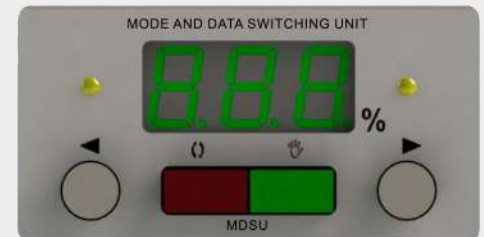
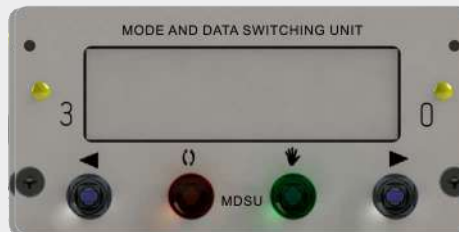
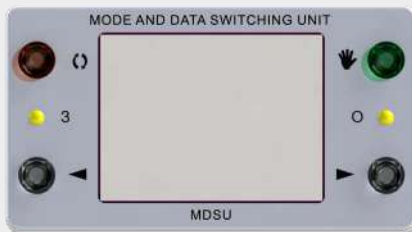


MODE AND DATA SWITCHING UNIT

Mode and data switching unit (hereinafter MDSU) is designed to switch control of actuators from automatic control devices to manual control, use manual control and display the current status of actuators.

MDSU is a functional analog of Manual Control Units of MCU-32, MCU-42 and similar to those.



MDSU performs the following functions:

- ▶ Changes modes and displays control modes for actuators (Automatic/Manual);
- ▶ Controls different types of actuators from the front panel of MDSU when the manual control is used;
- ▶ Outputs discrete control signals of “dry contact” type to change mode and control actuators;
- ▶ Indicates actuator position in digital and graphic form (digital only to perform MDSU - 03/6 Nuclear Power Plant, power supply unit, Radiy (NPP PSU R);
- ▶ Indicates analog signal values from actuator in the ranges : 0..5 mA, 0..20 mA, 4..20 mA, 0..10 B (except performing MDSU - 03/6 NPP PSU R) that are displayed as follows:
 - 1) actuator status made in percentage;
 - 2) display of physical value of input analog channel (mA, B) (except performing MDSU-02/X X X X P, MDSU - 03/6 NPP PSU R).

For MDSU - 03/6 NPP PSU R the display of the actuator status, expressed in percentage is performed at seven-segment LED indicator in the ranges: 0..5 mA, 0..20 mA, 4..20 mA, 0..10 V.

Additional functions:

- ▶ Indication of actuator's final position (except MDSU - 03/6 NPP PSU R);
- ▶ Indication of actuator's emergency state (except MDSU - 03/6 NPP PSU R);
- ▶ Indication confirming the transfer of external control scheme in the mode “Automatic/Manual”(except MDSU - 03/6 NPP PSU R);

- Indication confirming the transfer of control signals “More/Less (►/◄) to the actuator.

Technical characteristics:

MDSU meets the following technical regulations:

- Technical regulations on equipment electromagnetic compatibility;
- Technical regulations on low voltage electric equipment.

According to Regulations 306.2.245 MDSU belongs to:

- Safety Class 3 elements of normal operation, control elements and have Class identification 3HK;

According to Regulations 306.2.202, Standard of Organizations of Ukraine (SOU) NAEK 100, MDSU can perform functions of Category B and C.

According to Regulations 306.2.208, MDSU belongs to seismic category I. The maximum location mark – 70 m.

According to SOU NAEK 100, MDSU belongs to the following condition groups:

- operation E2.2, E2.3 (free mode zones);
- location P1.1, P1.2, P1.3, P2.1, P2.2.

According to Regulations 306.2.237, MDSU have a cybersecurity level - K2.

MDSU can be used as a part of I&C system with elements of safety class 3 and 4 according to Regulations 306.2.245.

MDSU has the following input analog channels:

- for current in the range 0..5 mA;
- for current in the ranges 0..20 mA, 4..20 mA;
- for voltage in the range 0..10 V.



MDSU is designed to use at nuclear facilities and other industries as a built-in element.

MDSU has built-in self-diagnostic elements which provide its reliable operation.

MDSU is developed for local and international customers.

Technical Features

Measurement ranges	0..5 mA, 0..20mA, 4..20 mA, 0..10 V
Input resistance not more than, not less than	50 Ohm (0..20,4..20 mA), 200 Ohm (0..5 mA), 1000 kOhm (0..10 V)
Load capacity of output discrete signals	DC: 1A (up to 30 V), AC: 60 W (up to 250 V)
Supply voltage	24 V
Power consumption	from 1,2 to 2,5 W
Dimensions	50x90x145, 40x80x150, 40x80x104
Mass, not more than	0,5 kg (MDSU - 03); 0,6 kg (MDSU - 02); 0,7 kg (MDSU - 01)

The Product Line of Physical Processes Analysis Design Bureau

Physical Process Analysis Design Bureau is focused on the development of seismic protection systems, calibration and qualification of data, received from devices, used at NPP. One of the most important products of the design bureau is the seismic sensor which obtains seismic impact data to provide seismic protection for equipment at nuclear power plants, mines, and other facilities that require seismic monitoring. The design bureau engineers also develop vibration measuring systems to carry out seismic sensors periodic calibration in a semi-automatic mode. In addition to nuclear industry oriented products engineers are developing information acquisition and display unit which is the key part of any monitoring system, including automatic systems for early diagnostics of emergencies. The other important task product is a high precision device to measure angles with different measurement ranges.