounting: S3;

- d) with terminals to connect an external loudspeaker, waterproof, wall mounting: S4;
- e) with a built-in loudspeaker, waterproof, portable: S4P;
- f) with a built-in microphone and speaker, three zones of PAC:
- S1-3-PM (panel mounting);
- S1-3-WM (wall mounting);
- g) with a built-in microphone and speaker, five zones of PAC:
- S1-5-PM (panel mounting);
- S1-5-WM (wall mounting);

h) with a built-in speaker and connector for an external microphone, three zones of PAC:

- S2-3-PM (panel mounting);
- S2-3-WM (wall mounting);

i) with a built-in speaker and connector for an external microphone, five zones of PAC:

- S2-5-PM (panel mounting);
- S2-5-WM (wall mounting);
- j) with a built-in speaker and connector for a microphone, waterproof, portable: SDP;
- k) wing substation SW-1, waterproof:
- SW-1-PM (panel mounting);
- SW-1-WM (wall mounting).

Figures from 4 to 8 describe controls and LEDs of talk-back stations. Description and assignment of the controls and LEDs are given in tables from 8 to 10.

Operation manual





Figure 4 – The controls and LEDs of S1-WM



Figure 5 – The controls and LEDs of S2-WM  $\,$ 

| Table 8 – Functionality of the controls and LEDs of S1-WM and S2-WM |
|---|
|---|

| Position | Name                 | Designation | Functionality  |
|----------|----------------------|-------------|--|
| 1        | Speaker              | _           | To ensure sound signaling of incoming and outgoing calls; to reproduce voice communication   |
| 2        | Status LED           | State       | <ul> <li>Green steady light: a user substation is non-faulty and ready for operation.</li> <li>No light: no power supply; the subscriber line is faulty.</li> <li>Red steady light: connection failure or error</li> </ul>   |
| 3        | Built-in microphone  | MIC         | To receive voice communication   |
| 4        | Call button with LED | CALL        | To call the assigned subscriber unit.<br>The functionality of the key:<br><i>– press a key:</i> to call;<br><i>– press the key during the incoming call:</i> to answer<br>the call;<br><i>– press the key during the outgoing call:</i> to end an<br>outgoing call.<br>Description of LED's operation:<br><i>– steady light:</i> the subscriber unit assigned to the<br>key is connected;<br><i>– flashing mode 3</i> (see table 7) – an outgoing call to<br>the subscriber unit assigned to the key;<br><i>– flashing mode 2</i> (see table 7) – an incoming call<br>from the subscriber unit assigned to the key |



| Position | Name                   | Designation | Functionality  |
|----------|------------------------|-------------|--|
| 5        | MIC button with<br>LED | MIC         | To switch on the microphone.<br><i>Steady light</i> – the microphone is on.<br><i>No light</i> – the microphone is off |
| 6        | Connector              | _           | To connect external intercom SCs (a microphone, headset)   |



Figure 6 - The controls and LEDs of S3

| Table 9 – | Functionality | of the | controls  | and LEDs | of S3 |
|-----------|---------------|--------|-----------|----------|-------|
| I uolo )  | 1 unceromancy | or the | controllo |          | 01 05 |

| Position | Name                       | Designation | Functionality  |
|----------|----------------------------|-------------|--|
| 1        | Connector                  | —           | To connect external intercom SCs (a microphone, headset)   |
| 2        | Call<br>button<br>with LED | CALL        | <ul> <li>To call an assigned subscriber unit.</li> <li>The functionality of the key:</li> <li><i>press a key:</i> to call;</li> <li><i>press the key during the incoming call:</i> to answer the call;</li> <li><i>press the key during the outgoing call:</i> to end the call.</li> <li>Description of LED's operation:</li> <li><i>steady light:</i> the subscriber unit assigned to the key is connected;</li> <li><i>flashing mode 3</i> (see table 7) – an outgoing call to the subscriber unit assigned to the key;</li> <li><i>flashing mode 2</i> (see table 7) – an incoming call from the subscriber unit assigned to the key</li> </ul> |
| 3        | Status<br>LED              | State       | Green steady light: the unit is ready for operation.<br>No light: no power supply; PA line is faulty.<br>Red steady light: connection failure or error   |



of S1-5-WM

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

| Table 10 – | Functionality | of the controls | and LEDs of S1 | -5-WM and S2-5-WM |
|------------|---------------|-----------------|----------------|-------------------|
|            | 2             |                 |                |                   |

| Position | Name                                       | Designation | Functionality   |
|----------|--|-------------|---|
| 1        | Speaker                                    | _           | To ensure sound signaling, to reproduce voice communication   |
| 2        | Group of subscriber<br>call keys with LEDs | 1 to 5      | To call a subscriber unit in PAC mode.<br>The functionality of the keys:<br><i>press a key:</i> to call;<br><i>press the key during the incoming call:</i> to answer the<br>call;<br><i>press the key during the outgoing call:</i> to end the call.<br>Description of LED's operation:<br><i>no light:</i> a subscriber unit is not assigned to the<br>corresponding line, or subscriber unit assigned to the<br>corresponding line is connected;<br><i>steady light:</i> the subscriber unit assigned to the<br>corresponding line is connected;<br><i>flashing mode 1</i> (see table 7): no connection with the<br>subscriber unit assigned to the corresponding line;<br><i>flashing mode 2</i> (see table 7): an incoming call from<br>the subscriber unit assigned to the corresponding line;<br><i>flashing mode 3</i> (see table 7): an outgoing call to the<br>subscriber unit assigned to the corresponding line;<br><i>flashing mode 3</i> (see table 7): an outgoing call to the<br>subscriber unit assigned to the corresponding line; |
| 3        | Status LED                                 | State       | Green steady light: the unit is ready for operation.<br>No light: no power supply; PA line is faulty.<br>Red steady light: connection failure or error  |



| Position | Name                 | Designation | Functionality   |
|----------|----------------------|-------------|---|
| 4        | Built-in microphone  | _           | To receive voice communication                              |
| 5        | Brightness key       | DIM         | To control backlight brightness of keys and LEDs            |
|          |                      |             | To call an assigned subscriber unit.                        |
|          |                      |             | The functionality of the key:                               |
|          |                      |             | – <i>press a key:</i> to call;                              |
|          |                      |             | – press the key during the incoming call: to answer the     |
| 6        |                      |             | call;   |
|          | Call button with LED | CALL        | - press the key during the outgoing call: to end the call.  |
|          |                      |             | Description of LED's operation:                             |
|          |                      |             | - steady light: the subscriber unit assigned to the key is  |
|          |                      |             | connected;  |
|          |                      |             | - flashing mode 3 (see table 7) $-$ an outgoing call to the |
|          |                      |             | subscriber unit assigned to the key;                        |
|          |                      |             | - flashing mode 2 (see table 7) $-$ an incoming call from   |
|          |                      |             | the subscriber unit assigned to the key                     |
|          | MIC button with      |             | To switch on the microphone.                                |
| 7        | LED                  | MIC         | <i>Steady light</i> – the microphone is on.                 |
|          |                      |             | <i>No light</i> – the microphone is off                     |
| Q        | Connector            |             | To connect external intercom SCs (microphone,               |
| 8        | Connector            | _           | headset)  |

The talk-back station PHS is designed for talk-back PAC with an option to call the subscribers of telephone network and broadcast to PA lines.

The types of unit:

- PHS1 (a dial keypad, built-in microphone and speaker);
- PHS3 (a dial keypad, built-in microphone).

PHS is outfitted with controls and LEDs, see figure 9. Description and assignment of the controls and LEDs are given in table 11.

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Figure 9 – The controls and LEDs of PHS1

| Table 11 – | Functionality | of the | controls | and L | EDs of | PHS |
|------------|---------------|--------|----------|-------|--------|-----|
|            |               |        |          |       |        |     |

| Position | Name                               | Designation | Functionality  |
|----------|------------------------------------|-------------|--|
| 1        | Speaker                            | -           | To ensure sound signaling; to reproduce voice communication  |
|          |                                    | LIST        | To create a pre-selected conference list   |
|          |                                    | PA          | To activate PAC mode   |
| 2        | Call control keys                  | PABX        | To activate PBX mode   |
|          | Can control keys                   | HOLD        | To put a subscriber on hold in PAC mode  |
|          |                                    | CALL        | To call the connected subscriber units during the current connection   |
| 3        | Built-in microphone                | MIC         | To receive voice communication   |
| 4        | Call LED                           | Call        | To indicate a call   |
| 5        | Status LED                         | State       | Green steady light: the unit is ready for operation.<br>No light: no power supply; PA line is faulty.<br>Red steady light: connection failure or error |
| 6        | MIC button with<br>LED             | MIC         | To switch on the microphone.<br>Steady light – the microphone is on.<br>No light – the microphone is off   |
| 7        | Group of numeric<br>keys with LEDs | 0 to 9      | To call a subscriber unit (PAC mode), dial keypad<br>0 to 9 (PBX mode)   |
| 8        | Call end button                    | END         | To stop a call   |



# 2.4 MICROPHONE PANELS CP TYPE

Microphone panels are designed to transmit voice communication via PA lines of one or two broadcast units.

The types of the microphone panels:

- a) single-channel, three zones:
- CP-3-PM (panel mounting);
- CP-3-WM (wall mounting);
- CP-3-TM (mounting on a bracket);
- CPW-3 (wall mounting, waterproof);
- CP-3-19 (vertical, panel mounting);
- b) dual-channel, three zones:
- CP2-3-PM (panel mounting);
- CP2-3-WM (wall mounting);
- CP2-3-TM (mounting on a bracket);
- CPW2-3 (wall mounting, waterproof);
- CP2-3-19 (vertical, panel mounting);
- c) single-channel, six zones:
- CP-6-PM (panel mounting);
- CP-6-WM (wall mounting);
- CP-6-TM (mounting on a bracket);
- CPW-6 (wall mounting, waterproof);
- CP-6-19 (vertical, panel mounting);
- d) dual-channel, six zones:
- CP2-6-PM (panel mounting);
- CP2-6-WM (wall mounting);
- CP2-6-TM (mounting on a bracket);
- CPW2-6 (wall mounting, waterproof);
- CP2-6-19 (vertical, panel mounting).



The microphone panels are outfitted with controls and LEDs, see figure 10. Description and assignment of the controls and LEDs are given in table 12.



Figure 10 – The controls and LEDs of microphone panel by the example of CP-6-WM Table 12 – Functionality of the controls and LEDs of the microphone panels

| Position | Name             | Designation | Functionality  |
|----------|------------------|-------------|--|
|          | Crown of laws DA | 1 to 6      | To select PA line.                                   |
| 1        | UNES with LED    | 1 10 0      | Steady light: PA line is selected                    |
|          | LINES WITH LEDS  | ALL         | To select all PA lines                               |
| 2        | Connector        | _           | To connect an external microphone                    |
| 3        | Group of status  | Ready       | The unit is connected to CU and ready for operation  |
| 5        | LEDs             | Fault       | Connection failure or microphone panel's malfunction |
| 4        | Microphone key   | MIC         | To activate the connected microphone.                |
| 4        | with LED         | MIC         | Steady light: the microphone is on                   |
| 5        | Brightness key   | DIM         | To control backlight brightness of controls and LEDs |

#### 2.5 COMBINED MICROPHONE PANELS, CP TYPE

The combined microphone panels are designed to transmit voice communication and alarm signaling to PA lines and alarm circuits.

The types of the combined microphone panels:

- a) single-channel, three zones, three alarms:
- CP-3.3-PM (panel mounting);



- CP-3.3-WM (wall mounting);
- CP-3.3-TM (mounting on a bracket);
- CPW-3.3 (wall mounting, waterproof);
- b) dual-channel, three zones, three alarms:
- CP2-3.3-PM (panel mounting);
- CP2-3.3-WM (wall mounting);
- CP2-3.3-TM (mounting on a bracket);
- CPW2-3.3 (wall mounting, waterproof);
- c) single-channel, six zones, six alarms:
- CP-6.6-PM (panel mounting);
- CP-6.6-WM (wall mounting);
- CP-6.6-TM (mounting on a bracket);
- CPW-6.6 (wall mounting, waterproof);
- d) dual-channel, six zones, six alarms:
- CP2-6.6-PM (panel mounting);
- CP2-6.6-WM (wall mounting);
- CP2-6.6-TM (mounting on a bracket);
- CPW2-6.6 (wall mounting, waterproof);
- e) single-channel, six zones, three alarms:
- CP-6.3-PM (panel mounting);
- CP-6.3-WM (wall mounting);
- CP-6.3-TM (mounting on a bracket);
- CPW-6.3 (wall mounting, waterproof);
- f) dual-channel, six zones, three alarms:
- CP2-6.3-PM (panel mounting);
- CP2-6.3-WM (wall mounting);
- CP2-6.3-TM (mounting on a bracket);
- CPW2-6.3 (wall mounting, waterproof).

the future



The combined microphone panels are outfitted with controls and LEDs, see figure 11. Description and assignment of the controls and LEDs are shown in table 13.

Note – Group of keys *ALARMS* is covered with protective glass to prevent from accidental keystroke.



Figure 11 – The controls and LEDs of combined microphone panel by the example of CP-6.6-WM  $\,$ 

| Table 13 – Functionality of the controls and LEDs of the combined microphone j | panels |
|--|--------|
|--|--------|

| Position | Name                 | Designation  | Functionality                             |
|----------|----------------------|--------------|---|
|          | Group of kove        | 1 to 6       | To initiate alarm.                        |
| 1        | Group of Keys        | 1 10 0       | Steady light: the alarm was initiated     |
|          | ALANMS WIT LEDS      | RESET        | To stop the initiated alarm               |
|          |                      | 1 to 6       | To select PA line.                        |
| 2        | Group of keys        | 1 10 0       | Steady light: the PA line was selected    |
| 2        | PA LINES with LEDs   | EMEDCENCV DA | Emergency notification to all PA lines.   |
|          |                      | EMEROENCITA  | Steady light – all PA lines are connected |
| 3        | Connector            | —            | To connect external microphone            |
| 4        | Crown of LEDs Alarma | Main power   | Mains power supply                        |
|          | Group of LEDs Alarm  | Backup power | Standby power supply                      |
|          | suit                 | Fault        | Mains or standby power supply failure     |



| Position | Name                 | Designation | Functionality                              |
|----------|----------------------|-------------|--|
|          |                      | Ready       | The unit is connected to CU and ready for  |
| 5        | Group of status LEDs | Ready       | operation                                  |
| 5        |                      | Foult       | Connection failure or microphone panel's   |
|          |                      | Fault       | malfunction                                |
| 6        | Microphone key with  | MIC         | To activate the connected microphone.      |
| 0        | LED                  | IVIIC       | Steady light: the microphone is on         |
| 7        | Brightness key with  | DIM         | To control backlight brightness of buttons |
|          | LED                  | DIN         | and LEDs                                   |

# 2.6 ALARM PANELS AP TYPE

The alarm panels are designed to provide alarm signaling via one or two general alarm systems.

The types of the alarm panels:

- 1) single-channel, three alarms:
- AP-3-PM (panel mounting);
- AP-3-WM (wall mounting);
- AP-3-TM (mounting on a bracket);
- APW-3 (wall mounting, waterproof);
- AP-3-19 (vertical, panel mounting);
- 2) dual-channel, three alarms:
- AP2-3-PM (panel mounting);
- AP2-3-WM (wall mounting);
- AP2-3-TM (mounting on a bracket);
- APW2-3 (wall mounting, waterproof);
- AP2-3-19 (vertical, panel mounting);
- 3) single-channel, six alarms:
- AP-6-PM (panel mounting);
- AP-6-WM (wall mounting);
- AP-6-TM (mounting on a bracket);
- APW-6 (wall mounting, waterproof);
- AP-6-19 (vertical, panel mounting);
- 4) dual-channel, six alarms:

- AP2-6-PM (panel mounting);

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- AP2-6-WM (wall mounting);
- AP2-6-TM (mounting on a bracket);
- AP2-6B (wall mounting, waterproof);
- AP2-6-19 (vertical, panel mounting).

The alarm panels are outfitted with controls and LEDs, see figure 12. Description and assignment of the controls and LEDs are shown in table 14.

Note – Alarm keys are covered with protective glass to prevent from accidental keystroke.



Figure 12 – The controls and LEDs of alarm panel by the example of AP-6-WM

Table 14 - Functionality of the controls and LEDs of the alarm panels

| Position                               | Name             | Designation                   | Functionality  |
|--|------------------|-------------------------------|--|
| 1 Group of buttons<br>ALARMS with LEDs | Group of buttons | 1 to 6                        | To initiate an alarm.<br>Steady light: the alarm was initiated |
|  | RESET            | To cancel the initiated alarm |  |
| 2 Group of Li<br>Alarm state           | Group of LEDs    | Main power                    | Mains power supply   |
|  | Alarm state      | Backup power                  | Standby power supply   |
|  |                  | Fault                         | Mains or standby power supply failure                          |
| 3                                      | Brightness key   | DIM                           | To control backlight brightness of keys and LEDs               |

## 2.7 POWER AMPLIFIERS

The power amplifiers are designed to amplify sound signals received from the microphone, ISDN lines or linear audio input.



The types of the power amplifiers:

- TPA-15 (power 15 W, wall mounting);
- 19-TPA-200 (power 200 W, rack mounting);
- 19-TPA-400 (power 400 W, rack mounting).

The power amplifiers are outfitted with controls and LEDs, see figures 13, 14. Description and assignment of the controls and LEDs are shown in tables 15, 16.



Figure 13 - The controls and LEDs of TPA-15

| Table 15 – Functionality o | of the controls and | LEDs of TPA-15 |
|----------------------------|---------------------|----------------|
|----------------------------|---------------------|----------------|

| Position | Name                        | Designation | Functionality   |
|----------|-----------------------------|-------------|---|
| 1        | Connector<br>Weipu WA22K4Z2 | _           | To connect an external microphone   |
| 2        | Amplifier status LED        | State       | Green steady light: a power amplifier is<br>non-faulty and ready for operation.<br>No light: a power amplifier or line is faulty.<br>Read steady light: no connection to CU |





Figure 14 – The controls and LEDs of 19-TPA-200

| Table 16 – | Functionality | of the cont | trols and L | EDs of 19-TP | A |
|------------|---------------|-------------|-------------|--------------|---|
| 14010 10   | 1 anotionally | or the com  |             |              |   |

| Position | Name                           | Designation  | Functionality  |
|----------|--------------------------------|--------------|--|
|          | Amplifian status               | Overload     | To indicate overload                                 |
| 1        | 1 Amplifier status $I \in D_s$ | Overheat     | To indicate overheat                                 |
| LEDS     |                                | Ready        | To indicate that the unit is ready for operation     |
| 2        | Reset key                      | Reset        | To reset and reboot the unit (unlock)                |
| 3        | Power fuse 10 A                | use 10 A FU1 | To protect the subscriber lines and the power supply |
| 5        | Tower fuse for A               |              | network against malfunctions                         |
| 4        | Piano type switch              | On, Off      | To power on (off)                                    |

#### 2.8 BROADCAST UNITS

## 2.8.1 PA line control device PACE-1

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

The device does not require connection to the external power network (it is powered directly from PA lines). There are no controls and LEDs on the casing.

#### 2.8.2 PA line control unit 19-PAC-6

PA line control unit 19-PAC-6 is designed to detect faulty connection, rupture or short circuit in PA lines. The PA line control unit is outfitted with controls and LEDs, see figure 15. Description and assignment of the controls and LEDs are shown in table 17.





| Position  | Name                                 | Designation         | Functionality   |
|-----------|--------------------------------------|---------------------|---|
| 1         | Power LED                            |                     | To indicate power status  |
|           |                                      | Ready               | <i>Steady light:</i> a control unit is non-faulty and ready for operation |
| 2         | PA fine status LEDs                  | Test                | Steady light: the test is running   |
|           |                                      | Fault               | Steady light: no connection with the SCs                                  |
| 3         | <i>Reset</i> key                     | Reset               | To stop the PA line test  |
| 4         | Test                                 | Test                | To start the test   |
| 5         | LCD                                  | _                   | LCD panel to display menu information                                     |
| 6         | Up and Down keys                     | $\bigcirc \bigcirc$ | To navigate in the menu   |
| 7         | Menu key                             | Menu                | To access the menu  |
| /         | Confirmation key                     | Select              | To confirm the select   |
| 8         | LAN input                            | LAN                 | An input to connect SCs   |
| 9         | Power fuse                           | FU1                 | To protect the hardware against malfunctions in                           |
|           |                                      |                     | the power supply network  |
| 10        | Piano type switch                    | On, Off             | To power on (off)   |
| Note – LE | EDs <i>Ready</i> and <i>Test</i> may | y light up at the   | same time during the test of PA lines                                     |

## Table 17 – Functionality of the controls and LEDs of 19-PAC-6

### 2.8.3 PA sound control unit 19-CHSW

PA sound control unit 19-CHSW is designed to control quality of audio messages by connecting a built-in speaker to a PA line (one out of six). Volume of speaker may be changed. The device is passive and does not require connection to the power network.

The PA sound control unit is outfitted with controls and LEDs, see figure 16. Description and assignment of the controls and LEDs are shown in table 18.



Figure 16 – The controls and LEDs of 19-CHSW





| Position | Name                      | Designation | Functionality   |
|----------|---------------------------|-------------|---|
| 1        | Toggle switch             | On, Off     | To start and stop listening to PA line  |
| 2        | Speaker                   | _           | To ensure sound signaling of incoming and outgoing calls; to reproduce voice communication  |
| 3        | PA line selector          | Channel     | To select PA line   |
| 4        | Volume control            | Volume      | To control volume of loudspeaker by rotating the knob. To turn the volume up – rotate it clockwise, to turn it down – counter clockwise |
| 5        | Group of keys<br>Channels | 1 to 6      | To control entertainment programs   |
| 6        | Channels LEDs             | Level       | To display the signal level received by PA line   |
| 7        | Piano type switch         | On, Off     | To power on (off)   |

Table 18 – Functionality of the controls and LEDs of 19-CHSW

### 2.8.4 Entertainment broadcast unit 19-P1

Entertainment broadcast unit 19-P1 is designed to broadcast entertainment programs via PA lines.

The unit reproduces programs from a USB storage device, FM, AM radio, or other external sources connected to AUX port. To maintain high quality of radio reception, we recommend connecting an external antenna, ANT-1 or ANT-2.

One system may include one to three entertainment sources with a common or individual amplifier at option. In this case, PA lines will be single- or three-program. The entertainment broadcast unit is outfitted with controls and LEDs, see figure 17. Description and assignment of the controls and LEDs are shown in table 19.



Figure 17 – The controls and LEDs of 19-P1

Table 19 – Functionality of the controls and LEDs of 19-P1

| Position | Name             | Designation | Functionality                      |
|----------|------------------|-------------|------------------------------------|
| 1        | Power status LED | С<br>С      | To display power status            |
| 2        | Multiplayer      | _           | To display information on programs |



| Position | Name              | Designation | Functionality   |
|----------|-------------------|-------------|---|
| 3        | Power fuse 3 A    | FU1         | To protect the hardware against malfunctions in<br>the power supply network |
| 4        | Piano type switch | On, Off     | To power on (off)   |

# 2.8.5 Mixer 19-MIX

Mixer 19-MIX is designed to connect an entertainment source to PA line amplifiers when several entertainment sources operate within the System. A user may connect a hand-held microphone to the unit and use it during the entertainment broadcasting (mixing mode). The mixer is outfitted with controls and LEDs, see figure 18. Description and assignment of the controls and LEDs are shown in table 20.



Figure 18 – The controls and LEDs of 19-MIX

Table 20 – Functionality of the controls and LEDs of mixer

| Position | Name              | Designation | Functionality                                  |
|----------|-------------------|-------------|--|
| 1        | Dowor status LEDs | = 24        | To display power status                        |
| 1        | Fower status LEDS | ~ 220       | To display power status                        |
|          |                   | Channel 1   | To switch between three entertainment          |
| 2        | Selectors         | to          | sources. Steady light means that one source is |
|          |                   | Channel 6   | working  |
| 3        | Fuse, 5 A         |             | To protect the hardware against malfunctions   |
|          |                   | POI         | in the power supply network                    |
| 4        | Piano type switch | On, Off     | To power on (off)                              |

# 2.8.6 Headphones HP-1

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

Headphones are stored on a bracket (included in the scope of delivery); for dry areas.

# 2.8.7 Antenna ANT type

Whip antenna ANT type is designed to receive and convert radio signals, omnidirectional. Wall- or mast-mounted.


### 2.8.8 Entertainment remote control EC-6 type

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

The types of the entertainment remote controls:

- EC-6 (without entertainment source);

- EC-6M (with entertainment source).

Figure 19 describes the controls and LEDs of EC-6. Description and assignment of the controls and LEDs are shown in table 21.



Figure 19 – The controls and LEDs of EC-6M

| Table 21 – Functionality of the controls | s and LEDs of EC-6M |
|--|---------------------|
|--|---------------------|

| Position | Name                           | Designation | Functionality  |
|----------|--------------------------------|-------------|--|
| 1        | Power status LED               | С<br>С      | To display power status  |
| 2        | Entertainment source (player)  | _           | To play radio entertainment programs,<br>AM and FM radio and other programs        |
| 3        | Piano type switch              | On, Off     | To start and stop operation of the unit  |
| 4        | Group of keys 1 to 6 with LEDs | 1 to 6      | To select PA line. Steady light means that<br>the corresponding PA line is working |
| 5        | Fuse holder 24 A               | FU1         | To protect the hardware against<br>malfunctions in the power supply<br>network     |

# 2.8.9 Selector SEL-4P type

Selector SELP type is designed to switch the connected loudspeakers between entertainment sources.



The selectors are wall-mounted or hinged, for dry service premises and living accommodations.

The types of the selectors:

- SEL-4P-PM (single-channel, panel mounting);
- SEL-4P-WM (single-channel, wall mounting);
- SEL-4PD-PM (dual-channel, panel mounting);
- SEL-4PD-WM (dual-channel, wall mounting).

### 2.8.10 Selector with volume control DMP type

The selector with volume control DMP type is designed to select sound channels of loudspeakers and independent volume control. Functions of program select, volume control and volume control override are available. Panel mounting or may be hinged.

#### 2.8.11 Volume control DM type

Volume control DM type is designed to control volume of the connected loudspeakers. Dual-channel, volume control override function.

The types:

- DM-10D-PM (panel mounting, power of connected loudspeakers 10 W);
- DM-10D-WM (wall mounting, power of connected loudspeakers 10 W);
- DM-25D-PM (panel mounting, power of connected loudspeakers 25 W);
- DM-25D-WM (wall mounting, power of connected loudspeakers 25 W);

– DM-25WD (wall mounting, power of connected loudspeakers 25 W, waterproof);

- DM-50D-PM (panel mounting, power of connected loudspeakers 50 W);

- DM-50D-WM (wall mounting, power of connected loudspeakers 50 W).

# 2.8.12 Volume control DMO type

Volume control DMO type is designed to control volume of the connected loudspeakers. Single-channel, volume control override function.

The types:

- DMO-10-PM (panel mounting, power of connected loudspeakers 10 W);
- DMO-10-WM (wall mounting, power of connected loudspeakers 10 W);
- DMO-25-PM (panel mounting, power of connected loudspeakers 25 W);

- DMO-25-WM (wall mounting, power of connected loudspeakers 25 W);

– DMO-25W (wall mounting, power of connected loudspeakers 25 W, waterproof);

- DMO-50-PM (wall mounting, power of connected loudspeakers 50 W);

- DMO-50-WM (wall mounting, power of connected loudspeakers 50 W).

#### 2.8.13 Switching unit 19-COM-4-6

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

#### 2.8.14 Alarm generator 19-AG

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

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



Figure 20 – The controls and LEDs of 19-AG

| Table 22 – Functionality of the | controls and LEDs of 19-AG |
|---------------------------------|----------------------------|
|---------------------------------|----------------------------|

| Position | Name                | Designation              | Functionality                            |
|----------|---------------------|--------------------------|--|
| 1        | Power I FDs         | Backup                   | To indicate available standby power      |
| 1        | Main                | Main                     | To indicate available main power         |
| 2        | Power circuit fuses | circuit fuses EU1 to EU4 | To protect the hardware against          |
| 2        |                     | 1010104                  | malfunctions in the power supply network |
| 3        | Piano type switch   | On, Off                  | To power on (off)                        |

#### 2.8.15 Matching transformer T-140 type

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

The types: T-140B (step-down), T-140D (step-up).



#### 2.9 RACKS, CABINETS, ENCLOSURES

### 2.9.1 Mounting rack 19IR type

Mounting rack 19IR – is a metal structure designed to house the SCs. The rack structure consists of a steel extra strong frame standing on four points with a shock absorber at the bottom, and a special bracket at the top to attach the rack to the bulkhead and fix it. Sidewalls and walls are outfitted with detachable metal panels with ventilation louvres. The front part has a transparent door and a lock against unauthorized access.

The height of the rack is measured in units "U" (one unit is 1.75" or 44.45 mm). Quantity of units depends on the rack type, see figure 21.

Equipment is placed inside the rack horizontally, one above another, and fastened by means of screws at the front; at the back it is fastened by the special rack ears. The units are mounted on the special rails; a user may pull the units out when necessary and do not need to take them out of the rack completely (for example, for maintenance or alignment).

The top part is designed as a panel with fans that ensure hot air outlet from the rack. Air is taken into the rack through side and rear panels.

The rack elements are grounded between themselves to maintain the integrity of protection grounding.



Figure 21 – The types of 19IR rack

# 2.8.2 Wall-mounted enclosure WME type

Wall-mounted enclosure WME type is a metal structure designed to enclose the SCs. It is smaller than a mounting rack and has a different type of mounting (wall-mounted). The enclosure is outfitted with six shock absorbers, a bracket for wall



mounting and door against unauthorized access. The enclosure has cable leads at the top and at the bottom.

The types:

- WME-9 (height 9U);
- WME-12 (height 12U);
- WME-15 (height 15U).

# 2.8.3 Fan unit ITS-FU-4

Fan unit ITS-FU-4 ensures air circulation inside the rack and removes the hot air through the panel. The fan unit is outfitted with controls and LEDs, see figure 22. Description and assignment of the controls and LEDs are shown in table 23.



Figure 22 – The controls and LEDs of ITS-FU-4

Table 23 – Functionality of the controls and LEDs of ITS-FU-4

| Position | Name              | Designation | Functionality   |
|----------|-------------------|-------------|---|
| 1        | Power LED         | ს<br>ს      | To display power status   |
| 2        | Fuses 5 A         | FU1         | To protect the hardware against malfunctions<br>in the power supply network |
| 3        | Piano type switch | On, Off     | To power on (off)   |

# 2.8.4 Wall-mounted metal enclosure BO type

Wall-mounted metal enclosure BO type is designed to enclose the SCs in dry premises and on open deck. Wall-mounted.

BO-1, BO-2, BO-3, BO-4 and BLTS2-BO types have various volume and outfitted with hinges for wall mounting, and a door with a lock and doorstop (opening angle is 105°). The bottom part is outfitted with the cable glands to connect the SCs.

# 2.8.5 Wall-mounted metal enclosure BO-1H

Wall-mounted metal enclosure BO-1H is designed to house equipment on open deck and to protect the SCs against low temperature. The interior of the enclosure is heated automatically when the temperature outside is greater than -15 °C.



The enclosure is made of stainless steel with hinges for wall mounting. The door is outfitted with a lock and doorstop (opening angle is  $105^{\circ}$ ). The bottom part of the enclosure is outfitted with cable glands to connect the SCs.

#### 2.10 SWITCHES, NETWORK DEVICES AND SIGNAL CONVERTERS

# 2.10.1 Switch SW type

Switch SW type is designed to switch network streams 10/100/1000 Base-T when the modules are interconnected by Ethernet network.

The types:

- SW-16 (16 network streams, mounted into the rack 19IR or enclosure WME);
- SW-16-WM (16 network streams, wall mounting);
- SW-24 (24 network streams, mounted into the rack 19IR or enclosure WME).

The switches are outfitted with controls and LEDs, see figure 23. Description and assignment of the controls and LEDs are shown in table 24.



Figure 23 – The controls and LEDs of SW-16

Table 24 - Functionality of the controls and LEDs of network switch SW type

| Position | Name                 | Designation       | Functionality  |
|----------|----------------------|-------------------|--|
| 1        | Power LED            | С<br>С            | To indicate power supply or reboot the unit                              |
| 2        | Channel status LEDs  | Connection/Active | To indicate operation of the device connected to the channel             |
| 3        | Ethernet ports       | —                 | Ports to connect the SCs   |
| 4        | Supply line fuse 5 A | FU1               | To protect the hardware against malfunctions in the power supply network |
| 5        | Piano type switch    | On, Off           | To power on (off)  |

# 2.10.2 Extension unit (PA lines) ITS-TBSW

Extension unit (PA lines) ITS-TBSW is designed to switch the subscribers of PAC network off-line (without control by an external server) and to link and exchange streams with other rack modules and extension units of PAC and PBX lines.



The types:

- ITS-TBSW-6 (6 microphone panel's voice streams);
- ITS-TBSW-12 (12 microphone panel's voice streams);

Figure 24 describes the controls and LEDs of the unit. Description and assignment of the controls and LEDs are shown in table 25.



Figure 24 – The controls and LEDs ITS-TBSW

Table 25 – Functionality of the controls and LEDs of CU

| Position  | Name                        | Designation  | Functionality   |  |  |
|---|-----------------------------|--------------|---|--|--|
| 1   | Power LED                   | ሳ            | To indicate power status  |  |  |
| 2   | Fuses 2 A                   | FU1 to FU12* | To protect microphone panel circuits  |  |  |
| 3   | Channels LEDs               | _            | To indicate channels' status  |  |  |
| 4   | Ports for microphone panels | X1 to X12*   | To connect microphone panels  |  |  |
| 5   | Ports for external systems  | XS1 to XS2   | To connect the SCs  |  |  |
| 6   | Power fuse 30 A             | FU13         | To protect the subscriber lines and the<br>power supply network against<br>malfunctions |  |  |
| 0   | Power supply fuse 2 A       | FU14         | To protect the hardware against<br>malfunctions in the power supply<br>network          |  |  |
| 7   | Piano type switch           | On, Off      | To power on (off)   |  |  |
| Note – * means that number of positions depends on the CU type. |                             |              |   |  |  |

# 2.10.3 Signal converter ST-2

Signal converter ST-2 is designed to convert Ethernet packet data transmission into signal 0 dB.



### **2.11 LOUDSPEAKERS**

The loudspeakers are designed to reproduce entertainment broadcasting and voice communication in PAC and alarm systems.

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 indoor premises, 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 indoor 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 indoor premises;

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;

1) LS 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, for explosion hazardous areas;

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

The types of GVR-Prometey:

- GVR-Exd-10-Prometey (input voltage 100 V, power 10 W);

- GVR-Exd-20-Prometey (input voltage 100 V, power 20 W);

- GVR-Exd-30-Prometey (input voltage 100 V, power 30 W);

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

#### 2.12 INTERCOM DEVICES AND ACCESSORIES

#### 2.12.1 Microphones

Dynamic microphones are intended to convert acoustic signals into electric ones and transmit them to the outputs of the communication devices.

The System includes the following types of microphones:

a) M1 - stationary, gooseneck, to receive voice communication in dry areas, connected to the main substations and user substations, outfitted with a quick connector, mounting type – into a connector of microphone panels and user substations;

b) M2 – hand-held with a PTT switch and cord 1.5 m, to receive voice communication in dry areas, connected to microphone panels and user substations, outfitted with a quick connector, wall-mounted or on a clip;

c) M3 – hand-held with a PTT switch, for wet, noisy areas and open deck; to use remotely with a connection to microphone panels through socket CBP1, wall mounting or mounting on a bracket.

The types:

- M3-W (cable 3 m);
- M3-10W (cable 10 m).

#### 2.12.2 Headset HS type

The headset is designed for talk-back communication in the noisy environment.

The types:

- HS-4 (crimped ends);
- HS-4C (with connector);
- HS-4AC (with angle connector);



- HS-6 (one-eared, crimped ends);
- HS-6C (one-eared, with connector);
- HS-6AC (one-eared, with angle connector).

#### 2.12.3 Intercom helmet

The intercom helmet is outfitted with a microphone, cable 3 m and hand-held PTT switch.

The summer types:

- TH-4M-S (crimped ends);
- TH-4M-S-C (with connector);
- TH-4M-S-AC (with angle connector).

The winter types:

- TH-4M-W (crimped ends);
- TH-4M-W-C (with connector);
- TH-4M-W-AC (with angle connector).

The intercom helmet is outfitted with a throat microphone, 3 m cable and PTT switch.

The summer types:

- TH-4L-S (crimped ends);
- TH-4L-S-C (with connector);
- TH-4L-S-AC (with angle connector).

The winter types:

- TH-4L-W (crimped ends);
- TH-4L-W-C (with connector);
- TH-4L-W-AC (with angle connector).

#### 2.12.4 Foot-switch FB1

The foot-switch FB1 is designed to activate the microphone. Connected to all user substations. Floor-mounted.



### 2.13 JUNCTION BOXES

### 2.13.1 Junction boxes

Junction boxes are designed to split single-program PA lines with volume control override circuits or to split control circuits of signaling units to various directions.

The System includes the following junction boxes:

- КР-124PW;
- КР-124;
- KP-124V.

All boxes are hinged and may be mounted in wet areas and on open deck.

#### 2.13.2 Sockets

The System includes the following types of the sockets:

- SM – designed to connect external microphones to the substations;

- CBP1 – designed to connect portable substations to the subscriber line, wall mounting, waterproof;

- HS-CB – designed to connect external intercom devices to PAC devices, wall mounting, waterproof;

- SHP – designed to connect headsets to PA lines with an option to select programs and control volume, hinged or panel mounting, for dry premises.

# 2.13.3 Cord CE type

The cord CE type is designed to extend a standard cord of external PAC intercom devices. Waterproof. CE has five length types: *1.5; 3.0; 5.0; 7.0; 10.0 m*.

The types:

- CE-1.5; CE-3; CE-5; CE-7; CE-10 (two waterproof connectors, socket and plug straight);

- CE-1.5BE; CE-3BE; CE-5BE; CE-7BE; CE-10BE (waterproof connector and crimped ends);

- CE-1.5AC; CE-3AC; CE-5AC; CE-7AC; CE-10AC (two waterproof connectors, socket and plug angle).



#### 2.14 POWER SUPPLY UNITS

#### 2.14.1 Power supply units

The power supply units are designed to power the System units from main and emergency power network 220 VAC or 24 VDC (providing switching from one to another).

The types of the power supply units:

- 19-PS-500;
- 19-PS-1000;
- ITS-PS-1500;
- ITS-PS-350.

The units are outfitted with controls and LEDs, see figures 25, 26. Description and assignment of the controls and LEDs are shown in tables 26, 27.



Figure 25 – The controls and LEDs of 19-PS-1000-48

Table 26 – Functionality of the controls and LEDs of ITS-CH-105

| Position | Name                      | Designation  | Functionality  |
|----------|---------------------------|--------------|--|
| 1        | Power LEDs                | Backup, Main | To indicate power supply                                       |
| 2        | Automatic circuit-breaker | On, Off      | To switch main and standby power automatically                 |
| 3        | Fuse 15 A                 | FU1          | To protect against malfunctions in<br>the power supply circuit |
| 4        | Piano type switch         | On, Off      | To start and stop the unit                                     |



Figure 26 – The controls and LEDs of ITS-PS-1000

Table 27 – Functionality of the controls and LEDs of ITS-PS-1000

| Position | Name                      | Designation | Functionality                                  |
|----------|---------------------------|-------------|--|
| 1        | Power LED                 | С<br>С      | To indicate power supply                       |
| 2        | LCD                       | —           | To display voltage and current values          |
| 3        | Reboot                    | $\bigcirc$  | To reboot the unit                             |
| 4        | Automatic circuit-breaker | On, Off     | To switch main and standby power automatically |

# 2.14.2 Standby power supply unit ITS-CH

Standby power supply unit ITS-CH is designed to charge the connected external battery (capacity up to  $200 A \cdot h$  and voltage 24 V) when power network is available, and to connect chargeable battery of the SCs to power network in the event of power mains failure.

External battery circuit is electrically isolated from the load during the charge (i.e. the battery charge is carried out in the cyclic mode).

The unit is outfitted with controls and LEDs, see figure 27. Description and assignment of the controls and LEDs are shown in table 28.

Public address system/General alarm system **TPA-1907** 







Figure 27 – The controls and LEDs of ITS-CH-105

Table 28 – Functionality of the controls and LEDs of ITS-CH-105

| Position | Name                               | Designation                           | Functionality   |
|----------|------------------------------------|---------------------------------------|---|
| 1        | Power LED                          | ሆ                                     | To indicate power supply                                    |
| 2        | Fan                                | _                                     | To cool the unit down                                       |
| 3        | Seven-segment LEDs                 | Voltage, V                            | To display voltage and current values                       |
| 5        | Seven-segment LEDs                 | Current, A                            | To display voltage and current values                       |
| 4        | Automatic circuit-breaker          | On, Off                               | To switch main and standby power automatically              |
| 5        | Fuse 5 A                           | FU1                                   | To protect against malfunctions in the power supply circuit |
| 6        | Piano type switch                  | On, Off                               | To start and stop the unit                                  |
| 7        | Start charge key                   | Force connection of a storage battery | To start the battery charge                                 |
| 8        |                                    | Select                                | To switch between current and voltage values                |
| 9        | Seven-segment LEDs<br>control keys | $\bigcirc \bigcirc$                   | To navigate on the menu                                     |
| 10       |                                    | SET/RESET                             | To confirm the selected values of                           |
| 10       |                                    |                                       | current or voltage  |
|          |                                    | Charge                                | Yellow light indicates the battery                          |
| 11       |                                    |                                       | charge  |
|          | Status LEDs                        | 1 Status LEDs Fault                   | Fault   |
|          |                                    |                                       | Valley light indicates that the writ is                     |
|          |                                    | Normal                                | renow light indicates that the unit is                      |
|          |                                    |                                       | non-rauncy and ready for operation                          |

# 2.14.3 Automatic power switch ITS-APS

the future

Automatic power switch ITS-APS is designed to switch main or standby power (220 VAC or 24 VDC) automatically to 6 outputs and to separate output and input circuits with a power fuse.

The automatic power switch is outfitted with controls and LEDs, see figure 28. Description and assignment of the controls and LEDs are shown in table 29.



Figure 28 – The controls and LEDs of ITS-APS

| Table 29 – | Functionality | of the  | controls | and | LEDs | of ITS- | -APS |
|------------|---------------|---------|----------|-----|------|---------|------|
|            | 1 ano no name | 01 1110 | •••••••  |     |      |         |      |

| Position | Name                                 | Designation     | Functionality   |
|----------|--------------------------------------|-----------------|---|
| 1        | Power LEDs                           | Main,<br>Backup | To indicate input power status                              |
| 2        | Output circuits fuses 10 A with LEDs | FU1 to FU6      | To protect against malfunctions in the power supply circuit |
| 3        | Switch                               | On, Off         | To switch the unit on (off), to change a power type         |

#### 2.15 SIGNALING UNITS

Signaling units are designed to inform the crew by light and (or) sound signaling on actuation of the general alarm (or other alarms).

The signaling units are powered from the System mounting rack with 24 V or 220 V.

# 2.15.1 Rotating lamp RL type

Rotating lamp RL type is designed to provide bright light signaling to attract attention on the open deck and in noisy areas. Wall-mounted, or mounted on a bracket only vertically.

The types of the signaling unit:

- RL-24-O (input voltage 24 VDC, globe colour orange);
- RL-220-O (input voltage 220 VAC, globe colour orange);



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

# 2.15.2 Flashing lamp FL type

Flashing lamp FL type is designed for light signaling to attract attention on the open deck and in noisy areas, with a beacon function. Mounted on a bracket only on a vertical surface, input voltage 24 VDC.

The types of the signaling unit:

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

# 2.15.3 Light signaling unit L type

Light signaling unit L type is designed for visual signaling to attract attention on the open deck and in noisy areas, w/beacon function. Wall-mounted.

The types of the signaling unit:

- L-24-O (input voltage 24 VDC, orange);
- L-220-O (input voltage 220 VAC, orange);
- L-24-C (input voltage 24 VDC, blue);
- L-220-C (input voltage 220 VAC, blue);
- L-24-K (input voltage 24 VDC, red);
- L-220-K (input voltage 220 VAC, red);
- L-24-3 (input voltage 24 VDC, green);
- L-220-3 (input voltage 220 VAC, green);
- L-24-Б (input voltage 24 VDC, white);



– L-220-Б (input voltage 220 VAC, white).

# 2.15.4 Rotating flashing lamp RFL type

Rotating flashing lamp RFL type is designed to provide bright light signaling to attract attention on the open deck and in noisy areas. Wall-mounted.

The types of the signaling unit:

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

### 2.15.5 Sound signaling unit A type

Sound signaling unit A type is designed for sound alarm signaling on the open deck and in noisy areas. Wall-mounted. A2-24, A2-220 are used in systems with channel redundancy.

The types of the signaling unit:

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

# 2.15.6 Howler HW type

Howler HW type is designed for sound alarm signaling on the open deck and in noisy areas. Wall-mounted.

The types of the signaling unit:

- HW-24 (input voltage 24 VDC);

- HW-220 (input voltage 220 VAC).



# 2.15.7 Buzzer-howler BH type

Buzzer-howler BH type is designed for sound alarm signaling on the open deck and in noisy areas. Wall-mounted.

The types of the signaling unit:

- BH-24 (input voltage 24 VDC);
- BH-220 (input voltage 220 VDC).

# 2.15.8 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. Wall-mounted.

The types of signaling unit:

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

# 2.15.9 Light signaling unit PGS-VSPYSHKA type

Light signaling unit PGS-VSPYSHKA type is designed for light alarm signaling in explosion hazardous areas. Wall-mounted.

The types of the signaling unit:

- PGS-VSPYSHKA-24 (input voltage 24 VDC);
- PGS-VSPYSHKA-220 (input voltage 220 VAC).

# 2.15.10 Sound signaling unit BExS110 type

Sound signaling unit BExS110 type is designed for sound alarm signaling in explosion hazardous areas. Wall-mounted.



The types of the signaling unit:

the future

- BExS110DFDC024AS1A1G (input voltage 24 VDC);
- BExS110DFAC230AS1A1G (input voltage 220 VAC).

# 2.15.11 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.

The types of the signaling unit:

- ORBITA MK S (light alarm signaling);
- ORBITA MK SZ (sound and light alarm signaling);
- ORBITA MK Z (sound alarm signaling).

### 2.15.12 Relay unit RB-139 type

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

The types of the signaling unit:

- RB-139-24 (input voltage 24 VDC);

- RB-139-220 (input voltage 220 VAC).



# **3 INTENDED USE**

### 3.1 OPERATIONAL LIMITATIONS

Connect all the SCs according to the electrical diagrams and table of connections of the order. All SCs shall be grounded; all ends shall be isolated.

Select place for installation and install the SCs in compliance with the operational limitations (operating temperature, IP rating and code of explosion-proof design).

#### Attention!

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

### **3.2 PREPARATIONS TO USE**

# **3.2.1 Safety features**

While preparing the System for operation, a user shall:

- train the personnel to operate with the SCs, test and control equipment; the personnel shall receive proper qualifications in the area of the occupational safety;

– familiarize the personnel with the grounding locations of all SCs, and check the reliability of the grounding;

– use the fuses from SPTA kit;

 $-\,{\rm switch}$  off the power of the SCs before disconnecting cables, replacement of fuses, units or modules.

# 3.2.2 Visual check procedure

Before switching the SCs on:

- observe integrity and initial position of the controls on the front panels of the SCs;

 $-\,{\rm check}$  and clean dust and dirt from the front panels of the SCs with a soft cloth, if necessary;

- check that cable connectors are securely connected to the SCs.

# **3.3** USAGE OF THE SYSTEM

# 3.3.1 Transmission of voice communication via PA lines

Select one, several or all zones on the microphone panel by pressing keys in the group *PA lines*, then press *MIC* key to switch on the microphone and say the command. The corresponding LEDs will light up next to the keys.



Press *MIC* key to stop the transmission, then press the key with a number of zone for the second time.

#### Attention!

The System will interrupt current alarm signaling and (or) entertainment broadcasting on all subscriber units during voice communication transmission via PA lines; they will resume once the transmission is over.

#### 3.3.2 Audio control via PA lines

To check quality of the transmitted messages the System may include the PA sound control unit 19-CHSW.

To provide audio control, select the PA line by a PA line selector, then rotate *Volume* knob and set the volume of the transmitted messages.

#### 3.3.3 Transmission of emergency notifications via PA lines

Press *EMERGENCY PA* key on the combined microphone panel, press *MIC* key to switch on the microphone and say the message. The corresponding LEDs will light up next to the keys.

To switch this mode off, press *MIC* key again and then press *EMERGENCY PA* key.

#### Attention!

1 Emergency notification mode has the highest priority among other communication types (see 1.3.3); therefore, any current messages, alarms or broadcasting will be interrupted, and resumed only after emergency notifications are finished.

2 Emergency notifications are transmitted to all zones simultaneously.

#### 3.3.4 Alarms initiation

This operation mode is available only if the System configuration includes the alarm generator 19-AG.

Use alarm panels AP type, combined microphone panels CP type and main substations MS type with a group of keys *ALARMS* to initiate alarms.

To initiate alarm open the cover or unlock the keys, press the corresponding alarm key on the alarm panel; the corresponding LED will light up, signaling units of general alarm will actuate, sound alarm signaling will be transmitted via PA lines.

To stop the alarm signaling press the alarm key for the second time or press *RESET* key (do not press unlock key for the second time).



To initiate the alarm in manual mode, press MANUAL.

Notes

1 Alarm signaling will interrupt voice communication transmission.

2 Types of general alarm signaling and other alarm types initiated by the System are assigned while configuring the System.

# 3.3.5 Fire alarm signaling

The fire alarm signaling may be initiated in several ways:

- fire alarm system sends control discrete signal (dry contact) to the alarm generator 19-AG; the generator, at the same time, initiates one of the six pre-configured alarms and supplies alarm signals to general alarm units and to PA lines of a broadcast unit;

- fire alarm system sends control discrete signal (dry contact) to the alarm generator 19-AG; the generator, at the same time, supplies alarm signals to general alarm units in compliance with control signal sequence of fire alarm;

- fire alarm system sends control discrete signal (dry contact) and audio signal 0 dB to alarm generator 19-AG; the generator, at the same time, supplies corresponding signals to general alarm units and starts alarm signaling via PA lines of broadcast unit.

Note – Voice communication will interrupt fire alarm signaling (see 1.3.3).

# 3.3.6 Entertainment broadcasting

Entertainment broadcasting may be carried out from a standard entertainment source (from the rack devices) and from an external one.

To provide broadcasting from the entertainment source, switch the device on, select a broadcasting program; broadcasting will start immediately after switch-on if PA line is not occupied with voice communication and general alarm transmission. To stop broadcasting, press the power button of the entertainment source or mixer 19-MIX (if available).

If the System with one or several single-program PA lines includes several entertainment sources, all sources shall be switched on and connected to the corresponding PA line by means of a selector of the mixer 19-MIX.

If the System includes three-program PA line, switch on all sources and select a broadcasting program. Entertainment programs are transmitted via corresponding circuits of the three-program PA line.



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Entertainment broadcasting is carried out from any external entertainment source through AUX port of the entertainment broadcast unit 19-P1; a user shall switch the device on and transfer to AUX mode (to retransmit input audio signal).

The headsets and loudspeakers are designed to listen to entertainment and public address broadcasting. The headsets shall be connected to sockets, SHP-3 type. The sockets may be connected to single-program or three-program PA line. SHP-3 type is outfitted with a volume control and program selector.

Select a broadcast channel and set the volume, or switch off a loudspeaker by the selector's knob.

#### 3.3.7 Volume controls and program selectors

Use a volume control to change the sound level of the loudspeaker:

- to turn the volume up - rotate the knob clockwise;

- to turn the volume down - rotate it counter clockwise;

- to turn the sound off - rotate the knob counter clockwise until it stops.

Use a program selector switch to select a channel. Rotate the knob to set the knob indicator line opposite a number of the required channel.

All volume controls and program selectors have a function of volume control override; command transmission will interrupt entertainment broadcasting not depending on the volume level of the unit or selected program. A position of the knob or selector does not have an effect on the volume of the command transmission.

#### 3.3.8 Backlight brightness dimming of keys and LEDs

All panels have the backlight of controls. Change brightness by *DIM* key from min. to max. levels.



# **4 TECHNICAL SERVICE**

#### 4.1 GENERAL INSTRUCTIONS

The System's TS 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 TS:

- TS-1 - semi-annual TS;

- TS-2 - annual TS.

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 on the running system.

The results of TS-2 are registered in the System's certificate.

#### 4.2 SAFETY FEATURES

While maintaining the TS, observe instructions in 5.1 of this operating manual.

#### 4.3 MAINTENANCE ROUTINE

The list of works for all types of TS is given in table 30. Maintenance routine is described in checklists, see tables 31-34. Table 4 describes consumables required for the TS.

| Charklist No.                   | Work  |   | TS type     |  |
|---------------------------------|---|---|-------------|--|
| CHECKIISt NO.                   |   |   | <b>TS-2</b> |  |
| 1                               | Visual check of the SC  | + | +           |  |
| 2                               | Operation test of the SC  | _ | +           |  |
| 3                               | Operation tests of command transmission, general alarm and entertainment broadcasting | _ | +           |  |
| 4                               | Check of SPTA kit completeness, its condition and operational documentation           | _ | +           |  |
| Notes                           |   |   |             |  |
| 1 "+" – work is obligatory.     |   |   |             |  |
| 2 "—" – work is not obligatory. |   |   |             |  |

Table 30 – The list of works



### Table 31 - Checklist No. 1. Visual check of the SC

| To be done           | Routine  | Man-hours |
|----------------------|--|-----------|
| 10 be done           | Kouthie  | per 1 SC  |
| Visually examine     | 1) Check completeness and appearance of the SC; mechanical           | 1 person  |
| the SC               | damage, paint defects shall be absent; the SCs shall have            | 5 minutes |
|                      | marking plates; legends shall be legible.                            |           |
|                      | 2) Clean up the SC surfaces with clean cloth.                        |           |
|                      | 3) Remove severe contamination, parts of corrosion, oil spots:       |           |
|                      | - from the front surfaces - with soap suds preventing from           |           |
|                      | penetration inside the SC; then clean dry all surfaces with dry      |           |
|                      | clean cloth and dry up;  |           |
|                      | <ul> <li>from other surfaces – with alcohol-soaked cloth.</li> </ul> |           |
|                      | 4) If varnish paint coating is damaged, polish it with sand          |           |
|                      | paper, then clean with alcohol-soaked cloth, cover with varnish and  |           |
|                      | dry up   |           |
| Check reliability of | Check that the connectors and attaching screws are fastened          | 1 person  |
| cable and bus        | tight; provide further fastening if needed                           | 5 minutes |
| connection to the SC |  |           |

# Table 32 – Checklist No. 2. Operation test of the SC

| To be done            | Routine   | Man-hours<br>per 1 SC |
|-----------------------|---|-----------------------|
| Operation test of the | 1) Check that the following LEDs light up:                  | 1 person              |
| System                | - channels LEDs on the units 19-CU type, ITS-TBSW,          | 10 minutes            |
|                       | 19-CHSW, 19-MIX;  | per 1 SC              |
|                       | - power LEDs on the units 19-CU type, 19-PAC-6, 19-P1,      |                       |
|                       | ITS-FU-4, ITS-TBSW, ITS-CH, ITS-PS, on the entertainment    |                       |
|                       | remote control EC-6, on the network switch SW-type;         |                       |
|                       | - group of status LEDs on the main substations, talk-back   |                       |
|                       | stations, microphone panels, power amplifiers, on the units |                       |
|                       | 19-PAC-6, ITS-CH, on the network switch SW-type;            |                       |
|                       | - button LEDs on the main substations, talk-back stations,  |                       |
|                       | microphone panels and alarm panels;                         |                       |
|                       | - group of LEDs Alarm state on the combined microphone      |                       |
|                       | panels and alarm panels.                                    |                       |
|                       | 2) Make sure LCDs of 19-PAC-6, 19-P1, EC-6M, ITS-TBSW       |                       |
|                       | display the data adequately.                                |                       |



Table 33 – Checklist No. 3. Operation tests of command transmission, general alarm and entertainment broadcasting

| To be done            | Routine   | Man-hours<br>per 1 SC |
|-----------------------|---|-----------------------|
| To test command       | 1) To transmit command to PA lines according to section 3.3.1,    | 2 people              |
| transmission, general | control compliance with priorities, see 1.3.3.                    | 1 hour                |
| alarm and public      | 2) Transmit emergency notification to PA lines according to       |                       |
| address               | section 3.3.3, control compliance with the priorities, see 1.3.3. |                       |
|                       | 3) Initiate alarms according to section 3.3.4, control compliance |                       |
|                       | with the priorities, see 1.3.3.                                   |                       |
|                       | 4) Start entertainment broadcasting according to section 3.3.6,   |                       |
|                       | control compliance with the priorities, see 1.3.3                 |                       |

Table 34 – Checklist No. 4. Check of SPTA kit completeness, its condition and operational documentation

| To be done         | Routine  | Man-hours<br>per 1 SC |
|--------------------|--|-----------------------|
| Check completeness | 1) Check completeness of SPTA kit and operational            | 1 person              |
| and condition of   | documentation according to the list of documents in section  | 1 hour                |
| SPTA kit and       | Completeness of Certificate.                                 |                       |
| operational        | 2) Check condition of each item, storage terms and make sure |                       |
| documentation      | that SPTA kit was re-completed in case of use.               |                       |
|                    | 3) Complete SPTA kit   |                       |

#### 4.4 INSTRUCTIONS ON SPTA KIT

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

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

#### 4.5 **PRESERVATION**

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

The time of represervation -2 years from the Manufacturer's commissioning.

The preservation is done in full terms for 2 years applying protection and packaging according to the relevant regulatory documents.

The represervation shall be done in heated rooms in the same order as the preservation.

The represerved System, SPTA kit and documents are placed in package.



#### 5.1 SAFETY FEATURES

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

All SCs shall be grounded!

Use a rubber rug in front of power supply units.

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

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

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

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

#### 5.2 CURRENT REPAIR OF THE SYSTEM COMPONENTS

#### 5.2.1 Current repair of the CU

Control operation of CU by LEDs located on the front panel. Faulty parts shall be replaced by own personnel using parts from portable SPTA kit. Table 35 describes potential malfunctions and troubleshooting.

| Malfunction                    | Potential reasons          | To be done                             |
|--------------------------------|----------------------------|--|
| No light of power LED          |                            | Replace the blown power fuse           |
| No light of power LED          | Power circuit failure      | FU7                                    |
| No light of left LED (channel  |                            | Replace the blown fuse of the          |
| status)                        |                            | corresponding circuit                  |
|                                |                            | 1 Test a communication line.           |
| No light of right LED (channel | Communication line failure | 2 Replace the cable if short circuit   |
| status)                        |                            | was detected.                          |
| status)                        |                            | 3 Replace the connected                |
|                                |                            | subscriber unit if the cable is intact |



# **5.2.2** Current repair of power amplifiers

Control operation of power amplifiers by the LEDs located on the front panel. Faulty parts shall be replaced by own personnel using parts from portable SPTA kit. Tables 36 describe potential malfunctions and troubleshooting.

Table 36 – Potential malfunctions of amplifiers

| Malfunction   | Potential reasons  | To be done   |
|---|--|--|
| No light of LED <i>State</i> (amplifier status) on TPA-15 | Damage or rupture of the cable   | Replace the cable or restore it using<br>soldering and providing insulation<br>of the damaged place  |
| 19-TPA does not switch on,                                | Power circuit fuse FU1 is blown  | Replace the fuse using SPTA kit<br>(consider the rate before<br>replacement)   |
| Keudy LED does not light up                               | Power supply unit is faulty  | Check the power supply unit (see table 39)   |
| 19-TPAisconstantlyrebooting,OverloadLEDlights up          | Total power of the connected<br>load is higher than the<br>amplifier's power | Disconnect extra load  |
| 19-TPA does not work, but<br>Overheat LED lights up       | Temperature mode of amplifier is violated                                    | Switch an amplifier to cool it down.<br>If after cooling the fault remains,<br>one cooler might be faulty. In this<br>case, contact the Manufacturer |

# 5.2.3 Current repair of broadcast units

Control operation of the broadcast units by the LEDs located on the front panel. Faulty parts are replaced by own personnel using parts from portable SPTA kit. Table 37 describes potential malfunctions and troubleshooting.

Table 37 – Potential malfunctions of the broadcast units

| Malfunction                  | Potential reasons                     | To be done                          |  |
|------------------------------|---------------------------------------|-------------------------------------|--|
| No light of power LED on     | Power circuit failure                 | Replace the blown power fuse        |  |
| 19-PAC-6, 19-P1, 19-MIX,     | Power supply unit is faulty           | Check the power supply unit (see    |  |
| EC-6, 19-AG                  |                                       | table 39)                           |  |
| No indication of the signal  | The unit has a malfunction            | Please contact the Manufacturer     |  |
| level                        | The unit has a martanetion            | r lease, contact the Manufacturer   |  |
|                              |                                       | Reboot the System                   |  |
| Fault LED lights up on       | Failure of communication line with CU | 1 Test cable integrity leading to   |  |
| 19-PAC-6                     |                                       | CU, replace the cable if rupture or |  |
|                              |                                       | damage was detected.                |  |
|                              |                                       | 2 Test a line for continuity        |  |
| No light of channels LEDs on | No signal from the                    | Check the entertainment source      |  |
| 19-MIX                       | entertainment source 19-P1            | 19-P1                               |  |



5.2.4 Current repair of switches, network devices, signal converters and fan unit

Control operation of switches, network devices, signal converters and fan unit by the LEDs located on the front panel. Faulty parts are replaced by own personnel using parts from portable SPTA kit. Table 38 describes potential malfunctions and troubleshooting.

Table 38 – Potential malfunctions of switches, network devices, signal converters and fan unit

| Malfunction                | Potential reasons             | To be done                          |  |
|----------------------------|-------------------------------|-------------------------------------|--|
| No light of power LED on   | Power circuit failure         | Replace the blown power fuse        |  |
| network switches SW type,  | Power supply unit is faulty   | Check the power supply unit (see    |  |
| ITS-TBSW, ITS-FU-4         |                               | table 39)                           |  |
| No light of channel status |                               |                                     |  |
| LEDs on network switch SW  | Failure of communication line | Replace the end subscriber terminal |  |
| type                       |                               |                                     |  |

# 5.2.5 Current repair of power supply units

Control operation of the power supply units by the LEDs located on the front panel. Faulty parts are replaced by own personnel using parts from portable SPTA kit. Table 39 describes potential malfunctions and troubleshooting.

Table 39 – Potential malfunctions of power supply units

| Malfunction                                | Potential reasons       | To be done   |
|--|-------------------------|--|
|  | No power supply         | Replace the blown power fuse   |
| No light of power LED                      | No power mains voltage  | Provide power supply from the external network   |
| No light below fuses on<br>ITS-APS         | Power circuit failure   | Replace the fuse of the corresponding output   |
| Steady light of <i>Fault</i> LED on ITS-CH | Lost battery connection | Check integrity of the cable<br>connected to the battery and<br>tightness of terminals. If the cable<br>is damaged, replace it or repair the<br>cable using soldering and insulate<br>the damaged part |

# 5.2.6 Current repair of subscriber units

Control operation of the subscriber units by the LEDs located on the unit's casing. Tables 40, 41 describe potential malfunctions and troubleshooting.



|  | Malfunction   | Potential reasons                                   | To be done   |
|--|---|---|--|
|  |   | Cable rupture                                       | Replace the cable or repair it using soldering and insulate the damaged place  |
|  | Fault LED lights up   | Configuration error                                 | Test the configuration with the help<br>of PC and the System's software. In<br>other cases, please, contact the<br>manufacturer's service centre   |
|  |   | A connector on the CU is damaged                    | Use another connector  |
|  | Flashing light of <i>Fault</i> LED and one or several indicators of button groups <i>SUBSCRIBERS</i> and <i>ZONES</i> | Lost connection with one or several subscriber unit | Check the communication line.<br>Replace the cable if short circuit is<br>detected. Replace subscriber unit if<br>there are no faults. If the fault<br>remains, check the System<br>configuration for errors |
|  | A subscriber called cannot hear<br>a message during the<br>communication session                                      | Microphone failure                                  | To replace the defective parts, please, contact the manufacturer   |

### Table 40 – Potential malfunctions of main substations

Table 41 – Potential malfunctions of talk-back stations, microphone and alarm panels

| Malfunction   | Potential reasons                         | To be done  |
|---|---|---|
| Red light:<br>– <i>State</i> – on talk-back<br>stations;<br>– <i>Ready</i> – on microphone<br>panels;<br>– <i>Main power</i> and <i>Standby</i><br><i>power</i> – on alarm panels | Damaged power circuit                     | Check power supply circuit for<br>short circuit. If there is no damage,<br>replace the blown fuse of the<br>corresponding power supply<br>circuit. Check connection and<br>operation of the power supply unit<br>(see table 39) |
|   | Failure of subscriber line                | Check the line for short circuit;<br>replace the cable in the event of<br>defect occurrence   |
| Flashing of <i>Fault</i> LED on<br>microphone panels and alarm<br>panels and one or several<br>indicators of button group<br><i>ZONES</i>   | Connection lost with one or several zones | Restart the system. If the fault<br>remains, check the cable for<br>rupture. If the fault remains this<br>time, check the system settings   |
| A subscriber called cannot hear<br>a message during the<br>communication session  | Microphone failure                        | Replace the microphone  |
|   | Subscriber line failure                   | See above   |



# 6 STORAGE

The System must be stored in the packaging inside the areas complying with the required storage conditions (+ 5 to + 40 °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 the 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 devices must be firmly secured or fastened.





### 8 DISPOSAL

Packaging material, SC damaged during operation of the System, and any overage 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 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 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.

These SC 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:

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 DIAGRAMS OF THE SYSTEM COMPONENTS



Figure A.1 – Assignment of terminals of mounting rack 19IR type





Figure A.2 – Connection of single-channel microphone panels



Figure A.3 – Connection of dual-channel microphone panels




---- the terminals are used only when connecting alarm panels AP-6, AP-6-19, AP-6W type

Figure A.4 – Connection of single-channel alarm panels

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---- the terminals are used only when connecting alarm panels AP2-6, AP2-6-19, AP2-6W type

Figure A.5 – Connection of dual-channel alarm panels





---- the terminals are used only when connecting combined microphone panels CP-6.6, CPW-6.6 type







---- the terminals are used only when connecting combined microphone panels CP2-6.6, CPW2-6.6 type

Figure A.7 – Connection of dual-channel combined microphone panels









Figure A.9 – Connection of talk-back stations





Figure A.10 – An example of main station, wing substation, microphones and loudspeakers connection



Figure A.11 – Connection of entertainment remote control







Figure A.12 – Connection of loudspeakers to command PA lines of single-channel system with junction boxes and volume control





Figure A.13 – Connection of single-channel volume control and loudspeaker SDL type to three-wire PA line





Figure A.14 – Connection of single-channel volume controls and loudspeaker SDL type to four-wire PA line





Figure A.15 – An example of selector, loudspeakers and headset connection in three-program PA line







Figure A.16 – Connection of loudspeakers to three-wire PA line of dual-channel system (with two racks № 1 and № 2 operating in redundancy mode) using dual-channel volume controls







Figure A.17 – Connection of loudspeakers to four-wire PA line of dual-channel system (with two racks A and B operating in redundancy mode) using dual-channel volume controls



## Mounting rack



Figure A.18 – An example of external systems connection





Figure A.19 – An example of power connection





Figure A.20 – An example of system connection





Figure A.21 – An example of dual-channel system connection







Figure A.22 – An example of the System composed of two independent racks



## ANNEX B CHARACTERISTICS OF THE SIGNAL TYPES

Table B.1 – Signal characteristics of A and AL types

| No. | Graphic representation of the sound signal | Layout of jumpers on board |                     |
|-----|--|----------------------------|---------------------|
|     |  | A-220                      | A-24                |
|     |  | AL-220                     | AL-24               |
| 1   | 250 ms 250 ms<br>1000 Hz<br>800 Hz         | 1<br>● ● ●                 | 1<br>● ● ●<br>● ● ● |
| 2   | 2800 ms 500 ms<br>1200 Hz<br>500 Hz        | 1<br>• • •<br>• •          | 1<br>●●●<br>● ● ●   |
| 3   | 1000 ms<br>1200 Hz<br>500 Hz               | 1<br>•••                   | 1<br>•••            |
| 4   | 100 ms 400 ms<br>544 Hz<br>440 Hz          | 1<br>• • •<br>• •          | 1<br>•••            |
| 5   | 1000 Hz —————————————————————————————————  | 1<br>●●●<br>●●●            | 1 *<br>●●●          |
| 6   | 0,69 ms<br>1450 Hz<br>0 Hz                 | 1<br>•••                   | 1<br>•••            |
| 7   | 140 ms<br>1000 Hz<br>800 Hz                | 1<br>• • •<br>• •          | 1<br>•••            |





| No.  | Graphic representation of the sound signal | Layout of jumpers on board |                   |
|--|--|----------------------------|-------------------|
|  |  | A-220<br>AL-220            | A-24<br>AL-24     |
| 8  | 420 Hz<br>625 ms<br>625 ms<br>625 ms       | 1<br>•••                   | 1 *<br>●●●<br>●●● |
| 9  | 3750 ms 250 ms<br>1200 Hz<br>500 Hz        |                            | 1<br>● ● ●        |
| 10   | 554 Hz — —                                 | No                         | 1 *<br>●●●        |
| 11   | 2900 Hz 20 ms 20 ms 2900 Hz 2400 Hz        | 1<br>••••                  | No                |
| * To set a sound signal on a signaling unit with input voltage 24 V interconnect S2 and – with a |  |                            |                   |

jumper according to figure B.1.



Figure B.1 – Connection of contacts S2 and – to set sound signals on a signaling unit with input voltage 24 V



## FOR NOTES