

Rotary drive units ERMS

FESTO



This product is also available as a modular mechanical system
Rotary drive ERMO



Key features

At a glance

Plug and work with the Simplified Motion Series

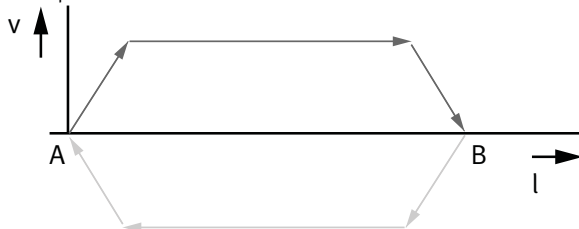


The simplicity of pneumatics is now combined for the first time with the advantages of electric automation thanks to the Simplified Motion Series. These integrated drives are the perfect solution for all users who are looking for an electric alternative for very simple movement and positioning tasks between two mechanical end positions, but don't want the commissioning process for traditional electric drive systems that can often be quite complex.

Integrated	Simple	Standardised	Connected
The integrated electronics in the drive are at the core of the Simplified Motion Series.	For commissioning, simply set all relevant parameters directly on the drive: <ul style="list-style-type: none"> • Speed and force • Reference end position and cushioning • Manual operation 	Electrical connection via M12 plug design <ul style="list-style-type: none"> • Power (4-pin): power supply for the motor • Logic (8-pin): control signal, sensor signal and power for the integrated electronics 	Use of extended functions possible via IO-Link: <ul style="list-style-type: none"> • Motion parameters can be set remotely • Copy and backup function for transferring parameters • Read function for extended process parameters

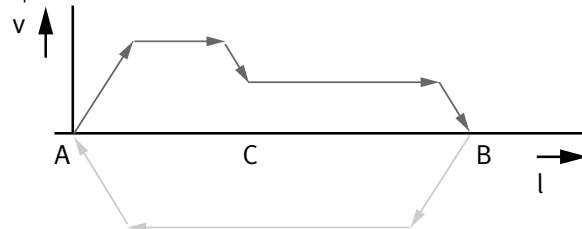
The functions of the Simplified Motion Series

Basic profile for movement between two end positions: with speed control



- These drives are designed for simple movements between two end positions.
- Proximity sensors are required in order to implement any intermediate positions.

Extended motion profile for simplified press-fitting and clamping functions: with speed and force control



The products in the Simplified Motion Series

Spindle axis unit
ELGS-BS-KF



Toothed belt axis unit
ELGS-TB-KF



Mini slide unit
EGSS-BS-KF



Electric cylinder unit
EPCS



Toothed belt axis unit
ELGE



Rotary drive unit
ERMS



Electric cylinder unit
EPCE



Key features

At a glance



- Without external servo drive: all the necessary electronic components are combined in the integrated drive
- Two control options integrated as standard: digital I/O and IO-Link
- Complete solution for simple movements between mechanical end positions
- Simplified commissioning: all parameters can be manually set directly on the drive
- No special expertise required for commissioning
- End-position feedback similar to that of a conventional proximity sensor is integrated as standard
- Sealed hollow shaft for the integrated through-feed of cables and tubing
- Standardised mounting interface for direct connection to the electric mini slides EGSL, EGSC and EGSS

Modular and flexible with motor, motor mounting kit and servo drive

This product is also available within the Optimised Motion Series as rotary drive ERMO:



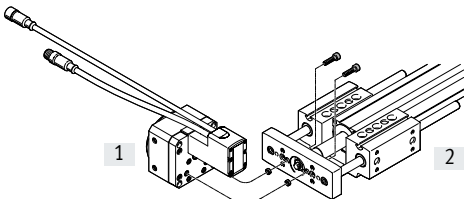
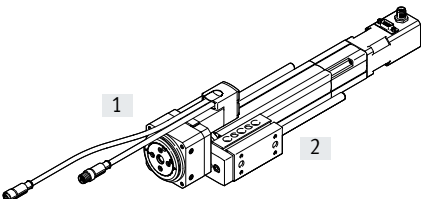
Rotary drive and motor in one unit. Compact and powerful rotating and swivelling with no limits. Sturdy and precise owing to backlash-free ball bearing.

- Rotary drive in 4 sizes for torque of up to 5 Nm
- Hollow shaft for energy through-feed for attachments
- Optional pneumatic or electric energy chain
- Optional proximity sensor for homing or position sensing
- Optional holding brake
- Modular: individual combinations with servo drive

Key features

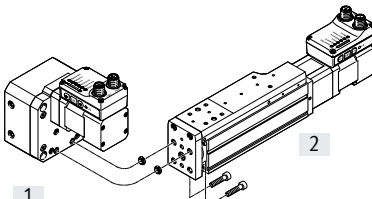
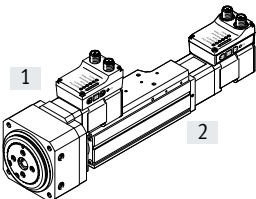
Possible combinations with Festo drives

Rotary drive unit ERMS on electric cylinder EPCO



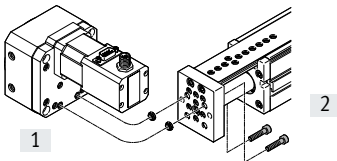
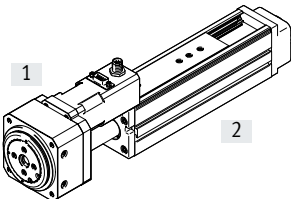
Size		Accessories	
[1] ERMS	[2] EPCO	Centring sleeve	Screw
25	40	ZBH-7 (x2)	M5x20 (x2)

Rotary drive unit ERMS on mini slide unit EGSS



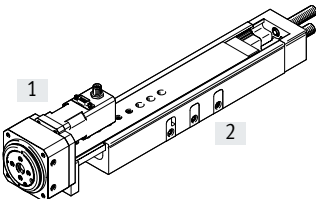
Size		Accessories	
[1] ERMS	[2] EGSS	Centring sleeve	Screw
25	45, 60	ZBH-7 (x2)	M5x12 (x2)
32	60	ZBH-7 (x2)	M5x15 (x2)

Rotary drive unit ERMS on mini slide EGSL

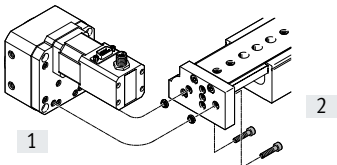


Size		Accessories	
[1] ERMS	[2] EGSL	Centring sleeve	Screw
25	55	ZBH-7 (x2)	M5x14 (x2)
32	55	ZBH-7 (x2)	M5x14 (x2)

Rotary drive unit ERMS on mini slide DGSL



The proximity sensor SIEN cannot be used as a reference sensor on the ERMO when ERMO-12 is combined with DGSL-12.



Size		Accessories	
[1] ERMS	[2] DGSL	Centring sleeve	Screw
25	20	ZBH-9-7 (x2)	M5x22 (x2)
25	25	ZBH-9-7 (x2)	M5x22 (x2)

Type codes

001	Series	
ERMS	Rotary drive	

002	Size	
25	25	
32	32	

003	Nominal swivel angle	
90	90°	
180	180°	

004	Motor type	
ST	Stepper motor ST	

005	Controller	
M	Integrated	

006	Control panel	
H1	Integrated	

007	Bus protocol/activation	
PLK	PNP and IO-Link®	
NLK	NPN and IO-Link®	

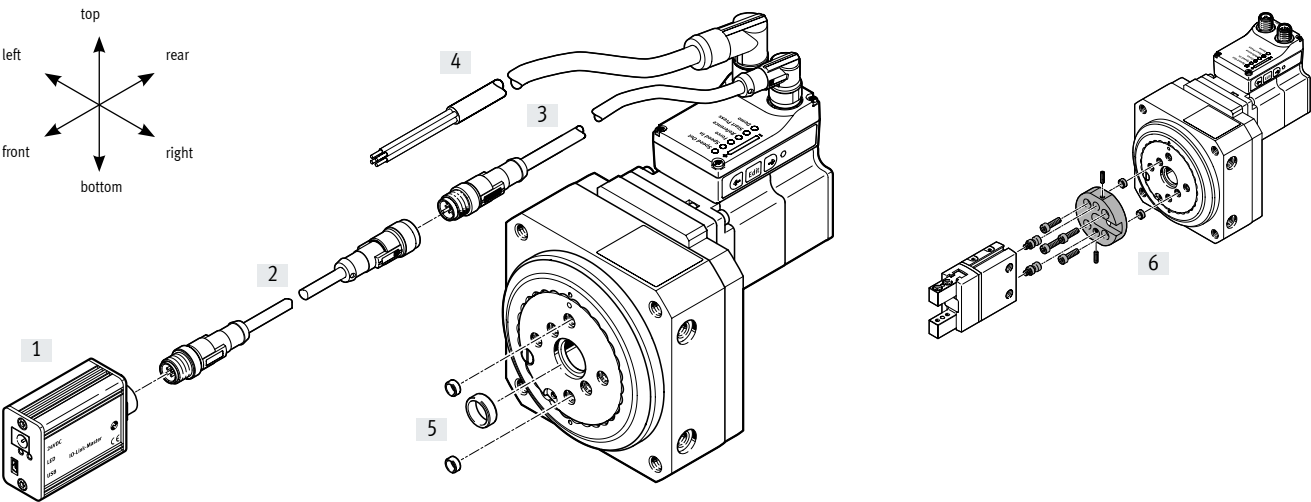
008	End-position sensing	
AA	With integrated end-position sensing	

009	Cable outlet direction	
	Standard	
L	Left	
R	Right	

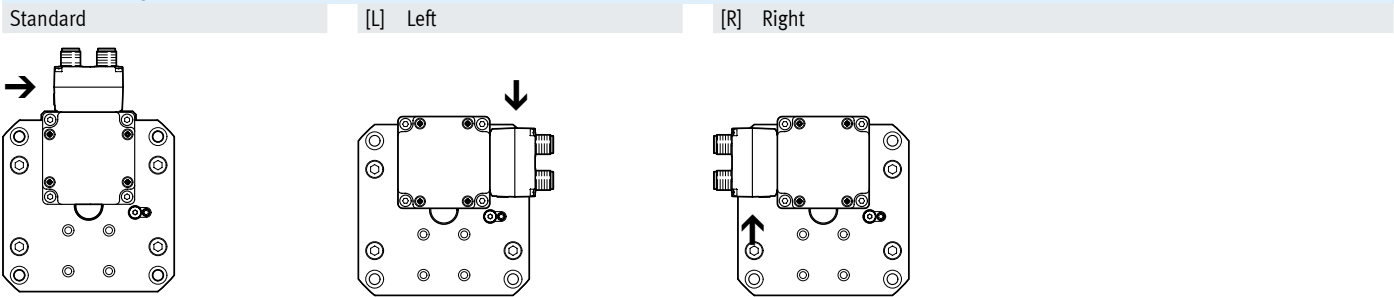
010	Electrical accessories	
	None	
L1	Adapter for operation as IO-Link® device	

011	Operating instructions	
	With operating instructions	
DN	No operating instructions	

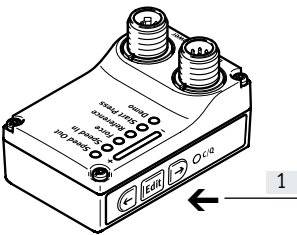
Peripherals overview



Motor mounting variants



Control elements





[1] Pushbutton actuators for parameterisation and control

Peripherals overview

Accessories		
	Type/order code	Description
		→ Page/Internet
[1]	IO-Link master USB CDSU-1	For straightforward use of the mini slide unit via IO-Link
[2]	Adapter NEFC-M12G8	<ul style="list-style-type: none"> • Connection between the motor and the IO-Link master • Only for use with IO-Link Port Class A Master (recommended)
[3]	Connecting cable NEBC-M12	For connection to a controller
[4]	Supply cable NEBL-T12	For connecting load and logic supply
[5]	Centring sleeve ZBH	<ul style="list-style-type: none"> • For centring attachments • For centring the rotary drive
[6]	Adapter kit DHAA	For drive/gripper connections
		adapter kit

Data sheet

-  Size
25, 32
-  Rotation angle
90°, 180°



General technical data					
Size		25		32	
Design		Electromechanical rotary drive with integrated drive			
Rotation angle		90, 180			
Gear ratio		9:1		7:1	
Mounting position		Optional			
Additional functions		Integrated end-position sensing			
		User interface			
Display		LED			
Homing		Positive fixed stop block			
		Negative fixed stop block			
Type of mounting		Via female thread			
Max. cable length					
Inputs/outputs		[m]	15		
IO-Link operation		[m]	20		
Product weight		[g]	1472		2304

Mechanical data			
Size		25	32
Permissible mass moment of inertia	[kgcm ²]	65	164
Peak torque	[Nm]	2.7	5.6
Max. speed	[rpm]	150	100
Max. speed at 90°	[rpm]	105	100
Speed press	[rpm]	3	2
Angular acceleration	[rad/s ²]	≤140	
Repetition accuracy	[°]	±0.05	±0.1
Torsional backlash ¹⁾	[°]	0.2	0.2

1) Without load in new condition

Data sheet

Electrical data			
Size		25	32
Motor			
Nominal voltage DC	[V]	24 (±15%)	
Nominal current	[A]	3	5.3
Max. current consumption (load)	[A]	3	5.3
Max. current consumption (logic)	[mA]	300	
Encoder			
Rotor position encoder		Absolute encoder, single turn	
Rotor position encoder measuring principle		Magnetic	
Rotor position encoder resolution		[bit]	16

Interfaces			
Size		25	32
Parameterisation interface			
IO-Link		Yes	
User interface		Yes	
Digital inputs			
Quantity		2	
Switching logic		PNP	
		NPN	
Characteristics		Not galvanically isolated	
		Configurable	
Specification		Based on IEC 61131-2, type 1	
Operating range		[V]	24
Digital outputs			
Quantity		2	
Switching logic		PNP	
		NPN	
Rotor position encoder		Absolute encoder, single turn	
Characteristics		Not galvanically isolated	
		Configurable	
Max. current		[mA]	100

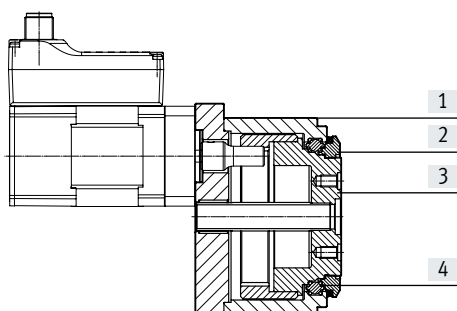
Data sheet

Technical data – IO-Link		
Size	25	32
SIO mode support	Yes	
Communication mode	COM3 (230.4 kBd)	
Connection technology	Plug	
Port class	A	
Number of ports	1	
Process data width OUT	[byte]	2
Process data content OUT	[bit]	1 (Move in)
	[bit]	1 (Move out)
	[bit]	1 (Quit Error)
Process data width IN	[byte]	2
Process data content IN	[bit]	1 (State Device)
	[bit]	1 (State Move)
	[bit]	1 (State in)
	[bit]	1 (State out)
Service data content IN	[bit]	32 (Force)
	[bit]	32 (Position)
	[bit]	32 (Speed)
Minimum cycle time	[ms]	1
Data memory required	[kilobyte]	0.5
Protocol version	Device V 1.1	
Operating and environmental conditions		
Size	25	32
Insulation class	B	
Ambient temperature	[°C]	0 ... +50
Storage temperature	[°C]	–20 ... +60
Note on ambient temperature	Above an ambient temperature of 30°C, the power must be reduced by 2% per K	
Temperature monitoring	Switch-off for excessive temperature	
	Integrated precise CMOS temperature sensor with analogue output	
Relative humidity	[%]	0 ... 85
Protection class	III	
Degree of protection	IP40	
Duty cycle	[%]	100
CE marking	To EU EMC Directive	
	To EU RoHS Directive	
KC mark	KC EMC	
Certification	RCM compliance mark	
Vibration resistance	Transport application test with severity level 1 to FN 942017-4 and EN 61800-2 and EN 61800-5-1	
Shock resistance	Shock test with severity level 1 to FN 942017-5 and EN 61800-2	
Maintenance interval	Lifetime lubrication	

Data sheet

Materials

Sectional view



Rotary drive

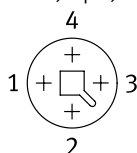
[1]	Housing	Anodised wrought aluminium alloy
[2]	Clamping ring	Anodised wrought aluminium alloy
[3]	Rotating plate	Anodised wrought aluminium alloy
[4]	Ball bearing	Rolled steel
	Sealing ring	NBR
	Note on materials	RoHS-compliant
		Contains paint-wetting impairment substances

Pin allocation

Power supply

Plug

M12x1, 4-pin, T-coded to EN 61076-2-111

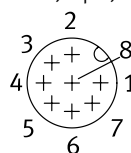


Pin	Function
1	Power voltage supply (24 V DC)
2	Reference potential, power voltage supply (GND)
3	Reserved, do not connect
4	Functional earth (FE)

Logic interface

Plug

M12x1, 8-pin, A-coded to EN 61076-2-101



When used with digital I/O

Pin	Function
1	Logic voltage supply (24 V DC)
2	Digital output 1 (State "In")
3	Digital output 2 (State "Out")
4	Reference potential, logic voltage supply (GND)
5	Digital input 1 (Move "In")
6	Digital input 2 (Move "Out")
7	Reserved, do not connect
8	Reference potential, logic voltage supply (GND)

When used with IO-Link

Pin	Function
1	L+ IO-Link power supply (24 V DC)
2	Reserved, do not connect
3	C/Q communication with the IO-Link master
4	L – Reference potential, IO-Link power supply (0 V)
5	Reserved, do not connect
6	Reserved, do not connect
7	Reserved, do not connect
8	L – Reference potential, IO-Link power supply (0 V)

Data sheet

Sizing example

Application data:

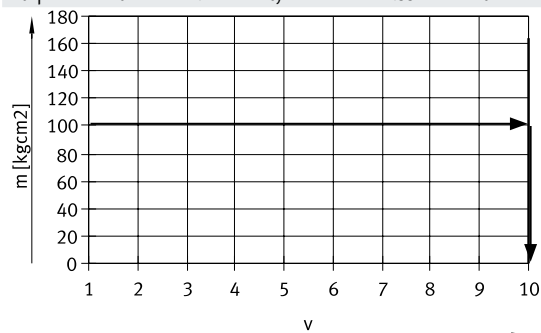
- Mass moment of inertia: 100 kgcm²
- Mounting position: horizontal
- Rotation angle: 180°
- Max. permitted positioning time: 1 s (one direction)

Step 1: Selection of the possible size from the table → page 8

Mechanical data		
Size	25	32
Permissible mass moment of inertia [kgcm ²]	65	164

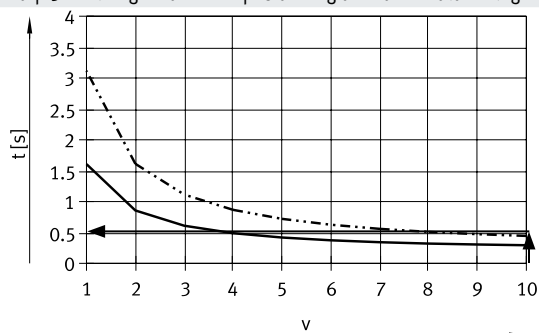
→ Smallest possible size: ERMS-32-180

Step 2: Selection of max. velocity level v for mass moment of inertia



→ Max. speed level for payload: level 10

Step 3: Reading off the min. positioning time t for rotation angle



— 90°
 - - - 180°

→ Min. positioning time for 180° at level 10: 0.5 s

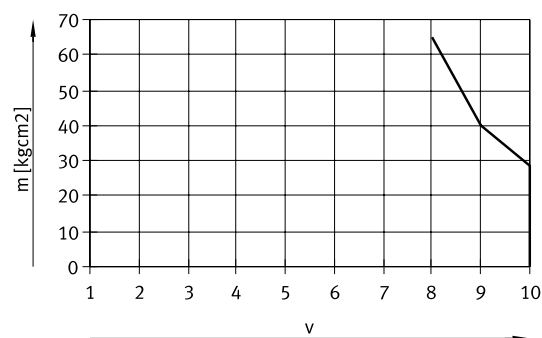
Result

The application can be implemented using ERMS-32-180. A minimum positioning time (one direction) of 0.5 s is achieved. Longer positioning times can be selected at any time using a lower speed level.

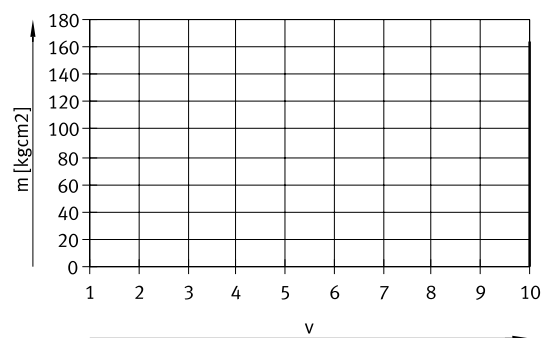
Data sheet

Mass moment of inertia m as a function of velocity level v

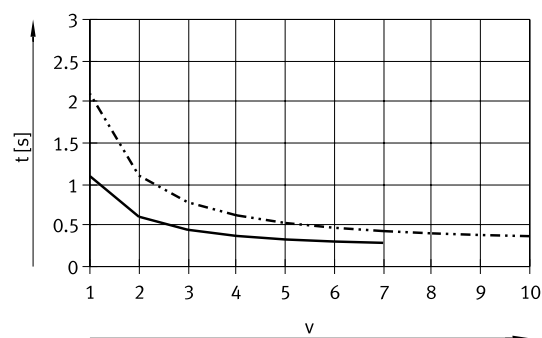
Size 25



Size 32

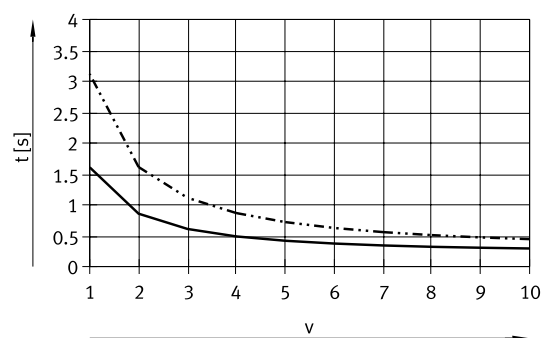
Positioning time t as a function of velocity level v and rotation angle

Size 25

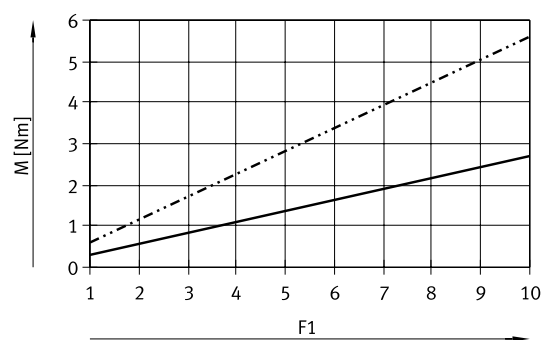


— 90°
 - - - 180°

Size 32



— 90°
 - - - 180°

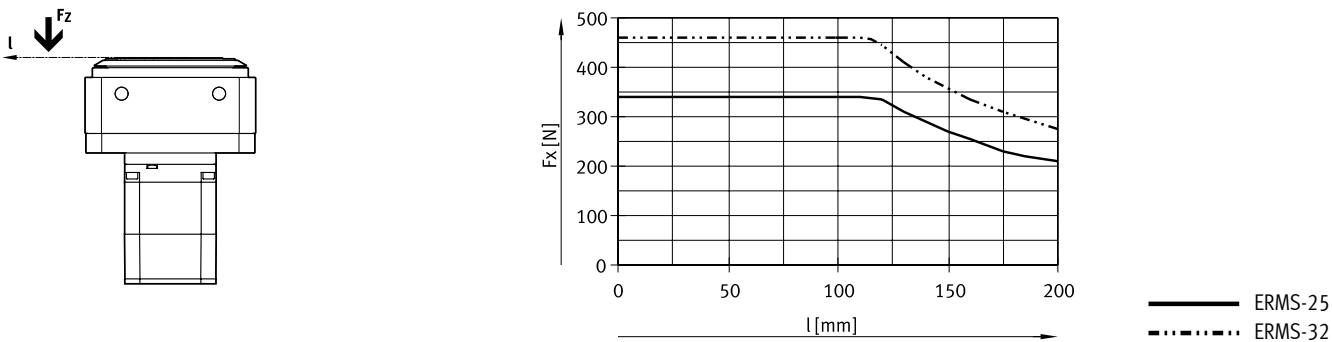
Torque M as a function of force level $F1$ 

— ERMS-25
 - - - ERMS-32

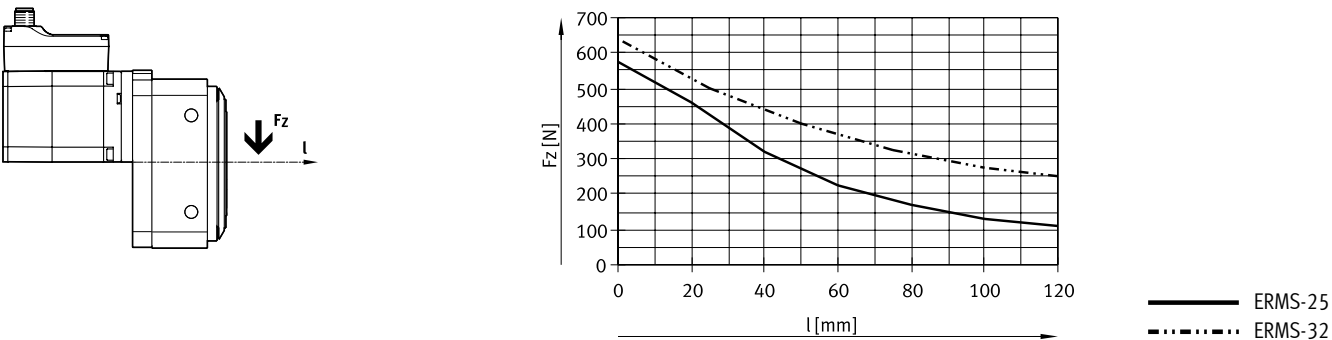
Data sheet

Max. permissible axial and radial force F _x /F _z			
Size		25	32
Static			
Axial force F _x	[N]	700	800
Radial force F _z	[N]	1200	2000
Dynamic			
Axial force F _x	[N]	350	450
Radial force F _z	[N]	450	550

Max. dynamic axial force F_x as a function of lever arm l



Max. dynamic radial force F_z as a function of lever arm l

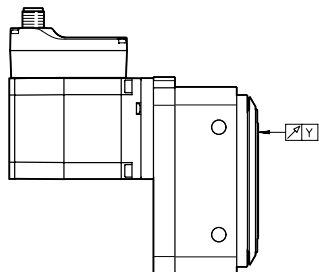


Data sheet

Axial eccentricity and concentricity

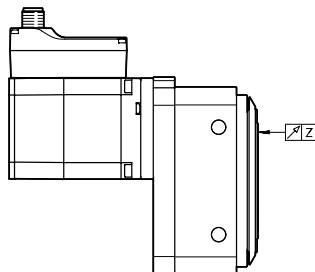
Axial eccentricity

Measured on the surface of the rotating plate at the plate edge, when new.



Concentricity

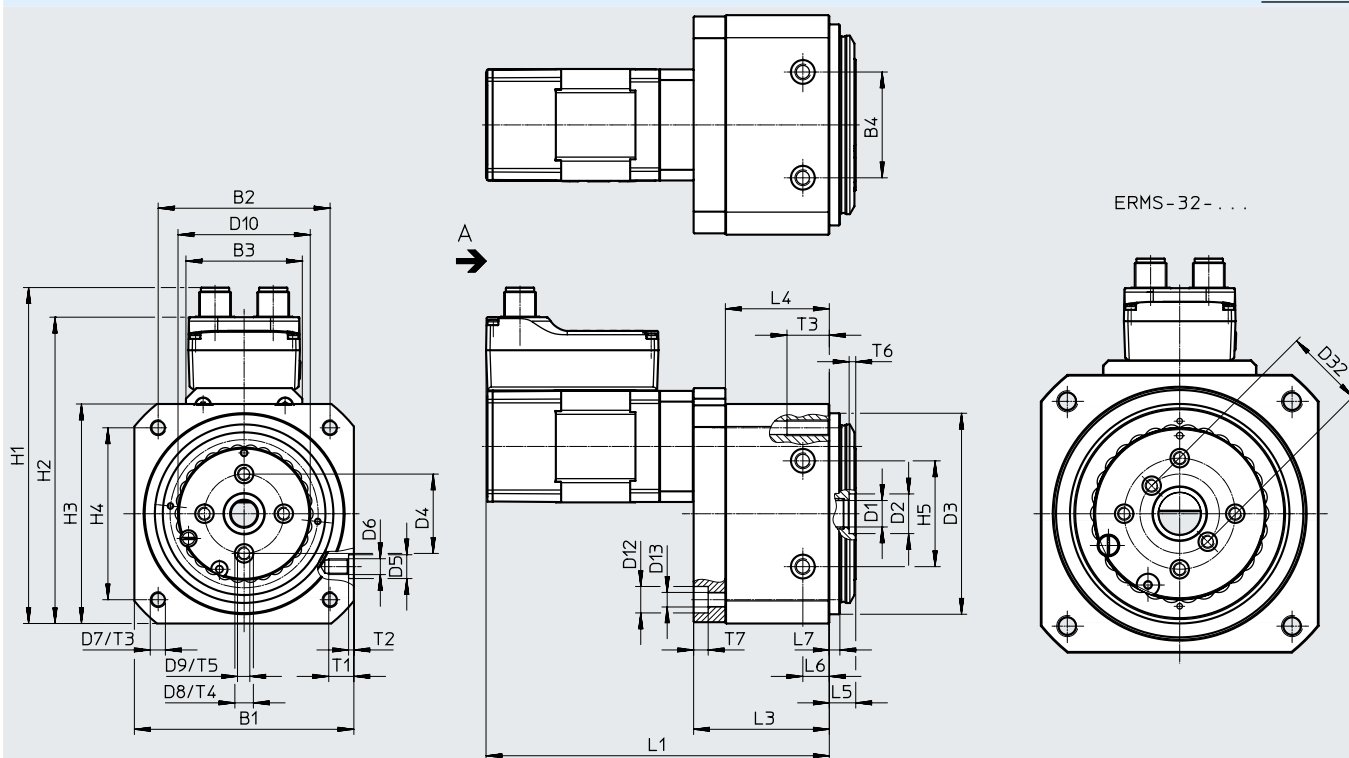
Measured at the centring hole of the rotating plate, when new.



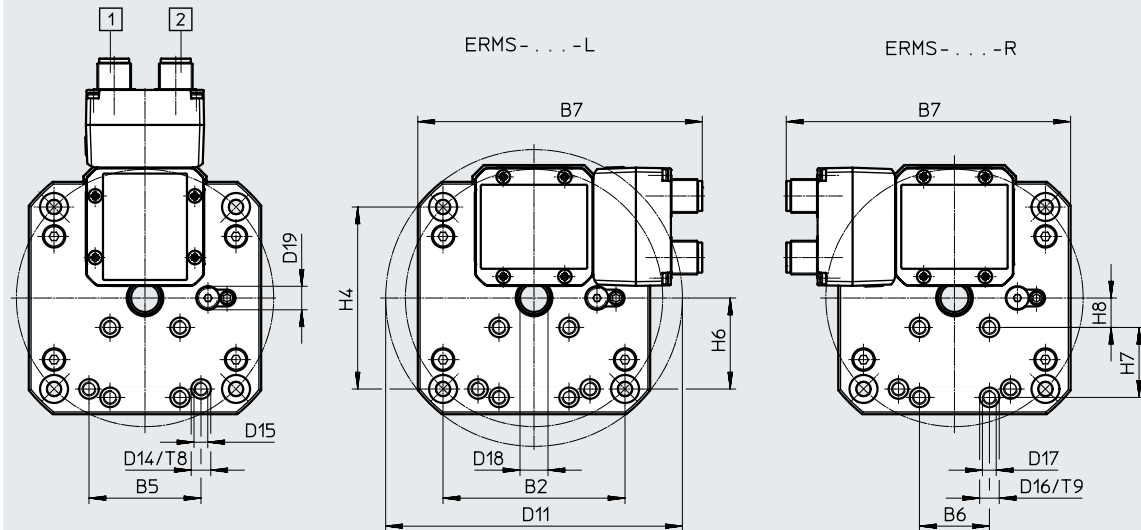
Size		25	32
Axial eccentricity Y	[mm]	<0.02	<0.04
Concentricity Z	[mm]	<0.02	<0.04

Data sheet

Dimensions

Download CAD data → www.festo.com

View A



- [1] Connection to logic interface
- [2] Connection for power supply

Data sheet

Size	B1 ±0.3	B2	B3	B4 ±0.03	B5 ±0.02	B6 ±0.02	B7	D1 ∅	D2 ∅ H8	D3 ∅ f8	D4 ∅ ±0.02
25	83	65	44	40	40	25	101.6	10	15	76	30
32	105	85	58	60	–	25	120	16	20	96	42

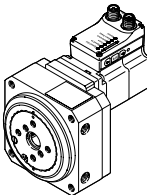
Size	D5 ∅ H7	D6	D7	D8 ∅ H7	D9	D10 ∅	D11 ∅ ±0.5	D12 ∅	D13 ∅	D14 ∅ H7	D15
25	9	M6	M6	7	M5	50	106	10	5.5	7	M5
32	12	M8	M8	7	M5	65	135	11	6.6	–	–

Size	D16 ∅ H7	D17	D18 max.	D19	D32 ±0.02	H1	H2	H3 ±0.3	H4	H5 ±0.03
25	7	M5	10	M8x1	–	127.1	115.9	83	65	40
32	7	M5	9	M8x1	30	149	137.8	105	85	60

Size	H6	H7 ±0.02	H8	L1 ±1.5	L3 ±0.6	L4	L5 ±0.2	L6 ±0.1	L7 ±0.1	T1
25	32.5	25	10.5	129.8	51.3	39.3	10	10	4	9.5
32	–	25	15	127	46.5	34.5	12	10	6	15

Size	T2 +0.1	T3	T4 +0.1	T5	T6 +0.1	T7	T8	T9
25	2	16	1.5	8.5	2.5	5.5	1.5	1.5
32	2.5	20	1.5	10	2.8	6.8	–	1.5


Ordering data

Ordering data	Size	Rotation angle	Part no.	Type
	25	90°	8087819	ERMS-25-90-ST-M-H1-PLK-AA
		180	8087820	ERMS-25-180-ST-M-H1-PLK-AA
	32	90°	8087821	ERMS-32-90-ST-M-H1-PLK-AA
		180°	8087822	ERMS-32-180-ST-M-H1-PLK-AA


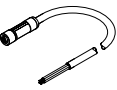
Ordering data – Modular product system



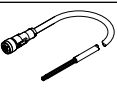
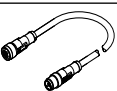
Ordering table					
Size	25	32	Conditions	Code	Enter code
Module no.	8087808	8087809			
Series	ERMS			ERMS	ERMS
Size	25	32		-...	
Nominal swivel angle [°]	90, 180	90, 180		-...	
Motor type	Stepper motor ST			-ST	-ST
Controller	Integrated			-M	-M
Control panel	Integrated			-H1	-H1
Bus protocol/actuation	NPN and IO-Link			-NLK	
	PNP and IO-Link			-PLK	
End-position detection	With integrated end-position sensing			-AA	-AA
Cable outlet direction	Standard				
	Left			-L	
	Right			-R	
Electrical accessories	Without				
	Adapter for operation as IO device			+L1	
Operating instructions	With operating instructions				
	Without operating instructions			DN	

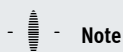
Accessories

Ordering data – Centring sleeves					Data sheets → Internet: zbh
	For size	Description	Part no.	Type	PU ¹⁾
	25	For centring the drive in the case of side mounting	8137184	ZBH-9-B	10
	32		8137185	ZBH-12-B	
	25, 32	For centring attachments on the rotating plate	186717	ZBH-7	
	25	For centring attachments in the middle of the rotating plate	191409	ZBH-15	
	32		150901	SLZZ-25/16	1

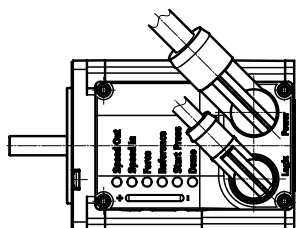
1) Packaging unit

Ordering data – Supply cables					Data sheets → Internet: nebl
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Angled socket, M12x1, 4-pin	Cable, open end, 4-wire	2	8080778	NEBL-T12W4-E-2-N-LE4
			5	8080779	NEBL-T12W4-E-5-N-LE4
			10	8080780	NEBL-T12W4-E-10-N-LE4
			15	8080781	NEBL-T12W4-E-15-N-LE4
	Straight socket, M12x1, 4-pin	Cable, open end, 4-wire	2	8080790	NEBL-T12G4-E-2-N-LE4
			5	8080791	NEBL-T12G4-E-5-N-LE4
			10	8080792	NEBL-T12G4-E-10-N-LE4
			15	8080793	NEBL-T12G4-E-15-N-LE4

Ordering data – Connecting cables					Data sheets → Internet: nebc
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Angled socket, M12x1, 8-pin	Cable, open end, 8-wire	2	8094476	NEBC-M12W8-E-2-N-B-LE8
			5	8094478	NEBC-M12W8-E-5-N-B-LE8
			10	8094481	NEBC-M12W8-E-10-N-B-LE8
			15	8094479	NEBC-M12W8-E-15-N-B-LE8
		Straight plug, M12x1, 8-pin	2	8080786	NEBC-M12W8-E-2-N-M12G8
			5	8080787	NEBC-M12W8-E-5-N-M12G8
			10	8080788	NEBC-M12W8-E-10-N-M12G8
			15	8080789	NEBC-M12W8-E-15-N-M12G8
	Straight socket, M12x1, 8-pin	Cable, open end, 8-wire	2	8094480	NEBC-M12G8-E-2-N-B-LE8
			5	8094477	NEBC-M12G8-E-5-N-B-LE8
			10	8094482	NEBC-M12G8-E-10-N-B-LE8
			15	8094475	NEBC-M12G8-E-15-N-B-LE8
		Straight plug, M12x1, 8-pin	2	8080782	NEBC-M12G8-E-2-N-M12G8
			5	8080783	NEBC-M12G8-E-5-N-M12G8
			10	8080784	NEBC-M12G8-E-10-N-M12G8
			15	8080785	NEBC-M12G8-E-15-N-M12G8


**Note**

The cables are positioned at a 45° angle to the axis.



Accessories

Ordering data – IO-Link master USB					Data sheets → Internet: cdsu
	Description	Cable length [m]	Part no.	Type	
	<ul style="list-style-type: none"> For using the unit with IO-Link An external power supply plug is additionally required (not included in the scope of delivery) 	0.3	8091509	CDSU-1	

Ordering data – Adapter					Data sheets → Internet: nefc
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Straight socket, M12x1, 8-pin	<ul style="list-style-type: none"> Straight plug, M12x1, 5-pin Only for use with IO-Link Port Class A Master (recommended) 	0.3	8080777	NEFC-M12G8-0.3-M12G5-LK