

Motor–Operated Mechanisms Types MT 50 MT100 and MT100M

for High-Voltage Disconnectors and Earthing Switches
for Outdoor Installation

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Application

The motor-operated mechanisms type **MT 50** and **MT100** and **MT100M** are designed for outdoor installation and used for the electrical remote operation of disconnectors and earthing switches.

Design

All components of the operating mechanism are assembled in an aluminium sheet housing with a door at the front. The control components are attached to mounting plate and wired to the terminal strip.

For connecting the control cables to the terminal strip is provided a clearance of approx. 10 cm.

The connections to motor, to the limit switches, and (if included) the blocking magnet and the lighting system are routed via an adapter plug.

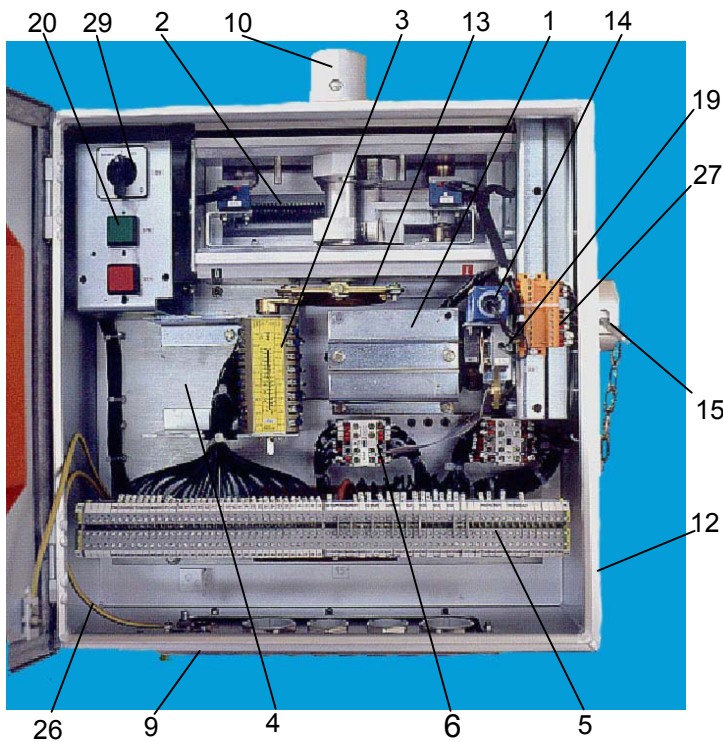
The basic version of MT...includes the following:

- Contactor control with lock-in feature
- 8-pole pilot switch with 4 NC and 4 NO contacts (by removing the bridges and cancelling the series connection the number of pilot switch contacts can be increased up to: 8 NC and 8 NO contacts).

- TQ 1.5 mm² flexible, black; except the motor lead which is: Dipotherm 0.56 mm², coloured.
- In case of AC operation, a rectifier is installed upstream of the DC motor.
- The incoming and outgoing cables are passed from below through a 4-mm-thick removable cable entry plate made of aluminium.
- The cable glands are not included in the standard scope of delivery, and must be provided by the customer. All bored holes (standard version: 2 x conduit thread P36, 4 x conduit thread P29 and 2 x conduit thread P16) are closed with blanking plugs. For ventilation is provided a cable gland with a filter insert. It is located in the cable entry plate. In that plate is also located the connection angle with 13-mm bored hole for the earth coming in from outside.
- The earthing connection in the box between the door and the housing has a cross-sectional area of 6 mm².
- An anti-condensation heater connected to the voltage supply is permanently mounted onto the terminal unit.

Other options can be supplied on request.

All devices are protected against accidental touching of electrical connections by means of appropriate constructional features or covers.



- 1 Motor (with cover)
- 2 Operating spindle
- 3 Pilot switch
- 4 Mounting plate
- 5 Terminal strip
- 6 Control contactor
- 9 Supply lead plate (with blanking plugs and earthing connection angle)
- 10 Operating shaft
- 12 Housing
- 13 Control disc
- 14 Safety contact
- 15 Cover for emergency operation
- 19 Blocking magnet
- 20 Push button
- 26 Flexible earthing connection
- 27 Adapter plug
- 29 Changeover switch

Additional options

- 1 Pilot switches (maximum of 2 pilot switches can be installed)
 - 1.1 8-pole pilot switch 4NC and 4NO contacts (same design as included in basic version).
Switching capacity: 2 A at 220VDC, T=20ms.
By removing the bridges and cancelling the series installation the number of pilot switch contacts can be increased up to: 8NC and 8NO contacts.
In this case the switching capacity is:
1 A at 220 VDC, T = 20 ms or
4 A at 110 VDC, T = 40ms
 - 1.2 8-pole pilot switch with 3NC, 3NO, 1 lagging NC, 1 leading NO.
Switching capacity:
3NC, 3NO and 1 lagging NC contact:
2 A at 220 VDC, T = 20 ms or
4 A at 110 VDC. T = 40 ms
By removing the bridges and cancelling the series installation the number of pilot switch contacts can be increased up to:
6NC, 6NO, 2 lagging NC, 1 lagging NC, 1 leading NO.
In this case the switching capacity is:
1 A at 220 VDC, T = 20 ms or
4 A at 110 VDC, T = 40 ms
 - 1.3 8-pole pilot switch with 3NC, 2NO, 1 lagging NC 1 leading NO, 1 leading NO.
Switching capacity:
3NC, 3NO, 1 lagging NC, 1 leading NO, contact:.
2 A at 220 VDC, T = 20 ms
By removing the bridges and cancelling the series installation the number of pilot switch contacts can be increased up to:
6NC, 4NO, 2 lagging NC, 2 leading NO,
the switching capacity is:
1 A at 220 VDC, T = 20 ms or
4 A at 110 VDC, T = 40 ms
- 2 Wiring of the pilot switches to the terminal strip:
 - 2.1 wires with marks
- 3 Local control system, consisting of:
 - 3.1 one changeover switch (local-off-remote) and rest control switch (ON-OFF), or
 - 3.2 one changeover switch (local-off-remote) and two push buttons (ON, OFF)
- 4 Blocking magnet
- 5 Miniature circuit breaker for:
 - 5.1 heater
 - 5.2 control system
 - 5.3 motor
- 6 Motor protection device:
 - 6.1 overload relay with automatic resetting
 - 6.2 overload relay with manual resetting
 - 6.3 overload circuit-breaker - automatic and manual reset
- 7 Control device for heating
 - 7.1 thermostat adjusted
 - 7.2 hydrostat – adjusted

- 8 Interior lighting (switches on when door is opened)
- 9 Device for locking the door:
 - 9.1 handle type “T”
 - 9.2 handle type “T” with cylinder lock
 - 9.3 double-beard lock
 - 9.4 padlock with prevent removal of the cover for emergency operation
- 10 Cable plate
 - 10.1 without holes
 - 10.2 with holes 2xPg36, 4xPg29, 2xPg21 closed with blanking plugs
 - 10.3 as 10.1 but with cable glands
- 11 Position indicator
 - 11.1 electrical (lamp)
 - 11.2 mechanical

Mode of Operation

Transmission of power from the motor to the operating spindle is via a gear train. The motor is below the spindle and arranged parallel to it, with a two-step gear train (for MT 50) or four-step gear train (for MT 100 and MT100M) between them

The motor operated mechanism is normally controlled from a control room or a local control cubicle, using an ON or OFF command. The control contactor picks up and locks in.

The switching angle of the output shaft is 190 degrees. When either of the end positions is reached, a limit switch cancels the operation.

Limit switches are tripped by the operating-cross, which is located on the output shaft.

Auxiliary switches are actuated by control disc fitted to the operating shaft.

Unauthorised opening of the door and removing of cover hood for manual emergency operation can be prevented by optionally built-on padlock.

The safety contacts interrupts the control circuit for the motor when the manual emergency crank is inserted, so that the unit can now be operated only with the manual emergency crank.

The optional blocking magnet prevents operation of the emergency manual operation of motor operated mechanism if there is no actuating signal from the control room. In this case it is not possible to insert the crank into the auxiliary pin for emergency operation.

Little Maintenance

The motor operating mechanism needs very little maintenance. Under normal climatic conditions the inspection intervals are every 5 years or 1000 operations.

Technical data of motor operated mechanisms MT50 MT100 and MT 100M	
Rated motor voltage	60,110,125 or 220 VDC 110 or 220 VAC, 50/60 Hz
Admissible deviation from the rated motor voltage	+10 / -20 %
Rated motor output, short-time duty	470 W
Switching time (depending on load): MT 50 MT 100 MT100M	between 3.5 and 6 sec. between 8 and 12 sec. between 10 and 16 sec.
Max. torque required at the operating shaft for emergency operation: MT 50 MT 100 MT100M	5 Nm 7.5 Nm 12 Nm
Rated torque on the operating shaft at rated voltage: MT 50 MT 100 MT100M	500 Nm 1000 Nm 750 Nm
Rotations of emergence crank for a 190° switching angle of the operating shaft	at least 70
Heating capacity	approx. 25 W
Heating voltage	60, 110, 125 or 220V
Degree of protection against contact with live or moving parts ingress of foreign bodies and water	IP 54
Cross-section of internal wiring (except motor and heater)	1,5 mm ²
Maximal cross-section of supply leads : solid stranded (with end sleeve)	4 mm ² 2,5 mm ²
Weight	40 kg
Dimensions (cubicle) L x W x H	500x210x500 mm
Technical data of the built-in control contactors	
Operating voltage	60, 110, 125, or 220 VDC 110 or 220 VAC
Admissible deviation from the operating voltage	+ 10 / - 15%
Rated power consumption of the magnet coils when operated with DC pick-up / holding when operated with AC pick-up / holding	7 W / 7 W 60 VA / 9 VA (50 W / 2,2 W)
Min. Signal duration for self-holding	75 ms
Technical data of the blocking magnet	
Operating voltage	60, 110, 125, or 220 VDC 110 or 220 VAC
Admissible deviation from the operating voltage	+ 10 / - 15%
Rated power consumption of the magnet coil when operated with DC	approx. 6 W
Duty cycle	100 %

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