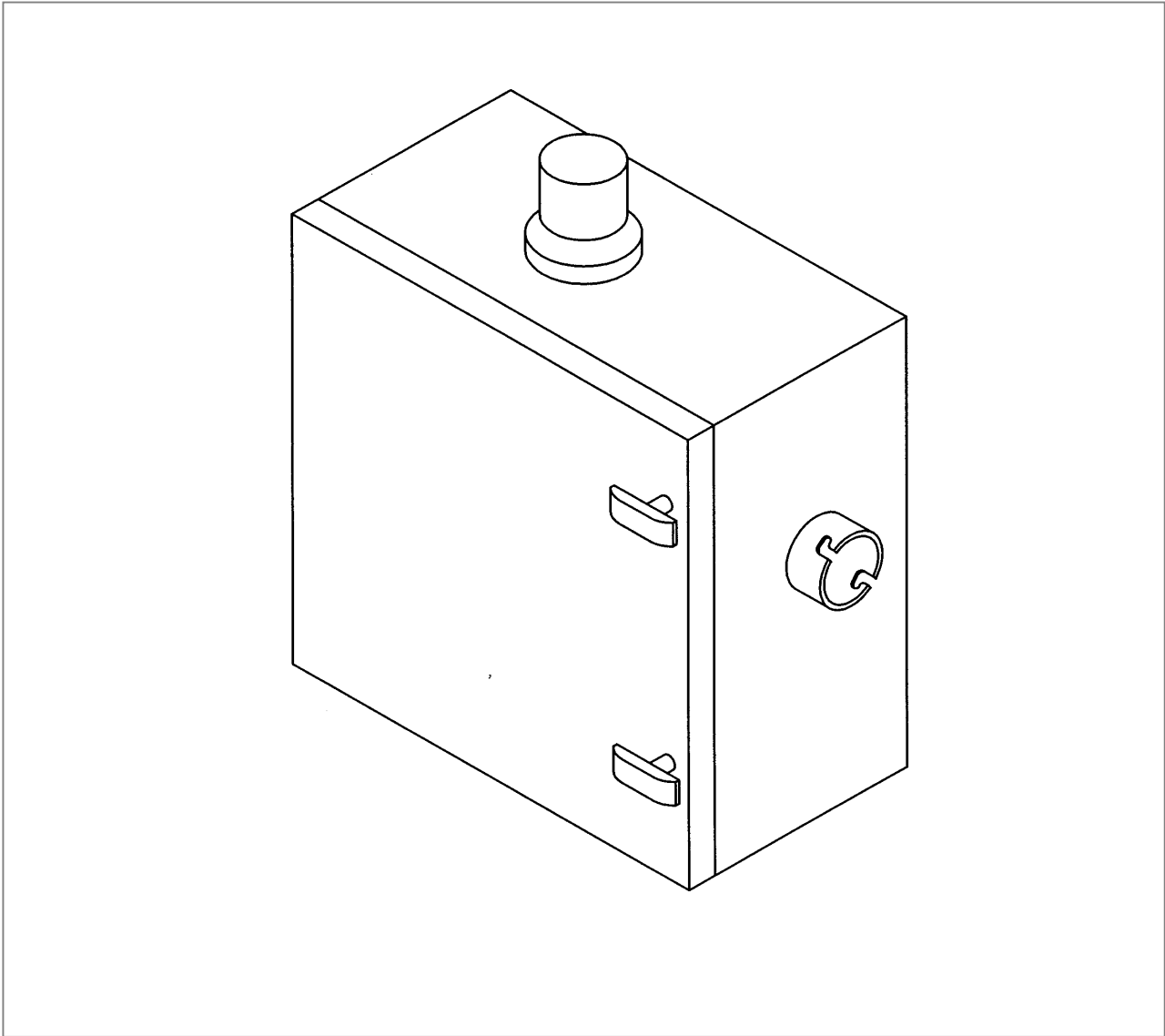


**Service Instruction**

**Motor-Operated Mechanisms  
Types MT50; MT100  
and MT50-3f; MT100-3f**  
for High-Voltage Disconnectors  
and Earthing Switches for Outdoor Installation

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**HAPAM**

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## 1 General Remarks

Practical experience has shown, that strict adherence to the recommendation of this instruction manual will ensure the best possible safe performance of the equipment.

In an instruction manual it is not possible to cover every possible eventuality that might occur when using technical apparatus. It is therefore requested that all incidences, in particular those for which the instruction manual provides no plausible explanation, be reported to us directly or through our local representatives.

These instructions are based on the present technical design. We reserve the right to make any technical changes.

We cannot accept any responsibility for any damage resulting directly from incorrect handling or operation, irrespective of whether specific reference is to be found in the instructions for erection and operation or not.

With respect to this document we reserve all rights also in the event of a patent being issued and registration being made under other commercial rights. Misuse, in particular copying and handing over to third parties is prohibited and offenders can be prosecuted under civil and criminal law.

## 2 Design

The motor-operated mechanisms types MT50..., MT100... are designed for outdoor installation and for the electrical remote operation of disconnectors and earthing switches.

All components of the operating mechanism are installed in an aluminium sheet housing (12) with a door (12a) at the front. Power transmission from the motor (1) to the operating spindle (2) is via a gear train.

The control components are attached to a mounting plate (4), and (with exception of the pilot switches) wired to the terminal strip (5). The length of the terminal strip support is designed to accommodate the maximum equipment configuration. The terminal designations are consistently structured, i. e. the same terminal designations are used for the same functions in all possible versions. Thanks to the use of TWIN terminals, the connections are positioned above each other for easy accessibility.

A clearance of approx. 10 cm is provided for connecting the control cables to the terminal strip.

The connections to motor (1), limit switches (17), (if included) blocking magnet (19) and lightning system (48) are routed via an adapter plug (27).

The basic version includes the following:

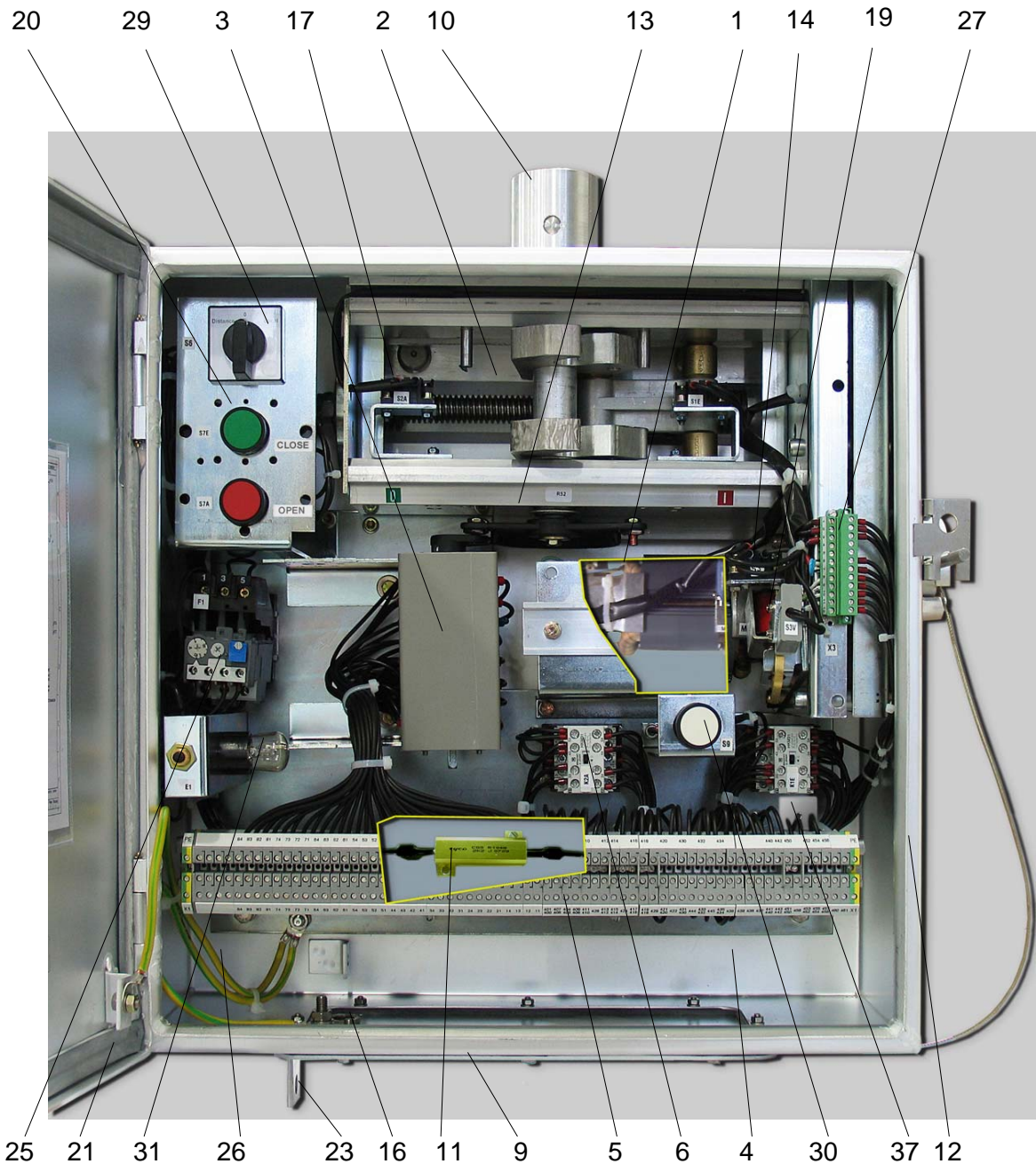
- a contractor control with lock-in feature
- a 8-pole pilot switch with 4 NC contacts and 4 NO contacts.

For switching capacity see section 5.4.

Cross sectional area for all internal connections is TQ 1.5 mm<sup>2</sup> flex., black; except the motor lead: Dipotherm 0.56 mm<sup>2</sup>, coloured. In the case of AC operation, a rectifier (37) is installed upstream of the DC motor.

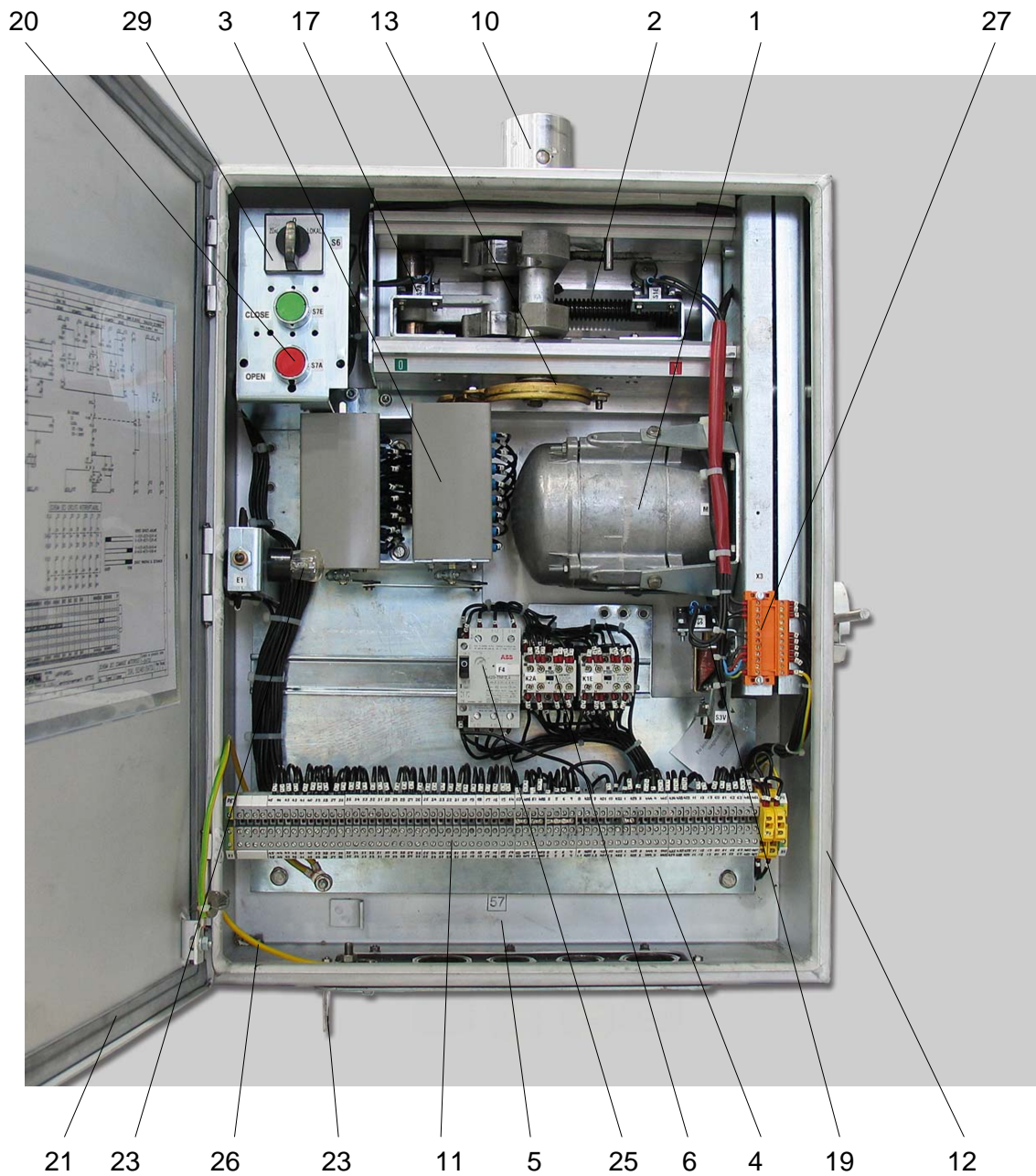
The incoming and outgoing cables are passed from below through a 4-mm-thick removable cable entry plate (9) made of aluminium. Cable glands (28) are not included in the standard scope of delivery, and must be provided by the customer. All bore-holes (standard version: 2 x conduit thread 36, 4 x conduit thread 29 and 2 x conduit thread 16) are accordingly closed with blanking plugs. A cable gland (16) (conduit thread 13.5) with a filter insert is provided for purposes of ventilation. It is located in the cable entry plate, as is the connection angle (23) with 13 mm bore-hole for the earth led in from outside. The earthing connection (26) in the box between door and housing has a cross-sectional area of 6 mm<sup>2</sup>. An anticondensation heater (11) permanently connected to the voltage supply is mounted on the mounting plate (4).

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



**Figure 1**  
**Inside view of motor-operated mechanism type MT50 ... 100**

- |                                     |  |
|-------------------------------------|--|
| 1. Motor (M1)                       | 16. Cable gland with filter insert for ventilation     |
| 2. Operating spindle and gear-train | 17. Limit switch (S2A)                                 |
| 3. Pilot switch (S4)                | 19. Blocking magnet (Y1)                               |
| 4. Mounting plate                   | 20. Push-buttons (open / close)                        |
| 5. Terminal strip                   | 21. Foamed silicone gasket                             |
| 6. Control contactor (K2A)          | 23. Earthing connection angle                          |
| 9. Supply lead plate                | 25. Overload protection (F1)                           |
| 10. Operating shaft                 | 26. Flexible earthing connection                       |
| 11. Anticondensation heater (R1)    | 27. Adapter plug                                       |
| 12. Housing                         | 29. Changeover switch (S6)                             |
| 13. Control disc                    | 30. Push-button for blocking magnet (S9)               |
| 14. Safety switch (S3)              | 37. Rectifier (when AC motor voltage is supplied) (G1) |

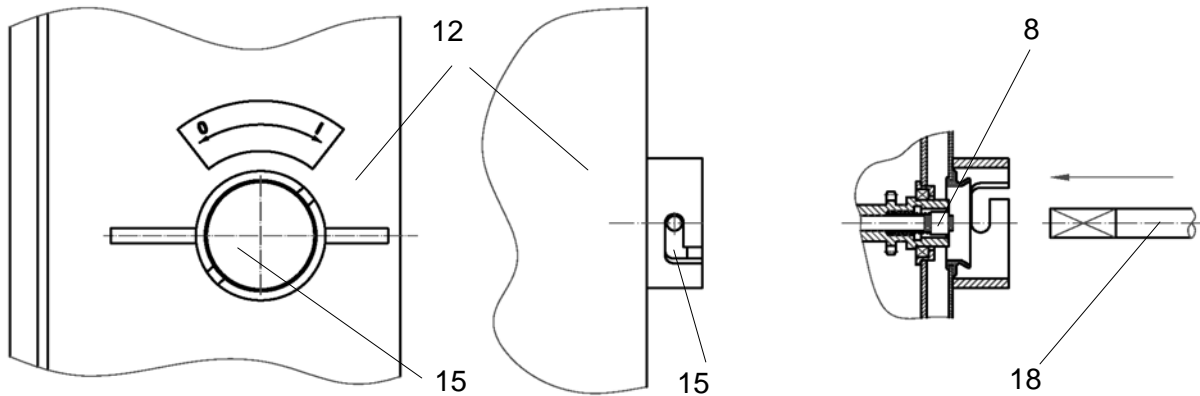


**Figure 2**  
**Inside view of motor-operated mechanism type MT50-3f ... 100-3f**

1. AC Motor (M1)	14. Safety switch (S3)
2. Operating spindle and gear-train	16. Cable gland with filter insert for ventilation
3. Pilot switch (S4)	17. Limit switch (S2A)
4. Mounting plate	19. Blocking magnet (Y1)
5. Terminal strip	20. Push button
6. Control contactor (K2A)	21. Foamed silicone gasket
9. Supply lead plate	23. Earthing connection angle
10. Operating shaft	25. Overload protection (F1)
11. Anticondensation heater (R1)	26. Flexible earthing connection
12. Housing	27. Adapter plug (X3)
13. Control disc	29. Changeover switch (S6)

## 2.1 Manual emergency operation

Crank (18), which can be inserted into the auxiliary pin (8) for emergency operation, serves for adjusting the unit and performing emergency operations. It is not permitted to use boring machine instead of the emergency crank. The corresponding opening provided on the housing is closed by cover (15). When the manual emergency crank is inserted into the auxiliary pin a safety contact (14) interrupts the control circuit for the motor to ensure that actuation is possible only by using the emergency crank.



The opening for manual emergency operation is located approx. 200 mm below the top edge of the box on the right-hand side. It is sealed with a cover (15) incorporating a bayonet lock. On request, unauthorized removal of the cover can be prevented by a locking device and a padlock (optional extra).

## 2.2 Blocking Magnet

Optionally a blocking magnet (19) can be installed. The blocking magnet de-energized prevents the motor-operated mechanism from being operated manually. In this case it is not possible to insert the hand crank (18) into the auxiliary pin (8) for emergency operation.

Blocking magnet circuit is designed in two versions (depend on client request):

- with push-button (30) - when the pushbutton is pressed, the blocking magnet is energised which allows inserting the hand crank into its nest and break motor control circuit.
- without push-button (30) - allows inserting the hand crank or electrical operation only when the blocking magnet is energized.

In the case of AC operation, a rectifier (37) is installed upstream of the blocking magnet.

## 2.3 Mechanical Interruption of Control Circuit

On special request, the control circuit for the motor can be interrupted mechanically, so that the operating mechanism is blocked and remains in its position. In this case cover (15) additionally is equipped with a pin which has to be inserted into the opening for manual emergency operation and actuates safety contact (14). Padlocking of cover (15) in this position is possible.

## 3 Optional Extras

(depending on customer's order)

- 3.1 Pilot switches (A maximum of 2 pilot switches can be installed)
  - 3.1.1 8-pole pilot switch with 4 NC contacts and 4 NO contacts. For switching capacity -see section 5.4.
  - 3.1.2 8-pole pilot switch with 3 NC contacts, 2 NO contacts , 1 lagging NC contact, 1 leading NO contact and 1 running lamp contact. For switching capacity see section 5.4.
  - 3.1.3 8-pole pilot switch with 3 NC contacts, 2 NO contacts , 1 lagging NC contact, 1 leading NO contact, 1 leading NO contact\* and 1 running lamp contact\*. For switching capacity see section 5.4.
- 3.2 Wiring of the pilot switches to the terminal strip.
- 3.3 Local control system, consisting of:
  - 3.3.1 One changeover switch (29) (local-of-remote) and one reset control switch (30) (ON-OFF), or
  - 3.3.2 One changeover switch (29) (local-of-remote) and two push buttons (20) (ON, OFF)

- 
- |       |   |
|-------|---|
| 3.4   | Blocking magnet (19) for preventing maloperation during manual emergency operation (details see paragraph 2.2).   |
| 3.5   | Interlock contactor (32).   |
| 3.6   | Automatic equipment for   |
| 3.6.1 | Heater (11)   |
| 3.6.2 | Control system  |
| 3.6.3 | Motor (1), or   |
| 3.6.4 | Locked-Blade requirement.   |
| 3.7   | Thermal overload relay (25) for motor protection.   |
| 3.8   | Interior lightning (48), switches on when door is opened.   |
| 3.9   | Handle (35) with safety lock (in place of the standard double-beard lock).  |
| 3.10  | Device for fitting a padlock.   |
| 3.11  | Lock device to prevent unauthorized removal of the cover (15) for manual emergency operation.                     |
| 3.12  | Mechanical interruption of control circuit for the motor, including lock device 3.11 (details see paragraph 2.3). |

## 4 Method of Operation

### 4.1 Method of Mechanical Operation

The motor-operated mechanism is fitted with a spindle, mounted on bearings in a housing closed at the sides. The motor (1) is below the spindle (2) and arranged parallel to it, with a two-step gear train (for MT 50) or four-step gear train (for MT 100) between them. Power is transmitted to the output shaft (10) from the spindle via a slide with two transmission bolts onto an operating cross, which in each of its end positions is arrested by one of these bolts. When the end position has been reached, the slide is halted by a cup-spring stop, without the operating position altering any further.

On request, the manual emergency operation feature can be protected against maloperation by means of a blocking magnet (19). When the blocking magnet is de-energised, the manual emergency crank (18) cannot be inserted.

Unauthorized removing of cover (15) for manual emergency operation can be prevented by an optionally built-on padlock (special design).

### 4.2 Method of Electrical Operation

The motor-operated mechanism is normally controlled from a control room or a local control cubicle, using an ON or OFF command (minimum pulse duration 75 ms; or 100 ms if an interlock contractor is installed). The control contractor picks up and locks in. The operating angle of the output shaft (10) is 190 degrees. When either of the end positions is reached, a limit switch (17) cancels the lock –in and terminates the switching operation. The limit switches are tripped by operating cross on the output shaft. In the case of AC operation, a rectifier (37) is installed upstream of the DC motor.

Release of the contractors via pilot switch contacts is not permissible!

Pilot switches (3) are actuated by the control disc (13) fitted to the operating shaft (10). The position signal meets the requirements of IEC 62271-102.

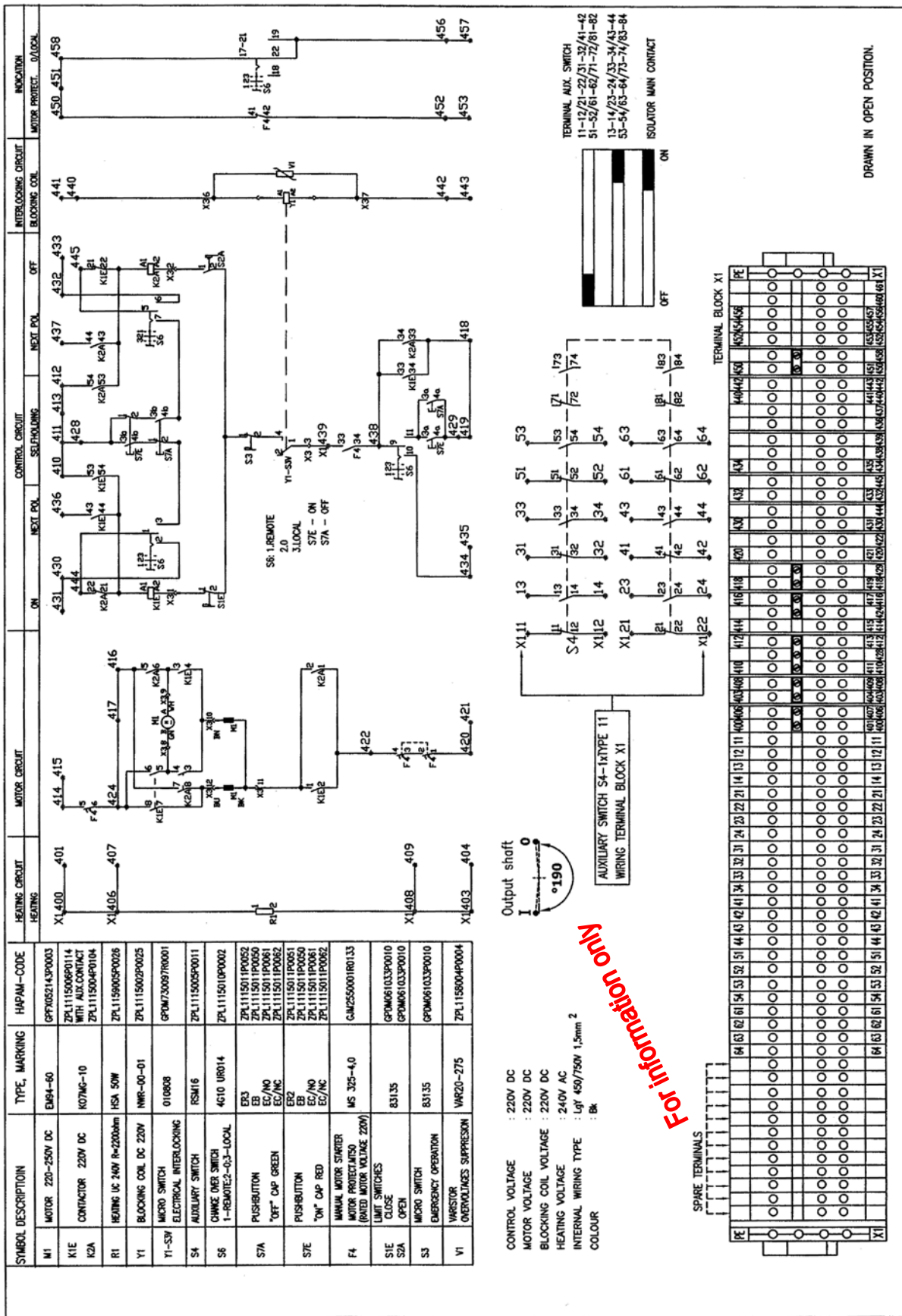
“CLOSED” position signal is given after closing when the top dead centre is overrun (i.e. after closing of the current path of the disconnecter and top dead centre interlocking by the operating linkage) and is cancelled upon opening even before the top dead centre is reached (i.e. before interlocking is cancelled). The signal for the “OPEN” position is given analogously.

The safety contact (14) interrupts the control circuit for the motor when the manual emergency crank (18) is inserted, so that the unit can now be operated only with the manual emergency crank.

The optional blocking magnet (19) when de-energised prevents the motor-operated mechanism from being operated manually, as it is not possible to insert the hand crank (18) into the auxiliary pin (8) for emergency operation. The blocking magnet is actuated by pushbutton (30) or (in version without pushbutton ) by remote voltage supplying.

An additionally interlock switch (51), directly attached and actuated by the blocking magnet (19).

- in version with push-button (30) – blocks electrical operation only when the blocking magnet is energized.
- in version without push-button (30) - allows electrical operation only when the blocking magnet is energised.



**Figure 3** Example of internal wiring diagram (standard design, additionally with local control system and blocking magnet).



## 5 Technical Data

### 5.1 Technical data of motor operated mechanisms

Type	MT50 MT100	MT50-3f MT100-3f
Rated motor voltage	60,110,125 or 220 VDC; 110 or 230 VAC, 50/60 Hz	3 x 230/400 VAC
Admissible deviation from the rated motor voltage	+10 / -20 %	+10 / -10 %
Rated motor power short-time duty input output	660 W 470 W	750 W 560 W
Switching time (depending on load): MT50... MT 100...	5 - 9 sec. 6 - 12 sec.	6,5 - 9 sec. 12 - 17 sec.
Max. torque required at the operating shaft for emergency operation: MT50... MT100...	5 Nm 7.5 Nm	3 Nm 4 Nm
Rated torque on the operating shaft at rated voltage: MT50... MT100...	500 Nm 1000 Nm	750 Nm 1000 Nm
Rotations of emergence crank for a 190° switching angle of the operating shaft: MT50... MT100...	at least 100 at least 140	at least 80 at least 110
Heating capacity	approx. 25 W	approx. 25 W
Heating voltage	60, 110, 125 or 230VAC	125; 230 VAC
Degree of protection against contact with live or moving parts ingress of foreign bodies and water:	IP 65	IP 65
Cross-section of internal wiring (except motor and heater)	1,5 mm <sup>2</sup>	1,5 mm <sup>2</sup>
Maximal cross-section of supply leads : solid stranded (with end sleeve)	4 mm <sup>2</sup> 2,5 mm <sup>2</sup>	4 mm <sup>2</sup> 2,5 mm <sup>2</sup>
Weight	max. 40 kg	max. 48 kg
Dimensions (cubicle) L x W x H	500 x 210 x 500 mm	650 x 500 x 210 mm

### 5.2 Technical data of the built-in control contactors

Operating voltage	60, 110, 125, or 220 VDC 110 or 230 VAC	110, 125 or 230 VAC
Admissible deviation from the operating voltage	+ 10 / - 15%	+ 10 / - 15%
Rated power consumption of the magnet coils when operated with DC pick-up / holding when operated with AC pick-up / holding	34 W / 4 W 39 VA / 8,1 VA	34 W / 4 W 39 VA / 8,1 VA
Min. Signal duration for self-holding	75 ms	75 ms

### 5.3 Technical data of the blocking magnet

Operating voltage	60, 110, 125, or 220 VDC* 110 or 230 VAC
Admissible deviation from the operating voltage	+ 10 / - 15%
Rated power consumption of the magnet coil when operated with DC	approx. 7 W
Duty cycle	100 %

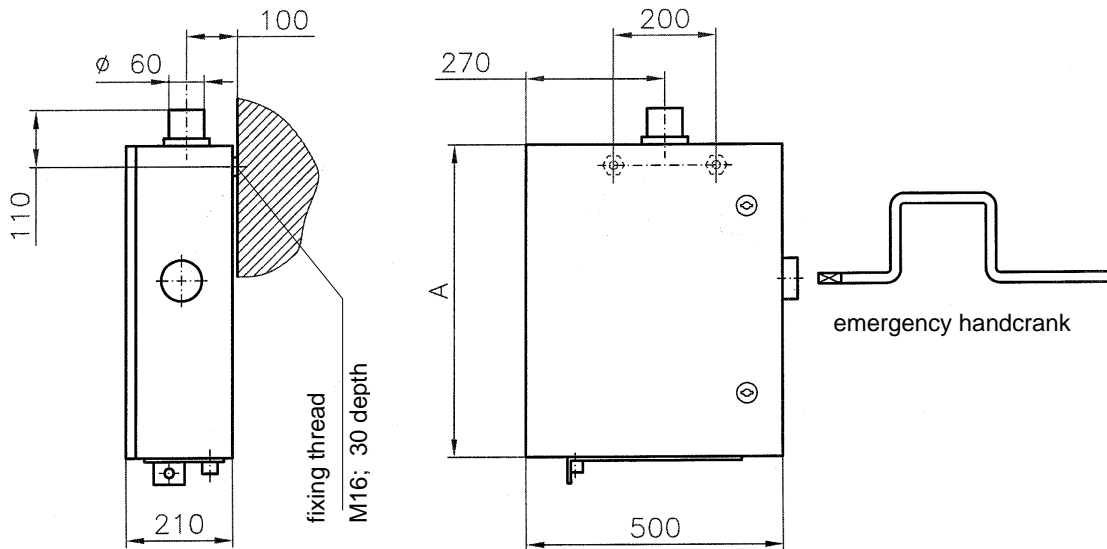
#### 5.4 Technical Data of the Pilot Switches

Design	Switching capacity	Current carrying capacity
Pilot switch item no. 3.1.1: 4 NC contacts 4 NO contacts	2A at 220 VDC, T = 20 ms	25 A
By removing the bridges and cancelling the series installation the number of pilot switch contacts can be increased up to : 8 NC contacts 8 NO contacts	1A at 220 VDC, T = 20 ms or 4A at 110 VDC, T = 40 ms	25 A 25 A
Pilot switch item no. 3.1.2: 3 NC contacts 3 NO contacts 1 lagging NC contact 1 leading NO contact* 1 running lamp contact*	2A at 220 VDC, T = 20 ms 2A at 220 VDC, T = 20 ms 2A at 220 VDC, T = 20 ms 1A at 220 VDC, T = 20 ms 1A at 220 VDC, T = 20 ms	25 A 25 A 25 A 25 A 25 A
By removing the bridges and cancelling the series installation the number of pilot switch contacts can be increased up to : 6 NC contacts 6 NO contacts 2 lagging NC contacts 1 leading NO contact* 1 running lamp contact*	1A at 220 VDC, T = 20 ms or 4A at 110 VDC, T = 40 ms	25 A 25 A
Pilot switch item no. 3.1.3: 3 NC contacts 2 NO contacts 1 lagging NC contact 1 leading NO contact 1 leading NO contact* 1 running lamp contact*	2A at 220 VDC, T = 20 ms 2A at 220 VDC, T = 20 ms 2A at 220 VDC, T = 20 ms 2A at 220 VDC, T = 20 ms 1A at 220 VDC, T = 20 ms 1A at 220 VDC, T = 20 ms	25 A 25 A 25 A 25 A 25 A 25 A
By removing the bridges and cancelling the series installation the number of pilot switch contacts can be increased up to : 6 NC contacts 4 NO contacts 2 lagging NC contacts 2 leading NO contact 1 leading NO contact* 1 running lamp contact*	1A at 220 VDC, T = 20 ms or 4A at 110 VDC, T = 40 ms	25 A 25 A



**Figure 4**  
Pilot switch, functional diagram

## 5.5 Main dimensions



dimension:	A
MT 50; MT100	500
MT 50-3f; MT 100 -3f	650

**Figure 5**

Motor operating mechanism type MT...

## 5.6 Table of Starting and Continuous Currents (Guiding Values)

Motor voltage	Starting current	Continuous current for rated torque
60 VDC	24 A	12A
110 VDC	24 A	9 A
125 VDC	20 A	9 A
220 VDC	17 A	7 A

For short circuit protection it is advisable to use a time-lag fuse the size of which should be chosen on the basis of the starting current, the continuous current and the prospective short-circuit capacity.

## 6 Transportation and Storage

Each operating mechanism was specially packed before shipment.

As soon as the equipment arrives at the place of destination an inspection for damage in transit should be carried out to find out the extent of damage, the cause of damage and, if necessary, its originator. The damage report, if any, should immediately be sent to the appropriate forwarding agency to be passed on to the transportation insurance company.

The operating mechanism should be stored in normal mounting position. To maintain corrosion protection provided by special packing as long as possible the operating mechanism should be left in this packing until installation is started.

In dry climate the duration for transportation and storage of the operating mechanism must not exceed 6 month without heating. For longer times of storage or if there is danger of moisture condensation the heater has to be connected unless precautions were taken by appropriate packing or storage to prevent moisture condensation. The bags with desiccative are to be removed prior to commissions the heating.

## 7 Installation

It must be ensured by all means that operating mechanism to be mounted separately are allocated to the associated disconnecter or earthing switch with identical serial number (see rating plate). Every operating mechanism should be mounted in accordance with the mounting instructions for the unit for which is intended.

For direct attachment of the operating mechanism to disconnectors or earthing switches designed for wall mounting, special instructions supplied along with the unit have to be observed. If the customer decides at a later date to mount the equipments in this way, he should apply to the Sales Department for these instructions.

The interior parts of the operating mechanisms (e.g. pilot switches, contractors etc.) are not resistant to the atmospheric conditions prevailing out of doors; therefore, care must be taken to ensure that these parts are not exposed to humidity during installation.

Upon arrival, the cable glands (28) optionally installed in the supply lead plate 9 are fitted with plastic plugs. After removing them, the cable can be led in. Cable glands not used should be plugged up and all cable glands should be sealed carefully to prevent any ingress of humidity, dust and sand.

Connection of the motor control components is made at terminal strip (5), and that of pilot switch (3) directly at the pilot switch contacts or at the terminal strip (5), depending on customer's order.

To avoid condensation it is absolutely necessary to connect the heater (11). After installation the heating is to be commissioned immediately even if the associated disconnectors and earthing switches have not yet been commissioned. The bags with desiccative serving to avoid corrosion during transport and storage are to be removed prior to commissioning the heating.

## 8 Commissioning

After connecting all cables, first operate the motor-operated mechanism with the emergency crank. It is not permitted to use a boring machine instead of the emergency crank. If the disconnecter or earthing switch engages properly according to the corresponding operating instructions, the operating mechanism can be actuated electrically.

The operating spindle of motor-operated mechanism requires to be greased with Molykote Longterm 2 Plus.

Make sure that safety contact (14) is functioning properly, i.e. the circuit must be interrupted when the emergency hand crank (18) is inserted.

Also check the pilot switch(es) (3) for proper contact make in the two end positions. Adjustments of the pilot switches are to be made by specialized personnel only.

Check blocking magnet (19) to make sure that its blocking pin is properly located before interlocking disc when the magnet is de-energized and prevents insertion of the hand crank (18).

Make sure that the venting holes within the filter insert of cable gland (16) are not plugged. If the units are painted, keep the filter insert free from paint.

**Note: We recommend waiting 1,5 minutes after switching operation to allow the motor and protection relay to cool down.**

## 9 Maintenance

The motor-operated mechanism hardly needs any maintenance.

It is recommended to have inspection carried out together with the inspection of the corresponding disconnecter or earthing switch after the first 5 years of operation, at the latest, however, after 1.000 make and break operations.

The inspection intervals mentioned above apply to normal ambient conditions. For extraordinary conditions (e.g. use in tropical climate or at excessively low temperatures or heavy pollution) these intervals should be reduced by 50 %.

The following details should be observed during the inspection or random test:

- a) Stop electrical supply to disconnecter and earthing switch. Care should be taken that the heating circuit and control voltage of the blocking magnet are disconnected.
- b) Observe IEC and national safety regulations.
- c) Check lubrication of operating spindle. If necessary, grease with Molykote Longterm 2 Plus and carry out several tests operations by hand.
- d) Check safety contact (14) (for details see section 8), and heating resistor (11) for proper functioning.
- e) Check pilot switch(es) (3) for proper contact make in both switching positions. Adjustments of the pilot switch, if required, should only be made by specialists.
- f) Check proper functioning of blocking magnet (19) and interlock switch (51), for details see section 8.
- g) Check whether the control and signalling cables are properly fitted to all terminals.
- h) Check whether the movement is properly transmitted from the operating shaft (10) to pilot switch (3) via control disc (13). If necessary, clean and grease the guides and running surfaces.
- i) Check for inadmissible ingress of foreign bodies and moisture.
- k) Clean filter insert of cable gland (16) in supply lead plate (9).
- l) Check gasket (21) of the door (12a) and replace, if necessary.
- m) After inspections, carry out a number of electrical test operations (at the same time, if possible, measure the starting currents, continuous currents and switching times) and reconnect the heating circuit and the blocking magnet to the power supply.

## 10 Spare Parts

It is recommended to keep the following parts in stock so that, in the case of disturbances, prolonged periods of interruption are avoided by rapidly replacing the individual parts. When ordering spare parts, give the following details:

- Type the serial number according to the rating plate of the specific unit
- Designation of spare part, item no. And order no. In accordance with these instructions
- Motor, control, heating and blocking magnet voltage.

Designation of spare parts	Ident. letter	Item No.	Quantity per operating mechanism	Order number
Motor DC (with pinion) MT50; MT100 operating voltage 110...125 VDC operating voltage 120...250 VDC	M	1 1	1 1	GPDM 06 0000 R0601 GPDM 06 0000 R0602
Motor AC (with pinion) MT50-f; MT100-3f operating voltage 3 x 230 VAC		1a	1	ZPL 1115007 P0001
Carbon brush for motor	-	-	2	GPFX 05 2143 P0098
Rectifier 15A, peak blocking voltage 500 VAC	G1	37	1	GPFX 73 0167 P0001
Control contactor operating voltage 110 VDC additional auxiliary contact 1NC + 3NO	K1E, K2A	6	2	ZPL 1115006 P0012 ZPL 1115004 P0004
Thermal overload protection relay TA25 (with manual resetting) motor operating voltage 110 VDC	F1	25	1	GJZ 252 1201 R0033
Manual motor starter MS325	F4			GJM 255 0001 R0129
(thermal overload & short circuit protection) Miniature Circuit Breaker MCB (thermal overload & short circuit protection) 16 pole pilot switch type 5 type 11 type 12 type 13 type16	F3 S4,S5	3	max. 2	ZPL 111 5005 P0005 ZPL 111 5005 P0011 ZPL 111 5005 P0012 ZPL 111 5005 P0013 ZPL 111 5005 P0016
8 pole pilot switch type 1 type 2 type 3 type 25	S5	3		ZPL 111 5005 P0001 ZPL 111 5005 P0002 ZPL 111 5005 P0003 ZPL 111 5005 P0025
Limit switch	S1E, S2A	17	2	GPDM 06 1033 P0010
Safety contact	S3	14	1	GPDM 06 1033 P0010
Blocking magnet	Y1	19	1	
operating voltage 110 VDC				ZPL 111 5002 P0026
Interlock switch (at blocking magnet)	Y1 - S3V	51	1	GPDM 73 0097 R0001
Anticondensation heater	R1	11	1	
operating voltage 50W 220...230 VAC				ZPL 115 9005 P0026
Thermostat 15 - 45 °C	E2	22	1	ZPL 111 5002 P0017
Foamed silicone gasket for door 12a (material sold by the meter)		21	1 piece approx.1.6 m	GMA 0268 916 P0011
grease Aliten N	-	cartridge 400 g		ZPL 0243001 P0017

## 11 List of Components

Item no.	Designation	Fig.
1.	Motor DC	1
	Motor AC	2
2.	Operating spindle (with cover) and gear-train	1; 2
3.	Pilot switch	1; 2
4.	Mounting plate	1; 2
5.	Terminal strip	1; 2
6.	Control contactor	1; 2
8.	Auxiliary pin for emergency operation	-
9.	Supply lead plate (with cable glands 28, earthing connection angle 23 and ventilation gland 16)	1; 2
10.	Operating shaft	1; 2
11.	Anticondensation heater	1
12.	Housing (with door)	1; 2
13.	Control disc	1; 2
14.	Safety contact	1; 2
15.	Cover for emergency operation (fastened by strand)	-
16.	Cable gland with filter insert for ventilation	1
17.	Limit switch	1; 2
18.	Swiveling emergency crank	-
19.	Blocking magnet	1; 2
20.	Push button	1; 2
21.	Foamed silicone gasket	1; 2
23.	Earthing connection angle	1; 2
24.	Mounting holes of operating mechanism	-
25.	Thermal overload relay	-
26.	Flexible earthing connection	1; 2
27.	Adapter plug	1; 2
28.	Cable gland	1
29.	Changeover switch (Local-0-Remote)	1; 2
30.	Push button for blocking magnet	1; 2
31.	Operating lever	-
32.	Interlock contactor	-
35.	Handle (optionally with safety lock)	-
37.	Rectifier	1
42.	Compartment for instructions and wiring diagrams	-
43.	Rating plate	-
44.	Double beard lock	-
47.	Padlock	-
48.	Lighting system	1; 2
51.	Interlock switch at blocking magnet	-

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