

**EWELLIX**

MAKERS IN MOTION

# Electric cylinders LEMC



# Electric cylinders

## LEMC



### Features

- High performance roller screw
- Steel push tube and aluminium protection tube
- Modular concept
- Possible to relubricate the roller screw nut with direct access
- Servo motors, asynchronous motors and customized motor adapters

### Benefits

- High load and lifetime capacity, as well as high acceleration and speed capabilities
- High stiffness and robustness
- Multiple combinations allow for use in wide range of applications
- Low maintenance requirements
- Optimal solution for a wide variety of applications, either with Ewellix-provided motors or with the motor of your choice

## Product description

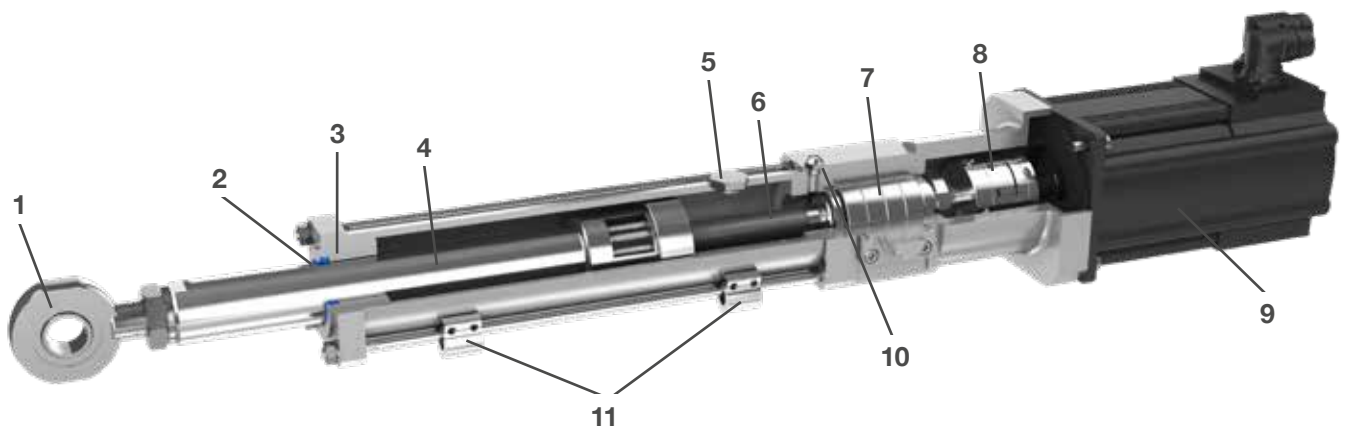
For generations, hydraulic cylinders were often the first choice for large forces or to move heavy loads. Today, hydraulic systems have a powerful rival in the linear motion world – the electric cylinder.

In many applications, electromechanical systems provide a host of advantages over their hydraulic counterparts. They are smaller and lighter, and since the motor powering the actuator is connected directly, electromechanical systems do away with bulky pumps, accumulators, oil tanks and pipework. The absence of pressurised oil has safety and environmental benefits too, minimizing the risk of fire, pollution or injury associated with leaks and spills.

LEMC electric cylinders replace hydraulic systems with a precision roller screw, driven by a locally mounted electric motor and gearbox.

This technology results in an actuator with a higher power density than conventional designs. LEMC actuators use a modular design that can be configured for many different applications and a range of motor types.

In addition to conventional servo motors, they can be supplied with an integrated gearbox and smart asynchronous motor. This provides additional safety and machine protection capabilities, with integrated soft start and motor protection functions. As a further benefit for operations and maintenance staff, the controller incorporates near field communication (NFC) capabilities, allowing it to be adjusted wirelessly using a smartphone.



1. Rod end
2. Scraper to keep out contaminants
3. Guiding bushing
4. Steel push tube and aluminium protection tube
5. Re-lubrication access
6. High quality Ewellix planetary roller screw for highest axial loads with low play and high efficiency
7. High quality SKF bearings
8. Coupling
9. Servo motor or Asynchronous motor
10. Sinter filter for high airflow
11. Adjustable Home and limit switches

## Performance overview of linear units

Linear unit	$F_{max}$ kN	$F_{0max}$	$V_{max}$ mm
–			
LEMC-U-2105	40	40	500
LEMC-U-2110	40	40	1 000
LEMC-U-3005	80	80	440
LEMC-U-3010	80	80	880

## Performance overview of actuators

Linear unit	Interface and gear ratio	Motor	$F_{co}$ kN	$F_{p0}$	$V_{max}$ mm/s
–	–	–			
LEMC-S-2105	L10/P10	LA1	6,1/6	17,3/16,8	163
LEMC-S-2105	L10/P10	LA2	6,1/6	17,3/16,8	338
LEMC-S-2105	L10/P10	LA3	10,9/10,6	27,8/27	125
LEMC-S-2105	L10/P10	LA4	10,9/10,6	27,8/27	294
LEMC-S-2105	P15	LA9	13,5	29,3	194
LEMC-S-2105	L10	LA5	14,4	33,5	163
LEMC-S-2105	L10/P10	LA6	14,4/14	31/30,1	338
LEMC-S-2110	L10/P10	LA1	3/2,9	8,5/8,3	325
LEMC-S-2110	L10/P10	LA2	3/2,9	8,5/8,3	675
LEMC-S-2110	L10/P10/P20	LA3	5,4/5,2/10,5	13,7/13,3/26,7	250/250/125
LEMC-S-2110	L10/P10/P20	LA4	5,4/5,2/10,5	13,7/13,3/26,7	588/588/294
LEMC-S-2110	L10	LA7	7,1	26,5	325
LEMC-S-2110	L10	LA8	7,1	26,1	675
LEMC-S-3005	L10/P10	LA3	10,5/10,2	26,6/25,8	125
LEMC-S-3005	L10/P10	LA4	10,5/10,2	26,6/25,8	294
LEMC-S-3005	L10	LB1	19,3	50,5	125
LEMC-S-3005	L10	LB2	19,3	50,5	269
LEMC-S-3005	P15	LA5	20	46,6	108
LEMC-S-3005	P15	LA6	20	43,1	225
LEMC-S-3005	L10/P10	LB5	34/32,9	69/67	113
LEMC-S-3005	L10/P10	LB6	32,9/31,9	54,9/53,3	269
LEMC-S-3010	L10	LA3	5,6	14,4	250
LEMC-S-3010	L10	LA4	5,6	14,4	588
LEMC-S-3010	L10	LB1	10,4	27,2	250
LEMC-S-3010	L10	LB2	10,4	27,2	538
LEMC-S-3010	L10	LB7	18,3	52,0	225
LEMC-S-3010	L10	LB8	18,3	52,0	538
LEMC-S-3010	P20	LA1	6,2	17,3	163
LEMC-S-3010	P20	LA2	6,2	17,3	338
LEMC-S-3010	P20	LA5	14,4	33,5	163
LEMC-S-3010	P20	LA6	14,4	31	338
LEMC-S-3010	P15	LB5	26,7	54,2	150
LEMC-S-3010	P15	LC2	26,7	49,6	358

## Motors and gearboxes

### Servo motors

The LEMC can be ordered with a servo motor. In this case, Ewellix has selected a series of Lenze motors and drives that best matches the performance of the actuator to the end-user application. To complete the design, several options can be selected such as absolute encoder (EnDat, Hyperface), safety brake or associated servodrive. It is also possible to equip the LEMC with your preferred brand of servo motor so that it integrates best into your system. Please contact Ewellix to check the feasibility of your configuration.

For more information please visit the following sites:

**Motors:**

<http://www.lenze.com/en-us/products/motors/>

**Drives:**

<http://www.lenze.com/en-us/products/inverters/>

### Drive options

The performance attributes shown in the table on the previous page are the result of specific Lenze servo motor and drive combinations. The LEMC can be offered with or without the servodrive. The servo-drive can be in the recommended configuration or any other configuration that fits your installation.

In the case of a different combination, please contact Ewellix to determine what effect the different configuration will have on the performance of the actuator.

### Motor technical data

Motor	Lenze servo motor	Lenze 9400 Highline servoamplifier
LA1	MCS12D20	E94ASHE0044
LA2	MCS12D41	E94ASHE0134
LA3	MCS12H15	E94ASHE0074
LA4	MCS12H35	E94ASHE0134
LA5	MCS12L20	E94ASHE0074
LA6	MCS12L41	E94ASHE0134
LA7	MCS12L20	E94ASHE0134
LA8	MCS12L41	E94ASHE0324
LA9	MCS12H35	E94ASHE0074
LB1	MCS14H15	E94ASHE0134
LB2	MCS14H32	E94ASHE0324
LB5	MCS14P14	E94ASHE0134
LB6	MCS14P32	E94ASHE0244
LB7	MCS14P14	E94ASHE0244
LB8	MCS14P32	E94ASHE0474
LC2	MCS14P32	E94ASHE0324

## Asynchronous motors

The LEMC with asynchronous motor is the combination of an LEMC linear unit, a gearbox and a Lenze smart asynchronous motor. The gearboxes are available with several ratios to either favor speed or load for any linear unit size. They are available packaged in parallel and right angle configurations. The gearboxes are oil lubricated. When ordering a LEMC with asynchronous motor, the proper configuration must be identified so that the drains and vents are located correctly.

## Smart functions

The asynchronous Lenze motor is equipped with a smart control box with the following features:

- Rotating speed can be adjusted freely between 500 and 2 600 r/min
- 3 digital inputs for changing speed and direction of movement
- 1 digital output for status message
- Integrated ramps for soft start and stop functions, to protect the system mechanics and full motor protection
- Less wiring thanks to electronic contactor and motor protection function
- Excellent energy efficiency
- Can be operated with an NFC-capable smartphone

## Performance overview of actuators with asynchronous motors

Linear unit	Interface and gear ratio	Motor	F <sub>co</sub>	V <sub>min</sub>	V <sub>max</sub>
LEMC-A-2110	B054/ B151	LAA2	4,3/12	15,5/ 5,5	80,2/28,7
LEMC-A-2110	B319/ P129	LBA2	25,4/10,3	2,7/ 6,5	13,5/ 33,3
LEMC-A-2110	P187/ P328	LBA2	14,9/ 26,2	4,5/ 2,5	23/13,2
LEMC-A-3005	B051/ B155	LBA2	ago-24	8/ 2,7	41,7/13,9
LEMC-A-3005	B319/ P129	LBA2	49,2/20	1,3/ 3,2	6,7/16,7
LEMC-A-3005	P187/ P328	LBA2	29/ 50,7	2,2/ 1,2	11,5/6,6

## Standard motor and gearbox types

Interface, gear ratio and motor	Lenze gearbox	Gearbox ratio	Lenze Smart motor
P129LBA2SN	G500-S220	12,992	M300-063-42
P187LBA2SN	G500-S220	18,776	M300-063-42
P328LBA2SN	G500-S220	32,867	M300-063-42
B054LAA2SN	G500-B45	5,411	M300-063-42
B151LAA2SN	G500-B45	15,111	M300-063-42
B319LBA2SN	G500-B110	31,919	M300-063-42
B051LBA2SN	G500-B110	5,185	M300-063-42
B155LBA2SN	G500-B110	15,556	M300-063-42

## Standard Motor interface

Layout	Inline		Parallel					
	21	30	21				30	
Ratio	1:1	1:1	1:1	3:2	2:1	1:1	3:2	2:1
<b>Lenze</b>								
MCS12	L1019110L	L1019110L	P1019110L	P1519110L	P2019110L	P1019110L	P1519110L	P2019110L
	-	-	-	-	-	-	-	P2019110H
MCS14	-	L1024130L	-	-	-	P1024130L	-	-
	-	-	-	-	-	P1024130H	P1524130H	P2024130H
<b>Siemens</b>								
1FK706x	L1024110L	L1024110L	P1024110L	P1524110L	P2024110L	P1024110L	P1524110L	P2024110L
	-	-	-	-	-	-	-	P2024110H
1FK708x	-	L1032130L	-	-	-	P1032130L	-	-
	-	-	-	-	-	P1032130H	P1532130H	P2032130H
<b>Parker</b>								
NX6	L1024110L	L1024110L	P1024110L	P1524110L	P2024110L	P1024110L	P1524110L	P2024110L
	-	-	-	-	-	-	-	P2024110H
NX8	-	L1032130L	-	-	-	P1032130L	-	-
	-	-	-	-	-	P1032130H	P1532130H	P2032130H
<b>Kollmorgen</b>								
AKM5x	L1019110L	L1019110L	P1019110L	P1519110L	P2019110L	P1019110L	P1519110L	P2019110L
	-	-	-	-	-	-	-	P2019110H
	L1024110L	L1024110L	P1024110L	P1524110L	P2024110L	P1024110L	P1524110L	P2024110L
	-	-	-	-	-	-	-	P2024110H
AKM6x	-	L1024130L	-	-	-	P1024130L	-	-
	-	-	-	-	-	P1024130H	P1524130H	P2024130H
	-	L1032130L	-	-	-	P1032130L	-	-
	-	-	-	-	-	P1032130H	P1532130H	P2032130H
<b>Rockwell / Allen Bradley</b>								
MPL-A/B45x	L1024110L	L1024110L	P1024110L	P1524110L	P2024110L	P1024110L	P1524110L	P2024110L
	-	-	-	-	-	-	-	P2024110H
MPL-A/B52x	-	L1028130L	-	-	-	P1028130L	-	-
MPL-A/B52x & B54x & B56x	-	L1028130L	-	-	-	P1028130H	P1528130H	P2028130H

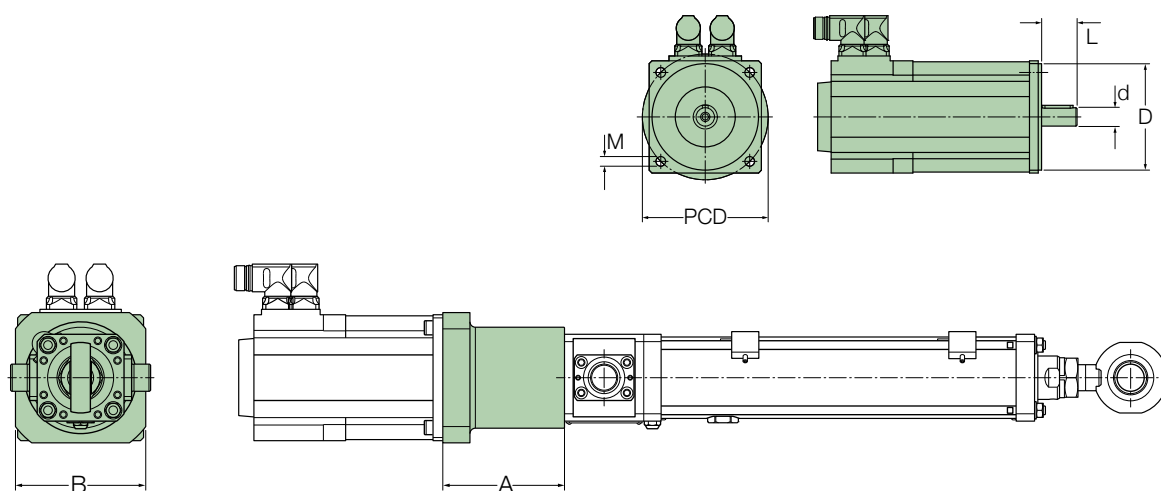
NOTE: For other motors, please contact Ewellix.

## Third party motors

In order to attach your preferred motor to the linear unit, Ewellix offers tailor made solutions within the specifications below.

For motor specifications which are not covered by the specifications below, please contact Ewellix.

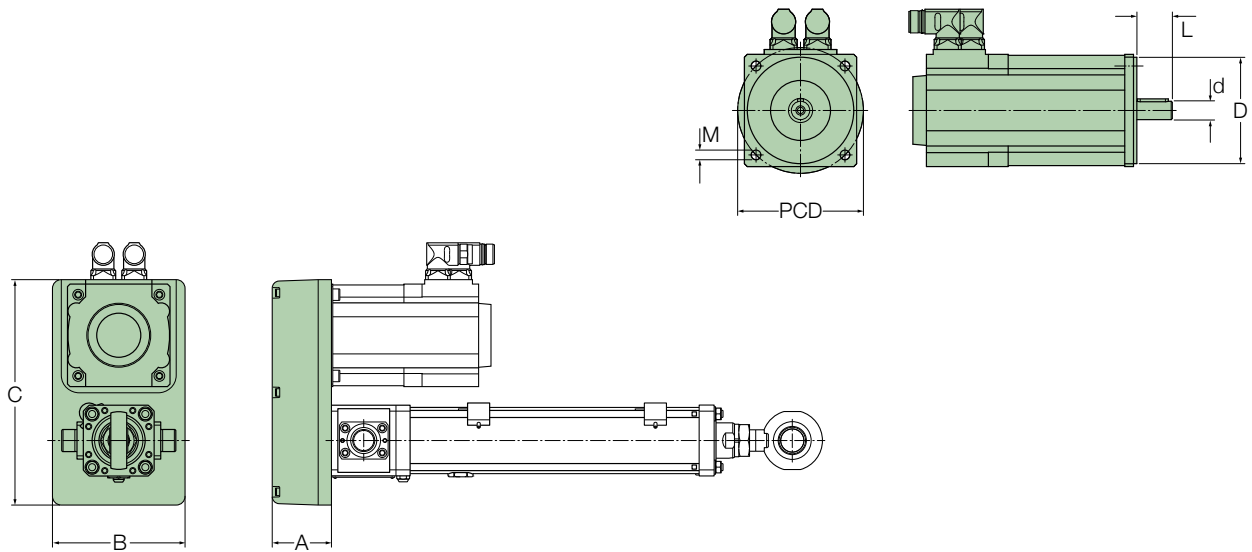
### Inline interface



LEMC	Interface	d	D	L	PCD	M	A	B	Torque max	Inertia	Weight
-		mm				-	mm		Nm	10 <sup>-4</sup> kgm <sup>2</sup>	kg
21	L1019110L	19	110 H8 <sup>-0</sup> <sub>-0,054</sub>	40...50	130	M8	112	120	60	1,6	1,7
21	L1024110L	24	110 H8 <sup>-0</sup> <sub>-0,054</sub>	40...50	130	M8	112	120	60	1,6	1,7
30	L1019110L	19	110 H8 <sup>-0</sup> <sub>-0,054</sub>	40...50	130	M8	106	120	60	1,6	2,9
30	L1024110L	24	110 H8 <sup>-0</sup> <sub>-0,054</sub>	40...50	130	M8	106	120	60	1,6	2,9
30	L1024130L	24	130 H8 <sup>-0</sup> <sub>-0,063</sub>	50...58	165	M10	118	150	120	3	2,6
30	L1028130L	28	130 H8 <sup>-0</sup> <sub>-0,063</sub>	50...60	165	M10	126,5	150	120	3	2,6
30	L1032130L	32	130 H8 <sup>-0</sup> <sub>-0,063</sub>	50...58	165	M10	118	150	120	3	2,6



## Parallel interface



LEMC	Interface	d	D	L	PCD	M	A	B	C	Torque max	Inertia	Weight
-		mm				-	mm			Nm	10 <sup>-4</sup> kgm <sup>2</sup>	kg
21	P1019110L	19	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	67	150	255	40	14,4	3,5
21	P1024110L	24	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	67	150	255	40	14,4	3,5
21	P1519110L	19	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	67	150	255	25	7,55	3,4
21	P1524110L	24	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	67	150	255	25	7,55	3,4
21	P2019110L	19	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	67	150	255	20	9,55	4,3
21	P2024110L	24	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	67	150	255	20	9,55	4,3
30	P1019110L	19	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	72	180	325	55	37,6	5,8
30	P1024110L	24	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	72	180	325	55	37,6	5,8
30	P1024130L	24	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...58	165	M10	72	180	325	55	37,6	5,6
30	P1024130H	24	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...58	165	M10	72	180	325	90	37,6	5,6
30	P1028130L	28	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...60	165	M10	72	180	325	55	37,6	5,6
30	P1028130H	28	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...60	165	M10	72	180	325	90	37,6	5,6
30	P1032130L	32	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...58	165	M10	72	180	325	55	37,6	5,6
30	P1032130H	32	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...58	165	M10	72	180	325	90	37,6	5,6
30	P1519110L	19	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	72	180	325	40	27,5	6,3
30	P1524110L	24	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	72	180	325	40	27,5	6,3
30	P1524130H	24	110 G8 <sup>+0.012</sup> / <sub>+0.066</sub>	50...58	165	M10	72	180	325	100	70,3	9
30	P1528130H	28	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...60	165	M10	72	180	325	100	70,3	9
30	P1532130H	32	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...58	165	M10	72	180	325	100	70,3	9
30	P2019110L	19	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	72	180	325	35	25	7
30	P2019110H	19	110 G8 <sup>+0.012</sup> / <sub>+0.066</sub>	40...50	130	M8	72	180	325	70	34,5	8,5
30	P2024110L	24	110 G8 <sup>+0.012</sup> / <sub>-0.066</sub>	40...50	130	M8	72	180	325	35	25	7
30	P2024130H	24	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...58	165	M10	72	180	325	70	34,5	8,3
30	P2028130H	28	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...60	165	M10	72	180	325	70	34,5	8,3
30	P2032130H	32	130 G8 <sup>+0.014</sup> / <sub>+0.077</sub>	50...58	165	M10	72	180	325	70	34,5	8,3

## Parallel gearbox

Parallel gearbox consists of one housing which fits on one side to the linear unit and on the other side to the motor adapter with the matching coupling. The coupling is already mounted on the input shaft of the gearbox and locked by a screw. The counterpart of the coupling is delivered with the motor adapter.

The parallel gearbox transmits the motor torque through three stage spur gear directly to the linear unit (max. output torque 300 Nm). Three gear ratios are available and it is maintenance free.



### Technical data

Gearbox type		CAM-GS-CBA-XX	CAM-GS-CCA-XX	CAM-GS-CDA-XX
Short designation	Unit			
Type	–	Parallel	Parallel	Parallel
Gear reduction	–	3,89	9,82	24,95
Nominal output torque	Nm	100	100	100
Max. output torque	Nm	300	300	300
Max. input power	W	3 000	3 000	3 000
Max. input speed	r/min	4 500	4 500	4 500
Efficiency	%	85	85	85
Weight	kg	9	9	9
Length	mm	98,5	98,5	98,5

### Manual override

The parallel gearbox has a manual override as built-in functionality. The gearbox can be manually operated through a hexagonal key located on the gearbox motor axis. As standard, the access to this key is covered by a plate (↳ fig. 1). On request, it's possible to have a round opening for direct access (↳ fig. 2) or to mount an electromagnetic brake (↳ fig. 3).

Fig. 1



Fig. 2



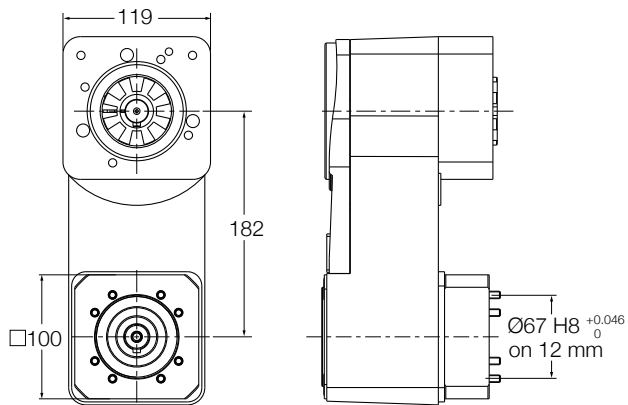
On request

Fig. 3



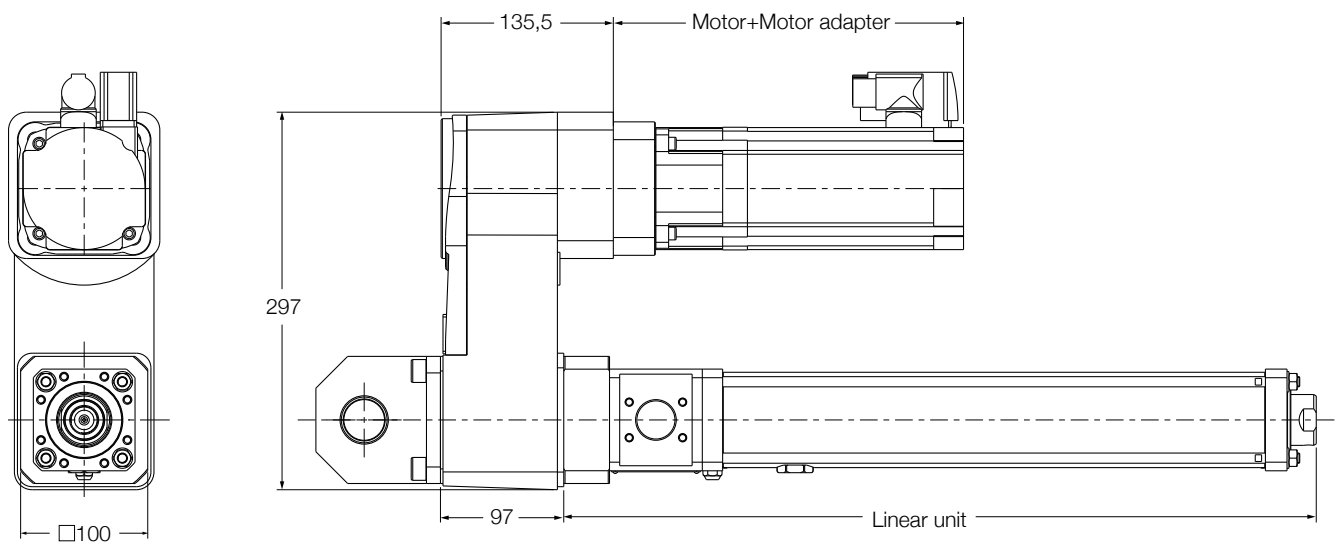
On request

## Dimensional drawing



All dimensions in mm

## Complete actuator



All dimensions in mm