

# OPERATING INSTRUCTIONS

## MPC 16/24/32TD8

(Translation – Version 1.2)



Control system for kinetic drives  
in accordance to DGUV V54 and igvw sqp2

**SAFETY FIRST – MADE IN GERMANY**

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## 1 General

You have purchased an excellent product that is remarkable for its high quality, reliability and safety. MOVEKET products have been specially developed for use in the events, production and stage sectors and boast features and components that have been tried and tested in practice.

This operating instructions contain information and recommendations necessary to the safe and reliable use of the devices concerned. For this reason, before doing anything it is absolutely essential to read this operating instructions through carefully and take note of the information and safety advice it contains.

The operating instructions is aimed at competent and proficient persons in accordance with the german accident insurer guidelines as well as trained staff employed by the operator. The contents describe the correct and proper handling, maintenance, testing of the device. Please pay special attention to the safety instructions.

If you have any questions, your nearest MOVEKET dealer or the manufacturer will be happy to answer them.

### 1.1 Disclaimer

This operating instructions, the technical specifications and other documentation have been prepared with the utmost diligence, based on the facts at the time of publication. Content changes may be made at any time without notice, whether to stay abreast of technological developments or to correct technical, grammatical or typographic errors.

Due to our policy of continuous development, it is possible that minor discrepancies may arise between the operating instructions and the actual products or their features. No claim is made that the products as supplied correspond to the descriptions, technical illustrations or other information contained in this manual.

Warranty and liability claims deriving from products supplied, these operating instructions or the technical documentation provided shall be governed exclusively, to the exclusion of all other claims, by the principles contained in the general terms and conditions of the manufacturer.

### 1.2 Warranty

For devices and components manufactured by us, we offer a warranty following our general terms and conditions commencing with the date of delivery: during such time we will repair defects of which we are informed in writing and that are substantiated or else provide suitable replacements according to our choice. In the case of certain devices, the possibility exists of extending the warranty period in the context of a maintenance agreement. Here, the product-specific fundamentals must be borne in mind.

No claims under the warranty shall exist in respect of damage caused by inappropriate use, improper handling, testing or maintenance, the use of excessive force, induction or undervoltage, alterations or repairs conducted by the operator or user, or any other external influences.

For claims under the warranty, the device is to be returned unopened in the original packaging to the address given below, accompanied by a description of the defect. A copy of the purchase invoice must be enclosed!

In case you have not purchased directly at MOVEKET the warranty terms follow the condition of the salespoint.

Wear attributable to normal operation, parts subject to wear, and expendables are not covered by this warranty.

In principle, liability is excluded in respect of personal injury or damage to property if any of the following points are applicable.

**The manufacturer accepts no liability for damage and disruption caused by:**

- improper use
- inappropriate use
- operating errors
- improper transport, installation or commissioning
- unauthorized modifications made to hardware or software
- modification of safety or protective equipment
- improper maintenance and recommissioning
- use of non-original parts or accessories
- failure to respect the prescribed test intervals and procedures
- failure to respect the prescribed maintenance intervals and procedures
- failure to follow the operating instructions
- failure to observe the guidelines, standards or regulations in force or sound engineering practice
- extraneous events (e.g. natural disasters, external factors, force majeure)

### **1.3 Intellectual property /copyright**

These operating instructions as well as all related technical documentation and materials are protected by copyright and may only be used for the operation, maintenance, commissioning and testing of the devices concerned by the operator or personnel authorized by the operator.

The disclosure to third parties, reproduction, dissemination or other use or exploitation of the material or extracts thereof is prohibited in the absence of the express permission in writing of the manufacturer. Violations will give rise to criminal prosecution as well as civil claims.

### **1.4 Safety instructions**

#### **1.4.1 Safety symbols**

Symbols are appended to certain paragraphs in this operating instructions where they contain warnings, safety instructions or handling recommendations that must be observed. In addition to these, all generally applicable national regulations in respect of health and safety at work must be obeyed.

#### **1.4.2 Warning signs**

Warning signs draw attention through self-explanatory symbols to hazardous situations and health risks. When notice is paid to them, they make a notable contribution to safety and reduce the risk of accidents at the workplace. Failing to observe such warnings could result in serious injury or even death as well as considerable damage to the devices themselves.



Warning of general danger in the handling of the device



Warning of dangerous electrical voltage levels

#### 1.4.3 Mandatory signs

Mandatory signs in the form of safety symbols serve to reduce the risk of accidents and prescribe a certain form of behaviour according to DGUV V9. Failing to observe such prescriptions could result in serious injury or even death.



Disconnect device from mains before opening



Before working on the device, de-energize it and safeguard against its being switched back on

#### 1.4.4 Advisory signs

Advisory signs draw attention to important information regarding the way the device should be handled by the operator/user. Failing to observe such advice could result in serious injury or even death as well as considerable damage to the devices themselves



Special information and instructions for the handling of the device

### 1.5 General



- Read and follow the operating instructions and the listed operation and safety notes.
- These operating instructions must be consulted without fail whenever the control system is sold or transferred or new staff are being trained in its use to ensure that the new operators/users are able to inform themselves in full as to its functionality and of the safety instructions.
- The devices were designed for the control of professional kinetic stage drives with 3-phase AC motors in the course of setup and dismantling. No other use is permissible. The devices may be operated only by specialists who have been instructed and trained in their use.
- The devices should be put into operation by adults only. Any handling of the devices by minors must be forbidden.
- Any electrical work required for the installation and maintenance of the devices must be performed by a qualified technician/electrician or by personnel of similar proficiency.
- After unpacking the device ensure that it is intact and complete. If this is not the case, please contact our service department immediately.
- Ambient temperatures above 40° C and below 1° C should be avoided.
- Protect the devices from moisture, dust and vibration.
- If the devices are exposed to large temperature differences between storage and operation (e.g. in touring applications) sufficient acclimatisation time must be allowed to prevent irreparable damage being caused by condensation.
- The penetration of liquids or metal objects into the device should be avoided.
- In view of their IP21 protection class, outdoor operation is only possible if external measures are taken to protect the devices from the adverse effects of weather and in particular moisture.
- Do not open the devices. There are no components inside capable of being repaired by the user.
- Do not dismantle or modify the devices.
- Never attempt to repair the devices yourself.
- In the event of a serious malfunction, switch off and unplug the devices before contacting your nearest service centre or the manufacturer for the equipment to be examined and if necessary repaired.

## 1.6 Intended Use

The control system complies with the EN 60204-32 directive and is designed for installation operations using lifting gear such as electric chain hoists and winches at low speeds ( $\leq 10$  m/min) or similar stage drives designed with 3-phase induction motors using 400 V AC phase-changing circuitry. No other use is permissible. Inappropriate and improper use will render the product warranty null and void.



Because the devices combine with the connected drives to form an entire system, it is absolutely essential that the connected drives comply with DGUV V54 or IGWW SQP2 and are inspected and tested at appropriate intervals. If this is not the case, the operation of the entire system and therefore also of the control system can no longer be regarded as being in conformity with DGUV V-54 or IGWW SQP2. Here it is a case of the weakest link in the chain determining the maximum safety.

Equal consideration must be given to all the slings, constructional elements, suspension points and suspended loads involved in their use. In the selection and dimensioning of all the bearing elements (e.g. suspension points, girder clamps, shackles, steel wire, roundslings, trusses, decorative elements etc.) found in the force flow, the loads and hazards involved in each case must also be taken into account (see also IGWV SQ P2 and DGUV I215-313).

**In this context, particular attention and consideration must be paid to the following factors:**

- The unladen weight of the chain hoist
- Dynamic factors involved in the operation
- Factors arising from errors

**NB:**

The operator always bears the overall responsibility for the system he is operating. He must familiarize himself with the relevant and applicable guidelines, norms and standards and observe them at all times. Before each use, he must conduct a risk assessment and analysis of the system configuration in question and determine in accordance with his findings the requisite safety standards for the individual components, for the overall system and also for the run parameters and keep a written record of his findings.



**For this purpose, the following basic principles and guidelines should be observed:**

- DGUV V54
- IGWV SQ P2
- DGUV I215-310
- DGUV I215-313

The applicable guidelines, norms and standards for setting-up, dismantling and operating the system are invariably governed by the degree of hazard (risk assessment), and this must be determined by the operator/user.

Furthermore, the specific laws, regulations and structural requirements of the country and/or state in which the devices are being used must be observed at all times.

If non-conforming connector cables or connection leads not authorized by the manufacturer are used to connect to the hoists and accessories, the safety functions may in some cases be impeded.

Operation under such conditions, inappropriate use and non-observance of the listed operating and safety instructions are all prohibited!

## 1.7 Power supply

According to VDE 0100 Part 722 in the case of temporary installations a residual current device (RCD) must be included in the supply circuit. These are integrated into the MPC TD8 controller.



It is essential to ensure that all three phases (400 V) are present at the device and the rotary field is in clockwise direction. If this is not the case the MPC will correct the rotary field by its built-in phase-changing circuit.

If one phase is missing, the corresponding phase LED (L1, L2 or L3) on the front panel of the MPC will fail to illuminate. This will be due to a fault in the external power supply or a defective cable in the

supply line. This fault is also monitored for, as are phase asymmetry and undervoltage errors, with the run being interrupted in each case if an error is detected.

For this reason, the electrical connection systems connected to the MPC should be fully tested with a appropriate test-device by an authorised/specialist technician before the cable is connected and the device brought into service.

All supply voltage errors are indicated visually by means of the red error LED.

**Note in particular:**

The power supply cable should never be removed during operation. Always halt the drives in motion first, using the power switch on the device, and isolate the connected hoists altogether from the power supply.



## 2 Introduction

### **Congratulations!**

We congratulate you on the purchase of the MPC TD8 for the control of 3-phase rotary current drives with direct control in accordance with DGUV V54 and IGWV SQP2.

**The MOVEKET products will impress you with their quality, functionality and safety!**

Please read these operating Instructions through carefully prior to first use.

Allow some time for this, in order to prevent malfunctions and supposed risks!

### **2.1 Function and use**

The device allow you to specifically operate 3-phase AC drives independently of one another in both directions. The MPC satisfies the technical requirements for the control of lifting gear (for an explanation, see 'Safety instructions'). In the event of a fault, the motor protection circuit breakers perform a 3-phase shutdown and are subject to compulsory group use, which means that in the event of the failure or malfunction of one drive, the others drives are locked.

The device is used in trade fair, event, studio, production and entertainment venues as well as in tour applications to control 3-phase AC motors. The devices were primarily designed to control the lifting and lowering of suspended loads during setting-up and dismantling operations with the help of lifting gear (e.g. electric chain hoists or winches). Such loads include, for example, trusses as well as lighting, video and sound reinforcement equipment.

The MPC is designed for drives using 400 V AC rotary current direct control. Here the respective manufacturer's instructions must be observed.

It is to be noted that in the operation of each drive the individual total power consumption is assured and the motor protection circuit breaker should be adjusted accordingly. (see 'Technical data: Tripping value').

### 3 Overview MPC TD8

The MOVEKET MPC TD8 is available in different sizes from 16 up to 32 channels. The usage for all these different type is the same.

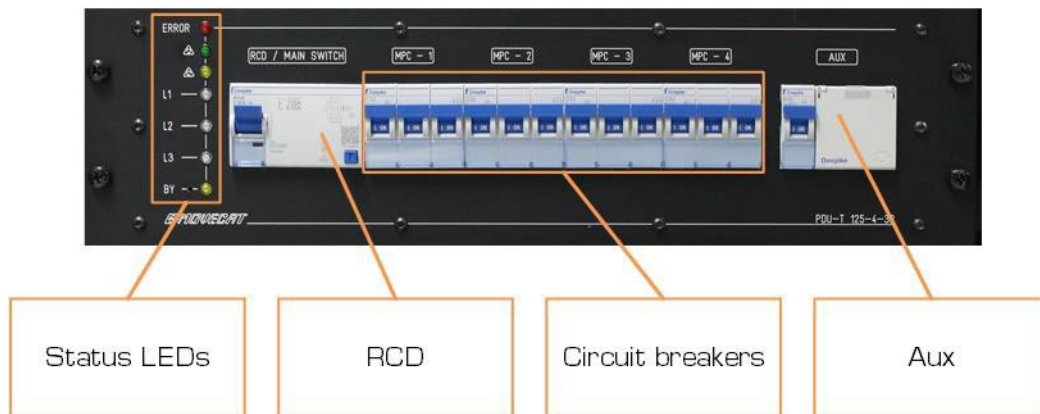
#### 3.1 Front view

This is the frontview of the MPC TD8.

It consists of a PDU at the bottom and two (16TD8), three (24TD8) or four (32TD8) units of a 8-channel control module.



### 3.1.1 Power Distribution Unit (PDU)



#### 3.1.1.1 Status LEDs

The status LEDs display the current status of the PDU:

- ERROR (red)** If any of the controller modules has an error, the emergency stop switch is engaged, one (or more) phase(s) is (are) missing at the power supply of the MPC or the power supply has a undervoltage situation.
- TRIANGLE (green)** Rotating field of the power supply is good (clockwise).
- TRIANGLE (yellow)** Rotating field of the power supply has been corrected (was counter clockwise)
- L1, L2, L3 (white)** These LEDs are indicating if the corresponding supply phase is present. If not all phases are present the red error LED will be on and the operation of the whole MPC is not possible.
- BY (orange)** Indicates if at minimum one control module is bypassed.

The MPC is equipped with a module that monitors the phase-direction and -symmetry as well as for undervoltage. If the error LED is not switched off within a short time of the device being switched on, a supply error is present

If, however, one of the three white Phase Fault LEDs fails to illuminate, there is a fault with the external power supply (please always check the external power supply before plugging in the MPC to ensure that the pin assignments and voltage potentials are correct).

#### 3.1.1.2 RCD

This is the main RCD for the whole MPC. The tripping current is 30mA for the residual current. Test the device at least once a year via the test button, at best each time before using the MPC.

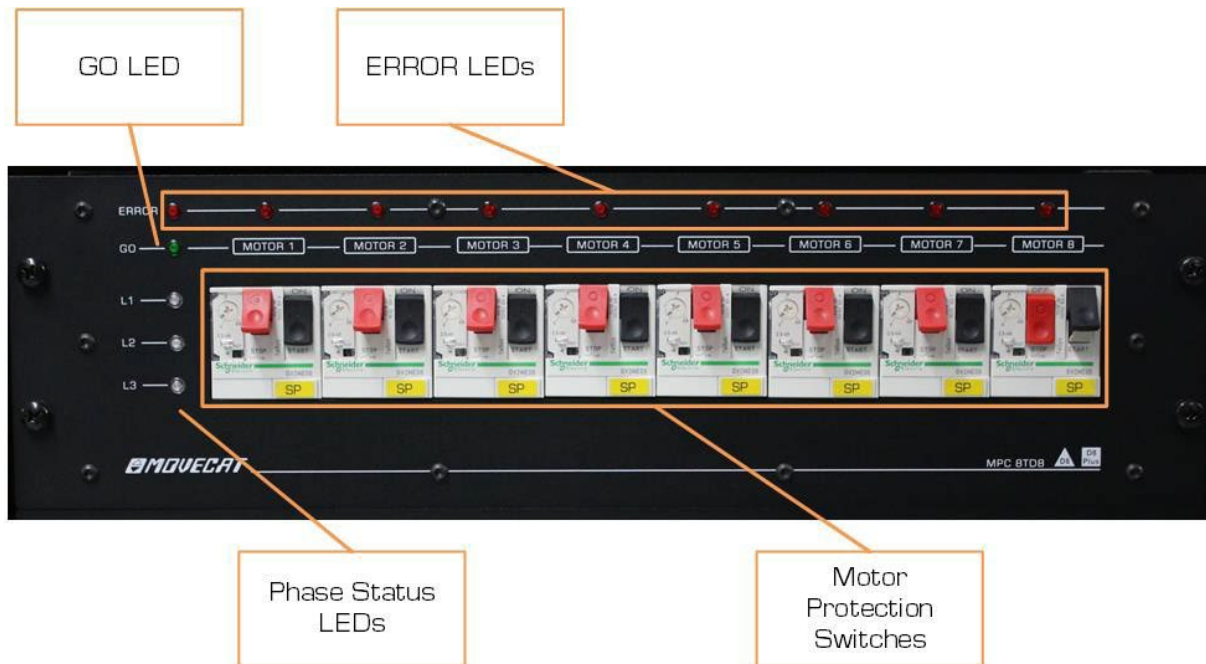
#### 3.1.1.3 Circuit breakers

For each module of the MPC there is a respective breaker section.

#### 3.1.1.4 Aux

This is an auxiliary schuko socket. It is fused by the nearby circuit breaker.

### 3.1.2 Controller module



#### 3.1.2.1 GO LED

The GO LED indicates, when the GO enabling button is activated.

#### 3.1.2.2 Error LEDs

The error LED on top of each motor protection switch lights up if the corresponding switch has been triggered.

The error LED above the GO is enlightened if any of the motor protection switch LED is on.

#### 3.1.2.3 Phase Status LEDs

The three white phase error LEDs confirm the presence of the three phases L1 to L3.

If a phase is missing, the LED assigned to it will not light up. (see 'Power supply').

For further troubleshooting please read section 'Typical errors'.

#### 3.1.2.4 Motor Protection Switches (MPS)

The motor protection circuit breakers protect the drives, connector cables and internal components from overload and damage by monitoring the power consumption of the drive. The motor protection circuit breakers simulate the windings of the motors. If, as a result of overload, too much current is flowing or if the drive is operated continuously for longer than the allowed time with the result that it overheats, the drive protection shuts down the overloaded drive. The winding simulation integrated in the motor protection circuit breaker prevents the hoist being restarted immediately until the motor winding has been allowed to cool down, thereby preventing the motor winding burning out and the consequent failure of the drive. The motor protection circuit breakers also trip in the event of a short-circuit, cross-circuit or short-to-ground.

**Note especially:**

Simply unplugging the affected drive and then plugging it into another controller output will lead inevitably to the overloading and even the failure of the drive in question or else to the MPC controller suffering damage!



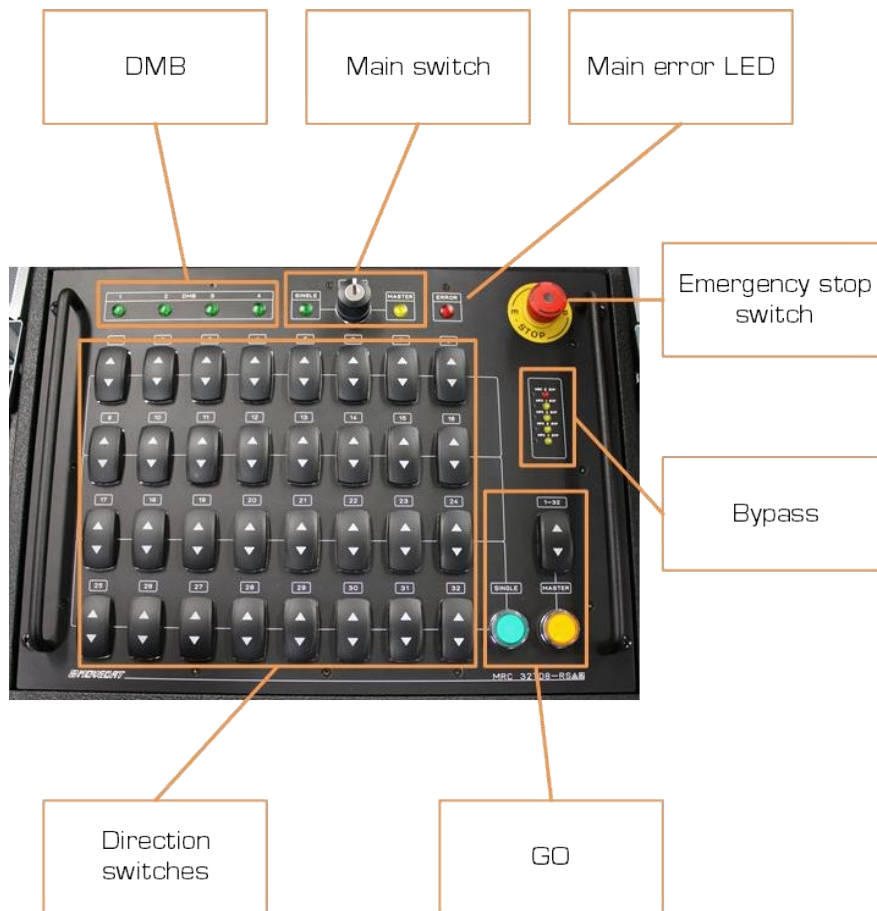
The motor protection circuit breakers are subject to the principle of compulsory group use. This means

that if one motor protection circuit breaker trips, all the connected drives will be shut down until the fault has been eliminated. The same applies when multiple MPC are combined via the M-Link system.

It should be pointed out that the tripping current that is set should depend upon the use to which the drive in question is being put (see 'Technical data: tripping value').

To ensure the fail-safe functioning of the motor protection circuit breakers, their functionality should be tested regularly – ideally each time the system is used – by means of the test button.

### 3.2 Top view

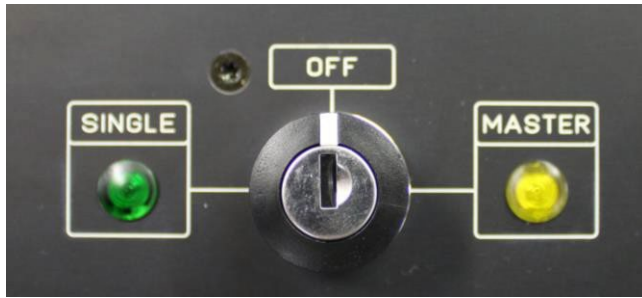


#### 3.2.1 Emergency stop switch

The E-Stop button shuts down all the connected drives immediately under all operating conditions. This also applies to drives connected to the MPC via the M-LINK system (see 'M-LINK system')

Activation of the E-Stop button switches off the main contactor instantaneously. The LED of the GO button is switched off. None of the drives can be moved any longer as the release is blocked. If you activate the E-Stop button in the course of operation, the drives will stop at once. The E-Stop button is self-latching and boasts a function display: when depressed, the button lights up in red. To enable the main contactor once again, take hold of the E-Stop button and turn it gently to the right; this will unlatch it, enabling will take place and the GO button will once again light up. It will then be possible once again to initiate a further run function by activating the GO button.

### 3.2.2 Main switch



This is the main switch of the MPC.

If set to 'OFF' the controller is turned off.

**Caution:** The operation mode of the MPC is selected by turning the switch to left (SINGLE) or to the right (MASTER). In MASTER mode, the direction of the move of all the drives that are directly connected to the MPC is than controlled by the single direction switch at the GO section. ALL drives will move as selected by that switch when the MASTER GO button is pressed. It is not possible to deactivate single drives that are connected to the MPC in that mode!



### 3.2.3 Direction switches

These switches are only used in SINGLE mode.

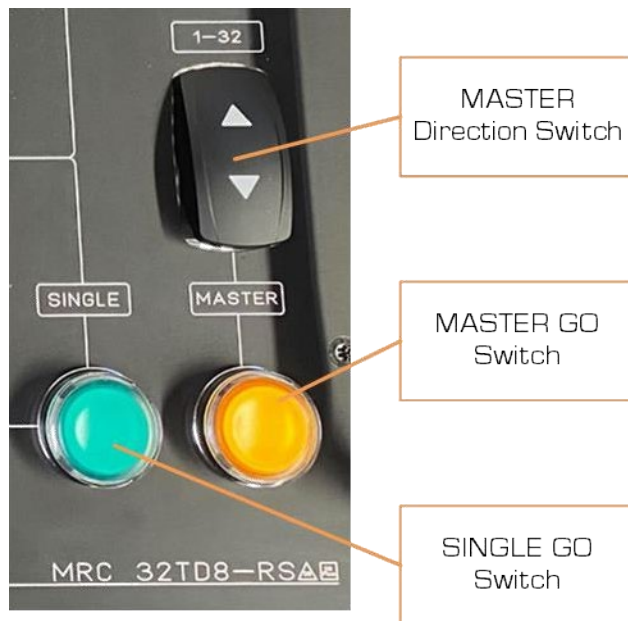
The switches have three different positions:

- UP            The drive will move up
- MID           The drive will not move
- DOWN        The drive will move down

The selected direction is also indicated by a corresponding illumination of the switches.

### 3.2.4 GO

Depending on the chosen operation mode (see 'Main Switch Section') either the Master Go or the Single Go Button will start a movement.



In MASTER mode, the single directions switches are bypassed and the master direction switch above the Master GO switch selects the direction of all CONNECTED drives at once! Only use this function carefully!

In SINGLE mode, the direction of the movements is selected by the direction switches on the left side of the SINGLE-GO button.

Depending on the chosen operation mode and if no errors are present the corresponding GO button will be illuminated (see 'Main switch').

### 3.2.5 DMB



A Dead-Man-Button (DMB) can be used in situations where the operator cannot ensure by himself that he is overlooking all moving drives or that a different person has to give an approval to operate the system safely.

To use one, just plug it into one of the DMB jacks on the back.

The DMB has three switching positions:

- Not pressed or fully pressed: Operation is not approved
- Half-pressed: Operation is approved

If a DMB is connected to the backside connectors of the controller these LEDs indicate if the corresponding DMB is half-pressed. If

The movement that is to be started by the corresponding GO-button activation is only granted if the DMB is half-pressed.

### 3.2.6 Bypass

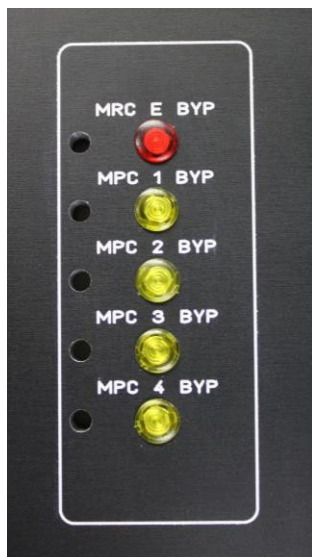
It is possible to bypass the build-in modules in cases of a hardware failure or for diagnostic reasons. If a module is bypassed, using the module is impossible and the emergency chain of the module is also bypassed.

#### CAUTION:

Only bypass certain modules or errors in situations when there is no other solution possible.



Always check that the mains are at the needed voltage and rotation field if you bypass the error chain.



To bypass a certain unit you have to switch the build in switches with a small slim penor nail.

The bypass is signalized by blinking of the corresponding LED.

The bypass will be kept until the power to the controller is completely turned off or the emergence-stop button is pressed.

### 3.3 Rear view



### 3.3.1 M-Link Sockets



In stand-alone operation of the MPC, the link terminal plugs should be plugged into the link sockets. The object of doing this is to complete the safety chain without no run is possible.

By connecting link cables to the link sockets, you can link up multiple MPCs. This makes it possible to use up to eight MPCs simultaneously in a linked group (see "Prior to operation: Linking").

The link terminal plugs are attached to the housing and must be plugged into their respective Link sockets during operation. (see also 'Prior to use')

The Link plugs consist of one 6-pole and one 7-pole XLR plug with special internal wiring.

Unless the link plugs are inserted or the group is fully linked up, operation of the system is impossible. The GO button will not light up in such cases.

### 3.3.2 Motor Connectors

#### 3.3.2.1 Multicore sockets

The motor output multi-pin socket connects to the HAN 16E 16-pin plug of the cable splitter (LKS). This splitter contains four CEE 16 A 4-pin cable couplers for the supply of four drives.

An ASK 16 connection cable can also be used here as an extension, which simplifies the cabling of the necessary drives, as only one main cable for every four drives needs to be laid until the immediate vicinity of the drives is reached and only then need the individual splitting occur.

#### 3.3.2.2 Single outlets (Motor 1-4)

The first four hoist are also linked to these single outlets.

It is forbidden to use both possible connection points (MC 1 and the single outlets) at once!



### 3.3.3 Mains connector

The connector cable is fitted with a CEE 5-pole. Before connecting to the power supply the delivery point should be checked.

### 3.3.4 DMB sockets

To connect up to four DeadManButtons to the MPC. See section 'DMB section' on how to use.

## 4 Operation

The paramount rule is that operation should only take place within view of the loads to be moved.

### 4.1 Connection and operation

**When connecting up the MPC TD8 controller there are several points to note. Proceed as follows:**

- Plug the cable splitter into the motor output multi-pin socket and close the clamp lock.
- Connect the drive to the cable couplers of the cable splitter. Note the numbering of each coupler that will lead to the desired drive
- Set the tripping current of the motor protection circuit breaker (see 'Technical data')
- Check the external power supply to ensure that the assignments and voltage potentials are correct
- Only then should you connect the main cable to a power socket
- Turn the Power switch to power the controller and to selected the operation mode
- Check that all the motor protection circuit breakers are switched on
- Test the E-Stop button The GO button should not be illuminated when the E-Stop button is pressed
- Now select a drive using the run direction selector assigned to it.
- Make sure that all the cables are hanging freely and there are no obstacles in the run area
- Make sure that there is no one underneath the suspended load
- Now press the GO button. The attached loads will move in the preselected direction.
- Check the safety function of the E-Stop button. Press the E-Stop button while the drives are running – the runs of all the drives in motion will come to an immediate halt – the GO button will be extinguished. It should no longer be possible to activate any runs.
- Unlatch the depressed E-Stop button again; the GO button should light up once again and the runs of the selected hoists will resume as soon as the GO button is activated.
- When the desired end position has been reached, release the GO button and the selected drives will stop immediately
- After a successful run, a sensible measure is to press the E-Stop button or in the ideal case even turn the Power switch to off to ensure the system comes to a definitive halt! When not in use, the MPC should always be isolated from the mains by means of the power switch.
- It is essential to have the running hoists in your field of vision at all times



## 4.2 Lifting

To move the attached loads upwards, set the run direction selector switch of the desired drive in the direction indicated by the arrow pointing upwards. If the drives fail to move but remain in their current positions, set the direction selector switch to its middle position. Pressing the GO button will trigger the preselected movement.

## 4.3 Lowering

To move the attached loads downwards, set the run direction selection switch of the desired drive in the direction indicated by the arrow pointing downwards. If the drives fail to move but remain in their current positions, set the direction selector switch to its middle position. Pressing the GO button will trigger the preselected movement.

## 4.4 Lifting and lowering in parallel (asynchronous runs)

To move the attached loads simultaneously in different directions, set the direction selector switches of the drives in question to the desired run positions. The GO button will activate the preselected runs of the individual drives.

## 4.5 M-Link system

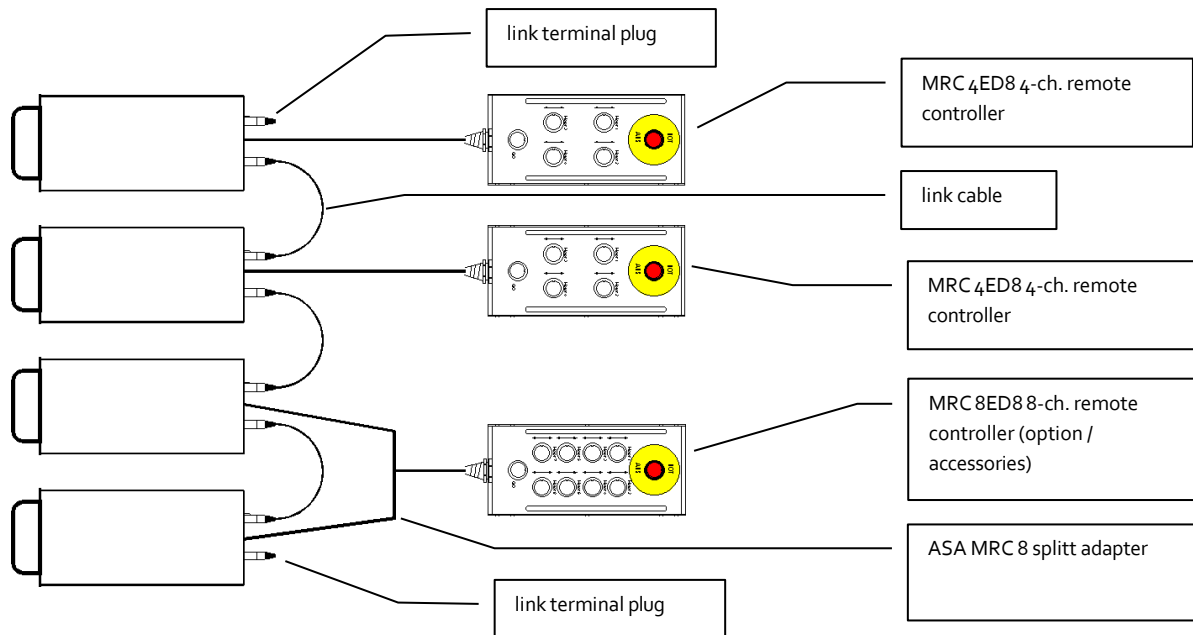
By connecting multiple MPC (max. eight units in one network), it is possible to control up to 256 drives simultaneously. The MPC are linked to one another using link cable via the link sockets. The drives are selected using the controls of the MPC in question; runs can be executed using the Go button of any of the MPC controls. Activating any GO button in the linked group activates runs by all the preselected hoists within the linked group.

If an error occurs in the Link system e.g. as a result of the tripping of any of the motor protection circuit breakers or the pressing of any E-Stop button, all the run-active hoists in the entire linked system will stop (forced group shutdown).

Linking is performed by connecting the 7-pole socket of the first MPC to the 6-pole socket of the second MPC using the link cable. The free sockets that result should be occupied by the link terminal plugs of the first and last controllers in the chain, for this purpose the open link system sockets should be closed off with the link terminal plugs. Only in this way can the safety chain be closed and the entire system enabled – the GO indicators of all the linked MPC will then light up!

The link cable is available in various lengths.

The following graphic illustrates the structure:



## 4.6 Forbidden Operations

The following operations are not permitted:



- Tipping (between consecutive run activations, a pause of at least 3 seconds is required)
- Turning individual drives on and off using their direction selectors in the course of a run
- Changing the run direction of drives with their direction selectors in the course of a run
- System operation of multiple MPCs without an active M-Llink system
- Removing or inserting plugs of any description in the course of a run
- Driving whilst unable to see the loads and the entire run path of all drives
- Moving loads over people's heads
- Scenic runs
- The transportation of people
- Use with lifting gear at speeds in excess of 10 m/min
- Operating outside the working conditions
- Use other than that intended and improper handling

## 5 Errors

As a fundamental rule, errors that require the MPC to be opened must not, and cannot, be eliminated by anyone other than authorized, skilled personnel.

If this rule is infringed, we cannot guarantee the safety of the device.

Therefore in the case of more serious malfunctions or errors contact your nearest service centre!

**CAUTION: THE DEVICE USES 400 V AC!**



### 5.1 Errors or system failures in the course of operation

The MPC features an internal safety chain in which relevant errors within an interdependent group (group supervision) are monitored and evaluated. This means that any error invariably leads to the shutting down of all the drives. Before the system can be operated again it is invariably necessary therefore to eliminate the operating error. The same is true in Link mode with additional MPCs.

### 5.2 Operating errors

- Undervoltage of mains (< 380V)
- Phase asymmetry
- Missing operating phase (L1, L2, L3) in the power supply
- Mainswitch switched to 'OFF'
- Not terminated link chain
- Tripping of any motor protection circuit breakers (In the event of a motor protection circuit breaker error, the procedure to be followed is described under 'motor protection circuit breakers').
- Emergency stop button pressed and latched

### 5.3 Typical errors (Stand alone)

The following errors can appear in stand alone operation of the MPC, thus without any other MPC connected by M-Link system:

1. Main Error LED is illuminated, DMB LEDs are illuminated, main switch without any function:
  - ➔ Problem with link chain (link cable faulty or termination plug not used)
2. Main Error LED is illuminated, Error LEDs of the modules are not and at least 1 DMB LED is also not illuminated, main switch without any function:
  - ➔ Problem with connected DMB (run not approved) or faulty DMB
  - ➔ Faulty DMB module
3. Main Error LED, the Error LEDs of the modules and DMB LEDs are illuminated, main switch without any function:
  - ➔ Emergency stop button pressed
4. One row of the direction switches without any illumination at all, L3 LED of one control module is not illuminated:

- Fuse F<sub>3</sub> of the control module is faulty
- 5. Whole MPC works without any problem, at one control module the L<sub>2</sub> LED is not illuminated:
  - Fuse F<sub>2</sub> of that control module is faulty
- 6. One row of the direction switches without illumination, L<sub>2</sub>+L<sub>3</sub> LEDs of a control module is not illuminated:
  - Fuses F<sub>2</sub> und F<sub>3</sub> of the control module is faulty
- 7. Main Error LED is illuminated, at a control module only the L<sub>2</sub> and L<sub>3</sub> LED as well as the error LED are illuminated:
  - Fuse F<sub>1</sub> of that control modules is faulty
- 8. Main Error LED is illuminated, at a control module only the L<sub>2</sub> LED as well as the error LED are illuminated:
  - Fuses F<sub>1</sub> and F<sub>3</sub> of that control module is faulty
- 9. Main Error LED is illuminated, at a control module only the L<sub>2</sub> LED as well as the error LED are illuminated:
  - Fuses F<sub>1</sub> and F<sub>2</sub> of that control module is faulty
- 10. Main Error LED is illuminated, at a control module none of the phase LEDs is illuminated but the error LED:
  - Fuses F<sub>1</sub>, F<sub>2</sub> and F<sub>3</sub> of that control module is faulty
- 11. Control panel without function, at a control module the error LED is illuminated, DMB module without function and illumination, emergency stop button without illumination:
  - Fuses F<sub>1</sub>, F<sub>1</sub>+F<sub>2</sub>, F<sub>1</sub>+F<sub>3</sub> or F<sub>1</sub>+F<sub>2</sub>+F<sub>3</sub> of the control panel is faulty
- 12. Error LED and DMB LED of the control panel are illuminated, if a DMB is connected the corresponding LED is not illuminated, main switch without function:
  - Fuse F<sub>2</sub> of the control panel is faulty
- 13. Error LED and DMB LED of the control panel are illuminated, if a DMB is connected the corresponding LED is illuminated, DMB without function:
  - Fuse F<sub>3</sub> or F<sub>2</sub> and F<sub>3</sub> of the control panel is faulty

#### 5.4 Operating errors (link operation)

The following error appear in link operation, thus with other MPC connected by M-Link system:

- 1. Control panel without function, at the linked MPC the error LED is enlightened:
  - Fuse F<sub>1</sub> of the control panel is faulty
- 2. Control panel without function, at the linked MPC the error LED is enlightened, by changing the order of the link the MPCs work without errors:
  - Fuse F<sub>2</sub> of the control panel is faulty
- 3. Control panel works without problems, if a DMB is connected the corresponding LED is ongoing enlightened regardless if pressed or not, at the linked MPC possibly the error LED is enlightened:
  - Fuse F<sub>3</sub> of the control panel is faulty

## 6 Inspection and Maintenance

### 6.1 Inspections

The devices and accessories must be subjected to an annual inspection by a specialist in the course of which the correct functioning of the safety systems and functions is tested in conjunction with the drives being used, The functioning, in particular, of the E-Stop button as well as the motor protection circuit breakers and RCDs in both single and group modes (M-Link) should be tested.



When used as mobile devices, annual inspections in accordance with DGUV V3 (VDE 0701/0702) must be conducted and documented. Here, regulations and requirements specific to the country of use must be respected.

To ensure the fail-safe functioning of the RCD and the motor protection circuit breakers, their functionality should be tested regularly – ideally each time the system is used – by means of the Test button.

### 6.2 Maintenance Instructions

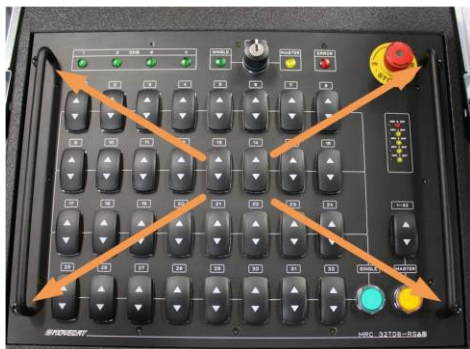
The MPC TD8 generally require no further maintenance.

The housing should be cleaned by wiping it with a damp cloth using commercially available, mild, degreasing cleaning agents. Please do not use substances containing solvents.

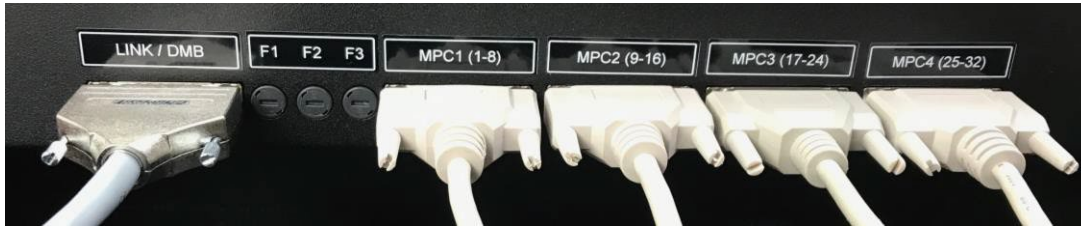
### 6.3 Fuses of the control panel

If necessary, the fuses of the control panel have to be replaced.

To reach those fuses, please untighten the four screws fixing the unit to the rack



On the backside, between the connectors for 'LINK/DMB' and 'MPC1', the three fuses are located.



**Caution: Before replacing fuses the mains needs to be disconnected from the MPC!**

Fuse values of the control panel:

F1: 5A

F2+3: 2A

Attention: There are no replacement fuses stored anywhere in the device!

## 6.4 Fuses of the control modules

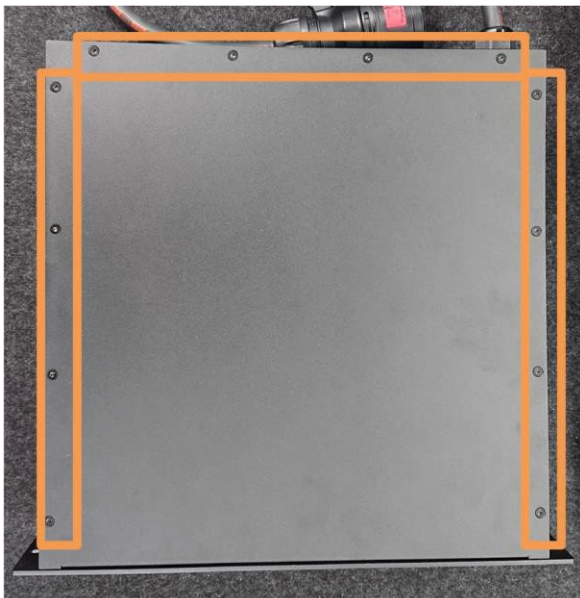
The fuses are located on the main PCB of the control modules.

To reach those, the module has to be opened.

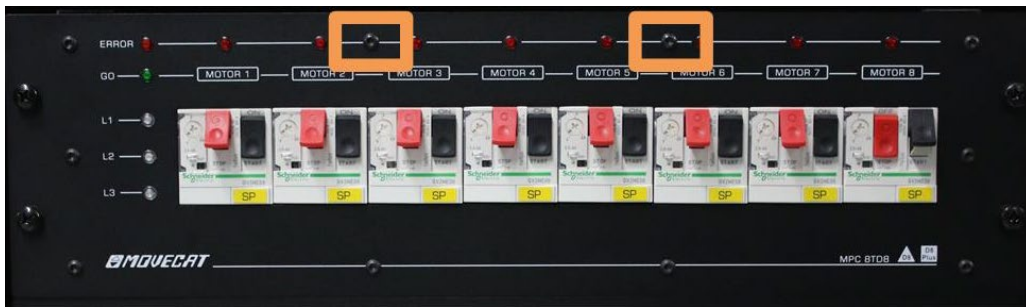
**CAUTION: THE DEVICE USES 400 V AC!**

Please proceed as follows:

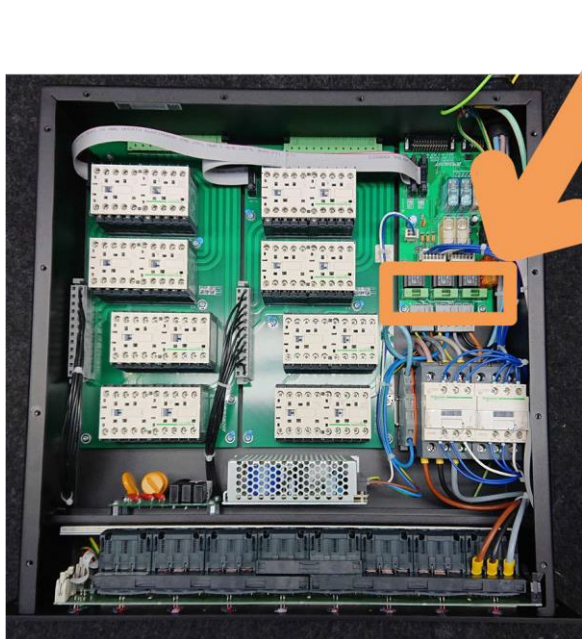
1. Switch the MPC completely off.
2. Disassemble as many outlet modules on the backside of the MPC as needed to reach the affected module.
3. Disconnect the mains connector of the MPC.
4. Release the rack screws of the affected module on the front.
5. Disconnect the green terminal connectors, the Sub-D connectors on the backside and disconnect the CEE16A connector of the module.
6. Extract the module out of the MPC case.
7. Loosen the 12 screws on the top:



- Loosen the 2 screws on the frontside of the module.



- Take off the lid.
- Replace the faulty fuses. They are placed in the orange outlined area of the module:



- Place back the lid.
- Tighten the 12 screws of the lid from top and the 2 screw from the front.
- Place the module back into the MPC case.
- Tighten the module with the rack screws to the MPC case.
- Reconnect the 2 green terminal connectors, the 2 Sub-D connectors and the main connectors of the module.

Fuse values of the control modul:

F1: 400mA

F2: 80mA

F3: 2A

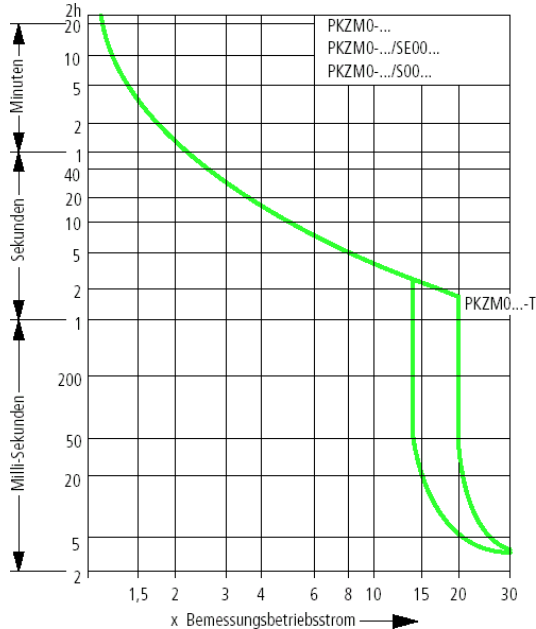
Attention: There are no replacement fuses stored anywhere in the device!

## 7 Technical data

Supply voltage :	400 V
Frequency:	50 Hz
Operation power consumption:	Depending on the motor 0,27 kW to 2,2 kW
Protection class:	IP 21
Connection:	63 A / 3-phase CEE 5p plug (16TD8-SP) 125 A / 3-phase CEE 5p plug (all other versions)
Temperature range operation:	0° to + 40° C
Temperature range transport:	- 20° to + 60° C

## 7.1 Setting the motor protection circuit breakers

The tripping value is set using the yellow setting screw on the motor protection circuit breaker in question. Here attention must be paid to the setting values and maximum power consumption of the drives in use in each case (manufacturer's instructions).



Tripping characteristic of the motor protection circuit breakers

In principle, the setting range of commercially available motor protection circuit breakers is limited. It is essential to assure that the setting range accords with the rated current of the drives.

### NB:

Three-phase drives often exhibit a high starting current that can lead to the power supply pre-fuse tripping; for this reason, it is necessary to pay attention to the fuses used and the characteristic of the power circuit-breakers or safety elements.



## 7.2 Setting of the drives

To discover the rated current that should be set for the drive, consult the specification plate, the test book or the operating instructions.

Ideal protection is assured when the tripping current of the circuit breaker is identical to the rated current; values 25% higher than the rated current afford no reliable protection, whilst values lower than the rated current result in a shortening of the operation/duty cycle.

### NB:

If the rated current of the drive is greater than the setting range of the motor protection circuit breaker, the operating/duty cycle will be reduced and this may also lead to the motor protection circuit breaker tripping immediately. This is not a malfunction!



### 7.3 Pin Assignment of the connectors

#### 7.3.1 DMB

XLR 7-pole	Colour
1	bridge to pin 3
2	blue
3	bridge to pin 1
4	red
5	n.c.
6	white
7	n.c.

#### 7.3.2 Multicore socket

Pin	Motor- assignments
1	1 - L1
2	1 - L2
3	1 - L3
4	2 - L1
5	2 - L2
6	2 - L3
7	n.c.
8	n.c.
9	3 - L1
10	3 - L2
11	3 - L3
12	4 - L1
13	4 - L2
14	4 - L3
15	n.c.
16	n.c.
PE	PE (M 1- 4)

## 8 Accessories

- Remote cable splitter
- Motor load cable splitter
- Load cable extensions of various lengths
- Motor cable extensions of various lengths
- Link cables of various lengths
- DeadManButton

## 9 Support, Hotline and Service

Your responsible MOVEKET service support centre, dealer or distributor as well as the manufacturer:

MOVEKET GmbH

Rudolf-Diesel-Straße 21

D-71154 Nufringen

[www.moveket.de](http://www.moveket.de)

You can reach the technical support in our working hours:

Support: +49 7032-37117-70

E-Mail: [support@moveket.de](mailto:support@moveket.de)

Outside our working hours you can reach in emergency situations the technical support via:

(Attention: The hotline is not free of charge!)

Hotline: +49 7032 37117-77

E-Mail: [hotline@moveket.de](mailto:hotline@moveket.de)

Working hours:

Monday – Thursday: 09:00 am - 17:00 pm

Friday: 09:00 am - 14:00 pm