



KLEElime actuators

In-line models

More than 80 years of experience – we know the industry

Brd. Klee Engineer and trading company was founded in 1944 and has been listed on OMX (formerly the Copenhagen Stock Exchange) since 1986.

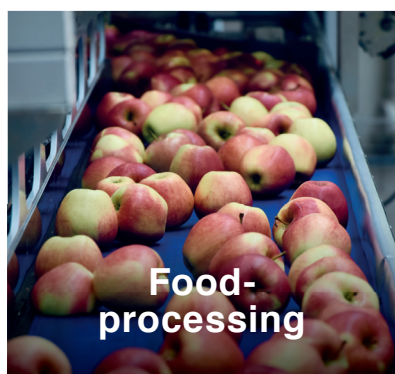
We are located in Albertslund and offer solutions within technical components and semi-finished products for Danish industry. Our broad and deep product-range is divided into eight areas: Gears & Gearmotors, Motors, Pumps & Blowers, Controls & Electronics, Pneumatics & Hydraulics, Linear Technology, Transmission Parts, Machine-, DIN- & Norm Parts, Rubber & Plastic.

In our workshop we build and assemble customer-specific solutions, e.g. in special colour, with customer logo or other text. The possibilities are many.

We are approx. 75 employees in Denmark. Our colleagues in our subsidiaries in Taiwan and China focus on sourcing and quality control for our Danish and international customers.



KLEE solutions



Electric actuators

Our own brand KLEEl ine

KLEEl ine "In-line" electric actuators are suitable for raising, lowering, lifting, pressing and pulling functions as well as for positioning.

Limit Switch by default

KLEEl ine actuators are offered as standard with a built-in limit switch. This means that jamming in extreme positions is avoided. At the same time a quiet and smooth drive is achieved, which is normally only possible using hall.

Space-saving planetary gear

In-line actuators from Brd. Klee are driven by planetary gears instead of worm gears. This brings several advantages. On the one hand, you get a slim and elegant actuator with an appearance very similar to a classic gas spring, and on the other hand, planetary gears use less power and are quieter than worm gears.

Low-noise

KLEEl ine are quiet actuators. If the actuator is to be used in a place with extra high demand for noise reduction, a Low-noise version is available.

One basic model – more options

KLEEl ine actuators are available in the basic model KLEEl ine 38/52 (where the number indicates the diameter in mm). Loads, power supply etc. appear in the catalogue. We also offer control units.

Control units

In industrial applications a control unit is often used for positioning. It is a cheap alternative to power steering, just as the use of steering prevents breakdowns in the event of incorrect operation. A control can be programmed to prevent the actuator from reaching the outer position. This prevents the actuator from subsequently crashing because it keeps trying to move further. We also offer a built-in overcurrent protection print, with simple drive and without external control units.

Use of In-line actuators

In-line actuators are used e.g. for conveyor systems and packaging lines (raising/lowering height). In the food industry and other demanding environments the stainless type is suitable. For packaging machines the actuator is used for positioning making items folded and glued in exactly the right place every time. On lifts, actuators are used to adjust the rail width.

Cold resistant and waterproof

KLEEl ine is cold-resistant and suitable for marine and offshore applications. KLEEl ine 38 actuator is waterproof and can work submerged in water.

The design is important

The compact and elegant design makes In-line actuators popular where appearance plays a role. Especially in the field of home care (car lifts, special wheelchairs, toilet seats, rehabilitation equipment, stairlifts etc.), where focus is on an up-to-date appearance. KLEEl ine's elegant look is design protected.

Advantages of KLEEl ine

By using In-line actuators from the KLEEl ine series you get a number of advantages. All actuators are supplied with Limit Switch by default. We supply built-in overcurrent protection, and can offer with Hall element for position-driving for simple drive without use of controller.

Thoroughly tested

KLEEl ine is stress tested in our own workshop for load and number of work cycles.

Fast delivery

We stock all standard sizes in Albertslund, Denmark. This means that the delivery time is short. Special models and other sizes are manufactured by request.

KLEEline in stainless steel AISI 316.

KLEEline in aluminium.



Fixture
Clevis
(Standard)



Fixture
O type
(Optional)



Fixture
Ballhead
(Optional)



Fixture
Universal head
(Optional)

Fixture bottom piece
(Optional)





Applications

Examples of use

The in-line actuators are driven by a permanent magnet motor with planetary gear. By using planetary gears instead of worm gears, you get a slim model that can be used in a number of applications.



Rehab/Medical applications:

- Wheelchairs (manual or automatic)
- Toilet and shower chairs
- Massage benches and operating tables
- Clinic and therapist chairs

Features & benefits:

- Design
- Small sizes
- Low power consumption
- Aluminum version is splash-proof (IP66)
- Easy to clean
- Stainless steel version AISI 316 is IP69K

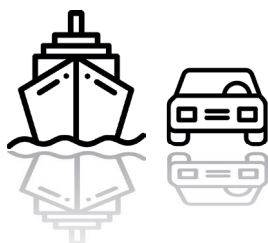


Industrial automation applications:

- Food and pharmaceutical industry
- Process industry
- Kitchens (hospitals etc.)

Features & benefits:

- Easy interface between PLC and other control panels
- Compact size and design
- Version in stainless steel is hygienic and waterproof (IP69K)



Mobile and maritime applications:

- Vehicles for disabled persons
- Boats / ships / offshore
- Trains / buses / special vehicles

Features & benefits:

- Compact design and RAL colours
- Low power consumption
- Easy interface between PLC and other types of control panels
- Easy to adapt to industrial speeds and load requirements
- Version in stainless steel AISI 316 is IP69K



Other applications:

- Windows / shutters

Features & fordele:

- Design, including RAL colours
- Small compact design
- Low noise level
- Low power consumption

KLEEl ine 38 aluminium

Standard specifications

Motor/gear

Motor 12 or 24 VDC
 Permanent magnet motor/planetary gear
 Sound level with load 60dB
 Maximum power consumption
 3,8 A (12VDC) - 1,8A (24 VDC)

Temperature

Application -20°C til +60°C
 Storage -40°C til +70°C

Density class

IP66.

Cable specifications

3 m, 2x1,0 mm² / 6x1,0 mm²
 (AWG17), diameter ~ 6,2/6,6 mm, black

Colour

Black (RAL 9005).

Materials

- Motor and actuator tube:
Powder coated aluminium
- Piston tube:
Stainless steel AISI 316
- Front and rear mounting brackets:
Alu. with clevis on the piston side

Duty cycle

S2 2 min (2 minutes operation at full load, then rest until ambient temperature is reached)

Options

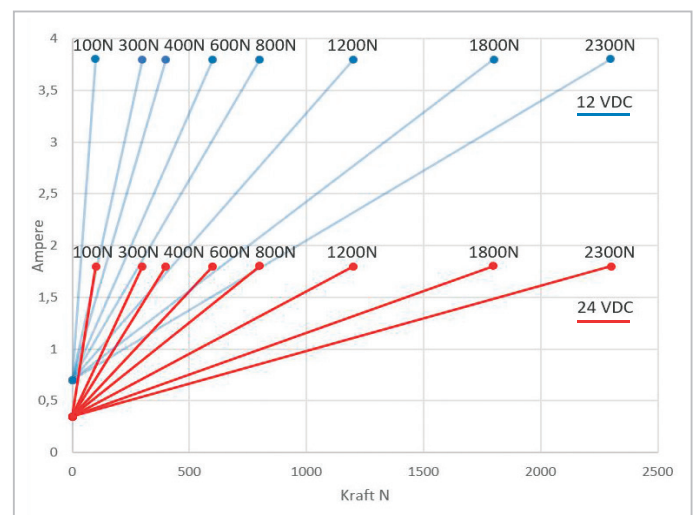
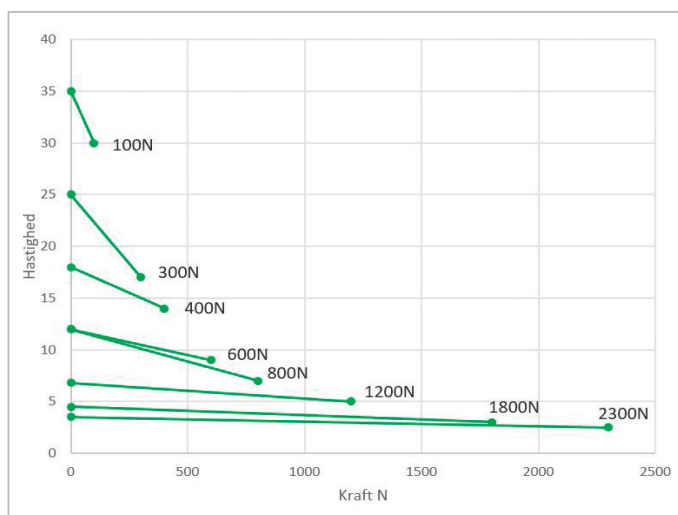
- Overcurrent protection
- Hall sensor
- Other cable lengths on request
(max 9 meter)
- Low-noise 56dB
- IP67M
- Limit Switch output

Upon request

Other stroke length than standard at additional cost. Minimum 20 mm. and a maximum of 500 mm.

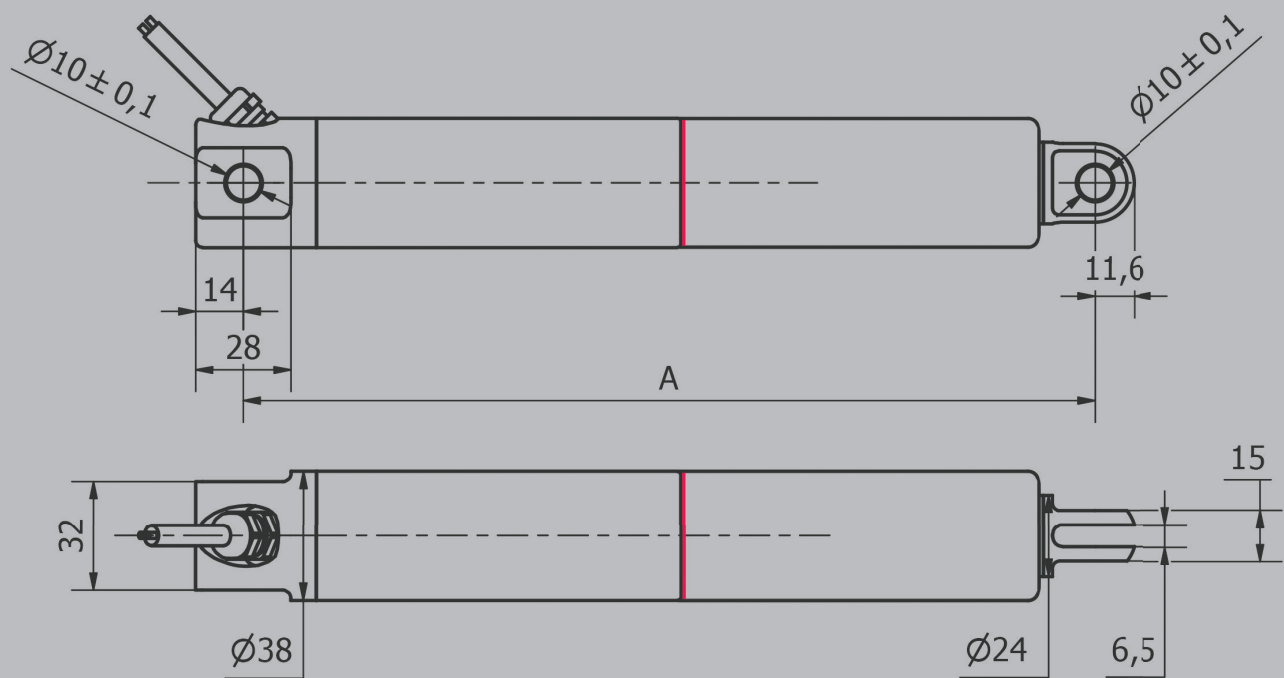
Features

KLEEl ine 38 comes as standard with a built-in Limit Switch and has a high protection of IP66. As an option, overcurrent protection is available, for simple operation the use of a controller.



Max. load	[N]	100	300	400	600	800	1200	1800	2300
Self-locking force	[N]	150	600	600	1600	1600	1800	3600	3450
Speed unloaded Normal	[mm/s]	35	25	18	12	12	6,8	4,5	3,5
Speed at load Normal	[mm/s]	30	17	14	9	8	5	3	2,5
Speed unloaded Low-noise	[mm/s]	25	25	16,5	13	8,5	5	3,3	3,3
Speed at load Low-noise	[mm/s]	23	20	14	10,5	7	4,5	3	2,5
Stroke length	[mm]	50	100	150	200	250	300	350	400
Weight	[Kg]	0,85	0,95	1,05	1,15	1,25	1,35	1,45	1,65

Dimensions for KLEEl ine 38 (all measurements in mm.)

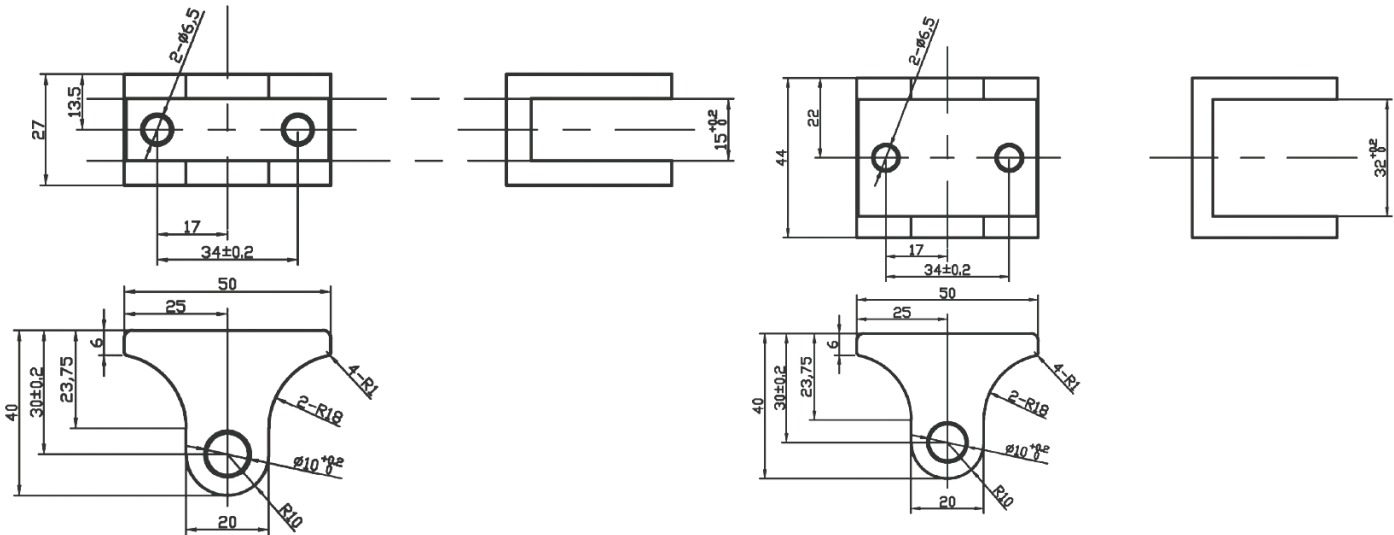


Specifications: Measure A

Torque ≤ 400	Standard		Hall sensor		Overcurrent protection	
	Normal	Low noise	Normal	Low noise	Normal	Low noise
100 - 800N	200+ stroke length	210+ stroke length	220+ stroke length	220+ stroke length	220+ stroke length	230+ stroke length
1200 - 2300N	210+ stroke length	220+ stroke length	230+ stroke length	230+ stroke length	230+ stroke length	240+ stroke length

Torque > 400	Standard		Hall sensor		Overcurrent protection	
	Normal	Low noise	Normal	Low noise	Normal	Low noise
100 - 800N	235+ stroke length	245+ stroke length	235+ stroke length	245+ stroke length	235+ stroke length	245+ stroke length
1200 - 2300N	245+ stroke length	255+ stroke length	245+ stroke length	255+ stroke length	245+ stroke length	255+ stroke length

Aluminium mounting bracket for KLEEl ine 38



KLEEl ine 38 stainless AISI 316

Standard specifications

Motor/gear

Motor 12 or 24 VDC
 Permanent magnet motor/planetary gear
 Sound level with load 60dB
 Maximum power consumption
 3,8 A (12VDC) - 1,8A (24 VDC)

Temperature

Application -20°C til +60°C
 Storage -40°C til +70°C

Density class

IP69K.

Cable specifications

3 m, 2x1,0 mm² / 6x1,0 mm²
 TPE cable (food approved)

Colour

Polished stainless steel AISI 316

Materials

- Motor and actuator tube:
Stainless steel AISI 316
- Piston tube:
Stainless steel AISI 316
- Front and rear mounting brackets:
Alu. with clevis on the piston side

Duty cycle

S2 2 min (2 minutes operation at full load, then rest until ambient temperature is reached)

Options

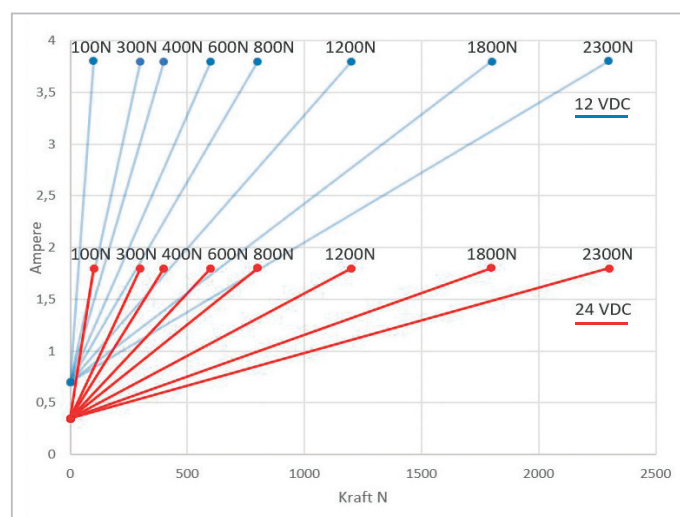
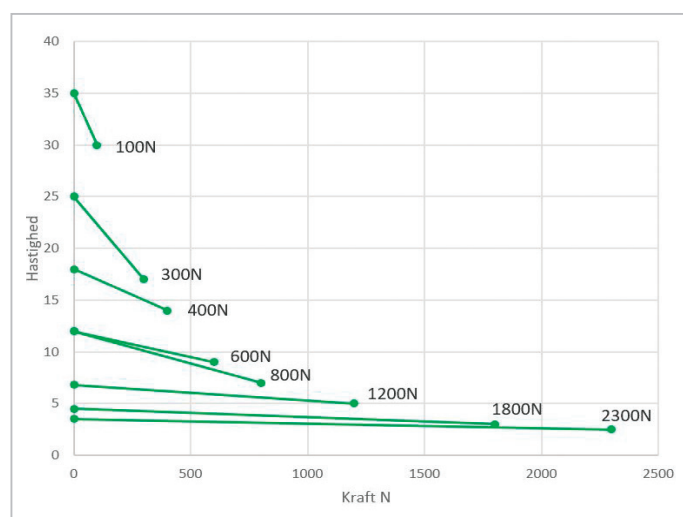
- Overcurrent protection
- Hall sensor
- Other cable lengths on request
(max 9 meters)
- Low-noise 56dB
- Limit Switch output

Upon request

Other stroke length than standard at additional cost. Minimum 20 mm. and a maximum of 500 mm.

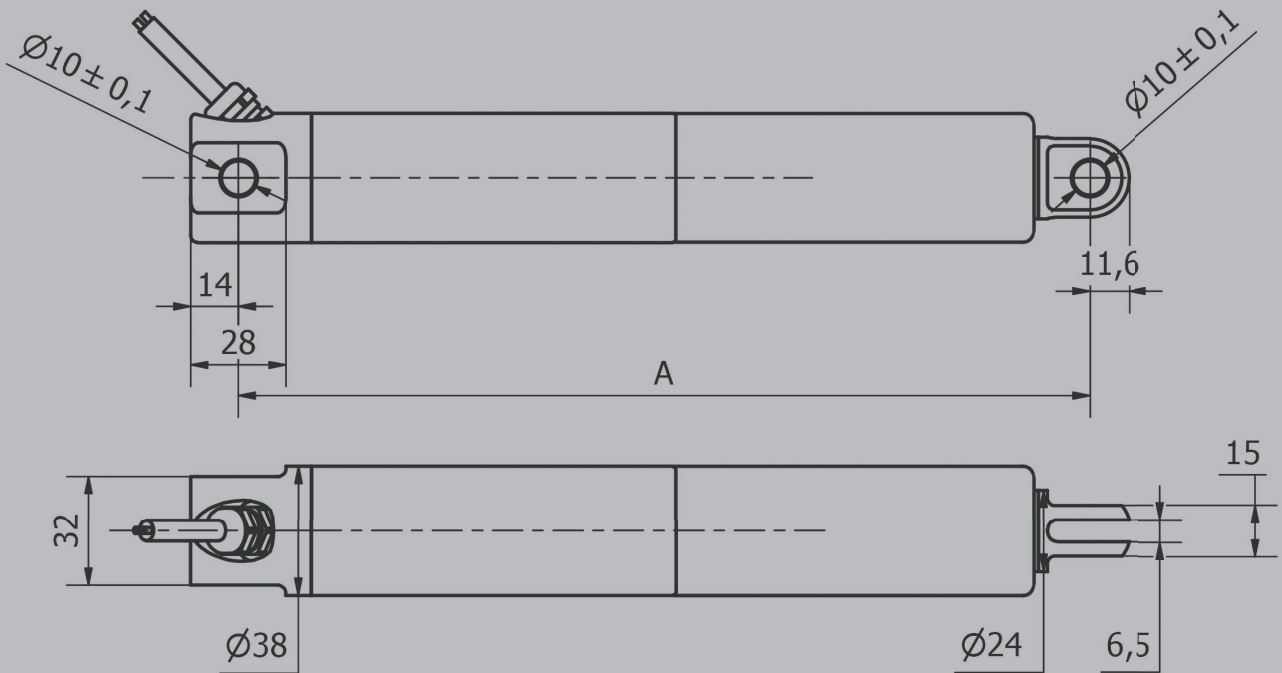
Features

KLEEl ine 38 comes as standard with a built-in Limit Switch and has a high protection of IP69K. As an option, overcurrent protection is available, for simple operation the use of a controller.



Max. load	[N]	100	300	400	600	800	1200	1800	2300
Self-locking force	[N]	150	600	600	1600	1600	1800	3600	3450
Speed unloaded Normal	[mm/s]	35	25	18	12	12	6,8	4,5	3,5
Speed at load Normal	[mm/s]	30	17	14	9	8	5	3	2,5
Speed unloaded Low-noise	[mm/s]	25	25	16,5	13	8,5	5	3,3	3,3
Speed at load Low-noise	[mm/s]	23	20	14	10,5	7	4,5	3	2,5
Stroke length	[mm]	50	100	150	200	250	300	350	400
Weight	[Kg]	0,85	0,95	1,05	1,15	1,25	1,35	1,45	1,65

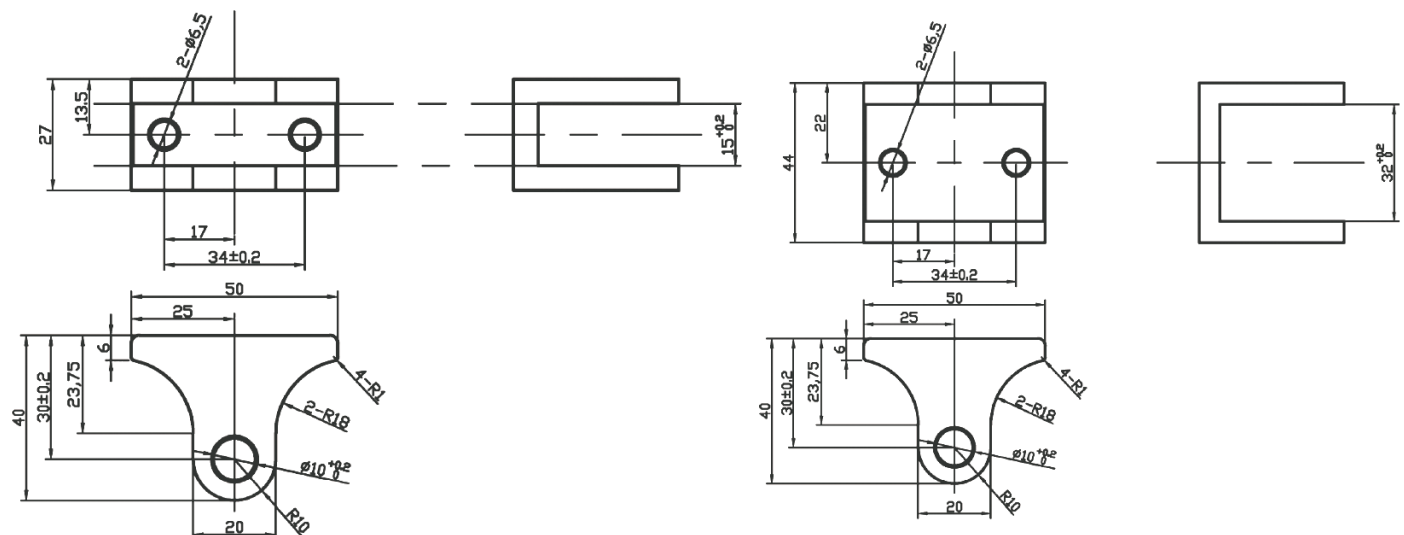
Dimensions for KLEElne 38 (all measurements in mm.)



Specifications: Measure A

Torque ≤ 400	Standard		Hall sensor		Overcurrent protection	
	Normal	Low noise	Normal	Low noise	Normal	Low noise
100 - 800N	200+ stroke length	210+ stroke length	220+ stroke length	220+ stroke length	220+ stroke length	230+ stroke length
1200 - 2300N	210+ stroke length	220+ stroke length	230+ stroke length	230+ stroke length	230+ stroke length	240+ stroke length
Torque > 400	Standard		Hall sensor		Overcurrent protection	
	Normal	Low noise	Normal	Low noise	Normal	Low noise
100 - 800N	235+ stroke length	245+ stroke length	235+ stroke length	245+ stroke length	235+ stroke length	245+ stroke length
1200 - 2300N	245+ stroke length	255+ stroke length	245+ stroke length	255+ stroke length	245+ stroke length	255+ stroke length

Aluminium mounting bracket for KLEElne 38



KLEElne 52 aluminium

Standard specifications

Motor/gear

Motor 12 or 24 VDC
 Permanent magnet motor/planetary gear
 Sound level with load 75 dB
 Maximum power consumption
 10A (12 VDC) - 5A (24 VDC)

Temperature

Application -20°C til +60°C
 Storage -40°C til +70°C

Density class

IP66

Cable specifications

3 m, 2x1,0 mm² / 6x1,0 mm²
 (AWG17), diameter ~ 6,2/6,6 mm, black

Colour

Black (RAL 9005).

Materials

- Motor and actuator tube:
Powder coated aluminium
- Piston tube:
Stainless steel AISI 316
- Front and rear mounting brackets:
Alu. with clevis on the piston side

Duty cycle

S2 2 min (2 minutes operation at full load, then rest until ambient temperature is reached)

Options

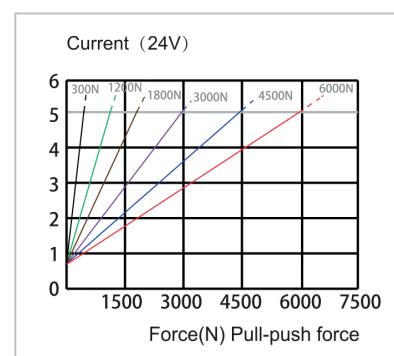
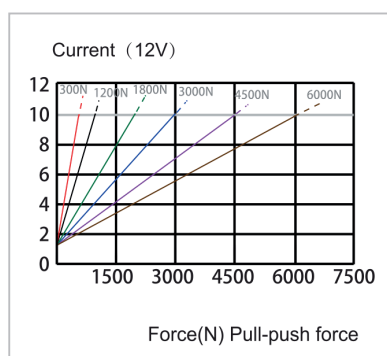
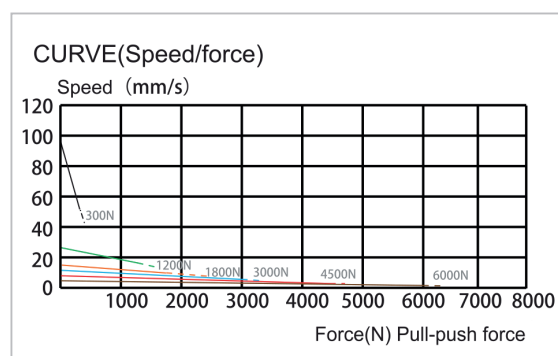
- Overcurrent protection
- Hall sensor
- Other cable lengths on request
- IP67M
- Limit Switch output signal

Upon request

Other stroke length than standard at additional cost. Minimum 20 mm. and a maximum of 500 mm.

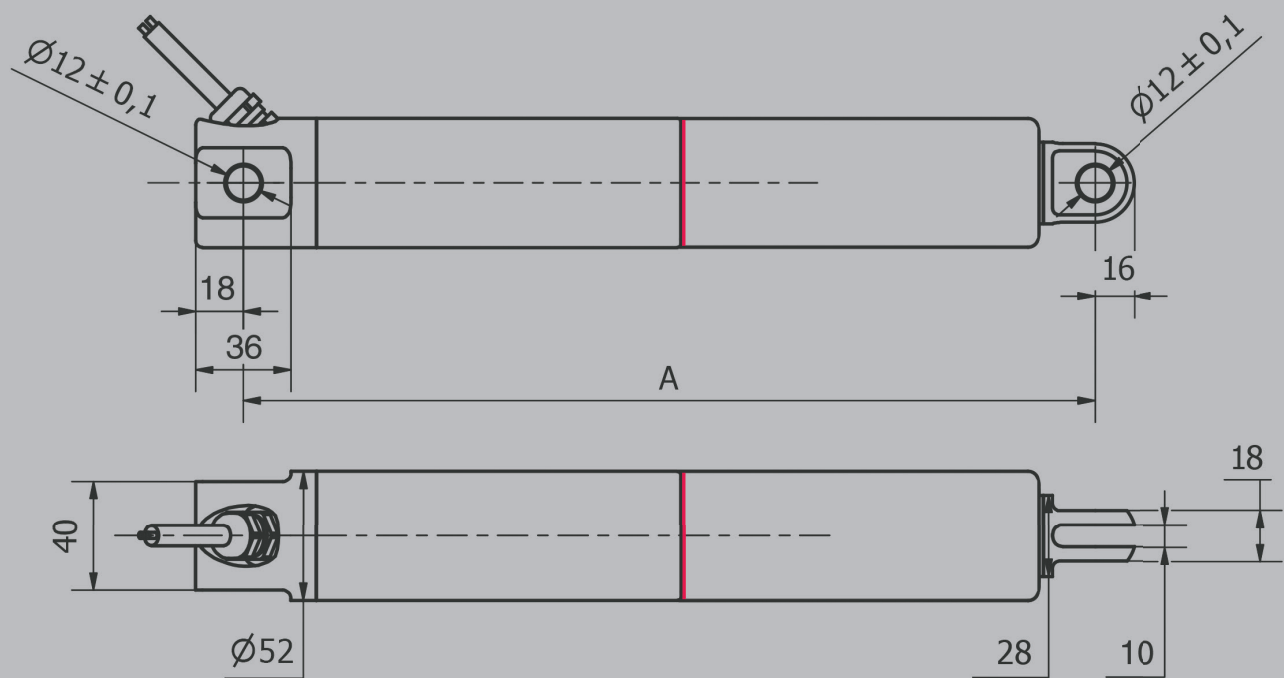
Features

KLEElne 52 comes as standard with a built-in Limit Switch and has a high protection of IP66. As an option, overcurrent protection is available, for simple operation the use of a controller.



Max. load	[N]	300	1200	1800	3000	4500	5000	6000	
Self-locking force	[N]	600	2400	3600	6000	8000	7500	8000	
Speed unloaded <small>Normal</small>	[mm/s]	88	24	16	9,6	6,4	4,8	4,8	
Speed at load <small>Normal</small>	[mm/s]	55	15	10	6	4,5	3,3	3	
Stroke length	[mm]	50	100	150	200	250	300	350	400
Weight	[Kg]	1,8	1,9	2	2,1	2,2	2,3	2,4	2,5

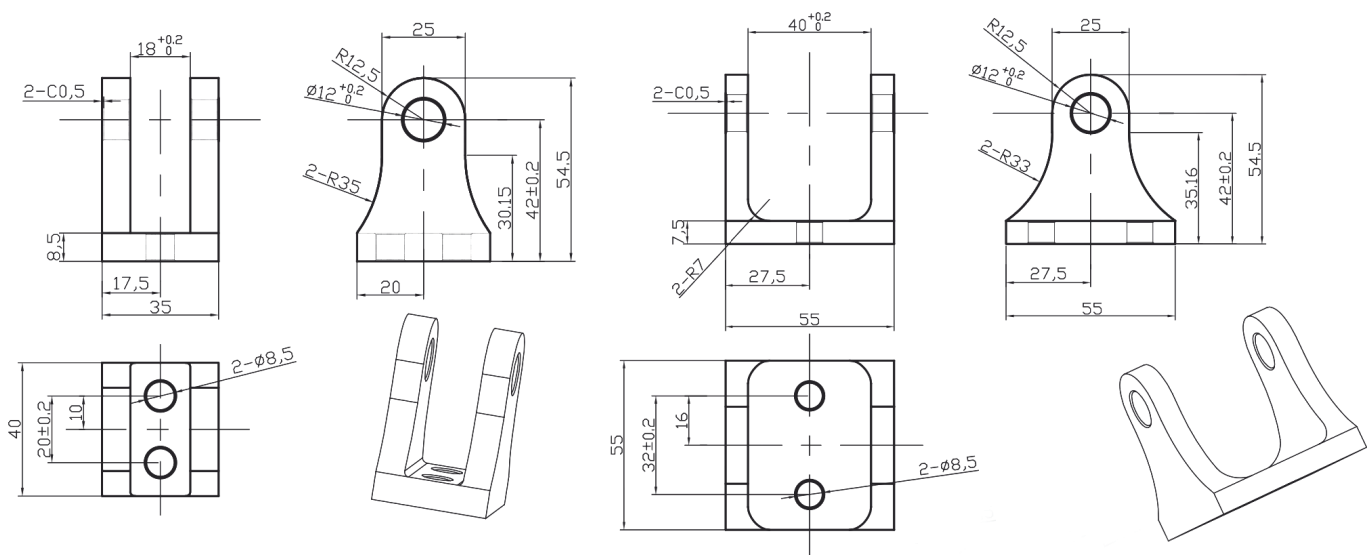
Dimensions for KLEEl ine 52 (all measurements in mm.)



Specifications: Measure A

Torque	Standard	Hall sensor	Overcurrent protection
	Normal	Normal	Normal
300 - 6000N	305 + stroke length	325 + stroke length	325 + stroke length

Aluminium mounting bracket for KLEEl ine 52



KLEEl ine 52 stainless AISI 316

Standard specifications

Motor/gear

Motor 12 or 24 VDC
 Permanent magnet motor/planetary gear
 Sound level with load 75 dB
 Maximum power consumption
 10A (12 VDC) - 5A (24 VDC)

Temperature

Application -20°C til +60°C
 Storage -40°C til +70°C

Density class

IP69K.

Cable specifications

3 m, 2x1,0 mm² / 6x1,0 mm²
 TPE cable (food approved)

Colour

Polished stainless steel AISI 316.

Materials

- Motor and actuator tube:
Stainless steel AISI 316
- Piston tube:
Stainless steel AISI 316
- Front and rear mounting brackets:
Alu. with clevis on the piston side

Duty cycle

S2 2 min (2 minutes operation at full load, then rest until ambient temperature is reached)

Options

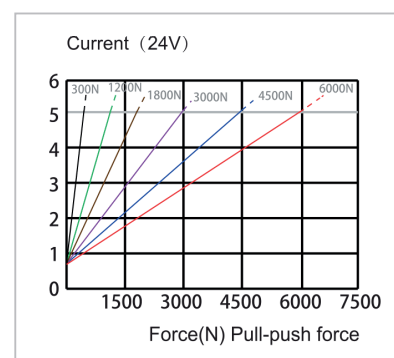
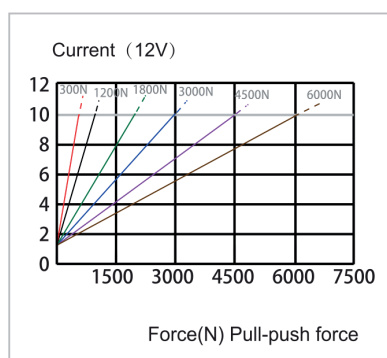
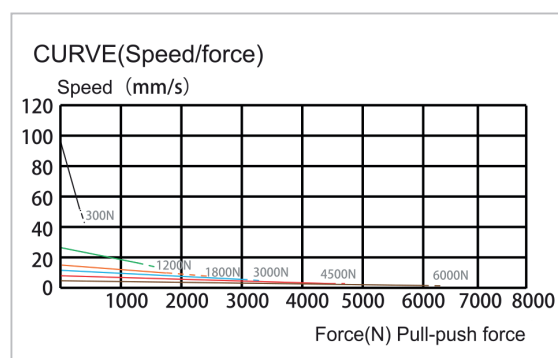
- Overcurrent protection
- Hall sensor
- Other cable lengths on request
- Limit Switch output signal

Upon request

Other stroke length than standard at additional cost. Minimum 20 mm. and a maximum of 500 mm.

Features

KLEEl ine 52 comes as standard with a built-in Limit Switch and has a high protection of IP69K. As an option, overcurrent protection is available, for simple operation the use of a controller.



Max. load	[N]	300	1200	1800	3000	4500	5000	6000	
Self-locking force	[N]	600	2400	3600	6000	8000	7500	8000	
Speed unloaded <small>Normal</small>	[mm/s]	88	24	16	9,6	6,4	4,8	4,8	
Speed at load <small>Normal</small>	[mm/s]	55	15	10	6	4,5	3,3	3	
Stroke length	[mm]	50	100	150	200	250	300	350	400
Weight	[Kg]	1,8	1,9	2	2,1	2,2	2,3	2,4	2,5

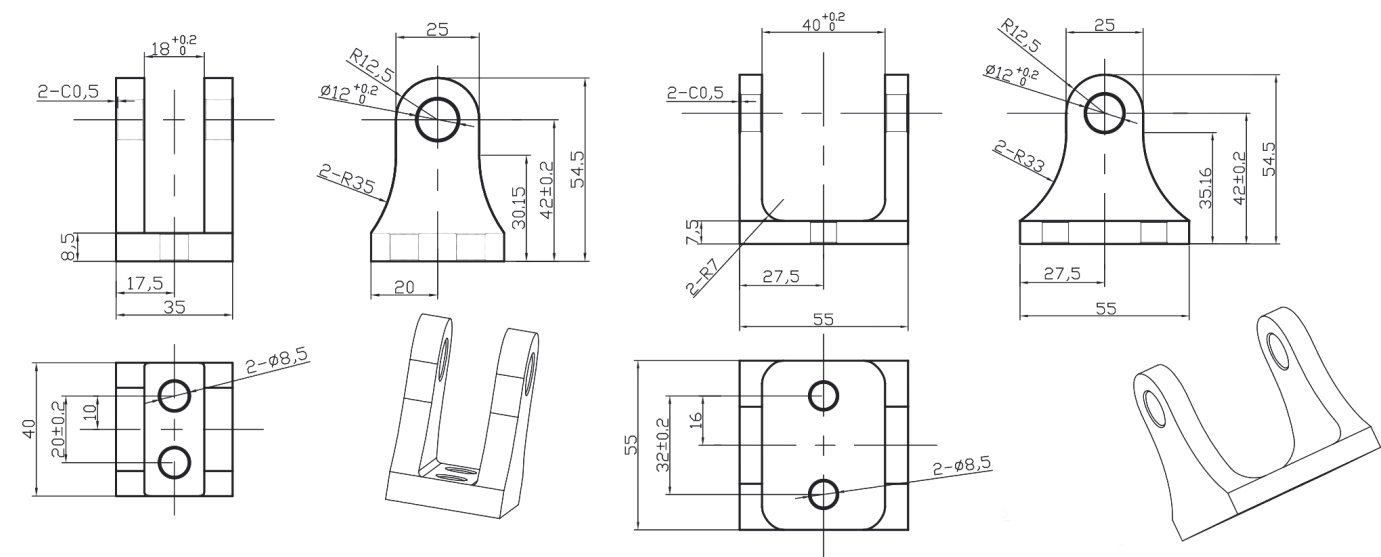
Dimensions for KLEEl ine 52 (all measurements in mm.)



Specifications: Measure A

Torque	Standard	Hall sensor	Overcurrent protection
	Normal	Normal	Normal
300 - 6000N	305 + stroke length	325 + stroke length	325 + stroke length

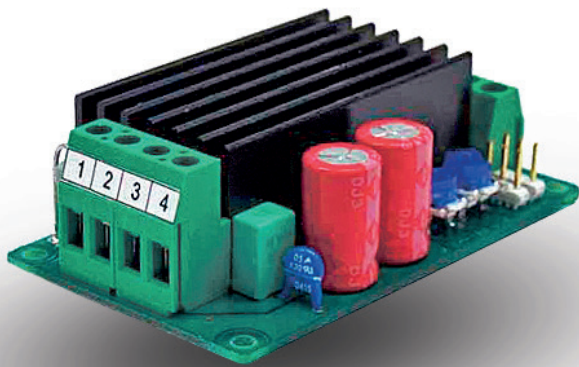
Aluminium mounting bracket for KLEEl ine 52



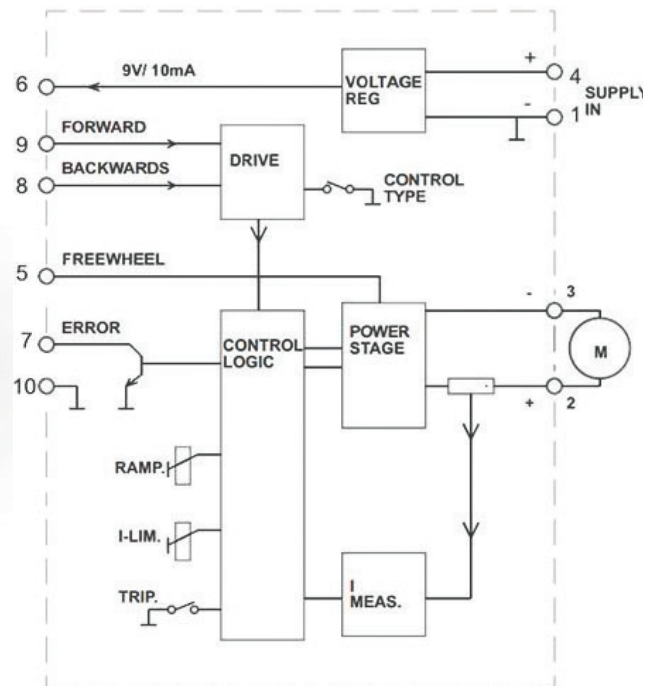
Control unit (1)

Model EM-180 actuator without/Hall

Standard control for 1 actuator (without Hall feedback)
and digital input via terminals.



Block diagram for EM-180



Accessories:

– DIN rail bracket

Specifications

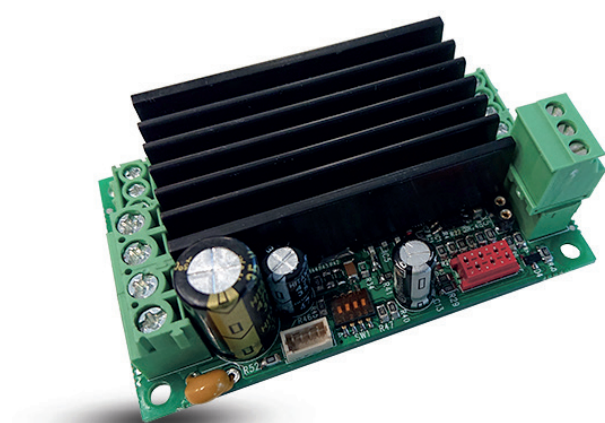
Supply voltage	2-32 VDC
Output current	10A continuous, 15A with 50% duty cycle
Digital Input	4-30 VDC
Built	Print (PCB)

Control unit (1)

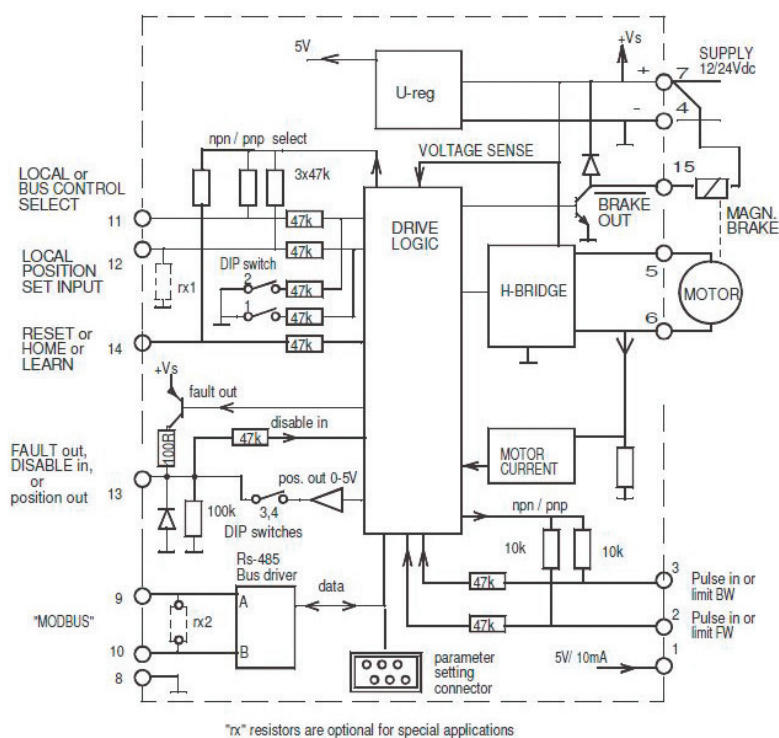
Model EM-348-SPF actuator w/Hall

Standard control for 1 actuator (with Hall feedback)

Analog input for variable positioning of the actuator.



Block diagram for EM-348-SPF



Accessories:

- DIN rail bracket
- EM-236 programming box
- EM-328 programming cabinet

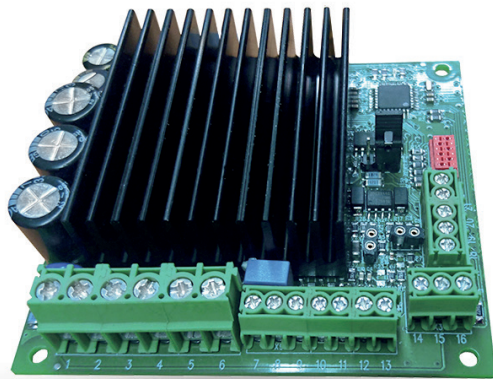
Specifications

Supply voltage	10-35 VDC
Output current	15A continuous
Digital Input	0-5 or 0-10 VDC
Built	Print (PCB)

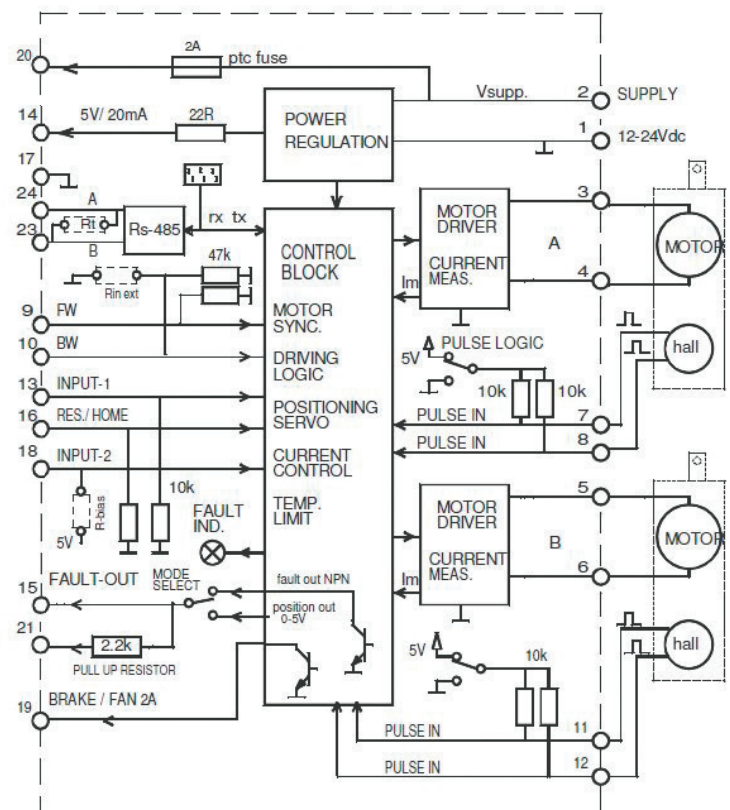
Control unit (2)

Model EM-339A-PLI actuator w/Hall (FW/BW)

Standard control for 2 actuators (with Hall feedback)
Parallel operation of actuators with digital input.



Block diagram for EM-339A-PLI



Accessories:

- DIN rail bracket
- EM-236 programming box
- EM-328 programming cabinet

Specifications

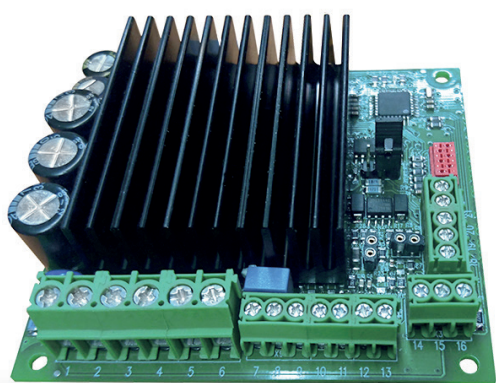
Supply voltage	12-35 VDC
Output current	2 x 10A continuous or 2 x 20A peak with 25% duty cycle
Digital Input	4-30 VDC
Build	Print (PCB)

Control unit (2)

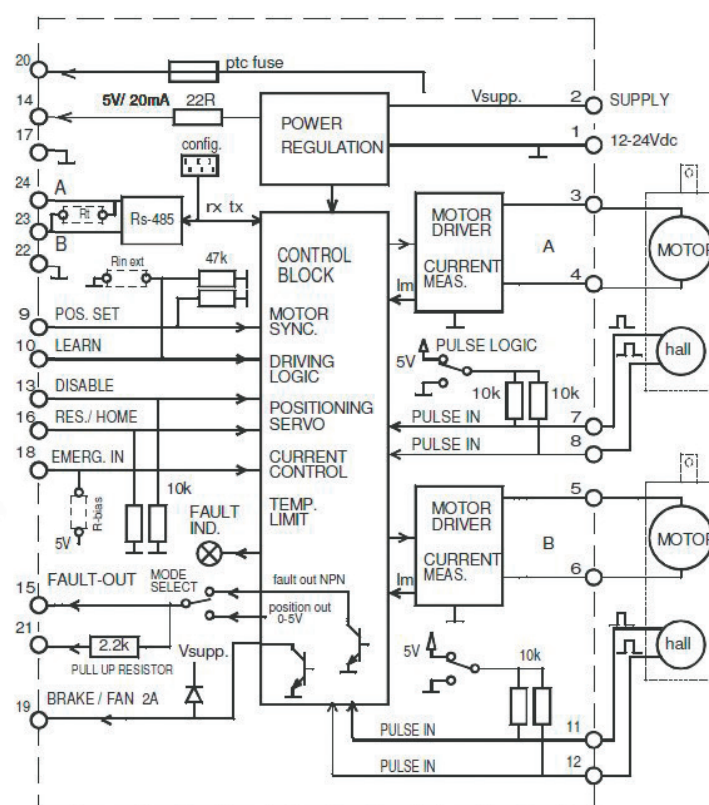
Model EM-339A-SPF actuator w/Hall (0-10 volts)

Standard control for 2 actuators (with Hall feedback)

Parallel operation of actuators with analog input.



Block diagram for EM-339A-SPF



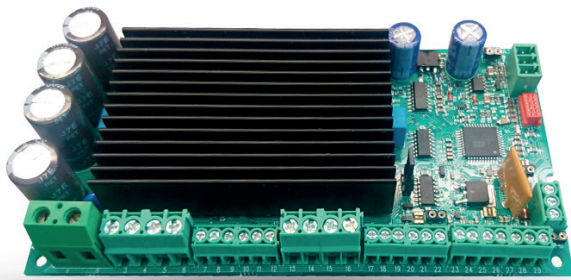
Accessories:

- DIN rail bracket
- EM-236 programming box
- EM-328 programming cabinet

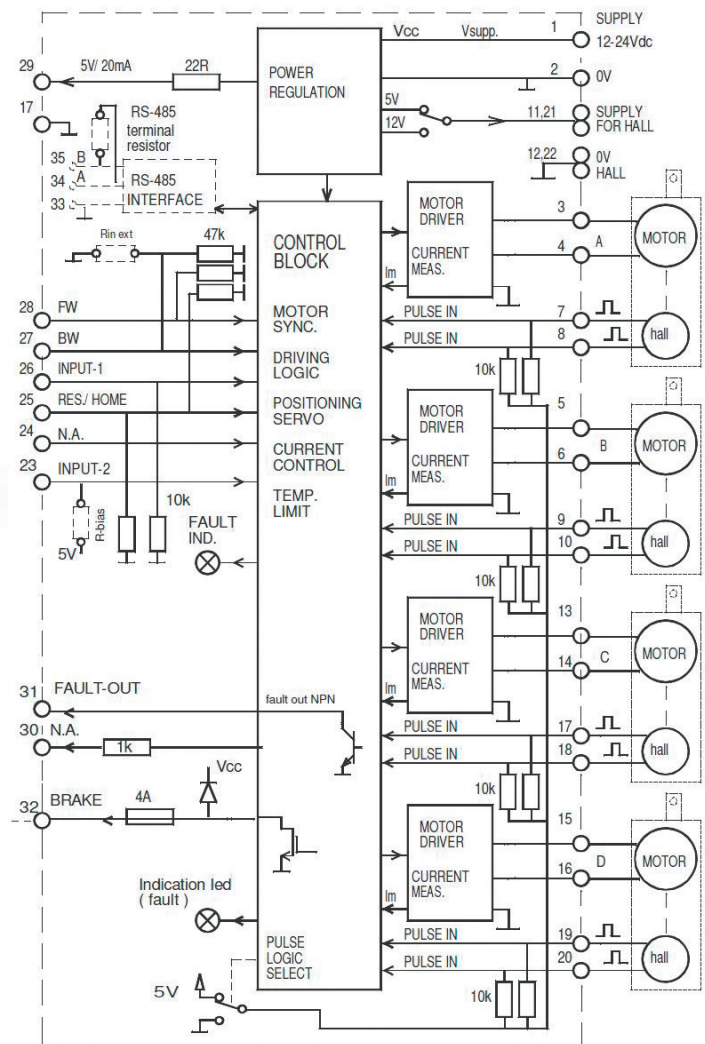
Specifications

Supply voltage	12-35 VDC
Output current	2 x 10A continuous or 2 x 20A peak with 25% duty cycle
Digital Input	0-5 eller 0-10 VDC
Build	Print (PCB)

Standard control for 4 actuators (with Hall feedback)
Parallel operation of actuators with digital input.



Block diagram for EM-337A-PLI



Accessories:

- DIN rail bracket
- EM-236 programming box
- EM-328 programming cabinet

Specifications

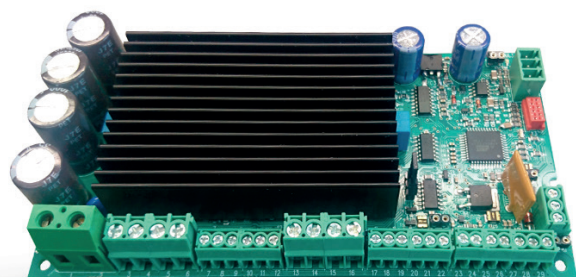
Supply voltage	10-35 VDC
Output current	4 x 8A continuous or 4 x 15A peak with 10% duty cycle
Digital Input	4-30 VDC
Build	Print (PCB)

Control unit(4)

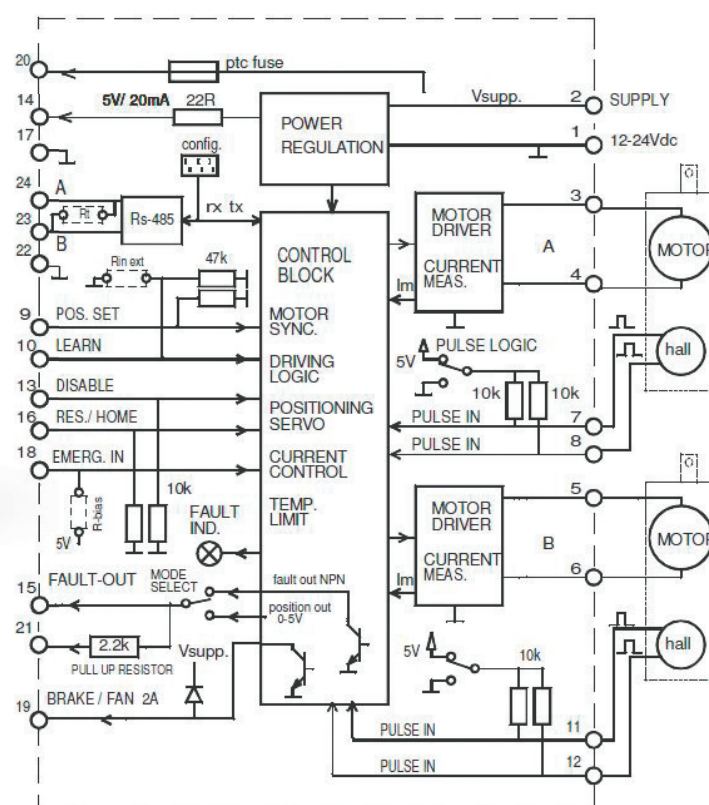
Model EM-337A-SPF actuator w/Hall (Parallel)

Standard control for 4 actuators (with Hall feedback)

Parallel operation of actuators with analog input.



Block diagram for EM-337A-SPF



Accessories:

- DIN rail bracket
- EM-236 programming box
- EM-328 programming cabinet

Specifications

Supply voltage	10-35 VDC
Output current	4 x 8A continuous or 4 x 15A peak with 10% duty cycle
Digital Input	4-30 VDC
Build	Print (PCB)

Hall sensor & OC Protection

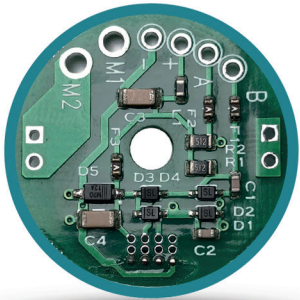
KLEEl ine actuators

Hall sensor

Hall sensor can be added to the actuator, whereby a signal feedback is obtained, which can be controlled

by either one of our controllers or via our own PLC.

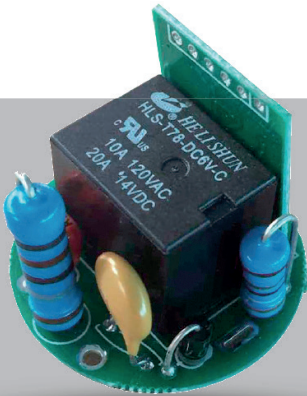
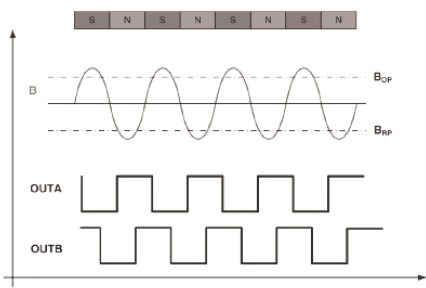
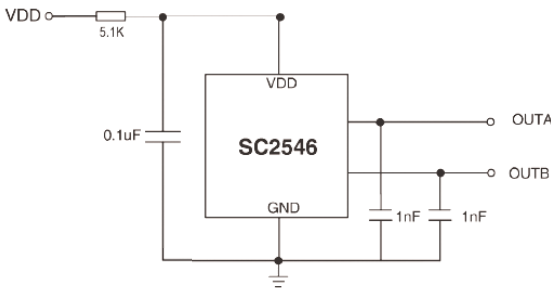
This function is used for parallel operation, positioning or if the stroke length is to be reduced.



Specifications

Operating voltage	2,5-12 VDC
Operating supply current	1,5-3,5 mA
Digital Input	5-15 K Ω

Hall sensor circuit diagram and output wave



Over Current Protection

Over current protection can be added to the actuator to prevent it from damage. This function can e.g. be useful if you want a completely simple operation out/in without using a controller.

Notes

- The response time of the circuit is 0.1-0.5 s.
- The ambient temperature range must be -20° C to +60° C, and the storage temperature -40° C to +70° C.
- S2 2min (2 minutes operation at full load, then rest until ambient temperature is reached).

Specifications

Voltage / Model	KLEEl ine 38	KLEEl ine 52
DC12V	4.5A	11.5A
DV24V	2.5A	6.5A

Programming devices

Mounting options

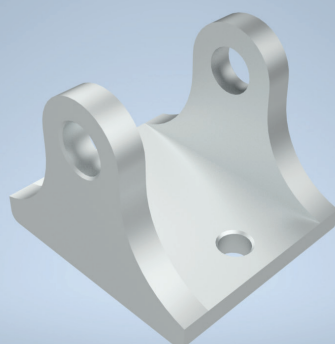
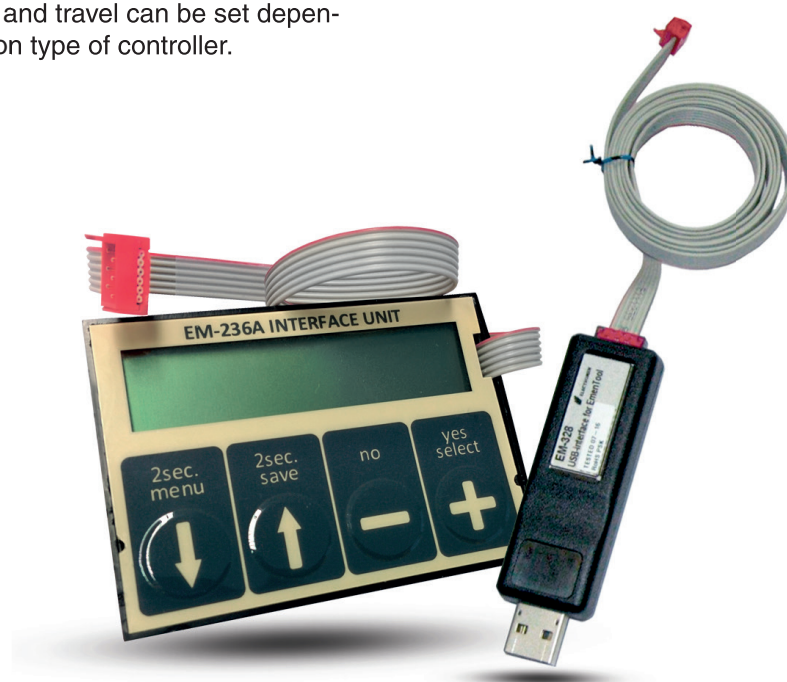
Programming box and cable

EM-328 USB programming cable for use with EmenTool Lite PC software.

(<http://www.electromen.com/en/products/item/download>).

With this tool, the parameter list of the controller can be monitored and changed. The setup can be saved and used again. This is necessary to set e.g. correct current limit. Also speed, ramp and travel can be set depending on type of controller.

The EM-236A programming box is a tool that can be used to monitor and change the parameter list of the controller. This is necessary to set e.g. correct current limit. Also speed, ramp and travel can be set depending on type of controller.



DIN rail and mounting bracket

DIN rail bracket for mounting together with control unit, for mounting of control panels in 3 sizes:

1. EM-180 and EM-348-SPF.
2. EM-339A-PLI and EM-339A-SPF.
3. EM-337A-PLI and EM-337A-SPF.

Mounting brackets are offered as a set with brackets for front and rear for KLEEl ine. The brackets are made from aluminium.



See more at www.klee.dk

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