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"Current repair of anti-radiation shelter № 52108 (group P-4) Ingul
Lyceum of the Ingul Village Council, at the address: st. Sadova, 49,
Ingulka village, Bashtanka district, Mykolaiv region"

Working project

Fire alarm

173-WP-2024-F-FA

Chief Project Engineer

Shelikhova V.

*Qualification Certificate for Engineering and
Construction Design AS№ 019809. Ministry of Regional
Development, Construction, Housing and Communal
Services of Ukraine. Attestation Architectural and
Construction Commission.*

2024

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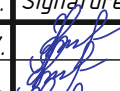
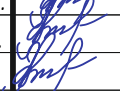
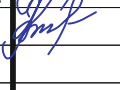

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173-WP-2024-F-FA.C

"Current repair of anti-radiation shelter № 52108 (group P-4) Ingul Lyceum of the Ingul Village Council, at the address: st. Sadova, 49, Ingulka village, Bashtanka district, Mykolaiv region"

Sw.	Several.	Sheet	Dock.	Signature	Date
CPE		Shelikhova V.			
Developed		Shelikhova V.			
Checked		Shelikhova V.			
N.Kontr.		Pyrov Y.			

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WP	1	1

Content

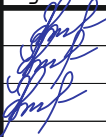


The project has been developed in accordance with current norms and regulations

Chief Project Engineer

Prof

Shelikhova V.

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									"Current repair of anti-radiation shelter № 52108 (group P-4) Ingul Lyceum of the Ingul Village Council, at the address: st. Sadova, 49, Ingulka village, Bashtanka district, Mykolaiv region"					
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			CPE		Shelikhova V.							WP	1	1
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3. Technical characteristics of FAS equipment

3.1 Fire-fighting control panel

"Tiras-8P" is designed to receive messages from fire detectors via alarm loops, convert signals, issue notifications for human perception, indicate the place of fire, transmit notifications via telephone line to a centralized fire station, turn on light annunciators.

PPKP "Tiras-8P" is designed for continuous round-the-clock operation in rooms with controlled climatic conditions. In the "Calm" mode, the correct functioning of the system is constantly monitored and warnings are issued with audible and visual signals about malfunctions (short circuit, line breakage, power supply malfunction).

Technical characteristics.

- power supply of the control panel from the 220V AC network;
- backup power supply of the device from a battery with a voltage of 10.8 V - 13.2 V 7 Ah;
- The control panel provides automatic switching to power from a backup source in case of a power loss in the network;
- the Tiras-8P device has terminals for connecting 8 alarm loops with resistance control;
- PPKP Tiras-8P has an automatic charger. The battery recovery time is 24 hours, 80 percent, 72 hours is 100 percent.

3.2. Thermal fire detector DETECTO HT10

The detector is intended for use as part of fire alarm systems in two-wire alarm loops to detect an increase in ambient temperature in closed rooms of buildings and structures, and to generate a fire message. The detector has a plastic casing

Characteristic

- Overall dimensions, mm, not more than:
- Diameter 110
- Height 52

Weight, kg, not more than 0.12 Protection class IP30

Mean time between failures, hours, not less than 40,000 Average service life, years, not less than 10

Fault determination time, s, no more than 10 Power supply

Supply voltage, V 10 - 30 LED switching voltage, V 0-30

Maximum switching power with LED terminal, W, no more than 0.25 Operating temperature range, class A2, oC 54 - 70

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3.3 Manual fire detector MFD-Tiras.

The detector is designed to send an alarm signal to fire alarm equipment in case of direct human impact on it, to be installed on the evacuation routes of people at a height of 1.5 m from the floor.

Technical characteristics.

- Supply voltage range, V 8 - 28
- Standby current, mA 0.1
- Current consumption when detectors are triggered (limited by an external resistor mA, not more than 22
- Internal resistance of detectors at current strength (20±2) mA, ohm, not more than 450
- Electrical resistance of contacts for a circuit with open contacts, Ohm, not more than 0.5
- Overall dimensions, mm:
- width 90 ± 2
- Height 93 ± 2
- Depth 40 ± 2
- Weight, kg, not more than 0.15
- Degree of protection of the case IP20
- Average service life, 10 years

3.2. Smoke fire detector DETECTO SMK10.

The detector is intended for use as part of fire alarm systems in two-wire alarm loops for detecting smoke in enclosed spaces of buildings and structures, and generating a fire message. The detector has a plastic case

Characteristic

-Overall dimensions, mm, no more:

- Diameter 110
- Height 52

Weight, kg, not more than 0.12 Protection class IP30

Mean time between failures, hours, not less than 40,000 Average service life, years, not less than 10

Fault determination time, s, no more than 10 Power supply

Supply voltage, V 10 - 30

Current consumption in standby mode, mA, not more than 0.11.

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4. Alarm message transmission system.

The project provides for a type 2 alarm notification transmission system.

According to clause 5.8 of DBN V. 2.5 – 56 – 2014, the signals from the control and receiving device are displayed on the central fire monitoring panel through the digital auto-dialer module (ADM). The lines of automatic transmission of the call to the central fire monitoring station are constantly monitored, a message about any line malfunction is displayed on the control panel and on the control panel (clause 6.9 Base DSTU-N CEN / TS 54-14 : 2021) General fire alarm and malfunction signals, as well as signals of transmission lines malfunction, are transmitted to the centralized fire monitoring panel.

5. Organization of electrical installation works.

Work on the installation of the fire alarm system must be carried out in accordance with the design and estimate documentation, which has been examined by the relevant authorities.

Equipment, products and materials used in the installation of installations must have a technical passport. Installation and adjustment of the equipment of the fire alarm system are carried out by specialists of specialized organizations that have a license to perform such work.

5.1 Installation of fire alarm detectors.

The number of fire detectors installed in the premises is determined by the technical characteristics of the fire detectors. The project uses smoke detectors such as DETECTO SMK10, manual fire detector SPR-Tiras, thermal detector DETECTO HT10.

To place detectors, it is necessary to select places in which the following are provided:

- Maximum distance from sources of electromagnetic interference (electrical wiring, etc.) and infrared radiation (thermal devices);

- Exclusion of water ingress on the body and leakage from the side of outlets;

Connect the detectors to the loops using sockets into which they are inserted. The sockets are fixed in the places where the detectors are installed.

The distance from wires and cables, loops, connecting lines with a voltage of up to 60V to power and lighting wiring when laying in parallel should be at least 0.5 m.

(Basis DBN V.2.5-56 – 2014) Installation of manual push-button fire detectors should be carried out at a height of 1.5 m from the floor level in places where free access to the detector is provided.

6. Operation of fire alarm systems.

Design, placement and operation of fire detectors must be carried out in accordance with section 7 of DBN B.2.5 – 56 – 2014.

Representatives of an organization that has a license for the right to service FAS systems are allowed to service the fire alarm system.

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7. Evacuation control system.

The project provides for an evacuation management system of the 2nd type in accordance with clause 10.12 of DBN B.2.2-5: 2023, namely:

- light and sound signs "Exit";
- Notification method: audible (toned signal);
- Order of notification - all at the same time.

8. Labor protection.

Equipment and cable products envisaged by this project have certificates of conformity UkrSEPRO or Declaration of Conformity. During the installation and operation of the fire alarm system, labor protection measures must be carried out in accordance with the following documents:

Law of Ukraine "On Labor Protection";

- DNAOP 1.1.10-1.07.01 "Rules for the operation of electrical protective equipment".

All electrical installation work should be carried out in accordance with PUE, DBN V. 2.5 - 56 - 2014. The envisaged design solutions ensure the standards of safety, fire safety, labor protection during the construction and further operation of automatic fire alarm structures.

9. Environmental protection measures.

Equipment and cable products envisaged by this project have certificates of conformity UkrSEPRO or Declaration of Conformity.

During the construction work, no impacts on the climate and microclimate are expected.

When performing all construction and installation works, a prerequisite is strict compliance with the requirements of environmental protection, preservation of its stable ecological balance and compliance with the conditions of land use established by the legislation of Ukraine on nature protection. Construction works, movement of mechanisms and machines, storage of materials in places not provided for by the project of production of works are prohibited. To prevent contamination of the soil with oil products of operating mechanisms, measures are taken to exclude the possibility of ingress of fuels and lubricants (FL) into the soil.

During the construction work, the existing water supply and sewerage networks are used. Water from the existing water supply network is used for drinking needs. Discharges into water bodies are not expected.

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10. Calculation of backup power supply of the system.

Device	I_{sp}, A	I_{poj}, A	Quantity
PPKP "Tiras 8P"	0,14	0,18	1
Detector IPR-1	0,0003	0,03	2
Detector DETECTO SMK10	0,0001	0.016	12
Detector DETECTO HT10	0,0001	0.016	1
OSZ-12 annunciator	0	0,1	3
Annunciator OS-1	0	0,035	0

$$sp (SYSTEMS) = 0,14 + 0,0003 \cdot 1 + 0,0001 \cdot 12 + 0,0001 \cdot 1 = 0,142 (A)$$

$$I_{POG} (SYSTEMS) = 0,18 + 0,03 \cdot 1 + 0,016 \cdot 12 + 0,016 + 0,1 \cdot 3 = 0,72 (A)$$

$$SAB = 0,142 \cdot 24 + 0,72 \cdot 3 = 5,57 (Ah)$$

The estimated capacity of the battery is less than the battery capacity of the control panel, so the installation of an additional power supply is not required.

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List of referenced and attached documents

Позначення	Name	Note
	<i>Referenced documents</i>	
DBN V. 2.5 - 56 - 2014	"Fire Protection Systems"	
DBN V. 1.2 - 7 - 2021	" Basic requirements for buildings, divels and structures. Fire safety."	
ДБН А.2.2 - 3 - 2014	" Composition and content of project documentation for construction ."	
DSTU EN 54	"Fire Alarm Systems"	
DBN V.2.2-5:2023	"PROTECTIVE STRUCTURES OF CIVIL PROTECTION"	
	<i>Documents to be attached</i>	
173-WP-2024-F-FA.EN	Explanatory note	
173-WP-2024-F-FA.S	Specification of equipment, materials and products.	

General Guidelines

This project of the fire alarm system, evacuation control system was developed on the basis of DBN B. 2.5 - 56 - 2014, the Contract for design work. Power supply of the fire control panel of the fire system

signaling (PPK FAS) is carried out from the sharp ends of the input circuit breaker of the object with a cable NHXH Fe 180/E30 3x1.5. The FAS PKP device of the "Tiras-8P" type monitors the condition of thermal, smoke and manual fire detectors. When the detector is triggered, a signal is issued to start the warning system, turn off ventilation.

The FAS device is programmed for round-the-clock operation. The device "Tiras-8P" should be installed in the room of shelter No. 12.

Fire alarm in the premises should be performed with manual fire detectors SPR-Tiras, thermal detectors DETECTO HT10, smoke detectors DETECTO SMK10.

Fire alarm beams should be used with 4 x 0.4 PSVV cables. For safe operation of the device, ground metal non-current-carrying parts. According to the degree of reliability of power supply, according to the norms of DBN V. 2.5-56-2014, the device PKP "Tiras-8P" is provided in the first category. A 7 Ah battery is used for backup power.

Equipment and alarm devices must pass incoming control.

All materials and equipment used must have UkrSEPRO certificates of conformity. The signal from the device is displayed on the central fire monitoring panel.






Ventilation shutdown with MRL 2.1

All electrical installation work should be carried out in accordance with the requirements of PUE standards,

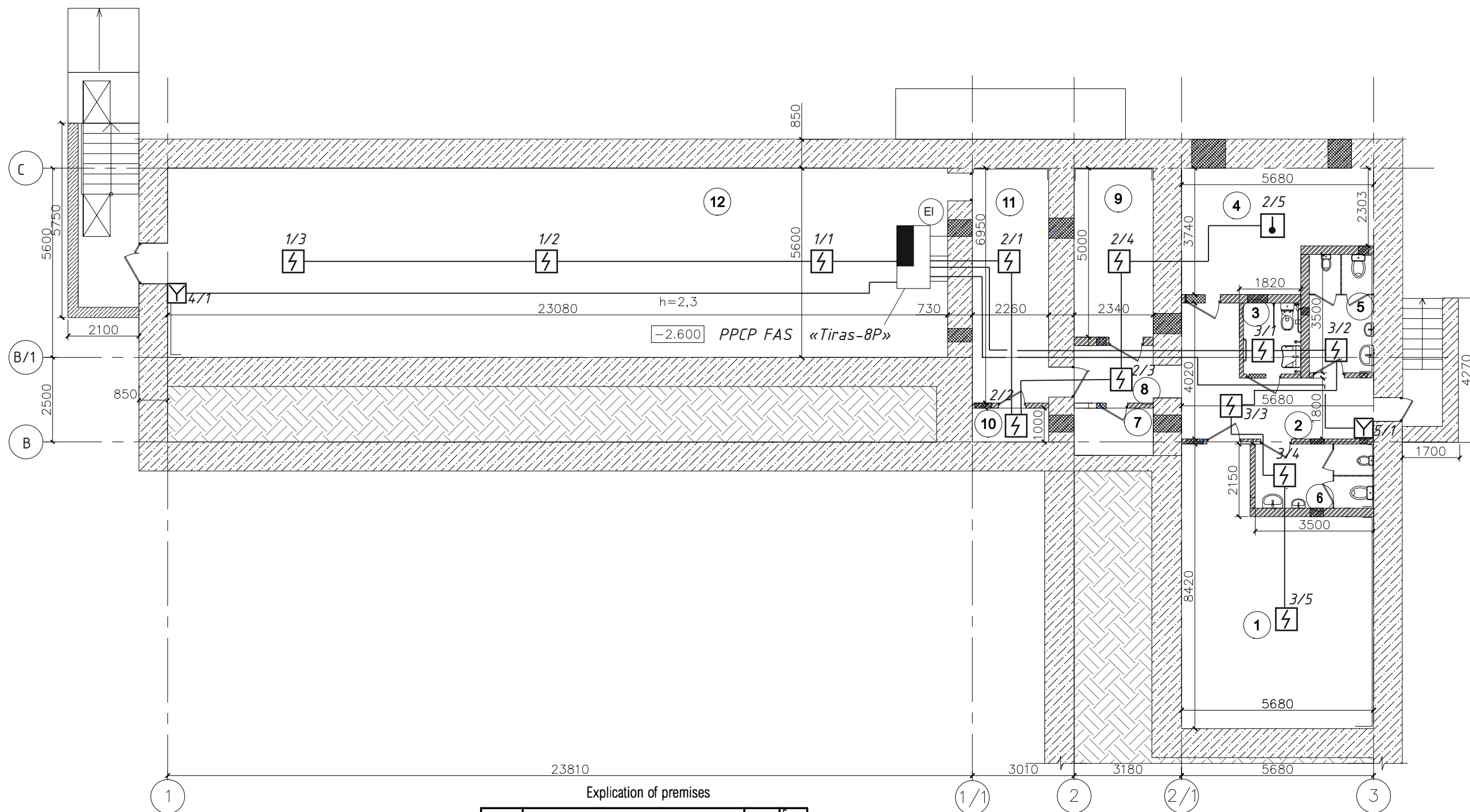
DBN V. 2.5 - 23 - 2010 DBN V. 2.5 -56 - 2014, DBN V. 1.1 -7 - 2016, DBN in Ukraine.

List of working drawings

Sheet	Name	Note
1	General data	A3
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3	Structural diagram of Fire alarm system.	A4
4	Electrical diagram.	A3

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						"Current repair of anti-radiation shelter № 52108 (group P-4) Ingul Lyceum of the Ingul Village Council, at the address: st. Sadova, 49, Ingulka village, Bashtanka district, Mykolaiv region"			
Sw.	Several.	Sheet	Dock.	Signature	Date		Stage	Sheet	Sheets
CPE		Shelikhova V.							
Developed		Shelikhova V.					WP	1	4
Checked		Shelikhova V.							
N.Kontr.		Pyrov Y.				General data			

Plan FA on mark 0.000.

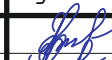

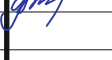




Explication of premises

Room Number	Name	Area, m ²	Executioner. Note.
1	Premises for persons to be sheltered	39.98	
2	Corridor	13.79	
3	Universal Sanitary and hygienic approx. for LMG	3.78	
4	Ventilation	18.05	
5	Women's bathroom	6.66	
6	Men's bathroom	6.66	
7	Water and food conservation facilities	3.28	
8	Corridor	3.98	
9	Premises for persons to be sheltered	11.93	
10	Switchboard room	2.26	
11	Premises for persons to be sheltered	15.71	
12	Main room	129.25	
		255.33	

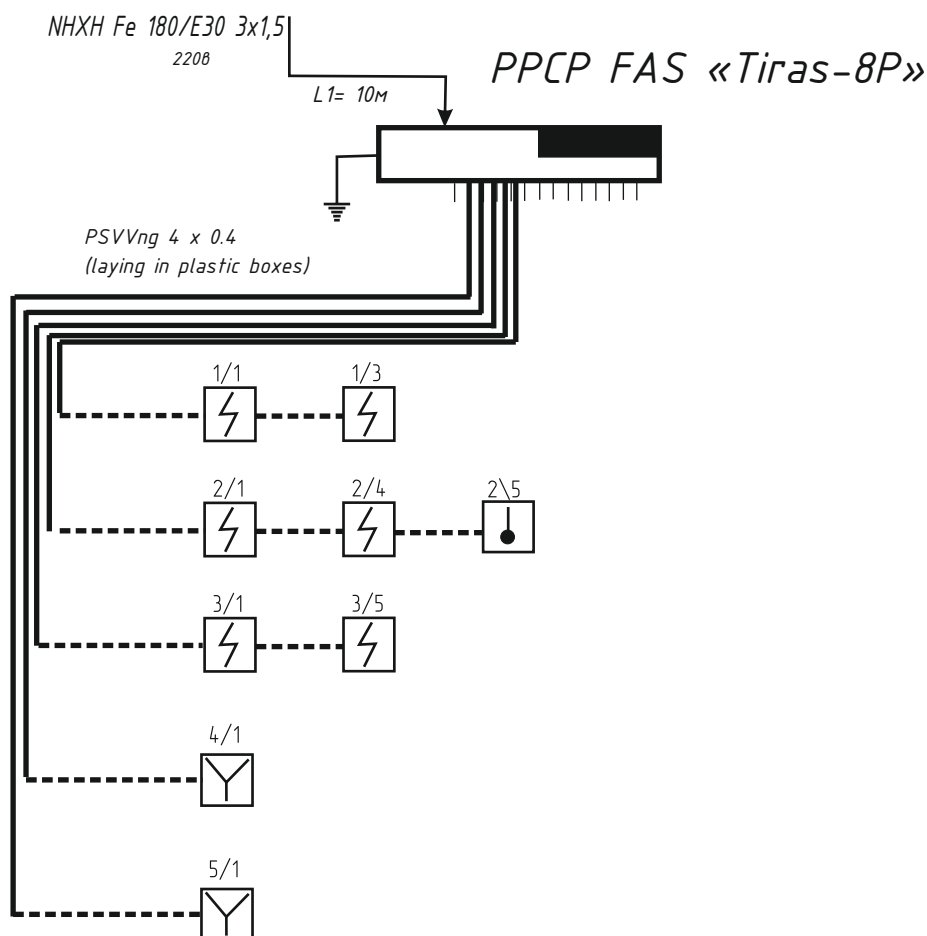
Legend:

- Y Fire extinguisher manual type SRP-Tiras.
- EI Emergency luminaire
- d DETECTO NT10 fire detector.
- z DETECTO SMK10 fire smoke detector.





						173-WP-2024-F-FA			
						"Current repair of anti-radiation shelter № 52108 (group P-4) Ingul Lyceum of the Ingul Village Council, at the address: st. Sadova, 49, Ingulka village, Bashtanka district, Mykolaiv region"			
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N.Kontr.	Pyrov Y.					Plan FA on mark 0.000.			



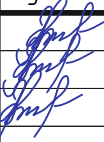


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Structural diagram of fire alarm



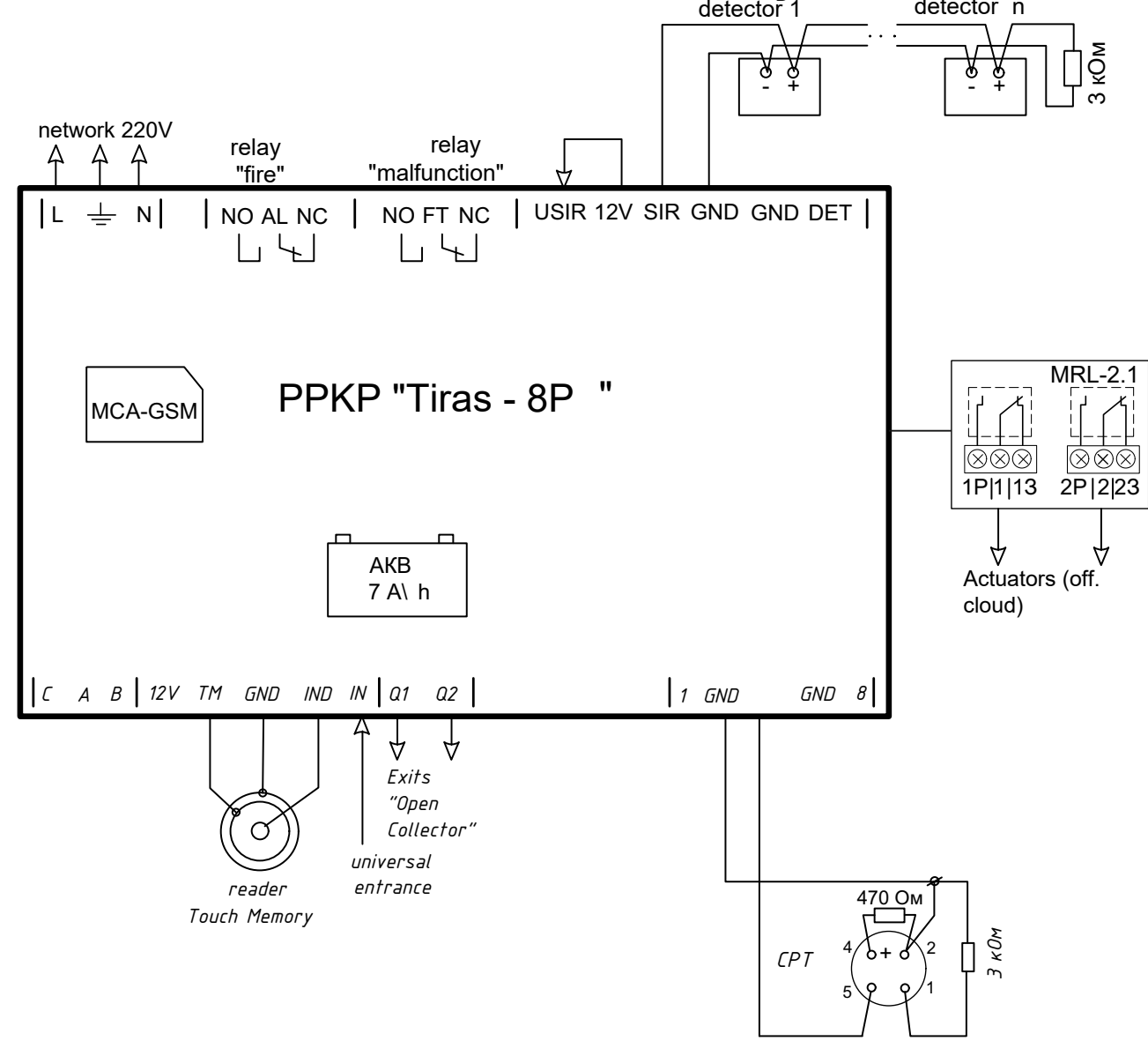
Legend:

-  Fire extinguisher manual type SRP-Tiras.
 Emergency luminaire
 DETECTO NT10 fire detector.
 DETECTO SMK10 fire smoke detector.

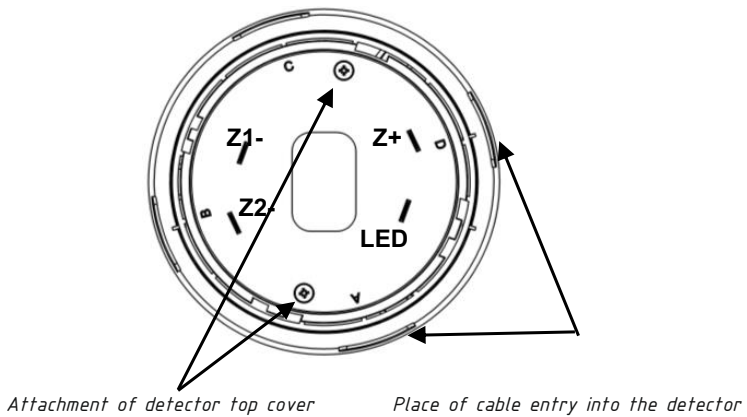
Inv. No. op.	Signature & Date	Deputy. Inv. №	<div> DETECTO NT10 fire detector.</div> <div> DETECTO SMK10 fire smoke detector.</div>						
			173-WP-2024-F-FA						
			"Current repair of anti-radiation shelter № 52108 (group P-4) Ingul Lyceum of the Ingul Village Council, at the address: st. Sadova, 49, Ingulka village, Bashtanka district, Mykolaiv region"						
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	CPE	Shelikhova V.					Stage	Sheet	Sheets
	Developed	Shelikhova V.			WP	3			
	Checked	Shelikhova V.							
							Structural diagram of Fire alarm system.		
	N.Kontr.	Pyrov Y.							

Arrangement of the fire alarm system on the basis of the device PKP "Tiras-8P."

Electrical connection diagram.

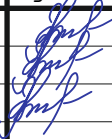




Appearance of the detector DETECTO SMK10, DETECTO NT10 from the side of the contacts







When using a detector with PKP manufactured by Tiras-12 LLC, it is not necessary to use an additional resistor Rd.

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Sw.	Several.	Sheet	Dock.	Signature	Date				
CPE	Shelikhova V.					Stage		Sheet	Sheets
Developed	Shelikhova V.					WP		4	
Checked	Shelikhova V.								
N.Kontr.	Pyrov Y.					Electrical diagram.			

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						173-WP-2024-F-FA.S			
						"Current repair of anti-radiation shelter № 52108 (group P-4) Ingul Lyceum of the Ingul Village Council, at the address: st. Sadova, 49, Ingulka village, Bashtanka district, Mykolaiv region"			
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CPE	Shelikhova V.						WP	1	1
Developed	Shelikhova V.								
Checked	Shelikhova V.								
						Specification of equipment, products and materials			
N.Kontr.	Pyrov Y.			