

**Outdoor operating mechanism
motor type NSN 50
manual type NRN 50**

for High-Voltage Disconnectors and Earthing Switches
for Outdoor Installation

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Application

Operating mechanism: motor type NSN50 and manual type NRN50 are designed for operating outdoor disconnectors and earthing switches.

Apart from possibility of using one operating mechanism to cooperation with high-voltage three-pole switch, electric circuit diagrams provided for operating mechanisms type NSN 50 enable also electrical connection of operating mechanisms of three single-pole switches in one remote control set.

Design

Motor operation mechanism consist of:

- mechanism with step screw-gear transmission driven by electrical motor;
- control panel;
- auxiliary switch (7 normally open contacts, 8 normally closed contacts, 1 impuls contact);
- switch with 1 normally open + 1 normally closed contact for busbars difference protection;
- blocking magnet, switching off electrical control in case of manual operating;
- anticondensation heater;
- terminal strip for connecting control and supply circuits.

Additionally, mechanism of operating drive is equipped with limit switches, for cutting out the supply of motor after reaching full operating angle by the output shaft.

The control panel is provided with:

- control pushbuttons;
- motor control contacts;
- thermal relay, interrupting the control circuits in case of overload of the motor.

All mechanisms and control components are attached to the body and installed in aluminium-sheet housing. Output shaft is passed from upper wall of the housing. In the left wall a switch settings either electrical or emergency manual control is fixed (accessible after the side door is opened).

In the bottom wall of the housing, bushing plate for mounting a gland for incoming connection cables and a gland for ventilation (with filter insert) is provided.

Two holes for fixing the operating mechanism to the supporting structure by means of bolts M16, are placed in the back wall of the housing.

Manual version of the operating mechanism does not have transmission chain, motor and its control accessories.

Coupling shaft

Coupling shaft enables coupling the shaft of disconnector or earthing switch with the output shaft of the operating mechanism. Maximum length of the coupling shaft is 1700 mm, and maximum aberration from vertical axis is 18°.

The coupling shaft may be easily shortened and adapted to installation requirements of the substation.

Mode of operation

Giving a pulse from pushbutton on control panel, or from outside control circuit, via one of the contactors, causes energising of the motor. Torque is transmitted from the shaft of the motor. When full rotating angle (192°) is reached, limit switch cancels the lock-in of the contactor, which switches off supply of the motor.

Giving pulse by means of second pushbutton enables return operation.

In the initial part of the operation, motion is transmitted onto auxiliary switch, causing opening of its normally open contacts and stopping it in the intermediate position, and then, while the main shaft reaches the extreme position, closing its normally open contacts. It signals reaching the extreme position.

During operation also the busbar difference protection pilot is switched. Switching follows the key diagram of the operating mechanism.

In case of manual emergency operation, energise the voltage trip by pushing the crank release button, and then set the setting switch, which causes cutting out the supply of control circuits and uncovers the inlet for crank-handle. After making about 54 revolutions of the crank-handle, the shaft of the operating mechanism is set from one extreme position to another.

Connecting box

In case of using operating mechanisms type NSN50 for single-pole operated disconnectors and earthing switches (mainly 420 kV), each three-pole set may be coupled in a remote control set.

Technical data	
Rated voltage: - motor - coils of contactors - coil of contactor controlling motor supply voltage - heater - voltage trip	220 / 380 V, 50Hz 220 V DC 380 V, 50 Hz 220 VDC or 220 V, 50 Hz 220 VDC
. Rated power - motor - heater	0,75 kW 50 W
Motor rated current	3,3 / 1,92 A
Starting current I _r /I _n	4,7
Torque on output shaft - rated - maximum	320 Nm 500 Nm
Operating time	ok. 5,5 s
Recommended number of switching cycles	1 / minute
Number of revolutions of the crank handle	54
Turning angle of output shaft	192°
Rated switching capacity of auxiliary switch	0,7 A; 20 s; 220 VDC
Max. cross-section of conductors connected to terminal strip	10 mm ²
Degree of protection of housing	IP 54
Rated mechanical endurance	2000 cycles
Weight: - motor NSN50 - manual NRN50	about 75 kg about 60 kg
Dimensions L x W x H	500x210x500 mm

