



EXPLOSION-PROOF MONITOR

MV-150V3

Operation Manual

PLA500.512.104.000 RE

Rev. 01

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This Manual provides information for service personnel how to perform installation, commissioning and maintenance of the Explosion-Proof Monitor MV-150V3 (hereinafter referred to as the MV-150V3).

The MV-150V3 exploitation is allowed to be used by personnel who has studied this manual, set of exploitation documentation and passed safety training.

The MV-150V3 is used as part of Program Apparatus Complex CCTV System DEL-150(V) (hereinafter referred to as the CCTV System) for viewing of the information received from the Video Cameras.

Scope of application is explosive zones of premises and outdoor facilities according to Ex-marking. The MV-150V3 is manufactured in accordance with the requirements of ISO 9001:2015.

In order to exclude the possibility of mechanical damage, violation of electroplating and paint coatings, the rules of storage and transportation of the device should be observed. When studying the rules of operation, it is also necessary to be guided by the technical description and operating instructions of the CCTV System.

The MV-150V3 consists of two metal enclosures connected to each other. A video monitor is installed in the first enclosure. A light-transmitting glass is installed in the wall of the enclosure. In the second enclosure, there are: a power supply board and a control board with electronic mounting elements. There are three explosion-proof cable glands on the lower wall of the enclosure. There are holders and grounding signs inside and outside the enclosure.

There are also buttons on the MV-150V3's front panel for switching screen layouts. The buttons are a piezoelectric principle of operation.

The Monitor EX MV-150V3 can be equipped by the Pushbutton Panel MV-150V or the Remote Control MV-150V

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to switch over and control different types of the Video Cameras.

1. Technical Characteristics

Name of parameter	Value
Diagonal, inches	19
Resolution	1280 x 1024
Brightness, cd/m ²	1600
Contrast	1000:1
Display colors, mln.	16.7 (RGB 6 bit, HI_FRC)
Pixel Pitch	0.294 x 0.294
Viewing Angle, °	85 (H), 80 (V)
Processor	Integrated Intel®J1800/2.00GHz Quad core processor
Memory	DDR3 SODIMM 4096 Mb
Network	RTL8111F Gigabit Ethernet
Hard drive	SSD 120 Gb
Operating system	MS Windows 10 Pro
Highlight	WLED
Power supply, VDC	24
Power consumption, max., Wt	150
Ex marking, TR CU 012/2011	1ExdbmbIIBT5Gb
Ex marking, ATEX	II2GExdbmbIIBT5Gb
Ingress protection	IP67
Ambient temperature range, °C	-45...+50
Dimensions, mm	444 x 402 x 102
Weight, kg	15
Service life, min., years	8

2. Explosion Safety During Operation

Explosion protection is provided by an explosion-proof enclosure and cast molding ("d" and "m" types of explosion protection).

3. Requirements for Keeping Equipment Specifications that Cause its Explosion Safety

During operation, it is forbidden to break the seals and open the

MV-150V3 enclosure.

When the MV-150V3 is switched on it is forbidden to connect and disconnect cables, power cable and grounding conductors. In case of malfunctions, it is necessary to turn off the MV-150V3 and disconnect the power cable from the power source. Then replace the faulty MV-150V3 with a serviceable one by connecting it according to the documentation.

During operation, check the condition of communication cables periodically. If a violation of the protective layer on the cable lines is detected, replace the damaged cable immediately.

Do not allow sealing violations. If a damage is detected, replace the faulty equipment.

Ensuring explosion safety during operation is according to the safety regulations, applicable to the equipment with which (or as part of which) the equipment is used.



ATTENTION!!! During operation, it is necessary to monitor the equipment status and its cables. In case of any mechanical damage of the equipment or any of the cables connected, further operation is strictly prohibited!

Prohibited actions while the MV-150V3 operation:

- Cleaning the screen with a dry cloth;
- Using abrasive cleaners;
- Touching the monitor screen with any hard objects;
- Unscrewing the screws and opening the back cover of the monitor;
- Connection a power supply voltage that does not correspond to the characteristics of the monitor;
- Using cables with outside diameter that does not correspond to the monitor's cable gland range 4...9 mm;
- Operation the monitor with the terminal box loosely closed or opened.

4. Installation



NOTIFICATION. Installation and further commissioning of the equipment should be carried out only by qualified specialists.

Before installing the MV-150V3, it is necessary to make sure that:

- Basic dimensions at the processing facilities correspond to the dimensions of the MV-150V3 (see Fig. 1), the Pushbutton Panel MV-150V (see Fig. 2) or the Remote Control MV-150V (see Fig. 3);
- Fixing bolts and screws are present;
- There is no damage of the connector insulation;
- There is no external damage of the components;
- There is no damage of the insulation of the signal cable;
- There is no damage of enclosure, cable gland and light-transmitting glass;
- Seal of the terminal box is installed and is in good condition.

The power cable is connected through cable gland to the corresponding port. Switching on occurs automatically when power is applied.

The monitor is connected to the CCTV System through a Rev.01

cable gland using a Cat5 communication cable (see Fig. 4). The cable line is connected to the terminals directly in the MV-150V3's terminal box from one side, and RJ-45 connector is installed on the cable from another side.

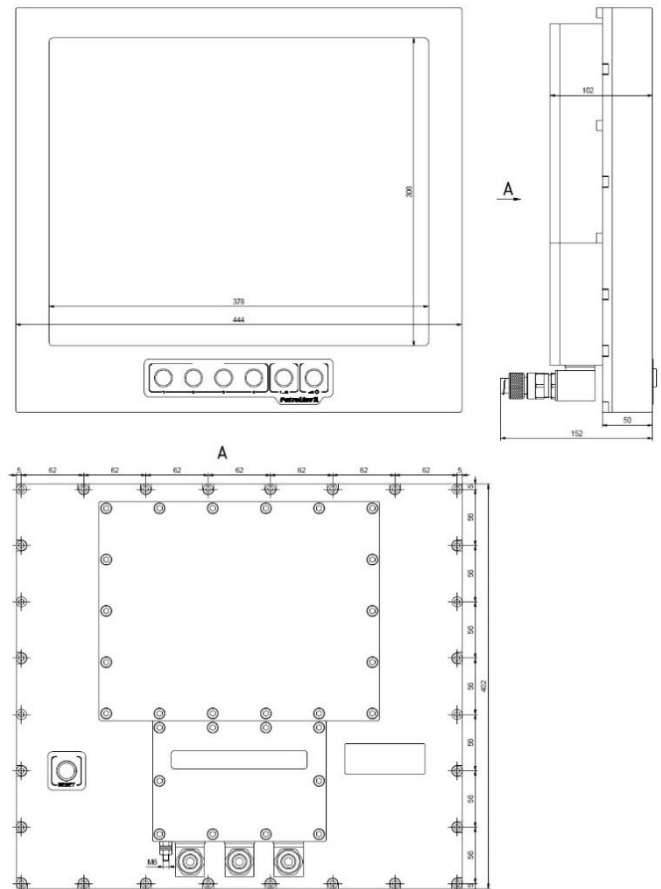


Figure 1. Overall dimensions of the MV-150V3 (panel mount configuration)

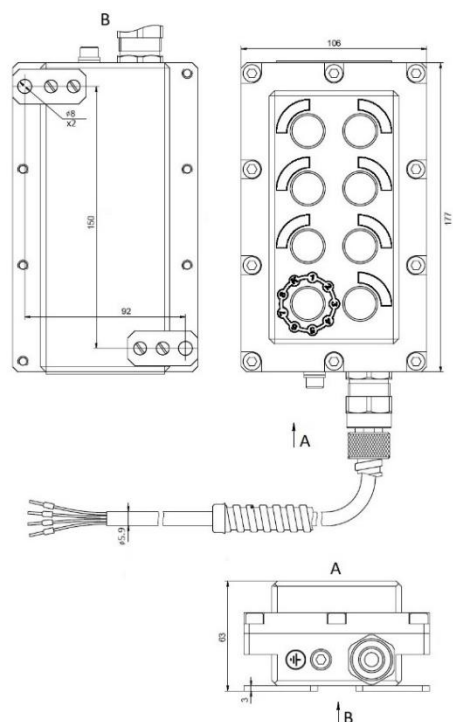


Figure 2. Overall dimensions of the Pushbutton Panel MV-150V

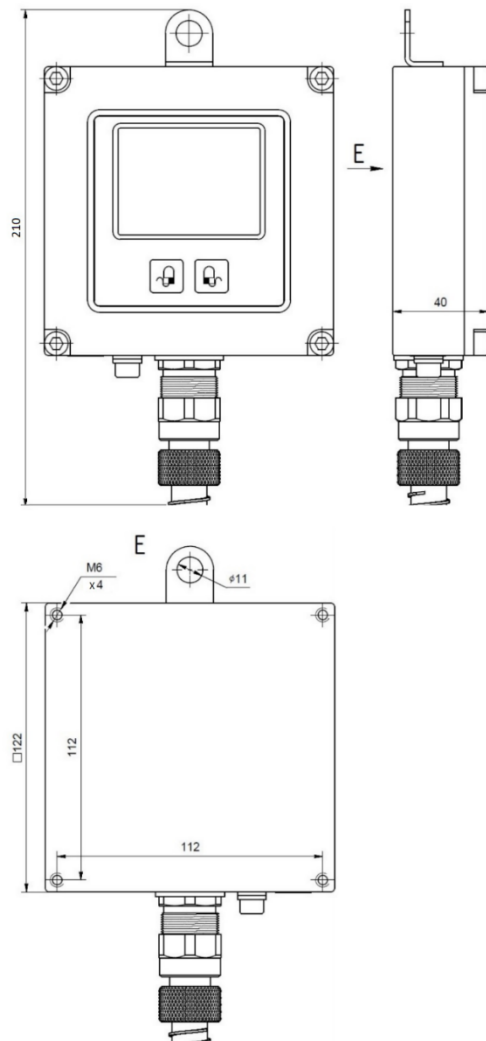


Figure 3. Overall dimensions of the Remote Control MV-150V

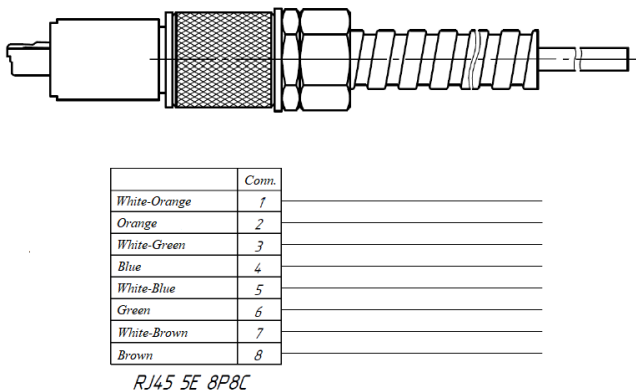


Figure 4. Communication Cable

Installation requirements

The MV-150V3 must be mounted in the driller's view, without blocking of working area view, at a level and at a distance convenient for information perception.

The MV-150V3 can be mounted on a bracket in the driller's cabin or can be placed on a suitable vertical surface at a height convenient for viewing (panel mount). The following factors should be considered:

- Providing easy access to the monitor for periodic maintenance work;
- Installation on a hard surface where there are no vibrations.

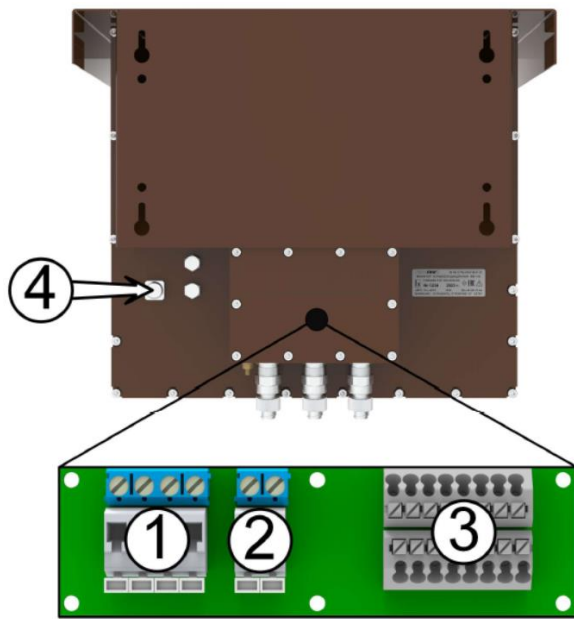


Figure 5. Installation example in the driller's cabin

Electrical connection

The electrical connection is performed in the following order:

1. Open the terminal box on the MV-150V3's back side using a 6 mm hex key (See Fig.6);
2. Run the Pushbutton Panel MV-150V's cable to the monitor through the cable gland #1 and connect it to the terminal according to the diagram (see Fig. 7);
3. Run power cable to the monitor through the cable gland #2 and connect it to the terminal according to the diagram (see Fig. 7);
4. Run communication cable to the monitor through the cable gland #3 and connect it to the terminal according to the diagram (see Fig. 7);
5. Close and lock the terminal box's cover;
6. Connect a grounding or zero protective conductor to the monitor enclosure;
7. Turn ON the MV-150V3 monitor.



1. Pushbutton Panel MV-150V terminal;
2. Power supply terminal;
3. Communication cable terminal;
4. Reset button

Figure 6. Terminal box

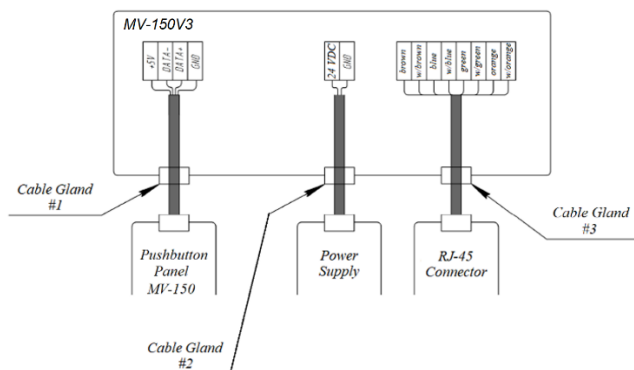


Figure 7. The MV-150V3 connections

5. The MV-150V3 Screen Operation

The software is automatically started after the MV-150V3 is turned ON and images from the Video Cameras are appeared on screen. The number of simultaneously displayed images from the Video Cameras can be switched over by buttons on the MV-150V3's front panel or via the Pushbutton Panel MV-150V or the Remote Control MV-150V.

6. Troubleshooting

In case of issues with the operation of the MV-150V3, inspect the device for visible damage and try to visually determine the cause of the malfunction. Troubleshooting options are provided below:

Malfunction	Possible Cause	Corrective Actions
The MV-150V3 is not turned ON	Power supply issue	• Checking of the power cable integrity; • Checking of the power supply availability; • Checking of the connection
"NO SIGNAL" message is on the screen	• Communication issue between the MV-150V3 and the Video Recorder; • Communication issue between the Video Camera and the Video Recorder; • Setup issue of the Video Recorder (IP, URL and etc.); • The Video Recorder malfunction	• Checking of the cables integrity; • Checking of the connections; • Checking of the Video Recorder settings (refer to CCTV System operation manual)
Incorrect display of the color gamma	PCB of the MV-150V3 issue	Calling to the Manufacturer's service center

7. List of Critical Failures and Possible Issues in Maintenance Leading to Equipment Failures and Actions to Prevent these Failures (troubleshooting)

Incorrect power supply can lead to equipment failure.

A short circuit or a break circuit in the power and communication lines of the MV-150V3, may cause loss of communication with the Video Recorder. In such case the message "NO SIGNAL" appears on screen.

In case of failure of the MV-150V3, it is necessary to check the equipment technical condition according to the Clause #6 of this Operation Manual. If troubleshooting did not lead to proper operation, it is necessary to stop operation and replace with obviously serviceable equipment. Defective equipment should be sent for repair to the Manufacturer or to the specialized authorized service center.

In case of failures that can lead to emergency situations, it is necessary to replace the equipment that has failed. If necessary, disable additional external devices.

8. Maintenance Procedure

Maintenance is carried out in the following order:

1. Cleaning the MV-150V3 enclosure and screen from contamination;
2. Checking the safety of seals (if available);
3. Checking the presence and strength of the mounting components;
4. Cleaning of connectors and terminals from contamination;
5. Checking for the absence of visible mechanical damages;
6. Replacement and (or) repair of damaged cable products;
7. Replacement of damaged connectors.

The contacts of the connector should be washed with an alcohol-gasoline mixture (need 3 ml.) using a soft brush. Connectors after cleaning and drying should be treated with Vaseline or similar lubricant. It is recommended to treat the threads on the connectors with graphite grease.



NOTIFICATION. Absence of maintenance records in the equipment passport (section "Maintenance Records") ENTAILS VIOLATION OF THE OPERATION RULES, and the Manufacturer has the right to withdraw from warranty obligations

9. Limit Conditions Parameters

In case of severe mechanical damage, leakproofness violations, seals violations, heating of parts to unacceptable temperatures, supply of unacceptable currents and voltages, further use is unacceptable or impractical, or restoration of its serviceable or operable condition is impossible or impractical.

10. Marking and Packaging

The MV-150V3's nameplate includes the following components (see Fig.8):

1. Trademark or name of manufacturer;
2. Part number;
3. Name and model;
4. Serial number;
5. Manufacturing year;
6. Explosion protection marking together with certificate number;
7. Technical characteristics.

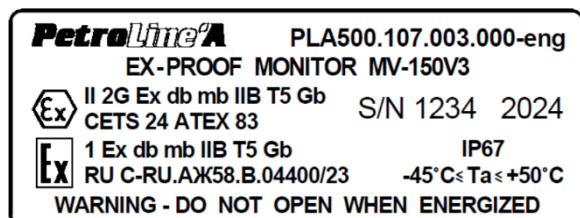


Figure 8. Example of the MV-150V3 marking

Other data required by regulatory and technical documentation may also be reflected on the nameplate.

Boxes made of plywood with metal handles for carrying are used to transport the MV-150V3.

11. List of Components

Full completeness is indicated in the passport for equipment released by Manufacturer.

12. Repair

Repair of the MV-150V3 is carried out at the Manufacturer or at a specialized authorized service center.



NOTIFICATION. Absence of repair records in the equipment passport (section "Repair Records") ENTAILS VIOLATION OF THE OPERATION RULES, and the Manufacturer has the right to withdraw from warranty obligations

13. Storage

The equipment requires careful handling, storage in dry, clean rooms with a constant temperature from -50°C to +65°C and a relative humidity of no more than 80%.

The long-term storage requires conservation, according to the requirements of the equipment conservation instructions.

The equipment arriving at the warehouses in the Manufacturer's containers are not unpacked, packed on flat pallets and stacked or in the cells of the racks.

Factory-sealed devices are not allowed to be opened in warehouses.

Small devices and devices arriving in individual packaging are stored in box pallets with installation in a stack.

Devices and components without individual packaging should be stored in shelving cells no more than 3 rows in height with the use of cushioning materials between them.

Small devices and products arriving without packaging can be stored in small-cell racks and cabinets, while devices or products of the same type should be stored in one cell.



NOTIFICATION. Absence of storage records in the equipment passport (section "Storage Records") ENTAILS VIOLATION OF THE OPERATION RULES, and the Manufacturer has the right to withdraw from warranty obligations

14. Transportation

Transportation of the equipment is allowed by all types of closed transport. The MV-150V3 in a package for transportation allows the impact of transport shaking with an acceleration of 30 m/s² with a frequency of 100 beats per minute or 1500 beats with that acceleration.

15. Disposal

The MV-150V3 is disposed of in accordance with the requirements and norms applicable in the oil and gas industry.

16. Warranty Obligations

The warranty period is 12 months from the date of receipt of equipment by the Customer, unless otherwise provided by the Agreement concluded between the Customer and the Manufacturer.

A full description of the warranty obligations is described in the equipment passport.

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