

# **MICRODRIVE 3**

## **Installation Instructions**

**(Translation of the original installation instructions)**



# Foreword

## Document revision history

Version	Date	Modification, change
1.0	01/2019	
2.0	06/2019	Ratings plate, disposal, graphics (installation), technical specifications,

## 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.

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

## 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.

# Table of contents

<b>Foreword</b>	<b>3</b>
Revisionsverlauf	Fehler! Textmarke nicht definiert.
<b>Disclaimer and exclusion of liability</b>	<b>3</b>
<b>Creation of a complete operating instruction manual for the entire end product</b>	<b>3</b>
<b>Table of contents</b>	<b>4</b>
<b>1. General Information</b>	<b>5</b>
1.1 Configurations	5
1.2 About these installation instructions	5
1.3 Safety notices within the installation instruction and the operating instructions for the entire machine	5
1.4 Conventions used	6
<b>2. Safety notices</b>	<b>7</b>
2.1 Proper and intended usage	7
2.2 Selection and qualification of personnel	7
2.3 Ratings plate	8
<b>3. Description</b>	<b>9</b>
3.1 Components	9
<b>4. Technical specifications</b>	<b>13</b>
<b>5. Installation</b>	<b>17</b>
5.1 Safety notices to observe during installation	17
5.2 Installation procedure	18
<b>6. Notes on operation</b>	<b>22</b>
<b>7. Maintenance and cleaning</b>	<b>23</b>
7.1 Maintenance	23
7.2 Cleaning	23
<b>8. Disposal</b>	<b>24</b>
8.1 Packaging material	24
8.2 Drive components	24
<b>Declaration of incorporation/installation</b>	<b>25</b>
<b>EU Declaration of Conformity</b>	<b>26</b>
<b>Additional information</b>	<b>27</b>

# 1. General Information

## 1.1 Configurations

The MICRODRIVE 3 drive is run in several different configurations. The MICRODRIVE 3 name, as used here, also includes the MICRODRIVE 3 MDZ3, MICRODRIVE 3 MD1-3 and MICRODRIVE 3 MD2-3 configurations.

## 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. They will also help you to increase the reliability and lifespan of the device.



### CAUTION

The notices in these instructions must be followed! Following the guidelines during installation and connection procedures will help to minimize:

- 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.

### 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.

## 1.3 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 MICRODRIVE 3 drive (by itself an incomplete machine)

- when the end product (for which the MICRODRIVE 3 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.

## 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



#### **CAUTION**

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

#### ***NOTICE***

NOTICE is used to address practices which are not related to personal injury but may result in damage to the product or surroundings.

## 2. Safety notices

### 2.1 Proper and intended usage

The MICRODRIVE 3 drive is meant to be installed in an end product.

- It provides motor adjustment capabilities for movable parts. It should be used in conjunction with suitable fitting brackets and mechanics.
- It can be used for such applications as beds, chairs, and tables.
- According to EN 60335-1, Section 19.7 – locked motor for max. 30 sec.



#### CAUTION

##### Risk of accident

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.

The MICRODRIVE 3 drive should not be used:

- in any environment where combustible or explosive gases or vapours (e.g., anaesthesiology) may be present,
- with pulling or pushing forces that exceed those specified on the ratings plate,
- in any application that will be cleaned with an automated washing system,
- in a moist environment,
- outdoors.

The MICRODRIVE 3 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.

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

### 2.2 Selection and qualification of personnel

The installation of the drive in the end product may only be performed by qualified personnel.

## 2.3 Ratings plate

- The ratings plates shown are an example; the specifications for your drive may differ from this illustration.

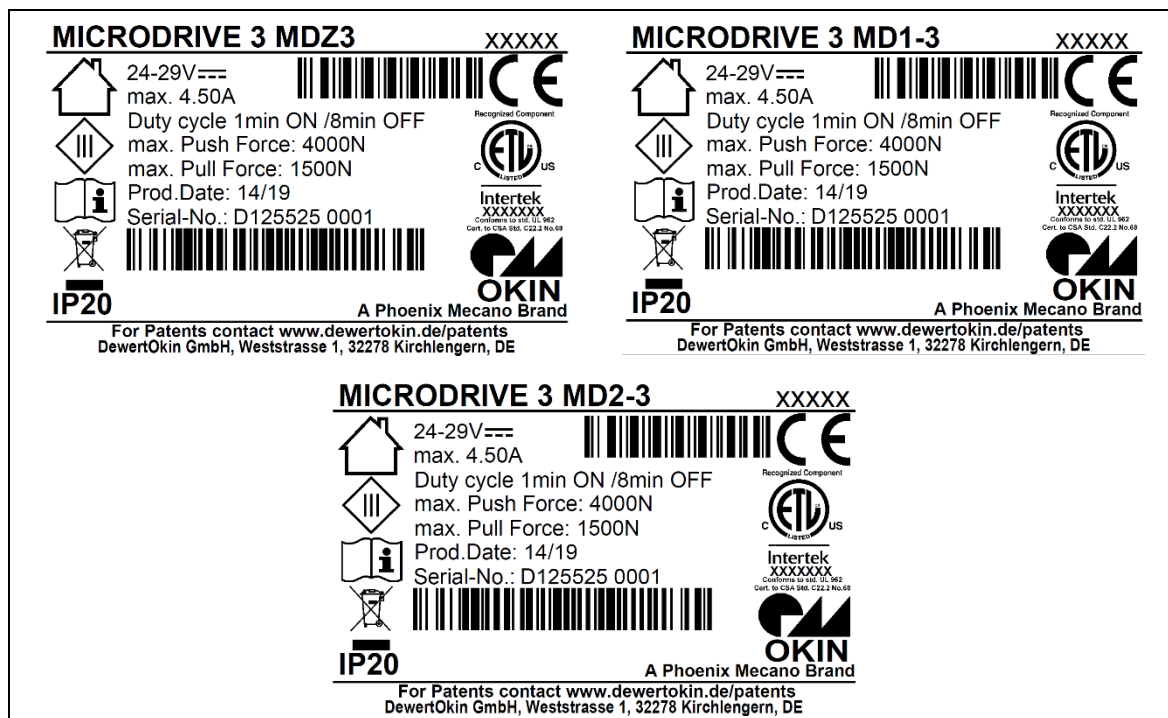






Figure 1 Ratings plate examples

### Legend for the ratings plate

MICRODRIVE 3 MDZ3	Model name
MICRODRIVE 3 MD1-3	
MICRODRIVE 3 MD2-3	
xxxxxx	Article number
24-29V ~	Input voltage
max. 4.50A	Current consumption
Duty Cycle 1min ON / 8min OFF	Intermittent operations: 1 minute on / 8 minutes pause
Push Force	Push force
Pull Force	Pull force
Prod.Date	Week / year
Serial-No.	Serial number
IP20	Protection degree
	Use in dry rooms only!
	Protection class: III (Safety extra low voltage)
	Follow all special disposal instructions!
	Mark of CE conformity



### 3. Description

The MICRODRIVE 3 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 MICRODRIVE 3 drive is controlled using an Okin handset.

The technical specifications for the variants are listed in Chapter 4 "Technical Specifications". The variants differ according to their:

- Working performance,
- Speed,
- Pushing and pulling forces,
- Dimensions and stroke,
- Clevises (stroke pipe, gear)
- Mount for the stroke pipe (refer to section 3.1.2),
- Connection variants (refer to section 3.1.3).

#### 3.1 Components

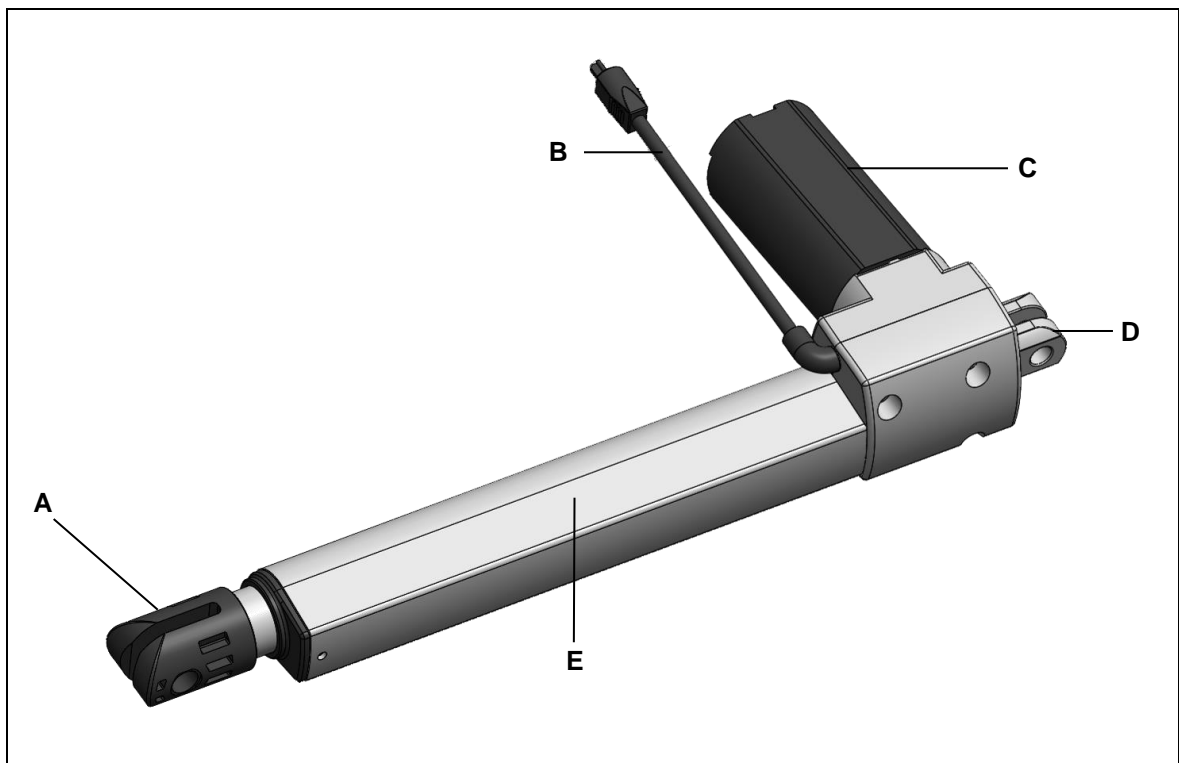


Figure 2 Main components of the drive MICRODRIVE 3

**A** Head of stroke pipe

**B** Electrical connection

**C** Motor

**D** Gear clevis

**E** Guidance profile

### 3.1.1 Stroke pipe head variants

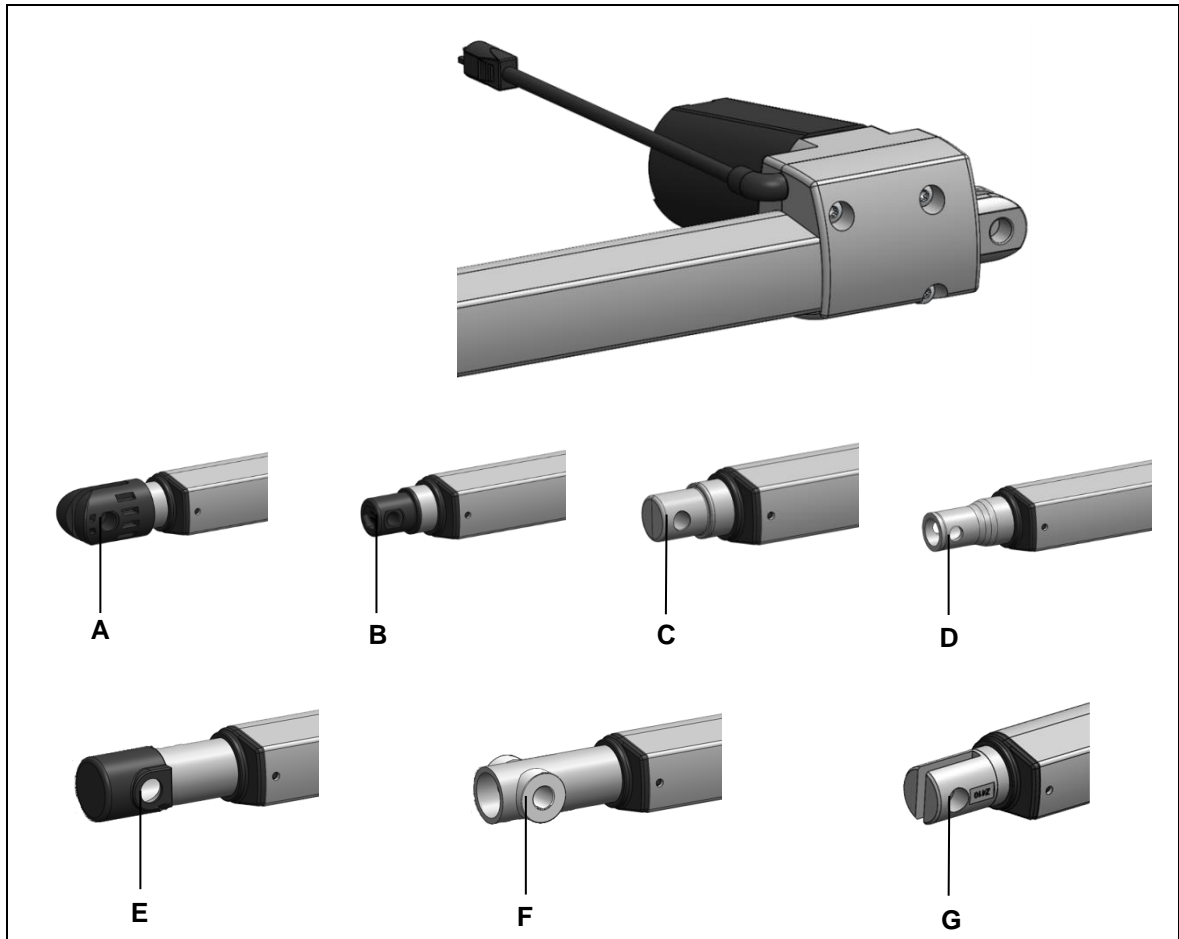


Figure 3 Variants of the stroke pipe head on the MICRODRIVE 3

- |   |  |
|---|--|
| <b>A</b> Stroke pipe head with slot / with hole         | <b>B</b> Stroke pipe head without slot / with hole         |
| <b>C</b> Stroke pipe head (metal)                       | <b>D</b> Stroke pipe with reduced end                      |
| <b>E</b> Stroke pipe head with hole                     | <b>F</b> Stroke pipe with hole (optional distance bushing) |
| <b>G</b> Stroke pipe head with slot / with hole (metal) |  |

### 3.1.2 Attachment of the stroke pipe

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.

- If the stroke pipe is unattached, then the end product can 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).

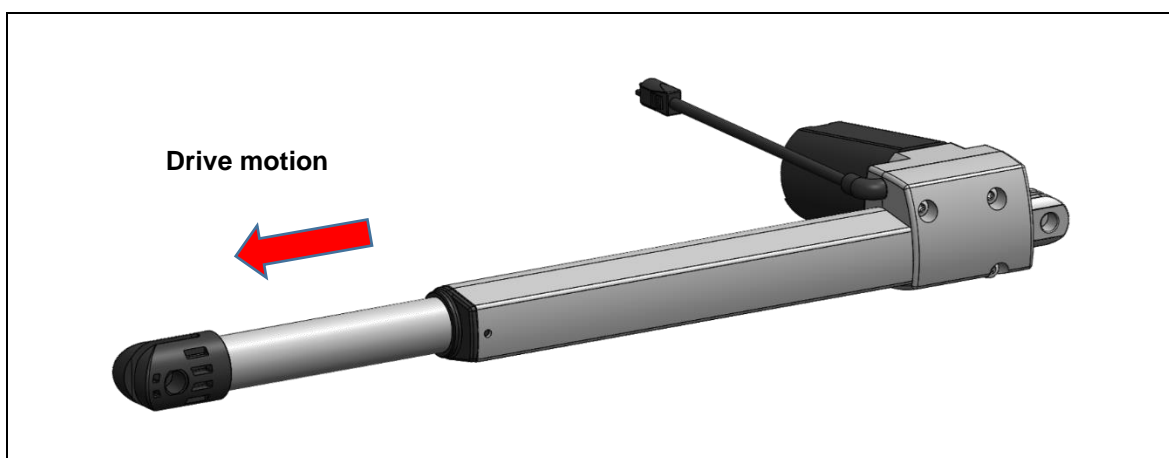


Figure 4 Loose fastening nut (stroke pipe not secured): only pushing forces

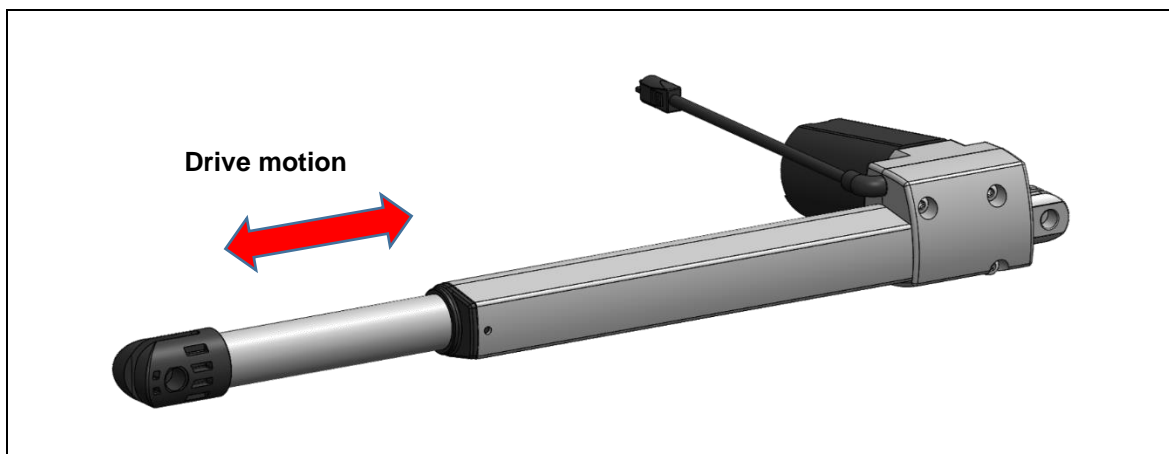


Figure 5 Stroke pipe screwed onto the spindle screw (attached): both pushing and pulling forces

### 3.1.3 Connection options

There are different power supply options for the MICRODRIVE 3 drive:

- LS plug,
- 5-pin plug,
- 3-Pol-Stecker,
- Motor control cable

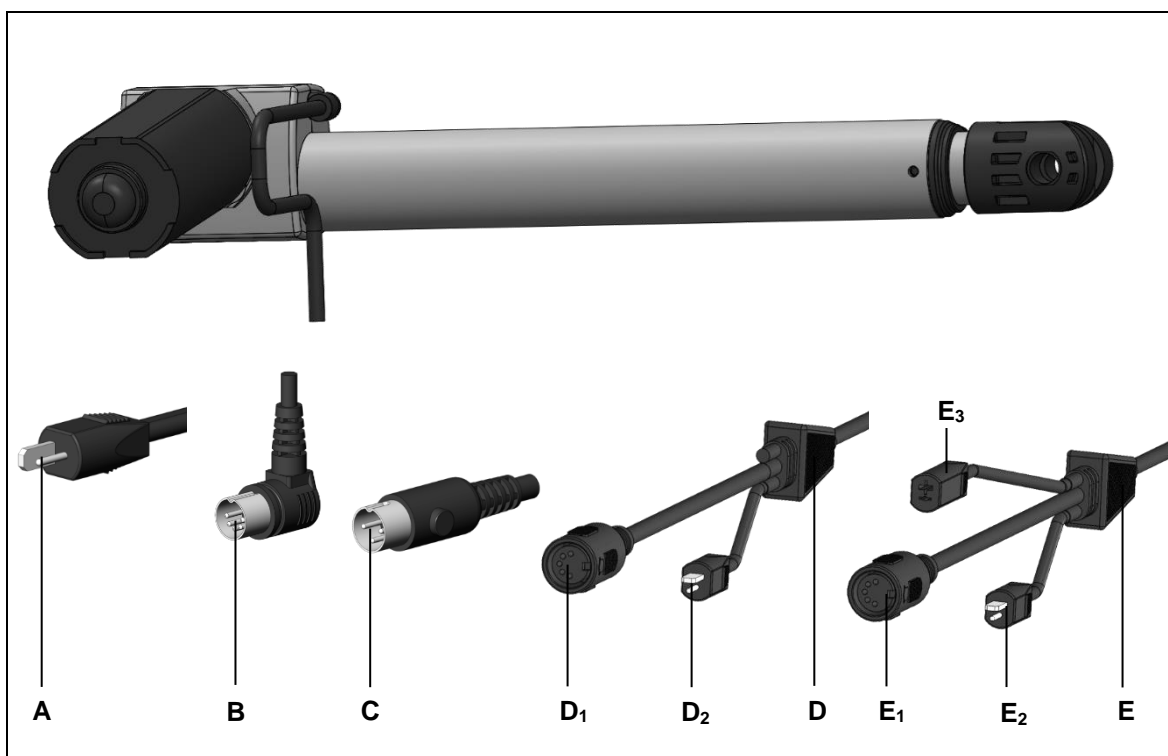


Figure 6 The connector plug and cable versions for the different MICRODRIVE 3 drive types

- |   |   |
|---|---|
| <b>A</b> LS plug for the MICRODRIVE 3 MDZ3                    | <b>B</b> 5-pin plug for the MICRODRIVE 3 MDZ3           |
| <b>C</b> 3-pin plug for the MICRODRIVE 3 MDZ3                 | <b>D</b> Motor control cable for the MICRODRIVE 3 MD1-3 |
|   | <b>D<sub>1</sub></b> Handset connection                 |
|   | <b>D<sub>2</sub></b> Power supply connection            |
| <b>E</b> Motor control cable for the MICRODRIVE 3 MD2-3       |   |
| <b>E<sub>1</sub></b> Handset connection                       |   |
| <b>E<sub>2</sub></b> Power supply connection                  |   |
| <b>E<sub>3</sub></b> Connection for an additional slave drive |   |

## 4. Technical specifications

Input voltage	24 V DC - 29 V DC
Current consumption at rated load	Max. 4.50 A, depending on version (refer to the ratings plate on the drive)
Permitted push force	Max. 4000 N, depending on version (refer to the ratings plate on the drive)
Permitted pull force	Max. 1500 N, depending on version (refer to the ratings plate on the drive)
Mode of operation <sup>1)</sup> under max. rated load	Intermittent duty 1 min ON / 8 min OFF
Protection class <sup>2)</sup>	III
Noise level	≤ 65 dB(A)
Drive type	Single drive
Load type	Push / pull
Adjustment speed <sup>3)</sup>	Up to 30 mm/second, depending on the version
Protection degree	IP20
Stroke	< 400 mm
Colour	Black
<b>Dimensions and weight</b>	
Length x width x height	Min. 129 mm x 148 mm x 51 mm
Weight	Approx. 1.5 kg, depending on version
<b>Ambient conditions for operation, storage and transport</b>	
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

- <sup>1)</sup> Mode of operation: intermittent duty 1 min./ 8 min. This means that after the unit is operated with its rated load for up to one minutes it must then be paused for 8 minutes. The system can malfunction if this pause is not observed!
- <sup>2)</sup> Safety extra low voltage
- <sup>3)</sup> Adjustment speed: the speed at which the clevis can move under no load (the speed varies depending on the load).

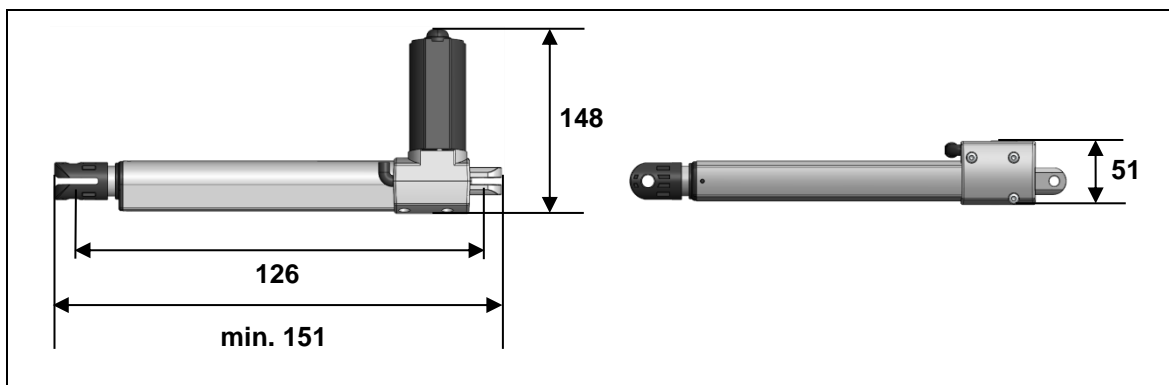


Figure 7 Dimensions of the MICRODRIVE 3 drive, stroke pipe head with slot / with hole (in mm), minimum dimension: 126 mm

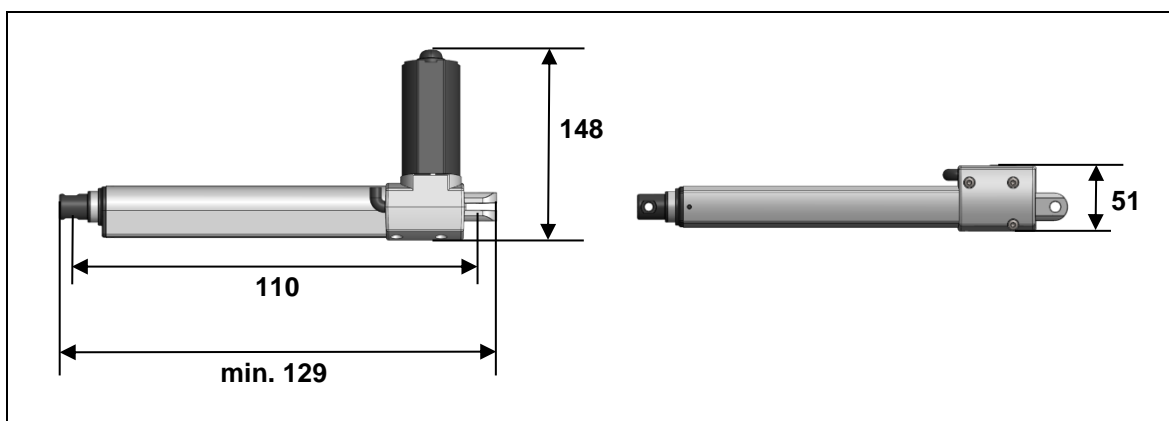


Figure 8 Dimensions of the MICRODRIVE 3 drive, stroke pipe head without slot / with hole (in mm), minimum installation dimension: 110 mm

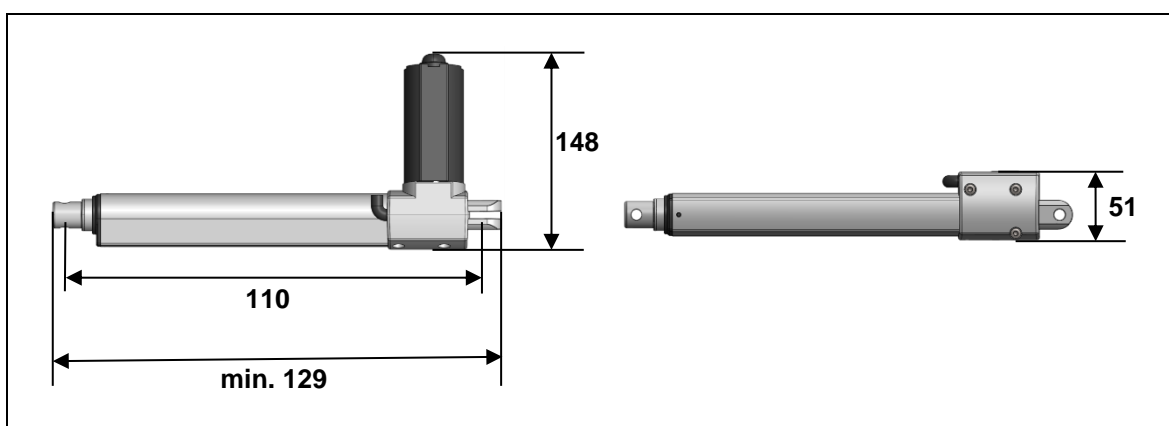


Figure 9 Dimensions of the MICRODRIVE 3 drive, metal stroke pipe head (in mm), minimum installation dimension: 110 mm

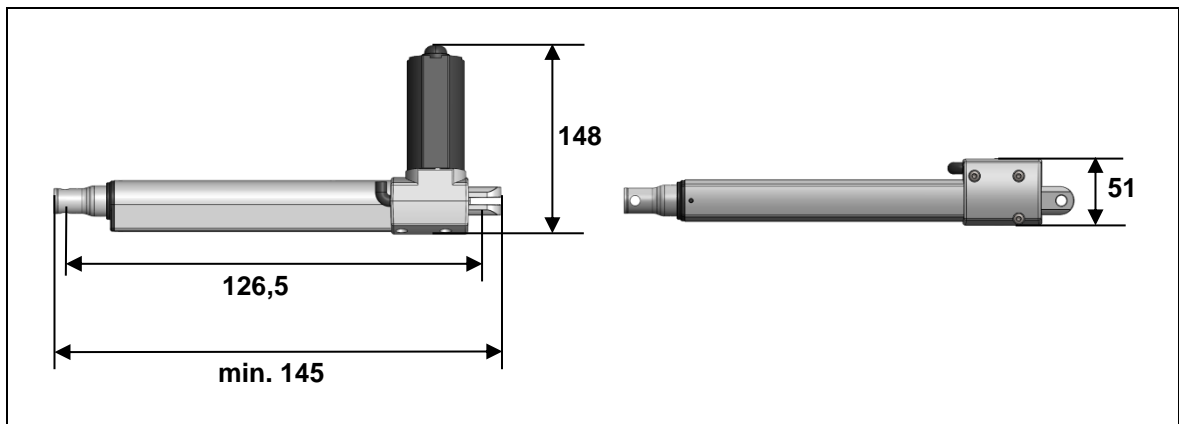


Figure 10 Dimensions of the MICRODRIVE 3 drive, stroke pipe with reduced end (in mm), minimum installation dimension: 126,5 mm

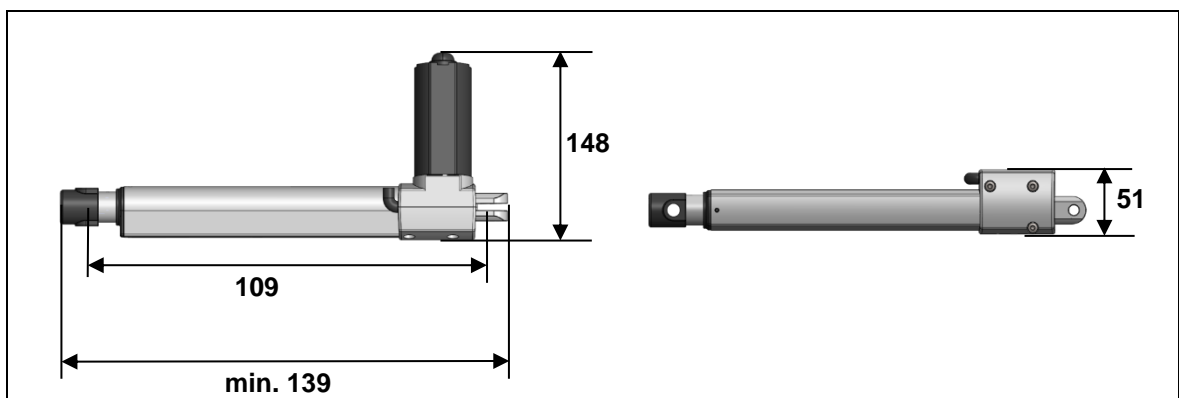


Figure 11 Dimensions of the MICRODRIVE 3 drive, stroke pipe head with hole (in mm), minimum installation dimension: 109 mm

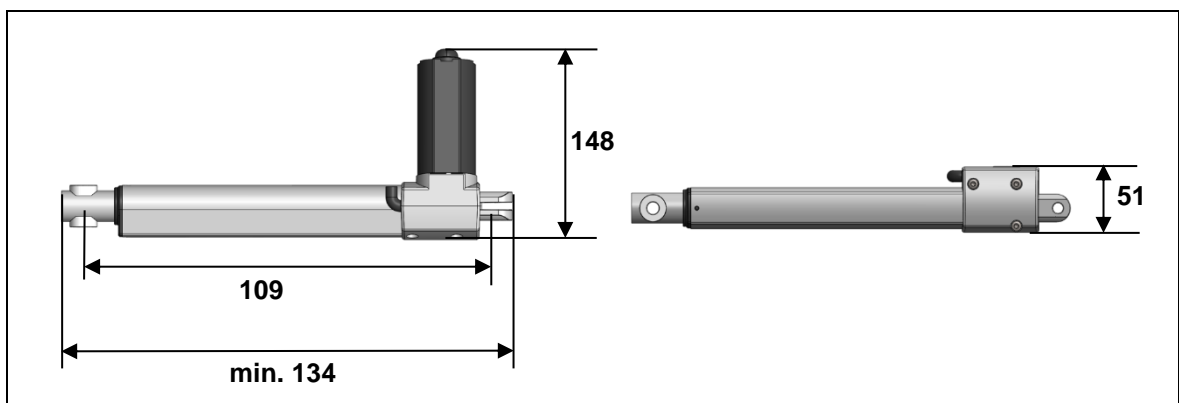


Figure 12 Dimensions of the MICRODRIVE 3 drive, stroke pipe head with hole (optional distance bushing) (in mm), minimum installation dimension: 109 mm

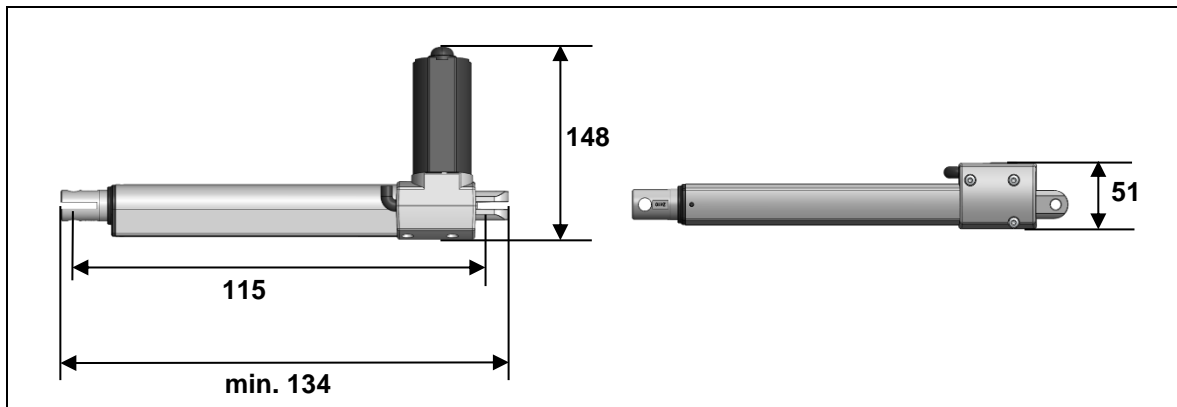


Figure 13 Dimensions of the MICRODRIVE 3 drive, metal stroke pipe head with slot / with hole (in mm), minimum dimension: 115 mm



## 5. Installation

### 5.1 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. The following rules must be observed while using the end product and while installing the drive.

#### **Avoiding fatigue fractures**

- 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.

#### **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.

Make sure that your operating instructions inform the user of these safety points.

## 5.2 Installation procedure

### NOTICE

Carry out the assembly of the drive when the application is in no-load position.  
In its final position, the drive must be either fully retracted or extended.  
Damage to the drive is prevented only in in no-load position and a safe assembly is ensured.

### 5.2.1 An installation example

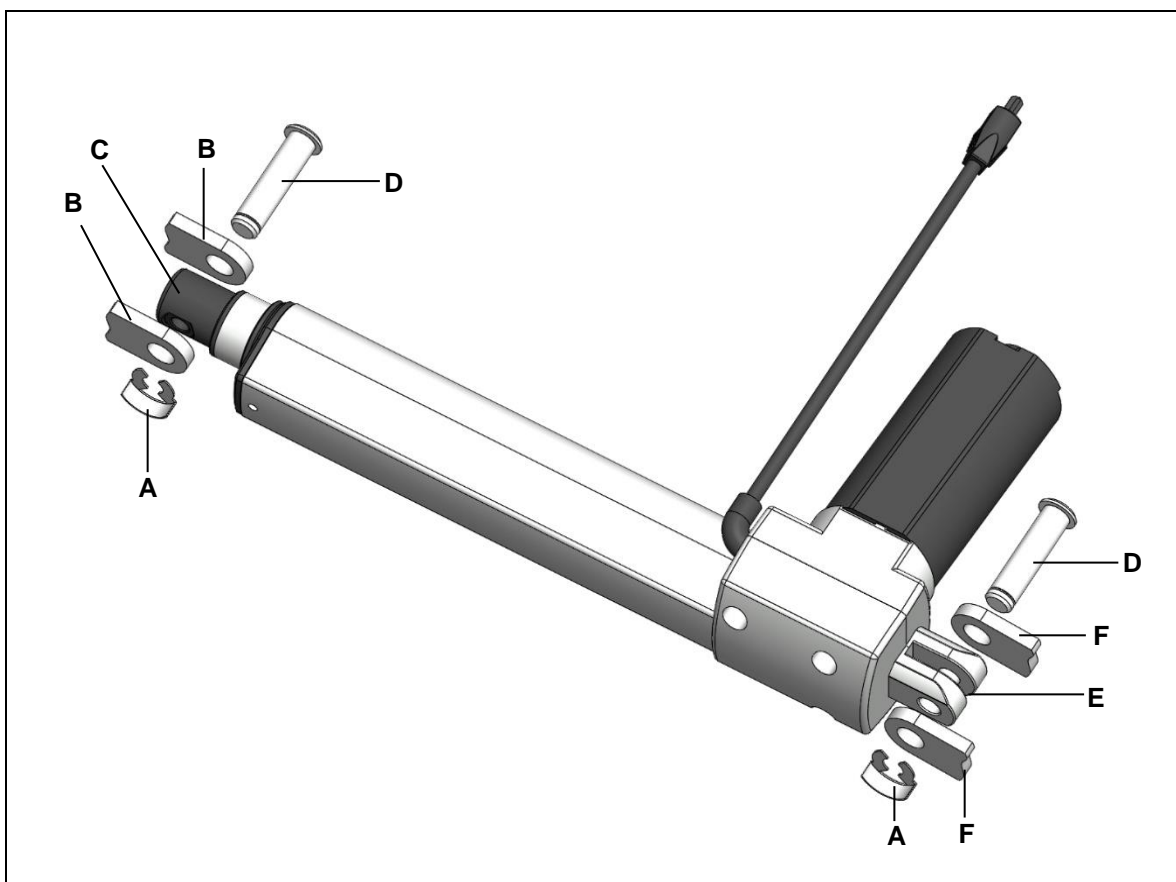


Figure 14 Installing the drive (example)

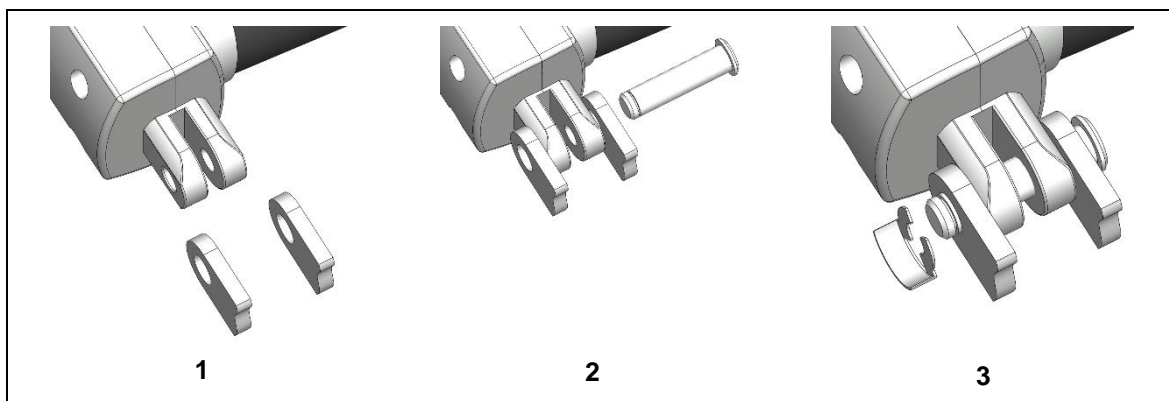
- |                              |   |
|------------------------------|---|
| <b>A</b> Safety clip         | <b>B</b> Bracket for securing the drive (on the stroke pipe side) |
| <b>C</b> Head of stroke pipe | <b>D</b> Mounting bolt  |
| <b>E</b> Gear clevis         | <b>F</b> Bracket for securing the drive (on the motor side)       |

In the following example, installation of the MICRODRIVE 3 drive into the end product is shown using the mounting bolt.

► Certain details may change because of technical changes.

- 1 Move your product into a position where it is supporting no load.
- 2 Push the drive's gear clevis (E) onto the bracket (F).
- 3 Insert the mounting bolt (D) into the bracket (F).
- 4 Secure the mounting bolt (D) with the safety clip (A).

#### Option 1



#### Option 2

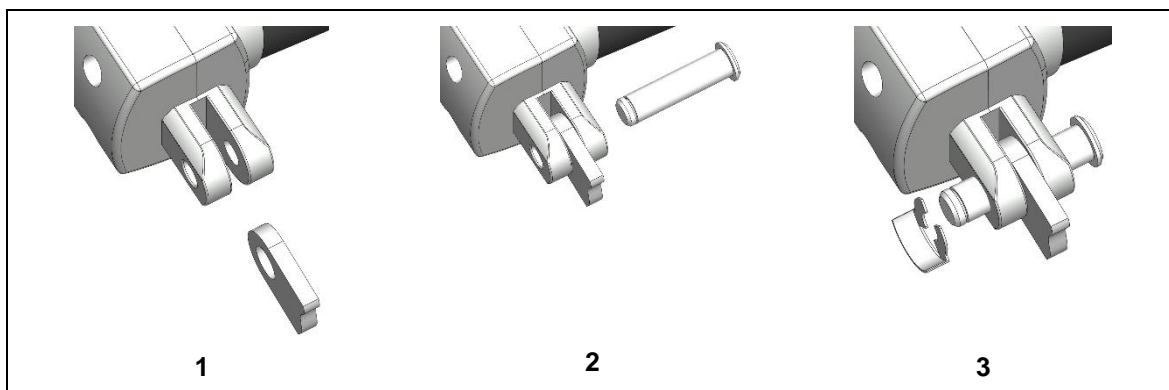


Figure 15 Steps for installing the gear clevis (example)

#### NOTICE

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.

- 5 If the stroke pipe clevis (C) 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.

**NOTICE**

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.

- 6 Attach the stroke pipe (C) using a mounting bolt (D) to the fitting (B).
- 7 Secure the mounting bolt (D) with the safety clip (A).
- 8 You may now connect the drive's electrical connection (refer to section 5.2.2).

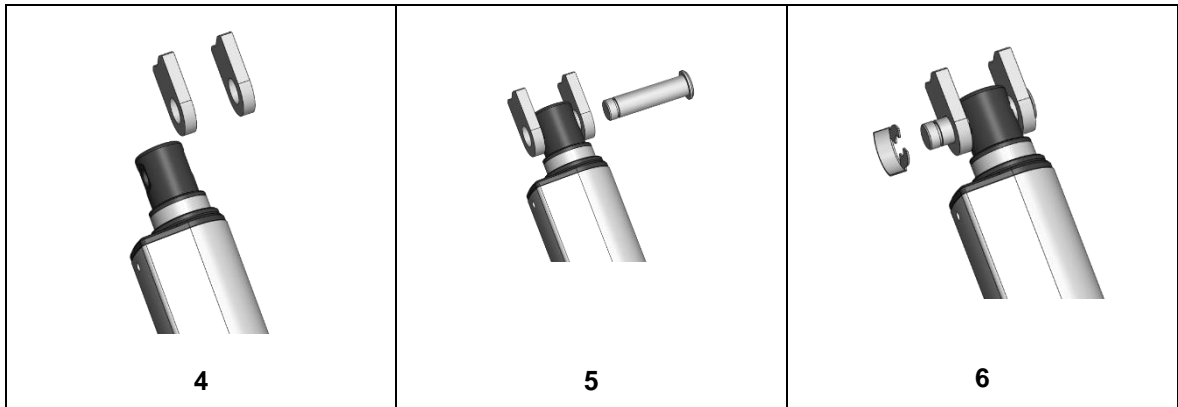


Figure 16 Steps for installing the stroke pipe (example)

### 5.2.2 Electrical connection



#### CAUTION

##### **Danger of pinching/crushing injuries!**

The electrical components may be connected or disconnected only when the mains power and the battery plug (when present) are disconnected. This ensures that uncontrolled movements cannot be triggered.

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

#### **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,  
or
- 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.

### 5.2.3 Dismantling



#### CAUTION

##### **Danger of pinching/crushing injuries!**

- The electrical components may be connected or disconnected only when the mains power and the battery plug (when present) are disconnected. This ensures that uncontrolled movements cannot be triggered.
- 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.

- 1 Move your product into a position where it is supporting no load.
- 2 If multiple drives are connected electrically, they should be disconnected from each other.
- 3 Remove the security clips and the mounting bolt.

## 6. Notes on operation

These 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 components (as defined in the Machinery Directive as a "partially assembled piece of machinery").

### Power-on time / intermittent operations

<b>NOTICE</b>
<p>The MICRODRIVE 3 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). The drive can overheat when these pauses are not maintained.</p> <p>The MICRODRIVE 3 drive must operate with an intermittent duty of 1 min. ON / 8 min. OFF. This means that after the unit is operated with its rated load for up to one minute it must then be paused for 8 minutes.</p>

### Shutting off the drive

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

### Avoiding cable damage

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

<b>NOTICE</b>
<p>The cables (in particular the electrical connection for the drive and the power supply cable for the drive system) must not be squashed or crushed. In order to prevent damage to the drive, no mechanical strain should be placed on the cables.</p>

## 7. Maintenance and cleaning

### 7.1 Maintenance

- ▶ The MICRODRIVE 3 drive does not require maintenance.

### 7.2 Cleaning

- ▶ Clean the MICRODRIVE 3 drive as needed using a dry, antistatic cloth.

<b>NOTICE</b>
<ul style="list-style-type: none"><li>• Always disconnect the mains power plug from the drive system (and the battery plug if present) before you start to clean the unit!</li><li>• Never clean the drive in an automated washing system or with a high-pressure cleaner. Do not allow fluids to penetrate the drive. Damage to the system could result.</li><li>• Do not use a cleanser that contains benzene, alcohol or similar solvents.</li><li>• Make sure that you do not damage the drive's connecting cable.</li></ul>

## 8. Disposal

### 8.1 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)).

### 8.2 Drive components

The MICRODRIVE 3 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 MICRODRIVE 3 drive.

The disposal of the product is regulated in Germany by Elektro-G, internationally by the EU Directive 2012/19/EC (WEEE), or by any applicable national laws and regulations.



The MICRODRIVE 3 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 Kirchlegern  
Deutschland - Germany

erklärt hiermit, dass nachstehend beschriebene  
unvollständigen Maschinen

*declares that the incomplete machines described  
below*

### **MICRODRIVE 3 MDZ3 MICRODRIVE 3 MD1-3 MICRODRIVE 3 MD2-3**

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 Kirchlegern  
Tel.: 05223 979-0  
Deutschland - Germany

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



Kirchlegern, Germany 25 November 2019

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

## 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 Kirchlegern  
Deutschland - Germany

erklärt hiermit, dass das Produkt

*declares that the following product*

**MICRODRIVE 3 MDZ3  
MICRODRIVE 3 MD1-3  
MICRODRIVE 3 MD2-3**

**mit DewertOkin-Steuerung / with DewertOkin control unit**

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/A11:2014
- 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)!*



Kirchlegern, Germany 25 November 2019

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

## **Additional information**

MICRODRIVE 3

- UL692
- CSA C22.2 No.68

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