ABOUT US

MecMot started its activities in 2017 by designing Screw Jack and Linear Actuator in a 25 m2 design office.

Since 2018, MecMot's screw jacks and linear actuators have been successfully produced for leading machine manufacturers and companies from various industries in Türkiye.

In 2018, MecMot bevel gearbox designs have been completed and have taken their place in the product portfolio. By 2019, MecMot has started to export many European countries.

In 2021, MecMot has continued growing by expanding its machine space and capacity in its 1500 m2 facility.

MecMot, exporting to nearly 24 countries today, has reached an important position in its own market in Türkiye. It has created a significant value in its field in a short time and has become one of the leading manufacturers.

Since its establishment, MecMot has always followed the confounding principle of "offering its customers advanced solutions in the most competitive terms by using the latest technology". MecMot's continuous and determined R&D policy in order to create sustainable value that reconciles the ecology and the benefit of its customers, and in oreder to always offer its customers the latest technology in the most competitive terms constitutes its core effort.

By the end of 2022, MecMot has completed a significant part of its target production investment. Thus, MecMot has accelerated and dedicated its efforts to realize its passion to be in global markets and its scope to take its place with the market leaders since its establishment.

MecMot has the ability to produce all its products easily and quickly, and delivers its products all over the world in the fastest way.

Scope of application:
MecMot's motivation, which has helped us to achieve the goals that we have set in mind since the first day is constantly strengthening. MecMot, as a company whose priority is always customer satisfaction by quality and functionality, serves to facilitate your work with its knowledge and experience in many fields such as Iron & Steel Industry, Solar Energy Systems, Defense Industry, Movable Platforms, Aerospace Industry, and Hydroelectric Systems.

MecMot
Mechanic Motion Partner

General Catalogue
Version 2.1

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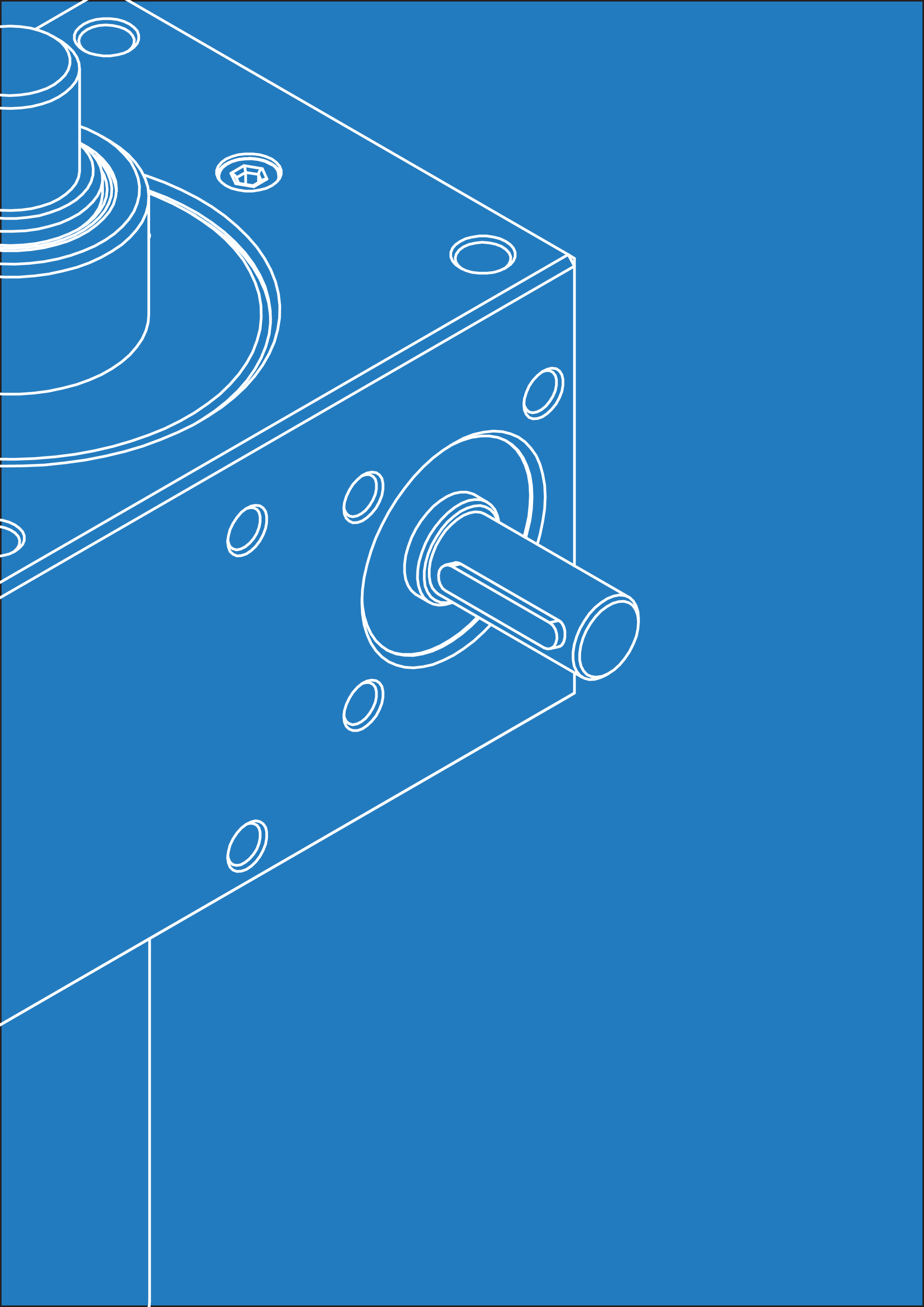
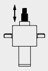
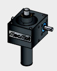
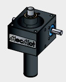
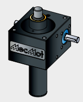
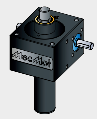
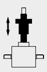
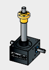
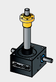
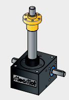
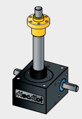


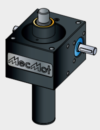
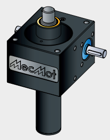
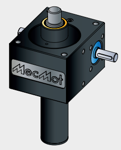
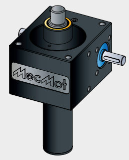
SCREW JACK

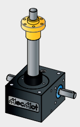
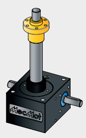
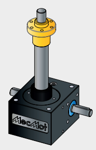
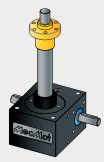
OVERVIEW SIZES/TYPES

Translating Screw (VH) 				
Series	VK5	VK10	VK25	VK50
Load	5kN	10kN	25kN	50kN
Ratio	4:1 16:1	4:1 16:1	6:1 24:1	7:1 28:1
Housing Material	C45	C45	GGG-50	GGG-50
Screw	Tr18x4	Tr20x4	Tr30x6	Tr40x7

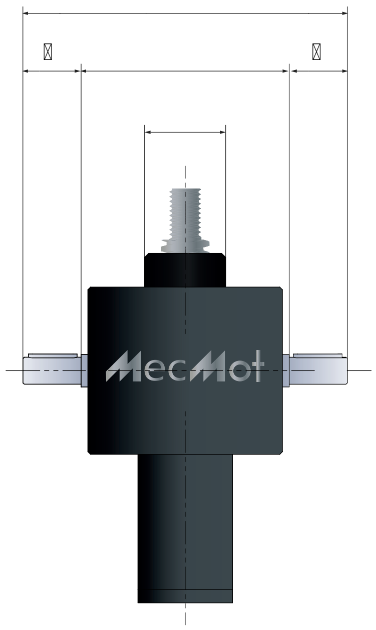
Rotating Screw (SH) 				
Series	VK5	VK10	VK25	VK50
Load	5kN	10kN	25kN	50kN
Ratio	4:1 16:1	4:1 16:1	6:1 24:1	7:1 28:1
Housing Material	C45	C45	GGG-50	GGG-50
Screw	Tr18x4	Tr20x4	Tr30x6	Tr40x7

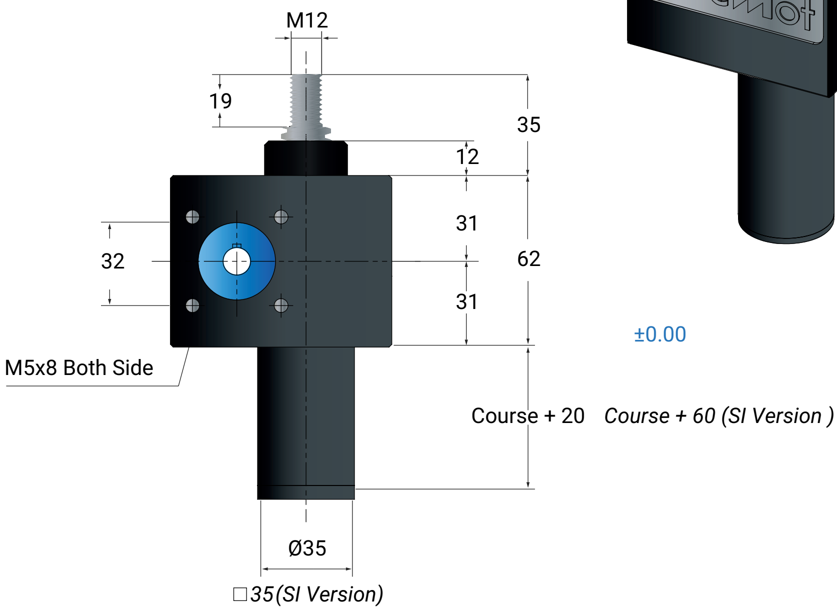
OVERVIEW SIZES/TYPES

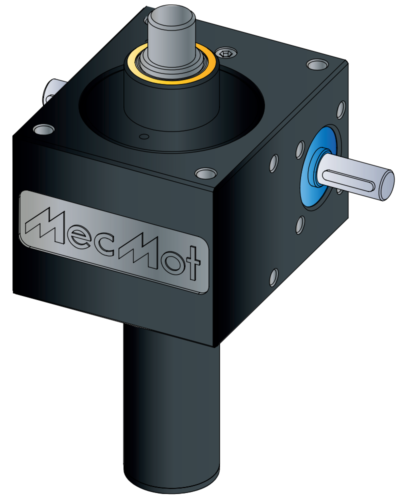
			
VK100	VK150	VK250	VK350
100kN	100kN	250kN	350kN
9:1	9:1	10:1	10:1
36:1	36:1	40:1	40:1
GGG-50	GGG-50	GGG-50	GGG-50
Tr55x9	Tr60x9	Tr80x10	Tr100x10

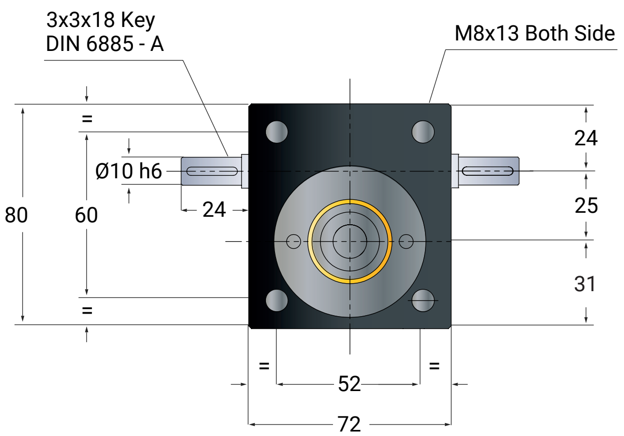
			
VK100	VK150	VK250	VK350
100kN	100kN	250kN	350kN
9:1	9:1	10:1	10:1
36:1	36:1	40:1	40:1
GGG-50	GGG-50	GGG-50	GGG-50
Tr55x9	Tr60x9	Tr80x10	Tr100x10

VK5-VH-S/SI Max 5 kN

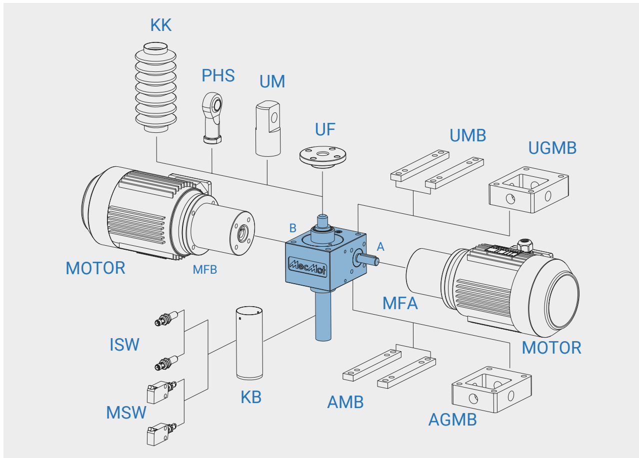








VH-S/SI ACCESORIES



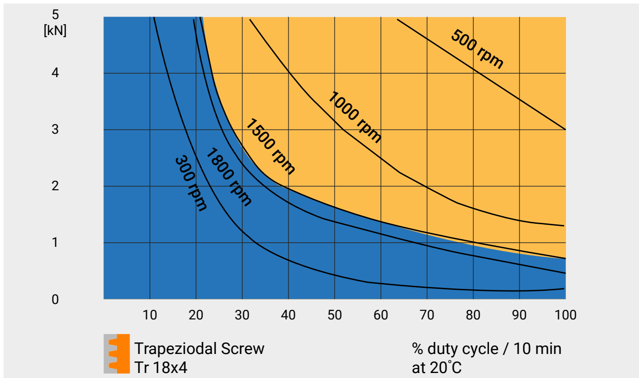
Standard Ratios

Type	Version	Speed	Standart screw	i	Stroke per drive shaft rotation
VK5-VH-A	Translating screw	Normal	Tr 18x4	4:1	1.00 mm
VK5-VH-B		Low speed		16:1	0.25 mm
VK5-SH-A	Rotating screw	Normal	Tr 18x4	4:1	1.00 mm
VK5-SH-B		Low speed		16:1	0.25 mm

General Features

Max static load: 5 kN
Max dynamic load: See duty cycle curves
Nominal speed: 1500 rpm
Max speed: 3000 rpm (depending force and duty cycle)
Screw size: Tr 18x4
Operation temperature: -10/60C
Screw lubrication: Grease lubrication
Input torque: Max 4.5 Nm (A) max 1.5 Nm (B)
Drive-through torque: Max 40 Nm

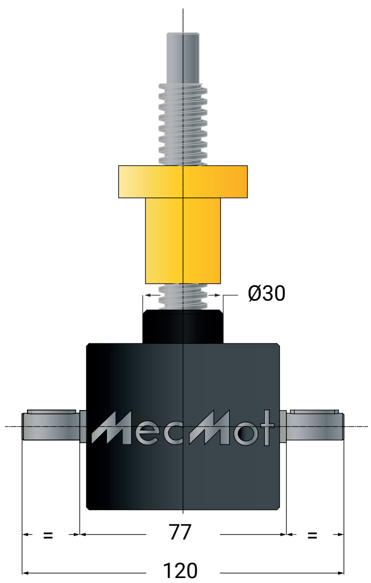
Duty cycle thermal limit, for S+R

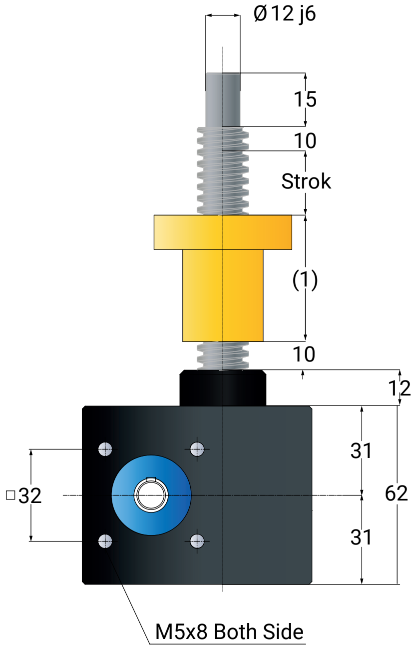


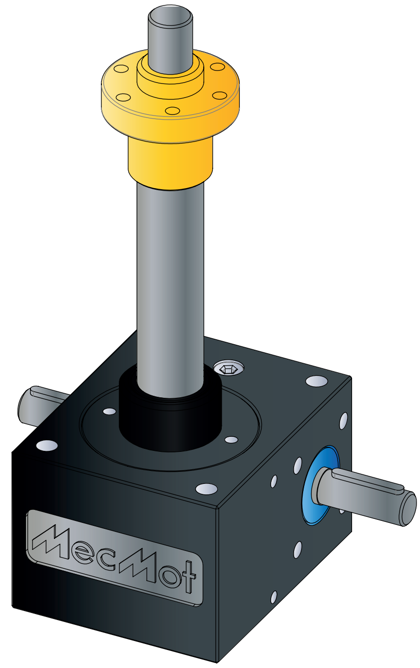
These curves above represents the thermally safe operating time of the product in percent.
These values are valid for the normal operating conditions of the system (lubrication, ambient temperature, environmental conditions, etc.). Otherwise, please contact Mecmot Engineering department.

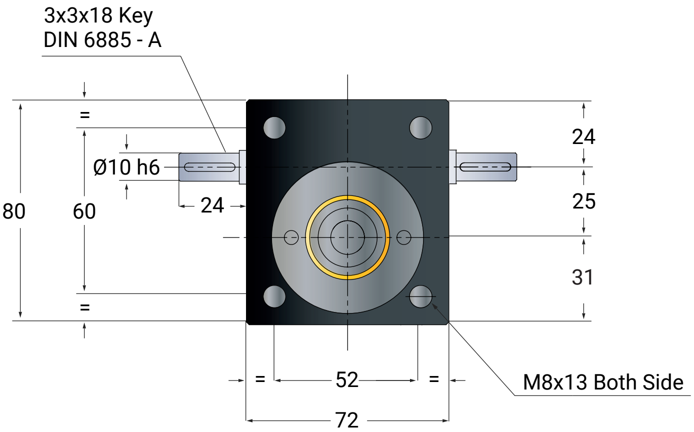
VK5-SH Max 5 kN

Trapeziodal Screw

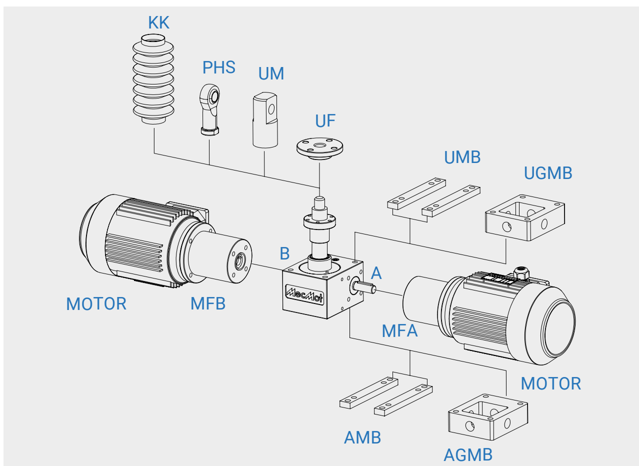




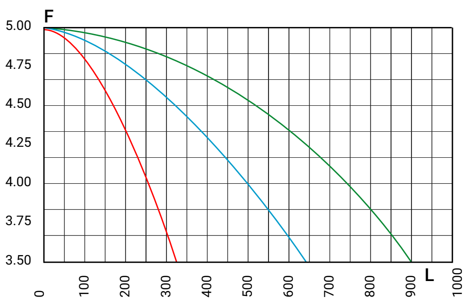


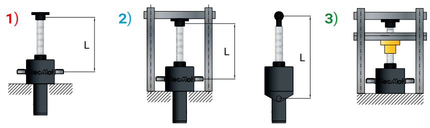


SH ACCESORIES

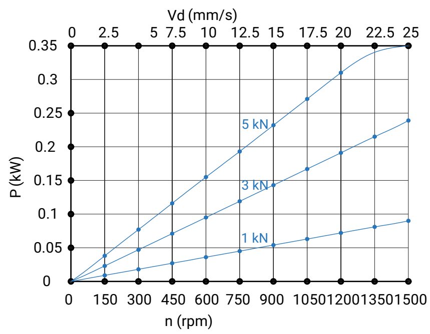


Euler's law (safety factor = 2 dynamic compression load)
Limit load 1 (red) - 2 (blue) - 3 (green)
F = Load [kN]
L = Overall trapezoidal screw lenght [mm]

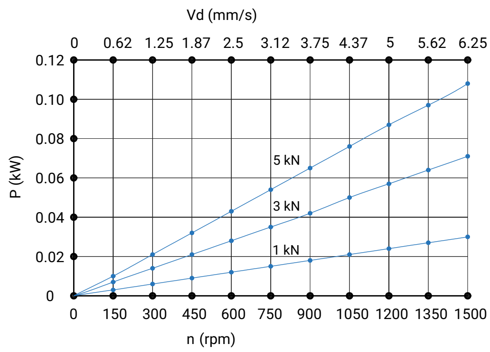




Power Curves (Reduction A Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]



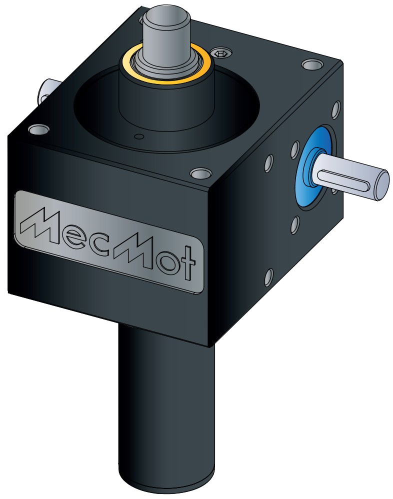
Power Curves (Reduction B Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

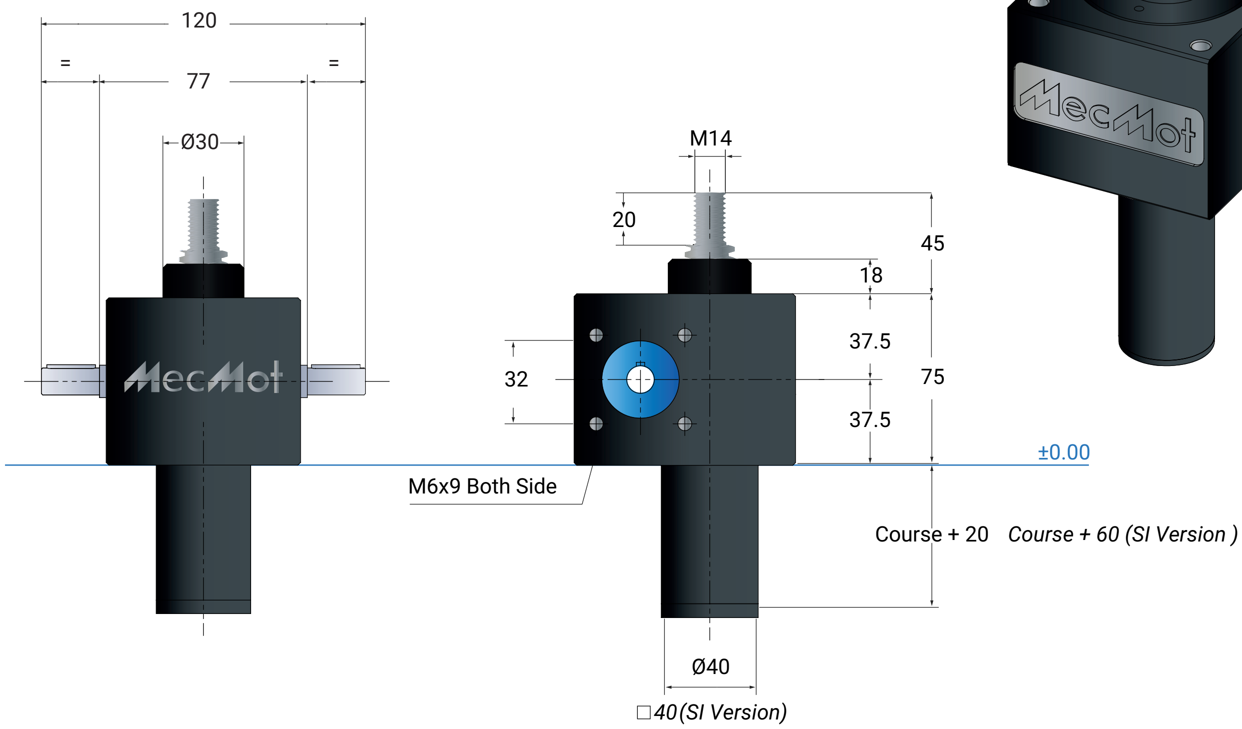


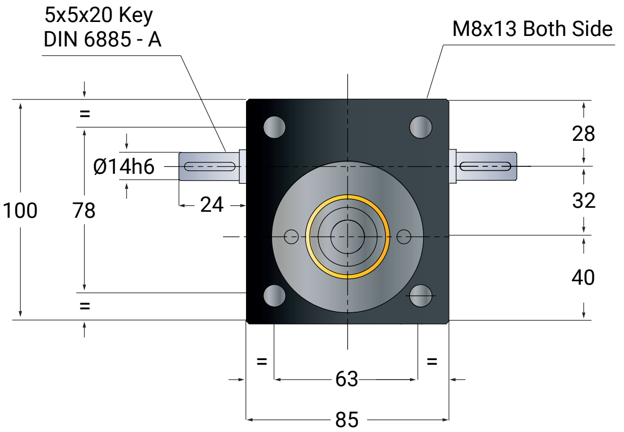
VK10-VH-S/SI

Max **10 kN**

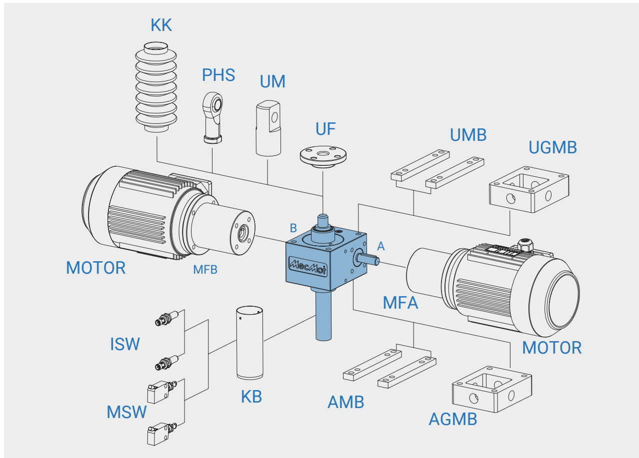
Trapeziodal Screw







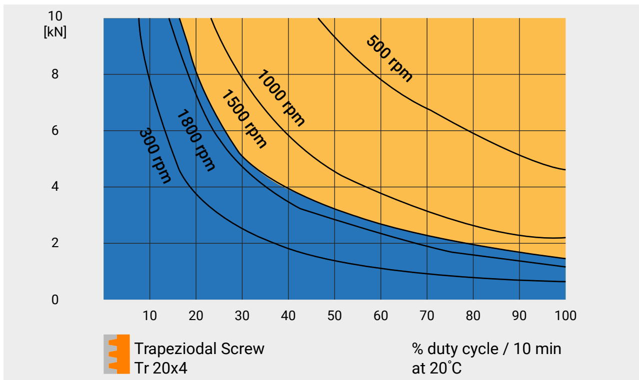
VH-S/SI ACCESORIES



Standard Ratios

Type	Version	Speed	Standart screw	i	Stroke per drive shaft rotation
VK10-VH-A	Translating screw	Normal	Tr 20x4	4:1	1.00 mm
VK10-VH-B		Low speed		16:1	0.25 mm
VK10-SH-A	Rotating screw	Normal	Tr 20x4	4:1	1.00 mm
VK10-SH-B		Low speed		16:1	0.25 mm

Duty cycle thermal limit, for S+R



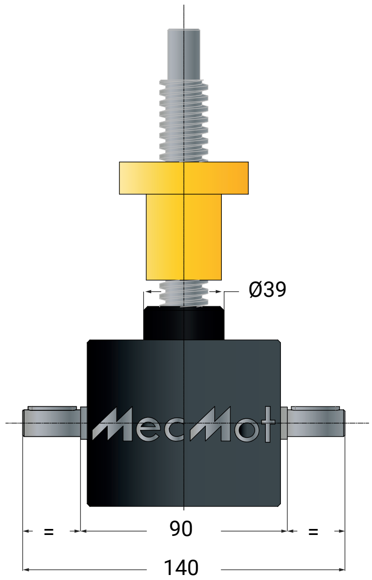
These curves above represents the thermally safe operating time of the product in percent.
These values are valid for the normal operating conditions of the system (lubrication, ambient temperature, environmental conditions, etc.). Otherwise, please contact Mecmot Engineering department.

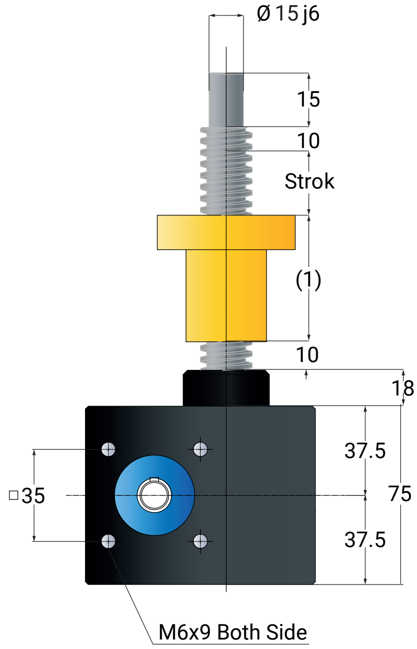
General Features

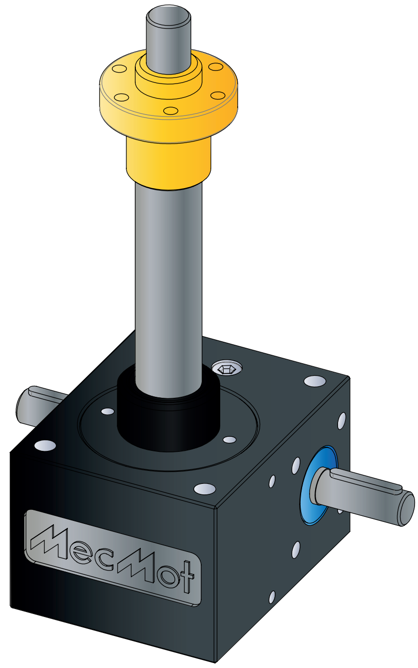
Max static load: 10 kN
Max dynamic load: See duty cycle curves
Nominal speed: 1500 rpm
Max speed: 3000 rpm (depending force and duty cycle)
Screw size: Tr 20x4
Operation temperature: -10/60C
Screw lubrication: Grease lubrication
Input torque: Max 13 Nm (A) max 7 Nm (B)
Drive-through torque: Max 55 Nm

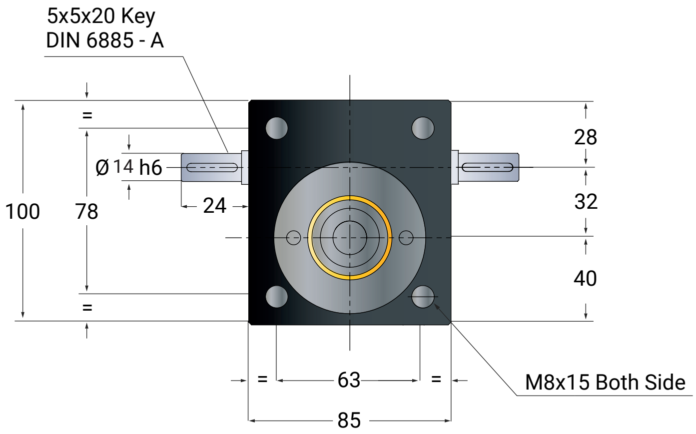
VK10-SH Max 10 kN

Trapeziodal Screw

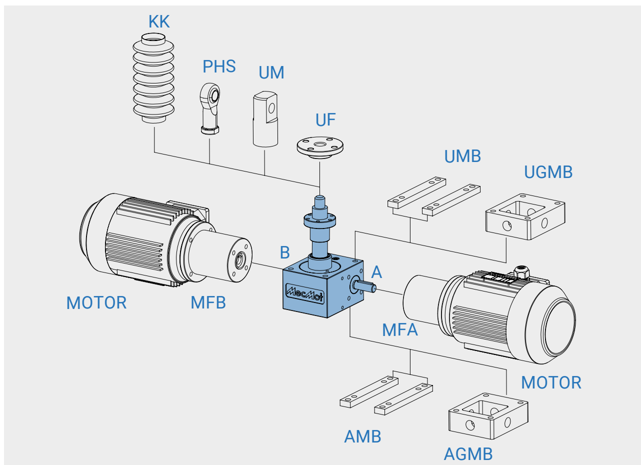




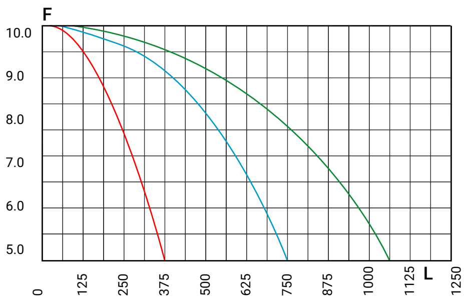


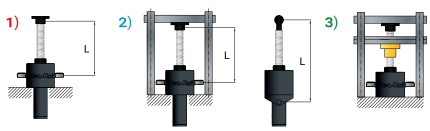


SH ACCESORIES

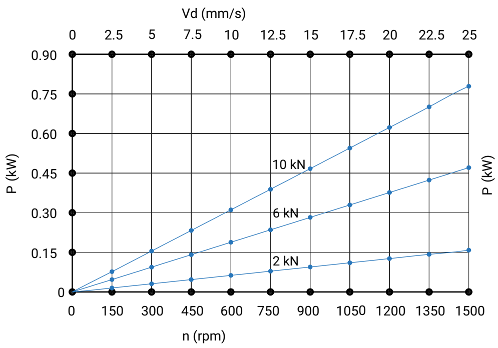


Euler's law (safety factor = 2 dynamic compression load)
Limit load 1 (red) - 2 (blue) - 3 (green)
F = Load [kN]
L = Overall trapezoidal screw lenght [mm]

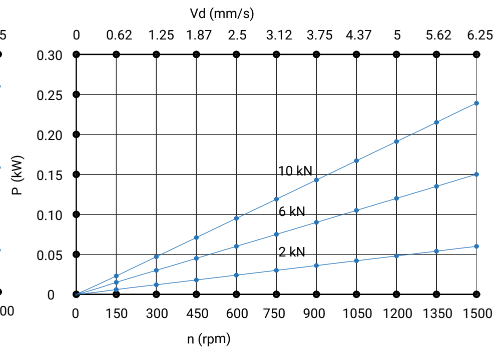




Power Curves (Reduction A Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]



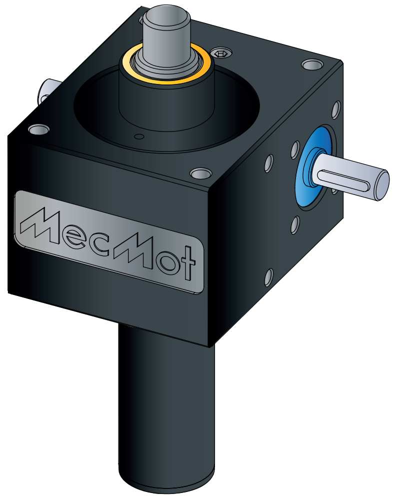
Power Curves (Reduction B Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

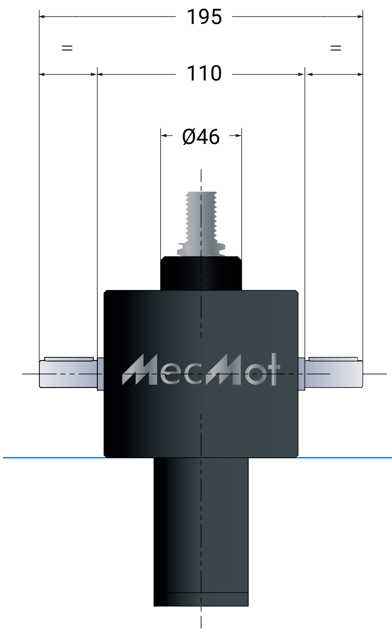


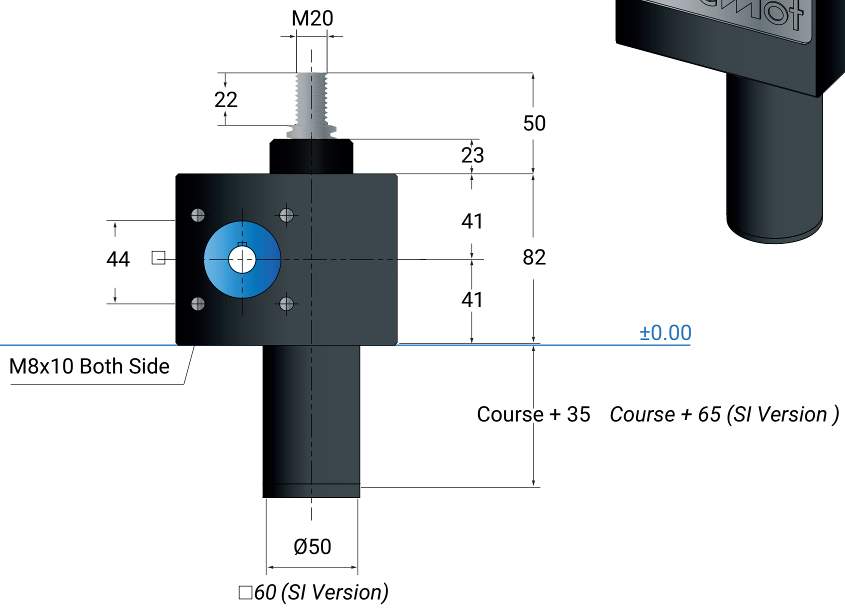
VK25-VH-S/SI

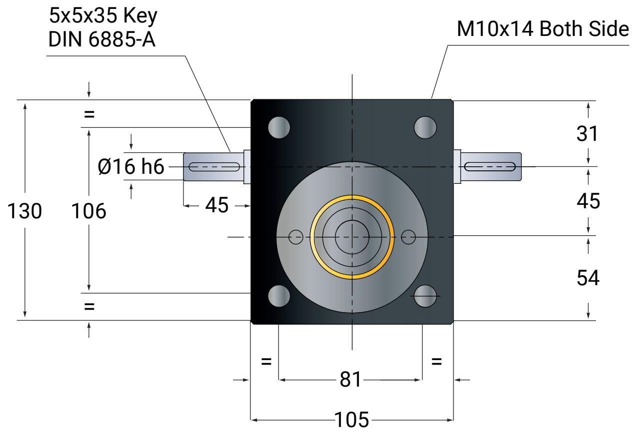
Max 25 kN

Trapeziodal Screw

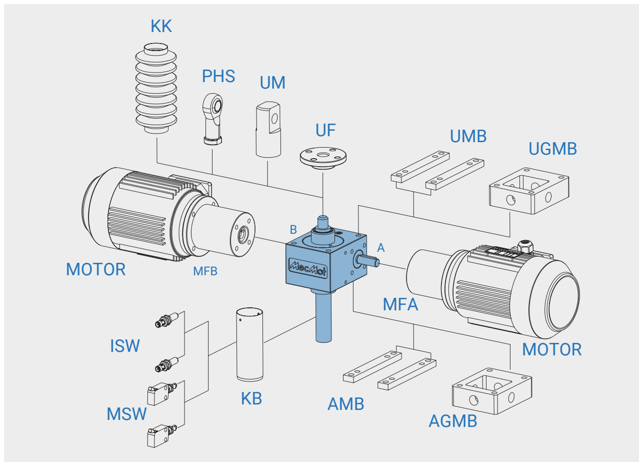








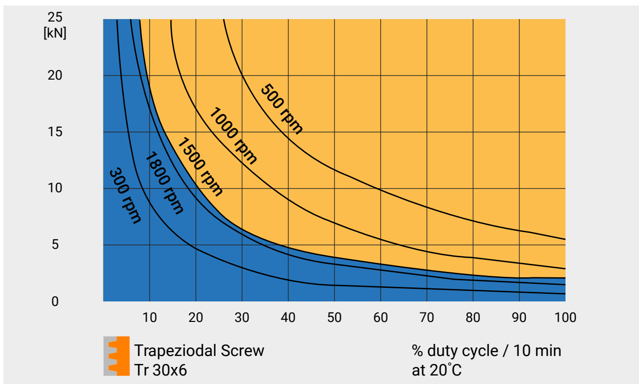
VH-S/SI ACCESORIES



Standard Ratios

Type	Version	Speed	Standart screw	i	Stroke per drive shaft rotation
VK25-VH-A	Translating screw	Normal	Tr 30x6	6:1	1.00 mm
VK25-VH-B		Low speed		24:1	0.25 mm
VK25-SH-A	Rotating screw	Normal	Tr 30x6	6:1	1.00 mm
VK25-SH-B		Low speed		24:1	0.25 mm

Duty cycle thermal limit, for S+R



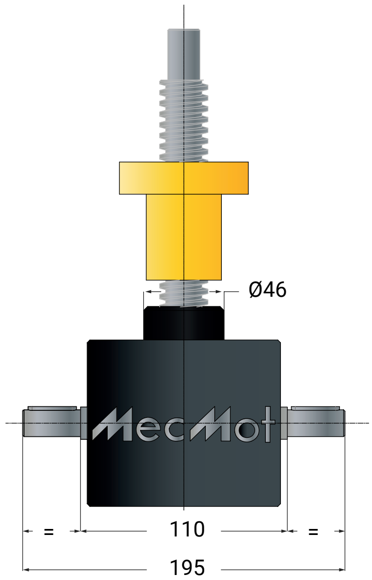
General Features

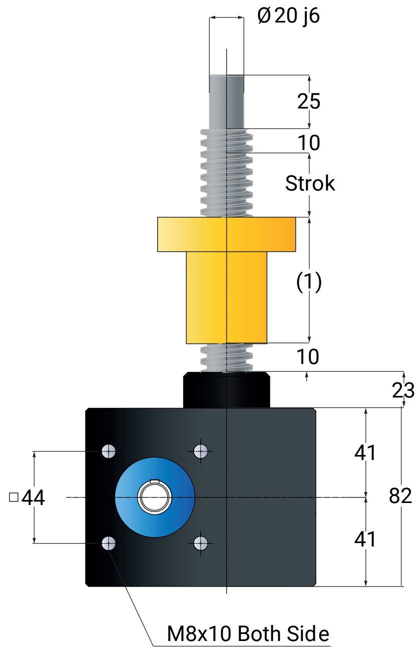
Max static load: 25 kN
Max dynamic load: See duty cycle curves
Nominal speed: 1500 rpm
Max speed: 3000 rpm (depending force and duty cycle)
Screw size: Tr 30x6
Operation temperature: -10/60C
Screw lubrication: Grease lubrication
Input torque: Max 18 Nm (A) max 10 Nm (B)
Drive-through torque: Max 100 Nm

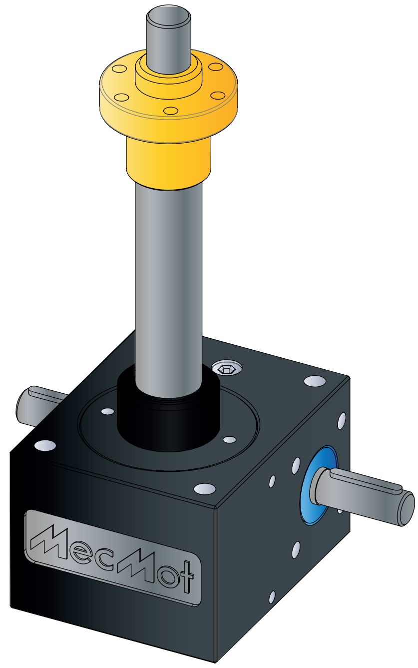
These curves above represents the thermally safe operating time of the product in percent. These values are valid for the normal operating conditions of the system (lubrication, ambient temperature, environmental conditions, etc.). Otherwise, please contact Mecmot Engineering department.

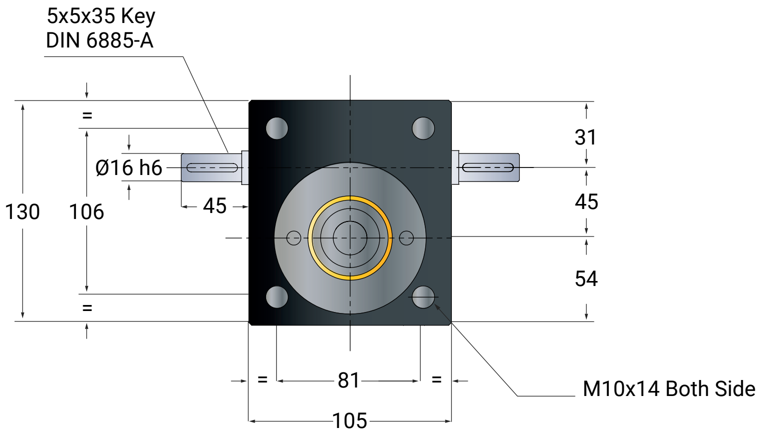
VK25-SH Max 25 kN

Trapezoidal Screw

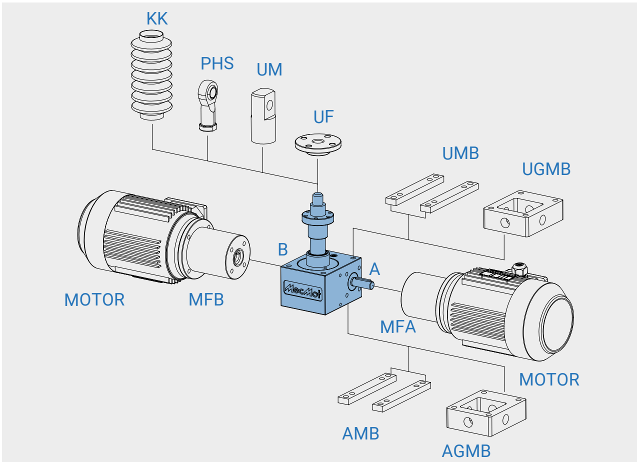




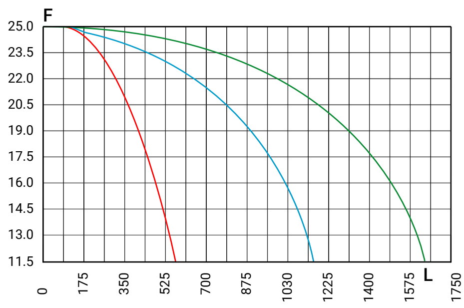


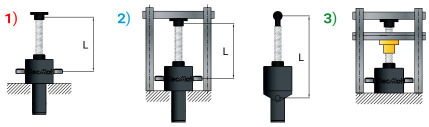


SH ACCESORIES

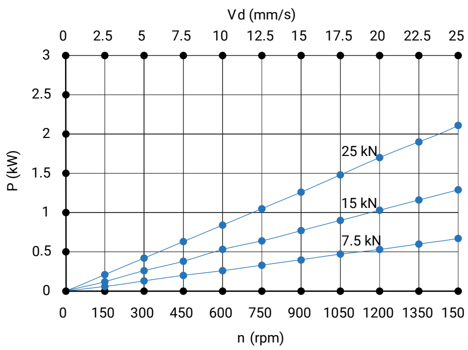


Euler's law (safety factor = 2 dynamic compression load)
Limit load 1 (red) - 2 (blue) - 3 (green)
F = Load [kN]
L = Overall trapezoidal screw lenght [mm]

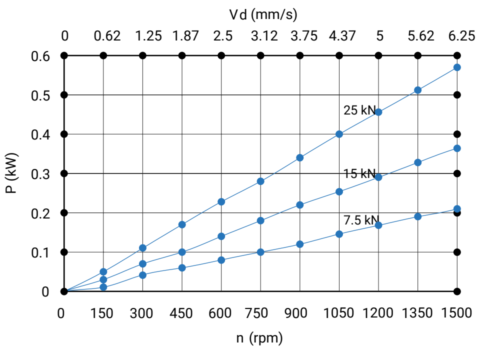




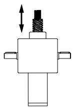
Power Curves (Reduction A Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]



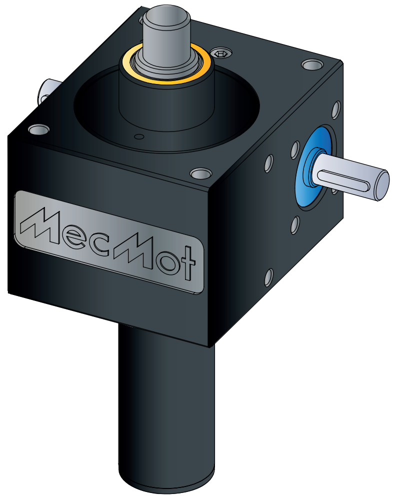
Power Curves (Reduction B Version)
P = Requested input power [kW]
n = Worm rotational speedt [rpm]
Vd = Spindle translation speed [mm/s]

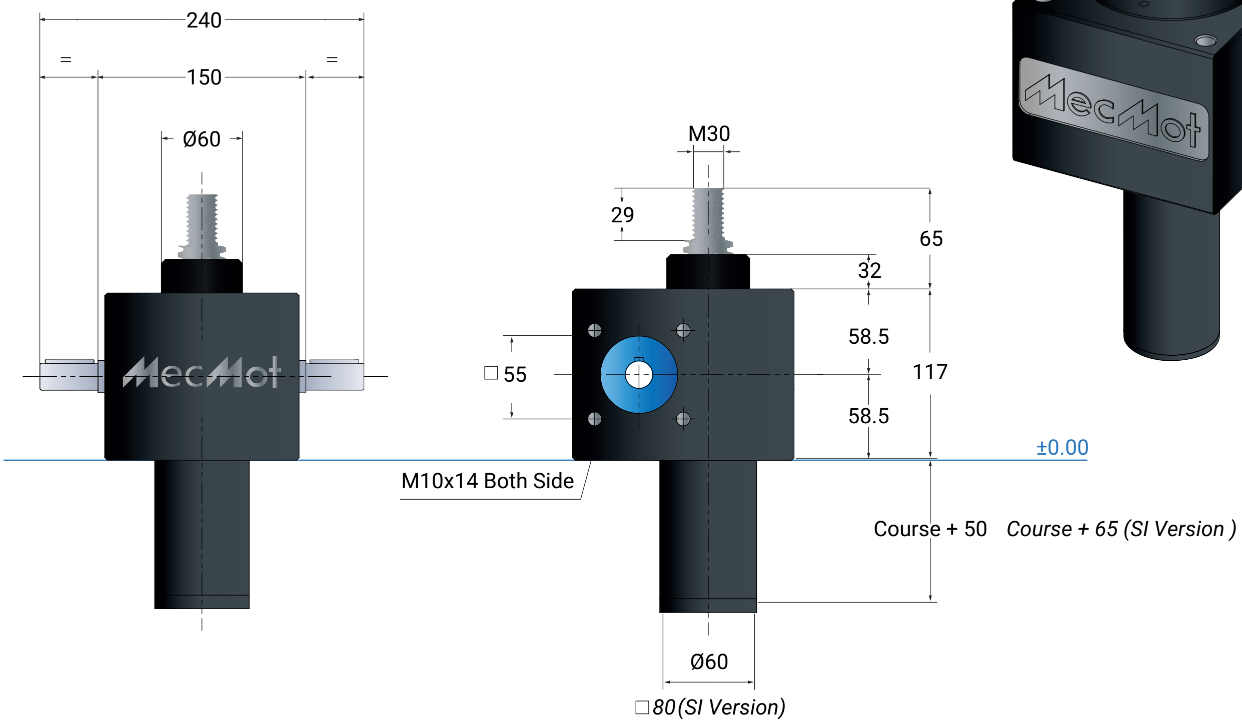


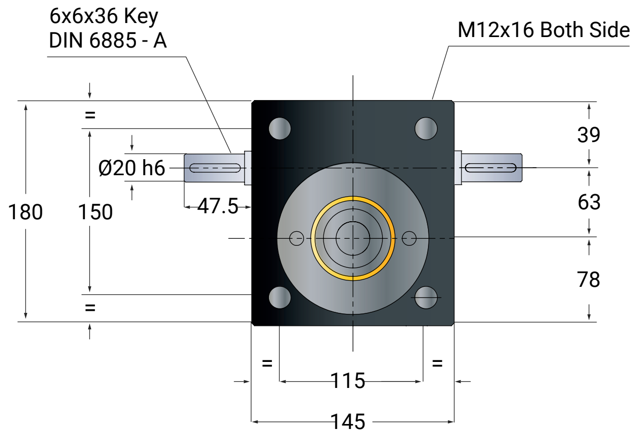
VK50-VH-S/SI



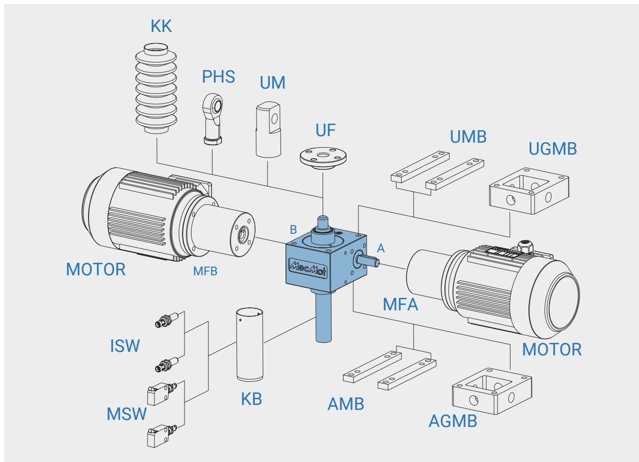
Max 50 kN







VH-S/SI ACCESORIES



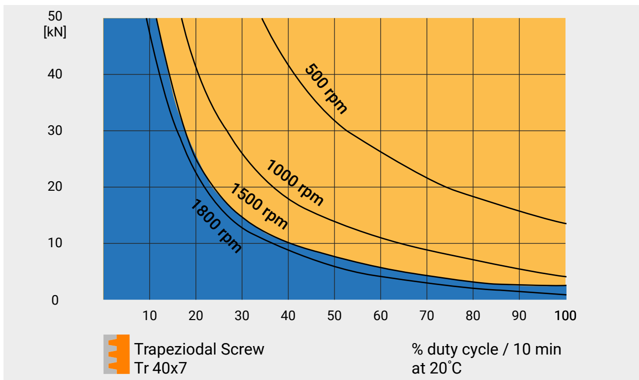
Standard Ratios

Type	Version	Speed	Standart screw	i	Stroke per drive shaft rotation
VK50-VH-A	Translating screw	Normal	Tr 40x7	7:1	1.00 mm
VK50-VH-B		Low speed		28:1	0.25 mm
VK50-SH-A	Rotating screw	Normal	Tr 40x7	7:1	1.00 mm
VK50-SH-B		Low speed		28:1	0.25 mm

General Features

Max static load: 50 kN
Max dynamic load: See duty cycle curves
Nominal speed: 1500 rpm
Max speed: 1800 rpm (depending force and duty cycle)
Screw size: Tr 40x7
Operation temperature: -10/60C
Screw lubrication: Grease lubrication
Input torque: Max 31 Nm (A) max 10.5 Nm (B)
Drive-through torque: Max 250 Nm

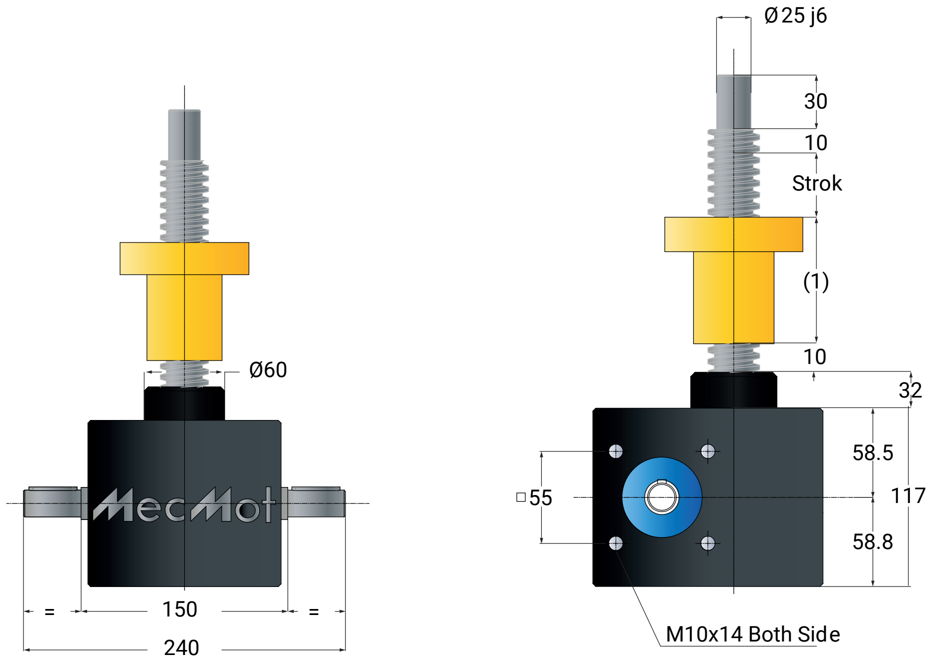
Duty cycle thermal limit, for S+R

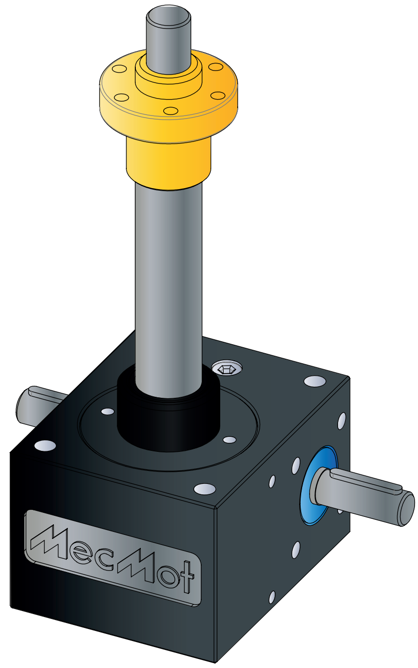


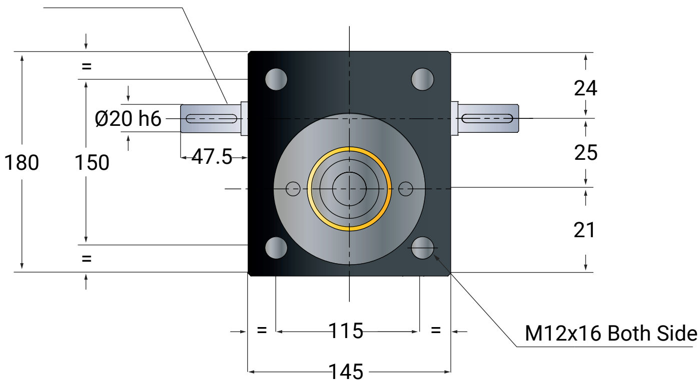
These curves above represents the thermally safe operating time of the product in percent. These values are valid for the normal operating conditions of the system (lubrication, ambient temperature, environmental conditions, etc.). Otherwise, please contact Mecmot Engineering department.

VK50-SH Max 50 kN

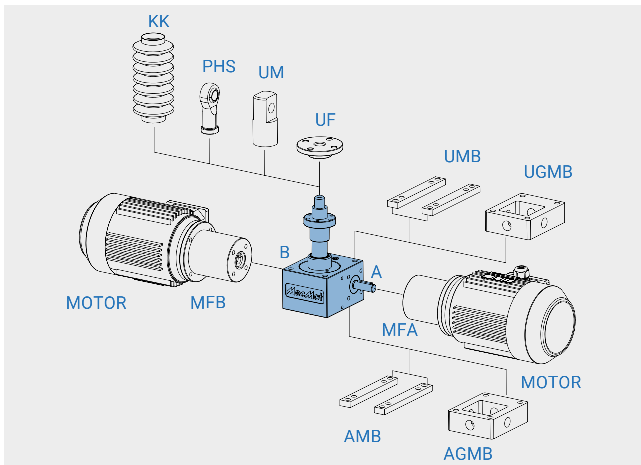
Trapeziodal Screw



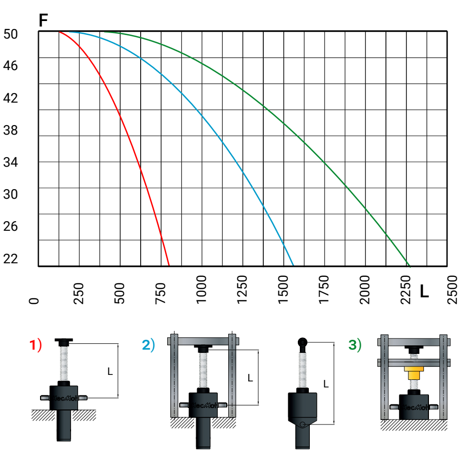




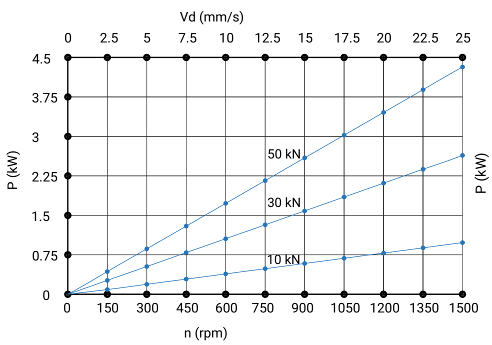
SH ACCESORIES



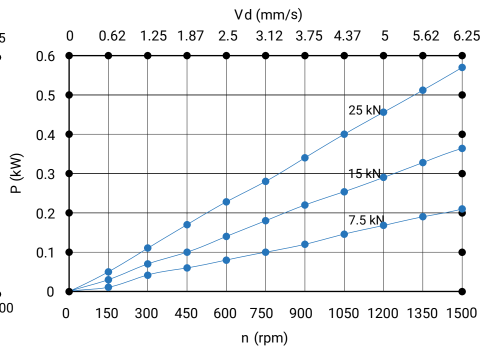
Euler's law (safety factor = 2 dynamic compres-
sion load)
Limit load 1 (red) - 2 (blue) - 3 (green)
F = Load [kN]
L = Overall trapezoidal screw lenght [mm]



Power Curves (Reduction A Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

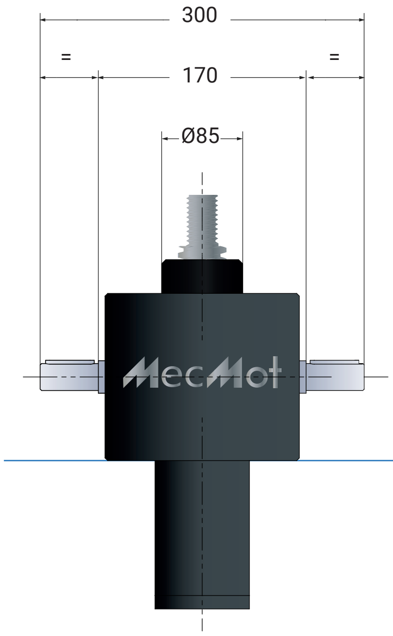


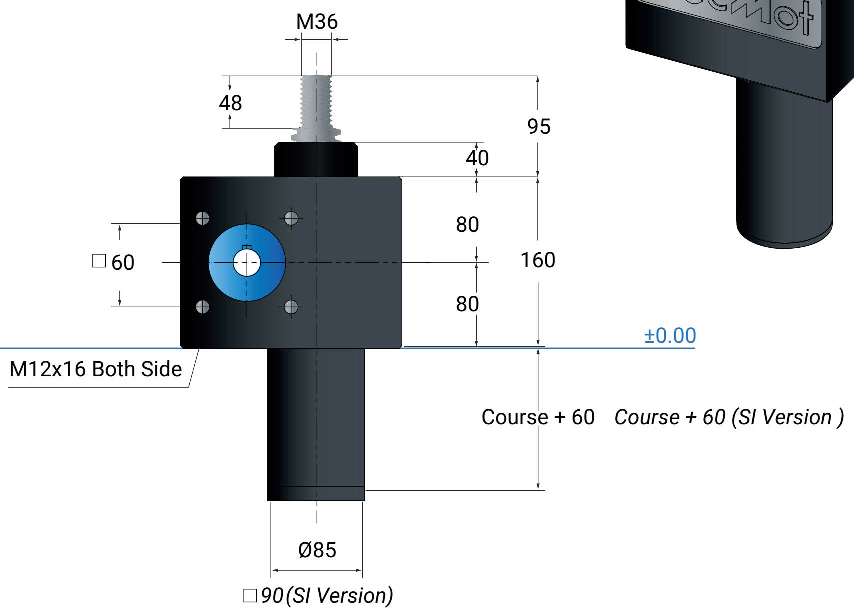
Power Curves (Reduction B Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

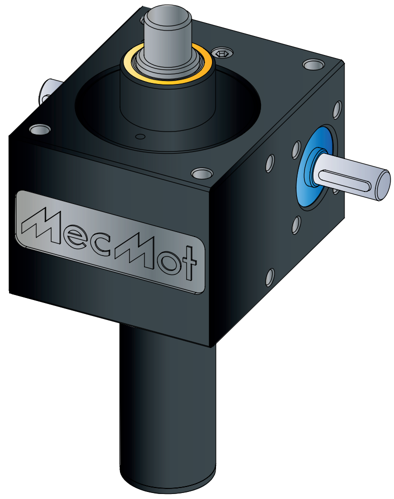


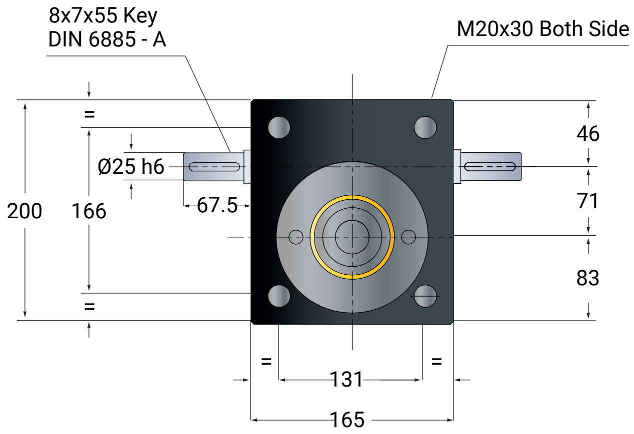
VK100-VH-S/SI Max 100 kN

Trapeziodal Screw

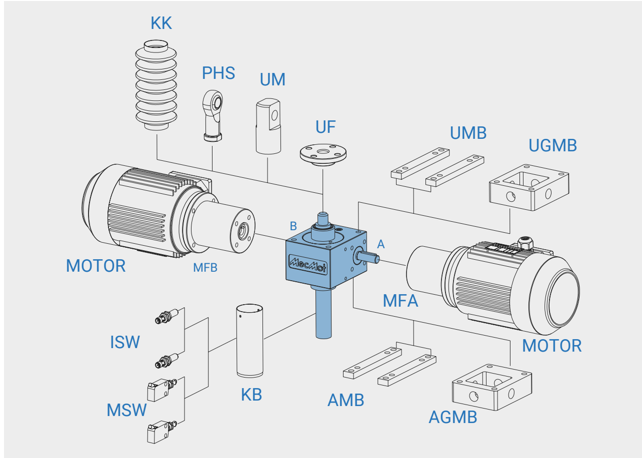








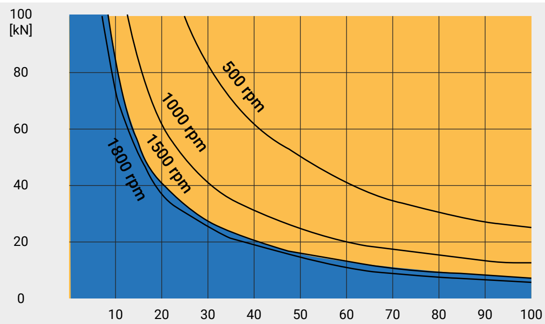
VH-S/SI ACCESORIES



Standard Ratios

Type	Version	Speed	Standart screw	i	Stroke per drive shaft rotation
VK100-VH-A	Translating screw	Normal	Tr 55x9	9:1	1.00 mm
VK100-VH-B		Low speed		36:1	0.25 mm
VK100-SH-A	Rotating screw	Normal	Tr 55x9	9:1	1.00 mm
VK100-SH-B		Low speed		36:1	0.25 mm

Duty cycle thermal limit, for S+R



Trapeziodal Screw
Tr 55x9

% duty cycle / 10 min
at 20˚C

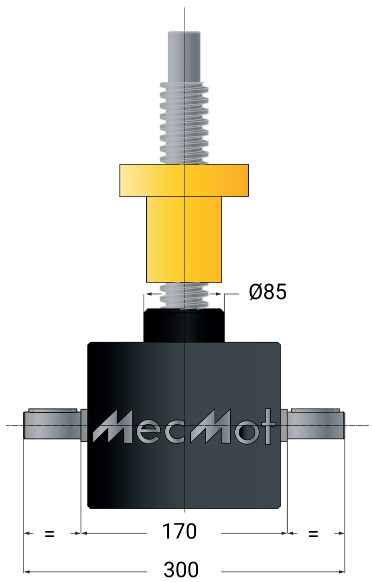
General Features

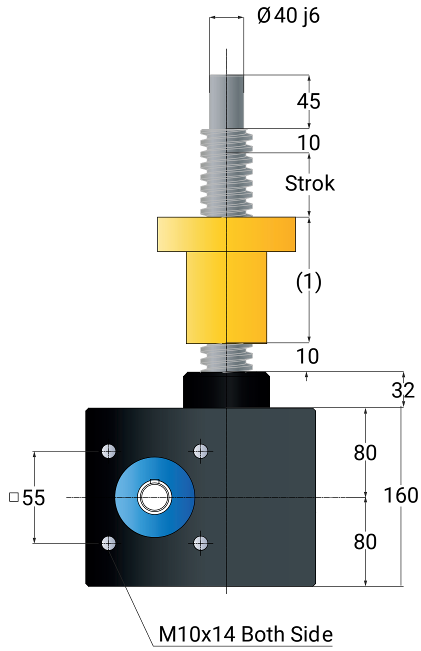
Max static load: 100 kN
Max dynamic load: See duty cycle curves
Nominal speed: 1500 rpm
Max speed: 1800 rpm (depending force and duty cycle)
Screw size: Tr 55x9
Operation temperature: -10/60C
Screw lubrication: Grease lubrication
Input torque: Max 52 Nm (A) max 14 Nm (B)
Drive-through torque: Max 540 Nm

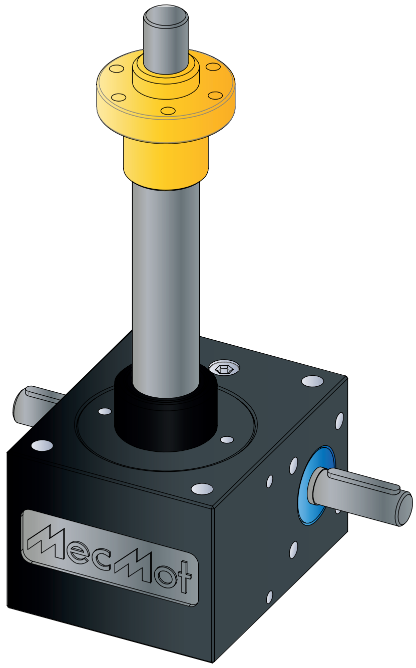
These curves above represents the thermally safe operating time of the product in percent.
These values are valid for the normal operating conditions of the system (lubrication, ambient temperature, environmental conditions, etc.). Otherwise, please contact Mecmot Engineering department.

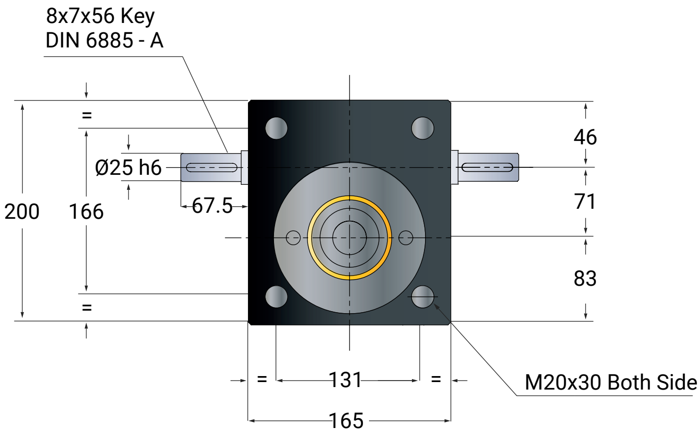
VK100-SH Max 100 kN

Trapeziodal Screw

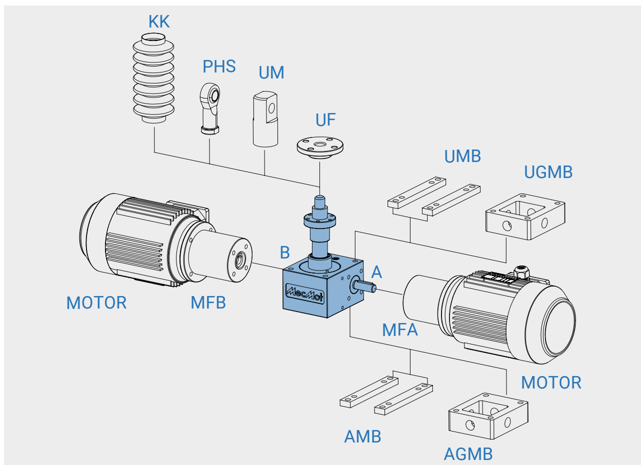




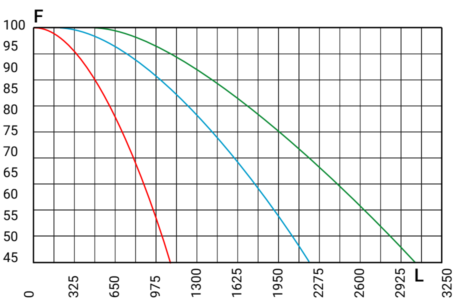


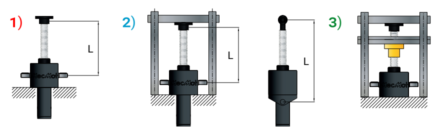


SH ACCESORIES

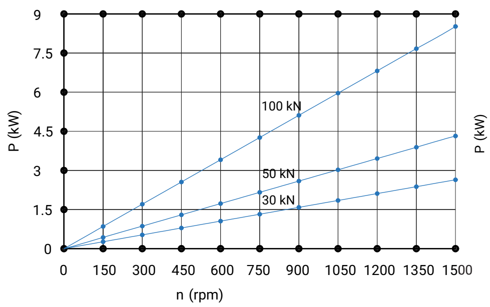


Euler's law (safety factor = 2 dynamic compression load)
Limit load 1 (red) - 2 (blue) - 3 (green)
F = Load [kN]
L = Overall trapezoidal screw lenght [mm]

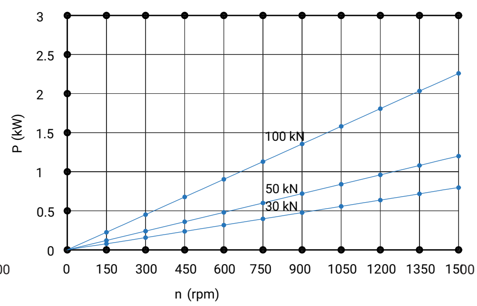




Power Curves (Reduction A Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

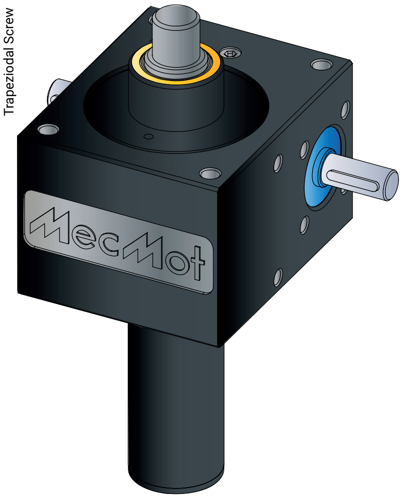


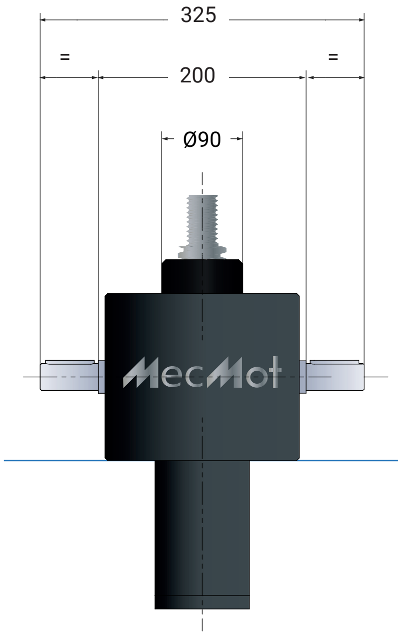
Power Curves (Reduction B Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

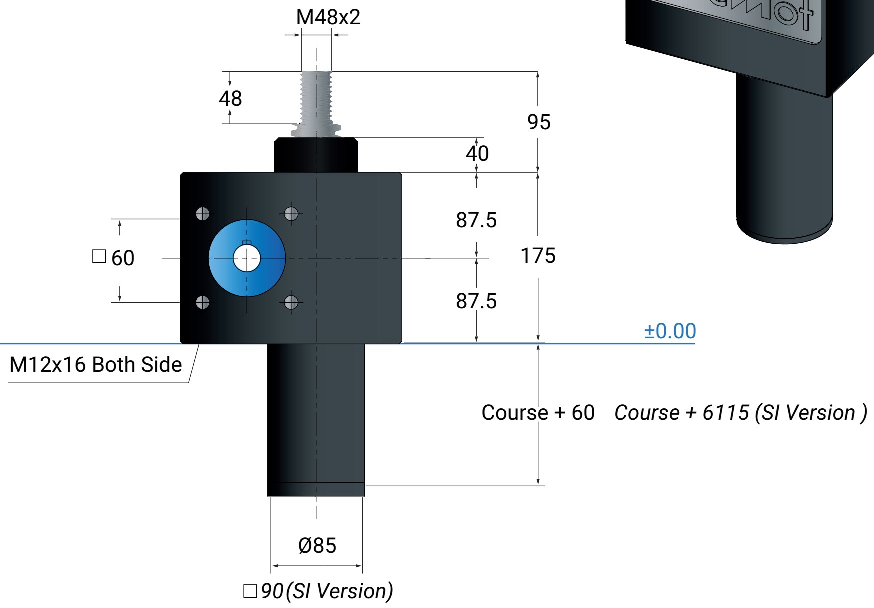


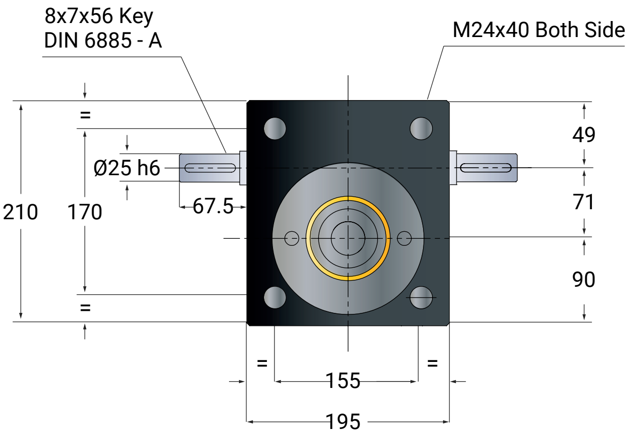
VK150-VH-S/SI Max 150 kN

Trapeziodal Screw

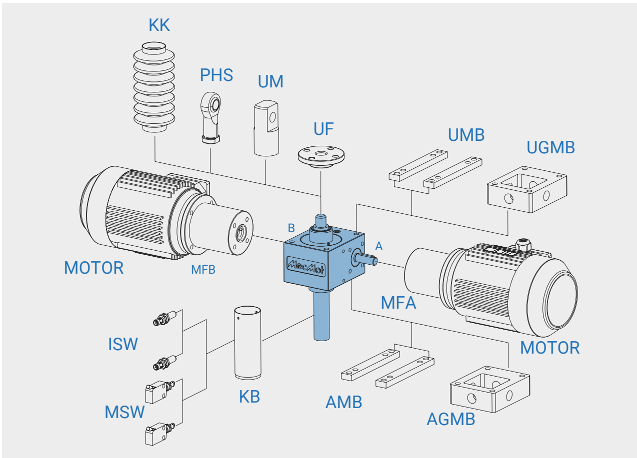








VH-S/SI ACCESORIES



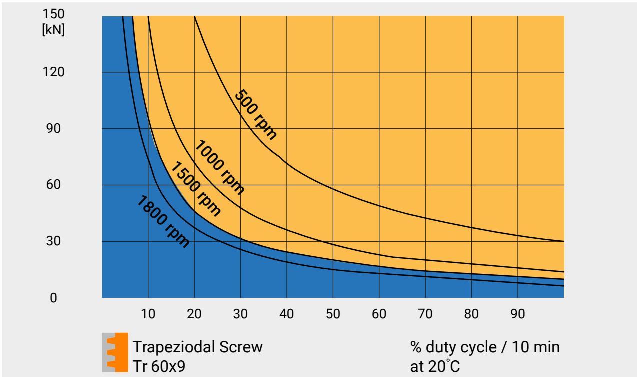
Standard Ratios

Type	Version	Speed	Standart screw	i	Stroke per drive shaft rotation
VK150-VH-A	Translating screw	Normal	Tr 60x9	9:1	1.00 mm
VK150-VH-B		Low speed		36:1	0.25 mm
VK150-SH-A	Rotating screw	Normal	Tr 60x9	9:1	1.00 mm
VK150-SH-B		Low speed		36:1	0.25 mm

General Features

Max static load: 150 kN
Max dynamic load: See duty cycle curves
Nominal speed: 1500 rpm
Max speed: 1800 rpm (depending force and duty cycle)
Screw size: Tr 60x9
Operation temperature: -10/60C
Screw lubrication: Grease lubrication
Input torque: Max 75 Nm (A) max 20 Nm (B)
Drive-through torque: Max 540 Nm

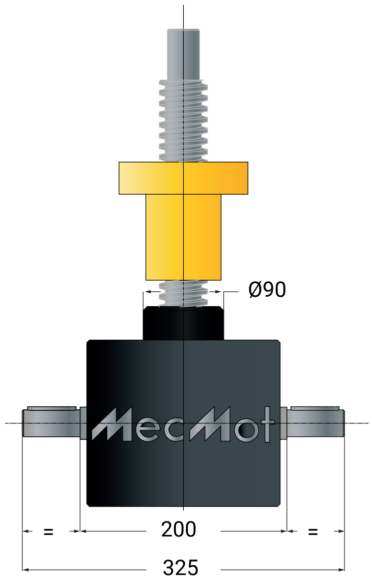
Duty cycle thermal limit, for S+R

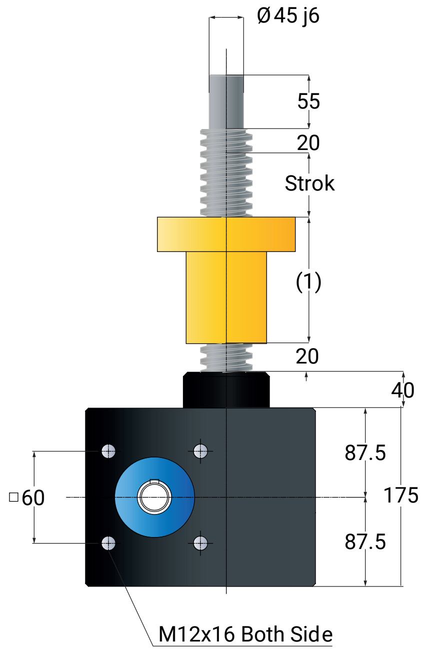


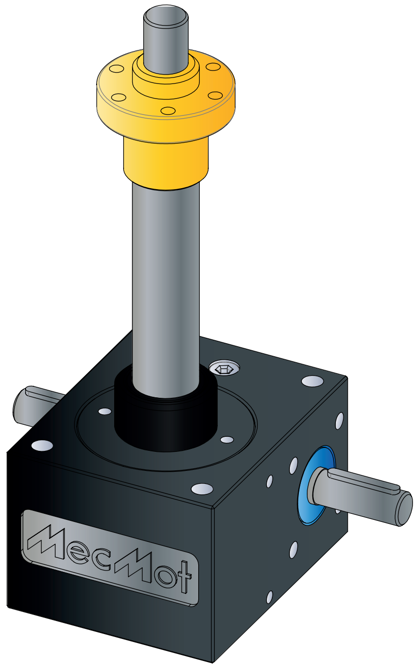
These curves above represents the thermally safe operating time of the product in percent. These values are valid for the normal operating conditions of the system (lubrication, ambient temperature, environmental conditions, etc.). Otherwise, please contact Mecmot Engineering department.

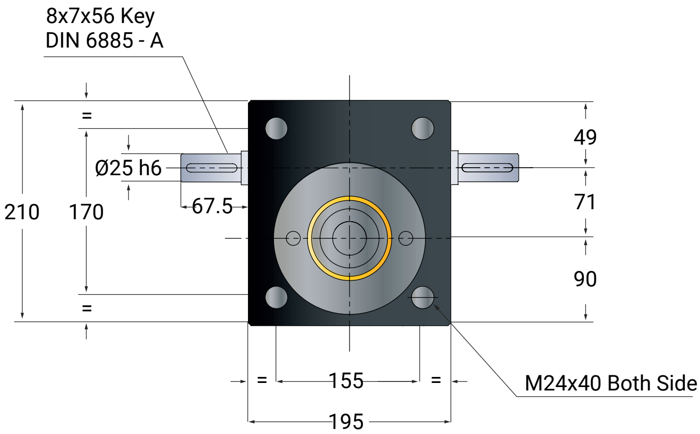
VK150-SH Max 150 kN

Trapeziodal Screw

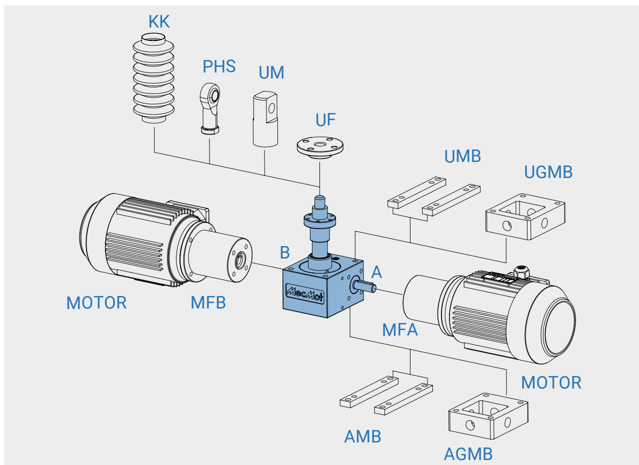




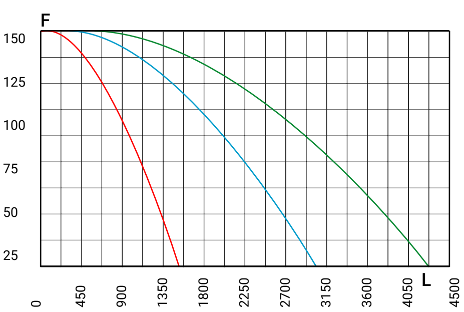


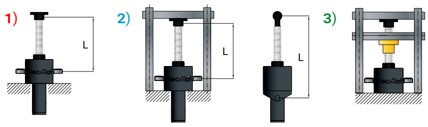


SH ACCESORIES

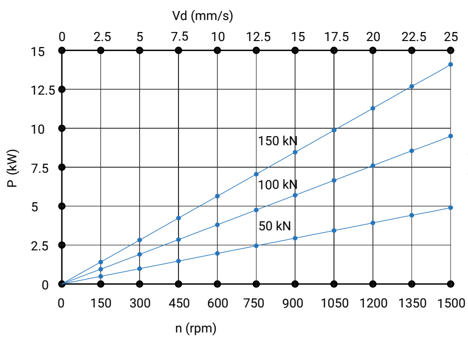


Euler's law (safety factor = 2 dynamic compression load)
Limit load 1 (red) - 2 (blue) - 3 (green)
F = Load [kN]
L = Overall trapezoidal screw lenght [mm]

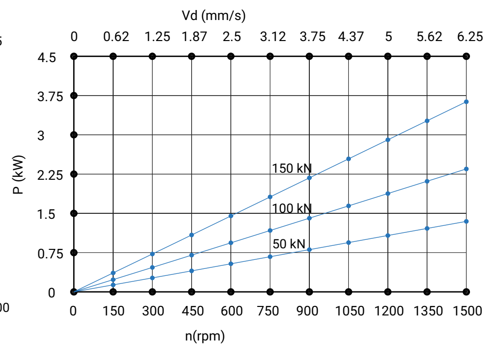




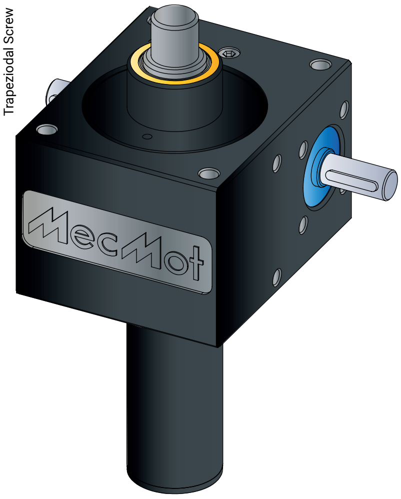
Power Curves (Reduction A Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

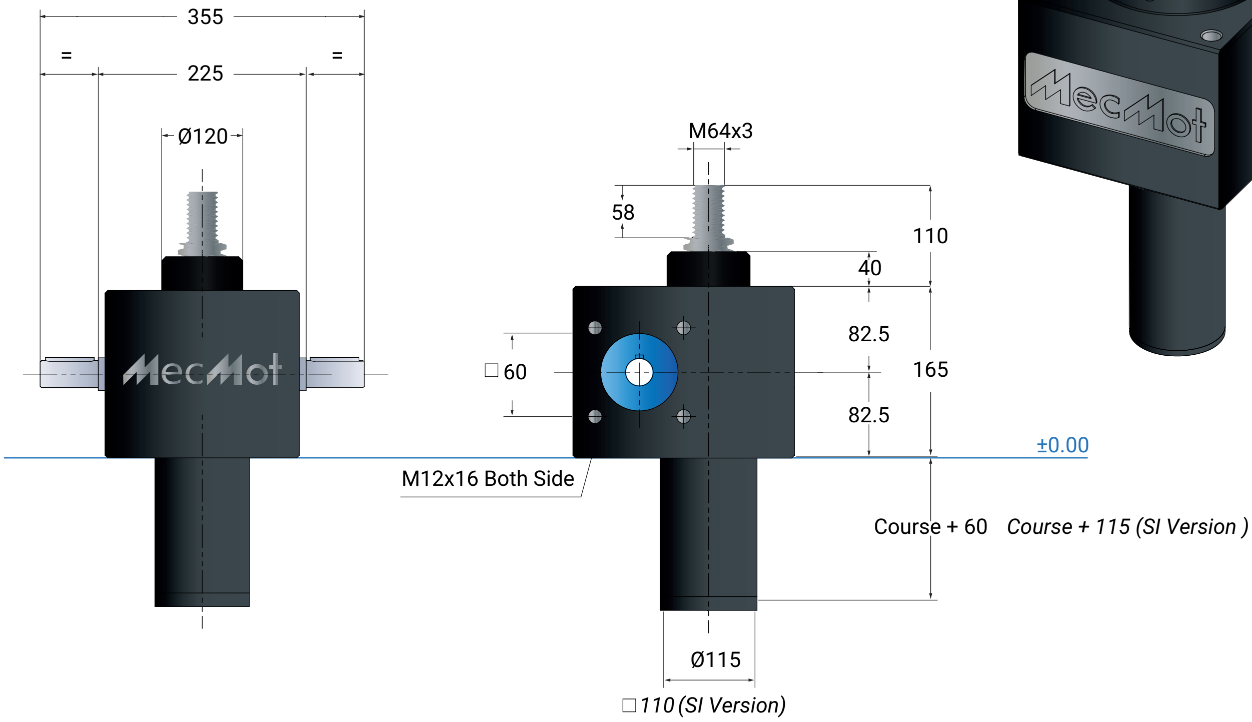


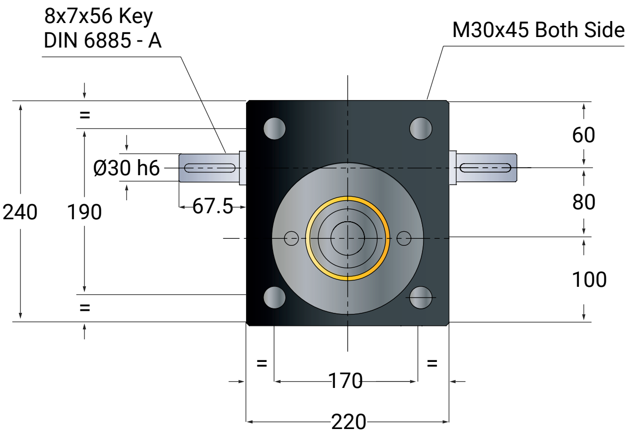
Power Curves (Reduction B Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]



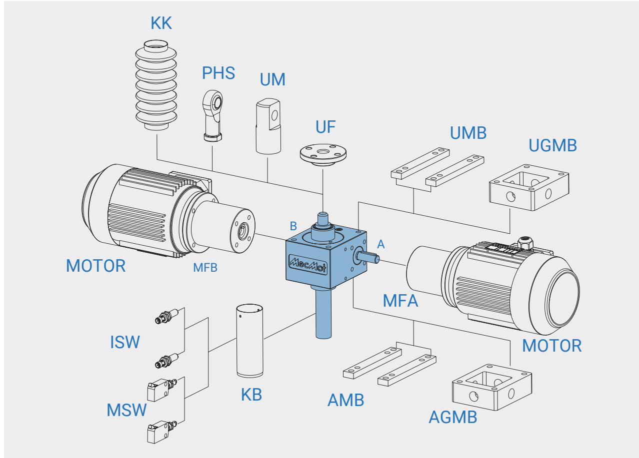
VK250-VH-S/SI Max 250 kN







VH-S/SI ACCESORIES



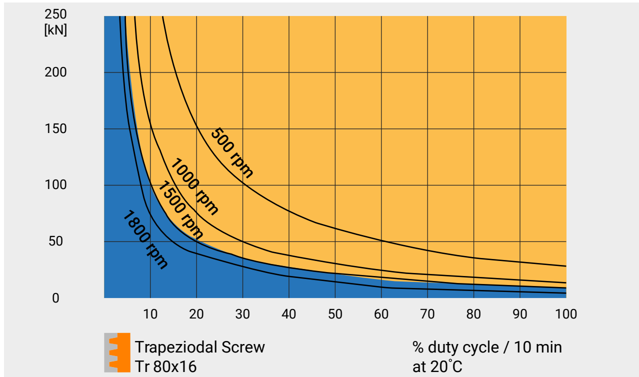
Standard Ratios

Type	Version	Speed	Standart screw	i	Stroke per drive shaft rotation
VK250-VH-A	Translating screw	Normal	Tr 80x10	10:1	1.00 mm
VK250-VH-B		Low speed		40:1	0.25 mm
VK250-SH-A	Rotating screw	Normal	Tr 80x10	10:1	1.00 mm
VK250-SH-B		Low speed		40:1	0.25 mm

General Features

Max static load: 250 kN
Max dynamic load: See duty cycle curves
Nominal speed: 1500 rpm
Max speed: 1800 rpm (depending force and duty cycle)
Screw size: Tr 80x10
Operation temperature: -10/60C
Screw lubrication: Grease lubrication
Input torque: Max 140 Nm (A) max 42 Nm (B)
Drive-through torque: Max 760 Nm

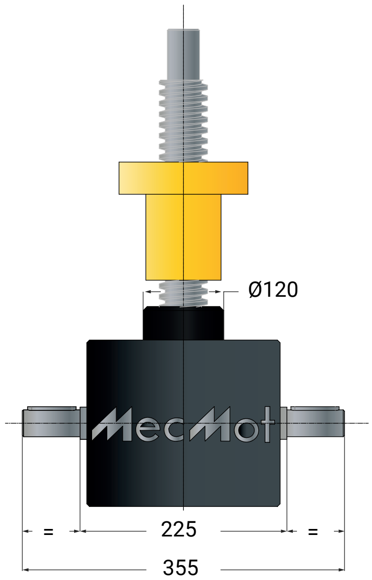
Duty cycle thermal limit, for S+R

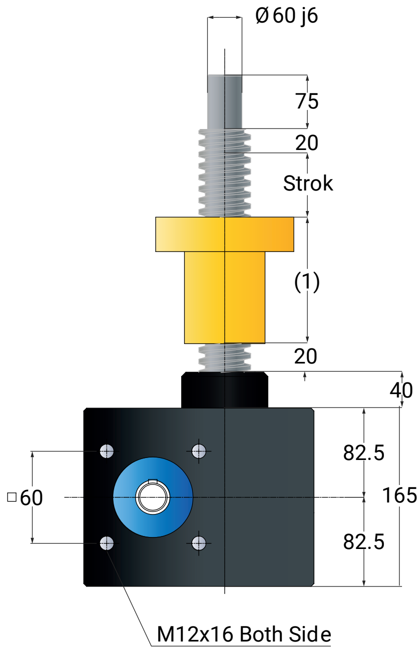


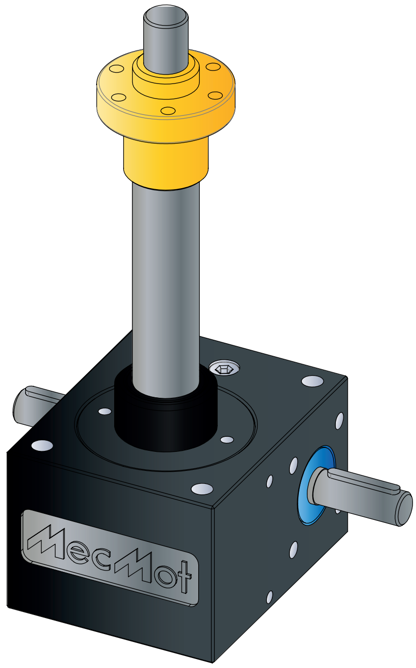
These curves above represents the thermally safe operating time of the product in percent.
These values are valid for the normal operating conditions of the system (lubrication, ambient temperature, environmental conditions, etc.). Otherwise, please contact Mecmot Engineering department.

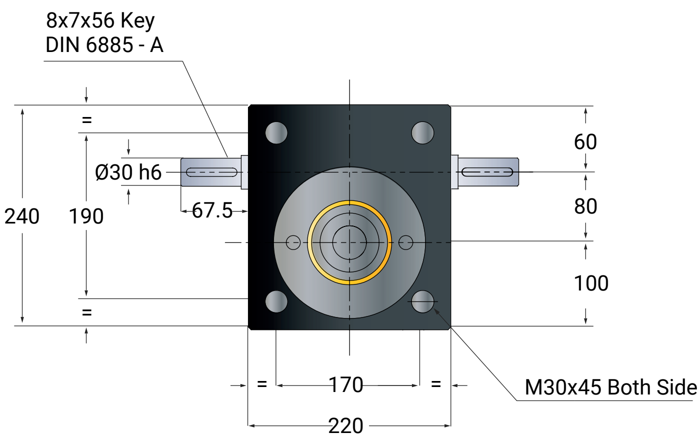
VK250-SH Max 250 kN

Trapeziodal Screw

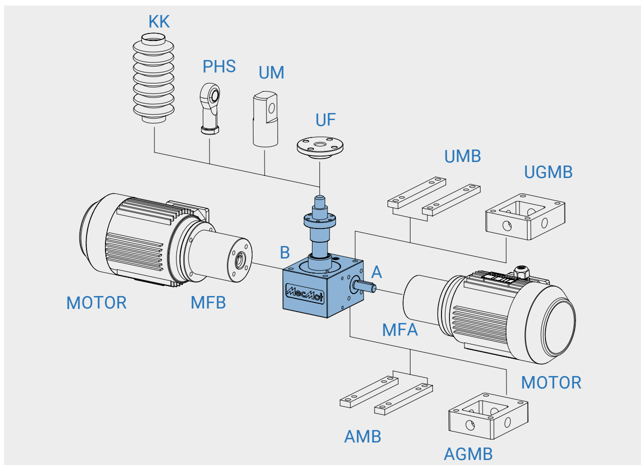




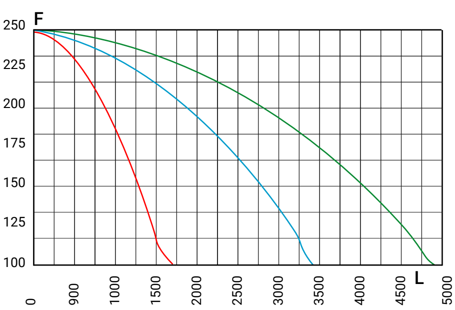


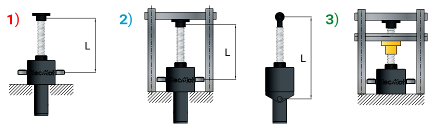


SH ACCESORIES

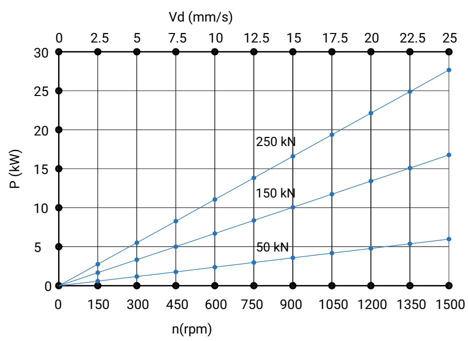


Euler's law (safety factor = 2 dynamic compression load)
Limit load 1 (red) - 2 (blue) - 3 (green)
F = Load [kN]
L = Overall trapezoidal screw lenght [mm]

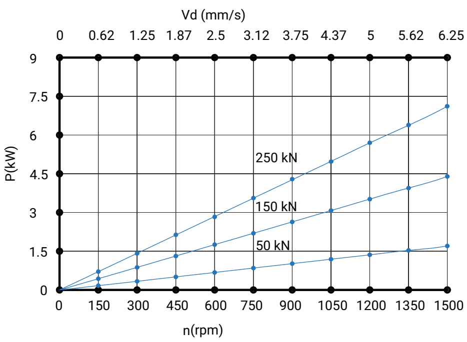




Power Curves (Reduction A Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

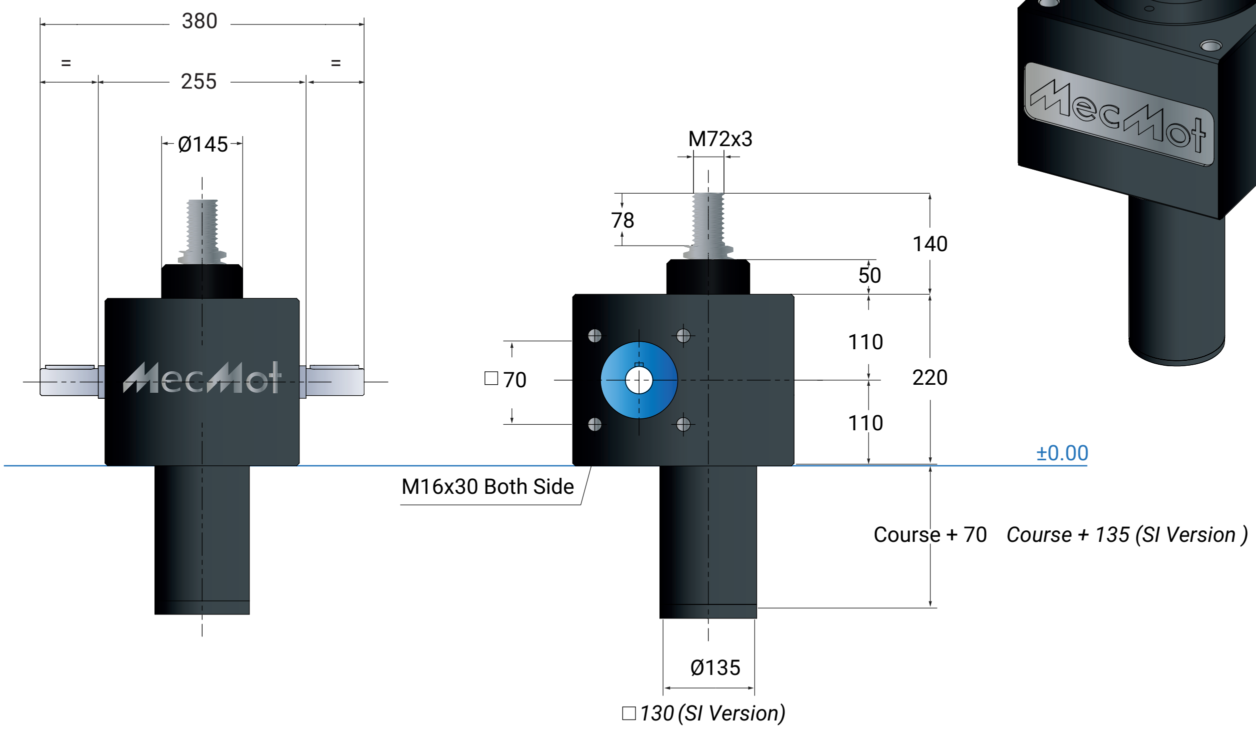


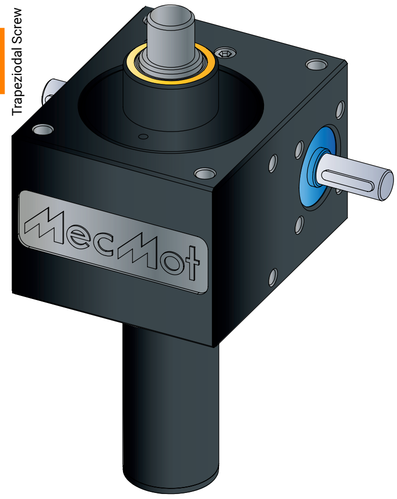
Power Curves (Reduction B Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]

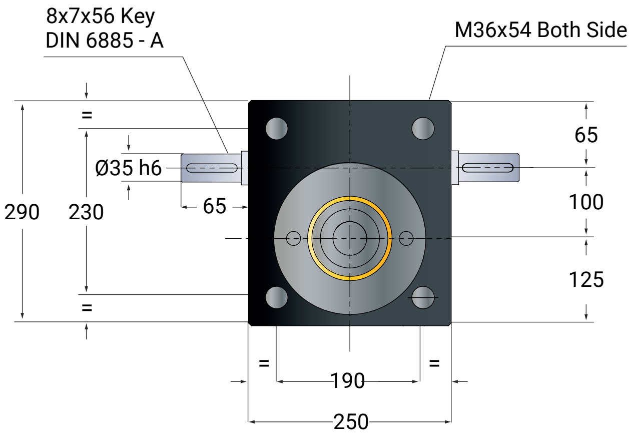


VK350-VH-S/SI Max 350 kN

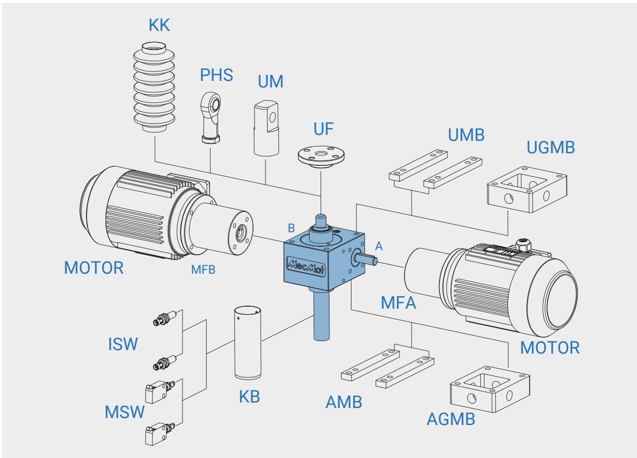
Trapeziodal Screw







VH-S/SI ACCESORIES



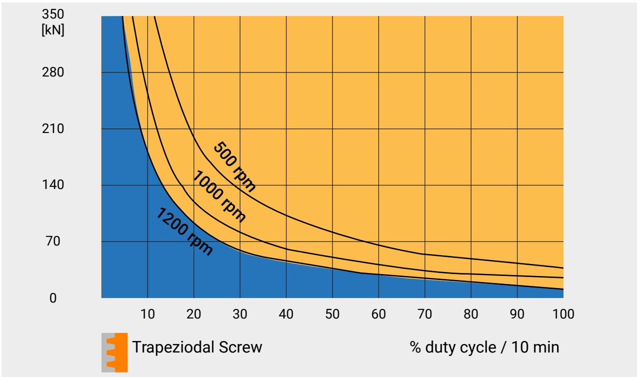
Standard Ratios

Type	Version	Speed	Standart screw	i	Stroke per drive shaft rotation
VK350-VH-A	Translating screw	Normal	Tr 100x10	10:1	1.00 mm
VK350-VH-B		Low speed		40:1	0.25 mm
VK350-SH-A	Rotating screw	Normal	Tr 100x10	10:1	1.00 mm
VK350-SH-B		Low speed		40:1	0.25 mm

General Features

Max static load: 350 kN
Max dynamic load: See duty cycle curves
Nominal speed: 1500 rpm
Max speed: 1800 rpm (depending force and duty cycle)
Screw size: Tr 100x10
Operation temperature: -10/60C
Screw lubrication: Grease lubrication
Input torque: Max 257 Nm (A) max 100 Nm (B)
Drive-through torque: Max 1600 Nm

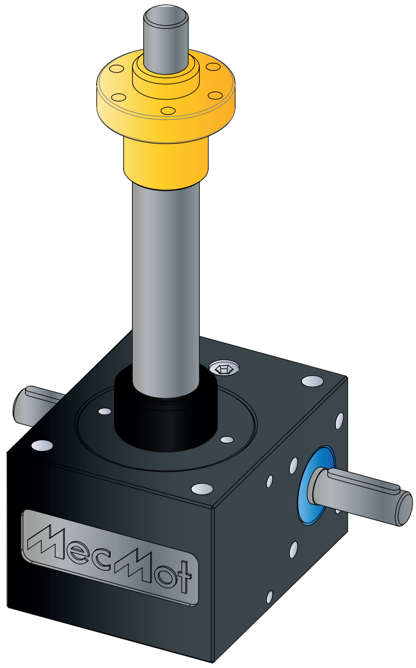
Duty cycle thermal limit, for S+R

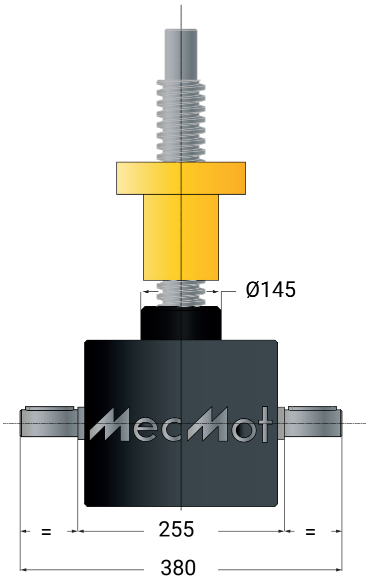


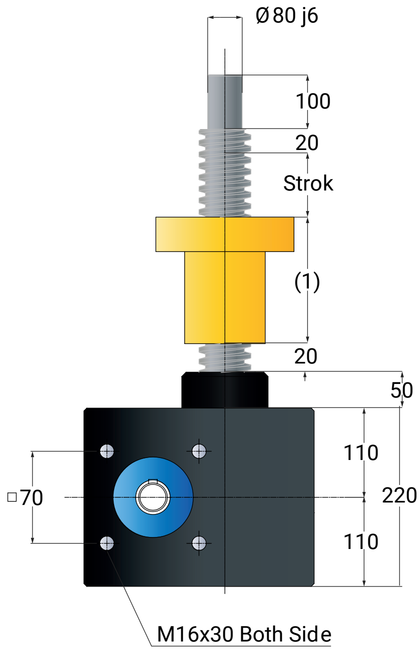
These curves above represents the thermally safe operating time of the product in percent. These values are valid for the normal operating conditions of the system (lubrication, ambient temperature, environmental conditions, etc.). Otherwise, please contact Mecmot Engineering department.

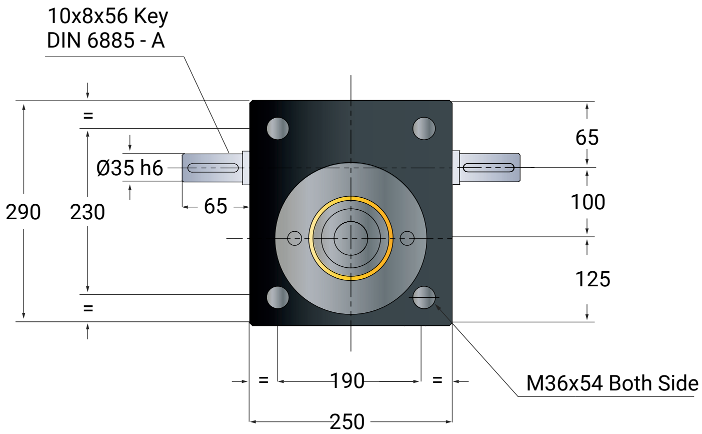
VK350-SH Max 350 kN

Trapeziodal Screw

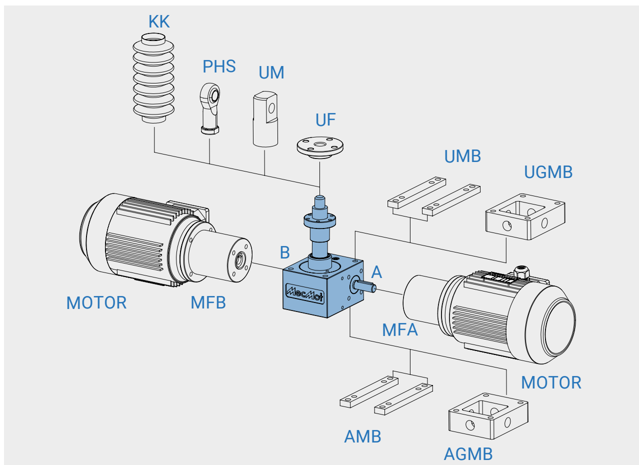




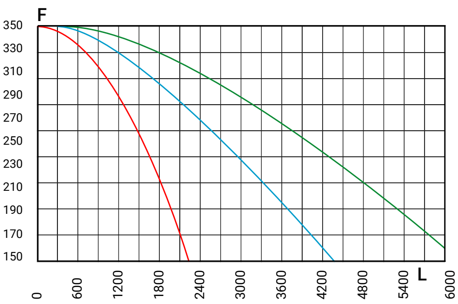


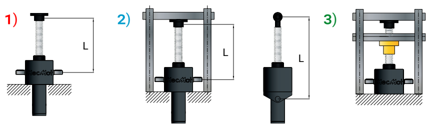


SH ACCESORIES

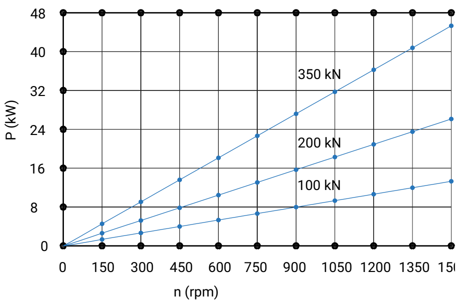


Euler's law (safety factor = 2 dynamic compression load)
Limit load 1 (red) - 2 (blue) - 3 (green)
F = Load [kN]
L = Overall trapezoidal screw lenght [mm]

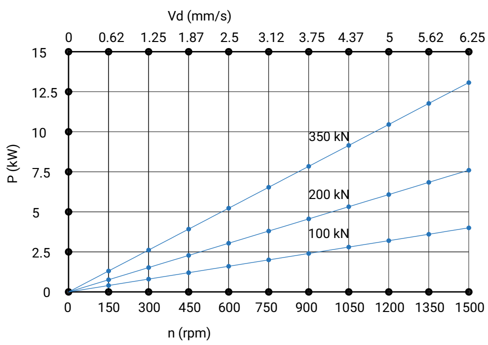




Power Curves (Reduction A Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]



Power Curves (Reduction B Version)
P = Requested input power [kW]
n = Worm rotational speed [rpm]
Vd = Spindle translation speed [mm/s]



SCREW JACK MODEL AND SIZE DEFINITION

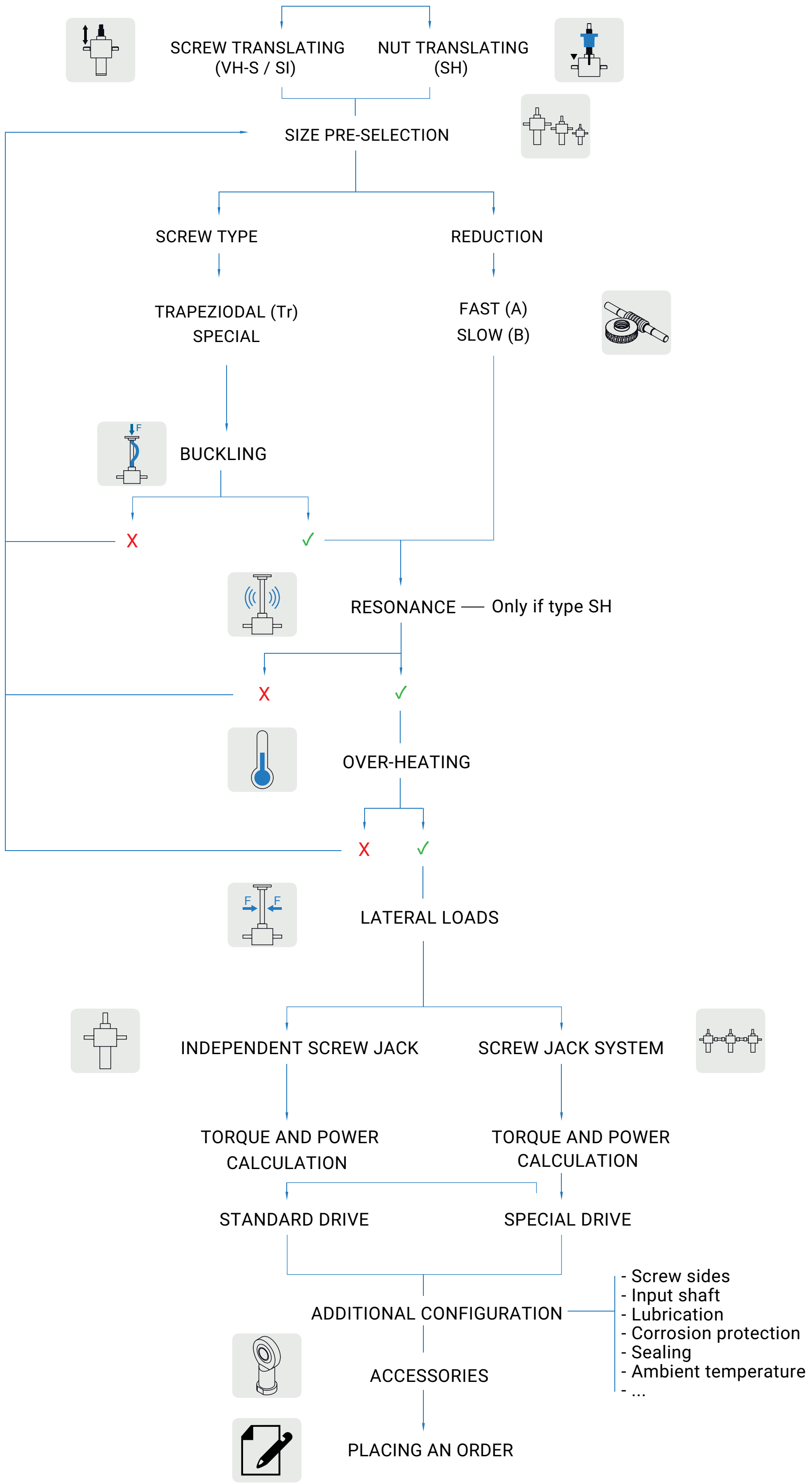
SCREW AND REDUCTION TYPE DEFINITION

SIZE VALIDATION

DRIVE TORQUE AND POWER CALCULATION

ADDITIONAL CONFIGURATION AND ACCESSORIES

PLACING AN ORDER



Critical Compression Buckling Load Of a Screw Jack

When there are compression loads on the screw, it may fail due to buckling, before reaching its static load capacity.
If the critical compression buckling load calculated is lower than the actual compression buckling load applied, a screw jack with a larger diameter screw must be selected and its suitability checked.
Check it using the following steps:

1. Compression Buckling Length and Corrector Factor

Select the length L (mm) and the factor K, to be considered in the buckling critical load calculation.
Do this based on the type of support on the sides of the screw jack, according to the figures shown on the right.

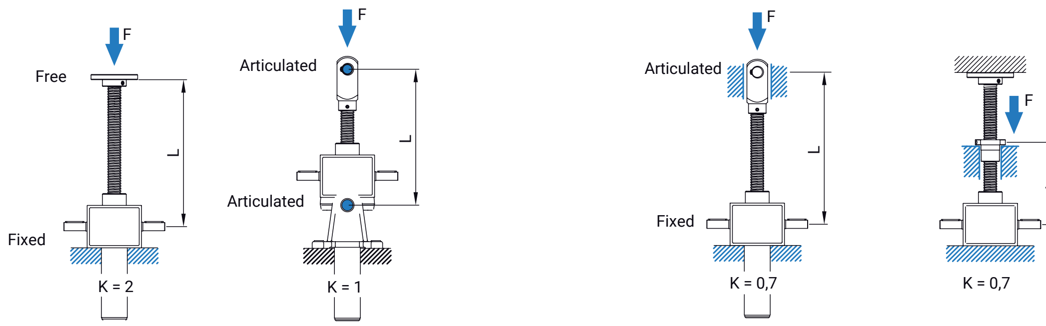
2. Buckling Critical Load

$$F_{crit}\ (kN) = 33{,}91 \times \frac{d^4}{(K \times L)^2}$$

d Screw core diameter (mm)
L Buckling length (mm)
K Length corrector factor.

Important

In general, the load applied on the screw jack, including possible impacts, must not surpass the calculated value.
The safety factor considered is 3; reconsider this if so considered opportune for the specific application. As a recommendation, when a hypothetical screw jack failure may involve injuries to people, multiply the critical load calculated by an additional factor of 0.6 (final safety factor, 5).



d - Screw core diameter (mm)

Trapezoidal screw (Tr)							
18x4	20x4	30x6	40x7	55x9	60x9	80x10	100x10
13	14,5	22,3	31,24	44	96	7,9	87,9

Critical Resonance Speed Of a Screw Jack

Applicable to the R version (the screw rotates and the nut moves).

With reduced diameter and long length screws, there is a risk of having considerable vibration on turning if this occurs at speeds close to the first vibration frequency (the second and highest correspond to very high speeds, at which the screws never work). In the worst cases, the screw may break and, additionally, the risk of collapse due to side buckling considerably increases.
For these reasons, be sure that the screw jack screw works at considerably lower rotation speeds than resonance speeds. If not, select a screw of a larger diameter and/or reduce its turning speed and/or modify the screw jack end supports.

1. Length, resonance and corrector factor

Select the length L and the correction factor M to consider. Do this based on the types of supports on the sides of the screw jack, according to the figures shown on the right.

2. Maximum admissible speed

$$n_{adm} \text{ (rpm)} = M \times \frac{d}{L^2} \times 10^8$$

d Screw core diameter (mm).
L Length between supports (mm).
M Corrector factor according to supports.

Important

The safety factor considered is 1.25 (maximum admissible speed = 80% of the critical resonance speed).

d - Screw core diameter (mm)							
Trapezoidal screw (Tr)							
18x4	20x4	30x6	40x7	55x9	60x9	80x10	100x10
13	14,5	22,3	31,24	44	96	7,9	87,9

Overheating Of a Screw Jack.

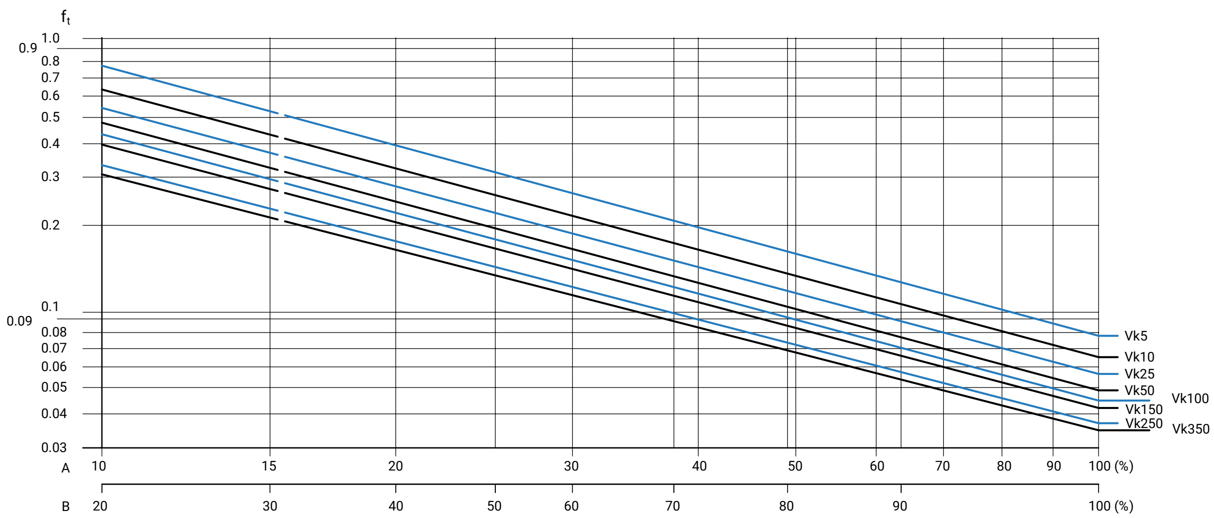
Applicable to the R version (the screw rotates and the nut moves).

With the aim of avoiding overheating due to internal friction of the screw jacks, the axial strength and the advance speed must be controlled. To do this, check the unit selected with the following formula. If it does not comply, choose a larger screw jack and/or reduce the load and/or reduce the speed. For very small strokes, please contact the MecMot technical department.

$F \times V \leq F_{max} \times V_{max} \times f_t$

F Axial strength on the screw (kN).
V Advance speed of the screw (mm/min).
F_{max} Axial load capacity of the screw jack (kN).
f_t Temperature factor, according to the diagram.
V_{max} $V_{max} \left(\frac{mm}{min}\right) = 1{,}500 \left(\frac{1}{min}\right) \times advance \left(\frac{mm}{rev}\right)$

For input speeds over 1,500 rpm, please contact the MecMot technical department.



A: Table for 60 minute intervals at 20°C .
B: Table for 10 minute intervals at 20°C .

Lateral load of a screw jack

MecMot recommends that, if they exist, the lateral loads on the screw must be supported by guide systems designed for this purpose, in addition to the guide for the gearbox, so that the screw or the nut exclusively support axial traction / compression loads. If there are side loads, the life of the screw jack will be notably reduced, as there will be premature wear of the screw and the nut, which is often the origin of faults.

Important

If it is essential that the screw jack is subject to lateral loads, please contact the MecMot design department for correct design of the unit.This includes the horizontal mountings, on which the screw can flex when subject to the action of its own weight.

Drive Torque and Power Of An Independent Screw Jack

After pre - selecting the suitable screw jack for the application, select the drive motor, following the steps below.

1. Drive torque

$$M_D \text{ (Nm)} = \frac{F \text{x} P \quad + M_I}{2 \text{ x } \pi \text{ x } \eta_{DG} \text{ x } \eta_{DS} \text{ x } i}$$

F Load to elevate in dynamic (kN)

P Screw pitch (mm)

M_I Idle torque (Nm)

i Screw jack gearbox

η_{DG} Gearbox dynamic efficiency

η_{DS} Screw dynamic efficiency

2. Power required

$$P_D \text{ (kW)} = \frac{M_D \text{ x } n}{9550}$$

M_D Drive torque (Nm)

n Screw jack input speed (rpm)

Important

In general, it is advisable to multiply the power value calculated for a safety coefficient of 1.3 to 1.5; or for small installations, a factor of 2.

When the load to move is lower than 10% of the elevator's nominal load, consider that value for the previous calculations.

3. Start-up torque

For loads between 25% and 100% of the screw jack's nominal value, calculate the start-up torque with this formula: $M_D \text{ (Nm)} = \frac{F \text{ x } P}{2 \text{ x } \pi \text{ x } \eta_{SA} \text{ x } i}$

η_{SA} Screw jack static efficiency (gearbox + screw)

Important

For loads under 25% of the screw jack's nominal value, select the start-up torque by multiplying the drive torque by 2.

η_{DG} Gearbox dynamic efficiency

rpm input	A version (Fast)							
	Vk5	Vk10	Vk25	Vk50	Vk100	Vk150	Vk250	Vk350
3,000	0,91	0,9	0,92					
1,500	0,88	0,89	0,9	0,9	0,9	0,9	0,9	
1.000	0,87	0,88	0,88	0,88	0,87	0,89	0,89	0,9
750	0,85	0,87	0,87	0,87	0,86	0,88	0,89	0,9
500	0,84	0,85	0,85	0,85	0,84	0,87	0,88	0,89
100	0,79	0,79	0,79	0,79	0,78	0,81	0,84	0,85

rpm input	B version (Slow)							
	Vk5	Vk10	Vk25	Vk50	Vk100	Vk150	Vk250	Vk350
3,000	0,75	0,77	0,76					
1,500	0,69	0,71	0,71	0,74	0,72	0,68	0,77	
1.000	0,67	0,69	0,68	0,69	0,67	0,67	0,76	0,77
750	0,64	0,66	0,67	0,68	0,65	0,65	0,75	0,77
500	0,61	0,64	0,63	0,64	0,62	0,64	0,74	0,76
100	0,54	0,56	0,54	0,55	0,53	0,55	0,66	0,69

η_{DS} Screw dynamic efficiency

Trapezoidal screw (Tr)							
18x4	20x4	30x6	40x7	55x9	60x9	80x10	100x10
0.41	0,38	0,38	0,35	0,33	0,31	0,27	0,23

M_I Idle torque

A version (Fast)							
Vk5	Vk10	Vk25	Vk50	Vk100	Vk150	Vk250	Vk350
0.08	0,22	0,3	0,7	1,68	1,8	2.6	3.2

B version (Slow)							
Vk5	Vk10	Vk25	Vk50	Vk100	Vk150	Vk250	Vk350
0.06	0,14	0,24	0,5	1,02	1,15	1,9	2,2

η_{SA} Screw jack static efficiency

	A version (Fast)							
	Vk5	Vk10	Vk25	Vk50	Vk100	Vk150	Vk250	Vk350
Trapeziodal	0,24	0,22	0,22	0,19	0,18	0,18	2,17	0,13

	B version (Slow)							
	Vk5	Vk10	Vk25	Vk50	Vk100	Vk150	Vk250	Vk350
Trapeziodal	0.15	0,14	0,13	0,12	0,11	0,11	0,12	0,1

Important

The values indicated in the tables correspond to the lubrication conditions established by Mecmot for gear-box and screw, and will be reached after a small period of operation.
In the case of low temperatures, these can be reduced considerably.

Planning Installations With Screw Jack

For the application of screw jacks in installations with several units, the following criteria must be taken into account:

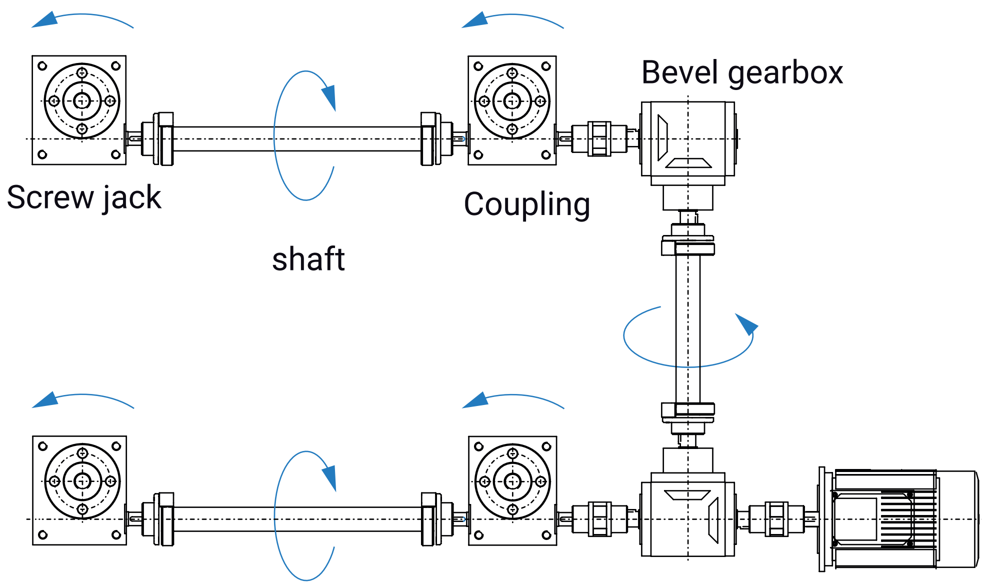
1. Define the number, position and orientation of the screw jacks.
2. Select the drag components (couplings, transmission shafts, supports, bevel gearboxes, motors, etc.) taking the following recommendations into account:

Ensure that the total load is distributed uniformly between all the installation's screw jacks.
The lowest possible number of transmission parts is recommended.
The transmission shafts should be as short as possible.
Try to protect the overall installation with a safety torque limiter.

3. If during the design of the installation a problem arises in defining the turning sense of the different elements, it is advised to apply the following method:

Indicate the orientation of the screw jack elements.
Mark the screw turning sense on each screw jack to "lift".
Show the position of the bevel gearboxes and the transmission shafts in a diagram.

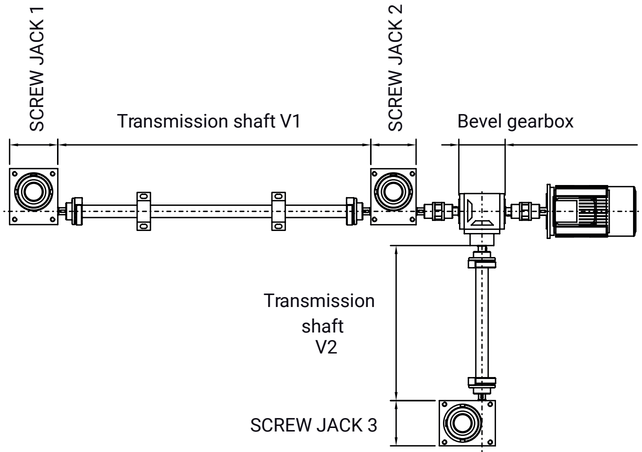
Example:
Elevation system with four screw jacks and two bevel gearboxes.



Drive Torque Of a Screw Jack System

The drive torque of a system made up of several screw jacks connected to each other depends on the torque required for the individual drive of each one and the efficiency of the transmission parts that connect them.

Example:



1. System drive torque

$$M_{DS}\ (Nm) = \frac{M_{D1}}{\eta_{v1}} + M_{D2} + \frac{M_{D3}}{\eta_{v2}} \times \frac{1}{\eta_k}$$

M_{D1} / M_{D2} / M_{D3} Screw jack drive torque 1 / 2 / 3 (Nm)
η_{v1} / η_{v2} Gearbox efficiency V1 / V2 (0.90 - 0.95 approx.)
η_k Distribution gearbox efficiency (0.90 approx.)

Important

In general, it is advisable to multiply the value calculated for a safety coefficient of 1.3 to 1.5; or for small installations, a factor of 2.
When the load to move is lower than 10% of the elevator's nominal load, consider that value for the previous calculations.

To help the calculation, some frequent arrangements are shown for those for which the system's drive torque can be calculated approximately using the formula below.
It is assumed that the load distribution is uniform between all the units and that they are all the same size.

M_{DS} **(Nm) =** $M_D \times f_s$
M_D Independent screw jack drive torque
f_s Factor, depending on system (see figures next page)

2. System start-up torque

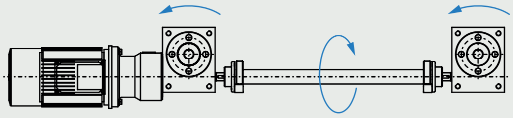
For loads by screw jack between 25% and 100% of the screw jack's nominal value, calculate the start-up torque with this formula: **MDS (Nm) =** $\frac{M_{DS}}{\eta_{SJ}}$

M_{DS} System drive torque (Nm)
η_{SJ} Elevator static efficiency

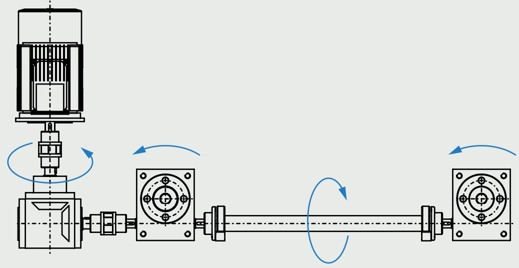
Important

For loads by elevator lower than 25% of its nominal value, multiply the system drive torque by 2.

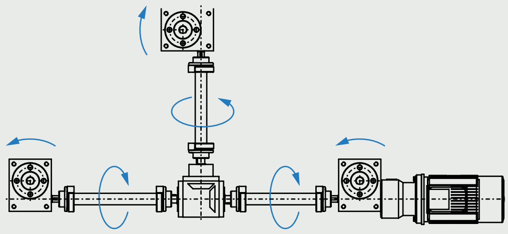
f_s = 2,1



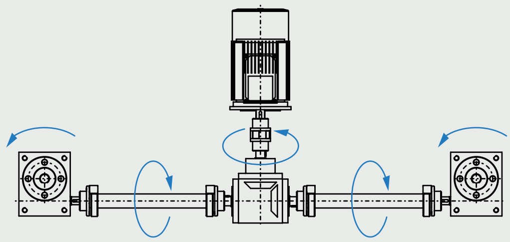
f_s = 2,25



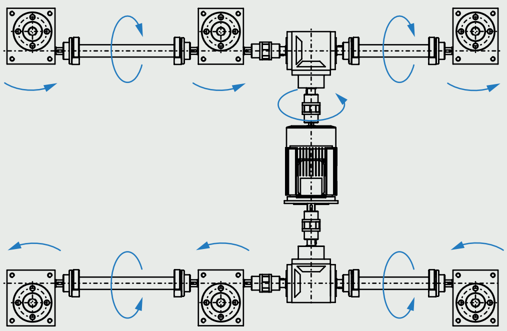
f_s = 3,34



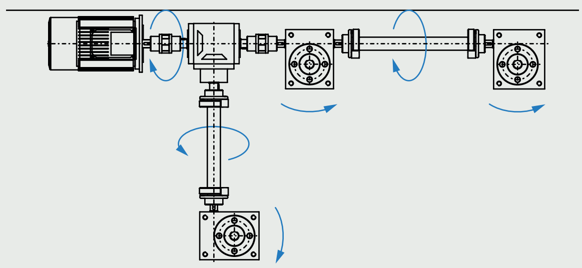
f_s = 2,25



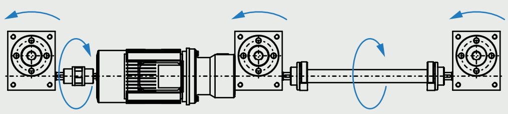
f_s = 6,8



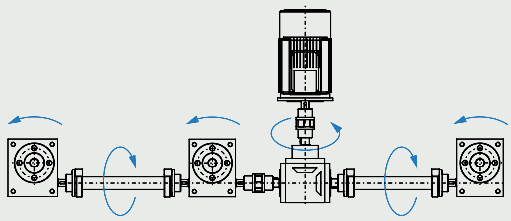
f_s = 3,27



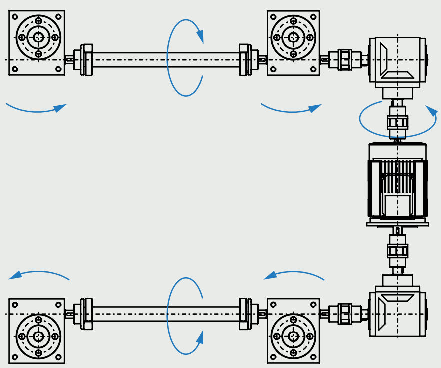
f_s = 3,1



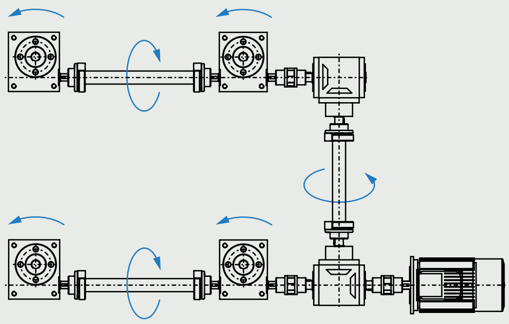
f_s = 3,35



f_s = 4,4



f_s = 4,6

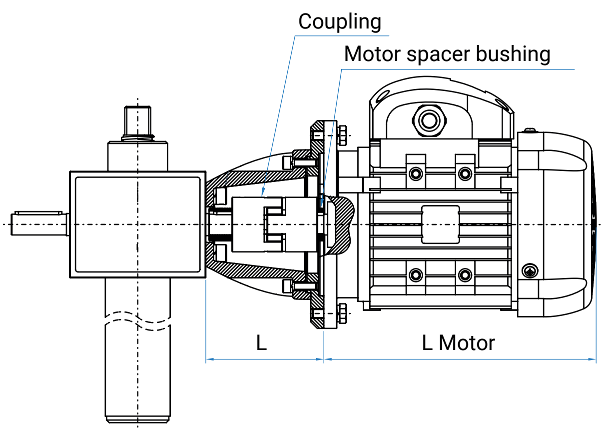


Standart Drive

The standard drive of the screw jacks is made using AC motors. The following table shows the powers available for each screw jack size and the type of flange on the motor, in addition to the length of its fastening flange to the gearbox.
For another size or different type of drive, please contact MecMot. MecMot can supply alternating or stepper motors with sensors of any type, etc.

	Motor Group																		
Motor flange	56		63		71		80		90		100		112	132		160		180	
	Pewer (kW)																		
	A	B	A	B	A	B	A	B	A	B	A	B	A	A	B	A	B	A	B
	0,06	0,09	0,12	0,18	0,25	0,37	0,55	0,75	1,1	1,5	2,2	3	4	5,5	7,5	11	15	18,5	22

Vk5	L	57	60	67						
	Motor flange	B14	B14	B14						
Vk10	L		63	70	83					
	Motor flange		B14	B14	B14					
Vk25	L			91	101	113	123			
	Motor flange			B5	B14	B14	B14			
Vk50	L			91	101	113	123			
	Motor flange			B5	B5	B14	B14			
Vk100	L				125	135	145	167	201	
	Motor flange				B5	B5	B14	B14	B14	
Vk150	L						145	165	199	
	Motor flange						B14	B14	B14	
Vk250	L					135	145	167	201	203
	Motor flange					B5	B5	B5	B5	B5



In general, it is always advisable that the motors incorporate a brake, standard brakes are sufficient for each motor size in most cases. This will ensure the screw does not loose position when it stops or if there are vibrations, etc.

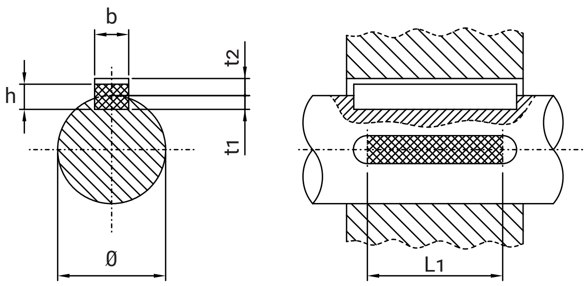
Maximum Transferable Torque Depending On Shaft / Paralel Cotter Pin (DIN 6885)

The following table shows the maximum transferable torque for a shaft and its keys. It is considered that the shaft is subject exclusively to torsional forces.

Important

Never apply to the input shaft of a screw jack torques over those indicated for its shaft and keys (see plans in the sub-chapter “sizes”).

Shaft diameter Ø (mm)	Key dimensions			Maximum transferable torque M_D (Nm) Key effective length, L_1 (mm)						
	b x h (mm)	t1 (mm)	t2 (mm)	10	16	20	28	40	50	70
8 - 10	3 x 3	1.8	1.4	5	9	12	-	-	-	-
10 - 12	4 x 4	2.5	1.8	9	13	17	-	-	-	-
12 - 17	5 x 5	3	2.3	15	24	30	42	-	-	-
17 - 22	6 x 6	3.5	2.8	25	40	50	70	100	-	-
22 - 30	8 x 7	4	3.3	39	63	78	109	157	195	-
30 - 38	10 x 8	5	3.3	50	82	102	143	204	255	357
38 - 44	12 x 8	5	3.3	62	98	123	173	247	308	432
44 - 50	14 x 9	5.5	3.8	82	132	164	230	330	412	575



Material: C45 (1.1191) according to EN 10083-1
Load type: Drive - Uniform / Load - Light knocks
Assembly: tight
Cycles: >1,000,000
Safety factor: 1.5 - 2.5
IMPORTANT For other conditions, please contact the MecMot technical department.

Lubrication

For further information, please contact the MecMot technical department. A complete cleaning and change of grease is recommended after five years. The greasing interval depends on the type of work and its cycle. It is advisable to lubricate from 30 to 50 hours after start-up and approximately every six months.It is important to avoid over-lubricating.

Gearbox	Total Multis Complex SHD 220 Synthetic Litium Grease
Trapeziodal Screw	Sentinel SL-OG Synthetic Open Gear Grease

Projection Against Corrosion, Sealing and Ambient Temperature

Projection against corrosion

Select the environment in which the equipment will work, using the atmospheric corrosion categories classification established in the DIN EN ISO 12944-2 standard (protection against the corrosion of steel structures using painted systems). Also establish the durability required before carrying out the first maintenance of the exterior surfaces (durability does not imply a "time" guarantee).If the corrosion category is higher than “C3” for your application and/or higher than “average” durability is required, please contact MecMot so that the technical department can select the surface protection system and select the most suitable components.

Corrosion Category		ENVIRONMENT	
		Outdoors	Indoors
C1	Very low		Buildings with heating and clean atmospheres.
C2	Low	Atmospheres with low levels of pollution. Rural areas.	Buildings with no heating and possible condensation.
C3	Medium	Urban and industrial atmospheres, with moderate SO2 pollution. Coastal areas with low salinity.	Manufacturing plants with high humidity and some pollution.
C4	High	Industrial areas and coastal areas with moderate salinity.	Chemical and swimming pool industries.
C5-I	Very hig (industrial)	Industrial areas with high humidity and aggressive atmosphere.	Buildings or areas with almost permanent condensation and high contamination.
C5-M	Very hig (maritime)	Coastal and maritime areas with high salinity.	Buildings or areas with permanent condensation and high contamination.

DURABILITY		
Low	L	2 to 5 years
Medium	M	5 to 15 years
High	H	More than 15 years

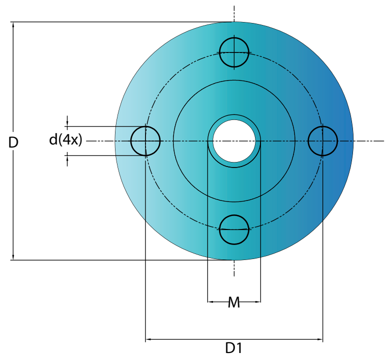
MecMot screw jacks offer, as standard, an IP54 protection index to prevent solid and liquid particles from entering the inside, which may damage them or reduce their designed service life. Use the following table, according to the DIN EN IEC 60529 standard, if the level of protection must be higher than that indicated. MecMot supplies, on request, specially designed units to withstand the most aggressive environments.The protection levels are defined with a code made up of the letters “IP“ and two numbers “XY”.

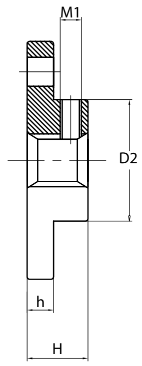
LEVEL OF PROTECTION "IP", AGAINST THE INPUT OF			
...Solid particles: "X"		...Liquids: "Y"	
	...		...
5	Protection against dust residues (the dust that may penetrate the inside does not imply incorrect operation of the equipment).	3	Protection against spray water (from angle up to 60º with vertical).
6	Total protection against the penetration of any kind of solid body (sealing).	4	Protection against water splashes (from any direction).
		5	Protection against water streams from any direction with hose.
		6	Protection against sporadic floods (example: tidal wave).
		...	...

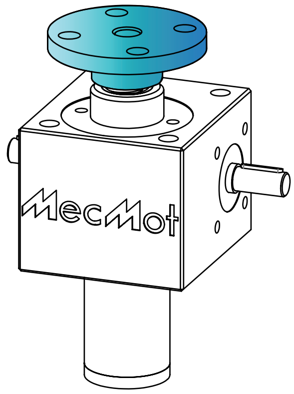
Ambient Temperature

Contact MecMot if your unit will be installed in an environment that may reach temperatures below -20ºC. MecMot technical department will prescribe the most suitable materials and sealing components for the specific conditions of the application. Also do this if ambient temperatures over 40ºC are expected.

UF - Fixing Flange

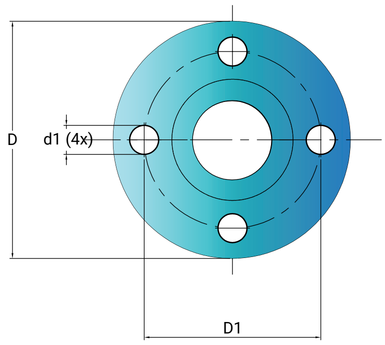


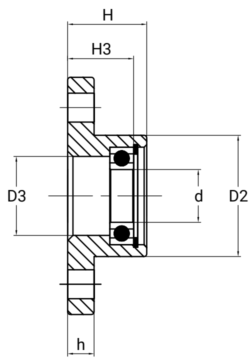


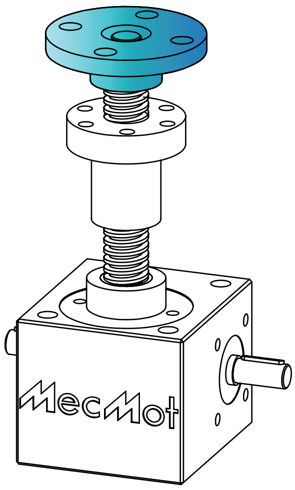


Part no.	D	D1	D2	M	d	h	H	M1	kg
UP07.03.01	65	48	29	M12	9	7	20	5	0.21
UP07.03.02	80	60	38	M14	11	8	21	6	0.38
UP07.03.03	90	67	46	M20	11	10	23	8	0.57
UP07.03.04	110	85	60	M30	13	15	30	8	1.20
UP07.03.05	150	117	85	M36	17	20	50	10	3.50
UP07.03.06	170	130	90	M42X2	21	25	50	10	4.70
UP07.03.07	210	165	120	M56X2	26	30	60	12	9.50
UP07.03.08	260	205	145	M72X3	32	40	80	16	18.4

UFS - Opposed Bearing Plate

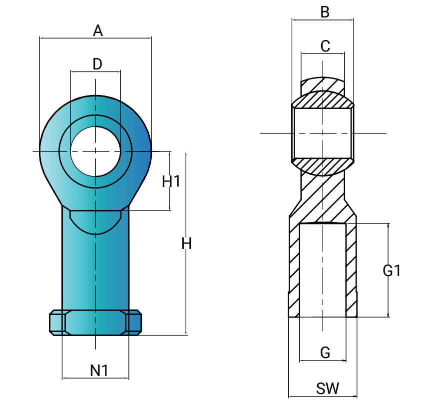


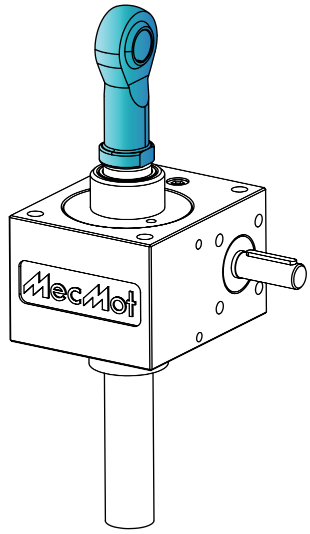




Part no.	0D	0D1	0D2	0D3	0d	0d1	h	H	H3	Larger	Si ring	kg
UP07.06.01	65	48	29	20	12	9	7	20	13	61901.2RS	J 24	0.17
UP07.06.02	80	60	39	28	15	11	8	21	17	6002.2RS	J 32	0.30
UP07.06.03	90	67	46	32	20	11	10	23	19	61904.2RS	J 37	0.48
UP07.06.04	110	85	60	42	25	13	15	30	22	6005.2RS	J 47	1.05
UP07.06.05	150	117	85	60	40	17	20	50	35	6008.2RS	J 68	3.10
UP07.06.06	170	130	90	68	45	21	25	50	31	6009.2RS	J 75	3.70
UP07.06.07	210	165	120	85	60	26	30	60	50	2x6012.2RS	J 95	6.90
UP07.06.08	265	205	145	95	80	26	32	65	54	2x6016.2RS	J 125	11.50

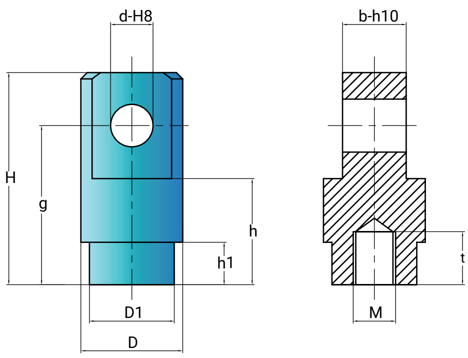
PHS - Rod end

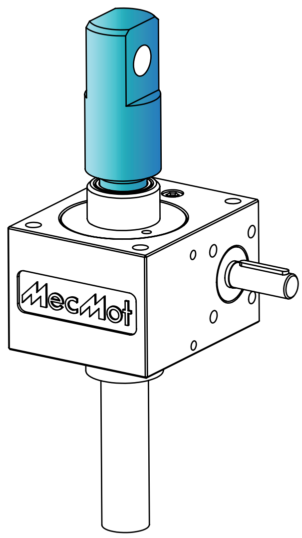




Part no.	A	B	C	D	G	G1	H	H1	SW	N1	kg
HM13.01.01	34	10	8	12	M12	23	50	17.5	18	17	0.10
HM13.01.02	40	12	10	15	M14	30	61	20	21	20	0.16
HM13.01.03	53	16	13	20	M20	40	77	27.5	30	27.5	0.32
HM13.01.04	73	22	19	30	M30	56	110	37	41	40	1.00
HM13.01.05	92	28	24	40	M36	65	142	46	60	52	1.90
HM13.01.06	112	35	31	50	M42x2	68	160	56	70	62	3.60
HM13.01.07	160	49	43	70	M56x2	80	200	80	85	80	8.30

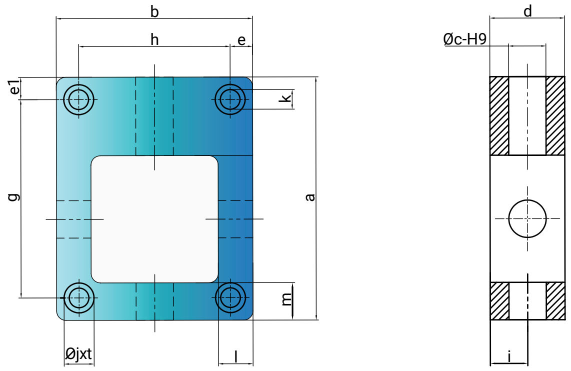
UM - Pivot Bearing end

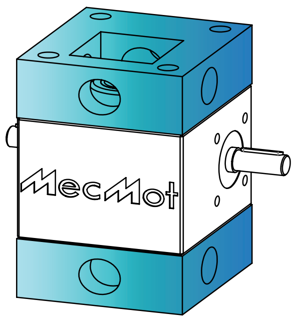




Part no.	H	D	D1	d	M	g	b	h	h1	t	kg
UP07.04.01	65	30	29	12	M12	48	18	25	20	22	0.25
UP07.04.02	80	40	39	14	M14	56	24	25	20	25	0.56
UP07.04.03	110	50	46	20	M20	80	30	45	25	25	1.20
UP07.04.04	130	65	60	30	M30	92	35	50	-	33	2.10
UP07.04.05	144	90	85	35	M36	108	40	65	-	55	4.40
UP07.04.06	210	100	90	50	M42x2	155	57	90	50	70	8.00
UP07.04.07	260	125	120	80	M56x2	180	80	85	40	63	16.00
UP07.04.08	280	145	145	95	M72x3	195	100	105	-	83	24.00

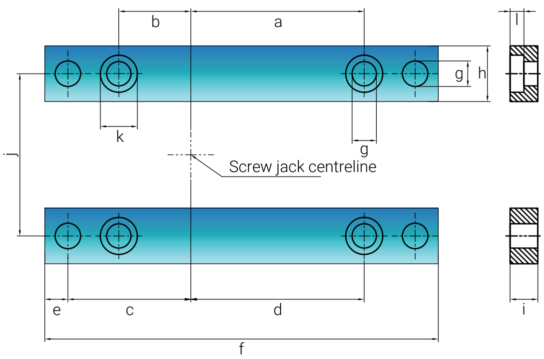
GMB - Pivot Bearing Plate

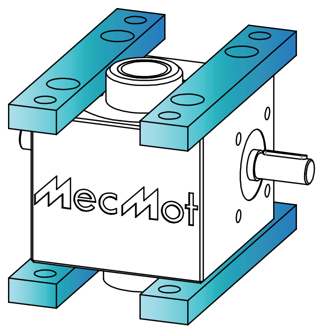




Part no.	a	b	c	d	e	e1	g	h	i	j	k	l	m	t	kg
UP07.02.01	80	72	16	30	10	10	60	52	15	15	9	18	10	9	0.80
UP07.02.02	100	85	16	30	11	11	78	63	15	15	9	16	11	9	1.15
UP07.02.03	130	105	20	40	12	12	106	81	20	18	11	25	25	11	2.80
UP07.02.04	180	145	30	50	15	15	150	115	25	20	13	24	30	13	5.30
UP07.02.05	200	175	40	70	22	17	166	131	35	26	17	40	30	18	11.1

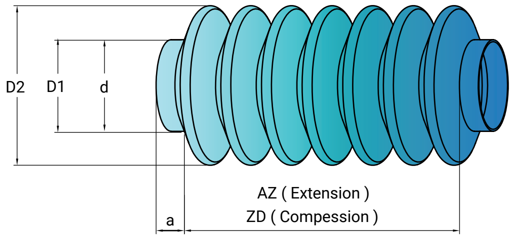
MB - Fixing Strips

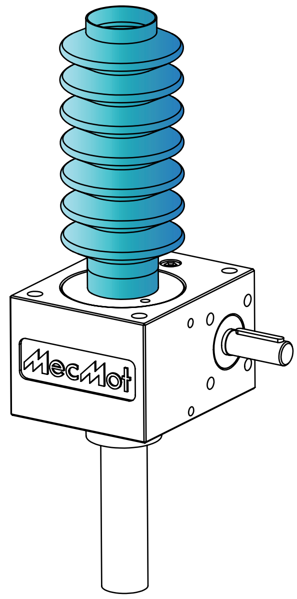




Part no.	a	b	c	d	e	f	g	h	i	j	k	l	kg
UP07.01.01	39	21	41	59	10	120	9	20	10	52	14	6	0.32
UP07.01.02	49	29	50	70	10	140	9	20	14	63	14	6	0.50
UP07.01.03	64	42	64	86	10	170	11	25	12	81	17	7.5	0.75
UP07.01.04	87	63	90	114	13	230	13	30	20	115	19	7	2.00
UP07.01.05	100	66	101	135	17	270	18	40	25	131	26	11	3.70

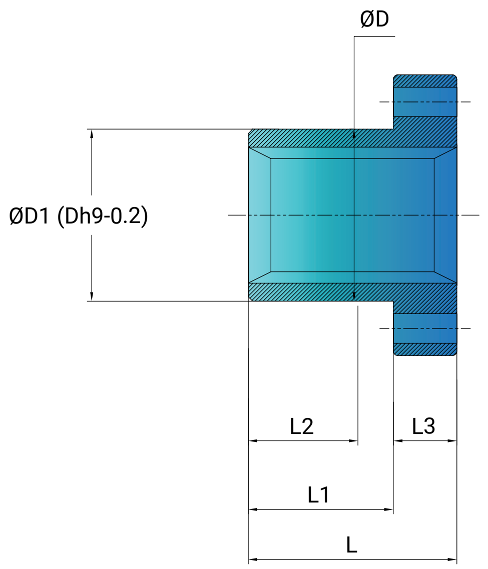
KK - Bellows

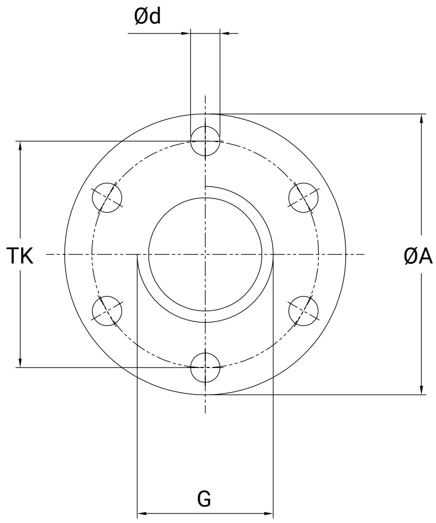




Part no.	a	d	ZD	AZ	Stroke	D1	D2	kg
HM14.01.01	10	29	35	300	265	40	76	0.15
HM14.01.02	10	39	80	420	340	40	80	0.21
HM14.01.03	15	46	70	370	300	50	83	0.25
HM14.01.04	18	60	85	475	390	66	102	0.43
HM14.01.05	15	85	75	360	285	85	118	0.29
HM14.01.06	15	90	50	400	350	92	141	0.44
HM14.01.07	15	120	90	480	390	125	166	1.10
HM14.01.08	15	145	100	700	600	172	236	2.40

HRS - Bronze Nut

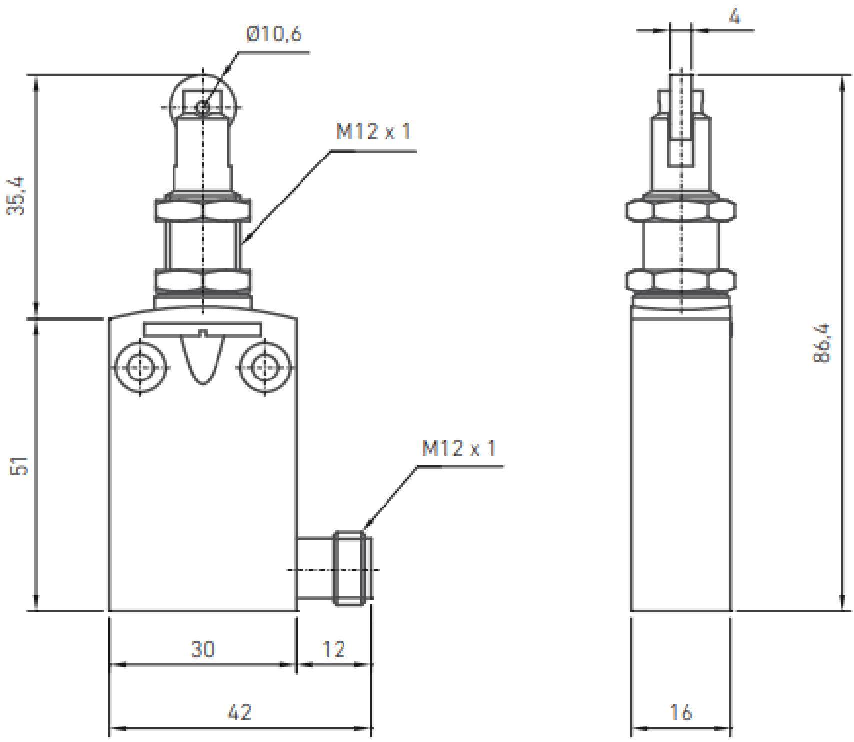




Part no	0	D1 Dh9	TK	A	d (6x1)	L	L1	L2	L3	kg
VK5-HRS	Tr 18x4	28	38	48	6	35	23	15	12	0,23
VK10-HRS	Tr 20x4	32	45	55	7	44	32	24	12	0,35
VK25-HRS	Tr 30x6	38	50	62	7	46	32	24	14	0,41
VK50-HRS	Tr 40x7	63	78	95	9	66	50	38	16	1,71

MSW - Mechanical Limit Switch

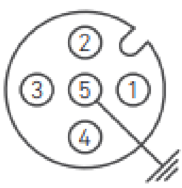
MSW with M12X1 CONTECTOR	VK5 VH-S/SI
	VK10 VH-S/SI
	VK25 VH-S/SI
	VK50 VH-S/SI
	VK100 VH-S/SI
	VK150 VH-S/SI
	VK250 VH-S/SI
	VK350 VH-S/SI

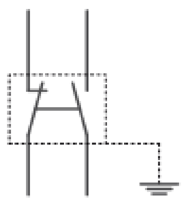


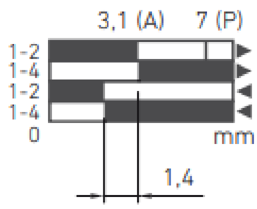
M12x1 connector specifications

5 Pin model
Snap switch PNP_NC + NA bipolar input

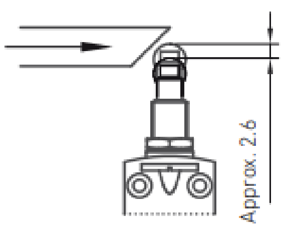
4 A - 60 V
1-2 = NC
3-4 = NA
5 =







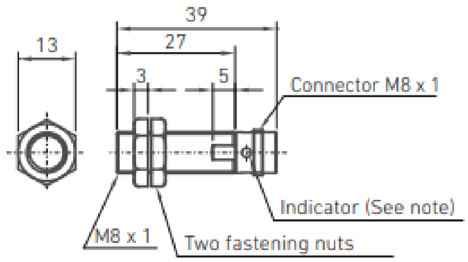
Roller-type switching end



ISW - Inductive Limit Switch

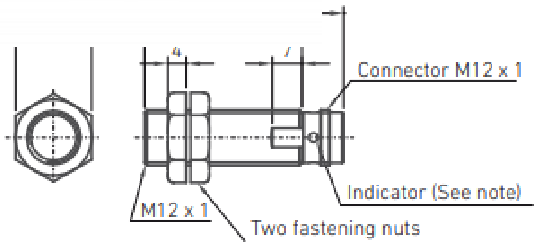
ISW M8x1 With M8x1 Connector	VK5 VH-S/SI
	VK10 VH-S/SI
	VK25 VH-S/SI
	VK50 VH-S/SI
	VK100 VH-S/SI
	VK150 VH-S/SI
	VK250 VH-S/SI
	VK350 VH-S/SI
ISW M12x1 With M812x1 Connector	VK5 VH-S/SI
	VK10 VH-S/SI
	VK25 VH-S/SI
	VK50 VH-S/SI
	VK100 VH-S/SI
	VK150 VH-S/SI
	VK250 VH-S/SI
	VK350 VH-S/SI

M8x1 inductive detector with M8x1 connector



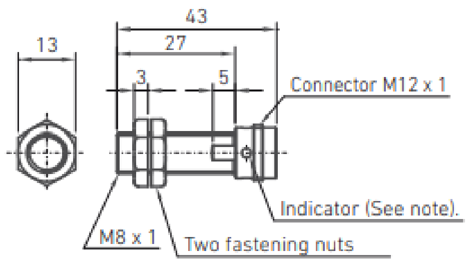
Note: Operation indicator (yellow LED, 4x90°)

nnector M12x1



Note: Operation indicator (yellow LED, 4x90°)

Inductive detector M8x1 with connector M12x1 (optional)

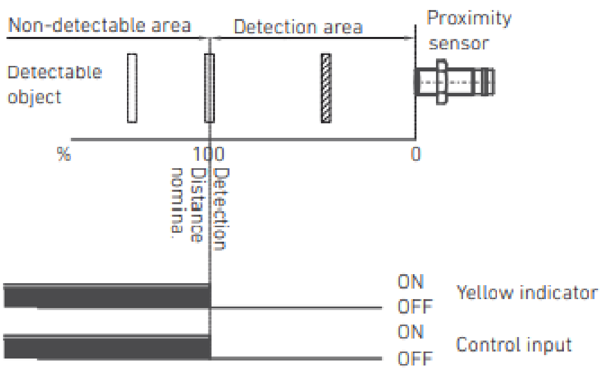


Note: Operation indicator (yellow LED, 4x90°)

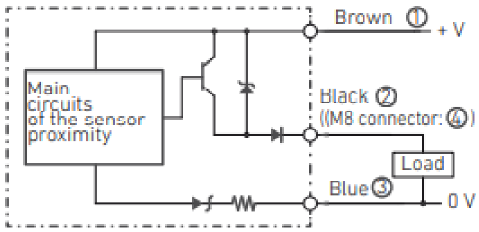
Connector specifications

CC Model 3-wire
PNP-NC input

Operating diagram



Input circuit



M8 connector
M12 connector
Pin 2 is not used

Accessories

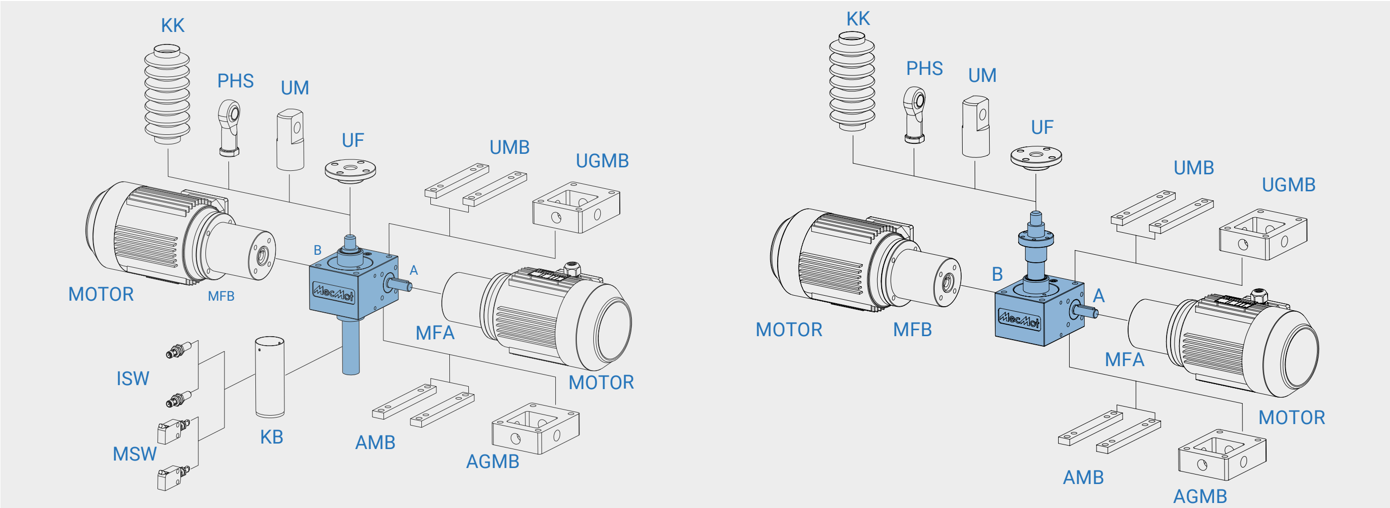
- **UF** Fixing Flange
- **UFS** Opposed Bearing Plate (In Rotating Screw Type
- **PHS** Rod End
- **UM** Pivot Bearing End
- **GMB** Pivot Bearing Plate
- **MB** Fixing Strips
- **KK** Bellows
- **MSW** Mechanical Limit Switch
- **ISW** Inductive Limit Switch
- **MFA** Motor for Right Side
- **MFB** Motor for Left Side
- **KB** Protective Tube

Screw Jack	Size	Version	Drive Ratio
VK Standard Product	5 kN 10 kN 25 kN	**SH** Rotating Screw	**A** High Speed
VKX / XVK Special Product	50 kN 100 kN 150 kN 250 kN 350 kN	**VH-S** Translating Screw **VH-SI** Translating Screw Unturning	**B** Low Speed

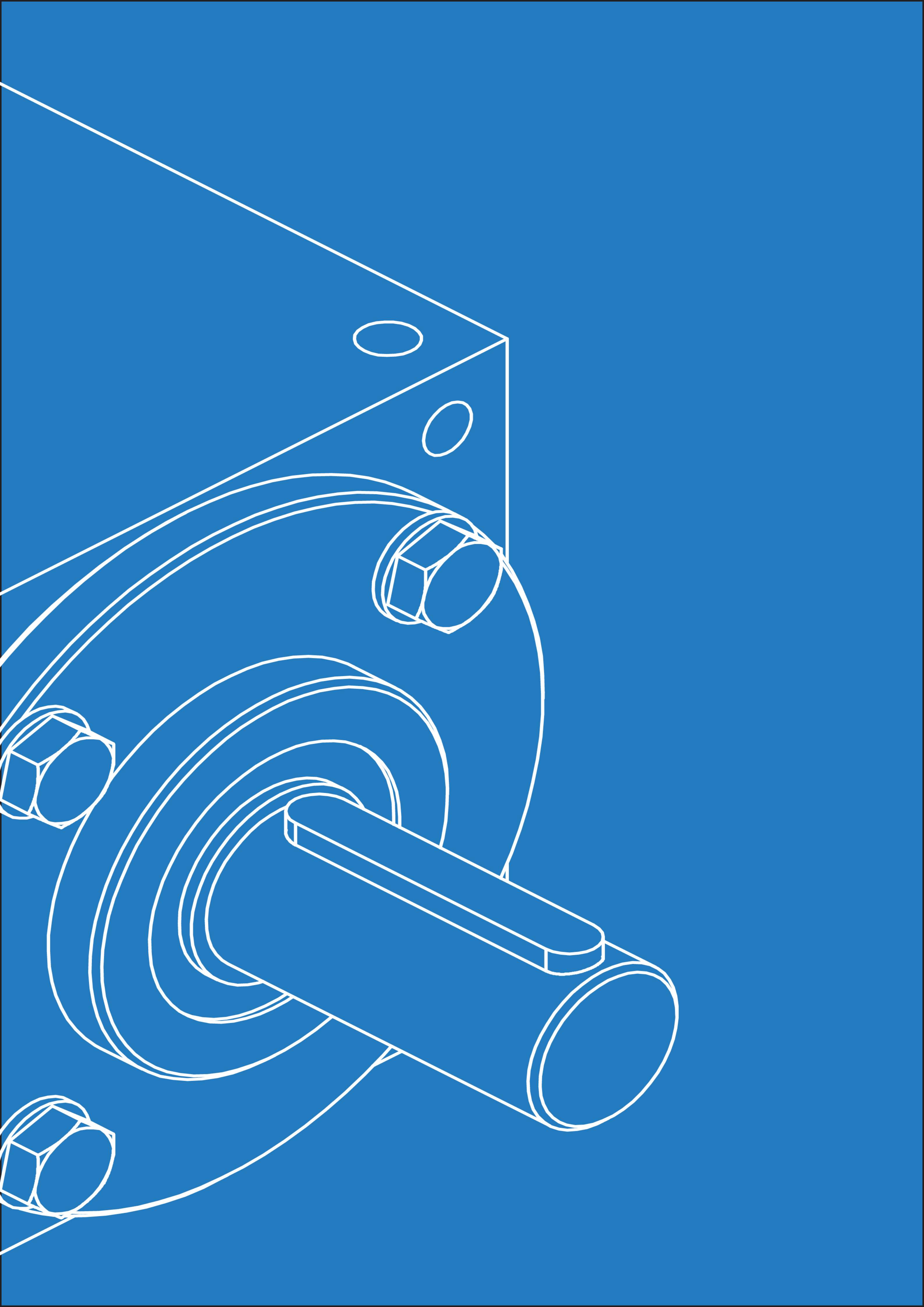
VK	25	VH-S	A

** Example of Ordering Code*

Screw Jack Vk Series
Order Code



Screw Version	Stroke Length	Spindle End	Drive Shaft Side	List ofAccessories
TRS Standard Type	**0000 mm** Stroke Length	**S** Standard	**A** Right Side **B** Left Side **AB** Both Side	-
TRX Stainless Type		**X** Special		
TRS	0380	S	A	KB-MF-ISW-KK



BEVEL GEARBOX

Housing
- Cubic shape
- Material: GGG - 40
- All sides machine finished.
- On request: Stainless steel.

Covers and hubs
- Material: GGG - 40
- Machining: İnternal centring tolerance **h7**, outher centring tolerance **f7**.
- On request: Stainless steel.

Solid Shafts
- Material: Carbon steel C45E + H + QT (UNI EN 10083-2), hardened and tempered.
- Machining: Cylindrical end, ground in tolerance **j6**, with key according to DIN 6885 part 1.
- On request: Stainless steel.
  Shaft end with spline profile according to DIN 5480.
  Shaft end machined to drawing.

Hollow Shafts
- Material: Input hollow shaft - carbon steel C45E + QT (UNI EN 10083-2), hardened and tempered.
  Output hollow shaft - alloy steel 39 NICrMo 3 (UNI EN 10083-3), hardened and tempered.
- Machining: Cylindrical end, ground in tolorance **H7**, with keyway according to DIN 6885 Part 1.
- On request: Stainless steel.
  Bore with spline profile according to ISO 14.

Bevel gears
- Material: Alloy steel 20 MnCr 5 (UNI EN 10084), case-hardened and tempered.
- Toothing: GLEASON, with spiroidal tooth.
- Running in with lapping.

Seals
- Oil seals in NBR, on request in VITON.
- O-rings in NBR.

Bearings
- Taper roller bearings on solid output shaft and input shafts.
- Ball bearings on hollow input shaft for motor flange.
- On request: Larger bearings for higher radial and / or axial load capacity.

The selection of a bevel gearbox depends on severalapplication factors:

- The kinematic scheme of the application to determine the design form, the kinematic scheme of the gear assembling and the shafts rotation directions.
- Torque and rotation speed required by the load (operating machine)
- Load variability, regarding the operating machine and its inertia.
- Working cycle: Number of starts-up per hour, operating time in hours per day duty cycle.
- Environmental conditions, ambşent temperature, presence of aggressive agents.
- Service life requirements in terms of operating hours of the application.
- Type of engine or type of drive on the bevel gearbox input, available or required by the aplication.

The avove mentioned points are all very important to determine the right size and the type of suitable bevel gearbox for customer's application.

To simplify the selection, some factors, which take into consideration the variability of the above mentioned conditions, are introduced. Applying these factors on the performance required by the application, we obtain recalculated reference performances which should be considered as a starting base for the selection by consulting the table of **Nominal performances** given for each bevel gearbox size.

The nominal data required by the application or by the operating machine are:

- Rotation speed , n [rpm]
- Torque, M_{tn} [Nm]

These data allow to calculate **the required nominal power** P_n [kW]:

$$P_n = \frac{M_{tn} \times n}{9550}$$

It is then necessary to determine the **recalculated referance power** P, defined by the following formula:

$$P_n = P_n \; x \; f_c \; x \; f_u \; x \; f_d$$

Where:

P_n required nominal power
f_c load factor
f_u daily operating time factor
f_d service life factor

The **load factor** f_c regards the load variability and the number of stars-up per hour; for its quantification and explanation please refer to the desciption and the table below. **The load factor** f_c, regarding the load variability is defined as follows:

f_c1 Light overloads: Load variation not exeeding 10% of the required nominal load no mass to be accelerated.
f_c2 Medium overloads : Load variation not exceeding 25% of the required nominal load with mass to be accelerated.
f_c3 heavy overload: Load variation up to 100% of the required nominal load, with large mass to be accelerated.

Number of starts-up per hour	1	5	60	120	240	1000	1800
f_c1	1	1	1.1	1.2	1.25	1.3	2
f_c2	1.2	1.2	1.3	1.4	1.45	1.5	1.6
f_c3	1.5	15	1.6	1.7	1.75	1.8	2

Housing

Cubic shape
Material: Grey cast iron EN-GJL-250 (UNI EN 1561)
All sides machine finished.
On request: Stainless steel.

Covers and hubs

Material: Grey cast iron EN-GJL-250 (UNI EN 1561)
Machining: İnternal centring tolerance **h7**, outher centring tolerance **f7**.
On request: Stainless steel.

Solid Shafts

Material: Carbon steel C45E + H + QT (UNI EN 10083-2), hardened and tempered.
Machining: Cylindrical end, ground in tolerance **j6**, with key according to DIN 6885 part 1.
On request: Stainless steel.
Shaft end with spline profile according to DIN 5480.
Shaft end machined to drawing.

Hollow Shafts

Material: Input hollow shaft - carbon steel C45E + QT (UNI EN 10083-2), hardened and tempered.
Output hollow shaft - alloy steel 39 NICrMo 3 (UNI EN 10083-3), hardened and tempered.
Machining: Cylindrical end, ground in tolorance **H7**, with keyway according to DIN 6885 Part 1.
On request: Stainless steel.
Bore with spline profile according to ISO 14.

Bevel gears

Material: Alloy steel 20 MnCr 5 (UNI EN 10084), case-hardened and tempered.
Toothing: GLEASON, with spiroidal tooth.
Running in with lapping in paris.

Seals

Oil seals in NBR, on request in VITON.
O-rings in NBR.

Bearings

Taper roller bearings on solid output shaft and input shafts.
Ball bearings on hollow input shaft for motor flange.
On request: Larger bearings for higher radial and / or axial load capacity.

The selection of a bevel gearbox depends on severalapplication factors:

- The kinematic scheme of the application to determine the design form, the kinematic scheme of the gear assembling and the shafts rotation directions.
- Torque and rotation speed required by the load (operating machine)
- Load variability, regarding the operating machine and its inertia.
- Working cycle: Number of starts-up per hour, operating time in hours per day duty cycle.
- Environmental conditions, ambşent temperature, presence of aggressive agents.
- Service life requirements in terms of operating hours of the application.
- Type of engine or type of drive on the bevel gearbox input, available or required by the aplication.

The avove mentioned points are all very important to determine the right size and the type of suitable bevel gearbox for customer's application.

To simplify the selection, some factors, which take into consideration the variability of the above mentioned conditions, are introduced. Applying these factors on the performance required by the application, we obtain recalculated reference performances which should be considered as a starting base for the selection by consulting the table of **Nominal performances** given for each bevel gearbox size.

The nominal data required by the application or by the operating machine are:

- Rotation speed , n [rpm]
- Torque, M_{tn} [Nm]

These data allow to calculate **the required nominal power** P_n [kW]:

$$P_n = \frac{M_{tn} \times n}{9550}$$

It is then necessary to determine the **recalculated referance power** P, defined by the following formula:

$$P_n = P_n \times f_c \times f_u \times f_d$$

Where:

P_n required nominal power
f_c load factor
f_u daily operating time factor
f_d service life factor

The **load factor** f_c regards the load variability and the number of stars-up per hour; for its quantification and explanation please refer to the desciption and the table below. **The load factor** f_c, regarding the load variability is defined as follows:

f_c1 Light overloads: Load variation not exeeding 10% of the required nominal load no mass to be accelerated.
f_c2 Medium overloads : Load variation not exceeding 25% of the required nominal load with mass to be accelerated.
f_c3 heavy overload: Load variation up to 100% of the required nominal load, with large mass to be accelerated.

Number of starts-up per hour	1	5	60	120	240	1000	1800
$fc1$	1	1	1,1	1,2	1,25	1,3	1,4
$fc2$	1,21	1,21	1,3	1,4	1,45	1,5	1,6
$fc3$	1,51	1,51	1,6	1,7	1,75	1,8	2

The **daily operating factor** f_u considers the number of operating hours per day reffering to operating under load with duty cycle required by the application:

Operating hours / day	1	2	4	8	16	24
f_u	0.7	0.8	0.9	1	1.15	1.3

The **service life factor** f_d considers the life time required by the application compared to the life time calculated with performances shown in the tables (average value 10.000 hours) referance to the gears.

Theoretic service life [hours]	20.000	15.000	10.000	5.000	3.000
f_u	1.2	1.1	1	0.9	0.8

With the **calculated input power** P:

$$P=P_n \; x \, f_c \, x \, f_u \, x \, f_d$$

It is possible to calculate the **torque** M_{t2} **reguired on the gearbox output**, considering the rotation speed required by the operating machine or the load:

$$M_{t2} = \frac{Px9550}{n_2}$$

Based on **nominal performances** table on page 12-13, using M_{t2} and n_2, it is possible to determine the bevel gearbox size for an initial selection. Then evaluating the gearbox ratios and the characteristics of the rotation speeds avaiable or required by the application, it is possible to select easily a ratio and determine the bevel gearbox input speed. The **input power** P_1 [kW] **required on the bevel gearbox**, shown in the table, already takes into account the **total bevel gearbox efficiency** η, with the ratio and the considered input speed:

$$P_1 = \frac{Mt_2xn_2}{9550x\eta}$$

Usuallly, the ratio selection implies a modification of the real gearbox output speed regards to the previously calculated one unless it is possible to vary and adjust the bevel gearbox input speed.

Bevel gearboxes YD Series

Thermal power limit (P_T)

After the gearbox size has been determined, it is necessary to verify the thermal operating conditions, which means toverify if the selected gearbox can operate in the required conditions without risk of overheating of the oil lubricant and of the componets.

Each gearbox has a **thermal power limit** P_T, which is determined based on continuous operating duty cycle over max. 3 hours at 20°C environment temperature, value stated in the table at the bottom of this page, which must not be exceeded without a controlled and forced cooling.

In case of risk of exceeding the thermal power limit, the bevel gearbox should be always lubricated exclusively with oil instead of grease.

In order to consider the real environment conditions, if diffrent from 20°C, and the duty cycle if diffrent from the reference one (continuous operating over max. 3 hours) two factors are introduced which modify the thermal power limit, allowing the calculation of the **corrected thermal power limit** P_{Tc}:

$$P_{Tc} = P_T \, x \, f_T \, x \, f_i$$

Where:
P_T thermal power limit
f_T ambient temperature factor
f_i duty cycle factor referred to continuous operating over 3 hours (period of time considered to determine the thermal power limit)

Ambient temperature factor f_T:

T [°C]	0	10	20	30	40	50	60
f_i	1.3	1.15	1	0.85	0.7	0.55	0.5

Duty cycle facor f_i:

Operating time over 3 hours [%]	100	80	60	40	20	10
f_i	1	1.2	1.3	1.5	1.6	1.8

Therefore, the continuous power used over 3 hours in the selected bevel gear box must not exceed the value of the **corrected thermal power** P_{Tc} referred to the same gearbox, otherwise the oil lubricant should be cooled.

Thermal powet limit (P_T) forcontinuous operating over 3 hour at 20°C ambient temperature:

SIZE	86	110	134	166	200	250
P_T [kW]	3.4	5.5	8	12.2	17.9	26.5

Bevel gearboxes YD Series

Technical features summary

SIZE	YD85	YD110	YD135
Housing side dimensions [mm]	85	110	135
Ratio	1 : 1 1 : 1.5 1 : 2 1 : 3 1 : 4		
Total efficiency (η)	0.90 ≤ η ≤ 0.93 (*)		
Input: solid shaft cylindrical with key STANDARD diameter [mm]	Ø 16 j6	Ø 20 j6	Ø 24 j6
Input: solid shaft cylindrical with key LARGER diameter [mm]	Ø 24 j6	Ø 26 j6	Ø 32 j6
Input: IEC motor flange	IEC 71 B5 IEC 80 B5 IEC 80 B14	IEC 80 B5 IEC 80 B14 IEC 90 B5 IEC 90 B14	IEC 90 B5 IEC 100-112 B5 IEC 100-112 B14
Output: solid shaft cylindrical with key	Ø 24 j6	Ø 25 j6	Ø 32 j6
Output: hollow shaft cylindrical with keyway	Ø 16 H7	Ø 20 H7Ø	24 H7
Output: solid shaft with hub cylindrical with key STANDARD diameter [mm]	Ø 16 j6	Ø 20 j6	Ø 24 j6
Output: solid shaft with hub cylindrical with key LARGE diameter [mm]	Ø 24 j6	Ø 25 j6	Ø 32 j6
Gearbox housing, shaft hub and covers material	GGG - 40		
Solid input shaft material	Steel C45E + H +QT (UNI EN 10083-2) hardened and tempered		
Hollow input shaft material	Steel C45E + H +QT (UNI EN 10083-2) hardened and tempered		
Solid output shaft material	Steel C45E + H +QT (UNI EN 10083-2) hardened and tempered		
Hollow output shaft material	Steel 39 NiCrMo 3 (UNI EN 10083-3) hardened and tempered		
Bevel gears	Toothing: Spiral GLEASON Material : Steel 20 MnCr 5 (UNI EN 10084) case-hardened lapped		
Gearbox mass [kg] (gearbox with solid input shaft and solid output shaft on both sides)	3.59		18

* Value referred to bevel gearbox without additional output.

Bevel gearboxes YD Series

Technical features summary

YD165	YD200	YD250	SIZE
165	200	250	Housing side dimensions [mm]
1 : 1 1 : 1.5 1 : 2 1 : 3 1 : 4			Ratio
0.90 ≤ η ≤ 0.93 (*)			Total efficiency (η)
Ø 32 j6	Ø 42 j6	Ø 55 j6	Input: solid shaft cylindrical with key STANDARD diameter [mm]
Ø 45 j6	Ø 55 j6	Ø 70j6	Input: solid shaft cylindrical with key LARGER diameter [mm]
90 B5 100-112 B5 100-112 B14	100-112 B5 132 B5 132 B14	132 B5 160 B5	Input: IEC motor flange
Ø 45 j6	Ø 55 j6	Ø 70 j6	Output: solid shaft cylindrical with key
Ø 32 H7	Ø 42 H7	Ø 55 H7	Output: hollow shaft cylindrical with keyway
Ø 32 j6	Ø 42 j6	Ø 55 j6	Output: solid shaft with hub cylindrical with key STANDARD diameter [mm]
Ø 45 j6	Ø 55 j6	Ø 70 j6	Output: solid shaft with hub cylindrical with key LARGE diameter [mm]
GGG - 40			Gearbox housing, shaft hub and covers material
Steel C45E + H +QT (UNI EN 10083-2) hardened and tempered			Solid input shaft material
Steel C45E + H +QT (UNI EN 10083-2) hardened and tempered			Hollow input shaft material
Steel C45E + H +QT (UNI EN 10083-2) hardened and tempered			Solid output shaft material
Steel 39 NiCrMo 3 (UNI EN 10083-3) hardened and tempered			Hollow output shaft material
Toothing: Spiral GLEASON Material : Steel 20 MnCr 5 (UNI EN 10084) case-hardened lapped			Bevel gears
32	60	145	Gearbox mass [kg] (gearbox with solid input shaft and solid output shaft on both sides)

* Value referred to bevel gearbox without additional output.

Bevel Gearboxes YD Series

Nominal Performances - Torque and Power

SIZE		YD85		YD110		YD135	
n_1 rpm	n_2 rpm	P_1max [kW]	T_2max [Nm]	P_1max [kW]	T_2max [Nm]	P_1max [kW]	T_2max [Nm]
Ratio R 1							
50	50	0.32	60	0.97	180	1.62	300
250	250	0.94	35	3.78	140	7.85	291
500	500	1.62	30	6.21	115	13.0	241
1000	1000	2.7	25	10.3	95	21.1	196
1500	1500	3.24	20	13.0	80	28.1	173
2000	2000	3.89	18	16.2	75	34.3	159
3000	3000	5.18	16	22.7	70	45.6	141
Ratio R 1.5							
50	33	0.23	65	0.49	135	0.81	225
250	167	0.72	40	2.25	125	3.95	220
500	333	1.08	30	4.32	120	7.75	215
1000	667	1.80	25	6.84	95	14.7	204
1500	1000	2.48	23	9.18	85	20.6	191
2000	1333	2.88	20	11.5	80	25.2	175
3000	2000	3.89	18	15.1	70	33.4	155
Ratio R 2							
50	25	0.15	55	0.31	115	0.51	190
250	125	0.54	40	1.42	105	2.44	181
500	250	0.94	35	2.70	100	4.71	175
1000	500	1.62	30	5.13	95	9.02	167
1500	750	2.02	25	7.29	90	13.0	160
2000	1000	2.38	22	9.18	85	16.7	155
3000	1500	3.24	20	12.1	75	23.4	144
Ratio R 3							
50	17	0.06	35	0.14	80	0.23	126
250	83	0.29	32	0.63	70	1.07	119
500	167	0.54	30	1.17	65	2.04	113
1000	333	1.01	28	2.19	61	3.91	109
1500	500	1.40	26	3.16	59	5.66	105
2000	667	1.58	22	4.07	57	7.30	101
3000	1000	2.16	20	5.94	55	10.3	95
Ratio R 4							
50	12.5	0.04	30	0.09	65	0.14	104
250	62.5	0.18	26	0.37	55	0.59	84
500	125	0.34	25	0.67	50	1.11	82
1000	250	0.65	24	1.21	45	2.12	79
1500	375	0.93	23	1.75	43	3.08	76
2000	500	1.19	22	2.26	42	3.98	74
3000	750	1.62	20	3.24	40	5.63	70

Thermal power limit [kW]	YD85	YD110	YD135
Thermal power limit [kW]	3.4	5.5	8

P_1max
The torque and power values stated in the Nominal peformances table refer to a minimum service life of 10 000 hours at following opera ting conditions:

- Applied load: uniform and without variations
- Driving unit: electric motor
- Rotation direction: one-way
- 1 (one) start-up per hour
- Operating hours per day 8
- Ambient temperature: 20C
- Thermal power limit value calculated considering a continuous operating time over 3 hours at nominal performances.

Bevel Gearboxes YD Series

Nominal Performances - Torque and Power

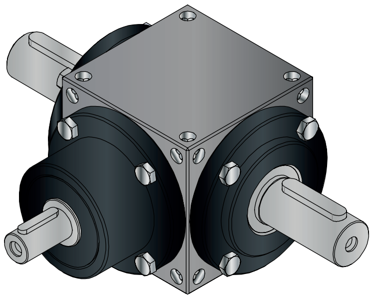
YD165		YD200		YD250		SIZE	
P_1max [kW]	T_2max [Nm]	P_1max [kW]	T_2max [Nm]	P_1max [kW]	T_2max [Nm]	n_1 rpm	n_2 rpm
							Ratio R 1
3.02	560	5.24	970	10.7	1980	50	50
11.4	420	22.1	820	37.2	1380	250	250
18.4	340	36.2	670	60.5	1120	500	500
30.2	280	59.4	550	98.2	910	1000	1000
40.5	250	77.7	480	131	810	1500	1500
50.0	230	95.0	440	160	740	2000	2000
64.8	200	126	390	214	660	3000	3000
							Ratio R 1.5
1.51	420	2.63	730	5.33	1480	33	50
7.38	410	13.0	720	26.1	1450	167	250
13.3	370	24.8	690	45.3	1260	333	500
21.6	300	43.2	600	73.4	1020	667	1000
29.2	270	57.2	530	98.2	910	1000	1500
36.0	250	70.5	490	119	830	1333	2000
47.5	220	92.8	430	160	740	2000	3000
							Ratio R 2
0.97	360	1.67	620	3.45	1280	25	50
4.72	350	8.23	610	17.0	1260	125	250
9.18	340	16.2	600	33.2	1230	250	500
17.3	320	30.8	570	57.8	1070	500	1000
22.7	280	44.5	550	76.9	950	750	1500
28.1	260	55.1	510	93.9	870	1000	2000
37.3	230	72.9	450	125	770	1500	3000
							Ratio R 3
0.43	240	0.76	420	1.53	850	17	50
2.07	230	3.60	400	7.42	825	83	250
3.96	220	7.02	390	14.6	810	167	500
7.56	210	13.3	370	28.1	780	333	1000
10.8	200	19.4	360	40.5	750	500	1500
14.0	195	25.2	350	52.5	730	667	2000
20.0	185	35.6	330	74.5	690	1000	3000
							Ratio R 4
0.27	200	0.46	340	0.94	700	12.5	50
1.15	170	1.96	290	4.18	620	62.5	250
2.16	160	3.78	280	8.10	600	125	500
4.18	155	7.29	270	15.7	580	250	1000
6.07	150	10.5	260	22.7	560	375	1500
7.83	145	13.5	250	29.1	540	500	2000
11.4	140	19.4	240	42.1	520	750	3000

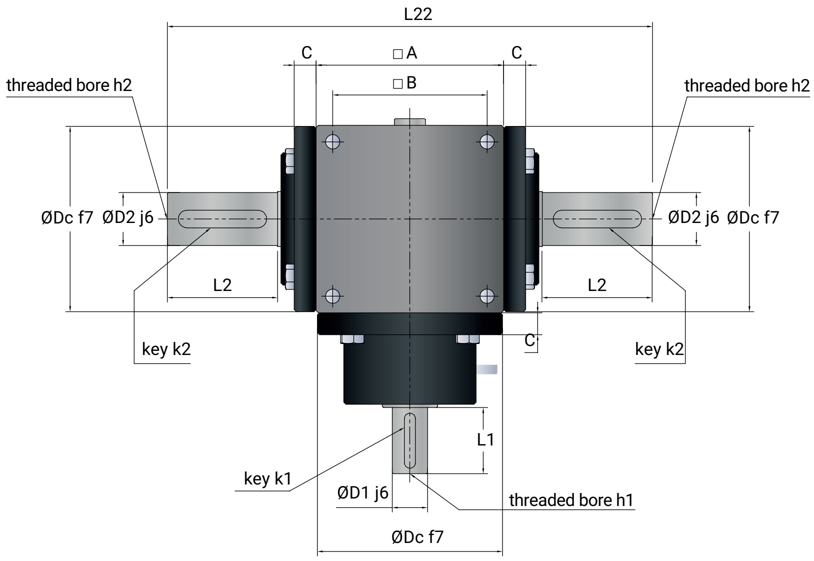
YD165	YD200	YD250	
12.2	17.9	26.5	Thermal power limit [kW]

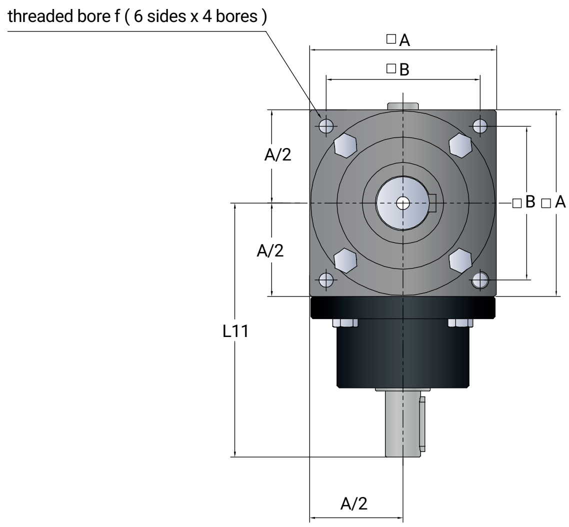
n_1 - input shaft speed
n_2 - output shaft speed
P_{1max} - max. input power
T_{2max} - max. output torque

Bevel Gearbox MMC Type

Input : Solid shaft
Output : Solid shaft on both sides







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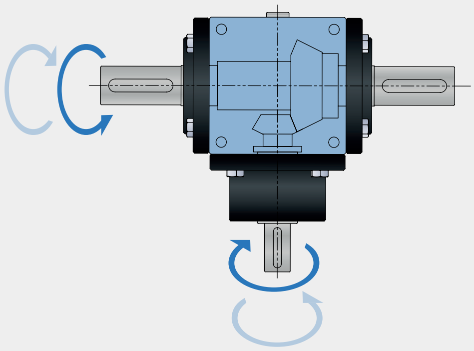

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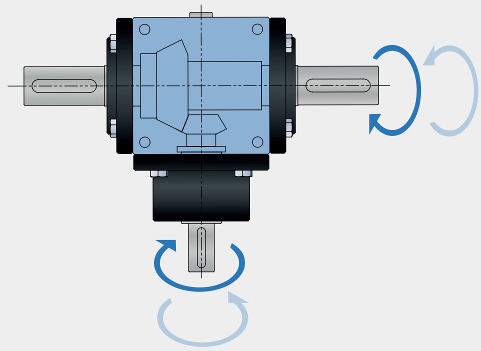
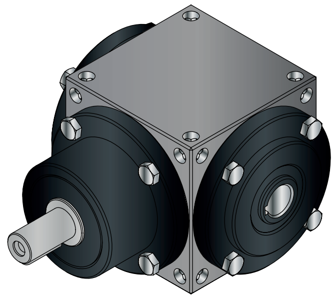
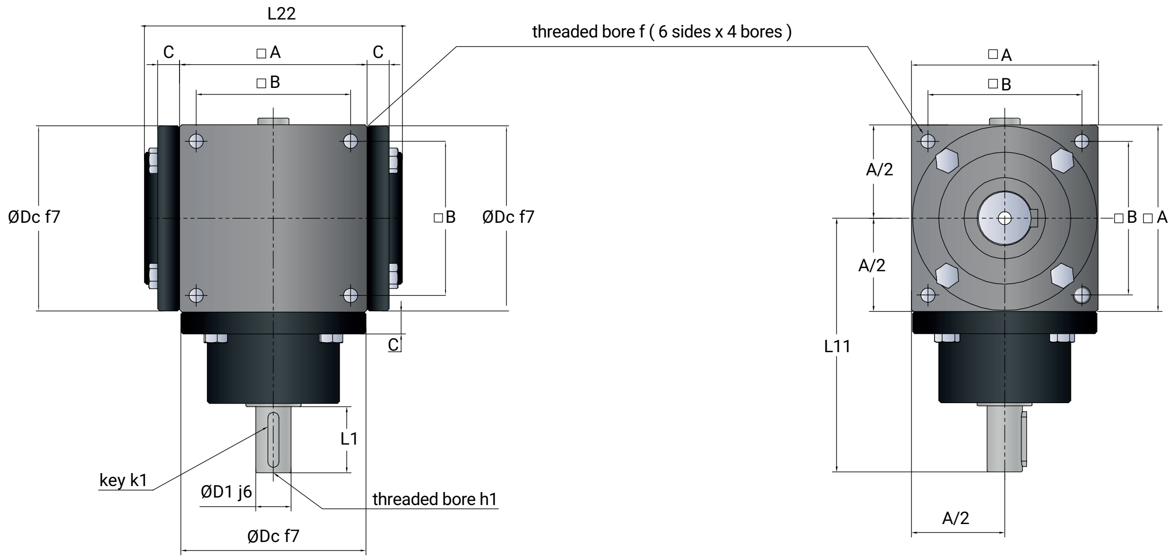


SIZE	YD85	YD 110	YD 135	YD 165	YD 200	YD 250
cube A	85x85x85	110x110x110	135x135x135	165x165x165	200x200x200	250x250x250
Ø D1	16	20	24	32	42	55
Ø D2	24	25	32	45	55	70
Ø Dc	84	100	122	156	185	230
□B	70x70	90x90	115x115	144x144	175x175	215x215
L1	30	40	50	65	85	100
L11	116	150	182	217	267	318
L2	50	55	65	90	110	140
L22	220	254	304	392	470	580
C	10	8	9	11	11	11
f	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 30	M14, depth 35	M16, depth 40
h1	M6, depth 12	M8, depth 20	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 25
h2	M6, depth 12	M8, depth 20	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 25
k1	5x5x25	6x6x35	8x7x45	10x8x60	12x8x80	116x10x90
k2	8x7x40	8x7x45	10x8x55	14x9x80	16x10x100	20x12x120

Bevel Gearbox MD Type

Input : Solid shaft
Output : Hollow shaft





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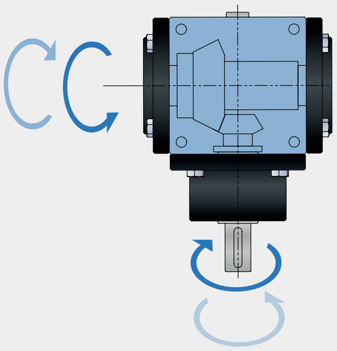
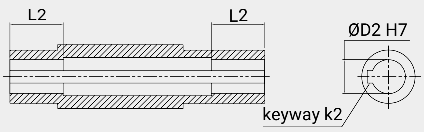
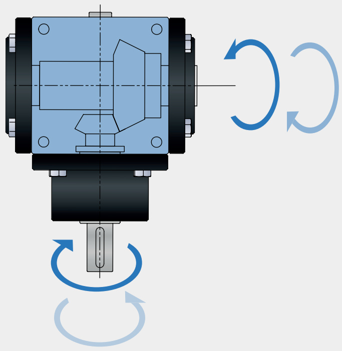




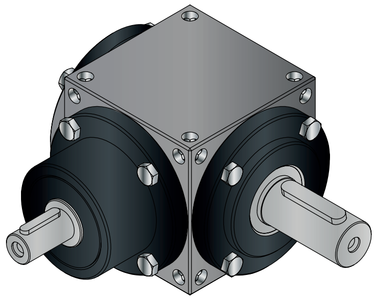
Design: 20

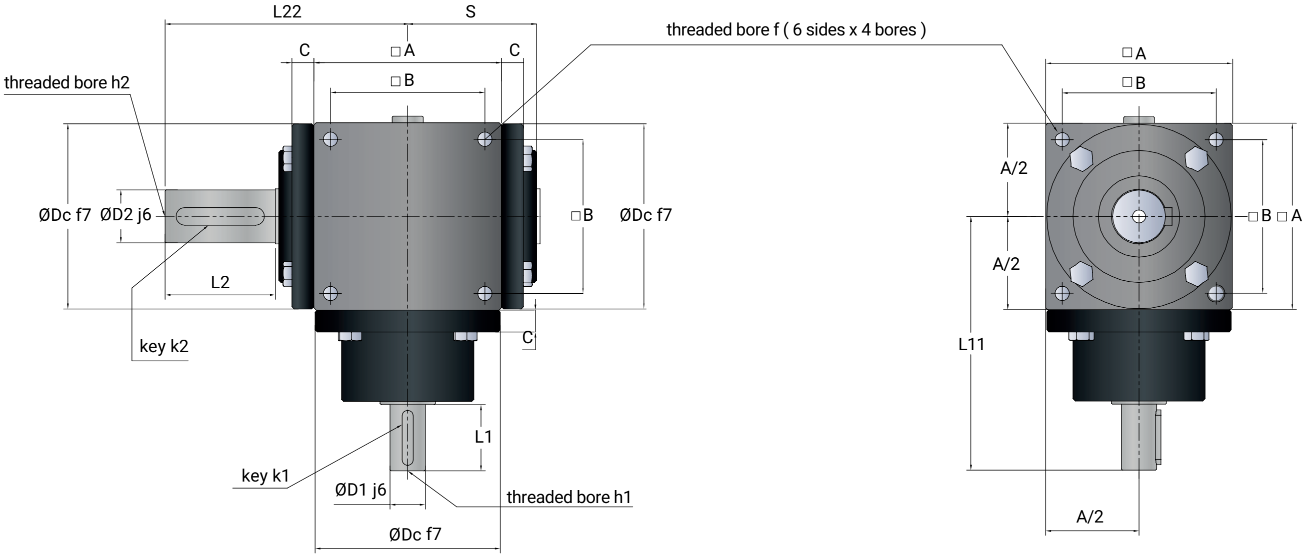


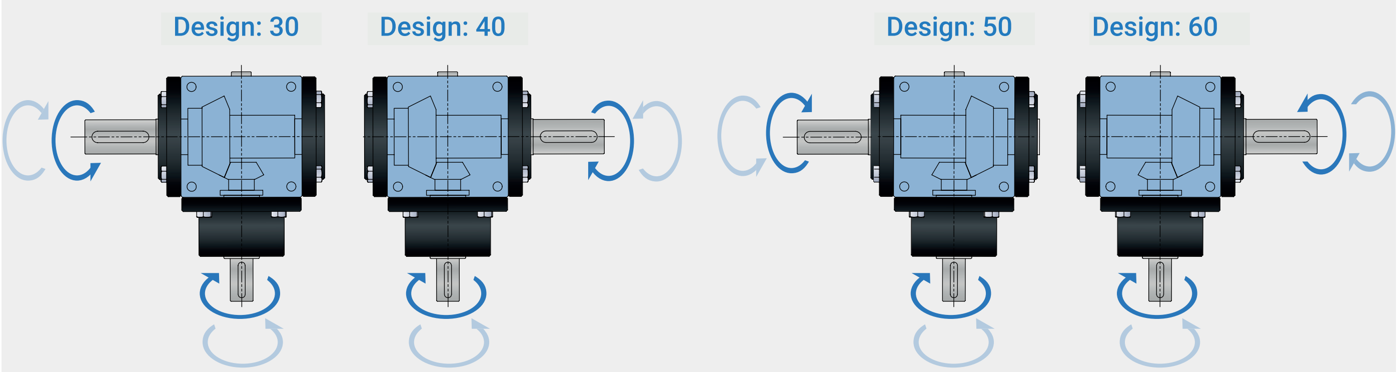
SIZE	YD 85	YD 110	YD 135	YD 165	YD 200	YD 250
cube A	85x85x85	110x110x110	135x135x135	165x165x165	200x200x200	250x250x250
Ø D1	16	20	24	32	42	55
Ø D2	16	20	24	32	42	55
Ø Dc	84	100	122	156	185	230
□B	70x70	90x90	114x114	144x144	175x175	215x215
L1	30	40	50	65	85	100
L11	116	150	182	217	267	318
L2	30	30	35	45	50	55
L22	120	144	174	212	250	300
C	10	8	9	11	11	11
f	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 30	M14, depth 35	M16, depth 40
h1	M6, depth 12	M8, depth 20	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 25
k1	5x5x25	6x6x35	8x7x45	10x8x60	12x8x80	12x8x80
k2	5x5	6x6	8x7	10x8	12x8	16x10

Bevel Gearbox MM Type

İnput : Solid shaft
Output : Solid shaft on one side



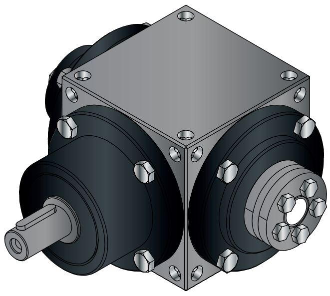


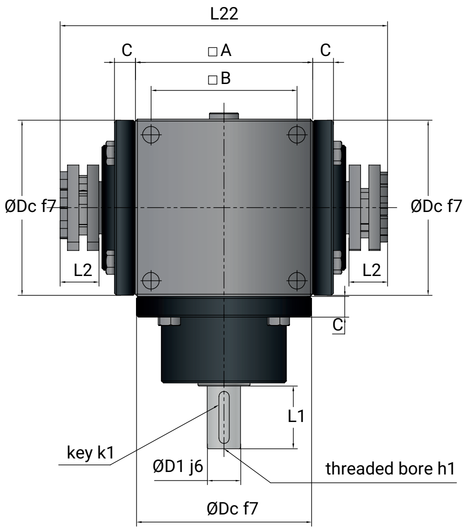


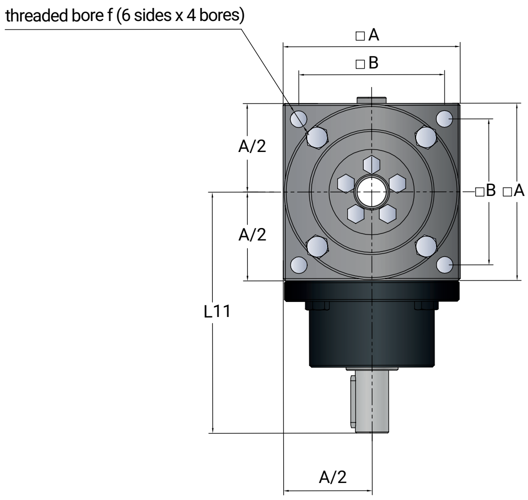
SIZE	YD 85	YD 110	YD 135	YD 165	YD 200	YD 250
cube A	85x85x85	110x110x110	135x135x135	165x165x165	200x200x200	250x250x250
S	58	70	75	104	123	145
Ø D1	16	20	24	32	42	55
Ø D2	24	26	32	45	55	70
Ø Dc	84	100	122	156	185	230
□B	70x70	90x90	114x114	114x114	175x175	215x215
L1	30	40	50	65	85	100
L11	116	150	182	217	267	318
L2	50	55	65	90	110	140
L22	110	127	152	196	235	290
C	10	8	9	11	11	11
f	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 30	M14, depth 35	M16, depth 40
h1	M6, depth 12	M8, depth 20	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 25
h2	M6, depth 12	M8, depth 20	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 25
k1	5x5x25	6x6x35	8x7x45	10x8x60	12x8x80	16x10x90
k2	8x7x40	8x7x45	10x8x55	14x9x80	16x10x100	20x12x120

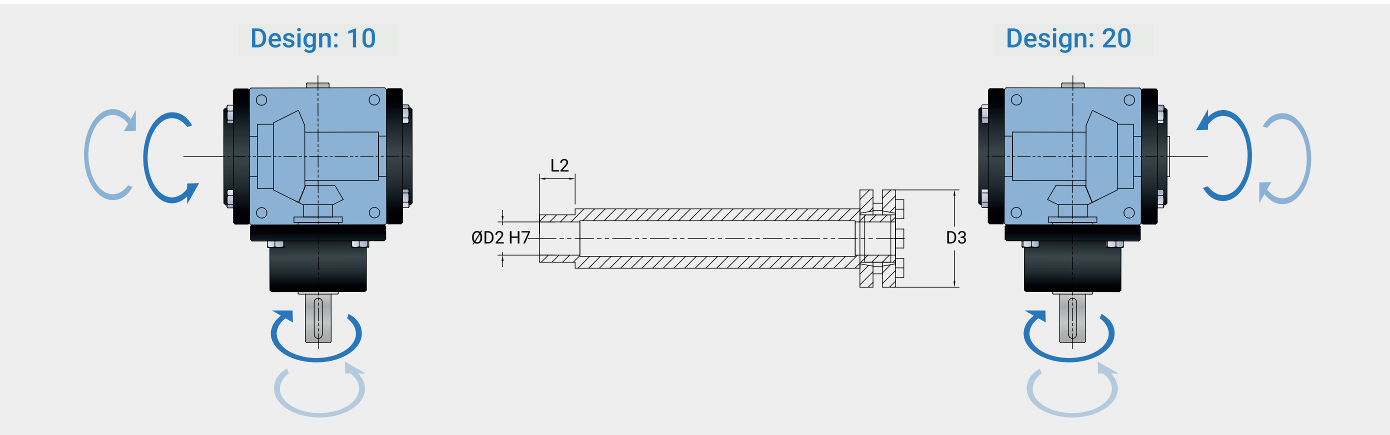
Bevel Gearbox MH Type

İnput : Solid shaft
Output : Solid shaft on one side





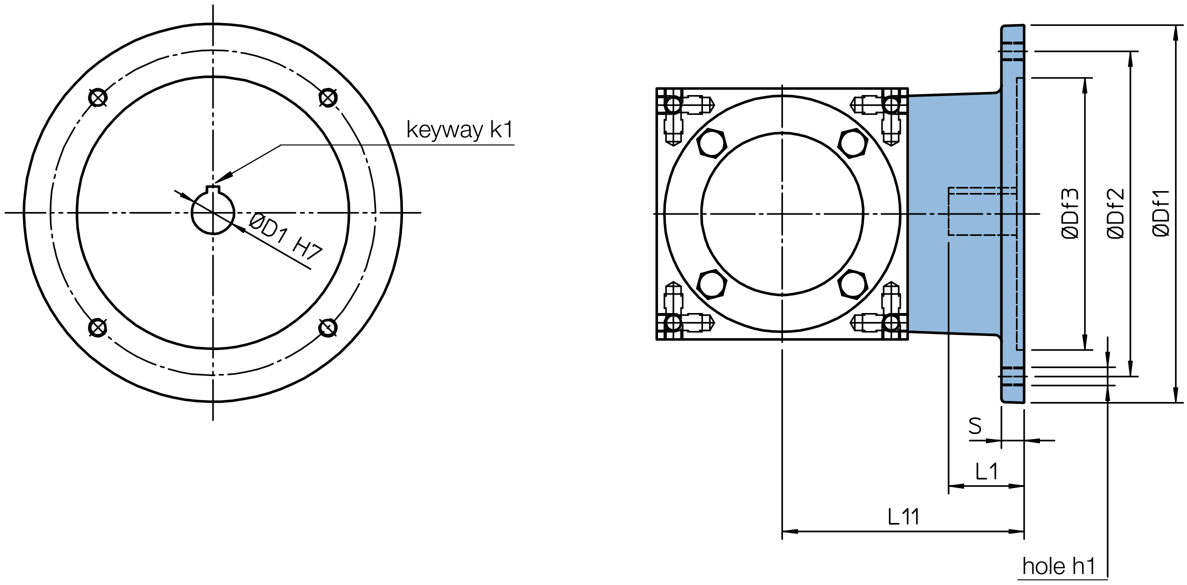




SIZE	YD 85	YD 110	YD 135	YD 165	YD 200	YD 250
cube A	85x85x85	110x110x110	135x135x135	165x165x165	200x200x200	250x250x250
S	58	70	75	104	123	145
Ø D1	16	20	24	32	42	55
Ø D2	24	26	32	45	55	70
Ø Dc	84	100	122	156	185	230
□B	70x70	90x90	114x114	114x114	175x175	215x215
L1	30	40	50	65	85	100
L11	116	150	182	217	267	318
L2	23	23	25	30	32	35
L22	166	190	224	272	314	370
C	10	8	9	11	11	11
f	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 30	M14, depth 35	M16, depth 40
h1	M6, depth 12	M8, depth 20	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 25
h2	M6, depth 12	M8, depth 20	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 25
k1	5x5x25	6x6x35	8x7x45	10x8x60	12x8x80	16x10x90
ØD3	50	50	60	80	90	115

Overall dimensions: YD - MF

Input: IEC motor flange and hollow shaft with keyway



Size	IEC Motor	Ø D1	Ø Df1	Ø Df2	Ø Df3	L1	L11	h1	k1	s
YD 85	71 B5	14	160	130	110	30	90	M8	5 x 5	13
	80 B5	19	200	165	130	40	100	M10	6 x 6	13
	80 B14	19	120	100	80	40	100	O7	6 x 6	13
YD 110	80 B5	19	200	165	130	40	105	M10	6 x 6	13
	80 B14	19	120	100	80	40	105	O7	6 x 6	13
	90 B5	24	200	165	130	50	115	M10	8 x 7	13
	90 B14	24	140	115	95	50	115	O9	8 x 7	13
YD 135	90 B5	24	200	165	130	50	125	M10	8 x 7	13
	100 - 112 B5	28	250	215	180	60	135	M12	8 x 7	13
	100 - 112 B14	28	160	130	110	60	135	O9	8 x 7	13
YD 165	90 B5	24	200	165	130	50	160	M10	8 x 7	15
	100 - 112 B5	28	250	215	180	60	160	M12	8 x 7	15
	100 - 112 B14	28	160	130	110	60	160	O9	8 x 7	15
YD 200	100 - 112 B5	28	250	215	180	60	220	M12	8 x 7	23
	132 B5	38	300	256	230	80	220	M12	10 x 8	23
	132 B14	38	200	165	130	80	220	O11	10 x 8	23
YD 250	132 B5	38	300	265	230	80	250	M12	10 x 8	25
	160 B5	42	350	300	250	110	250	M16	12 x 8	25

Bevel gearbox efficiency (η)

The efficiency of the bevel gears with GLEASON spiral toothing, lapped in pairs, basically is not influenced by the ratio and / or by the rotation input speed.
Furthermore, it has no remarkable varitions by varying the gearbox size.
The value $\eta = 0.97$, result of calculated average values, is assumed as a reasonable average value.
On the contrary, the efficency of bearings and oil seals, mounted on the input and output shafts depends on the rotation speed and the ratio.
Generally, it varies from 0.96 to 0.93 by changing from the minimum rotation speed of the shafts up to the maximum speed, referring to the **Nominal performances.**
The obove considerations bring to everage values of the bevel gearbox total efficiency in a range within 0.90 ... 0.93

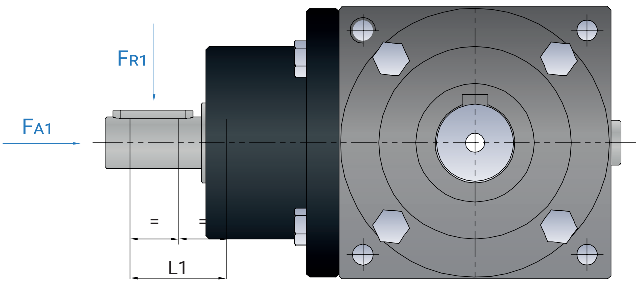
Angular backlash

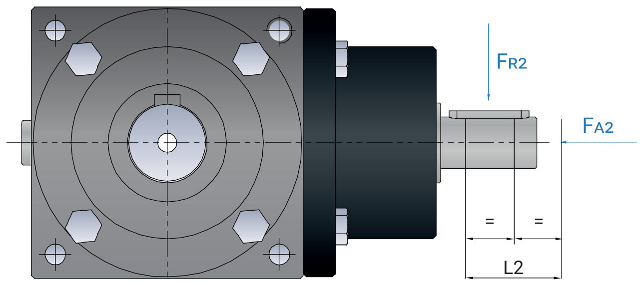
The standard angular on the output shaft, with input shaft locked, is lower than or aqual to 10 arcmin.
Therefore, 10 arcmin is assumed as maximum value of the standard backlash.
On request bevel gears with the gear set to obtain a lower backlash on the output shafts can be supplied.
The value of the reduced backlash is lower than (5 ... 6) arcmin.

Radial and axial forces on the shafts

The following table shows the maximum permissible radial (F_{R1}, F_{R2}) an axial (F_{A1}, F_{R2}) forces on the bevel gearbox input and output shafts, with referance to 1500 rpm input speed and the perfomances shown in the **Nominal performances** table.
Operating conditions different from the indicated reference conditions require a specific verification.

SIZE	INPUT SHAFT		OUTPUT SHAFT	
	F_{R1} [N]	F_{A1} [N]	F_{R2} [N]	F_{A2} [N]
YD 86	510	45	600	180
YD 110	600	180	1800	540
YD 134	1200	360	2500	750
YD 166	1800	540	3500	100
YD 200	2500	750	4500	1350
YD 250	3800	1150	6500	1900





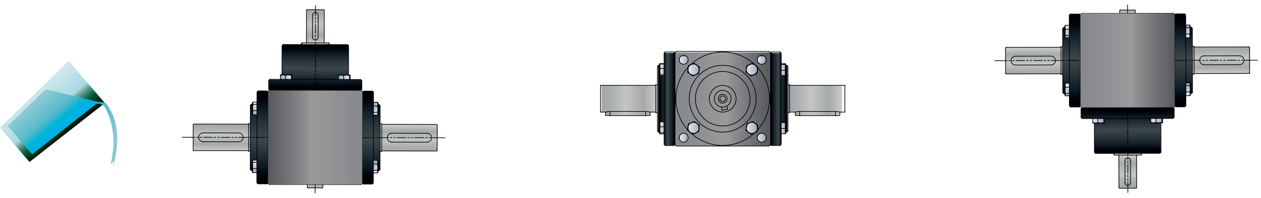
Bevel gearboxes YD Series

Mounting and operating position

The operating position of the bevel gearbox is important for an optimal lubrication of gears and bearings, as well as for the right definition of the oil plug and air breather position (if present).

Following schemes show the bevel gearbox with input solid shaft but they can also be applied for gearboxes with IEC motor flange (**MF**). In case of gearboxes with additional output shafts , please refer to the same schemes to define the input and main output position of the gearbox the position of the addinotial output shaft can be identified consequently.

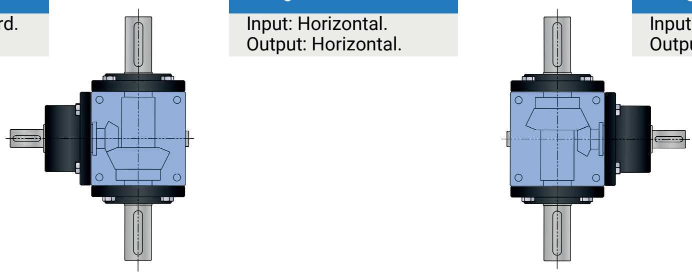
Bevel gearbox with output shaft **MMC**



Designation: A
Input: Vertical upward.
Output: Horizontal.

Designation: B
Input: Horizontal.
Output: Horizontal.

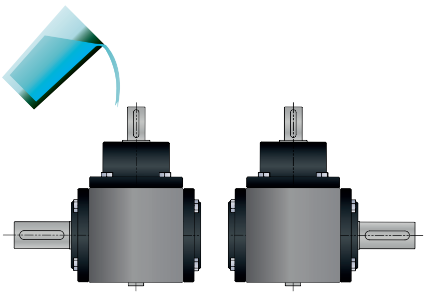
Designation: C
Input: Vertical upward.
Output: Horizontal.



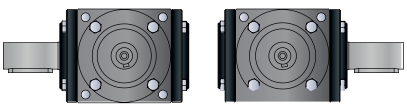
Designation: D
Input: Horizontal.
Output: Vertical, wheel, down.

Designation: E
Input: Horizontal.
Output: Vertical, wheel up.

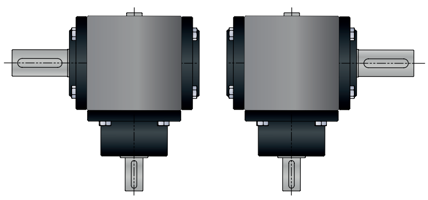
Bever gearbox with output shaft **MM**



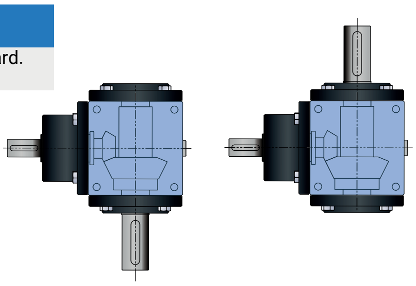
Designation: A
Input: Vertical upward.
Output: Horizontal.



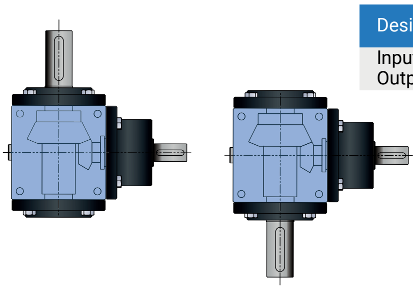
Designation: B
Input: Horizontal.
Output: Horizontal.



Designation: C
Input: Vertical upward.
Output: Horizontal.

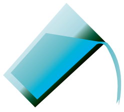


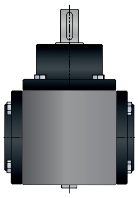
Designation: D
Input: Horizontal.
Output: Vertical, wheel down.



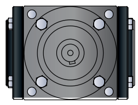
Designation: E
Input: Horizontal.
Output: Vertical, wheel up.

Bever gearbox with output shaft **MD**

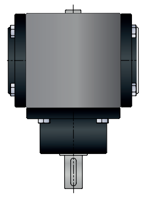




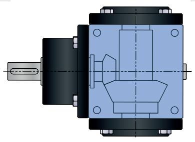
Designation: A
Input: Vertical upward.
Output: Horizontal.



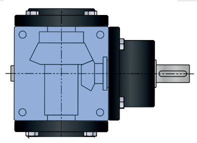
Designation: B
Input: Horizontal.
Output: Horizontal.



Designation: C
Input: Vertical upward.
Output: Horizontal.



Designation: D
Input: Horizontal.
Output: Vertical, wheel, down.

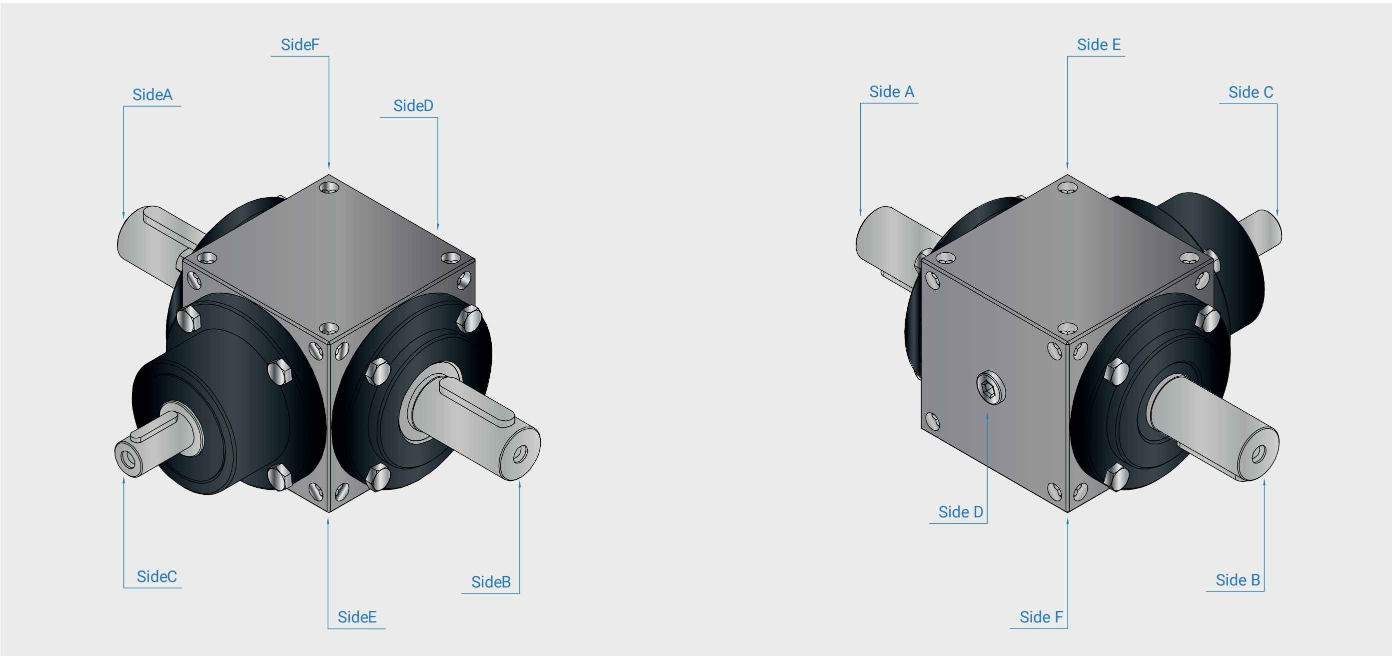


Designation: E
Input: Horizontal.
Output: Vertical, wheel up.

Indentification Of Bevel Gearbox Housing Sides

To decribe and define a bevel gearbox accurately, to indicate the mounting side of the bevel gear on the external structure or to determine the side of the oil plugs and air breather, it is necessary to identify each side of the gearbox housing.

In the following scheme, each side of the gearbox housing is identified with a letter and a colour. These references are used hereafter to show the direction of shafts rotation and the mounting operating position of the bevel gearbox.

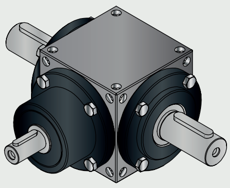


Side C is the side of the main input (solid shaft or IEC motor flange). Side A and side B correspond to the main output axis of the gearbox (solid shaft, cylindrical with key, on one or both sides, or hollow shaft with cylindrical hole and keyway). On side D and / or side E and / or side F it is possible to mount asolid shaft with hub, cylindrical with key, as additional output.

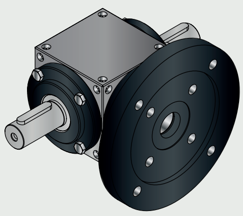
Bevel gearboxes YD Series

Moment of inertia of rotating mass

Following tables show the moment of inertia of the bevel gearbox rotating mass, referred to the input axis, expressed in kg·cm².
Design : Standard solid input shaft output shaft on both sides.

DESIGN	SIZE	Moment of inertia referred to input axis [kg·cm²]				
		Ratio R 1	Ratio R 1.5	Ratio R 2	Ratio R 3	Ratio R 4
	YD 85	3.5	2.0	1.5	1.2	1.1
	YD 110	7.6	3.4	2.3	1.5	1.3
	YD 135	21	11	7.5	5.6	4.9
	YD 165	73	37	27	20	17
	YD 200	176	92	67	50	43
YD ... MMC-MM-MD-MH	YD 250	595	317	233	177	158

Design : Connection for IEC motor (MF) as input - output shaft on both sides.

DESIGN	SIZE	Moment of inertia referred to input axis [kg·cm²]				
		Ratio R 1	Ratio R 1.5	Ratio R 2	Ratio R 3	Ratio R 4
	YD 85	5.1	4.8	4.7	4.7	4.6
	YD 110	11.1	6.9	5.8	5.0	4.8
	YD 135	24	14	11	8.9	8.2
	YD 165	73	36	26	19	16
	YD 200	174	90	65	48	41
YD ... MF-MMC-MM-MD-MH	YD 250	594	311	226	170	151

Bevel gearboxes YD Series

Ordering Code

	85	R1	MMC	Design 10	EH	O	...
YD	1	2	3	4	5	6	7

1 - Bevel gearbox size
85 - 110 - 135 - 165 - 200 - 250

2 - Ratio
R1 - R1.5 - R2 - R3 - R4

3 - Gearbox type
MMC - Input solid shaft, output solid shaft on both sides.
MM - Input solid shaft, output solid shaft on one side.
MD - Input solid shaft, output hollow shaft.
MH - Input solid shaft, output hollow shaft with shrink disk.

4 - Kinematic type

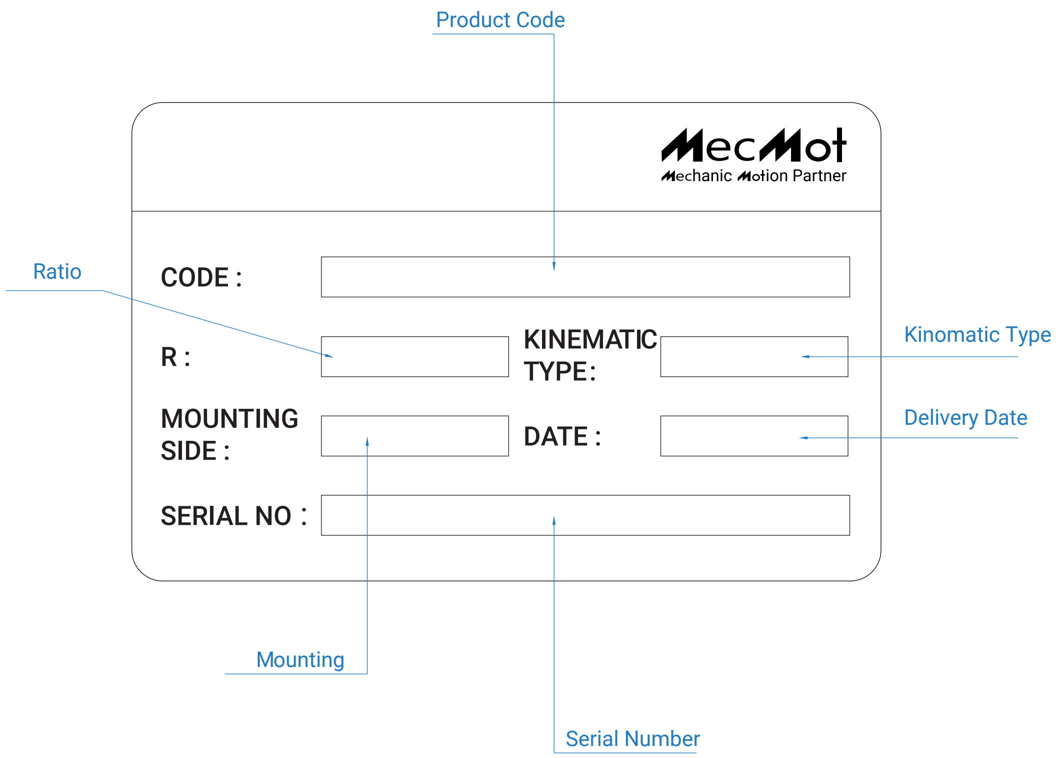
5 - Mounting side
A - B - C - D - E - F

6 - Operating position
A - B - C - D - E

7 - Other specifications
Example: Lubricant type - **grease** (standard) or **oil** (on request)
Example: Corrosion resist
Example:
YD 85 R1 MMC 10 E A

Product Label

Each Mecmot bevel gearbox is supplied with an identification label, as shown below which allows to identify the gearbox and contains technical information about the product.



Product Code: Alphanumeric code which identifies the size and the execution of the bevel gearbox.

Ratio: Ratio of the gearbox.

Kinematic Type: Kinematic type related to the direction of the shafts rotation.

Mounting Side: Mounting and working postion of the bevel gearbox.

Delivery Date: Date of assembling, expressed in week and year.

Serial Number: Identification number of the bevel gearbox which ensures the individuation of the product even after a long time; the serial number must be indicated in case of spare parts orders.

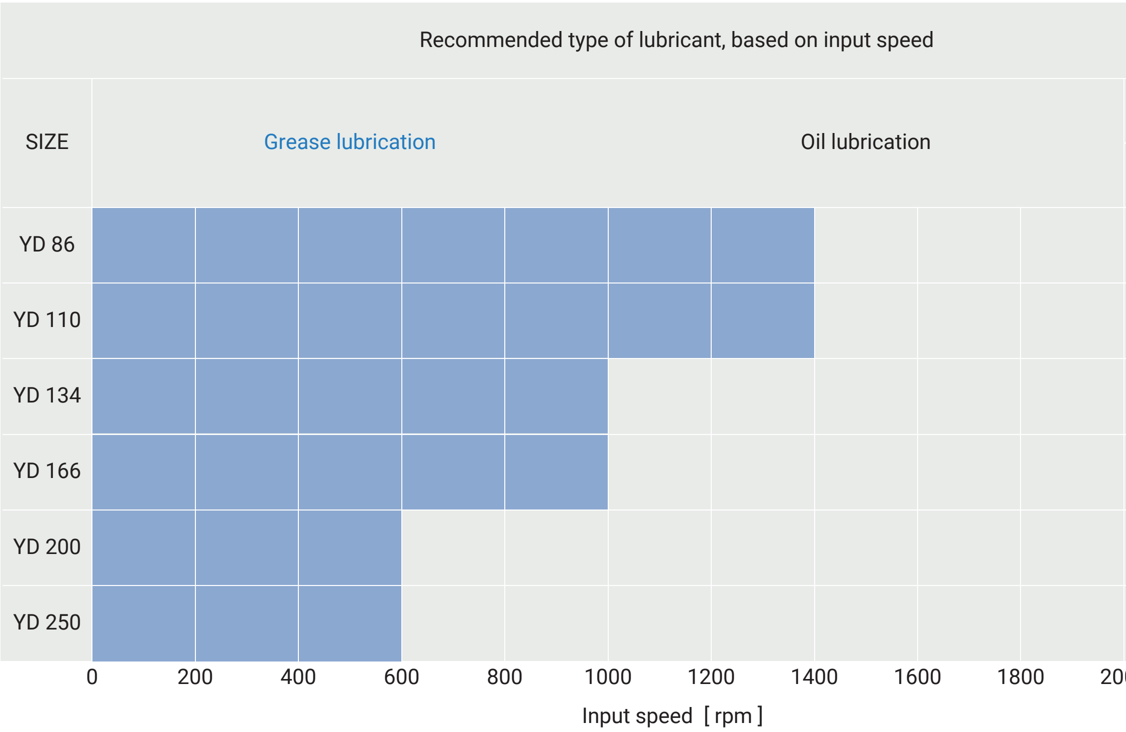
Lubrication and Maintenance

Mecmot bevel gearboxes YD series are supplied already lubricated.
Standart lubrication with grease, suitable for applications with low input speed and low daily duty cycle.

For applications with hign speeds and / or high daily duty cycle oil lubrication is recommended. In such cases, the gearbox housing is equipped with oil plugs and visual oil level indicator, while the air breather is supplied as separate component and must be fitted by the customer on the top upon installation.

Grease - lubricated gearboxes are maintenance - free. With no occasional seals damage nor disassembling of components due to maintenance, an inspection every 4 years, in case of daily operation up to 8 hours is sufficient.

Oil - lubricated gearbox require the first oil change after 500 operating hours and thereafter every 3000 operating hours.



SIZE	Q.ty Grease [kg]	Q.ty Oil [l]
YD 86	0.2	0.22
YD 110	0.4	0.45
YD 134	0.5	0.55
YD 166	1	1.1
YD 200	2.5	2.8
YD 250	5	5.5

NOTE : The quantity of oil lubricant, expressed in litres, is approximate; please refer to the oil level for a correct filling.

Operating conditions different from the above should be specified for a correct evalution and choice of lubricant type and quantity.

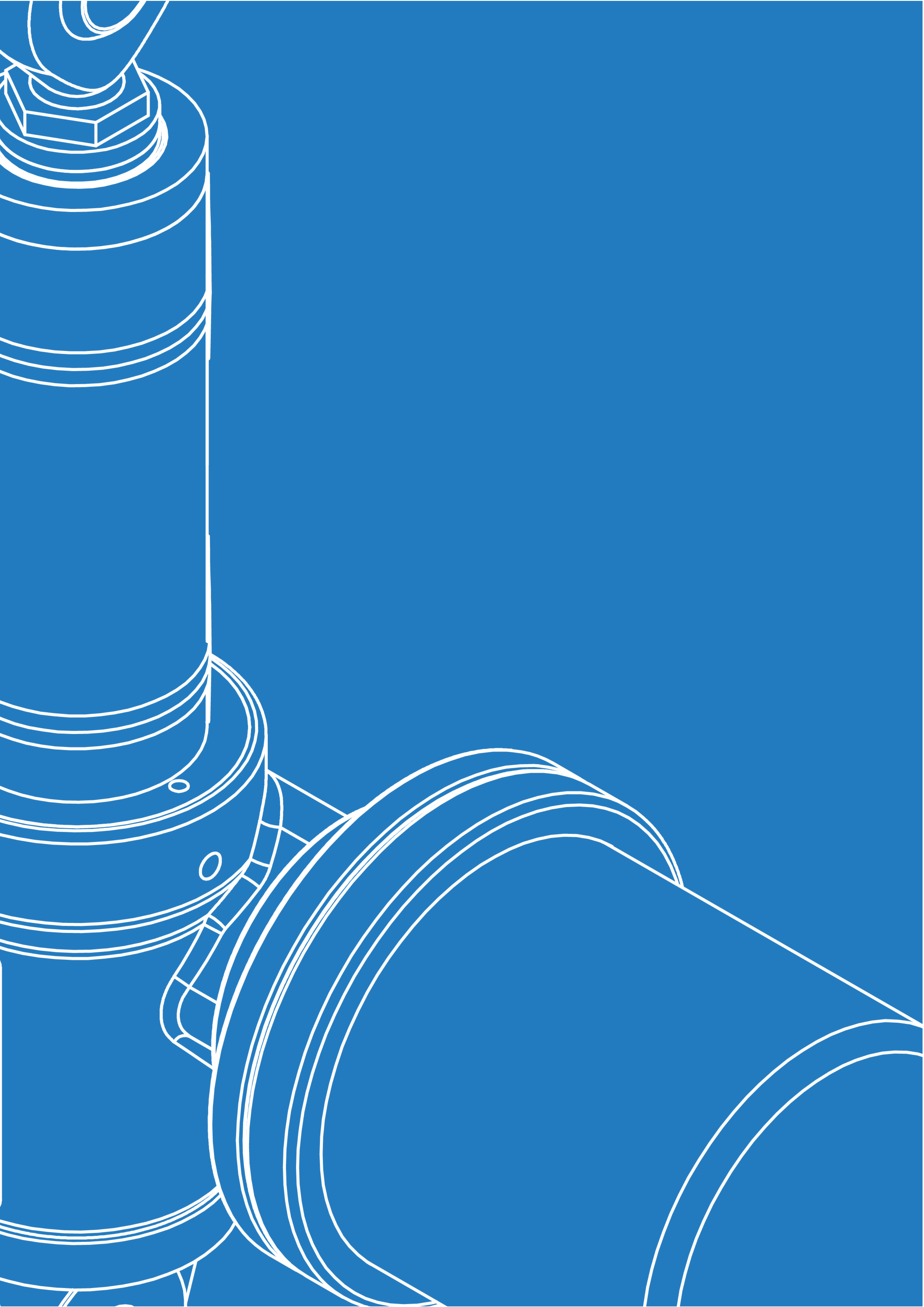
Mounting positions where input and output shafts are not all on the horizontal plane should be specified to evaluate the correct lubrication of the bearings and the shafts mounted on the vertical top position.

By ordering, please specify lubrication requirements: **Grease** or **oil.**

Recommended lubricants;

Grease : SHELL Gadus S5 V142W

Oil : SHELL Omala S4 GX



LINEAR ACTUATOR

2.1 MANUFACTURING FEATURES

Input drive: worm gear, geometric design for high performance.
Low angular backlash. Worm in case hardened steel 20 MnCr 5, with thread and input shafts ground. Helical wormwheel in bronze CuSn12-C.
Housing: designed and manufactured in monobloc form to obtain a compact body able to sustain heavy axial loads and high machining accuracy. High quality materials are used:

Castings in hardened aluminium alloy AC-AlSi10Mg T6.
Castings in spheroidal graphite cast iron EN-GJS-500-7 (UNI EN 1563).

Acme screw:
ISO trapezoidal thread ISO 2901 ... ISO 2904.
Material: Steel C 43 (UNI 7847).
Rolled or whirled.
Subjected to straightening, to ensure accurate alignment in operation.
Max. pitch error + 0.05 mm over 300 mm length.

Bronze nut:
ISO trapezoidal thread ISO 2901 ... ISO 2904.
Material: bronze EN 1982 – CuAl9-C (1-start thread).
Material: bronze EN 1982 – CuSn12-C (multiple start thread)
Max. axial backlash for new nut (0.10 ... 0.12) mm

Outer tube:
Material: aluminium alloy EN AW-6060 thick cold-drawn tube anodized ARC 20 (UNI 4522/66) inner diameter tolerance ISO H9
Steel St 52.2 (DIN 2391) cold-drawn tube inner diameter tolerance ISO H10 ... H11

Bearings:
On motor axis: radial ball bearings or taper roller bearings
On actuator axis: angular contact ball bearings or taper roller bearings, to avoid axial backlash and to assure high push-pull load capacity.

Front attachment:
Standard – with threaded hollow bore, in stainless steel AISI 303 or steel C 43 (UNI 7847)

Rear bracket:
In aluminium alloy for EP6, EP10
In spheroidal graphite cast iron for EP25, EP50, EP100
Pin in stainless steel AISI 303

Electric stroke length limit device ASW:
Electric switches activated by a shaped sleeve, for EP25, EP50, EP100

Magnetic stroke end switches FCM:
Magnetic switches activated by a magnetic ring, for EP6, EP10

Proximity stroke end switches FCP:
Proximity switches activated by the nut, for EP25, EP50, EP100

GENERAL WARNING

Actuators and gear boxes are devices meant to be installed into larger machines therefore **they cannot be considered as safety devices**.

INSTALLATION, USE, MAINTENANCE AND WASTE GUIDELINES

Mecmot recommendations:
Actuators and gear boxes being installed by qualified and authorised technicians
Electrical connections done by qualified personnel; during installation main electric power supply shall be turned off so to run safely all these operations (wearing also protection suits, gloves and glasses)
Actuators and gear boxes need very few maintenance operations: Cleaning and eventually greasing (according to instruction manuals)
Scheduled inspections to working actuator or gear box in order to detect in time possible problems: in case of doubts contact Mecmot.
IIf something wrong is detected do not try to fix it without Mecmot's technical advise: its after-sales dept. Will be at your complete disposal to solve it out.
All products are delivered with proper packing, according to customer needs and goods dimensions / weight. We recommend a safe product handling, using for example forklifts, safety belts...
Package, as well as the actuators themselves, shall be disposed / wasted according to laws in force in the user's Country.

INTRODUCTION

Linear actuators are independent systems used to obtain linear movements: Basically, they are made up by an electric motor, rotating a lead screw directly or by means of a gearbox.
A nut is then allowed to move along the lead screw carrying in and out a push rod connected to the nut itself.
Load shall be axial only, but it can be tensile or pushing, no matter what push rod direction is. Actuators can work both with or without load. Self-locking or not self-locking behaviour depend on the gearing ratio and load value. In any case, self-locking is always possible with additional components.
According to type of actuator and driving / control system used with it, we can have a simple ON / OFF device (pushing and / or pulling or aservo-mechanism.
Electric actuators main advantages towards pneumatic and hydraulic ones are basically following:
they can easily stop in intermediate positions all along their stroke, the power consumption happens only while the actuator is working (not necessary to keep it in position for example), the power supply is clean and easy to find, with no need of tubes.
Thus, wirings on applications frameworks will be easier to build and no dluids (i.e.oil) can accidentally be spared. This last feature is necessary in food and textile environments.

ACTUATOR MAIN COMPONENTS

Linear actuators consist in an electric motor directly connected to lead-screw / nut or by means of a worm gearbox, a belt / pulleys system or planetary gearings (1 or 2 stages).
The system turns out to be a rigid chain.

Running against mechanical stops causes serious damages to actuator's internal parts!

Actuators can host diffrent kinds of motors: AC theree or single phase, with brake, inverter-friendly DC, brushless and stepper-motors.
Many options are available such as second shafts, manual brake release and so on.
Selection of motor performances (torque, speed, service...) is done according to duty cycle requested to actuators.

GEAR-BOXES

Two kinds of gear-boxes are basically used on actuators too:
Steel worm-screw (1 or 2 stages) and plastic or bronze worm-wheel's material is chosen according to needed main performances such as low noise, lifetime, reduced backlash.

LEAD SCREW

Basically steel made and featuring cold-rolled profile, they are coupled with bronze or plastic polymer in order to grant safety and sturdiness against loads.

PUSH ROD

Push rods can be aluminium made for actuators whose loads are low, thick chrome-plated steel for those who stand high loads or stainless steel for special applications like in food industries.

ACTUATOR AND GEAR BOX APPLICATION FIELDS

Actuators and gear boxes can be used in several fields and various machineries. To give an example of how different can be the applications needing actuators we can list a few like: adjusting brushes height in floor-sweeping machines, positioning blades for wood-cutting machines, textile industries, paint and chemical plants, medical equipment (diffrent movements in X-ray machines) equipments for disable / aged people, solar panels, etc..

PARAMETERS FOR ACTUATOR OR GEAR BOX SELECTION PROCESS

The mainfeatures for actuator or gear box selection are:
Load dynamics (load trend along stroke)
Speed (linear speed trend along stroke)
Duty cycle
Environmental conditions
Stroke lenght
Power supply
Output rpm (gear box)
Output torque (gear box)
The configuration we get will be self-locking or non-self-locking according to its global efficiency.

LOAD AND LINEAR SPEED

These two parameters shall be evaluated both separately and together since they may effect each other during actuator working cycle, especially if additional elements like inertial phenomena, vibrations...are involved.
For example, if an heavy load has to be moved with changing speeds involving sharp accelerations and slowdowns, inertial load has to be added to physical load, thus affecting actuator choice.
In these cases please contact our Technical Dept.
Temperature working range can also be widened using special materials for some of the actuator components, special lubricants and seals (the same happens for aggressive environments). Of Course under-rating of actuator and duty cycle must also be taken under consideration.
In general, ball-screw units are non-self-locking therefore additional devices, such as brakes, can be necessary to lock actuators.

Duty cycle and environmental conditions

These parameters also need to be analyzed as linked together.
Duty cycle is defined as percentage rate between on-time and idle-time, on a timeframe of 5 min.
Environment is mainly related to temperature and occasional aggressive agents affecting materials (humidity, dust, acids...) Standard actuators duty cycle is rated in S3-30%, at 30°C ambient temp.
Working temperature range allowed for standard actuators is 10°C / +60°C.
However duty cycle can be raised building up high-efficiency actuators featuring ball-screws and planetary gearboxes, or over sizing the actuator whose ratings will therefore become higher.
Temperature working range can also be widened using special materials for some of the actuator components, special lubricants and seals (the same happens for aggressive environments.) Of course under- rating of actuator and duty cycle must also be taken under consideration.
In general, ball-screw units are non-self-locking therefore additional devices, such as brakes, can be necessary to lock actuators.

ACTUATOR WORKING STROKE

This feature (standard each 50 mm step) shall be chosen taking under consideration:
-Limits tied to high rotation speeds of internal lead screw and to its own weight (in case the actuator is mounted horizontally).
-Limits linked to lead screw length to avoid buckling problems.
Actuator shall than perform its job within its nominal stroke: while designing application / framework, 10mm extra-stroke on both stroke-ends (in and out) shall be included to decrease possibility of going at mechanical stroke.
Running against actuator's mechanical stops causes serious damages to its internal components! In case of strokes 20 times longer than lead screw diameter, 150 mm extra stroke shall be included in the design of the actuator so that, when push rod is completely extracted, it has still 150mm more to go: this will give more stiffness to the unit preventing radial backlash.
Excessive radial backlashes lead to side-forces on actuator's axis, thus unexpected wear and lubricant loss, non regular workouts.

POWER SUPPLY

To choose a suitable actuator it is important to start finding out which kind of electric power supply is available. Not all actuators are prepared for all voltages.

SELF-LOCKING

There is not a sharp thereshold between self locking and non self locking conditions, because this feature is affected by gears wear, type of load, presence of vibrations, mounting position etc... When in doubt the only way of being sure of actuator behaviour is testing it on the application. When actuator is not self-locking, its positioning precision and repeatability features are lower: in this case, some additional elements are required, such as brakemotors, control/ feedback systems or motor short-circuit to achieve magnetic braking effect (for DC motors without brake only).

ACTUATOR AND GEAR BOX INSTALLATION

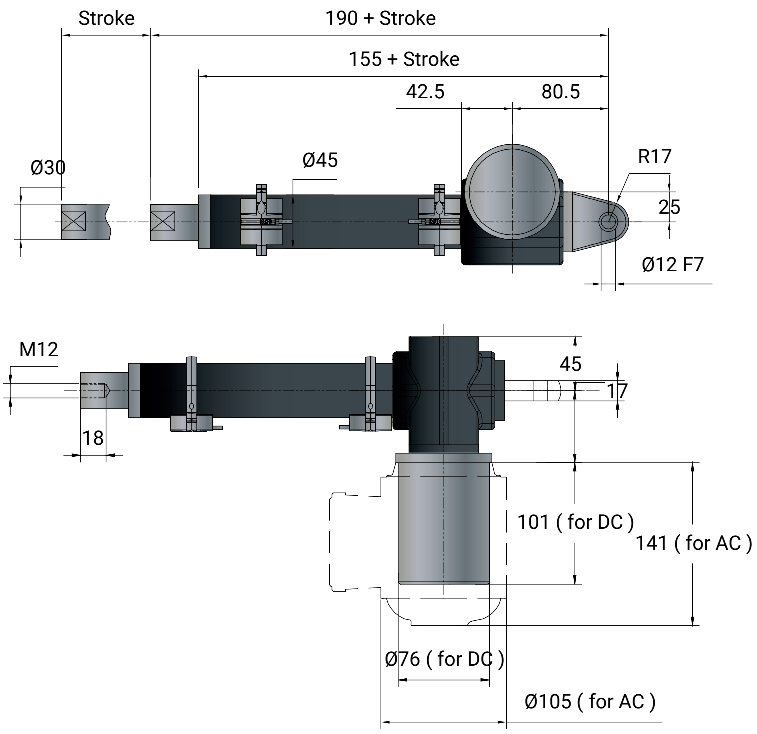
During machine designing, it is extremely important to forsee proper mounting points so that actuator will not have to stand radial forces but axial ones only.
Then, while the physical installation of the actuator into machinery, an accurate aligment of the connecting points is very important to avoid grease losses and nut wear due to radial forces.
Axis of front and back connecting points must always be parallel.
Actuators shall work within their nominal stroke.
When framework is being designed, 10mm extra stroke (in both directions) must be considered to have less possibilities of mechanical end-stops.
Also when stroke is 20 times longer than lead screw diameter, at least 150mm extra stroke (in extracted position) shall be included in order to prevent the actuator from having radial forces when push rod is completely out.

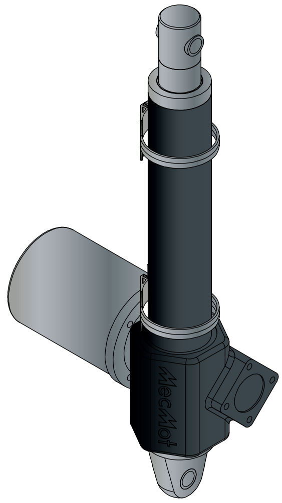
Running against mechanical stop causes serious damages to actuator components!

Off-set load lead to side-forces on actuator axis causing unexpected wear, lubricant loss and non-regular operation.
Before starting the actuators or gear box up, following checkings shall be performed:
If actuator is equipped with limit switches devices, before starting the motor, ensure they are connected and working, in order to avoid any mechanical end-stops.
Make sure push rod will start travelling in the correct direction and limit swiches are correctly adjusted. Start motor "step-by-step" to check all this.
All wirings of actuator (motor and stroke control devices) must be done with power switched off. If not, both operator and actuator are at risk.
When actuators are equipped with single-phase motors, capaciotors must be discharged before ant operation.
In case limit switches are already adjusted, be careful because manual rotation of push-rod will cause adjusment loss!

For a correct selection of actuators it is absolutely necessary to refer to above reported instructions and technical advises. Mecmot declines any responsibility releted to demanges caused to things and persons due to not proper use of the technical information given on this catalouge or incorrect use of actuators and gear boxes.
More information about installation of the actuators are reported in the use and maintenance manual.

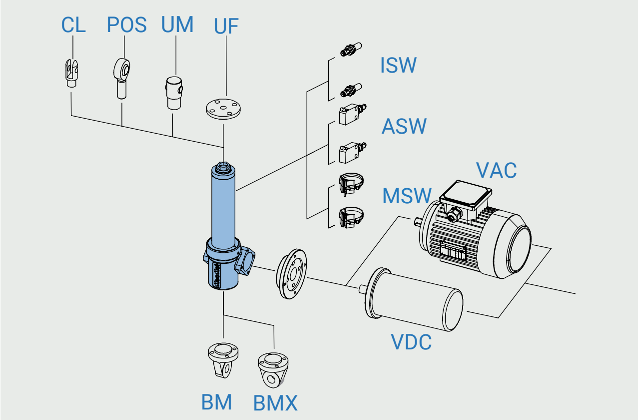
EP6-AC/DC Max 8 kN

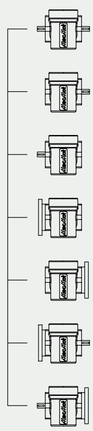




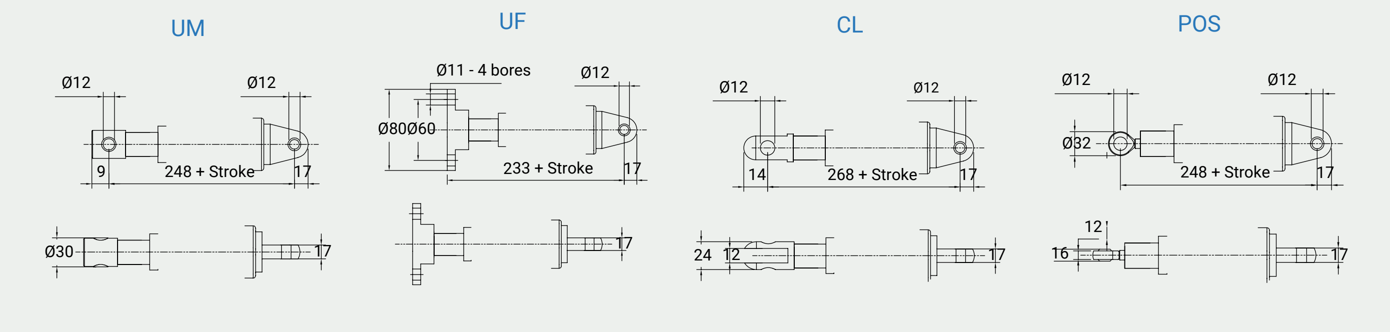
GENERAL FEATURES

Permanent magnet DC motor
Three phase or single phase motor
Worm gearbox
Acme Lead Screw
Crome plated push rod
Working temperature range -10 C - +60 C
Potentiometer and encoder on request
Duty %30 (5 min) a +30 C



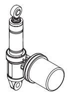


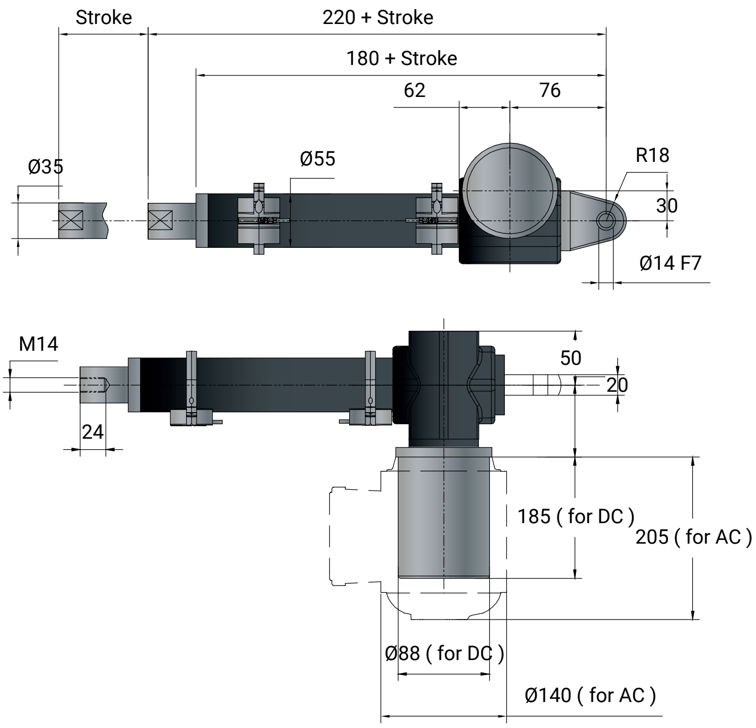
- V1-Double output without motor
- V2-Right output without motor
- V3-Left output without motor
- V4-Left output with motor flange
- V5-Right output with motor flange
- V6-Left motor flange - right output
- V7-Right motor flange - left output

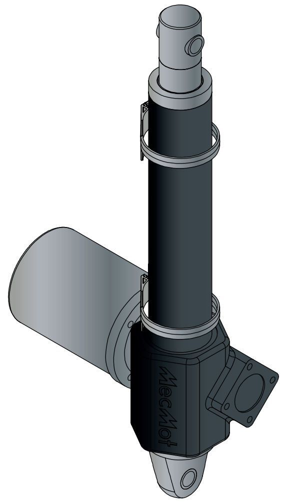


EP6 (Vac 3-phase)					
Fmax (N)	Speed (mm/s)	Version	Motor Size	Motor Power (KW)	Motor Speed (KW)
500	46	A01	IEC56	0,09	2800
900	30	A02	IEC56	0,09	2800
1800	15	A03	IEC56	0,09	2800
3850	7,5	A04	IEC56	0,09	2800
8000	3,7	A05	IEC56	0,09	2800

EP6 (Vdc)						
Fmax (N)	Speed (mm/s)	Version	Motor Size	Motor Power	Motor Speed (rpm)	Max Current for F max (A) 24 Vdc
500	46	A11	IEC56	0,09	2800	12
900	30	A21	IEC56	0,09	2800	12
1800	15	A31	IEC56	0,09	2800	12
3850	7,5	A41	IEC56	0,09	2800	12
8000	3,7	A51	IEC56	0,09	2800	12

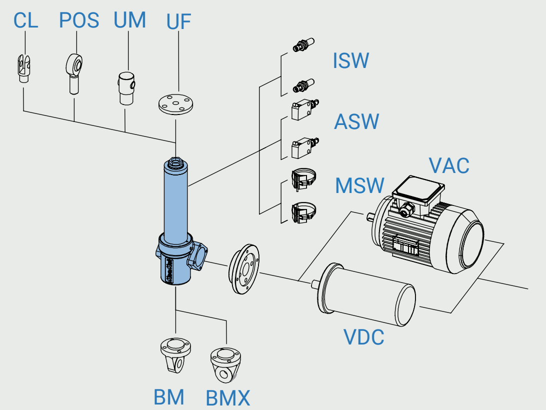
EP10-AC/DC  Max 12 kN

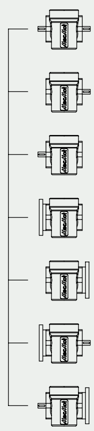




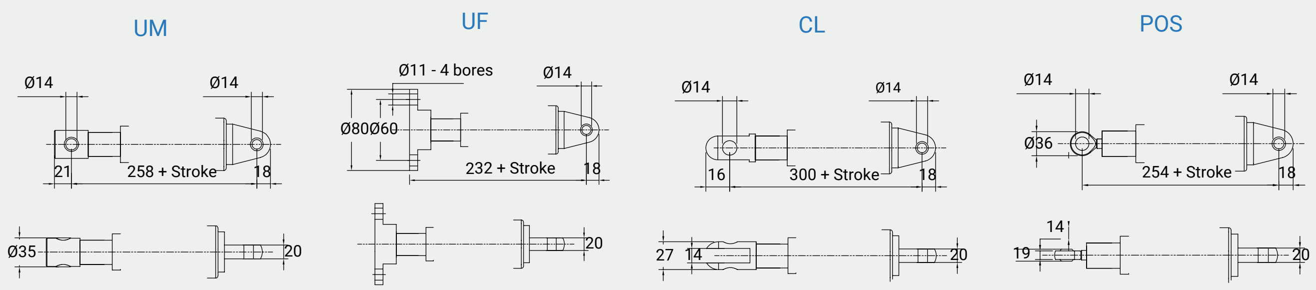
GENERAL FEATURES

Permanent magnet DC motor
Three phase or single phase motor
Worm gearbox
Acme Lead Screw
Crome plated push rod
Working temperature range -10 C - +60 C
Potentiometer and encoder on request
Duty %30 (5 min) a +30 C



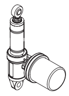


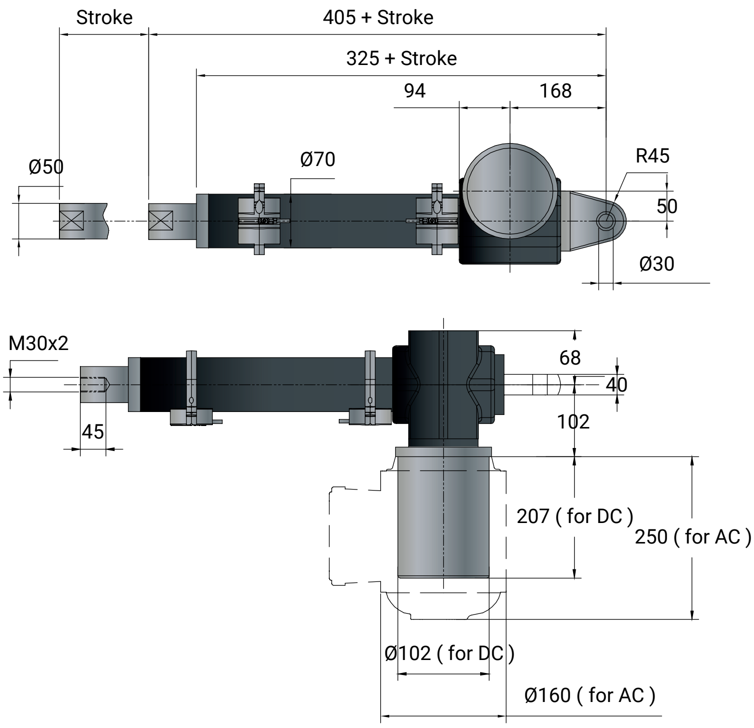
- V1-Double output without motor
- V2-Right output without motor
- V3-Left output without motor
- V4-Left output with motor flange
- V5-Right output with motor flange
- V6-Left motor flange - right output
- V7-Right motor flange - left output

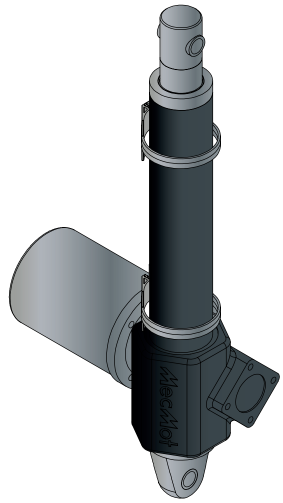


EP10 (Vac 3-phase)					
Fmax (N)	Speed (mm/s)	Version	Motor Size	Motor Power (KW)	Motor Speed (KW)
1200	46	A01	IEC63	0,37	2800
5000	11	A02	IEC63	0,37	2800
8000	7,5	A03	IEC63	0,37	2800
12000	5,5	A04	IEC63	0,37	2800

EP10 (Vdc)						
Fmax (N)	Speed (mm/s)	Version	Motor Size	Motor Power	Motor Speed (rpm)	Max Current for F max (A) 24 Vdc
1200	46	A11	IEC63	0,25	2800	12
5000	11	A21	IEC63	0,25	2800	12
8000	7,5	A31	IEC63	0,25	2800	12
12000	5,5	A41	IEC63	0,25	2800	12

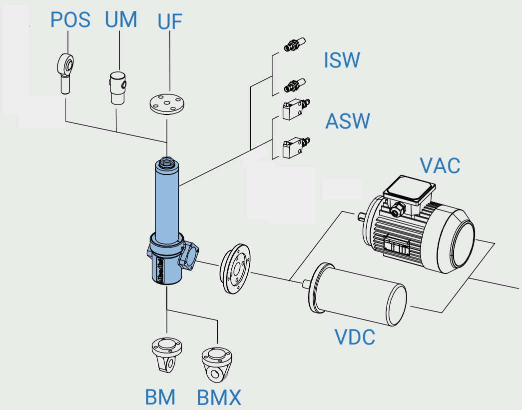
EP25-AC/DC  Max 35 kN

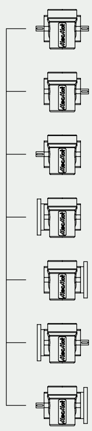




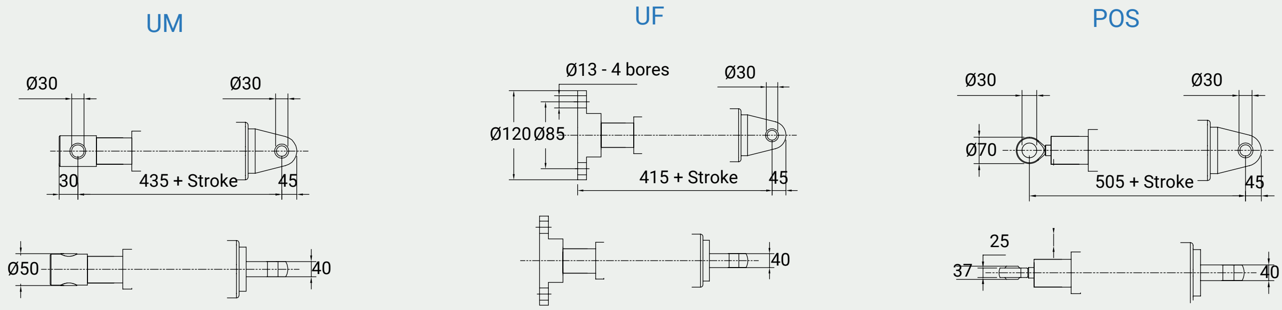
GENERAL FEATURES

Permanent magnet DC motor
Three phase or single phase motor
Worm gearbox
Acme Lead Screw
Crome plated push rod
Working temperature range -10 C - +60 C
Potentiometer and encoder on request
Duty %30 (5 min) a +30 C





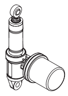
V1-Double output without motor
V2-Right output without motor
V3-Left output without motor
V4-Left output with motor flange
V5-Right output with motor flange
V6-Left motor flange - right output
V7-Right motor flange - left output



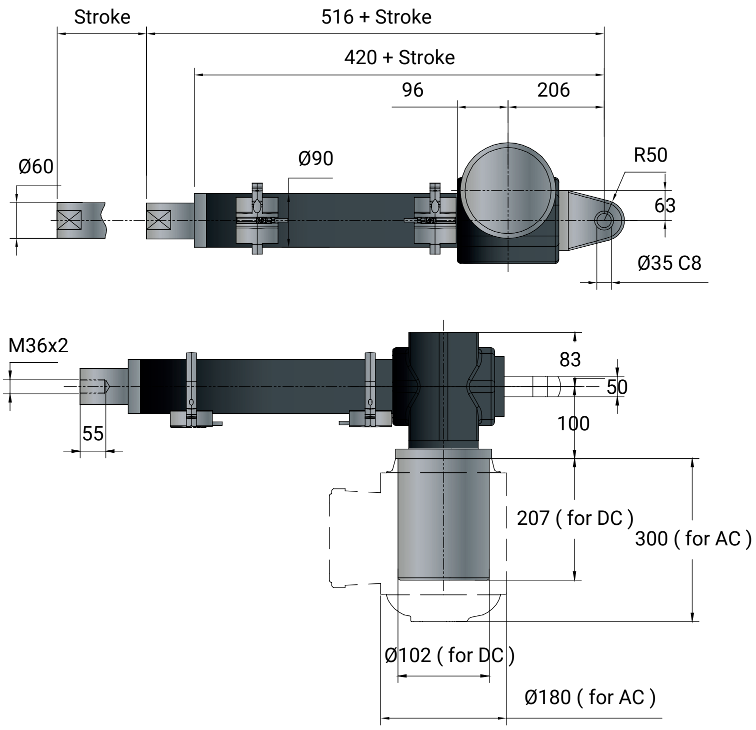
EP25 (Vac 3-phase)					
Fmax (N)	Speed (mm/s)	Version	Motor Size	Motor Power (KW)	Motor Speed (KW)
5000	46	A01	IEC80	1,1	2800
15000	15	A02	IEC80	1,1	2800
25000	11,5	A03	IEC80	1,1	2800
35000	6	A04	IEC80	1,1	2800

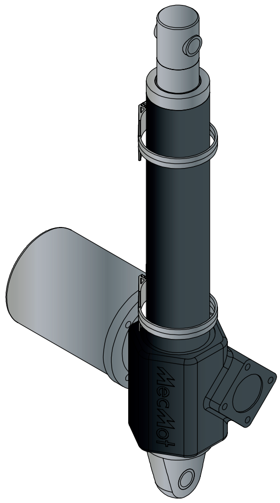
EP25 (Vdc)						
Fmax (N)	Speed (mm/s)	Version	Motor Size	Motor Power	Motor Speed (rpm)	Max Current for F max (A) 24 Vdc
2800	46	A11	IEC80	0,5	2800	12
8500	15	A21	IEC80	0,5	2800	12
1200	11,5	A31	IEC80	0,5	2800	12
20000	6	A41	IEC80	0,5	2800	12

EP50-AC/DC



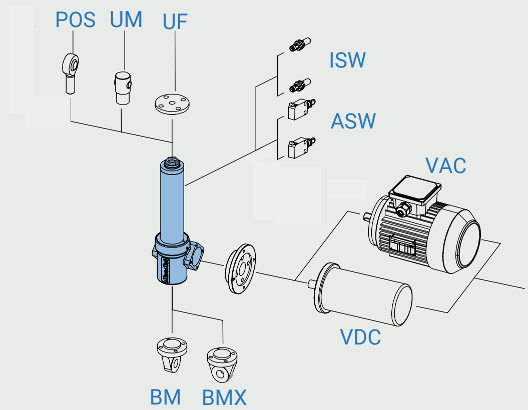
Max 60 kN

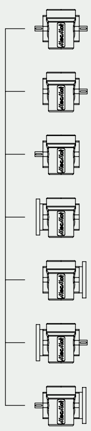




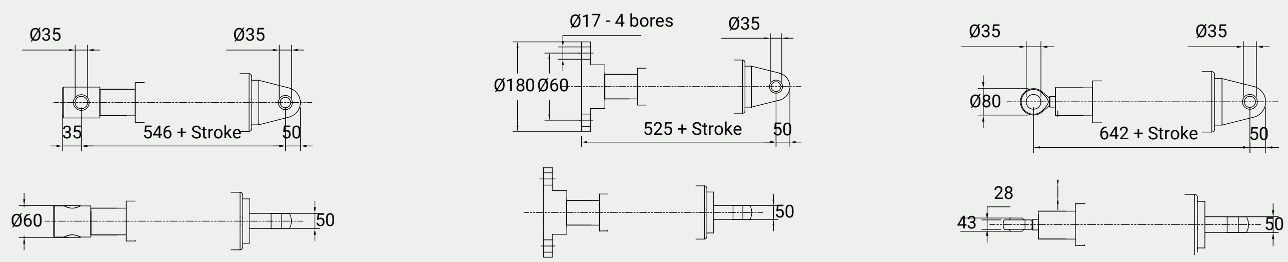
GENERAL FEATURES

Permanent magnet DC motor
Three phase or single phase motor
Worm gearbox
Acme Lead Screw
Crome plated push rod
Working temperature range -10 C - +60 C
Potentiometer and encoder on request
Duty %30 (5 min) a +30 C





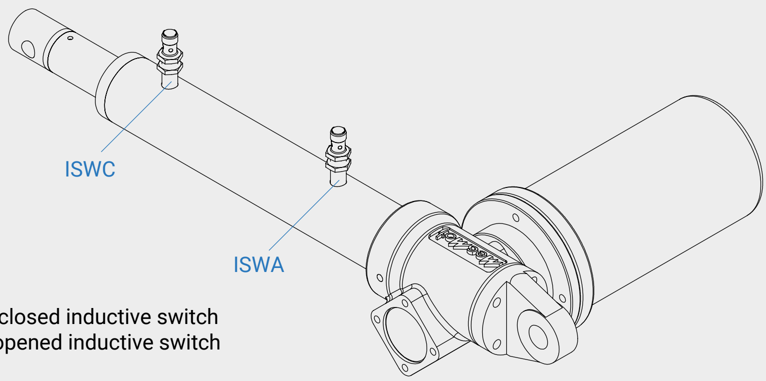
V1-Double output without motor
V2-Right output without motor
V3-Left output without motor
V4-Left output with motor flange
V5-Right output with motor flange
V6-Left motor flange - right output
V7-Right motor flange - left output



EP10 (Vac 3-phase)					
Fmax (N)	Speed (mm/s)	Version	Motor Size	Motor Power (KW)	Motor Speed (KW)
10000	46	A01	IEC90	2,2	2800
20000	23	A02	IEC11	2,2	2800
40000	11,5	A03	IEC11	2,2	2800
60000	8	A04	IEC11	2,2	2800

EP10 (Vdc)						
Fmax (N)	Speed (mm/s)	Version	Motor Size	Motor Power	Motor Speed (rpm)	Max Current for F max (A) 24 Vdc
4000	46	A11	IEC80	0,5	2800	12
8000	23	A21	IEC80	0,5	2800	12
17000	11,5	A31	IEC80	0,5	2800	12
24000	8	A41	IEC80	0,5	2800	12

INDUCTIVE SENSORS ISW

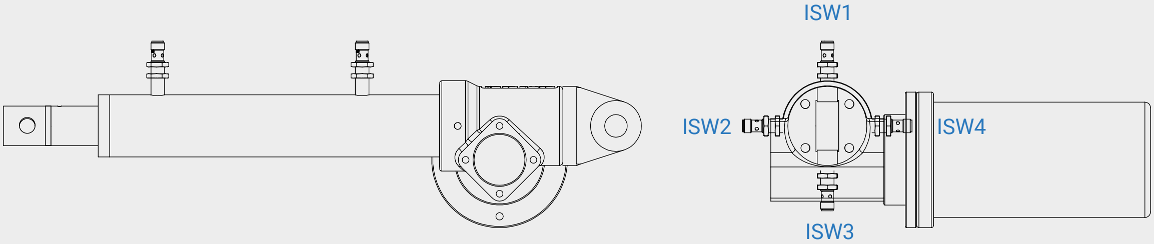


ISWC: All -closed inductive switch
ISWA: All-opened inductive switch

ISW INDUCTIVE LIMIT SWITCHES	
DC Voltage	5 ÷ 40 Vdc
Temperature Range	25° ÷ 75°
Proction Level	IP67
Switch Status Indicator	YELLOW LED

ORDERING KEY REFERENCES
Inductive sensors: 2ISW = 2 Sensors NO+NC

ISW POSITION

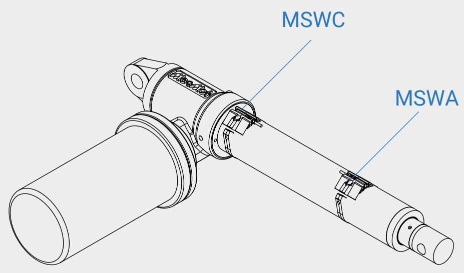


Magnetic limit switches MSW

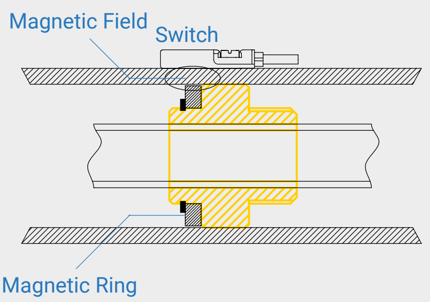
Magnetic sensors are activated by a magnetic field generated by a magnetic ring fixed to the nut.
These reads are mounted on outer tube with brackets; outer tube shall therefore be built with non-magnetic materials.

The magnetic switches are fixed as shown in the figure, the customer can rotate at will by adjusting the bracket.

Due to the size of the magnetic switches and to the so called switching band generated by the internal magnet the maximum working stroke is reduced by a few milimetres. This switching band width differs according to actuators size.



MSWC: All -closed magnetic switch
MSWA: All-opened magnetic switch
Supplied on EP6 - EP10



MSW MAGNETIC LIMIT SWITCHES			
Performance	Type Reed NC	Type Reed NO	PNP
DC voltage	3/110 V	3/30 V	6/30 V
AC voltage	3/110 V	3/30 V	/
25°C Current	0,5 A	0,1 A	0,20 A
Power	20 VA	6 VA	4 W
Supply Cable	PVC 2 x 0,14 mm	PVC 2 x 0,14 mm	PVC 3 x 0,14 mm
Cablenght		2500 mm	
Protection		IP67	

Circuit Reed NC

Circuit with normally closed Reed switch protected by a varistor against overvoltages caused when switching off, with LED indicator.

Circuit PNP

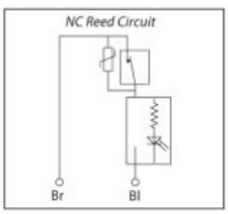
Circuit with Hall-effect switch and PNP outlet.
Protected against overvoltage spikes and reverse of polarity.
With LED indicator.

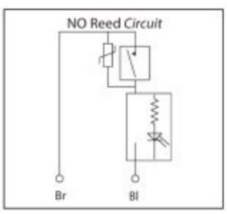
Circuit Reed NO

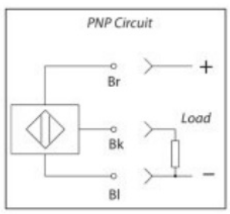
Circuit with normally open Reed switch protected by a varistor against overvoltages caused when swiching off, with LED indicator.

Ordering Key References

Magnetic limit switches:
2MSW0=2 Sensors circuit Reed NC
(standart version without prior information)
2MSW1=2 Sensors circuit Reed NO
2MSW2=2 Sensors PNP

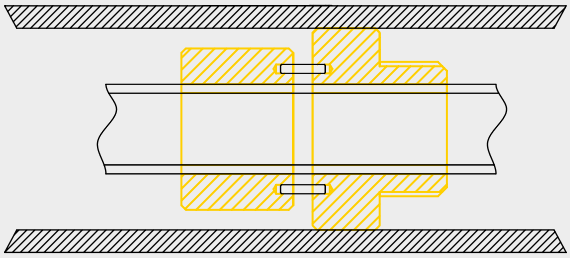






SAFETY NUT

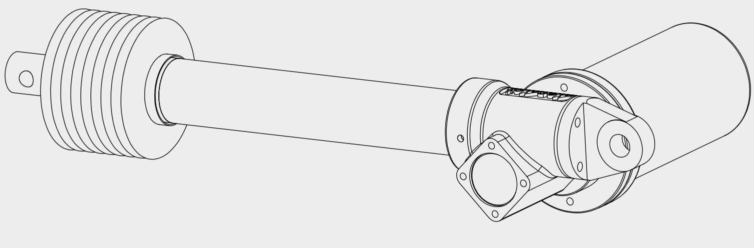
The safety nut has been designed to start working only in case of main nut maximum wear. This safety nut is connected to the main bronze nut and travels with it along the stroke.
When the bronze nut is completely worn out, the steel nut starts working on acme screw until it comes to a complete grip to acme screw.
This kind of nut can work in both directionsand that is integral with the load in both compression or traction (pushing / pulling).



Bellows Boot

Option "KK"

Bellows boot protectspush rods: pharmaceuntical and food industries or aggressive environments are typical examples of applications where this option can be required.



Ordering Code

	10	A01	200	UM	BM	MSW	V6	KK	...
EP	1	2	3	4	5	6	7	8	9

1 - Linear actuator size
6 - 10 - 25 - 50

2 - Version
A01 - A02 - A03 - A04 - A05 - A11 - A21 - A31 - A41 - A51

3 - Stroke
100 - 200 - 300 -400 - 500 - 600 - 700 - 800

4 - Front attachment
UM - UF - CR - POS

5 - Rear attachment position
BM - Standart
BMX - 90°

6 - Stroke end switches
ISW - Inductive proximity switches
MSW - Magnetic switches
ASW - Electric switches

7 - Actuator input
V1-Double output without motor
V2-Right output without motor
V3-Left output without motor
V4-Left output with motor flange
V5-Right output with motor flange
V6-Left motor flange - right output
V7-Right motor flange - left output

8- Accessories
SN - Safety nut
KK - Bellow

9- Other specifications
Example: Low noise
Push rod stainless steel

MecMot

Mechanic Motion Partner

General Catalogue
Version 2.1