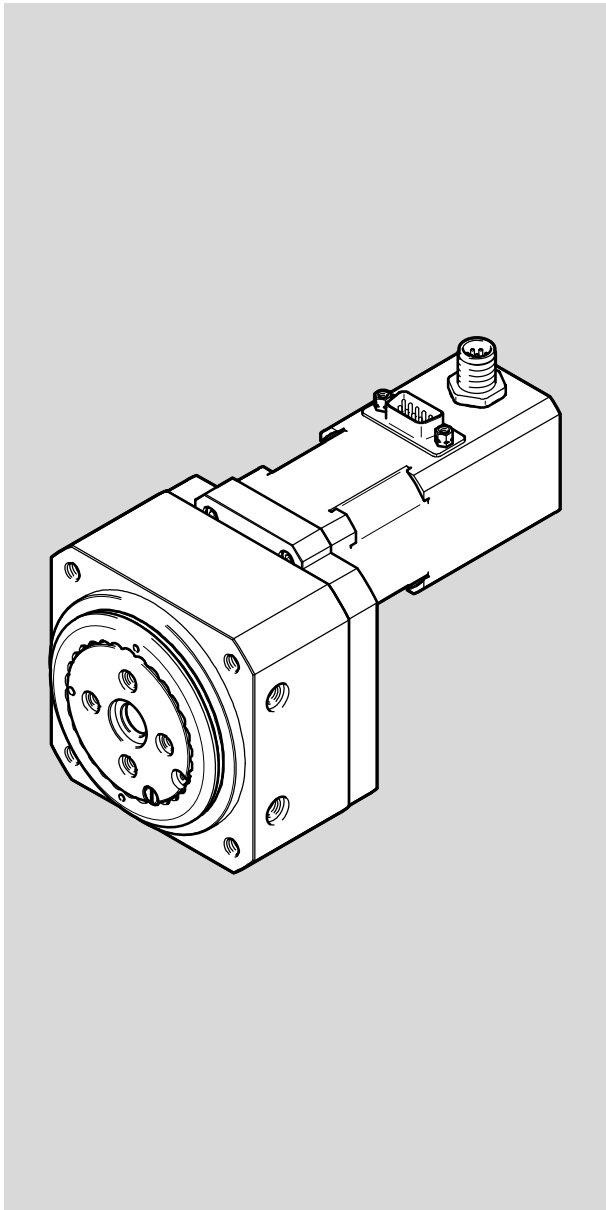


# Rotary drive

## ERMO



# FESTO

en Operating instructions

8076313  
2017-11a  
[8076315]

Translation of the original instructions

Symbols:



Warning

Installation and commissioning may only be performed in accordance with these instructions by technicians with appropriate qualifications.



Caution



Note



Environment



Accessories

# English – Rotary drive ERMO

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## Documentation on the product

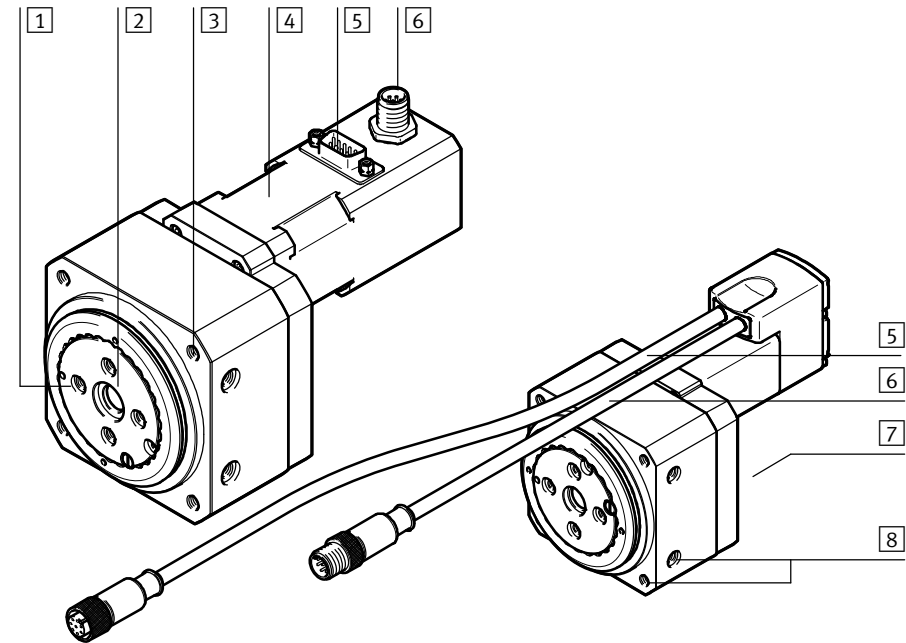


For all available product documentation → [www.festo.com/pk](http://www.festo.com/pk)

## 1 Configuration

ERMO-25/32

ERMO-12/16



- |  |  |
|--|--|
| <p>1 Thread/centring holes for attachment components</p> <p>2 Rotating plate</p> <p>3 Thread for mounting</p> <p>4 Motor</p> | <p>5 Connection for the motor/holding brake</p> <p>6 Encoder connection</p> <p>7 Thread for proximity sensor (reverse side)</p> <p>8 Thread for mounting</p> |
|--|--|

Fig. 1



### Note

You receive specially preconfigured drive and controller combinations with the OMS system (Optimized Motion Series → [www.festo.com](http://www.festo.com)).

## 2 Safety

### 2.1 Intended use

The ERMO rotary drive in combination with the controllers CMMO-ST or CMMS-ST is intended for swivelling payloads (permissible controller → [www.festo.com/catalogue](http://www.festo.com/catalogue)). The product is intended for use in industrial environments. Measures for interference suppression may need to be implemented in residential areas.

### 2.2 General safety information

- Take into consideration the legal regulations applicable for the location.
- Only use the product if it is in its original status and in an excellent technical status.
- Use the product only within the defined values (→ 12 Technical data and 13 Characteristic curves).
- Take into account the labelling on the product.
- Do not make any unauthorised modifications to the product.
- Observe other applicable documents.
- Take into consideration the ambient conditions at the location of use.
- Protect the product during storage and operation from damaging influences. These influences include:
  - Wetness or moisture
  - Corrosive coolant or other materials (e.g. ozone)
  - UV radiation
  - Oils, greases and grease-solvent vapours
  - Grinding dust
  - Glowing chips or sparks

### 2.3 Mounting and connecting

- Observe tightening torques. Unless otherwise specified, the tolerance is  $\pm 20\%$ .

### 2.4 Qualification of specialized personnel

Only qualified personnel may perform installation, commissioning, maintenance and disassembly of the drive. The qualified personnel must be familiar with installation and operation of electrical control systems.

## 3 Function

The rotation of the motor is transferred over a helical gear unit to the rotary table. The reference position of the rotary table can be detected with the help of accessories (→ 5.1.3 Mount accessories).

## 4 Transport



### Note

The rotary drive without holding brake is not braked in the de-energised status and can move unexpectedly. Prevent an accidental rotary movement:

- Use motors with integrated holding brake (only available with ERMO-16 ... 32  
→ [www.festo.com/catalogue](http://www.festo.com/catalogue)).

- Take product weight into account (→ 12 Technical data).

## 5 Installation



### WARNING

In case of external movement of the rotary table, open electrical connections can conduct dangerous voltage potentials (generator principle).

- Move the rotary table only with cabled connections.

### 5.1 Installation, mechanical

#### Requirements




### Note

Loss of the homing position with:

- dismantling of the motor (e.g. turning of the motor)  
After this, for ERMO with order variant OMS (Optimized Motion Series), the index signal must be adjusted again to the reference switch. This adjustment is possible via the FCT (Festo Configuration Tool).
- replacement of reference switch
- position change of stop
- After completion of mounting, start homing (→ 6 Commissioning).

- Do not modify the screws and threaded pins.  
Exception: Direct request in these operating instructions to make changes.
- Connect motor cables only after the drive is mounted.

**Mounting position, vertical or diagonal**



**WARNING**  
 Uncontrolled payload if there is a power failure.  
 Injury due to electric shock, impact, or pinching.

- For eccentric attachment components, use only motors with holding brake.
- Check whether safety measures are required to prevent falling (e.g. toothed latches, bolts or emergency buffer).  
 Take appropriate measures, if necessary.

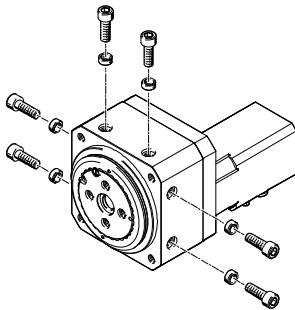
**5.1.1 Mount drive**

**Requirements**

- Place the product in such a way that its control sections are accessible (e.g. proximity sensors).

**Interfaces for mounting components to the profile**

On the side



From the front/rear

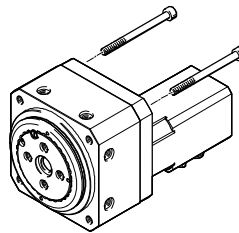


Fig. 2

- Select mounting components or accessories (→ [www.festo.com/catalogue](http://www.festo.com/catalogue)).
- Make sure that mounting components are outside the positioning range.
- Fasten the drive.
- Tighten screws evenly.

Size		12	16	25	32
Screw		M4	M5	M6	M8
Tightening torque	[Nm]	3	5	8	24
Centring hole	[mm]	∅7H7	∅7H7	∅9H7	∅12H7
Max. screw-in depth (Side mounting)	[mm]	7	8	9.5	15

Tab. 1

### 5.1.2 Mount attachment component

- Fasten the attachment component to the rotary table with screws and centring sleeves. Observe maximum screw-in depth and tightening torque (→ Tab. 2).

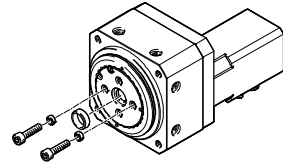


Fig. 3

Size		12	16	25	32
Screw		M3	M4	M5	M5
Max. screw-in depth	[mm]	7	8	8.5	10
Tightening torque	[Nm]	1	3	5	5
Centring					
Screw drill hole	[mm]	Ø5H7	Ø7H7		
Central drill hole	[mm]	Ø12H8	Ø12H8	Ø15H8	Ø20H8

Tab. 2

### 5.1.3 Mount accessories

For use of the proximity sensors as reference switches:  
Select proximity sensors corresponding to the input logic of the used controller (PNP/NPN) (→ [www.festo.com/catalogue](http://www.festo.com/catalogue)).

- Mount proximity sensors:
  - Loosen threaded pin **1** of the clamping component and remove both.
  - Turn rotary table slowly until the marking **3** has reached the position below the drill hole of the threaded pin **1**.  
As a result, the screw head for the switch contact in the threaded hole is visible.
  - Screw the proximity sensor **2** into the thread up to the stop on the screw head.
  - Unscrew the proximity sensor approx. 1.5 turns.  
This results in a distance of 1.5 mm to the screw head of the switch contact.
  - Tighten threaded pin in the clamping component (≅ 2.5 mm).  
Tightening torque:
    - ERMO-12: 0.2 Nm,
    - ERMO-16/25/32: 0.8 Nm.

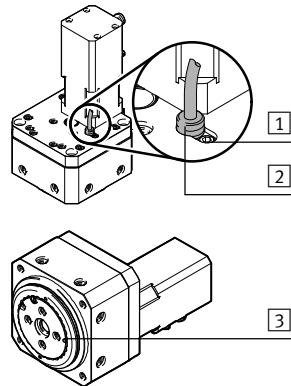


Fig. 4



## 5.2 Installation, electric



**Note**

If unused plug connectors are touched, there is a danger that damage may occur to the ERMO or to other parts of the system as a result of electrostatic discharge (ESD).

- To avoid such discharges: Use protective caps on unused ports.



**Note**

To ensure compliance with EMC safety:

The maximum length of the individual cables should not exceed 30 m.

1. Switch off power to the controller and secure it from being restarted accidentally.  
Cancelling the enable signal on the controller is not sufficient.

2. Wire the motor to the controller in accordance with the following tables.

The pre-assembled cables from Festo offer sufficiently large cable cross-sections as well as screening of the motor/encoder cable with earth contact on both sides (→ 10 Accessories).

**Motor connection/holding brake: round plug (8-pin)/Sub-D plug connector (9-pin, 5 → Fig. 1)**

Pin	Allocation	ERMO-12/16	ERMO-25/32
1	String A		
2	String A/		
3	String B		
4	String B/		
5	n.c.		
6	n.c.		
7	Holding brake +24 V <sup>1)</sup>		
8	Holding brake GND <sup>1)</sup>		
9	n.c.		

1) Only for motors with holding brake ERMO-16/25/32-ST-EB

Tab. 3

ERMO

Encoder connection: round plug (8-pin, 6 → Fig. 1)<sup>1)</sup>

Pin	Allocation	ERMO-12/16/25/32
1	Signal trace A	
2	Signal trace A/	
3	Signal trace B	
4	Signal trace B/	
5	GND encoder	
6	Signal trace N	
7	Signal trace N/	
8	VCC auxiliary supply 5 V	

1) Only for motors with encoder ERMO-...-ST-E

Tab. 4

## 6 Commissioning



**WARNING**

Unexpected movement of components.  
Injury due to electric shock, impact, or pinching.

- Protect positioning range from access (e.g. with protective guards).
- Make sure that no foreign objects are present in the positioning range.
- Carry out commissioning with low speeds and torques.

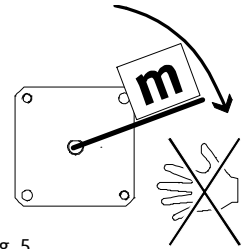


Fig. 5



**Note**

Commissioning of the preconfigured drive and controller combination with the OMS system (Optimized Motion Series) is described in the fast start instructions (→ [www.festo.com/sp](http://www.festo.com/sp)).

Procedure	Purpose	Note
1. Check travel	Determining the approach direction of the motor	Even with identical control, motors of the same design can turn in opposite directions due to different wiring.
2. Homing	Comparison of the real situation to the image in the controller	Homing takes place: <ul style="list-style-type: none"> <li>– to the reference switch</li> <li>– against an end stop (e.g. with stop kit EADP). Comply with max. impact energy (→ Tab. 6)</li> <li>– to the limit switch (only for controller CMMS-ST). Observe additional information (→ Operating instructions of the drive system).</li> </ul>
3. Test run	Checking the overall behaviour	Check the following requirements: <ul style="list-style-type: none"> <li>– Rotary table moves through the intended positioning cycle completely.</li> <li>– If present, the rotary table stops when the limit switch is reached.</li> </ul> After a successful test run, the rotary drive is ready for operation.

Tab. 5

Size		12	16	25	32
Max. impact energy	[J]	$0.2 \times 10^{-4}$	$0.7 \times 10^{-4}$	$1.6 \times 10^{-4}$	$2.9 \times 10^{-4}$

Tab. 6

## 7 Maintenance



### WARNING

Unexpected movement of components.  
Injury due to electric shock, impact, or pinching.

- For all work on the drive, switch off power to the system and secure it from being restarted accidentally.

- Clean the drive as required with a soft cloth. Do not use aggressive cleaning agents.

## 8 Disassembly and repair



### WARNING

Unexpected movement of components.  
Injury due to electric shock, impact, or pinching.

- For all work on the drive, switch off power to the system and secure it from being restarted accidentally.
- Observe notes on transport (→ 4 Transport).

- Remove motor cables and mounting screws.

In case of repair:

- Send drive to Festo or contact Festo service (→ [www.festo.com/sp](http://www.festo.com/sp)).
- Festo carries out the required repairs, fine adjustments and checks.
- Information about spare parts and accessories (→ [www.festo.com/spareparts](http://www.festo.com/spareparts)).

## 9 Disposal

- Dispose of the packaging and the drive at the end of its useful life through environmentally friendly recycling in accordance with applicable regulations.

## 10 Accessories

→ [www.festo.com/catalogue](http://www.festo.com/catalogue)

## 11 Fault clearance

<b>Malfunction</b>	<b>Possible cause</b>	<b>Remedy</b>
Squeaking noises, vibrations or the drive is not running smoothly.	Tension	Change arrangement of the tool/payload. Change travel speed.
	Controller incorrectly set	Change controller parameters.
Rotating plate does not move.	Loads too high	Reduce payload/torques.
	Fastening screws of the tool too long	Observe max. screw-in depth (→ 5.1.2 Mount attachment component).
	Brake closed	Check wiring, open brake.
Rotary table runs over reference position.	Proximity switch does not switch.	Check proximity switch, connections, controller and control system.

Tab. 7

## 12 Technical data

### 12.1 Mechanical data

Size <sup>1)</sup>		12	16	25	32
Design		Electromechanical rotary drive with stepper motor and integrated gear unit			
Mounting position		Any			
Max. axial force	[N]	180	290	350	450
Max. radial force	[N]	200	300	450	550
Nominal torque <sup>2)</sup>	[Nm]	0.15	0.8	2.5	5
Holding torque	[Nm]	0.33	0.8	4	7
Nominal rotary speed	[rpm]	100		66	50
Max. speed	[rpm]	200		150	100
Permissible mass moment of inertia	[kgcm <sup>2</sup> ]	3	13	65	164
Repetition accuracy	[°]	±0.05			±0.1
Torsional backlash (new)	[°]	0.2			
Ambient temperature	[°C]	0 ... +50			
Storage temperature	[°C]	-20 ... +60			
Relative air humidity	[%]	0 ... 85 (non-condensing)			
Degree of protection		IP40			
Vibration and shock resistance					
Vibration in accordance with IEC 60068-2-6:2007-12		0.15 mm, 10 ... 58 Hz 20 m/s <sup>2</sup> , 58 ... 150 Hz			
Shock in accordance with IEC 60068-2-27:2008-02		150 m/s <sup>2</sup> , 11 ms			
Continuous shock in accordance with IEC 60068-2-27:2008-02		150 m/s <sup>2</sup> , 6 ms			
Note on materials		Contains paint-wetting impairment substances			
Materials					
Housing, clamping ring, rotary table		Anodised aluminium			
Sealing ring		NBR			
Ball bearing, screws		Steel			
Product weight					
Without brake	[kg]	0.475	0.90	1.35	2.20
With brake	[kg]	–	0.96	1.50	2.38

1) The PositioningDrives engineering software is available for sizing (→ [www.festo.com/sp](http://www.festo.com/sp)).

2) Theoretical torque at nominal rotary speed

## 12.2 Electrical data

Size	12	16	25	32
<b>Motor ERMO-...-ST</b>				
Nominal operating voltage DC [V]	24			
Nominal current [A]	0.8	1.4	3.0	4.2
Step angle with full step [°]	1.8 ± 5 %			
<b>Brake ERMO-...ST-B</b>				
Operating voltage DC [V]	–	24 ± 10 %		
Rated output [W]	–	8		
Holding torque [Nm]	–	1	2.5	2.5
Mass moment of inertia [kgcm <sup>2</sup> ]	–	0.69	1.3	1.3
<b>Encoder ERMO-...ST-E</b>				
Rotary position encoder	Encoder, optical, incremental			
Rotary position encoder interface	RS422 TTL AB-chan. + zero index			
Pulses/revolution	500			
Zero pulse	Yes			
Nominal DC operating voltage [V]	5			
Insulation protection class	B (130 °C)			
CE marking (see declaration of conformity) <sup>1)2)</sup>	according to EU EMC Directive			

1) The device is intended for use in an industrial environment.

Measures for interference suppression may need to be implemented in residential areas.

2) Maximum length of the individual connecting cables: 30 m

Tab. 9

## 13 Characteristic curves

Torque M as a function of speed n

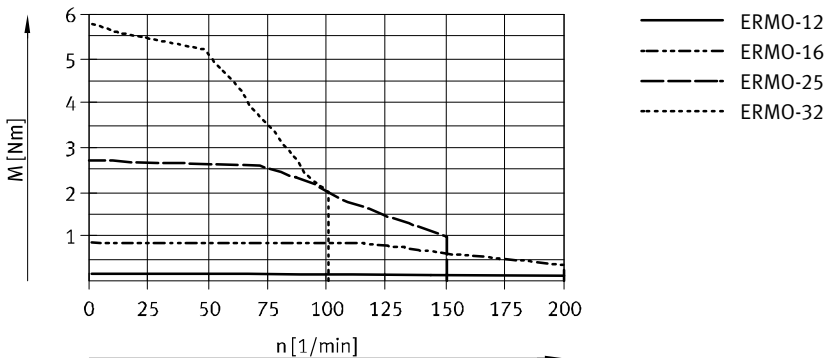


Fig. 6

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