

MEGAMAT 12 (MNZ)

Installation Instructions

(Translation of the original installation instructions)

Foreword

Document revision history

Version	Date	Modification, change
1.0	05/2018	First release
1.1	12/2019	Function and installing the Bowden cable

Disclaimer and exclusion of liability

DewertOkin is not responsible for damage resulting from:

- failure to observe these instructions,
- changes made to this product which have not been approved by DewertOkin, or
- the use of replacement parts which have not been approved or manufactured by DewertOkin.

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Creation of a complete operating instruction manual for the entire end product

These instructions are only intended to be used by the end-product manufacturer. They should not be given to the operator of the end product. The factual information contained within may be used as a basis when creating the end-product manual.

The warning and danger notices are best suited for use in the end product's manual. However it is not sufficient to simply follow these notices. You should also carry out an internal risk assessment for your end product. This can then be used as the basis for the safety notices in your manual.

These installation instructions do not contain all information required to safely operate the end product. They only describe the installation and operation of the drive as partially completed machinery.

The instructions are intended for the technicians responsible for manufacturing an end product and not for the operators of the end product.

Notice for customers in EU nations**German Inspection Authority (TÜV SÜD Product Service) testing label**

The construction of the MEGAMAT 12 (MNZ) drive has been inspected by the German TÜV SÜD Product Service Inspection Authority. TÜV SÜD Product Service also monitors the production of the MEGAMAT 12 (MNZ). The official German TÜV SÜD Product Service certifies this construction inspection and production monitoring.



Figure 1 TÜV SÜD Product Service Safety Mark

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1. General Information

The MEGAMAT 12 (MNZ) drive is referred to here as the MEGAMAT MNZ.

1.1 Configurations

The MEGAMAT MNZ drive can be used in several different configurations. The term MEGAMAT MNZ also refers to the following facility versions:

- MEGAMAT MNZ
- MEGAMAT MN1
- MEGAMAT MN2

1.2 About these installation instructions

These installation instructions must be followed closely in order to install this drive successfully and safely in the end product. These instructions are not an operating manual for the end product.

These instructions will help you to minimize danger, repair costs and down times. They will also help you to maximize the reliability and lifespan of the end product.

 CAUTION	
	<p>The notices in these instructions must be followed! Following the guidelines during installation and connection procedures will help to minimize</p> <ul style="list-style-type: none">• the risk of accident and injury, and• damage to the drive system or the end product.

These installation instructions have been written with due care and attention. However, we cannot guarantee that the data, images and drawings are complete and correct nor do we accept any liability for the information contained therein, unless required by law.

- ▶ We reserve the right to make unannounced technical changes in the course of our continual product improvement process!

1.3 Availability of this document

As manufacturer of the end product, you are obligated to comply with Machinery Directive 2006/42/EC. This directive stipulates that the installation instructions must be kept on file for governmental inspection purposes.

1.4 Conventions used

Notices which do not relate to safety are indicated in these instructions with a triangle:

- ▶ Triangular notice symbol

Safety notice explanations

	<p> WARNING</p> <p>WARNING indicates a hazardous situation which, if not avoided, <i>could</i> result in death or serious injury.</p>
	<p> CAUTION</p> <p>CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.</p>
	<p>NOTICE</p> <p>NOTICE is used to address practices which are not related to personal injury but may result in damage to the product or surroundings.</p>

2. Safety notices

2.1 Proper and intended usage

The MEGAMAT MNZ drive is meant to be installed in an end product.

- it provides motor adjustment capabilities for movable furniture. It should be used in conjunction with suitable fittings and mechanics
- it can be used for care purposes (CARE)
- it can be used in a hospital (HOSP)
- it can be used for furniture applications (in beds, reclining chairs, etc.)

	 CAUTION
	This drive should only be used for the applications described above. Any other use is forbidden. Improper usage can lead to accidents or destruction of the unit. Such non-approved applications will lead immediately to the expiration of all guarantee and warranty claims on the part of the end-product manufacturer against the manufacturer.

Improper usage

Be sure to follow the notices below concerning improper usage. You should include them in your product manual in order to inform the users of your end product.

	 WARNING
	The MEGAMAT MNZ drive should not be used: <ul style="list-style-type: none"> • in any environment where combustible or explosive gases or vapours (e.g., anaesthesiology) may be present, • in a moist environment, • outdoors, • in applications that are cleaned in wash tunnels (exception is the IPX6W version), • for raising and lowering loads in industrial or technical applications.

	 CAUTION
	The MEGAMAT MNZ drive may not be operated: <ul style="list-style-type: none"> • by small children, • by frail or infirm persons without supervision, or • in the proximity of small children.

The MEGAMAT MNZ drive can be used by children of 8 years and older, persons with reduced physical, sensory or mental capabilities, or persons with lack of experience or knowledge when they are supervised or instructed concerning the safe use of the device and when they understand the resulting risks. Do not allow children to play with this device. The cleaning and user maintenance must not be carried out by children without supervision.

	 CAUTION
	<p>You should only use spare parts which have been manufactured or approved by DewertOkin. Only these parts will guarantee a sufficient level of safety.</p>

Optional: ER mechanical reset option

	 CAUTION
	<p>The mechanical reset function is not a safety system and does not avert danger.</p>

DewertOkin does not guarantee that the drive will function in the event of a power outage. Lowering is always possible, however, when the mechanical reset function (ER) is used.

If the end-product manufacturer chooses to guarantee the functionality of the end product during a power outage, then the end-product manufacturer is responsible for arranging a mechanism to ensure this functionality.

2.2 Safety notices within the installation instruction and the operating instructions for the entire machine

The manufacturer of the end product is only permitted to operate the MEGAMAT MNZ drive (by itself an incomplete machine)

- when the end product (for which the MEGAMAT MNZ drive is intended) is in compliance with all protective measures specified in the Machinery Directive 2006/42/EC, and
- when the manufacturer expressly declares the compliance of the end product.

The manufacturer of the end product must create a manual for the users of that product. The safety notices in the end-product manual must be written based on the end product's risk assessment.

2.3 Selection and qualification of personnel

This drive should only be installed into the end product by someone who has completed training in electronic motor assembly or has equivalent qualifications.

You should only install this drive when you are qualified to do so. Otherwise, a properly qualified person should be found for this task.

2.4 Notice on safety during operations

Basic safety rules must be followed in order to ensure that the end product can be continually operated in a safe manner. These rules must be observed while using the end product and while installing the drive.

These rules and safety measures can be categorized as follows:

- Construction measures before the installation (refer to the "Ensuring operational reliability during installation" section in Chapter "Installation").
- Safety fundamentals during the drive installation and during cable and wire routing (refer to the "Safety notices to observe during installation" section in the "Installation" Chapter).
- Using the drive in intermittent duty (refer to the "General information" section in the "Operating notes" chapter).
- Basic safety rules during operation (refer to the "Operating notes" Chapter).
- The creation of a manual for the end product which contains these and other safety rules.

Creating a user's manual

The manufacturer of the end product must create a manual for the users of that product. The safety notices in the end-product manual must be written based on the end product's risk assessment.

2.5 Product identification

2.5.1 Ratings plate

A ratings plate on each drive specifies the exact name and serial number of the drive. It also states the technical specifications valid for that particular drive. The following illustration shows where the specifications are located on the drive's ratings plate.

- ▶ The ratings plate shown is an example; the specifications for your drive may differ from this illustration.

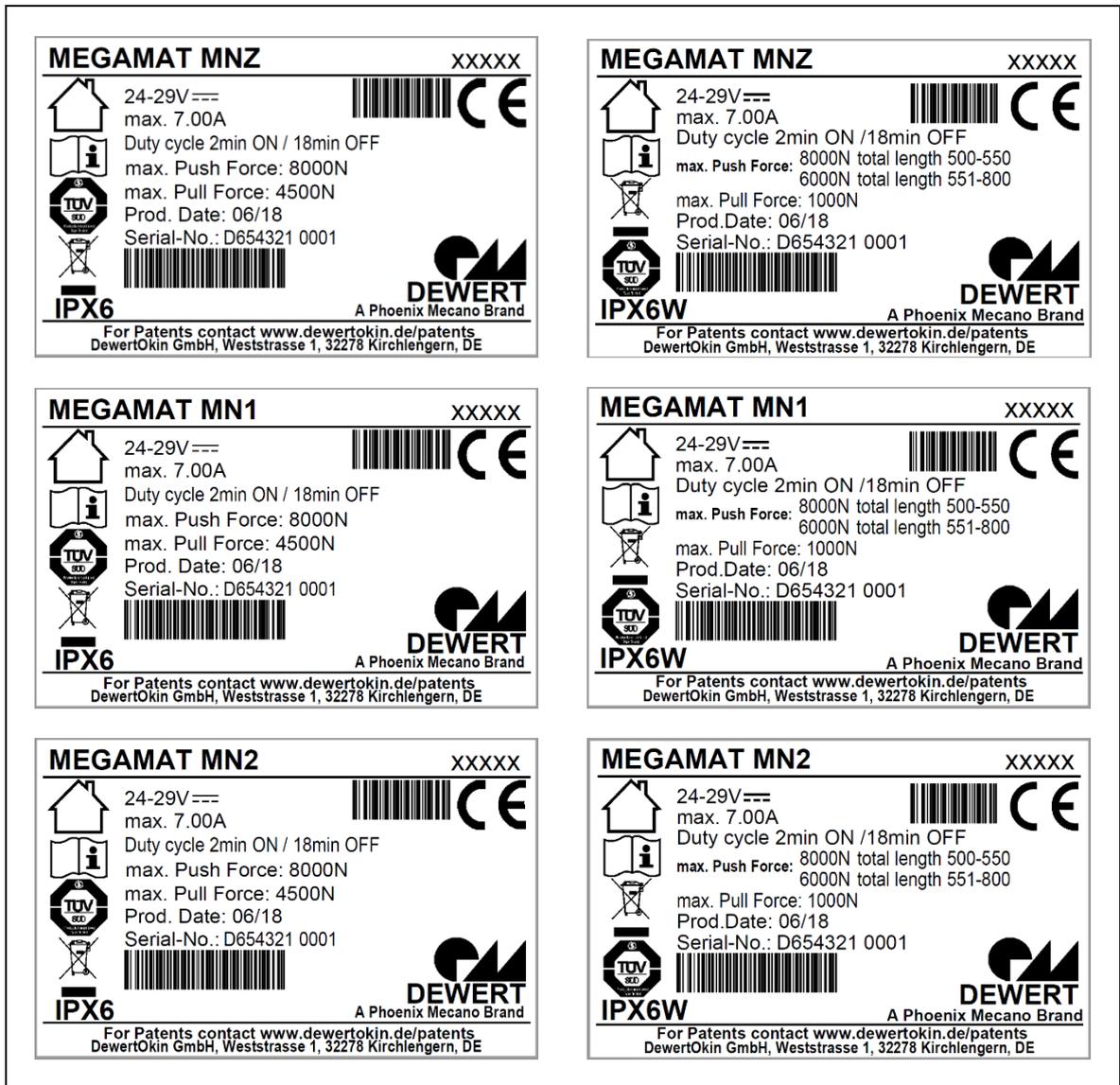


Figure 2 Rating plates (examples)

MEGAMAT MNZ	Model name
xxxxx	Article number
24 – 29V 	Input voltage
Max. 7.00A	Current consumption
Duty cycle: 2 min ON / 18 min OFF	Intermittent operations: 2 minutes / 18 minutes
max. Push Force	Push force
total length xxx-xxx	Max. pushing force for a stroke of ... to ... millimetres
max. Pull Force	Pull force
Prod. Date	Calendar week / year
Serial No.	Serial number for your drive
IPX6	Protection degree
	Use in dry rooms only!
	Follow all special disposal instructions!
	Mark of CE conformity

3. Possible combinations

The MEGAMAT MNZ single drive can be combined for use with other single drives, double drives or control units. The following basic combinations are possible:

- a MEGAMAT MNZ with handset and control unit
- a MEGAMAT MNZ in combination with other drives with an additional control unit or double drive

Systems can be customized by combining drives with the handset and control units as needed. Make sure that you switch off the electricity before connecting any components (connect while in a voltage-free state).

DewertOkin has separate system instruction manuals containing all information and instructions needed for these systems.

- ▶ Only a DewertOkin device should be used to control the drive since they have already been verified to work together.
- ▶ A control unit or a double drive is needed to operate the MEGAMAT MNZ single drive. A handset is also required.

**NOTICE**

Check with DewertOkin for approval concerning any special device configurations that are customized for your requirements.

4. Description

The MEGAMAT MNZ drive is an electrically driven motor that is responsible for moving the end product in a linear direction. This adjustment is created by the in and out movement of a stroke pipe. The movements of the MEGAMAT MNZ drive are controlled using a control unit or a double drive which is connected to a DewertOkin handset.

The different drive models vary according to their:

- the clevis
- power of the drive
- mounting of the stroke pipe
- electrical connection
- pushing and pulling forces
- dimensions and stroke
- mechanical reset option

► We reserve the right to make unannounced technical changes in the course of our continual product improvement process!

4.1 Components

The main components of the MEGAMAT MNZ drive are the motor and the stroke pipe. The stroke pipe is protected by the drive housing when it is retracted. Mounting fixtures are located at the outer end of the stroke pipe and at the opposite end of the drive. They are used to mount the drive in the end product.

4.1.1 Version: Standard

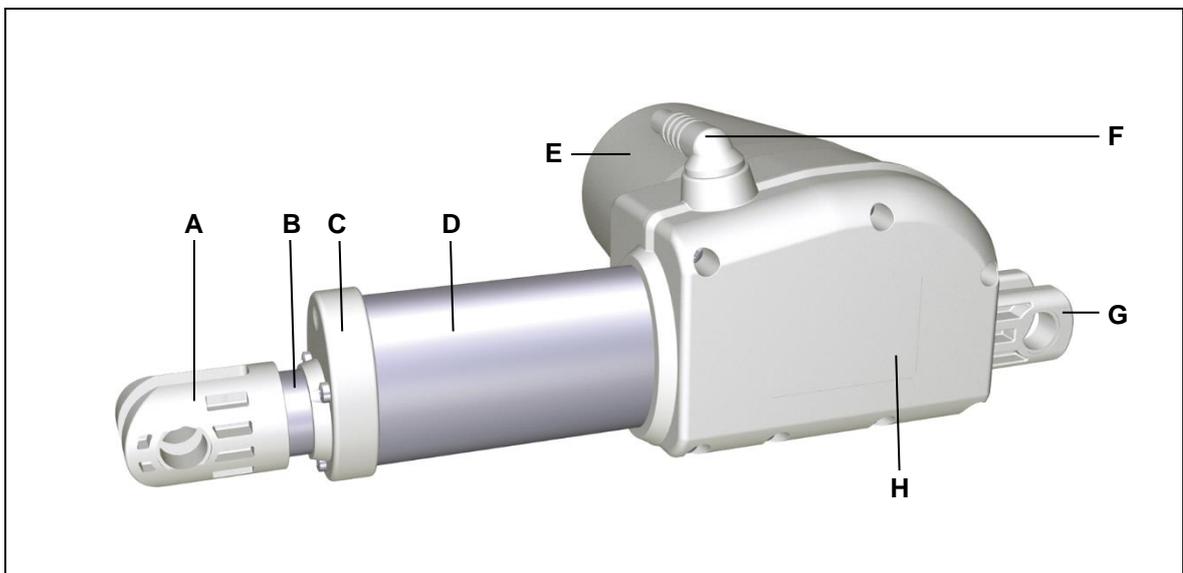


Figure 3 Main components of the MEGAMAT MNZ drive (standard version)

- | | |
|---|--------------------------------|
| A Clevis (example: stroke pipe clevis) | B Stroke pipe |
| C Guiding cap | D Guidance profile |
| E Motor casing cover | F Electrical connection |
| G Gear clevis | H Gear housing |

4.1.2 Version: Mechanical reset option (ER)

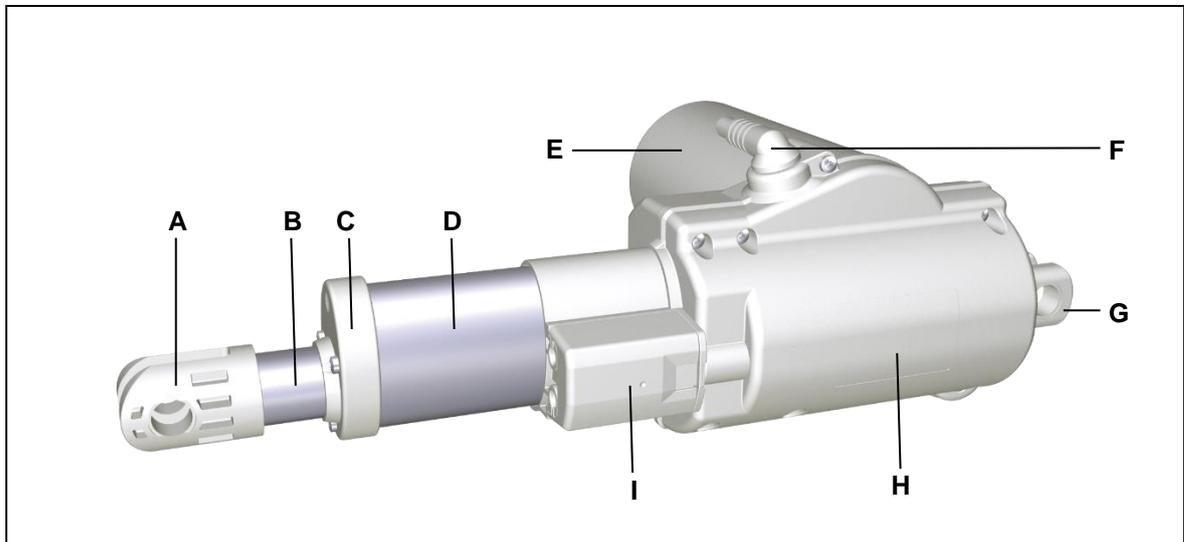


Figure 4 Main components of the MEGAMAT MNZ drive featuring the reset function (ER)

- | | |
|--|--------------------------------|
| A Clevis (example: stroke pipe clevis) | B Stroke pipe |
| C Guiding cap | D Guidance profile |
| E Motor casing cover | F Electrical connection |
| G Gear clevis | H Gear housing (ER) |
| I Bowden cable retainer for reset function (ER) | |

4.1.3 Stroke pipe options

There are two types of stroke pipes available for different types of applications. The stroke pipe can be screwed onto the spindle screw or it can be mounted unattached. The drive only exerts pushing force when the stroke pipe is mounted loosely (unattached). The motions of the drives for these two versions are shown in the following illustrations.

 CAUTION	
	<p>If the stroke pipe is unattached, then the end product must be designed to prevent the stroke pipe from coming out during operations. This can be accomplished by implementing a fixed end-stop mechanism (refer to the "Safety notices to observe during installation" in the "Installation" chapter).</p>

► The following illustrations show the standard version.

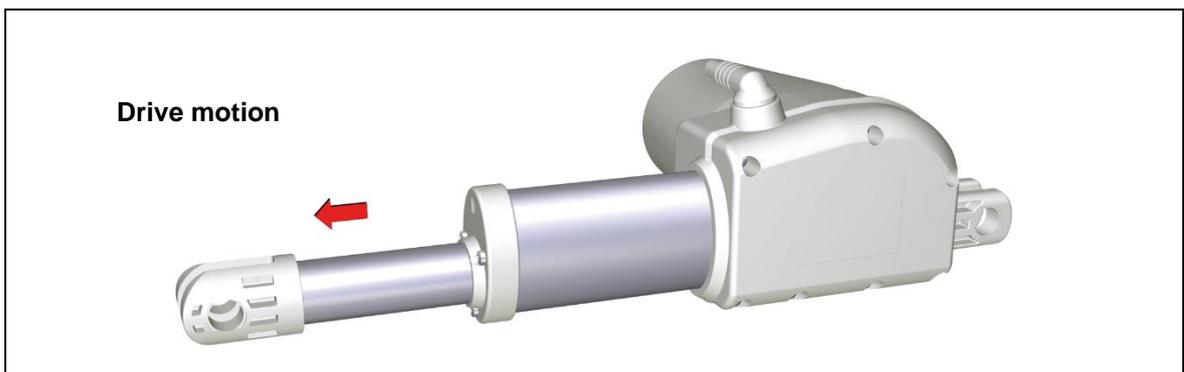


Figure 5 Loose fastening nut (stroke pipe not secured): only pushing forces

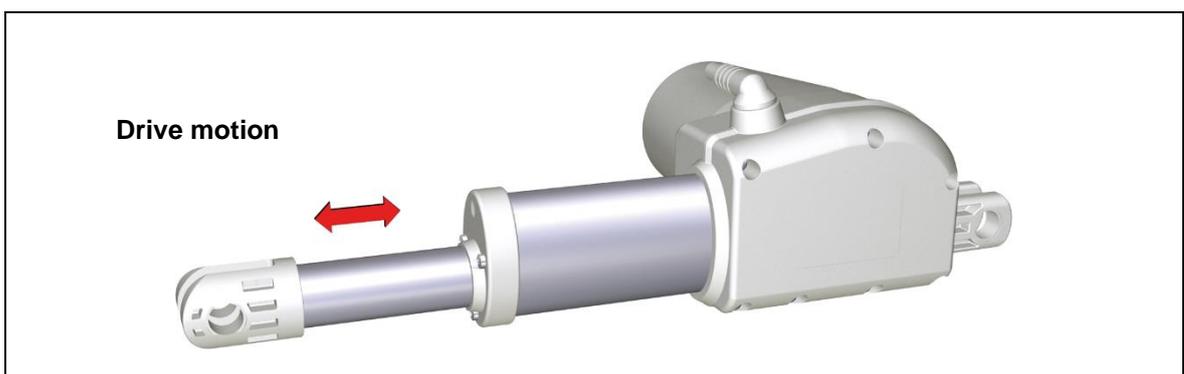


Figure 6 Stroke pipe screwed onto the spindle screw (attached): both pushing and pulling forces

4.1.4 Clevis variants

Stroke pipe clevis

There are various stroke pipe clevis variants available for the MEGAMAT MNZ drive:

- Stroke pipe clevis (plastic version)
- Stroke pipe clevis (zinc die-cast version)

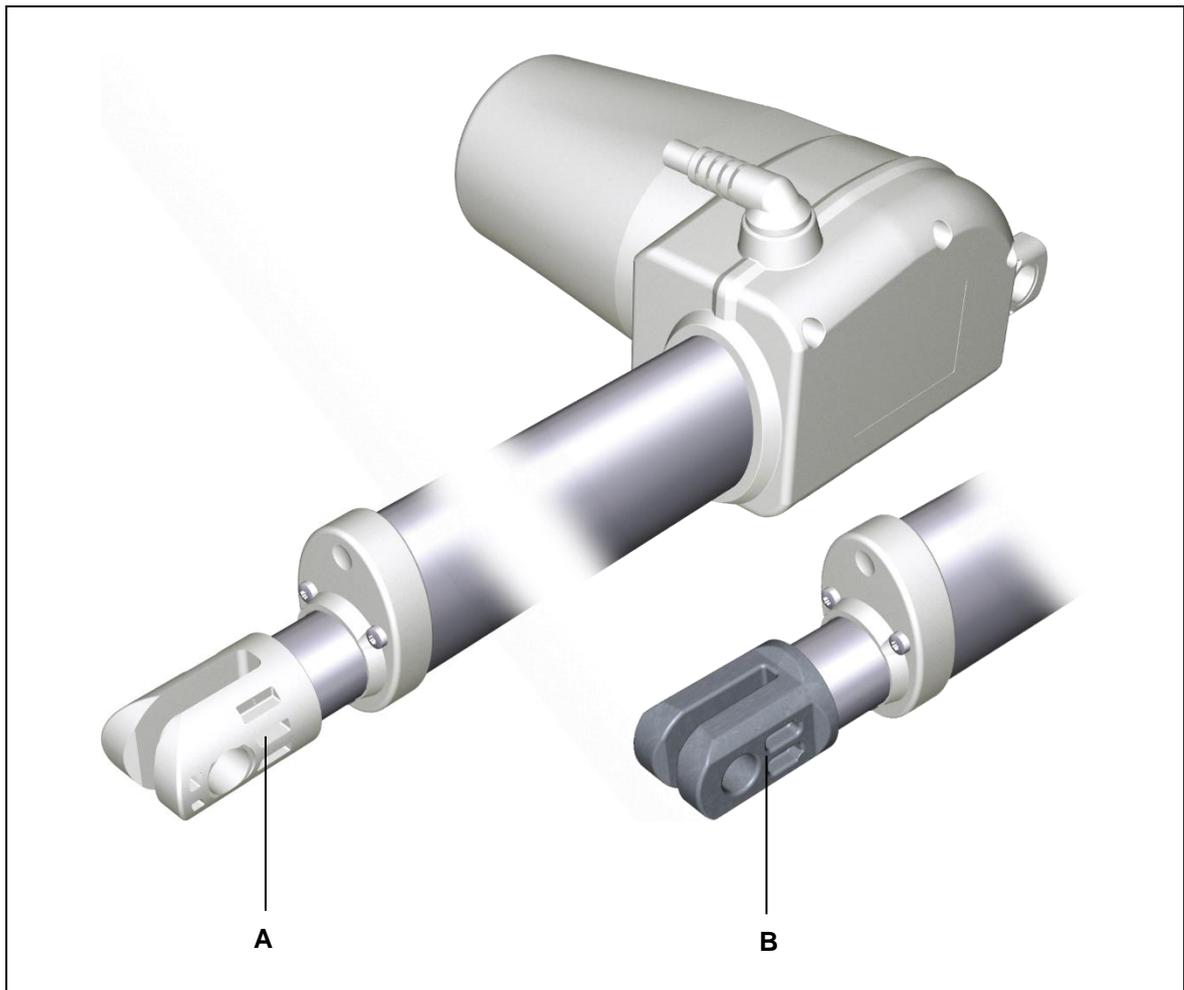


Figure 7 Clevis variants

A Stroke pipe clevis: Plastic version

B Stroke pipe clevis: Zinc die-cast version

Gear clevis variants

There are various gear clevis variants available for the MEGAMAT MNZ drive:

- Plastic version of the gear clevis
- Zinc die-cast version of the gear clevis

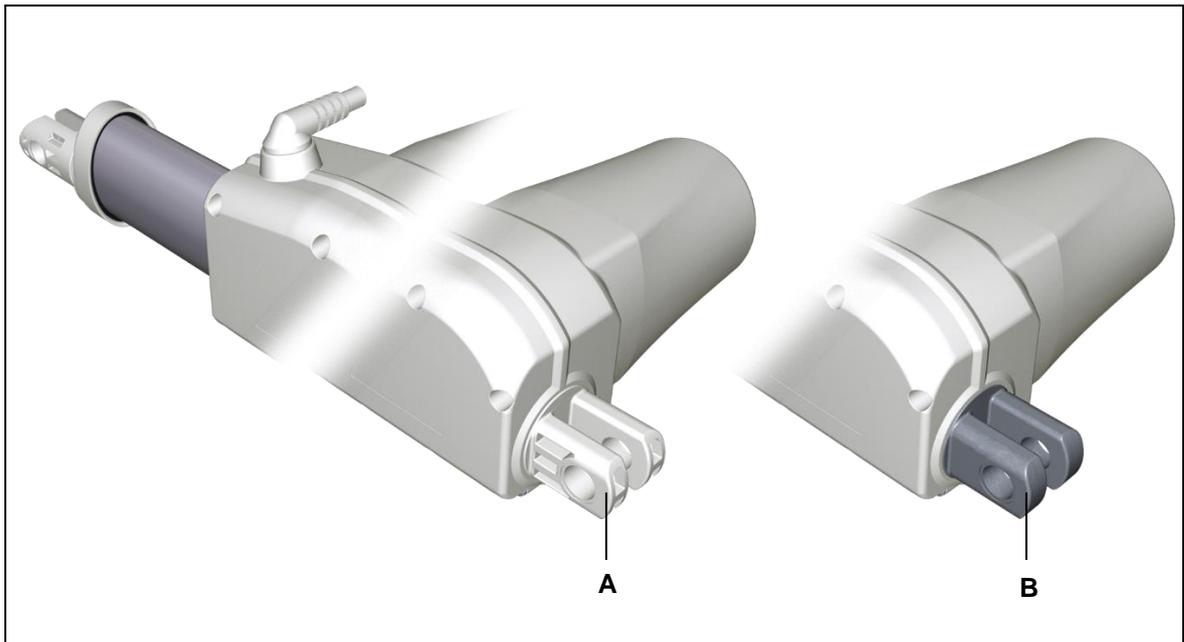


Figure 8 Gear clevis variants

A Plastic version of the gear clevis

B Zinc die-cast version of the gear clevis

4.1.5 Guidance profile cap variants

There are various guidance profile cap variants available for the MEGAMAT MNZ drive:

- Guidance profile cap, standard version
- Guidance profile cap (drives > 6000 N)
- Guidance profile cap (drives that can be put through wash tunnels) IPX6W)

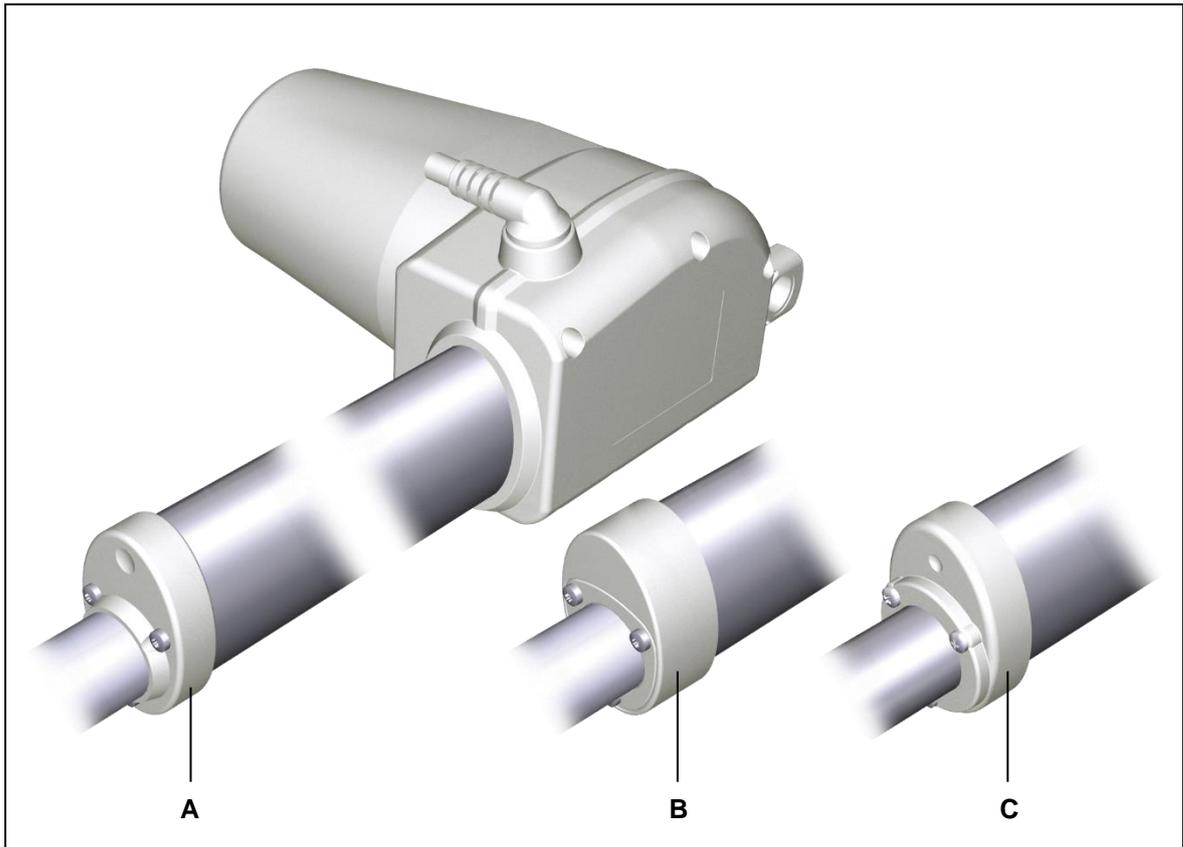


Figure 9 Guidance profile cap variants

A Guidance profile cap, standard version

B Guidance profile cap (drives > 6000 N)

C Guidance profile cap (drives that can be put through wash tunnels) IPX6W)

4.1.6 Option: MEGAMAT MNZ with reset function (ER)

	 CAUTION
	The mechanical reset function is not a safety system and does not avert danger. This ER reset function is not designed for continuous use.

The mechanical reset function is used for lowering the unit manually (e.g. during a power outage).

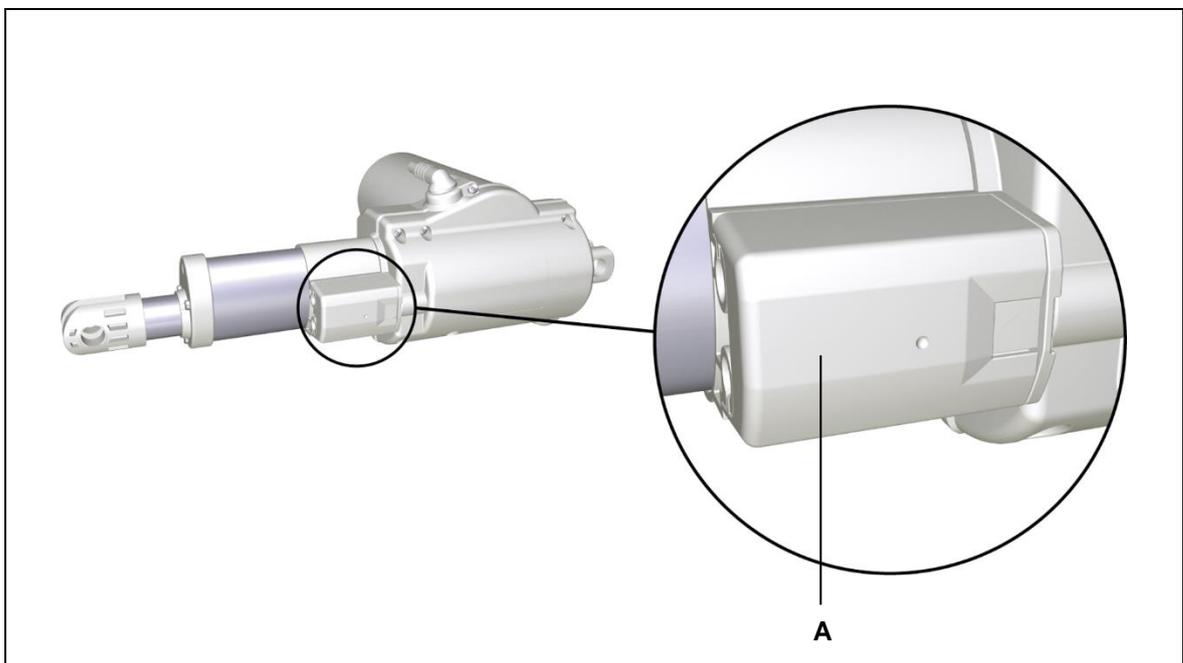


Figure 10 MEGAMAT MNZ drive with reset function (ER)

A Release unit with Bowden cable retainer

4.1.7 Electrical connection options

There are two different electrical connection options available: Connections with a permanently attached (spiralised or smooth) motor cable or a shorter permanently attached motor cable. For the motor cable, the electrical connection is permanently attached at the factory and cannot be opened. For the short cable, there is a connection with a releasable snap-on cap which can be opened by an electrician. In this case, the snap-on cap has openings on the side, through which a screwdriver can be inserted to release the snap connection.

NOTICE	
	<p>In the event of servicing when changing the motor connection cable to the short cable:</p> <ul style="list-style-type: none">• Carefully loosen the snap-on cap using a suitable tool.• Replace the snap-on cap if it is damaged.• Check that there is a secure connection between the snap-on cap and the short motor cable.

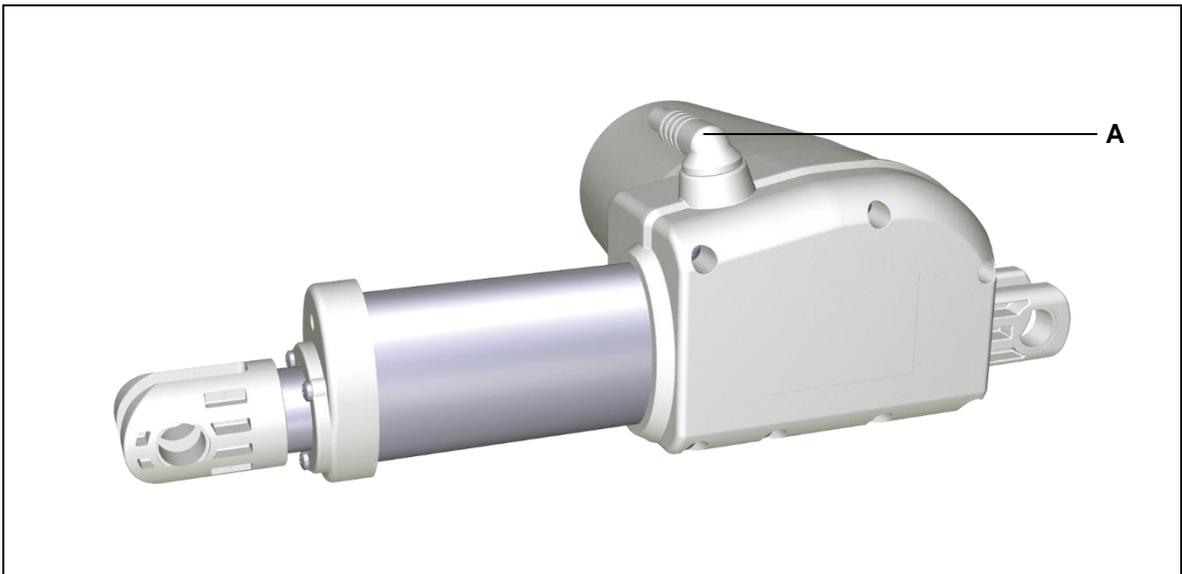


Figure 11 Permanently attached motor cable

A Attached electrical connection

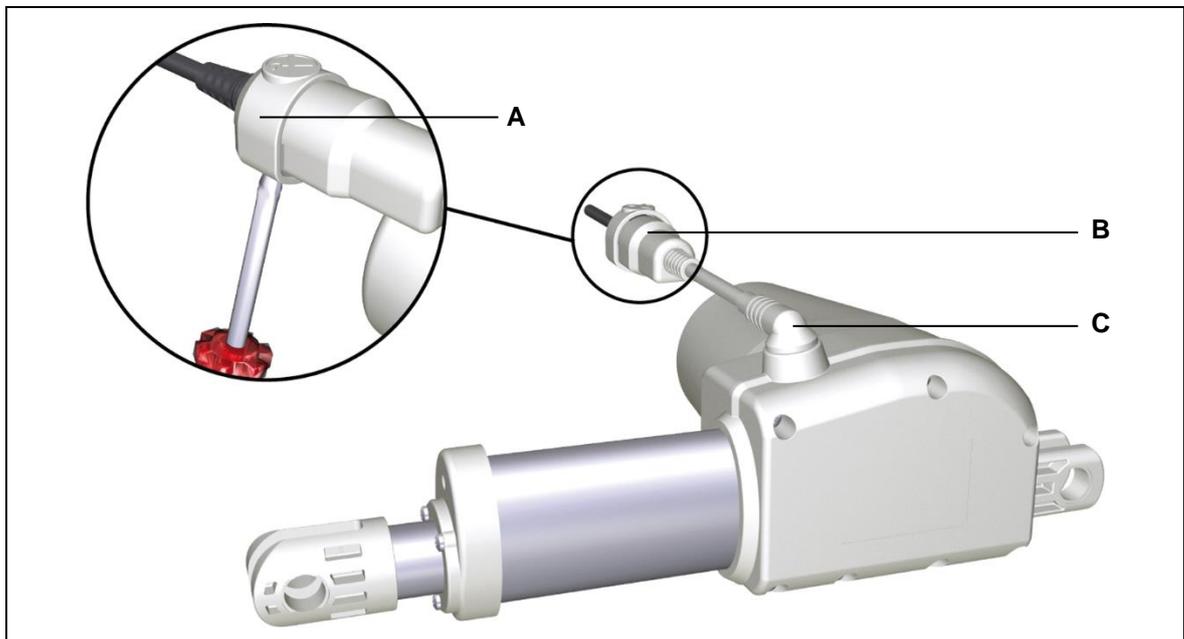


Figure 12 Connection for short motor cable

- A** Snap-on cap
- B** Plug with snap-on cap
- C** Permanently attached electrical connection (short motor cable)

	<p>CAUTION</p>
	<p>You must stop using the drive if the snap-on cap or the connection between the snap-on cap and the short motor cable is damaged.</p>

The following symbol can be found on the MEGAMAT MNZ drive's snap-on cap:



This symbol indicates that the unit should only be opened by qualified specialists!

4.1.8 Connection options

There are different power supply options for the MEGAMAT MNZ drive:

- LS plug (angled plug, single O-ring)
- LS plug (angled plug, double O-ring, suitable for washing tunnels)
- 8-pin plug (angled connector, single O-ring)
- 8-pin plug (angled plug, double O-ring, suitable for washing tunnels)
- LS plug (straight plug with snap-on cap, double O-ring, suitable for washing tunnels)
- 8-pin plug (straight plug with snap-on cap, double O-ring, suitable for washing tunnels)

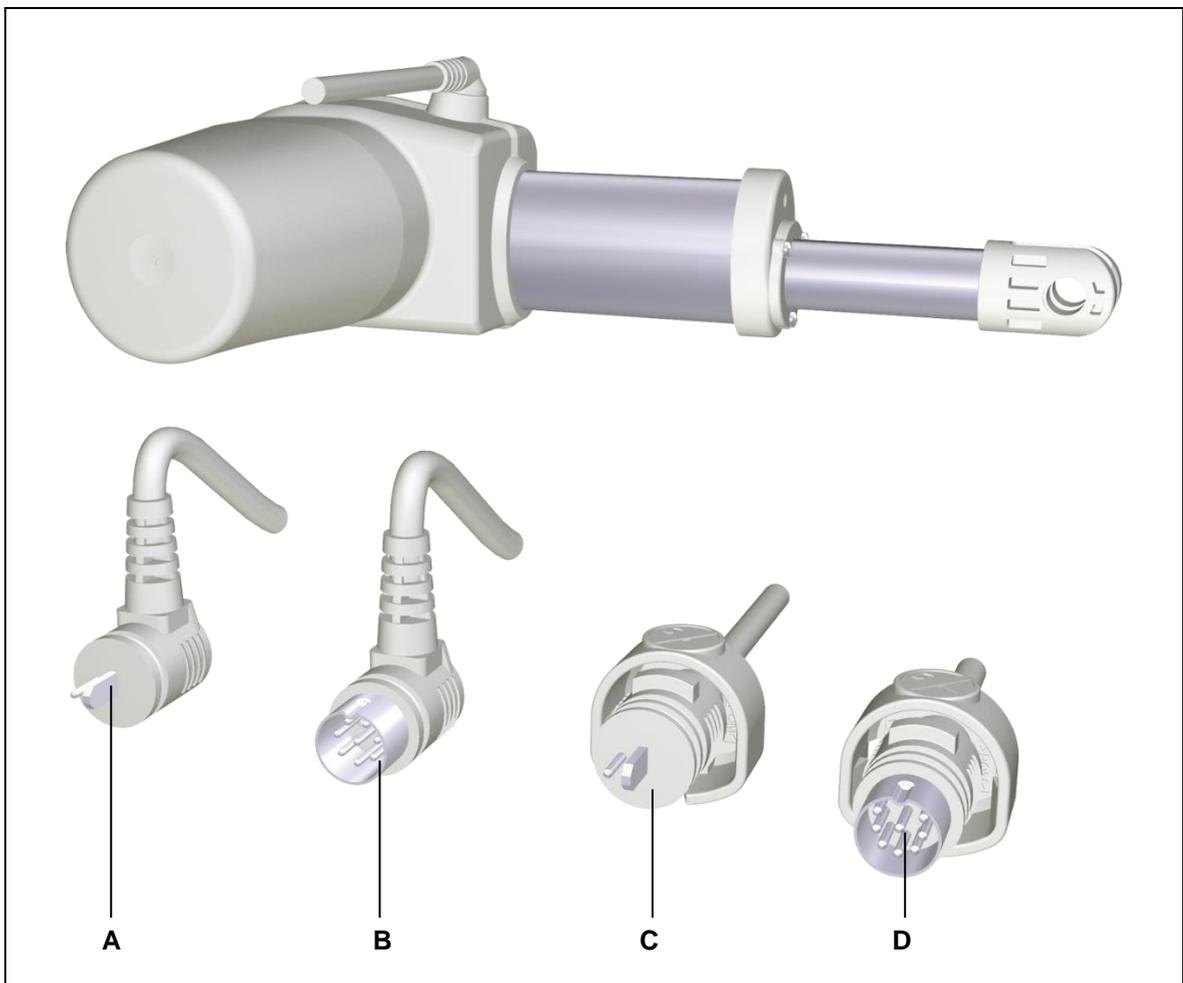


Figure 13 Motor cable plug variants (examples)

A LS plug (angled plug)

B 8-pin plug (angled plug)

C Short motor cable with LS plug (straight plug with snap-on cap)

D Short motor cable with 8-pin plug (straight plug with snap-on cap)

5. Technical specifications

	MEGAMAT MNZ (standard version)	MEGAMAT MNZ (ER version)
Rated voltage	24 V DC – 29 V DC	
Current consumption at rated load	max. 7.00 A	max. 3.50 A
Permitted push force	max. 8000 N depending on version (refer to the ratings plate) *Depends on stroke	max. 4500 N depending on version (refer to the ratings plate)
Permitted pull force	max. 4500 N depending on version (refer to the ratings plate)	max. 4500 N depending on version (refer to the ratings plate)
Mode of operation ¹⁾ under max. rated load.	Intermittent duty: 2 min/18 min (max 5 switching cycles per minute)	
Protection class	III	
Noise level	≤ 50 dB(A)	
Drive type	Single drive	
Load type	Push / pull	
Stroke	max. 500 mm	
Adjustment speed ²⁾	51 mm/s	15 mm/s
Protection degree	IP20, IPX4, IPX6, IPX6W ³⁾	
Dimensions and weight		
Length x width x height (in mm)	min. 191 x 151 (169) x 96	min. 231 x 179 x 103
Weight	approx. 2.0 kg	approx. 2.3 kg
Ambient conditions for operation, storage and transport		
Transport / storage temperature	from -20 °C to +50 °C from -4 °F to +122 °F	
Operating temperature	from +10 °C to +40 °C from +50 °F to +104 °F	
Relative humidity	from 30% to 75%	
Air pressure	from 800 hPa to 1060 hPa	
Height	< 2000 m	

¹⁾ Mode of operation: intermittent duty = 2 min./18 min. This means that after the unit is operated with its rated load for up to two minutes it must then be paused for 18 minutes. The system can malfunction if this pause is not observed!

²⁾ Adjustment speed: the speed at which the clevis can move under no load (the speed varies depending on the load).

³⁾ For the specification of protection degree IPX6W, W indicates wash-tunnel proof (refer to the following chapter 5.1, "Information on suitability for use in wash tunnels".)

5.1 Information on suitability for use in wash tunnels (version IPX6W)

Suitability for wash tunnels is based on compliance with the standard EN 60601-2-52 ("Medical electrical equipment - Parts 2-52: Special health and safety requirements including essential medical beds"), which includes the specific elementary safety factors and relevant functional requirements for hospital beds. The requirements for suitability in wash tunnels are among the special requirements.

In the German-speaking countries, these requirements for the washing process were summarized in the "Machine Decontamination" recommendations of the AK-BWA. In particular, the cleaning and disinfecting agents used must not contain substances which change the surface structure or the adhesion properties of the plastic materials.

Recommended cleaning agents

- Secumatic FDR from ECOLAB
- Neodisher Dekonta AF from DR. WEIGERT
- Thermosept NDR from SCHÜLKE
- similar products with a pH of 5 – 8, in a concentration of 0.5%

Recommended washing liquid

- Secumatic FKN from ECOLAB
- Neodisher Mediklar from DR. WEIGERT
- Thermosept BSK from SCHÜLKE
- similar products with a pH of 5 – 8, in a concentration of 0.2%

Product requirements

- the product must not contain any solvents
- the surface structure or adhesive property of the plastic must not change
- the product must not be able to break down lipids

Washing of cables

Before washing, the following should be noted:

- in order to maintain the integrity of the cable, the cable must be positioned so that it is not strained during the washing process. Damage to the cable can be prevented by placing the cable on the bed, a flat surface or a cable receptacle

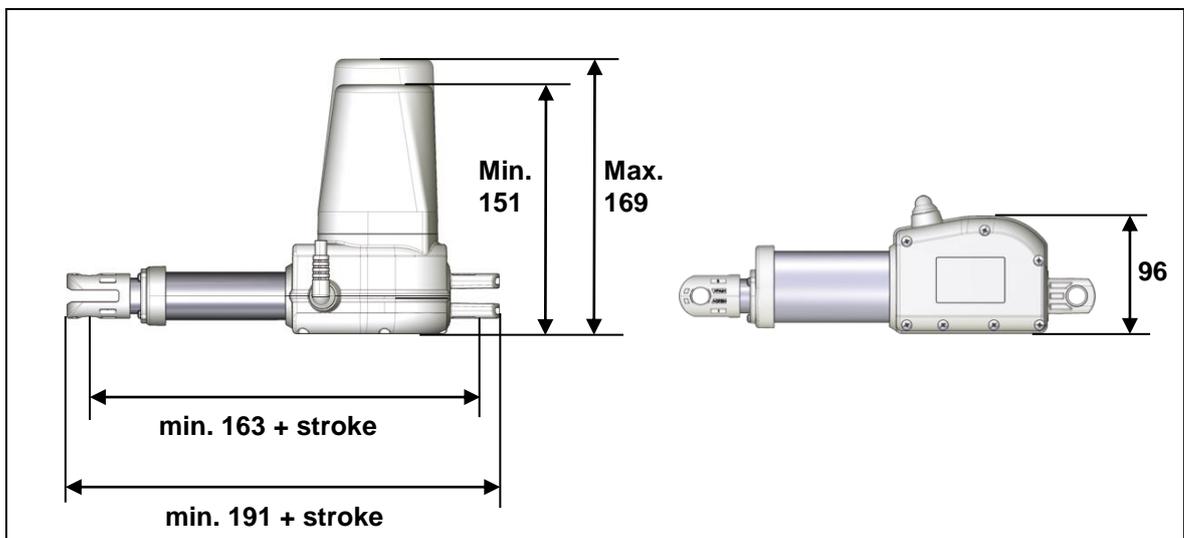


Figure 14 Dimensions of MEGAMAT MNZ drive (in mm), minimum installation dimensions: 163 mm

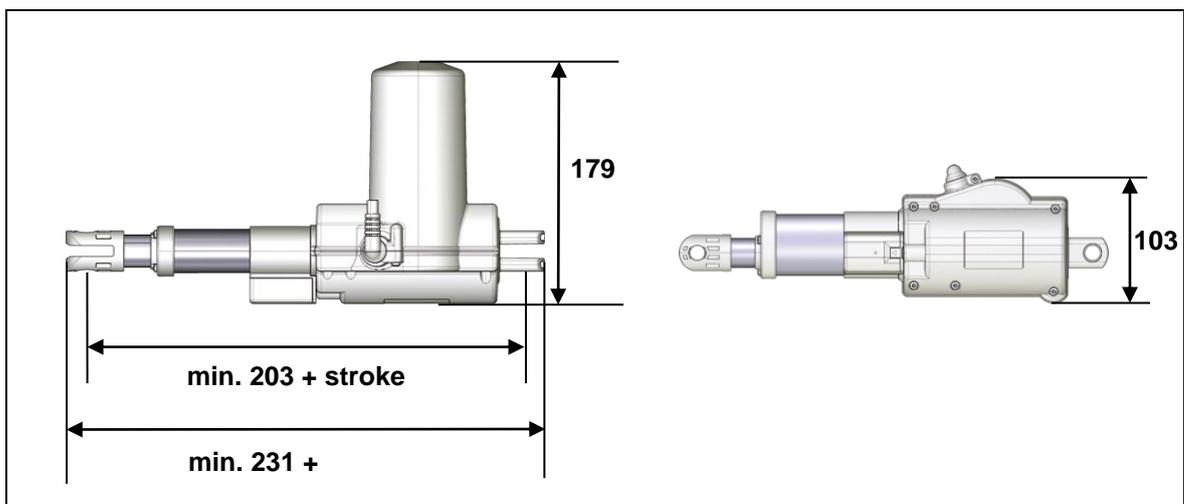


Figure 15 Dimensions of MEGAMAT MNZ drive with reset function (ER) (in mm), minimum installation dimensions: 203 mm

6. Installation

6.1 Safety notices to observe during installation

Basic safety rules must be followed in order to ensure that the end product can be continually operated in a safe manner. These rules must be observed while using the end product and while installing the drive.

6.1.1 Ensuring operational reliability during installation

The safety and reliability of the end product containing the DewertOkin drive can be ensured by using the proper construction methods described below.

Avoiding fatigue fractures

 CAUTION
<div style="display: flex; align-items: center;">  <div> <p>Drives that are incorrectly installed can undergo fatigue fractures which then create a risk of injury.</p> <ul style="list-style-type: none"> • Install the drive in the end product so that it is properly aligned. This will help prevent shear stress. • Do not position the drive at a slanted angle when installing it in the end product. A slanted angle between the intended direction of movement of the end product and the drive's direction will create shear stress and could lead to a fatigue fracture. • Be sure to install the drive so that it can always move freely in all operative states. • You should never screw the stroke pipe into the drive (versions with fixed nuts). </div> </div>

Avoiding a pinching hazard

 CAUTION
<div style="display: flex; align-items: center;">  <div> <p>A stroke pipe is used to provide the drive motion. When designing your product, you should take this into account with passive safety mechanisms and with the appropriate safety notices in your operating instructions:</p> <ul style="list-style-type: none"> • Installation methods for ensuring passive safety: Install the MEGAMAT MNZ drive so that none of the positions where shear and pinch hazards exist are accessible externally. </div> </div>

When preparing safety notices for the operator, Make sure that your operating instructions inform the user of these safety points.

Avoiding an over-extension of the stroke pipe (when mounted unattached)

 CAUTION

There must be a fixed mechanical end stop built into the end product for MEGAMAT MNZ drive models where the stroke pipe is not attached to the spindle screw. If no fixed mechanical end stop exists, the stroke pipe can over-extend. This can cause malfunctions, personal injury, and damage to the drive system.

Avoiding an overrun of the stop point with the end product

Your end product should contain mechanical end stops. These will limit the drive movement and significantly increase operational safety. DewertOkin recommends that you build such mechanical end stops into your end product.

If, for technical or cost reasons, you choose not to use end stops, then we strongly recommend the use of an additional safety limit switch whenever the DewertOkin drive is being used for at-risk functions. A safety limit switch will protect the drive from a critical failure and overrun in the event that the top end switch malfunctions.

- ▶ The safety end switch shuts the drive down as soon as the normal end switch is passed over. The safety end switch is integrated directly into the drive and does not require any additional installation. The drive may take up an extra 23 mm when installed with the safety limit switch.

 NOTICE

When installing the reset function (ER), you must use mechanical end stops (both for the upper limit and for the lower limit) in your end product in order to prevent mechanical damage to the drive system.

- ▶ The mechanical end stops or stroke limiters in the end product must be adjusted to fit the retracted and extended dimensions of the drive. Make sure that the drive does not reach the mechanical end stop position before it has been fully extended.

6.2 Installation procedure

6.2.1 An example installation

Before installing the drive, make sure that you are observing all of the safety notices found in the "Safety notices to observe during installation" section.

	CAUTION
The plug for the connecting cable should be unplugged during the installation.	

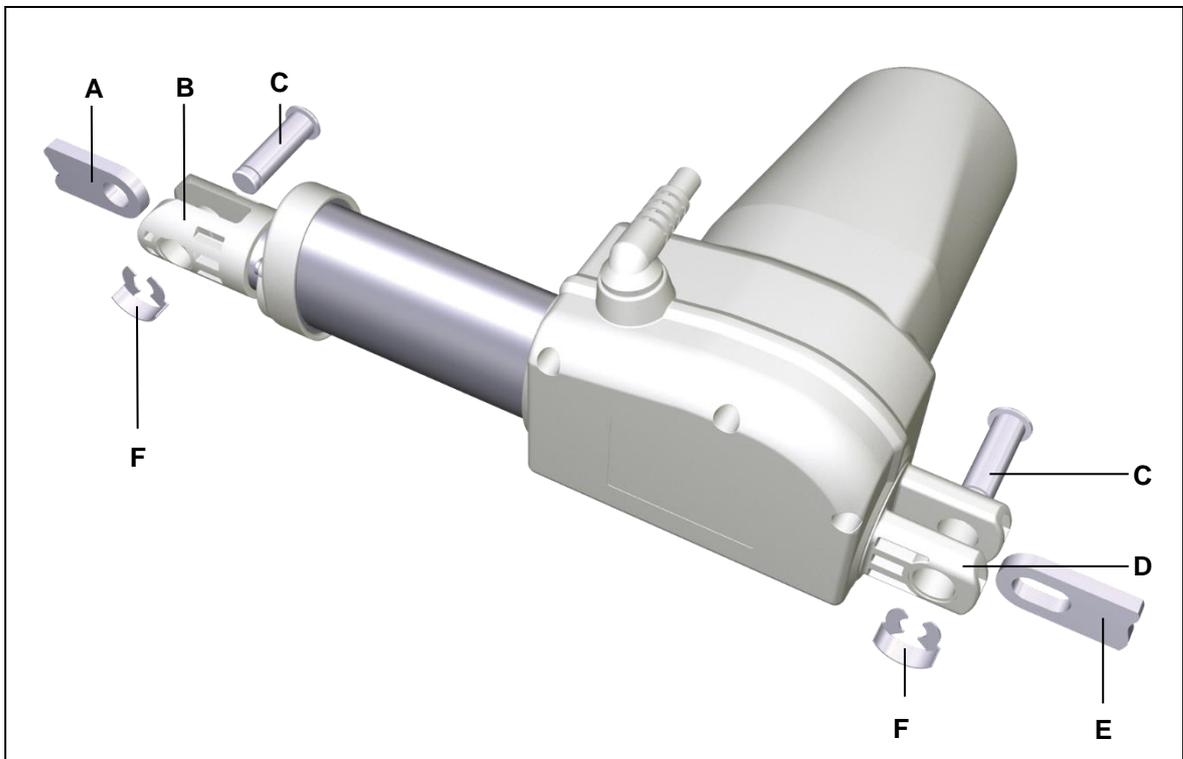


Figure 16 Installing the drive (example)

- | | |
|---|-----------------------------|
| A Bracket for securing the drive (on the stroke pipe side) | B Stroke pipe clevis |
| C Mounting bolt | D Gear clevis |
| E Bracket for securing the drive (on the motor side) | F Safety clip |

- The fitted mounts on the end product should have elongated slots so that the installed position can be adjusted.

	NOTICE
The support brackets for the clevises must be in alignment.	

In the following example, installation of the MEGAMAT MNZ drive into the end product is shown using mounting bolts.

► Certain details may change based on the variation in use and technical modifications.

- 1 Push the drive's gear clevis (E) onto the bracket (F).
- 2 Insert the mounting bolt (C) into the bracket (F).
- 3 Secure the mounting bolt (C) with the safety clip (G).

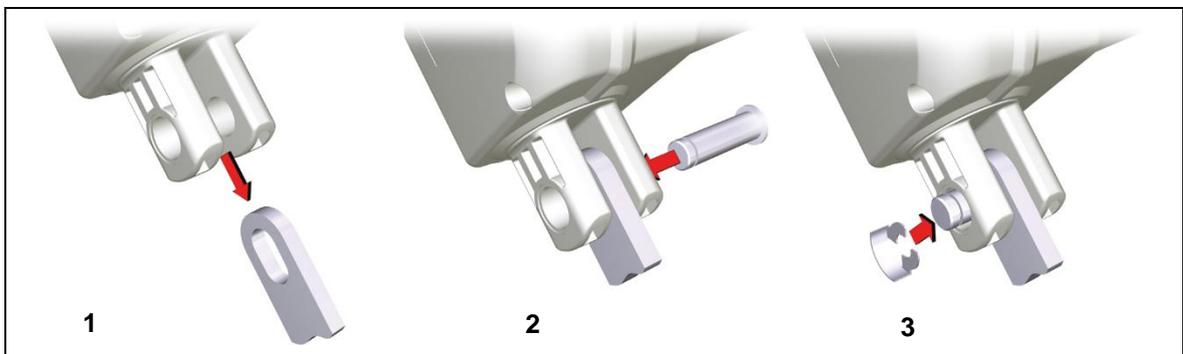


Figure 17 Steps for installing the gear clevis (example)

	CAUTION
Versions with fixed nuts: You should never screw the stroke pipe into the drive. A stroke pipe that has been screwed into the drive can result in fatigue fractures.	

- 4 If the stroke pipe clevis/head (B) does not align exactly with the gear clevis (E), the stroke pipe may be unscrewed out of the drive by no more than a half turn.

	CAUTION
Versions with fixed nuts: The stroke pipe may only be turned one half rotation out of the drive. Do not rotate the stroke pipe further out. An over-rotation can lead to unsafe operations. The stroke pipe clevis must not be detached from the stroke pipe!	

- 5 Attach the stroke pipe clevis (B) using a mounting bolt (C) to the mounting bracket (A).
- 6 Secure the mounting bolt (C) with the safety clip (G).
- 7 Now connect the drive to the control unit or the double drive. Ensure that the electrical connection cable (D) cannot be pulled out.

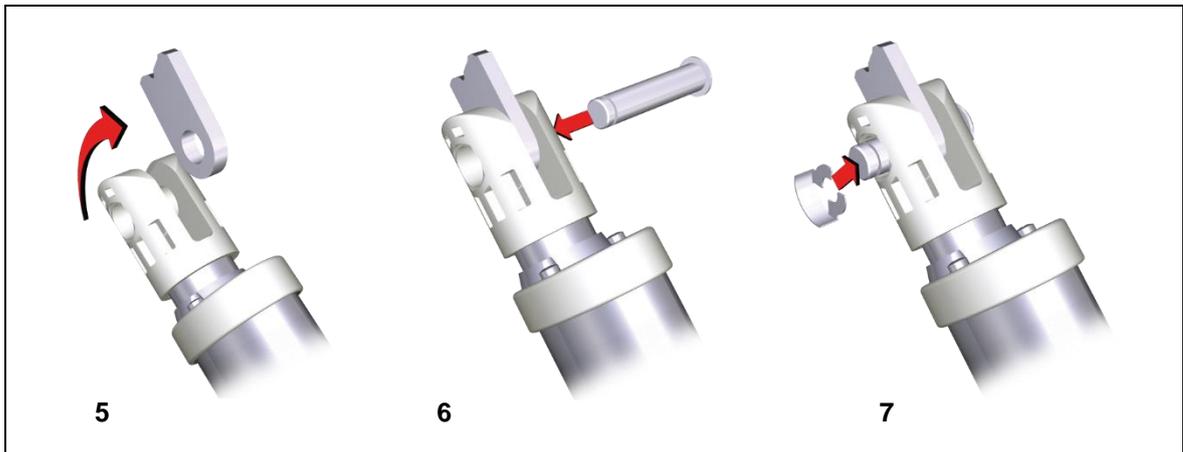


Figure 18 Steps for installing the stroke pipe clevis (example)

- ▶ If the hand switch will be used to control two drives, you must first connect both drives electrical-ly to each other (for example, over a control unit or double drive). Then you can connect the handset.

6.2.2 Installing the Bowden cable for the optional mechanical reset function (ER)

	NOTICE
	During the installation, use a Bowden cable with some type of length compensation mechanism (for example, attach a spring to the Bowden cable).

Definition of Bowden cable

Definition of nipple	
Soldering nipple	DIN 71985 – D 5 x 7.5 x 1.5
Trunnion	DIN 71985 – E 1.8
Definition of Bowden cable case	
Diameter of external sheathing	5 mm
Diameter of inner cable	1.5 mm
Recommendation for the Bowden cable sheath	
Outer diameter	5.8 mm
Inner diameter	5.1 mm
Length	9.7 mm

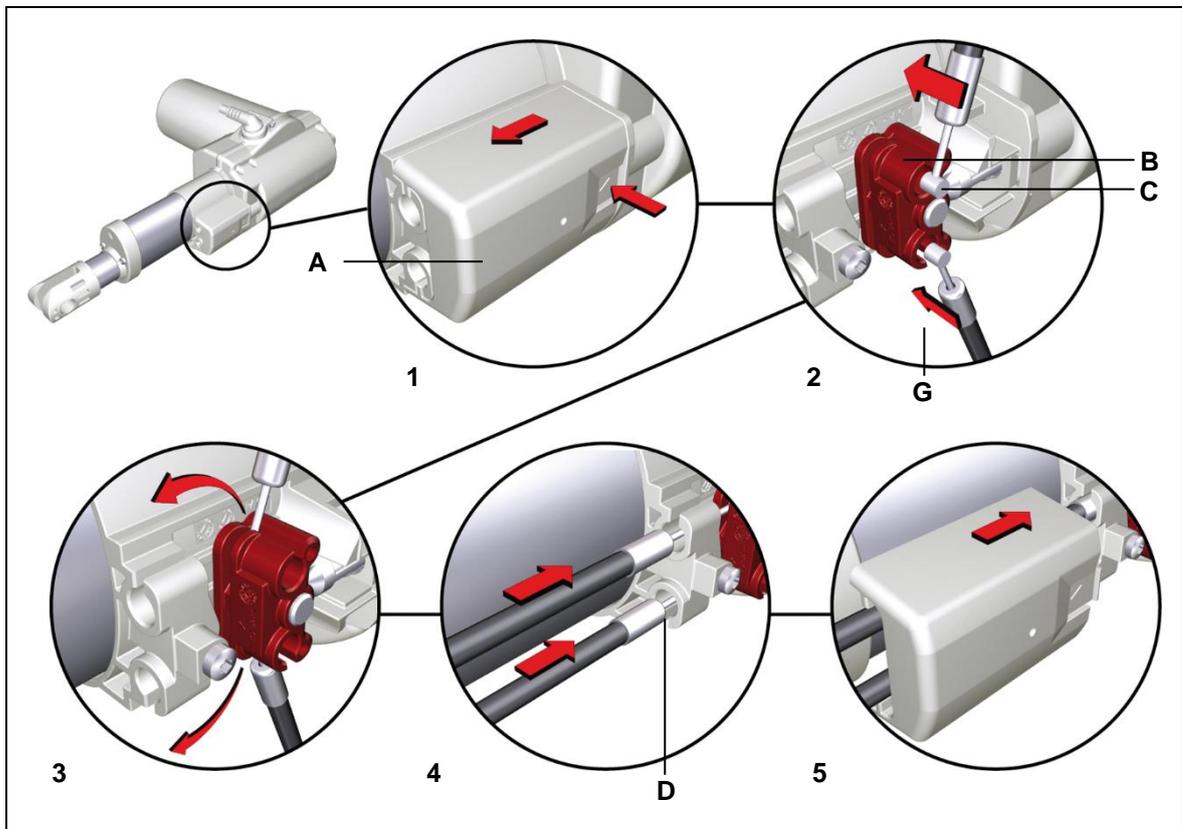


Figure 19 Installation of the Bowden cable for the mechanical reset function (ER)

- 1 Press the arrow on the cover of the Bowden cable holder while pulling off the cover (A).
- 2 Insert the Bowden cable nipple (C) sideways into the Bowden cable holder (B) as shown in Figure 19.
- 3 Move the Bowden cable to the guide (D) and insert the Bowden cable sheath into the guide.
- 4 Repeat steps 2 and 3 with the second Bowden cable.
- 5 Slide the cover back onto the Bowden cable holder until it clicks into place.

⚠ CAUTION	
	<p>Do not put too much tension on the Bowden cable. An over-strained Bowden cable could cause an accidental adjustment to occur by triggering the mechanical reset function.</p>

- ▶ The Bowden cable holder (B) must be pulled until it reaches the end stop (all the way up) in order to ensure that the ER functions properly. The ER function is only designed for operation with one Bowden cable. The ER's clutch opens up when the pull force reaches 110 N. The pull force must not exceed 250 N, otherwise the ER could be damaged.
- 6 Mount the Bowden cable to your end product.

NOTICE	
	<p>Only operate ever with one Bowden cable Simultaneous operation of both Bowden cables prevents the rotation of the rocker arms and can damage the mechanics.</p>

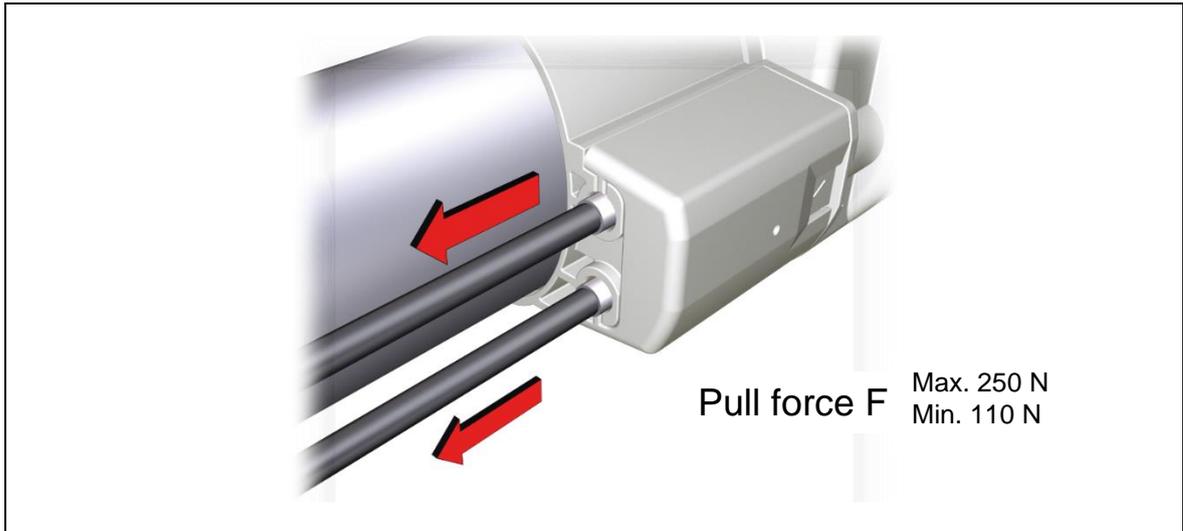


Figure 20 Mechanical reset function (ER)

7 Verify that the mechanical reset function is functioning properly.

6.2.3 Electrical connection

 CAUTION	
	<p>Electrical components should be connected or disconnected only when the mains power plug and the battery plug (when present) are both unplugged.</p>

Routing the electrical cables

When routing the cables, be sure that:

- the cables cannot get jammed,
- no mechanical load (such as pulling, pushing or bending) will be put on the cables, and
- the cables cannot be damaged in any way.

Fasten all cables (especially the mains cable) to the end product using sufficient strain relief and kink prevention methods. Be sure that the design of the end product prevents the mains cable from coming into contact with the floor during transport.

6.2.4 Connection option: Short cable with detachable snap-on cap covering the electrical connections

⚠ CAUTION	
	<p>Only personnel with the following training are qualified to work on the electrical connections:</p> <ul style="list-style-type: none"> • someone who has completed training in electronic motor assembly, • someone with equivalent qualifications, or • someone who has successfully completed the appropriate DewertOkin training program. <p>You should only work on the electrical connections if you are qualified to do so. Otherwise, a properly qualified person should be found for this task.</p>

The snap-on cap has openings on the side, through which a screwdriver can be inserted to release the snap connection.

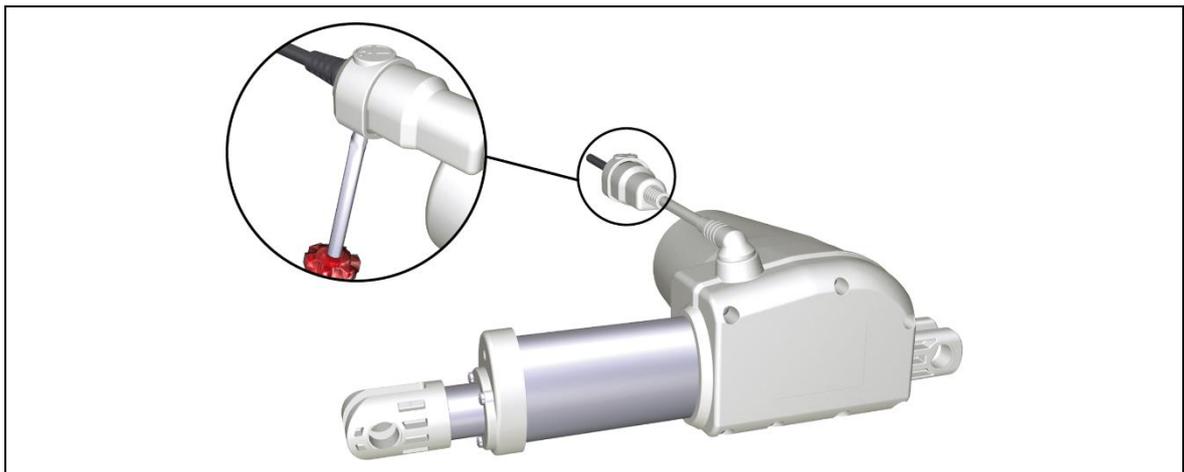


Figure 21 Snap-on cap for the short cable

NOTICE	
	<p>If the motor connection cable needs to be replaced:</p> <ul style="list-style-type: none"> • carefully loosen the snap-on cap using a suitable tool • replace the snap-on cap if it is damaged

⚠ CAUTION	
	<p>You must stop using the drive if the snap-on cap or the connection between the snap-on cap and the short version of the cable is damaged.</p>

6.2.5 Permanently attached strain relief mechanism at the electrical connections

	 CAUTION
	<p>You may not open up the electrical access connection if the electrical connections are equipped with a permanent strain relief mechanism.</p>

6.2.6 Removing the drive

	 CAUTION
	<p>Electrical components should be connected or disconnected only when the mains power plug and the battery plug (when present) are both unplugged.</p>

	 CAUTION
	<p>Be sure to carry out work on the drive in a position so that no loads are bearing on it. Only in this way can you be sure to avoid any risks of crushing or injury.</p>

► Certain details may change because of technical changes.

- 1 Move your product into a position where it is supporting no load.
- 2 Remove the connecting cable from the controller or double drive.
- 3 If multiple drives are connected electrically, they should be disconnected from each other.
- 4 For the ER option: Open the cover of the ER and remove the Bowden cables.

	NOTICE
	<p>Be sure to support the drive's weight while you are loosening the bolt.</p>

- 5 Remove the security clips and the mounting bolt.
- 6 Remove the drive from the end product.

7. Operating notes

The factual information contained within may be used when you are creating the end-product manual. The installation instructions do not contain all information required for the safe operation of the end product. They only describe the installation and operation of the drive as a partially assembled piece of machinery.

	 CAUTION
	<p>When creating the operating instructions, remember that the installation instructions are intended for qualified specialists and are not for typical users of the end product.</p>

7.1 General information

- ▶ Only a DewertOkin device should be used to control the drive since they have already been verified to work together.

Power-on time / intermittent operations

The MEGAMAT MNZ drive has been designed for intermittent operations. Intermittent operation is an operational mode where the drive must pause after a specified maximum period of operation (power-on time). This protects the drive from overheating. Extreme overheating can cause a malfunction.

- ▶ The ratings plate specifies the maximum power-on time and the required pause intervals.

Avoiding electrical risks

	 WARNING
	<p>Make sure that all live (current-carrying) parts of the drive system and power supply cannot be touched. In particular, be sure that unused power and control unit connections are covered adequately.</p>

Avoiding cable damage

Be sure that your operating instructions inform the user about the possible cable risks.

	 CAUTION
	<p>The cables (particularly the connecting cable) should not be run over. In order to prevent injuries or drive damage, no mechanical strain should be placed on the cables.</p>

Shutting off the drive

	 CAUTION
	In order to shut off the drive, unplug the mains power plug and the battery plug (when present). The power plug (of the control unit or double drive) must always be accessible during operations so that emergency shut-off is possible.

7.2 Notice for operating with optional configuration

Configuration: Attached nut

	 CAUTION
	You should never screw the stroke pipe into the drive. A stroke pipe that has been screwed into the drive can result in fatigue fractures.

	 CAUTION
	The stroke pipe may only be turned one half rotation out of the drive. Do not rotate the stroke pipe further out. An over-rotation can lead to unsafe operations. The stroke pipe clevis must not be detached from the stroke pipe!

Configuration: ER mechanical reset option

Make sure that your operating instructions inform the user about how to avoid damaging the ER system:

	NOTICE
	The Bowden cable or reset lever for the ER mechanical reset function must be pressed down completely during the entire resetting movement. If the lever is not completely pressed down, the clutch mechanism may engage or partially engage during the reset motion. This can wear out the mechanics and result in premature system malfunctions.

	NOTICE
	When actuating the mechanical reset function (ER), make sure that the manual adjustment motion takes place in the proper direction. Otherwise, the ER mechanism could be damaged.

- ▶ Depending on the implementation of your end product, it may be possible to lower the product simply using gravity. If your end product does not lower under its own weight, then you should apply gentle pressure on it to help it go down.

	CAUTION
The mechanical reset function (ER) is not a safety system and does not avert danger.	

Observe the following when operating the MEGAMAT MNZ together with the mechanical reset function ER:

- There should be no external dirt on the drive. Contaminants could prevent the mechanical reset (ER) from functioning reliably. We therefore recommend that a visual inspection (refer to section 9.1), cleaning, and a quick-release functionality check all be included in the service plan for your end product.
- The ER is equipped with a high-quality clutch system, which can be actuated at any time, even when under load.
- In an emergency, you can move the drive mechanically using the mechanical release. Use the mechanical release mechanism to return the drive to its home position.
- A conventional Bowden cable, which is secured in the ER's cable holder (refer to section 6.2.2), is used for providing this mechanical release. The Bowden cable is not included in our delivery.
- The Bowden cable holder must be pulled until it reaches the end stop (all the way) in order to ensure that the ER functions properly. The ER function is only designed for operation with one Bowden cable. The ER's clutch opens up when the pull force reaches 110 N. The pull force must not exceed 250 N, otherwise the ER could be damaged.
- After the mechanical reset function has been carried out, the clutch will engage automatically when the drive system is moved back into position. The drive system is then ready.

	NOTICE
<p>Only operate ever with one Bowden cable Simultaneous operation of both Bowden cables prevents the rotation of the rocker arms and can damage the mechanics.</p>	

Make sure that your operating instructions inform the user about how to avoid damaging the ER system.

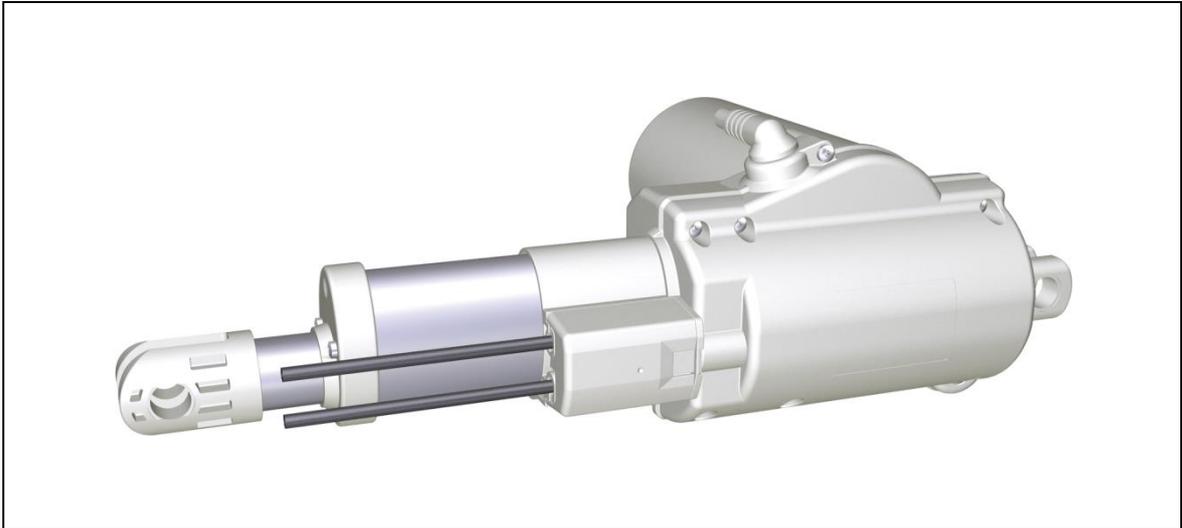


Figure 22 MEGAMAT MNZ drive with reset function (ER)

 CAUTION	
	<p>Danger of getting stuck or jammed!</p> <p>Depending on your end product, there may be a danger of getting stuck or jammed while the release function is operating. Be sure that your operating instructions inform the user about all possible dangers related to getting stuck or jammed in your end product.</p>

- 1 Pull the Bowden cable to manually trigger the ER reset function. As long as the Bowden cable is being pulled, the reset function is enabled and the end product is not locked in position.
 - 2 Release the Bowden cable to end the reset function. The drive re-engages and the end product is ready for use.
- The reset function may only be engaged when at a standstill.

8. Troubleshooting

This chapter describes troubleshooting methods for fixing problems. If you experience an error that is not listed in this table, please contact your supplier.

	 CAUTION
	<p>Only qualified specialists who have received electrician training should carry out troubleshooting and repairs.</p>

Problem	Possible cause	Solution
The handset or drive system is not functioning.	There is no mains supply voltage.	Connect the mains power.
	The hand switch or drive system is defective.	Please contact your supplier or sales agent.
The drive is suddenly not capable of movement.	Possibly the thermal circuit breaker on the transformer has been triggered.	The drive system should be allowed to pause for 20 to 30 minutes.
	The thermal fuse on the transformer may have been triggered.	Please contact your supplier or sales agent.
	The unit's fuse may have been triggered.	Please contact your supplier or sales agent.
	There is no mains supply voltage.	Connect the mains power.
	A lead-in connection has been interrupted (mains power, hand switch or auxiliary drive).	Check the cables and reinsert them, if required.
ER version: The motor is running but there is no motion.	The Bowden cable is not in its home position. There is too much tension on the Bowden cable.	Adjust the Bowden cable.
ER version: The drive is resetting itself.	The override function of the drive has been used continuously for adjusting the end product.	Replace the drive.

9. Maintenance

- ▶ You should only use spare parts which have been manufactured or approved by DewertOkin. Only these parts will guarantee a sufficient level of safety.

9.1 Maintenance

Type of check	Explanation	Time interval
Check the function and safety of the electrical system.	A qualified electrician should carry out this inspection. (Refer to the "Electrical connection" section in the "Installation" Chapter.)	Periodic inspections can be carried out at intervals based on the risk assessment which you conduct for your end product.
Look over the housing periodically for any signs of damage.	Check the housing for breaks or cracks. The IP-class protection will be impaired by any breakage or cracks.	At least every six months.
Look over the plug-in connections and electrical access points for signs of damage.	Check that all electrical cables and connections are firmly seated and correctly positioned.	At least every six months.
Look over the cables for any signs of damage.	Check the connecting cables for pinching or shearing. Also check the strain relief and kink protections mechanisms, in particular after any mechanical load.	At least every six months.
Periodic functional test of the end switches.	Move the drive to the end positions in order to test the end switches.	At least every six months.
A periodic check that the ER mechanical reset function is functioning properly.	Check the ER mechanical reset function by pulling the Bowden cable.	At least every six months.
Periodic visual inspections, cleaning, and then a mechanical-reset functionality test.	Check to see if the mechanical reset function (ER) is dirty. Clean and check function again.	At least every six months.
Periodic visual inspection of the seals.	Check that the seals are firmly seated and complete.	At least every six months.

9.2 Cleaning and care

The MEGAMAT MNZ drive was designed so that it would be easy to clean. Its smooth surfaces simplify the cleaning process.

NOTICE	
	<ul style="list-style-type: none">• Never clean the drive in an automated washing tunnel or with a high-pressure cleaner. Do not allow fluids to penetrate the drive. Damage to the system could result.• An exception to this rule is the IPX6W version, which may be washed in a wash tunnel (refer to section 5.1). <p>Do not use a cleanser that contains benzene, alcohol or similar solvents.</p>

- 1 Always disconnect the mains power plug of the control unit or double drive (and the battery plug if present) before you start to clean the unit!
- 2 Clean the MEGAMAT MNZ drive using a moist cloth while it is in its retracted position.
- 3 Make sure that you do not damage the drive's connecting cable.

10. Disposal

10.1 Packaging material

The packaging material should be sorted into recyclable components and then disposed of in accordance with the appropriate national environmental regulations (in Germany according to the recycling law KrWG from 01.06.2012; internationally according to the EU Directive 2008/98/EC (Waste Framework Directive WFD as of 12.12.2008)).

10.2 Drive components

The MEGAMAT MNZ drive consists of electronic components, cables and metal and plastic parts. You should observe all corresponding national and regional environmental regulations when disposing of the MEGAMAT MNZ drive.

The disposal of the product is regulated in Germany by Elektro-G, internationally by the EU Directive 2011/65/EC (RoHS), or by any applicable national laws and regulations. (The product is not regulated by the EU Directive 2012/19/EC (WEEE).)



The MEGAMAT MNZ drive should not be disposed of with normal household waste!

Einbauerklärung

nach Anhang II der EU-Maschinenrichtlinie
2006/42/EG

Der Hersteller

Declaration of Incorporation

*According to Appendix II of the EU Machinery
Directive 2006/42/EC*

The manufacturer:

DewertOkin GmbH
Weststraße 1
32278 Kirchlengern
Deutschland - Germany

erklärt hiermit, dass nachstehend beschriebene
unvollständigen Maschinen

*declares that the incomplete machines described
below*

MEGAMAT MNZ

MEGAMAT MN(n)¹

die folgenden grundlegenden Anforderungen der
Richtlinie Maschinen (2006/42/EG) erfüllt:

*complies with the following basic requirements of the
Machinery Directive (2006/42/EC):*

Abschnitt:

Sections:

1.1.3; 1.3.3; 1.3.4; 1.3.7; 1.5.1; 1.5.2; 1.5.5; 1.5.6; 1.5.7; 1.5.8; 1.5.9; 1.5.10; 1.5.13

Die unvollständige Maschine darf erst dann in Be-
trieb genommen werden, wenn festgestellt wurde,
dass die Maschine, in die die unvollständige Ma-
schine eingebaut werden soll, den Bestimmungen
der Richtlinie Maschinen (2006/42/EG) entspricht.

*You may only operate this incomplete machine after
you have confirmed that the end product (into which
this machine will be installed) complies with the
Machinery Directive 2006/42/EC.*

Der Hersteller verpflichtet sich, die speziellen Unter-
lagen zur unvollständigen Maschine einzelstaatli-
chen Stellen auf begründetes Verlangen elektronisch
zu übermitteln. Die zur Maschine gehörenden
speziellen technischen Unterlagen nach Anhang VII
Teil B wurden erstellt.

*On reasonable request, the manufacturer is obliged
to send the special documentation accompanying the
partially completed machinery in electronic form to
the appropriate national institution. The special
technical documents corresponding to the machine
have been created according to Appendix VII, part B.*

Für die Zusammenstellung der technischen Unter-
lagen ist bevollmächtigt: DewertOkin GmbH
Weststraße 1
32278 Kirchlengern
Tel.: 05223 979-0
Deutschland - Germany

*For preparation of the technical documentation is
authorized: DewertOkin GmbH
Weststraße 1
32278 Kirchlengern
Tel.: 05223 979-0
Deutschland - Germany*

Kirchlengern, Germany 19 December 2019



Dr.-Ing. Josef G. Groß
Geschäftsführer / Managing Director

¹⁾ (n) steht für 1 – 5

¹⁾ (n) stands for 1 - 5

EG-Konformitätserklärung

Nach Anhang IV der EMV-Richtlinie 2014/30/EU

Nach Anhang IV der EU-Niederspannungsrichtlinie 2014/35/EU

Nach Anhang VI der RoHS-Richtlinie 2011/65/EU (inkl. Delegierte Richtlinie (EU) 2015/863)

Der Hersteller

EU Declaration of Conformity

In compliance with Appendix IV of the EMC-Directive 2014/30/EU

In compliance with Appendix IV of the LVD-Directive 2014/35/EU

In compliance with Appendix VI of the EU RoHS Directive 2011/65/EU (incl. Commission delegated Directive (EU) 2015/863)

The manufacturer

DewertOkin GmbH
Weststraße 1
32278 Kirchlengern
Deutschland - Germany

erklärt hiermit, dass das Produkt

declares that the following product

MEGAMAT MNZ¹⁾
MEGAMAT MN(n)^{1,2)}

die Anforderungen folgender EG-Richtlinien erfüllt:

meets the requirements of the following EU directives:

Richtlinie über elektromagnetische Verträglichkeit 2014/30/EU

Electromagnetic Compatibility Directive 2014/30/EU

Niederspannungsrichtlinie 2014/35/EU

Low Voltage Directive 2014/35/EU

DELEGIERTE RICHTLINIE (EU) 2015/863 DER KOMMISSION vom 31. März 2015 zur Änderung von Anhang II der Richtlinie 2011/65/EU des Europäischen Parlaments und des Rates hinsichtlich der Liste der Stoffe, die Beschränkungen unterliegen.

COMMISSION DELEGATED DIRECTIVE (EU) 2015/863 of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances.

Angewendete Normen

Applied standards:

- EN 60335-1:2012/A13:2017
- EN 55014-1:2006/A1:2009/A2:2011
- EN 55014-2:1997/A1:2001/A2:2008
- EN 61000-3-2:2014
- EN 61000-3-3:2013
- EN 62233:2008

Konstruktive Änderungen, die Auswirkungen auf die in der Montageanleitung angegebenen technischen Daten und den bestimmungsgemäßen Gebrauch haben, das Produkt also wesentlich verändern, machen diese Konformitätserklärung ungültig!

This declaration of conformity is no longer valid if constructional changes are made which significantly change the drive system (i.e., which influence the technical specifications found in the instructions or the intended use)!



Kirchlengern, Germany 18 December 2019

Dr.-Ing. Josef G. Groß
Geschäftsführer / Managing Director

¹⁾ mit DewertOkin-Steuerung

¹⁾ with DewertOkin control unit

²⁾ (n) steht für 1 – 5

²⁾ (n) stands for 1 – 5

Additional information

MEGAMAT MNZ drive system

The following standards and norms were used in the versions with at least IPX4 and higher in according to

- EN 60601-1:2006 + A1:2013, IEC 60601-1:2005 + A1:2012 (short description: Edition 3.1), Medical electrical equipment.
- EN 60601-1-2:2015, IEC 60601-2-2:2014 (short description: Edition 4.0), EMC

IEC/EN60601-1, Section 4	General requirements
IEC/EN60601-1, Section 6	Classification
IEC/EN60601-1, Section 7.1	Labelling – general
IEC/EN60601-1, Section 7.2	Labelling – inscriptions
IEC/EN60601-1, Abschnitt 8	Protection against electrical danger
IEC/EN60601-1, Section 11.1	Overheating protection
IEC/EN60601-1, Section 11.2	Fire prevention
IEC/EN60601-1, Section 11.3	Design requirements for fire-resistant housing
IEC/EN60601-1, Section 13	Dangerous situations and error conditions
IEC/EN60601-1, Section 16.6	Leakage current
IEC/EN60601-1, Section 17	Electromagnetic compatibility
IEC/EN60601-2-52, Section 201.11.6.5.101	Protection against water ingress: only applied for at least IPX4
IEC/EN60601-2-52, Section 201.9.8.3.2	Static load

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