EWELLIX

Electromechanical EWELLIX Linear Actuator

SEMC

Product Data Sheet

We pioneer motion

SCHAEFFLER

Contents

1 EWELLIX servo linear actuator SEMC

1 EWELLIX servo linear actuator SEMC

001BEC09

Features

- high-performance roller screw drives for high speed (up to 600 mm/s) and acceleration requirements (up to 9.5 m/s^2)
- highly dynamic servo-motor for high speed and acceleration requirements
- optional anti-rotation device
- adjustable external proximity switches
- optional lubricant for compatibility with food-grade grease
- optional fail-safe brake, absolute encoder on servo-motor
- recirculating roller screw drives with low lead (up to 1 mm) available on request

Benefits

- long service life thanks to roller screw drive technology
- aluminum body to save weight and limit the overall weight of the linear actuator
- customized motor adapter for maximum flexibility (max. motor cross-section 90 mm)
- compact solution with high power density

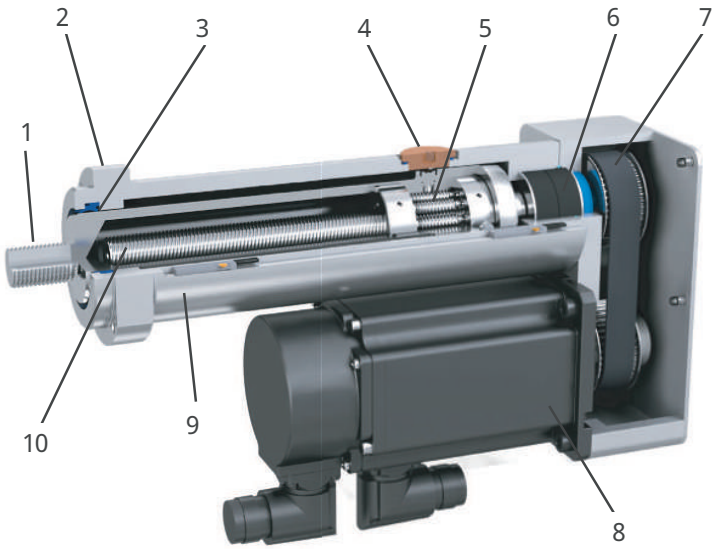
Product description

In addition to its standard electromechanical linear actuator product range, Schaeffler offers a comprehensive customization program that is able to fulfill specific application requirements. This is important for the recognition of Schaeffler as a company and solution provider in the field of Knowledge Engineering.

The SEMC linear actuator is a customized solution developed by Schaeffler. The application requirements consisted of a dimensionally compact and lightweight linear actuator with long service life, high speed, and high acceleration.

The Schaeffler solution is based on a BRC15 × 5 or 8 roller screw drive with an all-aluminum housing. This results in a very compact solution weighing less than 7 kg including the motor, which is nevertheless robust thanks to the roller screw drive technology used.

2 Design of the EWELLIX servo linear actuator SEMC



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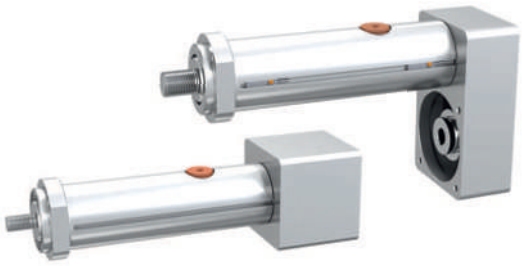
1	External thread on the push tube (customization available upon request)	2	Front attachment
3	Front wiper for protection against contamination	4	Connection for direct grease access on the roller screw nut housing
5	High-quality planetary roller screw drive with backlash compensation	6	Bearing for supporting axial loads
7	Pulley/belt drive (gear ratio 1:1)	8	Servo-motor
9	Aluminum housing	10	Steel push rod

1.1 SEMC, linear unit

3 SEMC linear unit



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1 Technical data

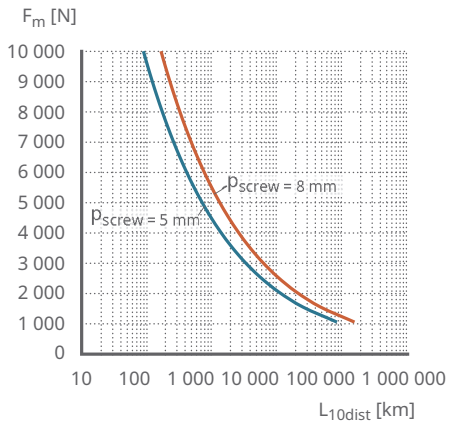
Designation	Symbol	Unit	SEMC1505 w/o motor		SEMC1508 w/o motor	
			P10	L10	P10	L10
Performance data						
Max. dynamic axial force	F_{max}	kN	7.4	10	4.5	6.2
Max. dynamic axial force L10 [1)]	F_{L10}	kN	7.4	9	4.5	6.2
Max. static axial force	$F_{0\ max}$	kN	7.4	10	4.5	6.2
Dynamic load capacity	C	kN	26	26	27.4	27.4
Torque to reach F_{max}	M_{max}	Nm	7.5	10	7.5	10
Max. linear speed	v_{max}	mm/s	375	375	600	600
Max. speed	n_{max}	min^{-1}	4500	4500	4500	4500

Designation	Symbol	Unit	SEMC1505 w/o motor		SEMC1508 w/o motor	
			P10	L10	P10	L10
Max. acceleration	a_{max}	mm/s²	6	6	9.5	9.5
Duty cycle	D_{unit}	%	100	100	100	100
Mechanical data						
Screw drive type	–	–	Roller screw drive	Roller screw drive	Roller screw drive	Roller screw drive
Screw drive diameter	d_{screw}	mm	15	15	15	15
Screw drive lead	p_{screw}	mm	5	5	8	8
Lead accuracy	–	–	G5	G5	G5	G5
Stroke	S	mm	0 to 125	0 to 125	0 to 125	0 to 125
Internal overstroke each side	S_0	mm	2	2	2	2
Backlash	$S_{backlash}$	mm	0	0	0	0
Efficiency	η_{lu}	mm	78	80	77	79
Gear reduction	ι	–	1	1	1	1
at 0 mm stroke	m_{lu}	kg	3.7	3.7	3.7	3.7
Δ per 50 mm stroke	Δm	kg	0.4	0.4	0.4	0.4
Ambient						
Ambient temperature	T_{amb}	°C	0 to +40	0 to +40	0 to +40	0 to +40
Protection code (IP)	–	–	IP54S	IP54S	IP54S	IP54S

[1] Maximum dynamic axial force for application of the theoretical life calculation L_{10}

Life diagram

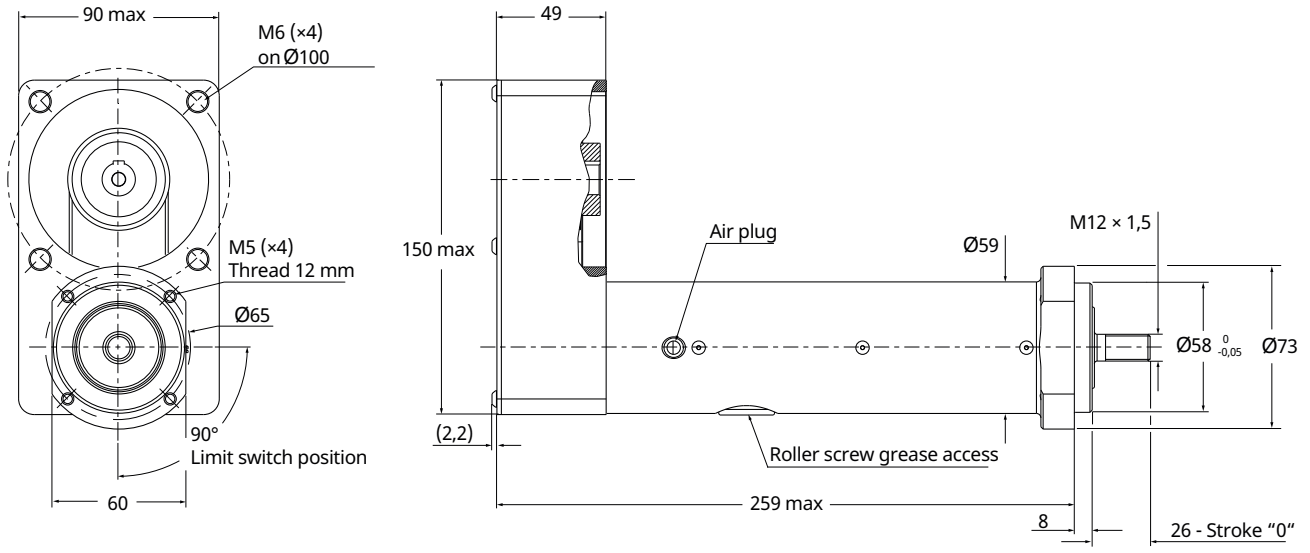
4 Life diagram SEMC



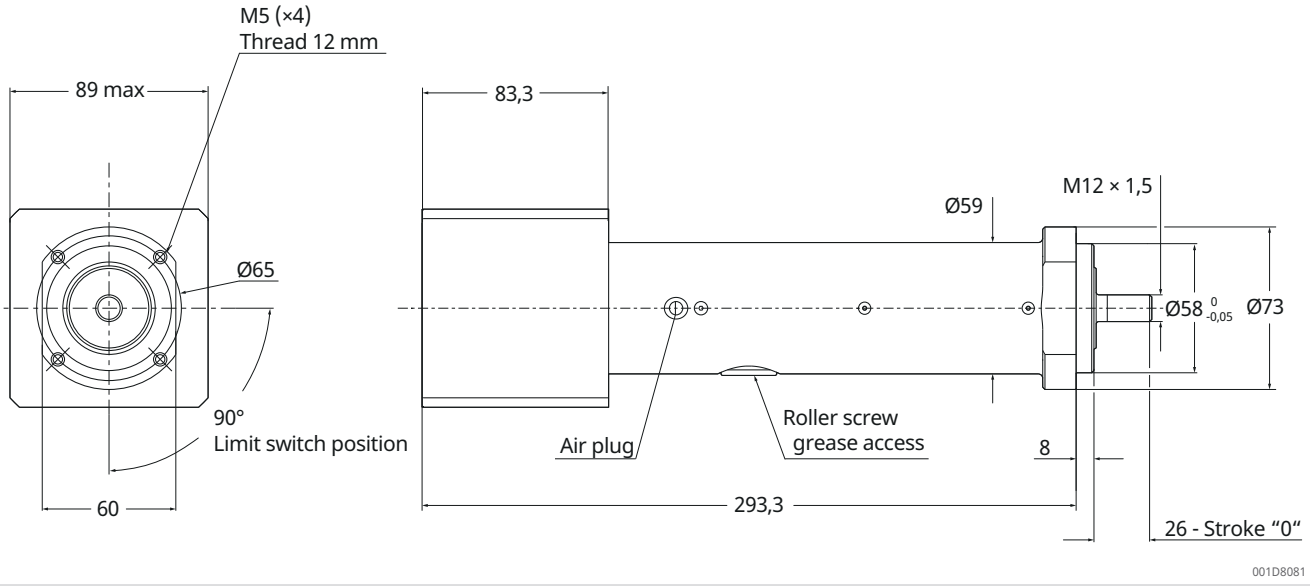
F_m	Equivalent dynamic axial load	L_{10dist}	Service life distance

Dimensional drawings

5 Dimensional drawing parallel configuration



6 Dimensional drawing inline configuration

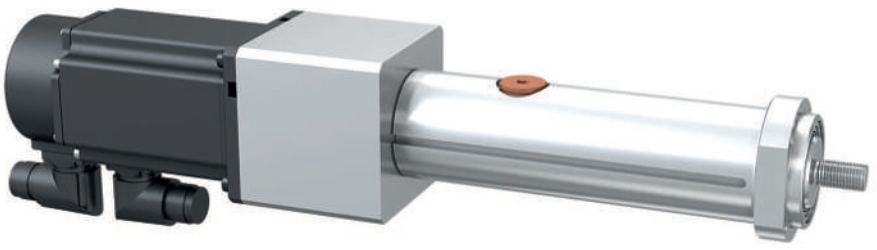


Ordering designation

See ordering designation for linear unit SEMC ➤12|1.2.

1.1.1 SEMC, servo-motor, inline configuration

7 SEMC servo-motor, inline configuration



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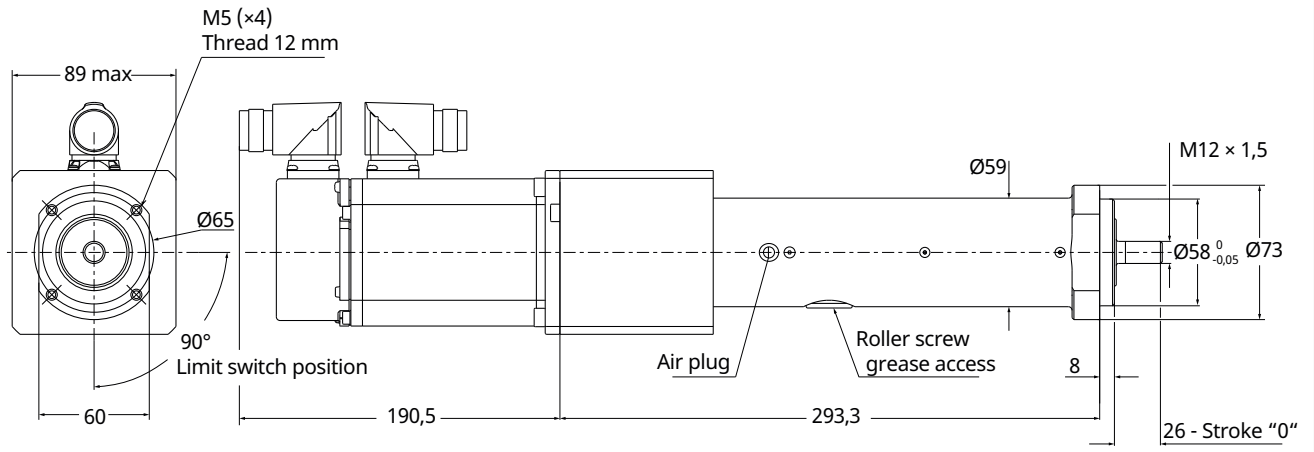
2 Technical data

Designation	Symbol	Unit	SEMC1505 Lenze MCS	SEMC1508 Lenze MCS
			L10	L10
Performance data				
Continuous force at zero speed	F_{c0}	kN	3.2	2.0
Continuous force at max. speed	$F_{c\ vmax}$	kN	2.4	1.5
Peak force at zero speed	F_{p0}	kN	7.9	4.8
Peak force at max. speed	$F_{p\ vmax}$	kN	4.7	2.9
Dynamic load capacity	C	kN	26	27.4
Holding force (optional motor brake)	F_{hold}	kN	10	7.1
Max. linear speed	v_{max}	m/s	300	480
Max. acceleration	a_{max}	m/s^2	6	9.5
Duty cycle	D_{unit}	%	100	100
Mechanical data				
Screw drive type	–	–	Roller screw drive	Roller screw drive
Screw drive diameter	d_{screw}	mm	15	15
Screw drive lead	p_{screw}	mm	5	8
Lead accuracy	–	–	G5	G5
Stroke	S	mm	0 to 125	0 to 125
Internal overstroke each side	S_0	mm	2	2
Backlash	$S_{backlash}$	mm	0	0
Gear reduction	i	–	1	1
at 0 mm stroke	m_{lu}	kg	8	8
Δ per 50 mm stroke	Δm	kg	0.4	0.4
Ambient				
Ambient temperature	T_{amb}	°C	0 to +40	0 to +40
Protection code (IP)	–	–	IP54S	IP54S

8 Dimensional drawing



Drawing valid for a stroke of 125 mm (the maximum stroke on SEMC)

For brake option, add 20 mm to the servomotor length

For brake option, add 0.8 kg

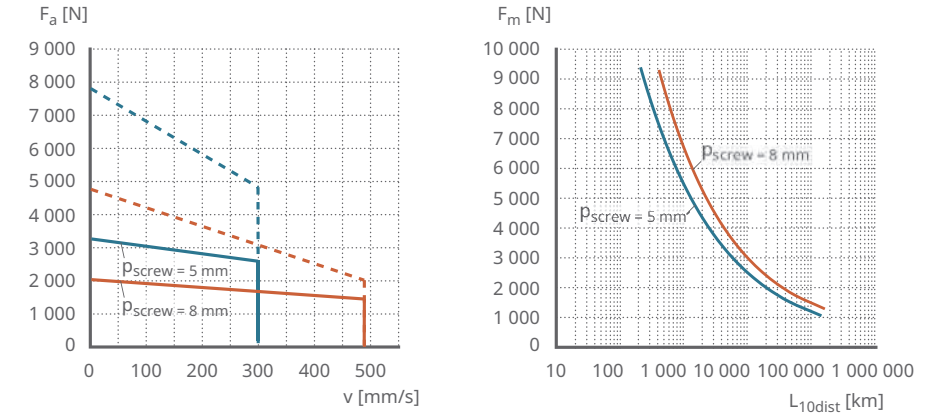
For absolute encoder option, add 51 mm to the servomotor length

Motor plugs/connectors are orientable

3 Standard motor type

Motor	Lenze servo-motor	Lenze 9400 Highline servoamplifier
LE6	MCS09D41	E94ASHE0034

9 Performance diagrams



F_a	Axial force	v	Speed
F_m	Equivalent dynamic axial load	L_{10dist}	Service life distance
p_{screw}	Screw drive lead		

Ordering designation

See ordering designation for linear unit SEMC ➤12|1.2.

1.1.2 SEMC servo-motor, parallel configuration

10 SEMC servo-motor, parallel configuration

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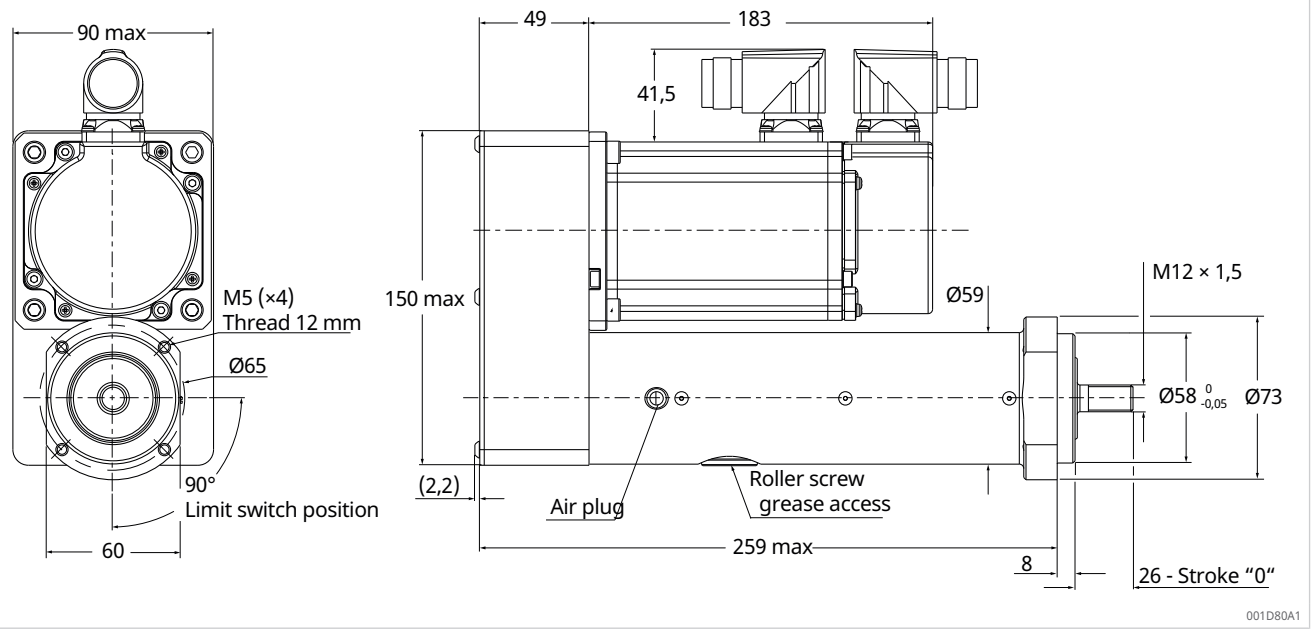
4 Technical data

Designation	Symbol	Unit	SEMC1505 Lenze MCS	SEMC1508 Lenze MCS
			P10	P10
Performance data				
Continuous force at zero speed	F_{c0}	kN	3.1	1.9
Continuous force at max. speed	$F_{c\ vmax}$	kN	2.4	1.5
Peak force at zero speed	F_{p0}	kN	7.4	4.5
Peak force at max. speed	$F_{p\ vmax}$	kN	4.6	2.8
Dynamic load capacity	C	kN	26	27.4
Holding force (optional motor brake)	F_{hold}	kN	10	6.7
Max. linear speed	v_{max}	m/s	300	480
Max. acceleration	a_{max}	m/s^2	6	9.5
Duty cycle	D_{unit}	%	100	100
Mechanical data				
Screw drive type	–	–	Roller screw drive	Roller screw drive
Screw drive diameter	d_{screw}	mm	15	15
Screw drive lead	p_{screw}		5	8
Lead accuracy	–	– mm	G5	G5
Stroke	S	mm	0 to 125	0 to 125
Internal overstroke each side	S_0	mm	2	2
Backlash	$S_{backlash}$	mm	0	0
Gear reduction	i	–	1	1
at 0 mm stroke	m_{lu}	kg	8	8
Δ per 50 mm stroke	Δm	kg	0.4	0.4
Ambient				
Ambient temperature	T_{amb}	°C	0 to +40	0 to +40
Protection code (IP)	–	–	IP54S	IP54S

11 Dimensional drawing



Drawing valid for a stroke of 125 mm (the maximum stroke on SEMC)

For brake option, add 20 mm to the servomotor length

For brake option, add 0.8 kg

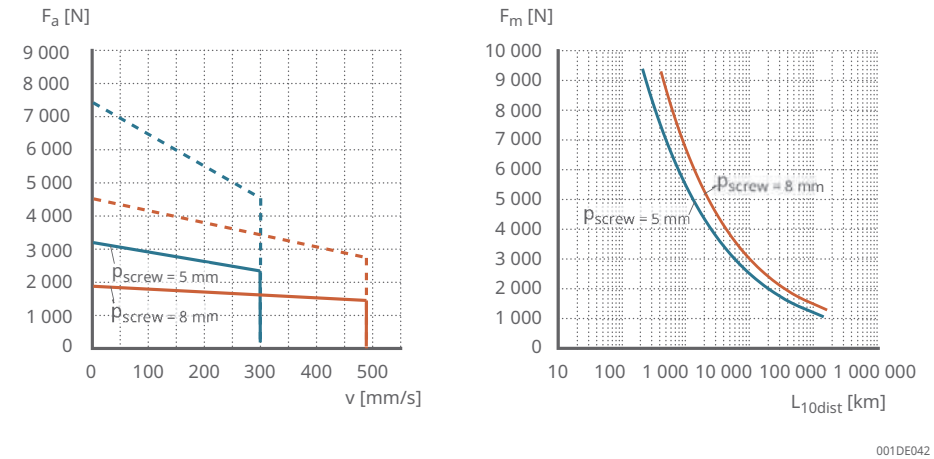
For absolute encoder option, add 51 mm to the servomotor length

Motor plugs/connectors are orientable

5 Standard motor type

Motor	Lenze servo-motor	Lenze 9400 Highline servoamplifier
LE6	MCS09D41	E94ASHE0034

12 Performance diagrams



F_a	Axial force	v	Speed
F_m	Equivalent dynamic axial load	L_{10dist}	Service life distance
p_{screw}	Screw drive lead		

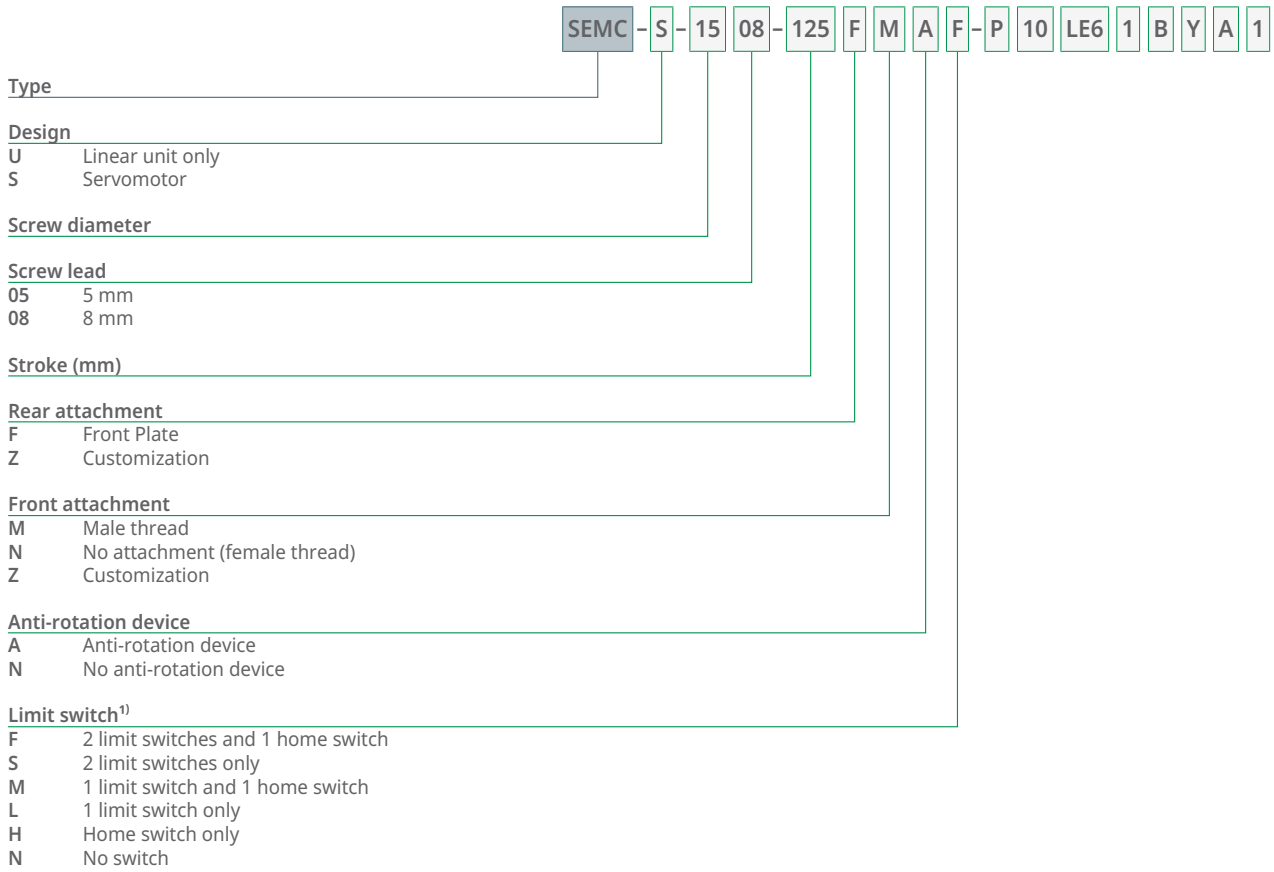
Ordering designation

See ordering designation for linear unit SEMC ➤12|1.2.

1.2 Ordering designation

1

13 Structure of the order designation for linear unit SEMC



1) The limit switch configuration can be limited by the stroke length

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14 Structure of ordering designation for linear unit SEMC with motors

Linear unit interface
L Inline interface
P Parallel interface

Interface and gear ratio
10 Gear ratio 1:1

Motor code

Feedback
1 Resolver
2 Hiperface absolute encoder

EM brake
B Brake 24 VDC
N No brake

Motor drive
Y Drive included
N No drive

Drive fieldbus
A CanOpen
B Devicenet
C Ethercat
D Ethernet
E Powerlink MN/CN
F Powerlink CN
G Profibus
H Profinet
N No fieldbus

Power and signal cables
1 5 m
2 10 m
3 15 m
4 20 m
N No cable

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PDB 109 / 01 / en-US / 2026-05