Valve box "SZI"

for compressed medical gases and the vacuum
complying to EN ISO 7396-1

INSTRUCTION MANUAL

Table of contents

1. Technical data

Construction: flush-mounted part is made of plastics or steel sheet, wall-mounted part (doors) white, powder coated, equipped with the lock with the emergency unlocking, inlet and outlet of gas from the top.

Pressure: compressed gases 0 – 10 bar
vacuum 0 - -0.9 bar

	Weight	Outer dimensions (WxHxD)
SZI-1	4.5 kg	380x450x90
SZI-2	6.1 kg	380x450x90
SZI-3	7.3 kg	380x450x90
SZI-4	10.5 kg	560x480x90
SZI-5	14.2 kg	560x480x90
SZI-6	15.4 kg	560x480x90

Power supply: 12V DC, 0.1A

Assembly: Flush-mounted or wall-mounted in a housing
- Pressured inlets/outlets from the top: copper pipe 15x1.
- Vacuum inlets/outlets from the top: copper pipe 15,18,22x1 or according to the design.
- Optionally only informative inlets.

The box is equipped with a system of analog pressure converters 0-5V and built-in gas monitor. Too high or too low level or excessive gas consumption is signaled optically and acoustically (break-down consisting in damage of the distribution conduits or the medical equipment).

1.1 Information about the device
- Device should be stored in a dry place in temperature between +10 C - +45 C.
- The valve box is a part of a central gas supply system according to EN ISO 7396-1. The pipes in the pipeline must by hard soldered.
- The valve-informative box, according to 93/42/EWG directive and the decree of the Ministry of Health, Journal of Laws No 16 item 74 dated January 12, 2011 is a medical manufactured product – class IIb.

2. Application

For monitoring pressure of medical gases and vacuum for hospital units, operating theatres, ICU rooms in central gas supply systems. Possibility of transmitting information to the central alarm unit or central computer.

3. Construction

The housing of the valve box contains up to 6 shut-off valves, analog pressure converters 0-5V, emergency supply point type NIST and gas alarm unit with LCD display mounted on the doors.

4. Installation

- Wall mounting of the housing – the doors should be disassembled prior to the assembly.
- Connection of copper pipes to the main system.
- Before start-up of the installation the doors should be assembled again.
- Supply the 12V DC voltage to a box.
- Connect „+" and „-" poles to marked pins.

!!! Attention !!!
Mounting must be performed ONLY by qualified technicians experienced in servicing medical equipment.
Read manual before mounting valve box.

!!! Attention !!!
Polarity of the connection is very important, any mistake causes a damage of the electronic system

!!! Attention !!!
Before performing a leak test vacoumeter should be removed.

- Perform leak test of pipeline system in accordance with the EN ISO 7396-1;

5. Operation

5.1 First start-up
1. Before start-up make sure all tests in accordance with EN ISO 7396-1 finished successfully.
2. Slowly open each valves in box;
3. Make sure that pressures in manometers are as determined by project;
4. Connect power supply;
5. Make sure that alarm unit shows correct informations (gas type and pressure);
6. Device is ready to use.

In order to use shut-off valves, the doors must be opened.

The box may also be opened without a key in case of an emergency. This is done by pushing the lock with the plastic mounting into the box. Upon completion of the necessary steps, the plastic mounting fixing the lock should be replaced and put back in the door. Close the door with a key.

According to EN ISO 7396-1, the valve box is equipped with the physical unsealing. For this purpose the relevant shut-off valve must be closed, the pipeline behind the valve should be emptied. Then, physical cut-off may be unscrewed and screwed in again after the works.

For the emergency supply, NIST connectors should be used. They are encoded for the given gas. NIST connectors together with the pressure reducer should be mounted on the emergency bottle with compressed gas, placed in proper socket, pushing it in and screwing down the pin cap. Before opening of the valve of the bottle, it is required to loosen reducer's hand wheel. After slow opening of the valve of the bottle the pressure on the reducer may be set as per working pressure in the installation.

6. Maintenance / repair

Each valve box must be subjected to maintenance at least once a year. In particular, it is required to check the shut-off valves and points of emergency supply and check the tightness of the pressure connections inside the box. Any repairs may only be performed by a qualified personnel. Use only genuine parts of HYDRO-GAZ-MED Sp.j.

6.1 List of spare parts

- Analog pressure transducer 0-16 bar –
  Cat. No.: 3100R0016G05B000
- Analog pressure transducer -1-0 bar –
  - Cat. No.: 3300R00B0V05B00001
- ball valve ½" degreased – cat. No.: ZKUL-DN15
- Signaling device with measuring module – cat. No.: IBPL H0122N
- Remote signaling device – cat. No.: IBPL-H01

6.2 List of the authorized service points

Hydro-Gaz-Med. Sp.j.,
Willowa 40 St.,
05-205 Dobczyn,
Poland
tel. +48 22 787 65 60,
email: gazmed@gazmed.pl

7. Cosntruction diagram

Shut off valves
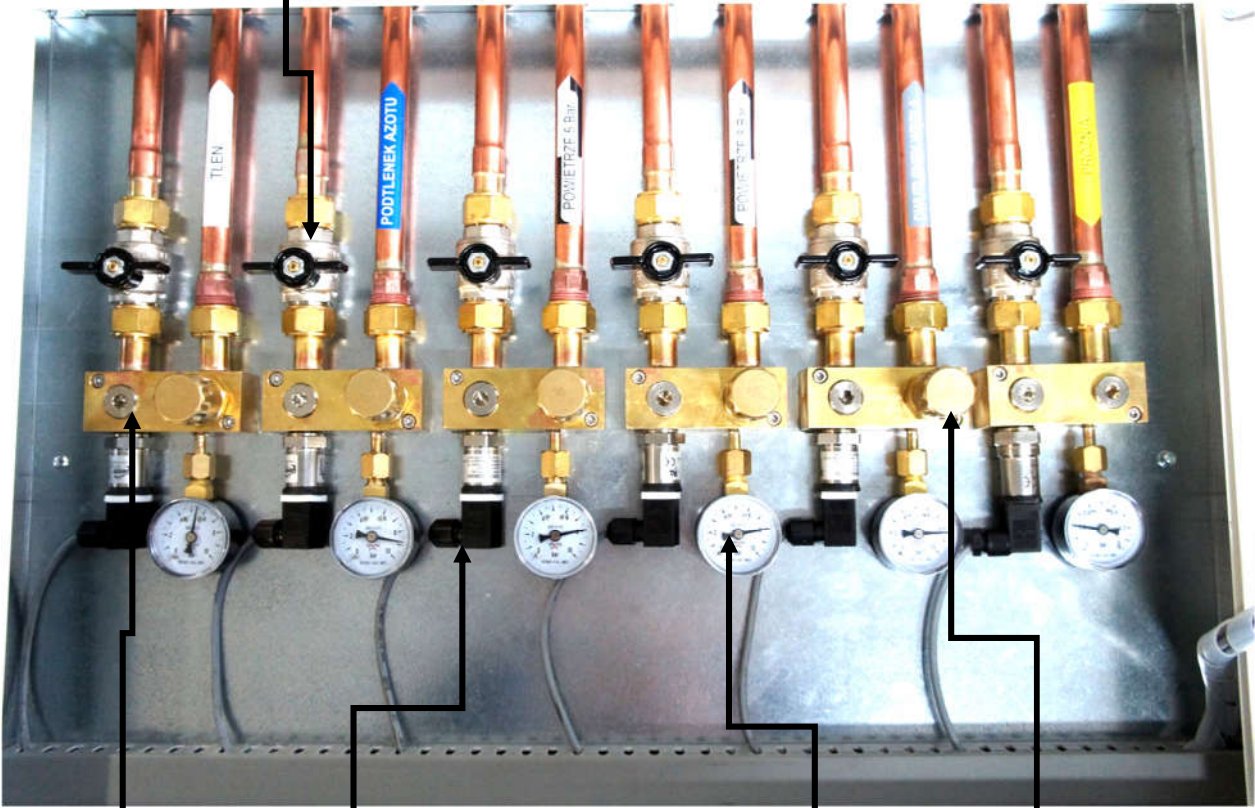
Phisical opening of pipeline system

Pressure transducer

Manometer

emergency supply point NIST

8. Alarm system

8.1 Alarm unit mounted in valve box
Functions: transmission of data to the remote alarm unit and display of information on the status of the monitored gases together with visual and audio alarm status.
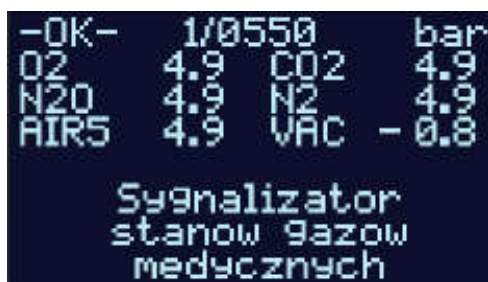
Power input: < 750mW

Length: 148 mm

Width: 80 mm

Height: 41 mm

Weight: ca 165 g

Screen overview

For each gas its pressure is displayed with the accuracy of a tenth of a bar. In case the pressure of any of the gases is lower than this user-defined in the program, the name of the gas and red diode start to blink, and the sonic alarm activates. The sonic alarm may be switched off for a period of 15 minutes by pressing a button. If the pressure of a gas is higher than the user-defined in the system, the name of the gas and green diode start to blink, and the sonic alarm activates. The sonic alarm may be switched off for a period of 15 minutes by pressing a button.

8.2 Description of connections in alarm unit

12V DC connection block

Blocks for connecting analog converters
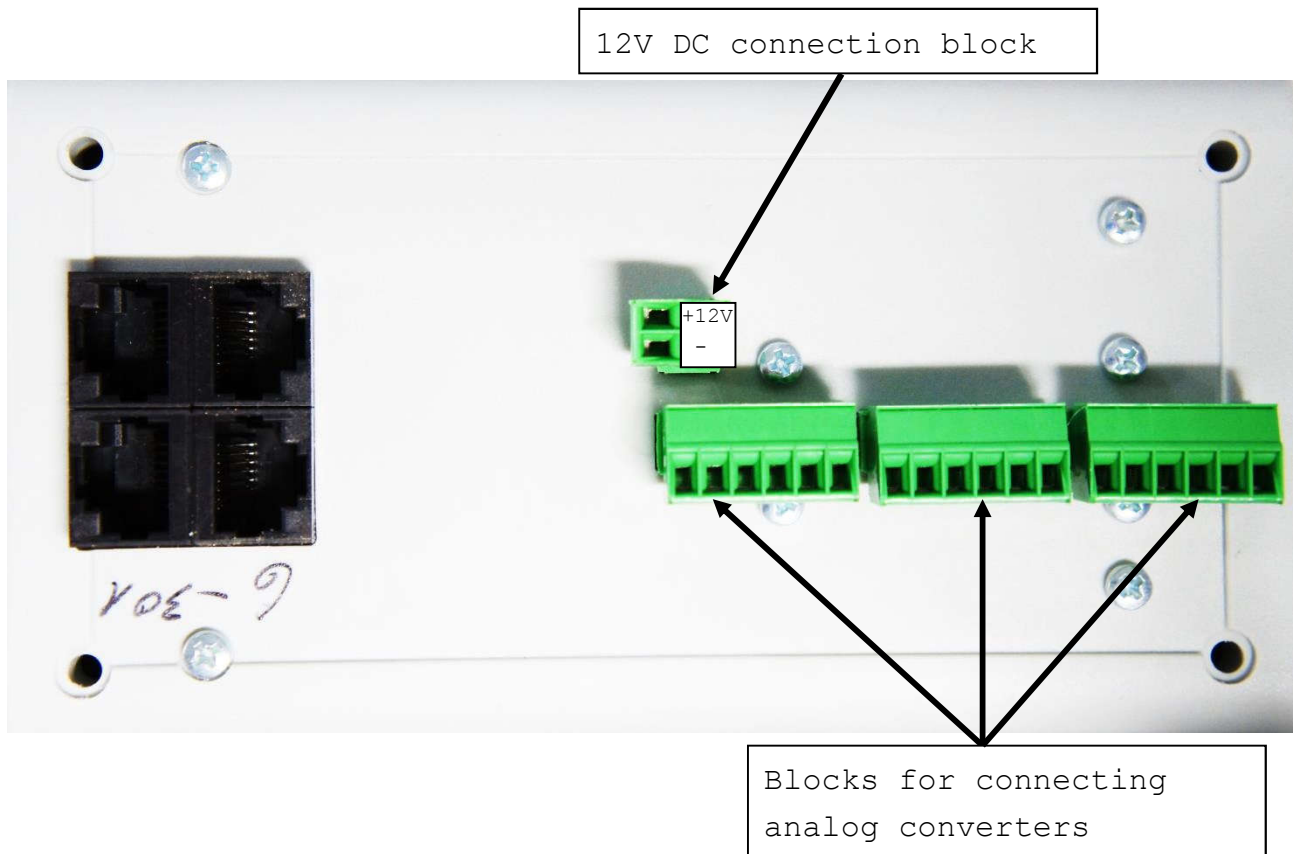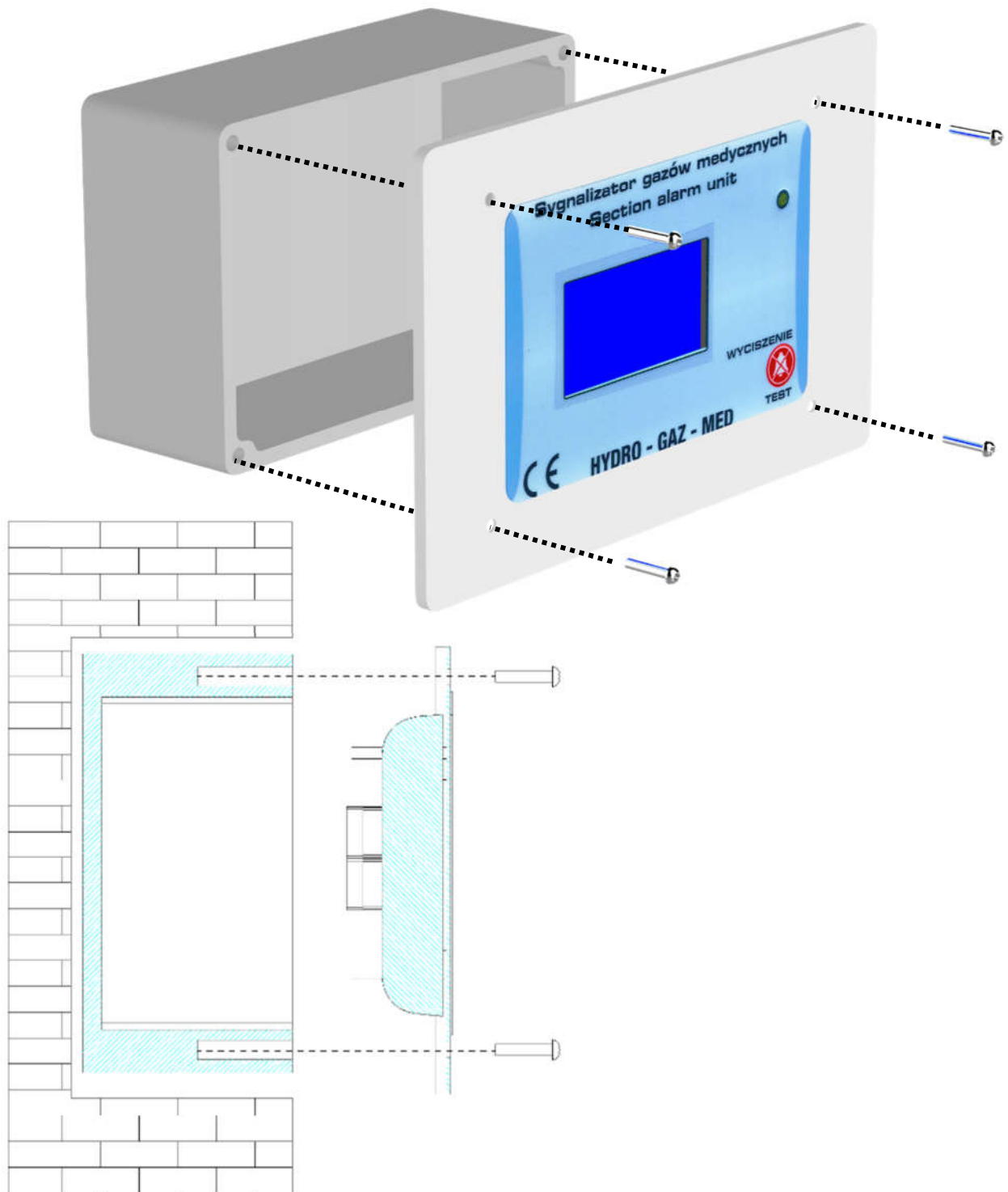
9. Remote alarm unit

9.1 Under plaster version

Functions: displays informations on a status of monitored gasses together with visual and audio signalling the alarm status. The remote alarm unit operates identically as the alarm unit mounted in the valve box.

Power input:	< 100 mA
Length:	180 mm
Width:	90 mm
Height:	42 mm
Weight:	~ 200 g

9.1.1 Assembly drawing of under plaster alarm unit

9.2 Remote alarm unit – on wall version

Alarm unit is equipped in touchscreen. On the screen there is TEST buton, which should be weekly used to check functioning of alarm unit.

On the housing we have dual color LED from visual signal. In case of alarm the LED blinks; green light when pressure is to high, and red light when pressure is to low.

With each visual signal there is also audio signal.

To mute the audio signal we need to touch the bell symbol on the screen. After 15 minutes, if the cause of the alarm was not removed, audio signal returns. It will be returning till cause of the alarm will not be gone.

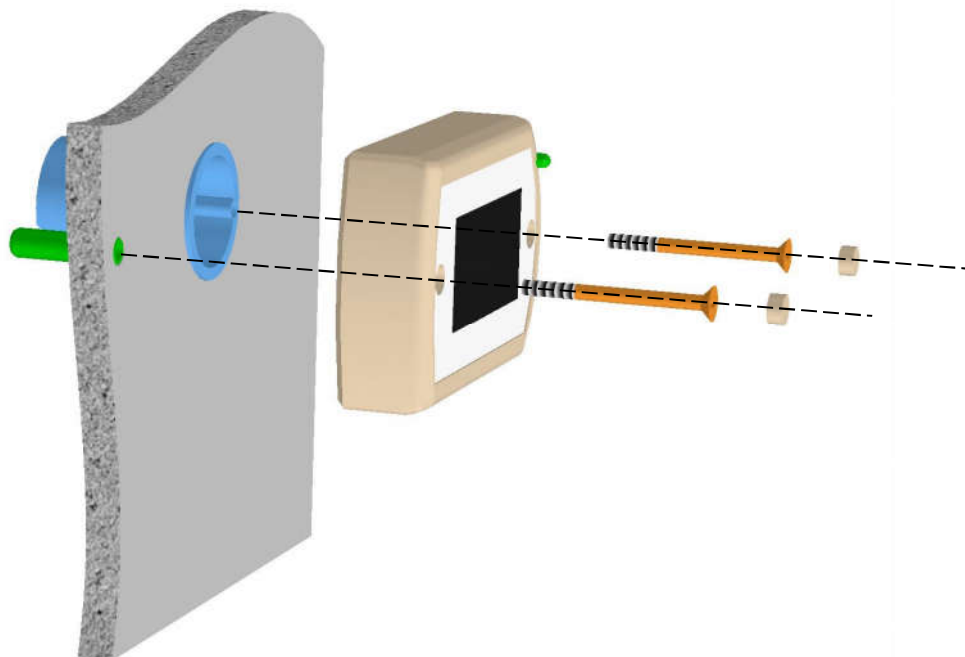During normal work green is LED is constantly ON.

9.2.1 Display
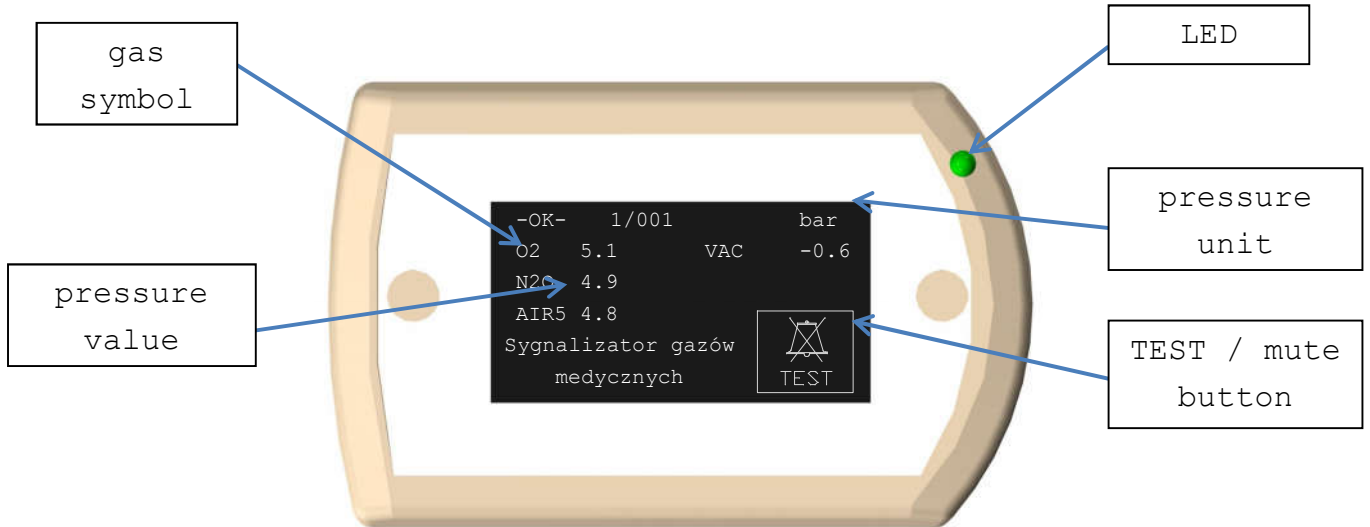
9.2.2 Mounting of on plaster alarm unit

Scope of delivery:
- 35 mm plastic under plaster casing
- 2 screws and 1 fisher
- plugs for installation holes
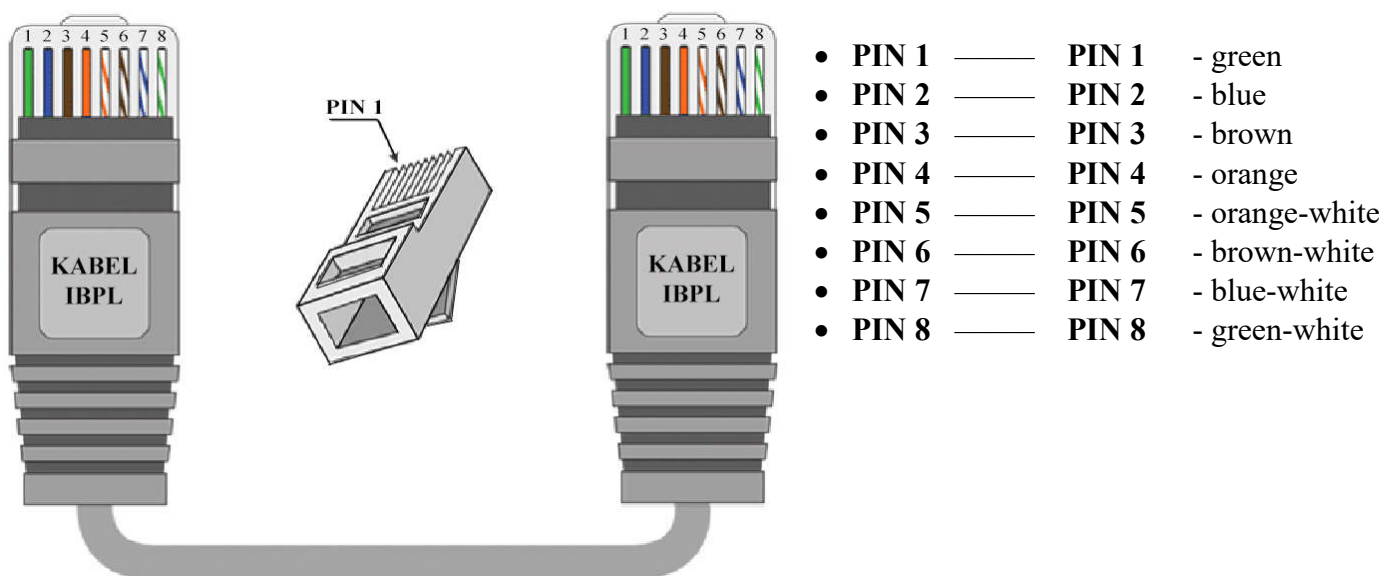
9.2.3 Mounting procedurę

1. Install plastic casing
2. Mount the alarm unit with one screw to plastic casing
3. Mark the other hole
4. Drill the second hole and mount the fisher in
5. Prepare cable (*see clause 8.6*)
6. Pull the cable out of the wall through the plastic casing, max length from the wall 5-8 cm
7. Put the plug in the alarm unit
8. Mount the alarm unit
9. Put the plugs in the holes after the screws

9.3 Connecting cables

In order to connect the external alarm unit (mounted in the Operating Theatre or ICU room etc.) the standard UTP or FTP cable should be used (4-pair coil of fifth or higher category). All transmission cables must be tipped with standard RJ-45 pins. The connection cables do not have interlace.

In the back side of the housing there are 4 RJ-45 sockets for the connection with the transmission cables. To sockets closer to the edge of the housing, the cable connected to the remote alarm unit or BMS system should be connected. To sockets close to the middle part of the housing, the cable connected to the computer with BMS/SCADA system and / or transmission cable to another valve box should be connected. If the sockets have not been used for the connection of the transmission cable, the **IBPL-T1** terminator should be put in them.

Cable diagram and recommended colors of wires:

- PIN 1 ——— PIN 1   - green
- PIN 2 ——— PIN 2   - blue
- PIN 3 ——— PIN 3   - brown
- PIN 4 ——— PIN 4   - orange
- PIN 5 ——— PIN 5   - orange-white
- PIN 6 ——— PIN 6   - brown-white
- PIN 7 ——— PIN 7   - blue-white
- PIN 8 ——— PIN 8   - green-white

If transmission cables that are too short may be elongated by connecting them with the help of the **splitters**, while each empty socket of the **splitter** should have terminator in it.

The pin should be placed in the back panel of the alarm unit.

9.4 Exemplary diagram of the central monitoring system

Front view

Alarm units

Alarm units

Valve box#2

Valve box #1

Hospital ward #2

Hospital Ward #1

Alarm unit

Valve box #45

Hospital Ward#45

TECHNICAL DIRECTOR

Central alarm unit 7"

To computer with MS Windows®