Integrated drives EMCA

New

Integrated drives EMCA

Key features

At a glance

The positioning drive EMCA is a brushless DC motor (EC motor) for positioning tasks with integrated power and control electronics.
That avoids long motor cables, improves the electromagnetic compatibility and reduces the installation time and space requirements.

In detail

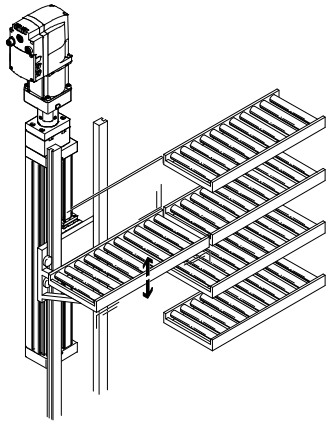
- 64 freely programmable position sets
- Absolute position sensing via:
  - Standard: single-turn absolute encoder
  - Optional: multi-turn absolute displacement encoder with integrated buffer, for saving the position values of movements for up to 7 days (without external power supply). The time can be extended using an external battery box (➔ 23)
- Optional: integrated holding brake including holding brake control
- Bus protocol: CANopen, EtherNet/IP
- Safety function: "safe torque off" (STO)
- Selectable degree of protection:
  - Standard: IP54 housing and connection technology
  - Optional: IP65 housing and connection technology for increased requirements
- Accessories:
  - Gear unit:
    - Standard: flange-mounted gear unit and angle step (in stock)
    - Special gear unit on request
  - Braking resistor:
    - Integrated chopper braking resistor
    - Optional: external braking resistor
- Drive configuration with PositioningDrives
  - Sizing of EMCA and gear unit
  - Braking resistor required: Yes/No
- Commissioning via the Ethernet interface with Festo Configuration Tool (FCT)

1 LED indicators
2 Parameterisation interface
3 CANopen, EtherNet/IP interface
4 Terminal box
5 Motor shaft
6 Motor flange

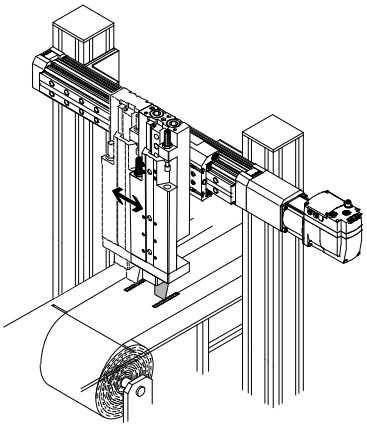
Application examples

- Machines in the fields of printing presses and post presses
- Packaging and labelling machines
- Woodworking machines
- Textile industry
- Medical technology
- Material transport
- Conveying
- Labelling
- Electronics manufacturing

Adjusting sorting conveyors



Programming formats for paper or foil cutting machines

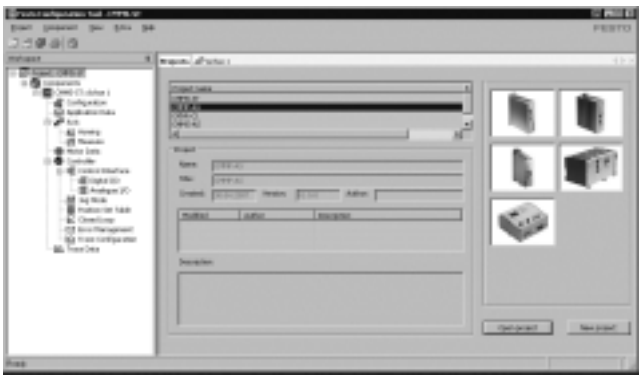


Integrated drives EMCA

Key features

FCT software – Festo Configuration Tool

Software platform for electric drives from Festo



- All drives in a system can be managed and saved in a common project
- Project and data management for all supported device types
- Easy to use thanks to graphically supported parameter entry
- Universal mode of operation for all drives
- Work offline at your desk or online at the machine

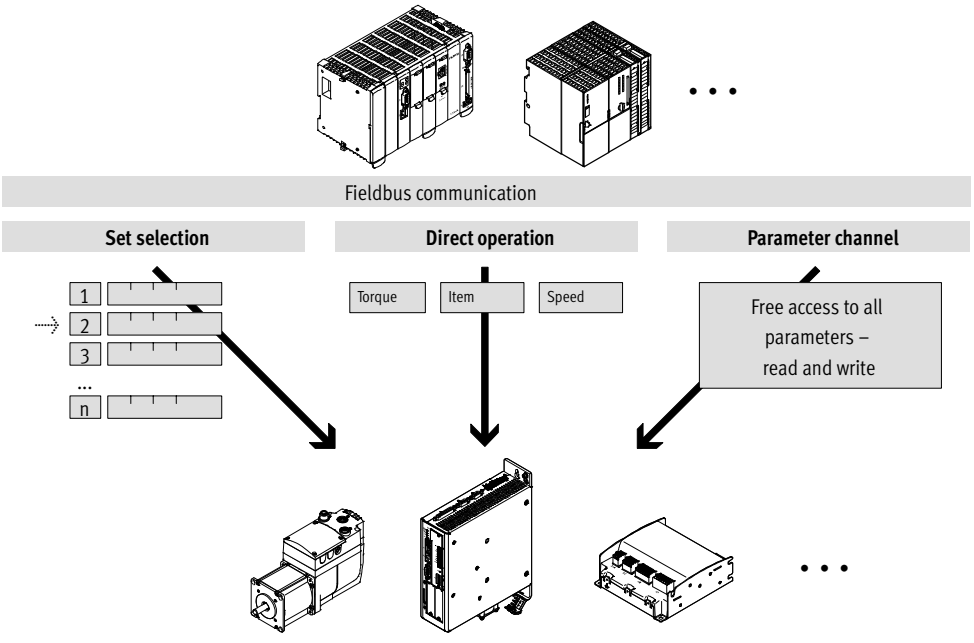
FHPP – Festo Handling and Positioning Profile

Optimised data profile

Festo has developed an optimised data profile, the "Festo Handling and Positioning Profile (FHPP)", which is especially tailored to handling and positioning applications.

With the FHPP data profile, Festo motor controllers can be actuated using a fieldbus interface via standardised control and status bytes.

The following are defined, among others:
- Operating modes
- I/O data structure
- Parameter objects
- Sequence control



New

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Type codes

FESTO

EMCA – EC – 67 – M – 1 T E B – CO – S1

Product type	
EMCA	Motor with controller

Motor technology	
EC	EC motor

Motor flange size	
67	67 mm

Length	
S	Short
M	Medium

Nominal operating voltage	
1	24 V DC

Electrical connection	
T	Terminal box

Measuring unit	
E	Absolute encoder, single-turn
M	Absolute encoder, multi-turn displacement encoder

Brake	
–	None
B	With holding brake

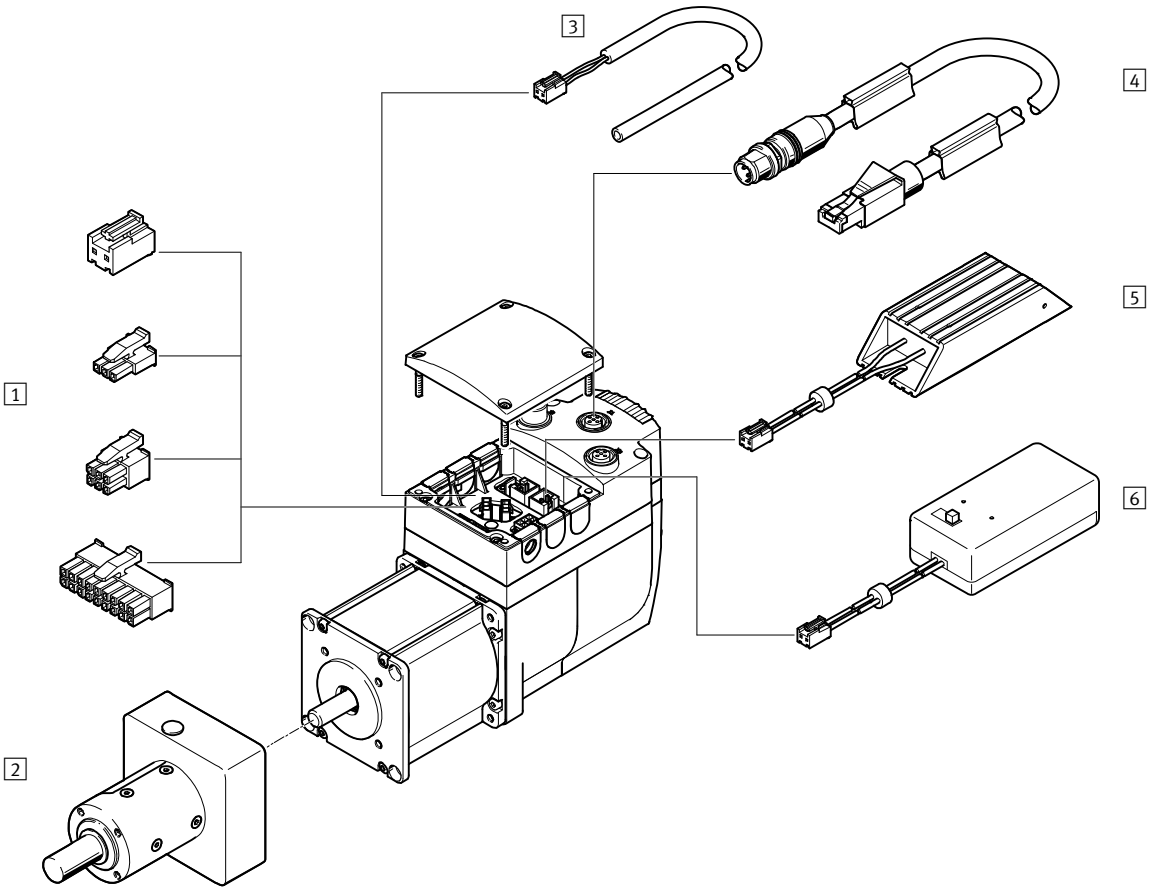
Bus protocol/activation	
CO	CANopen
EP	EtherNet/IP
DIO	Digital I/O interface

Degree of protection for electrics	
–	Standard
S1	IP65

Integrated drives EMCA

Peripherals overview

Using the variant EMCA-...-CO as an example



Accessories[1]			➔ Page/Internet
1	Plug assortment NEKM	Connector plug for power supply and reference/limit switch (for plug X4, X6, X7, X8, X9 ➔ 11)	23
2	Gear units EMGC	Increases the torque of the motor, while simultaneously reducing the rotational speed	16
3	Pre-assembled cable NEBM	For power supply, STO interface and I/O interface	23
4	Connecting cable NEBC-D12G4	To parameterise the integrated drive	24
5	Braking resistor CACR-LE2	Absorbs the energy that is supplied back into the intermediate circuit during braking or with external excitation	23
6	Battery box EADA	To save the position values in combination with the multi-turn absolute displacement encoder	23

1) Not included in the scope of delivery of the integrated drive

New

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Technical data

FESTO

Size 67

Voltage
24 V DC

Bus protocol

CANopen

EtherNet/IP

General technical data		
Controller operating mode		PWM MOSFET power output stage
		Cascade controller with
		P position controller
		PI speed controller
		PI current controller
Parameterisation interface		Ethernet
Ethernet, supported protocols		TCP/IP
Max. transmission rate	[Mbit/s]	100
Rotary position encoder		Absolute encoder, single-turn
		Absolute encoder, multi-turn displacement encoder
Rotary position encoder measuring principle		Magnetic
Resolution		
Single-turn	[bit]	12 (4096 increments per revolution)
Multi-turn displacement encoder	[bit]	32 (revolutions)
Operating time of multi-turn displacement encoder		Without external battery: 7 days
		With external battery: 6 months
Display		LED
Type of mounting		Connecting flange with through-hole
Mounting position		Any

Electrical data			
Size		S	M
Nominal voltage	[V DC]	24 ±20%	
Nominal current	[A]	6.9	7.2
Peak current	[A]	10.2	10.3
Rated motor output	[W]	120	150
Peak power of motor	[W]	158	200
Max. current, digital outputs	[mA]	100	
Switching logic, input/output		PNP	

Technical data, motor			
Size		S	M
Nominal speed	[rpm]	3100	3150
Maximum rotational speed	[rpm]	3500	3300
Nominal torque	[Nm]	0.37	0.45
Peak torque	[Nm]	0.85	0.91
Mass moment of inertia of rotor	[kg cm^2]	0.175	0.301
Perm. shaft load			
Axial	[N]	60	
Radial	[N]	100	

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Technical data

Technical data, holding brake		
Holding torque	[Nm]	1
Power consumption	[W]	9
Mass moment of inertia	[kg cm^2]	0.021

Technical data			
Interfaces	I/O	CANopen	EtherNet/IP
Number of digital logic outputs	4	2	2
Number of digital logic inputs	11	2	2

Technical data – Bus protocol			
Interfaces		CANopen	EtherNet/IP
Position sets		64	64
Communication profile		CiA 402 and FHPP	FHPP
Max. fieldbus transmission rate	[Mbit/s]	1	100
Terminating resistor	[Ω]	120 (can be activated via DIP switches)	–

Safety data		
Safety function to EN 61800-5-2		Safe torque off (STO)
Performance Level (PL) to EN ISO 13849-1		Category 3, Performance Level d
Safety integrity level (SIL) to EN 61800-5-2		SIL 2
Max. positive test pulse with 0 signal	[µs]	10000
Max. negative test pulse with 1 signal	[µs]	600
Proof test interval		20 years
PFH		1x 10^{-9}
PFD		1.86x 10^{-5}
Diagnostic coverage	[%]	90
Safe failure fraction (SFF)	[%]	> 90
Hardware fault tolerance		1
Certificate issuing authority		TÜV 01/205/5514.00/16
CE marking (see declaration of conformity)		To EU EMC Directive[1)]
		To EC Machinery Directive
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Weight [g]		
Size	S	M
Product weight	1900	2260
Additional holding brake	350	350
Additional multi-turn displacement encoder	25	25

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Technical data

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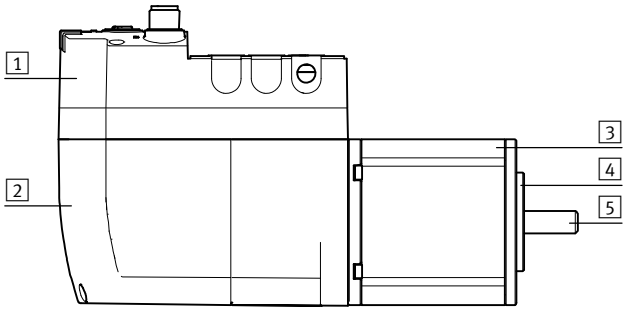
Operating and environmental conditions		
Characteristics of digital logic outputs		– Freely configurable in some cases – Not galvanically isolated
Characteristics of logic inputs		Galvanically connected to logic potential
Logic input specification		Based on IEC 61131-2
Protective function		i^2t monitoring
		Following error monitoring
		Software end-position detection
		Voltage failure detection
		Current monitoring
		Temperature monitoring
Degree of protection		
EMCA-..., motor shaft		IP54
EMCA-..., motor housing incl. connection technology		IP54
EMCA-...-S1, motor housing incl. connection technology		IP65
Ambient temperature	[°C]	0 ... +50
Note on ambient temperature		Power must be reduced by 1.75% per °C at ambient temperatures above 20 °C
Storage temperature	[°C]	–25 ... +70
Relative air humidity	[%]	0 ... 95 (non-condensing)
Corrosion resistance class CRC[1)]		1
Certification		RCM mark
		c UL us - Recognized (OL) – pending
CE marking (see declaration of conformity)		To EU EMC Directive[2)]
		To EC Machinery Directive

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Materials



Integrated drive		
Housing		
1	Terminal box	Glass fibre-reinforced plastic
2	Lower housing part	Die-cast zinc
–	Seals	NBR
Motor		
3	Housing profile	Aluminium
4	Flange	Die-cast zinc
5	Shaft	Steel
Note on materials		RoHS compliant
		Contains paint-wetting impairment substances

Integrated drives EMCA

Technical data

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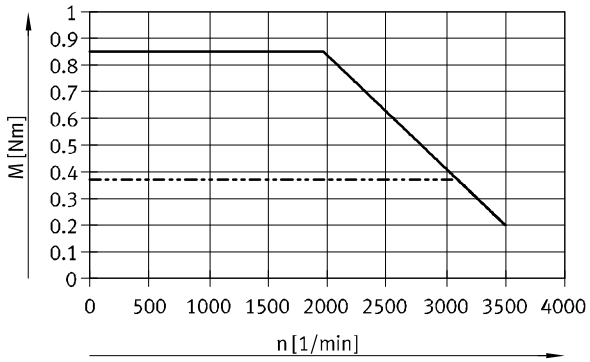
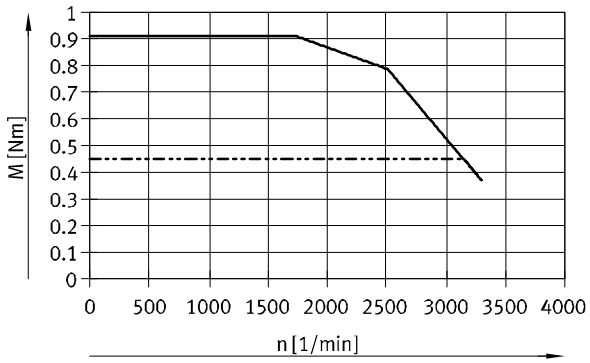
Torque M as a function of speed n

EMCA-EC-67-S



EMCA-EC-67-M



Note

Typical motor characteristics (typical production tolerances ±20%) at nominal voltage.

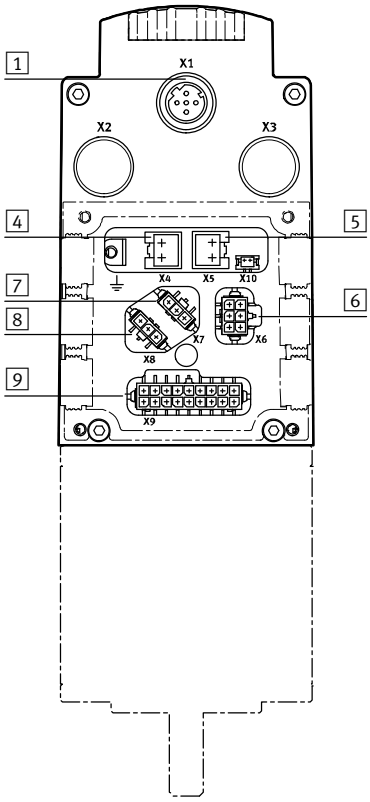
Integrated drives EMCA

Technical data

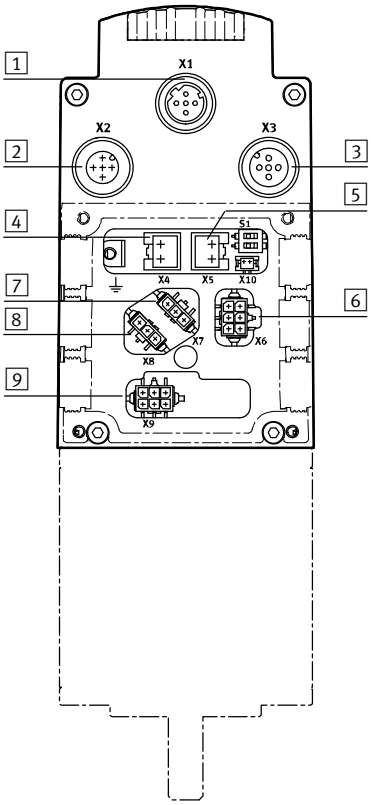
FESTO

Pin allocation

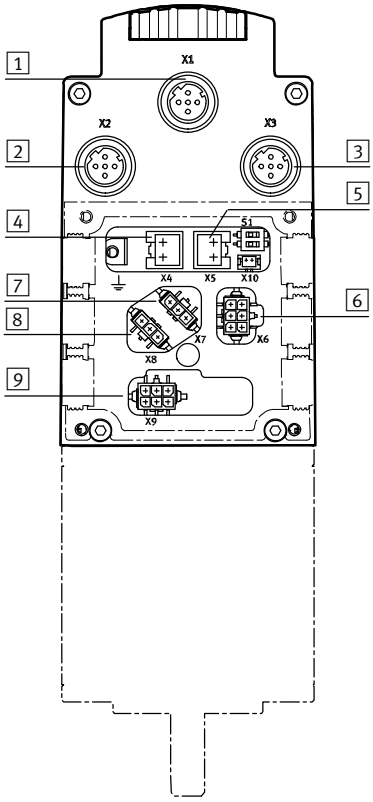
EMCA-...-DIO



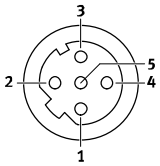
EMCA-...-CO



EMCA-...-EP

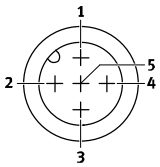


1 [X1] Parameterisation interface (Ethernet)



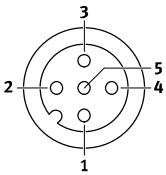
PIN		Function
1	TD+	Transmitted data+
2	RD+	Received data+
3	TD–	Transmitted data–
4	RD–	Received data–
5	–	n.c.
Housing		Shield/functional earth

2 [X2] CAN IN (CAN interface)



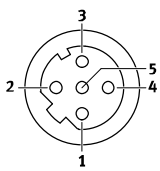
PIN		Function
1	CAN shield	Screening
2	n.c.	–
3	CAN GND	CAN bus reference potential
4	CAN H	CAN bus high
5	CAN L	CAN bus low
Housing		Shield/functional earth

3 [X3] CAN OUT (CAN interface)



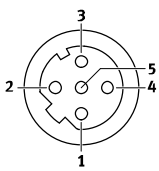
PIN		Function
1	CAN shield	Screening
2	n.c.	–
3	CAN GND	CAN bus reference potential
4	CAN H	CAN bus high
5	CAN L	CAN bus low
Housing		Shield/functional earth

2 [X2] EP IN (EtherNet/IP interface)



PIN		Function
1	TD+	Transmitted data+
2	RD+	Received data+
3	TD–	Transmitted data–
4	RD–	Received data–
5	–	n.c.
Housing		Shield/functional earth

3 [X3] EP OUT (EtherNet/IP interface)



PIN		Function
1	TD+	Transmitted data+
2	RD+	Received data+
3	TD–	Transmitted data–
4	RD–	Received data–
5	–	n.c.
Housing		Shield/functional earth

Integrated drives EMCA

Technical data

FESTO

Pin allocation

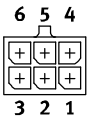
4 [X4] Power supply

PIN		Function
1	24 V DC	Power supply
2	GND	Reference potential

5 [X5] Braking resistor

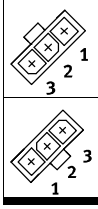
PIN		Function
1	ZK+	Connection for external braking resistor
2	BR-CH	

6 [X6] STO interface



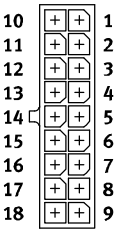
PIN		Function
1	NC1	Acknowledgment contact 1
2	NC2	Acknowledgment contact 2
3	24 V DC	Voltage output
4	STO1	Control input
5	STO2	Control input
6	GND	Reference potential

7/8 [X7/X8] Limit and reference switches



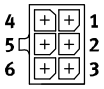
PIN		Function
1	24 V DC	Voltage output
2	Switch 1	Signal input 1
3	GND	Reference potential
1	24 V DC	Voltage output
2	Switch 2	Signal input 2
3	GND	Reference potential

9 [X9] I/O interface on EMCA-...-DIO



PIN		Function (mode0/mode1)
1	DIN	Record selection 1
2	DIN	Record selection 2
3	DIN	Record selection 4
4	DIN	Record selection 8
5	DIN	Record selection 16
6	DIN	Record selection 32/jog+
7	DOUT	Ready
8	DOUT	Configurable
9	24 V DC	Voltage output
10	DOUT	Start confirmed/teach confirmed
11	DOUT	Motion complete
12	DIN	Control mode 0/1
13	DIN	Start/teach
14	DIN	Open brake, delete remaining path/jog–
15	DIN	Stop
16	DIN	Acknowledge release/error
17	–	n.c.
18	GND	Reference potential

9 [X9] I/O interface on EMCA-...-CO/-EP



PIN		Function
1	DOUT	Ready
2	DOUT	Configurable
3	24 V DC	Voltage output
4	DIN	Controller enable
5	DIN	Sample input
6	GND	Reference potential

10 [X10] External battery

PIN		Function
1	Battery+	Connection for external battery
2	Battery–	

Integrated drives EMCA

Technical data

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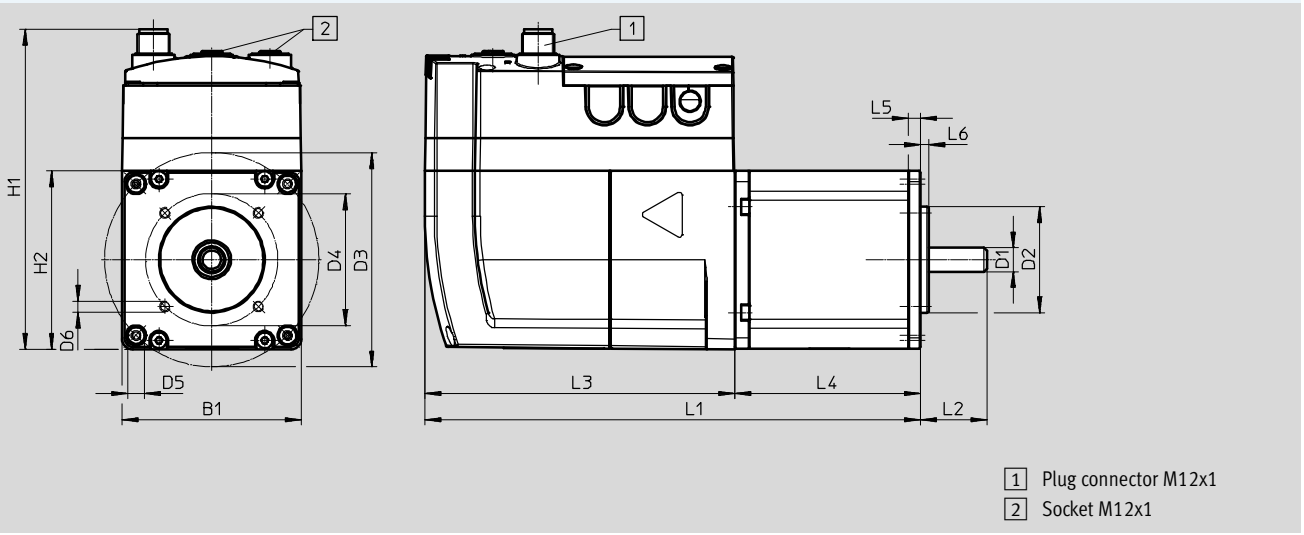
Dimensions Download CAD data ➔ **www.festo.com**

EMCA-...-CO



Type	B1	D1 ∅ h6	D2 ∅ h8	D3 ∅ ±0.2	D4 ∅ ±0.2	D5 ∅ +0.2	D6	H1 ±0.5
EMCA-...-S	67	9	40	81	50	6.3	M4x5	121.1
EMCA-...-M								

Type	H2	L1	L2 ±0.5	L3 ±0.3	L4 ±0.8	L5 ±0.3	L6 –0.1
EMCA-...-S	67	169.9	25	117.2	52.7	4.7	3
EMCA-...-M		187.4			70.2		

Integrated drives EMCA

Technical data

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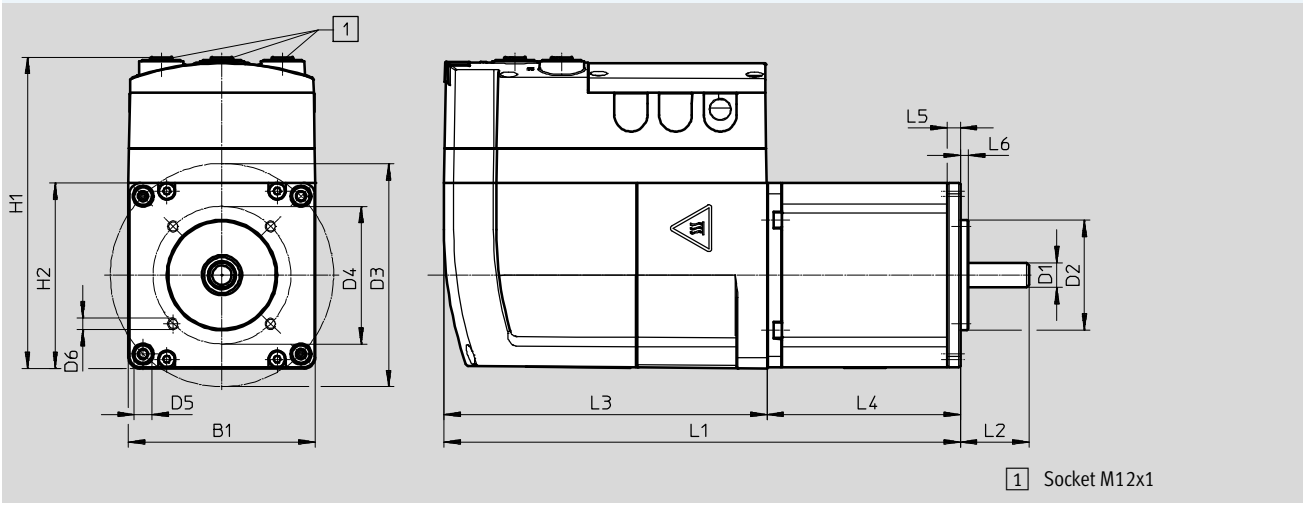
Dimensions Download CAD data ➔ **www.festo.com**

EMCA-...-EP/EMCA-...-DIO



Type	B1	D1 ∅ H6	D2 ∅ H8	D3 ∅ ±0.2	D4 ∅ ±0.2	D5 ∅ +0.2	D6	H1 ±0.5
With EtherNet/IP interface								
EMCA-...-S	67	9	40	81	50	6.3	M4x5	113
EMCA-...-M								
With I/O interface								
EMCA-...-S	67	9	40	81	50	6.3	M4x5	111.5
EMCA-...-M								

Type	H2	L1	L2 ±0.5	L3 ±0.3	L4 ±0.8	L5 ±0.3	L6 −0.1
With EtherNet/IP interface							
EMCA-...-S	67	169.9	25	117.2	52.7	4.7	3
EMCA-...-M		187.4			70.2		
With I/O interface							
EMCA-...-S	67	169.9	25	117.2	52.7	4.7	3
EMCA-...-M		187.4			70.2		

New

Integrated drives EMCA

Technical data

Ordering data – Stock items						
Size		Measuring unit		Degree of protection	Part No.	Type
Short	Medium	Encoder, single-turn	Encoder, multi-turn	IP54		
Interface: CANopen						
■		■		■	**8034238**	**EMCA-EC-67-S-1TE-CO**
	■	■		■	**8034239**	**EMCA-EC-67-M-1TE-CO**
■			■	■	**8034240**	**EMCA-EC-67-S-1TM-CO**
	■		■	■	**8034241**	**EMCA-EC-67-M-1TM-CO**
Interface: EtherNet/IP						
■		■		■	**8061201**	**EMCA-EC-67-S-1TE-EP**
	■	■		■	**8061202**	**EMCA-EC-67-M-1TE-EP**
■			■	■	**8061203**	**EMCA-EC-67-S-1TM-EP**
	■		■	■	**8061204**	**EMCA-EC-67-M-1TM-EP**
Interface: I/O						
■		■		■	**8061196**	**EMCA-EC-67-S-1TE-DIO**
	■	■		■	**8061197**	**EMCA-EC-67-M-1TE-DIO**
■			■	■	**8061199**	**EMCA-EC-67-S-1TM-DIO**
	■		■	■	**8061198**	**EMCA-EC-67-M-1TM-DIO**

Integrated drives EMCA

Ordering data – Modular product system

FESTO

Ordering table

Size		67	Condi-tions	Code		Entry code
M	Module no.	**1509036**				
	Product type	EMCA motor with controller		**EMCA**		EMCA
	Motor technology	EC motor		**-EC**		-EC
	Flange size	67 mm		**-67**		-67
	Overall length	Short		**-S**		
		Medium		**-M**		
	Nominal operating voltage	24 V DC		**-1**		-1
	Electrical connection	Terminal box		**T**		T
	Measuring unit	Absolute encoder, single-turn		**E**		
		Absolute encoder, multi-turn displacement encoder		**M**		
O	Brake	None				
		With holding brake		**B**		
M	Bus protocol/activation	CANopen		**-CO**		
		EtherNet/IP		**-EP**		
		Digital I/O interface		**-DIO**		
O	Degree of protection for electrics	Standard				
		IP65		**-S1**		

M Mandatory data
O Options

Order code

	EMCA	–	**EC**	–	**67**	–		–	**1**	**T**			–		–	

Integrated drives EMCA

Accessories

FESTO

Gear unit EMGC-...-P

Planetary gear units

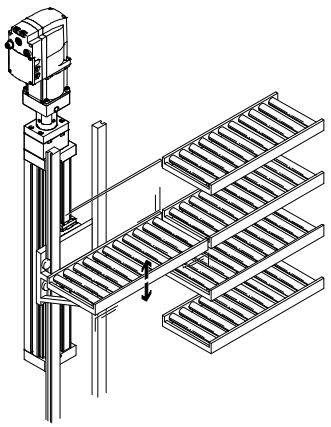
EMGC-40 EMGC-60

Technical data										
Gear unit type		EMGC-40-P-G...								
Gear ratio	[i]	3	4	5	7	12	16	20	25	35
Gear unit type		Planetary gear units								
		Single-stage				Two-stage				
Continuous output torque[1]	[Nm]	5	6.5	6.5	6.5	10	14	14	14	14
Max. output torque[2]	[Nm]	10	13	13	13	12.5	17.5	17.5	17.5	17.5
Break-away torque at 25 °C	[Nm]	0.015								
No-load torque at 25 °C[3]	[Nm]	0.06								
Max. drive speed[4]	[rpm]	6000								
Max. radial force[5]	[N]	400								
Max. axial force	[N]	300								
Torsional rigidity	[Nm/arcmin]	0.85	0.85	0.85	0.65	0.85	0.85	0.85	0.85	0.85
Max. torsional backlash	[deg]	0.5				0.67				
Mass moment of inertia[6]	[kgcm^2]	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Max. efficiency	[%]	94				92				
Operating temperature[7]	[°C]	–20 ... +90								
Degree of protection		IP54								
Running noise[8]	[dB(A)]	≤ 62								
Product weight	[g]	450				550				
Note on materials		RoHS compliant								
		Contains paint-wetting impairment substances								

1) At the output shaft
2) Related to a rotational speed of 3000 rpm and operating mode S1
3) Related to a rotational speed of 3150 rpm
4) The permissible operating temperature may not be exceeded
5) Reference plane corresponds to the middle of the output shaft length
6) Related to the drive shaft
7) Note the temperature range of the motor
8) Related to the rotational speed of 3000 rpm at a distance of 1 m

Fitting instructions for EMGC-40

- Only suitable for vertical mounting position
- With gear unit EMGC-40, the axis should not be used as a Z-axis but as part of a three-dimensional gantry, for example



Integrated drives EMCA

Accessories

Gear unit type		EMGC-60-P-G...										
Gear ratio	[i]	3	4	5	7	10	12	16	20	25	35	40
Gear unit type		Planetary gear units										
		Single-stage					Two-stage					
Continuous output torque[1]	[Nm]	20	26	26	26	16	36	42	42	44	44	42
Max. output torque[2]	[Nm]	36	44	44	44	24	45	52	52	55	55	52
Break-away torque at 25 °C	[Nm]	0.02										
No-load torque at 25 °C[3]	[Nm]	0.15										
Max. drive speed[4]	[rpm]	6000										
Max. radial force[5]	[N]	450										
Max. axial force	[N]	500										
Torsional rigidity	[Nm/arcmin]	2.4	2.4	2.4	1.7	1.3	2.4	2.4	2.4	2.4	2.4	2.4
Max. torsional backlash	[deg]	0.5					0.67					
Mass moment of inertia[6]	[kgcm^2]	0.4	0.34	0.32	0.3	0.29	0.34	0.34	0.32	0.32	0.3	0.29
Max. efficiency	[%]	94					92					
Operating temperature[7]	[°C]	–20 ... +90										
Degree of protection		IP54										
Running noise[8]	[dB(A)]	≤ 62										
Product weight	[g]	900					1200					
Note on materials		RoHS compliant										
		Contains paint-wetting impairment substances										

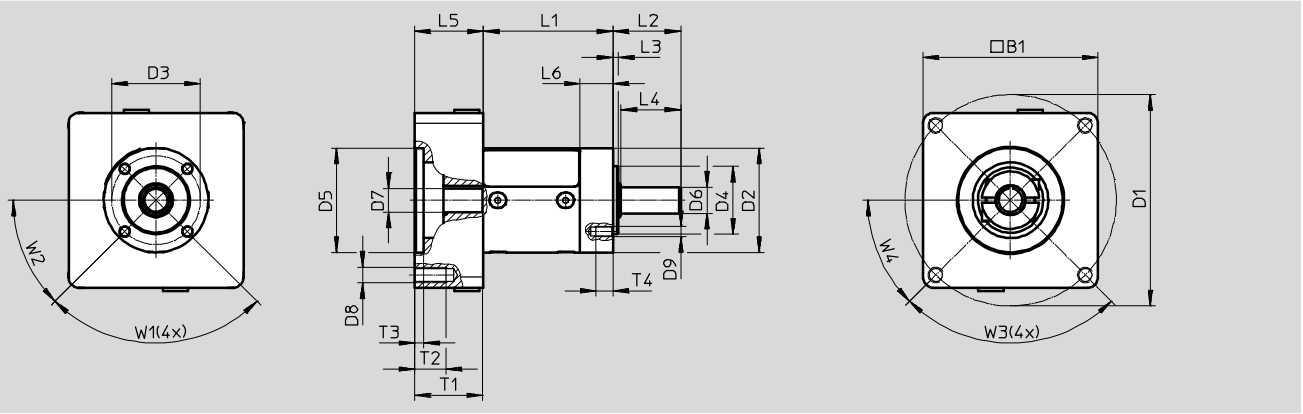
1) At the output shaft
2) Related to a rotational speed of 3000 rpm and operating mode S1
3) Related to a rotational speed of 3150 rpm
4) The permissible operating temperature may not be exceeded
5) Reference plane corresponds to the middle of the output shaft length
6) Related to the drive shaft
7) Note the temperature range of the motor
8) Related to the rotational speed of 3000 rpm at a distance of 1 m

Integrated drives EMCA

Accessories

Dimensions Download CAD data ➔ **www.festo.com**

EMGC-40-P-...



Type	B1	D1 ∅ ±0.1	D2 ∅ −0.1	D3 ∅ ±0.1	D4 ∅ h6	D5 ∅ G7	D6 ∅ h7	D7 ∅ G6	D8	D9	L1 ±0.5	L2 −0.3	L3 ±0.2
EMGC-40-P-G3-SEC-67	67	81	40	34	26	40	10	9	M6	M4	49.7	26	2
EMGC-40-P-G4-SEC-67													
EMGC-40-P-G5-SEC-67													
EMGC-40-P-G7-SEC-67													
EMGC-40-P-G12-SEC-67											65.3		
EMGC-40-P-G16-SEC-67													
EMGC-40-P-G20-SEC-67													
EMGC-40-P-G25-SEC-67													
EMGC-40-P-G35-SEC-67													

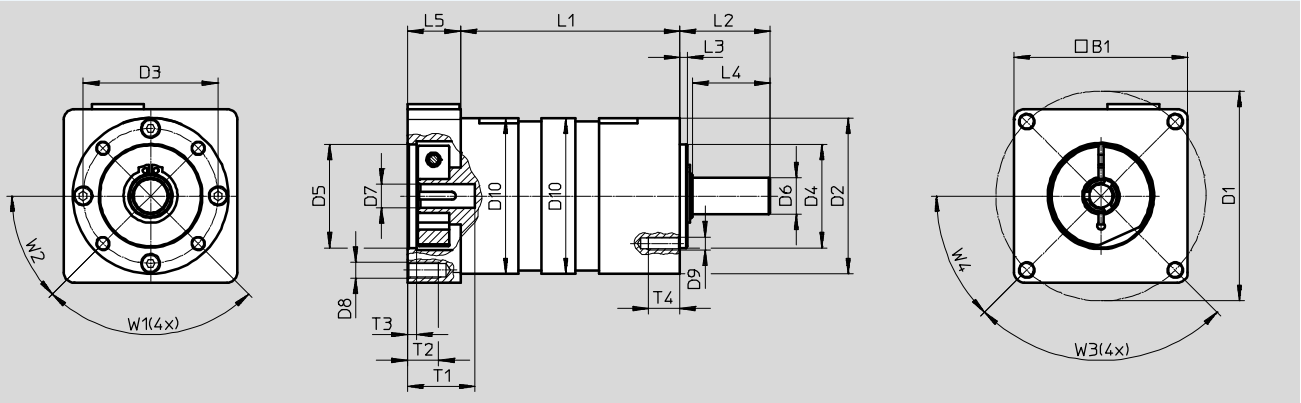
Type	L4 −0.1	L5	L6	T1	T2	T3 +0.2	T4	W1	W2	W3	W4
EMGC-40-P	23	26.3	12.7	26	13	3.5	6.5	90°	45°	90°	45°

Integrated drives EMCA

Accessories

Dimensions Download CAD data ➔ **www.festo.com**

EMGC-60-P-...



Type	B1	D1 ∅ ±0.1	D2 ∅ −0.1	D3 ∅ ±0.1	D4 ∅ h6	D5 ∅ G7	D6 ∅ h6	D7 ∅ G6	D8	D9	D10 ∅	L1 ±0.5
EMGC-60-P-G3-SEC-67	67	81	60	52	40	40	14	9	M6	M5	60	62.5
EMGC-60-P-G4-SEC-67												
EMGC-60-P-G5-SEC-67												
EMGC-60-P-G7-SEC-67												
EMGC-60-P-G10-SEC-67												
EMGC-60-P-G12-SEC-67												84.5
EMGC-60-P-G16-SEC-67												
EMGC-60-P-G20-SEC-67												
EMGC-60-P-G25-SEC-67												
EMGC-60-P-G35-SEC-67												
EMGC-60-P-G40-SEC-67												

Type	L2 −0.3	L3 ±0.2	L4 −0.1	L5	T1	T2	T3 +0.2	T4	W1	W2	W3	W4
EMGC-60-P	35	3	30	20.5	26.1	13	3.5	12	90°	45°	90°	45°

Integrated drives EMCA

Accessories

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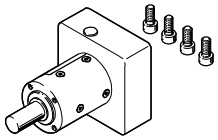
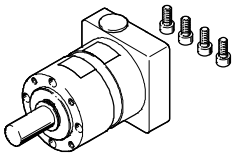
Ordering data

	Gear unit type	Gear ratio		Part No.	Type
	EMGC-40-P-...	3	Single-stage	**8000594**	**EMGC-40-P-G3-SEC-67**
		4		**8000595**	**EMGC-40-P-G4-SEC-67**
		5		**8000596**	**EMGC-40-P-G5-SEC-67**
		7		**8000597**	**EMGC-40-P-G7-SEC-67**
		12	Two-stage	**8000598**	**EMGC-40-P-G12-SEC-67**
		16		**8000599**	**EMGC-40-P-G16-SEC-67**
		20		**8000600**	**EMGC-40-P-G20-SEC-67**
		25		**8000601**	**EMGC-40-P-G25-SEC-67**
		35		**8000602**	**EMGC-40-P-G35-SEC-67**
	EMGC-60-P-...	3	Single-stage	**8000612**	**EMGC-60-P-G3-SEC-67**
		4		**8000613**	**EMGC-60-P-G4-SEC-67**
		5		**8000614**	**EMGC-60-P-G5-SEC-67**
		7		**8000615**	**EMGC-60-P-G7-SEC-67**
		10		**8000616**	**EMGC-60-P-G10-SEC-67**
		12	Two-stage	**8000617**	**EMGC-60-P-G12-SEC-67**
		16		**8000618**	**EMGC-60-P-G16-SEC-67**
		20		**8000619**	**EMGC-60-P-G20-SEC-67**
		25		**8000620**	**EMGC-60-P-G25-SEC-67**
		35		**8000621**	**EMGC-60-P-G35-SEC-67**
		40		**8000622**	**EMGC-60-P-G40-SEC-67**

Products available ex-stock

Integrated drives EMCA

Accessories

Gear unit EMGC-...-A

Right-angle gear unit

Technical data		
Gear unit type		EMGC-67-A-G1-...
Gear ratio	[i]	1
Gear unit type		Right-angle gear unit
Continuous output torque[1]	[Nm]	2
Max. output torque[2]	[Nm]	2.1
Break-away torque at 25 °C	[Nm]	0.04
No-load torque at 25 °C[3]	[Nm]	0.1
Max. drive speed[4]	[rpm]	4500
Max. radial force[5]	[N]	400
Max. axial force	[N]	300
Torsional rigidity	[Nm/arcmin]	0.105
Max. torsional backlash	[deg]	0.67
Mass moment of inertia[6]	[kgcm^2]	0.09
Max. efficiency	[%]	90
Operating temperature[7]	[°C]	–20 ... +90
Degree of protection		IP54
Running noise[8]	[dB(A)]	≤ 70
Product weight	[g]	930
Note on materials		RoHS compliant
		Contains paint-wetting impairment substances

1) At the output shaft
2) Related to a rotational speed of 3000 rpm and operating mode S1
3) Related to a rotational speed of 3150 rpm
4) The permissible operating temperature may not be exceeded
5) Reference plane corresponds to the middle of the output shaft length
6) Related to the drive shaft
7) Note the temperature range of the motor
8) Related to the rotational speed of 3000 rpm at a distance of 1 m

Integrated drives EMCA

Accessories

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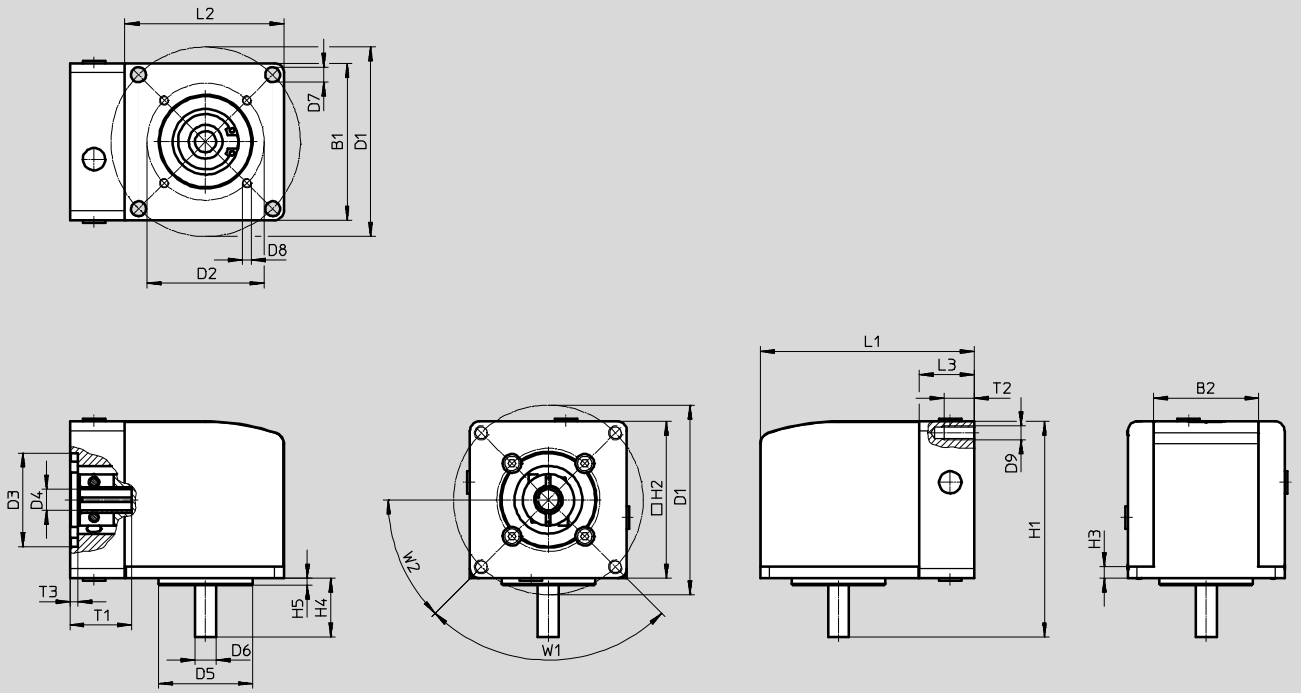
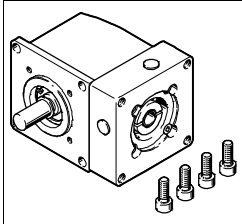
Dimensions Download CAD data ➔ **www.festo.com**



Type	B1	B2	D1	D2	D3	D4	D5	D6	D7	D8	D9	H1
			∅	∅	∅	∅	∅	∅	∅			
		±0.2	±0.1	±0.1	G7	G6	h7	h7	H12			
EMGC-67-A-G1-SEC-67	67	45	81	50	40	9	40	9	6.4	M4	M6	92

Type	H2	H3	H4	H5	L1	L2	L3	T1	T2	T3	W1	W2
		±0.1	−0.1							+0.2		
EMGC-67-A-G1-SEC-67	67	5	25	3	91.5	68	23.5	26.3	13	3.5	90°	45°

Ordering data

	Gear unit type	Gear ratio	Part No.	Type
	EMGC-67-A-G1	1	**2321480**	**EMGC-67-A-G1-SEC-67**

Products available ex-stock

Integrated drives EMCA

Accessories

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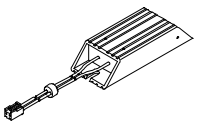
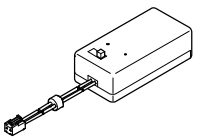
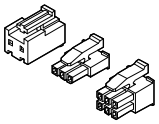
Ordering data – Braking resistor

	Resistance value [Ω]	Nominal power [W]	Weight [g]	Degree of protection	Cable length [mm]	Dimensions [mm]	Part No.	Type
	6	60	140	IP65	300	Length: 102 Width: 40 Height: 21	**8047913**	**CACR-LE2-6-W60**

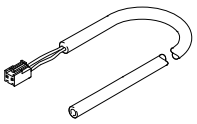
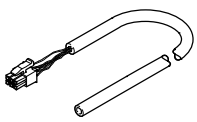
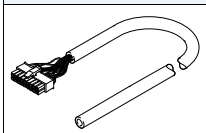
Ordering data – Battery box

	Description	Degree of protection	Cable length [mm]	Dimensions [mm]	Part No.	Type
	• To save the position values in combination with the multi-turn absolute displacement encoder • It contains a standard 9 V battery (6LR61)	IP40	135	Length: 68 Width: 33 Height: 25	**8047912**	**EADA-A-9**

Ordering data – Assortment of plugs

	Description	For bus protocol/ activation	Part No.	Type
	Connector plug for power supply and reference/limit switch (for plug X4, X6, X7, X8, X9 ➔ 11) Not included in the scope of delivery of the integrated drive	CANopen EtherNet/IP	**8034242**	**NEKM-C-20**
		I/O	**8034243**	**NEKM-C-21**

Ordering data – Pre-assembled cable

	Description	Cable length [m]	Part No.	Type
For power supply (plug connector X4) for EMCA-...-CO/-EP/-DIO				
	Electrical connection: One end: pre-assembled with plug connector, other end: open cable end	10	**4977492**	**NEBM-L4G2-E-10-N-LE2**
For STO interface (plug connector X6) for EMCA-...-CO/-EP/-DIO and I/O interface (plug connector X9) for EMCA-...-CO/-EP				
	Electrical connection: One end: pre-assembled with plug connector, other end: open cable end	10	**4977493**	**NEBM-L5G6-E-10-N-LE6**
For I/O interface (plug connector X9) for EMCA-...-DIO				
	Electrical connection: One end: pre-assembled with plug connector, other end: open cable end	10	**4977494**	**NEBM-L5G18-E-10-N-LE18**

Integrated drives EMCA

Accessories

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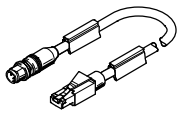
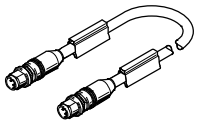
Ordering data – Connecting cable				
	Cable length [m]	Weight [g]	Part No.	Type
For parameterisation interface (plug X1)				
	1	89	**8040451**	**NEBC-D12G4-ES-1-S-R3G4-ET**
	3	219	**8040452**	**NEBC-D12G4-ES-3-S-R3G4-ET**
	5	347	**8040453**	**NEBC-D12G4-ES-5-S-R3G4-ET**
	10	674	**8040454**	**NEBC-D12G4-ES-10-S-R3G4-ET**
For EtherNet/IP interface (plug X2, X3)				
	0.5	57	**8040446**	**NEBC-D12G4-ES-0.5-S-D12G4-ET**
	1	93	**8040447**	**NEBC-D12G4-ES-1-S-D12G4-ET**
	3	223	**8040448**	**NEBC-D12G4-ES-3-S-D12G4-ET**
	5	350	**8040449**	**NEBC-D12G4-ES-5-S-D12G4-ET**
	10	679	**8040450**	**NEBC-D12G4-ES-10-S-D12G4-ET**