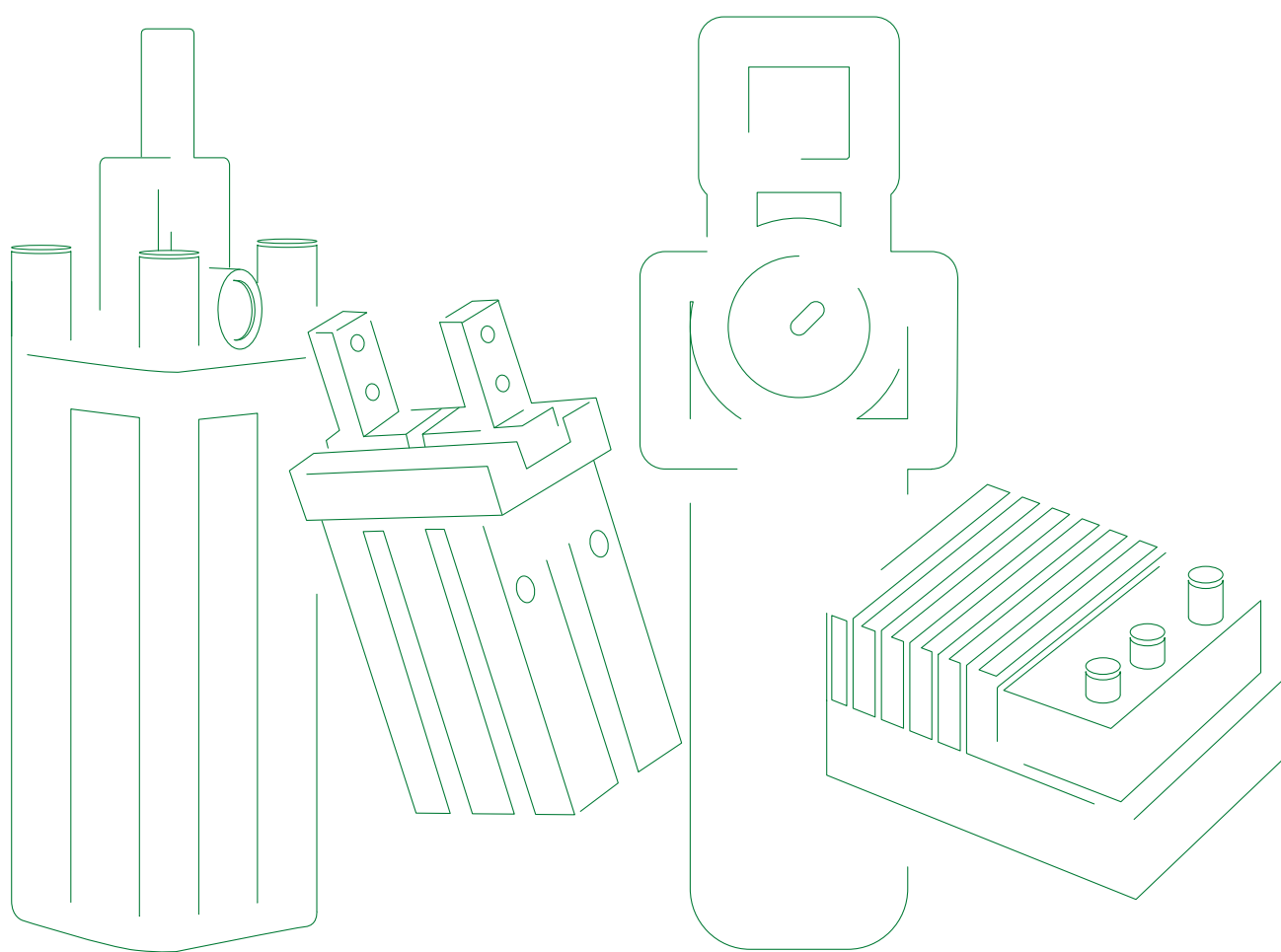




PNEUMAX



GENERAL CATALOGUE

SOLUTIONS FOR PNEUMATIC AUTOMATION

2025



Series 1605

The purpose of producing a rodless cylinder is to provide a space saving option over conventional cylinders. On a traditional rod type cylinder, the total space occupied with rod out is more than double the length of the cylinder, while with rodless cylinder it is little more than its stroke. Profiled tube allows mounting of sensors 1500._, RS._, HS._ and 1580._, MRS._, MHS._ on the two sides of carriage, by means of suitable brackets. Standard accessories include foot mounting brackets for installation on cylinder and caps, intermediate mounting brackets to give support to long stroke cylinders under load (over one metre), an oscillating coupling device for installation between the mounting plate and the load and on request, a very precise external movement device.

Construction characteristics

Other seals	oil resistant NBR rubber
Bands	tempered stainless steel
Cushion bushings	aluminium
Barrel	anodized aluminium
Mounting place	anodized aluminium
Piston seals	special 80 shore nitril mixture, wear resistant
Plain bearing guide	acetal resin
Piston	acetal resin
End caps	anodized aluminium

Operational characteristics

Fluid	filtered and lubricated air
Pressure	0.5 ... 8 bar
Working temperature	-5 °C ... +70 °C
Max. speed	1.5 m/s (normal working conditions)
Bores	Ø25 - Ø32 - Ø40 - Ø50 - Ø63
Max. strokes	6 meters

Please follow the suggestions below to ensure a long life for these cylinders:

- use clean and lubricated air.
- Please adequately evaluate the load involved and its direction, especially in respect to the moving carriage (also see tables for loads and admitted moments).
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

Please note: air must be dried for applications with lower temperature.

Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

For applications where a low smooth uniform operations speed is required, you must specify this on your purchase order so that we can use the proper special grease.

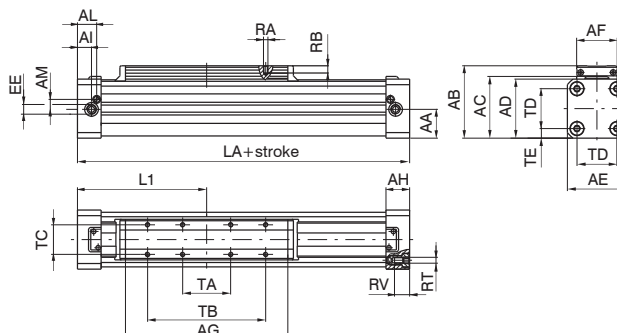
Use and maintenance

This type of cylinder, due to its characteristics, has to be used within certain criteria. Correct use will give long and troublefree operation. Filtered and lubricated compressed air reduce seal wear. Verify that the load will not produce unforeseen stresses. Never combine high speed with heavy load. Always support the long stroke cylinder with intermediate brackets and never exceed the specified working conditions. If maintenance is required, follow the instructions supplied with the repair kit.

Basic version

Coding: 1605.Ø.stroke.01.M

(Max. stroke 6 m)

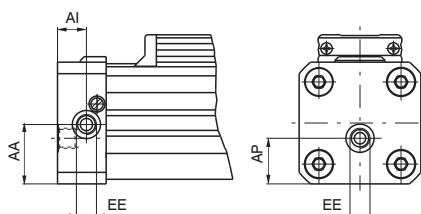


Left head

Coding: 1605.Ø.stroke.02.M

(Max. stroke 6 m)

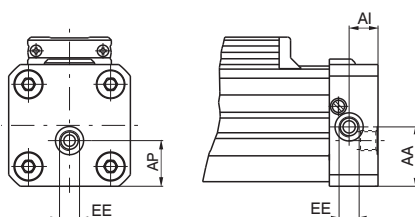
Possibility of a single feed cylinder head



Right head

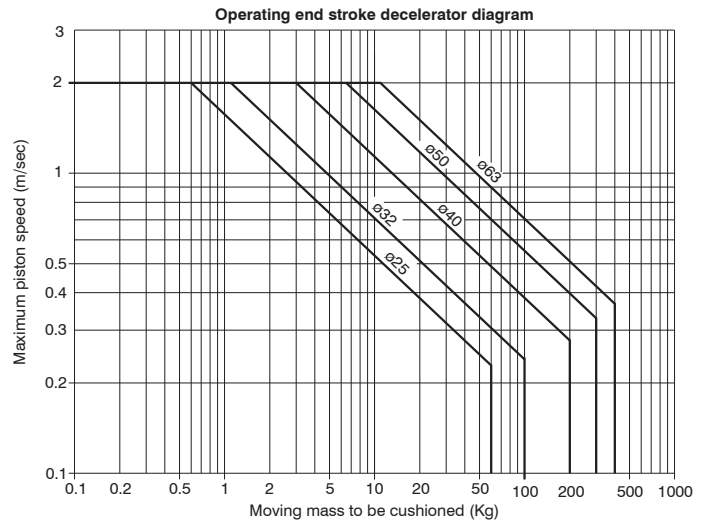
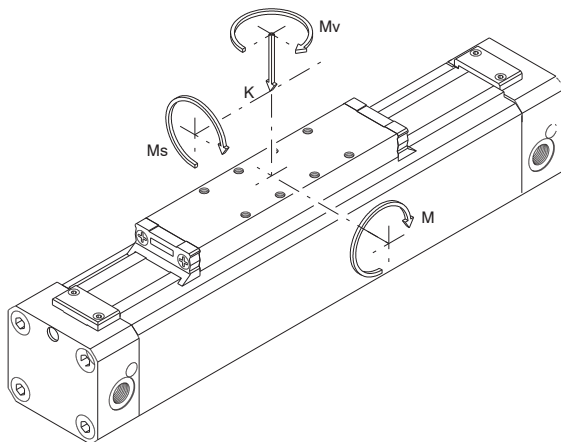
Coding: 1605.Ø.stroke.03.M

(Max. stroke 6 m)



Bore	25	32	40	50	63
AA	19,5	25,5	31	39	46,5
AB	56	70	80	98	113,5
AC	48,5	60	70	85	100
AD	44	55	65	80	95
AE	40	55	65	80	95
AF	30	40	40	55	55
AG	117	146	186	220	255
AH	23	27	30	32	36
AI	12,5	14,5	17,5	19	23
AL	19	22,5	24,5	26	30
AM	7,5	10,5	11,5	13,5	16
AP	13	15,2	23	30	35,5
EE	G1/8"	G1/4"	G1/4"	G1/4"	G3/8"
L1	100	125	150	175	215
LA	200	250	300	350	430
RA	M4	M5	M5	M6	M6
RB	7,5	9,5	9,5	11,5	11,5
RT	M5	M6	M6	M8	M8
RV	13,5	16,5	16,5	20,5	20,5
TA	30	40	40	65	65
TB	80	110	110	160	160
TC	23	30	30	40	40
TD	27	36	47	54	68
TE	6,5	9,5	9	13	13,5
Weight (g)	Stroke 0	900	1650	2650	4330
	every 100 mm	225	340	490	8010
Stroke tolerance: + 2 mm.					

Basic version cylinder



Recommended loads and moments in static conditions

Cylinder bore	Decelerating stroke (mm)	Max. recommended load K (N)	Max. recommended bending moment M (Nm)	Max. recommended cross moment Ms (Nm)	Max. recommended twisting moment Mv (Nm)
25	20	300	15	0,8	3
32	25	450	30	2,5	5
40	31	750	60	4,5	8
50	38	1200	115	7,5	15
63	49	1600	150	8,5	24

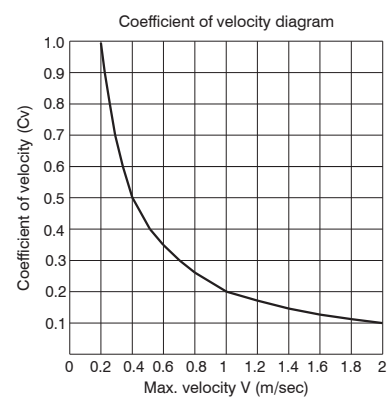
Attention: use guided carriage for heavier loads or precise linear movements (MG or MH versions).

All reported data are referred to carriage plane and indicates MAX - values in static conditions. These values should not be exceeded either in dynamic conditions (best speed <1m/sec).

Should the cylinder be utilised at its maximum performances, ensure the proper additional absorbers are used.

Calculation of permissible load (Kd) in dynamic conditions

$$K_d = K \cdot C_v$$



Loads under combined stressing conditions

It is important to take into consideration the following formula when there are a combination of forces with torque:

$$\left[\left(2 \times \frac{M_s}{M_{s \max}} \right) + \left(1.5 \times \frac{M_v}{M_{v \max}} \right) + \frac{M}{M_{\max}} + \frac{K}{K_{\max}} \right] \times \frac{100}{C_v} \leq 100$$

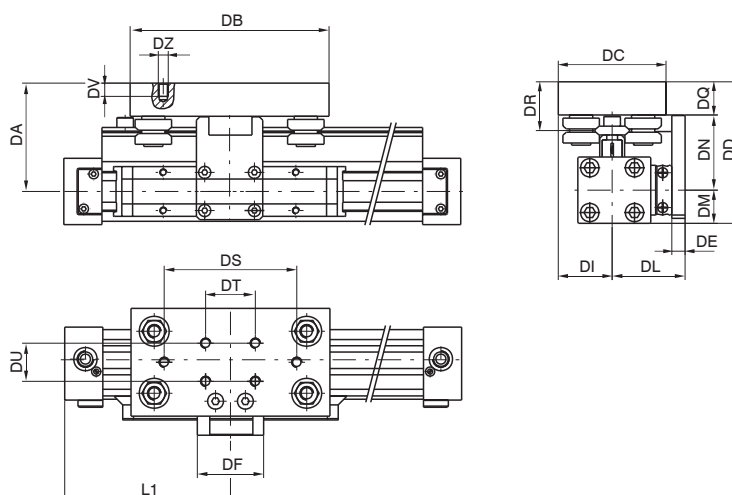
Cylinder with linear control unit

Coding: 1605.Ø.stroke.01.MG

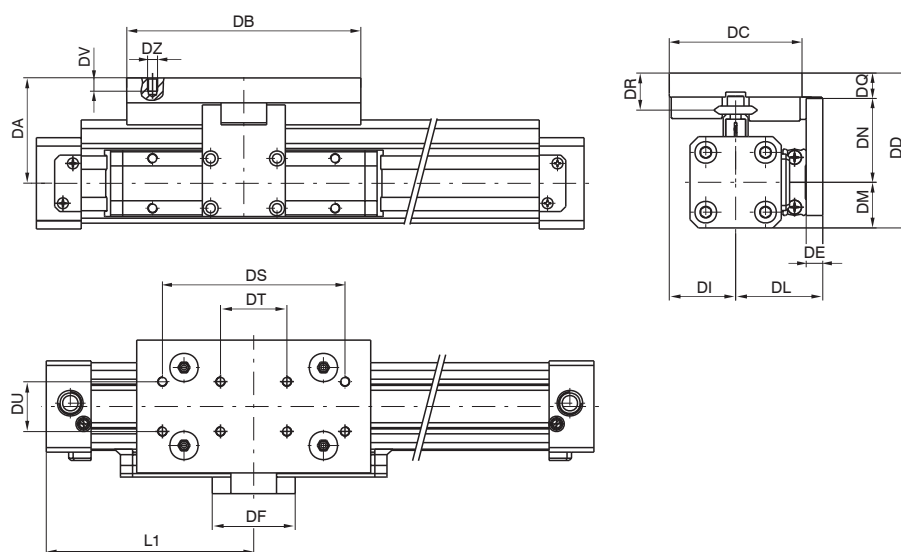
(Max. stroke 3 m)



Cylinders Ø25



Cylinders Ø32, Ø40, Ø50



Bore	DA	DB	DC	DD	DE	DF	DI	DL	DM	DN	DQ	DR	DS	DT	DU	DV	DZ	L1	Weight (g)	every 100 mm
25	65	120	65	85	8	40	32,5	44	20	45,5	19,5	29	80	30	23	8	M6	100	850	90 g
32	63	141	80	90,5	10	50	40	52,5	27,5	48,5	14,5	21,5	110	40	30	8	M5	125		
40	68,5	141	80	101	10	50	40	57,5	32,5	54	14,5	21,5	110	40	30	8	M5	150		
50	76	141	80	116	12	80	40	70	40	61,5	14,5	21,5	110	40	30	8	M5	175		

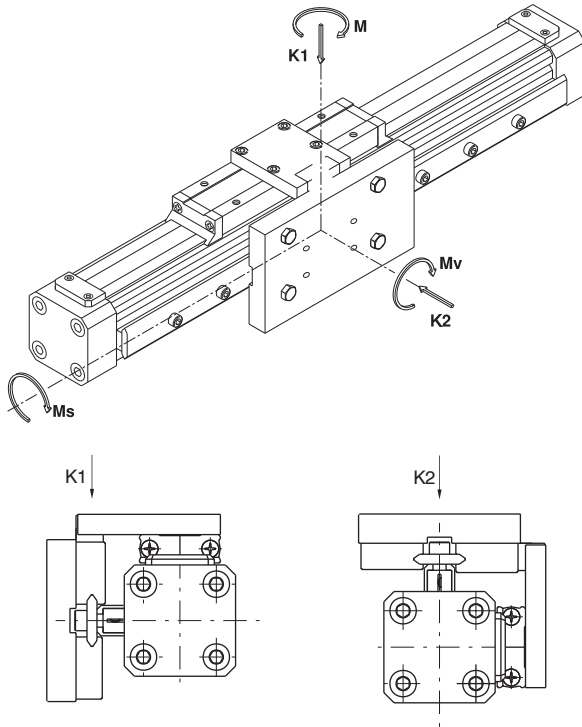
For cylinders weight refer to base version

Construction and working characteristics

Rod	carbon steel with hardness higher than 55-60 HRC
Bearing with shaft	shielded bearing with shaped ring
Carriage plate	anodised aluminium
End cap	acetal resin

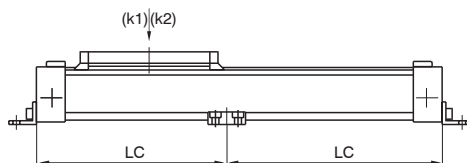
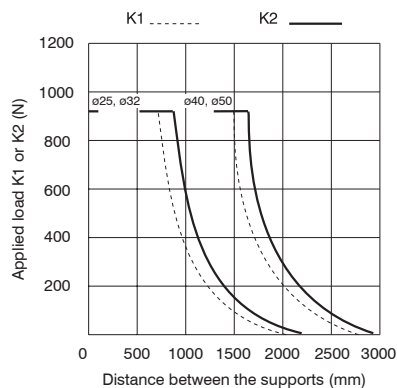
Cylinder with linear control unit Ø25, Ø32, Ø40 and Ø50 mm

Max. suggested loads and moments



K1 (N)	K2 (N)	M (Nm)	Ms (Nm)	Mv (Nm)
960	960	40	12	40

Max. load (K1 o K2) depending on the distance LC between the supports

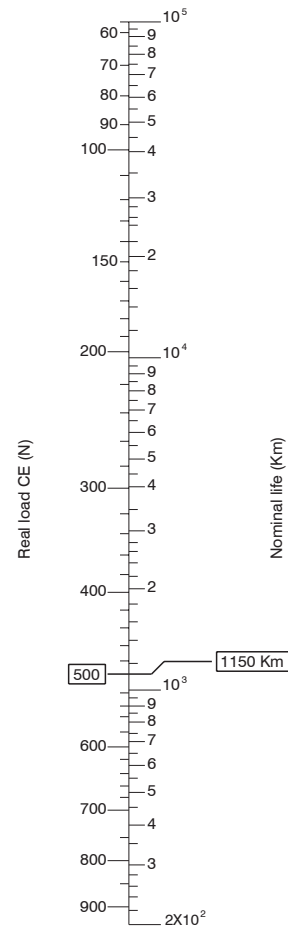


Real load (CE) under combined stressing conditions

It is important to take into consideration the following formula when there are a combination of forces with torque:

$$CE = [K1 + K2 + (24 \times M) + (80 \times Ms) + (24 \times Mv)] \leq 960$$

Nomograph load / life



All data refers to a linear control unit properly lubricated with linear speed < of 1.5 m/s

Example to compute the life

Compute the linear control unit life with a load of 100 N applied 50 mm off its axle.

$$Ms = 0,05 \times 100 = 5 \text{ Nm} \quad K1 = 100 \text{ N}$$

How to compute the real load using the formula:

$$CE = [K1 + K2 + (24 \times M) + (80 \times Ms) + (24 \times Mv)]$$

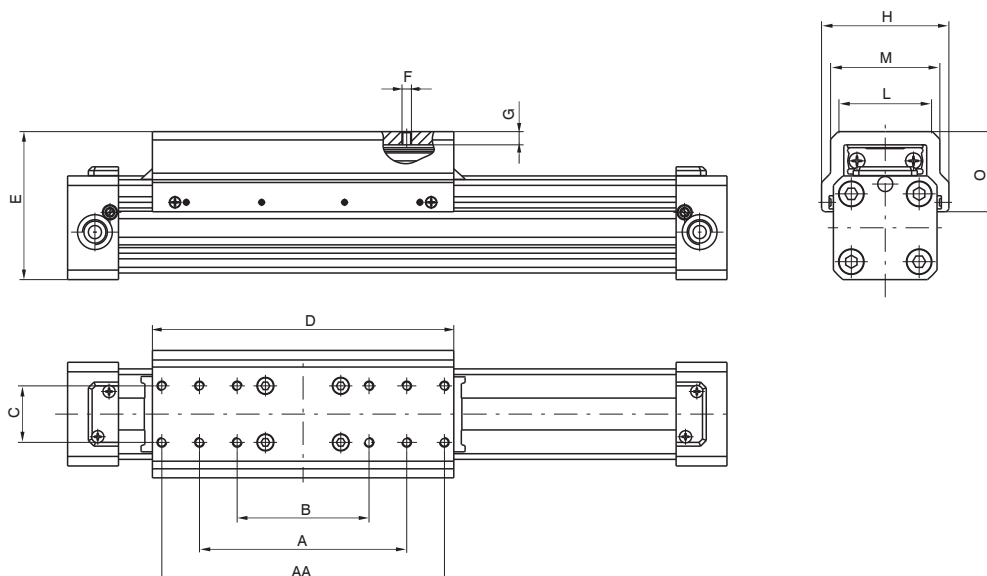
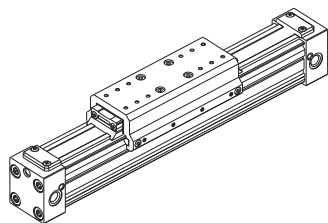
$$CE = [(100 + 0) + (24 \times 0) + (80 \times 5) + (24 \times 0)] = 500 \text{ N}$$

After having verified that the CE is lower than 960 N we realise that the life is 1150 Km from the nomograph.

► **Cylinder with plain bearing guide**

Coding: 1605.Ø.stroke.01.MH

(Max. stroke 6 m)



Bore	AA	A	B	C	D	E	F	G	H	L	M	O	Weight (g)
Ø25	/	80	55	23	130	64 ^{±1}	M4	6,5	57	36	42	32	235
Ø32	/	110	70	30	160	78,5 ^{±1}	M5	7	68	50	58	42,5	445
Ø40	/	110	70	30	202	88,5 ^{±1}	M5	7	77	52	60	45,5	595
Ø50	210	160	110	40	235	114,5 ^{±1}	M6	14	100	71	83	61,5	1453
Ø63	210	160	110	40	270	130 ^{±1}	M6	14	116	76	90	65,5	1810

► **Complete plain bearing guide**

Coding: 1600.Ø.05F

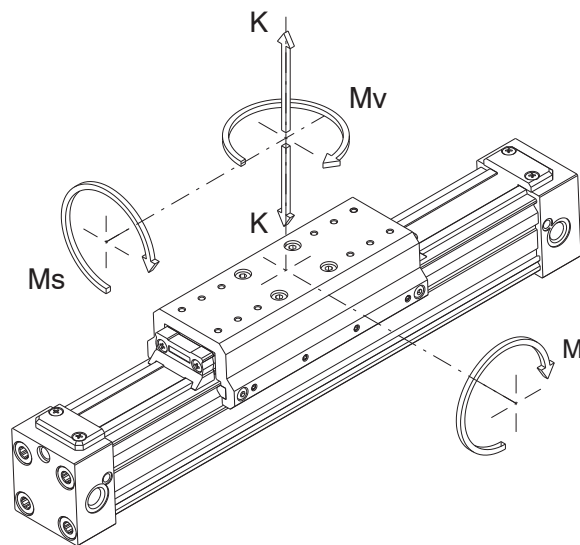


Construction and working characteristics

Plain bearing
Carriage plate

reinforced carbon fibre nylon
anodised aluminium

Cylinder with plain bearing guide $\varnothing 25$, $\varnothing 32$, $\varnothing 40$, $\varnothing 50$ and $\varnothing 63$ mm
Max. suggested loads and moments



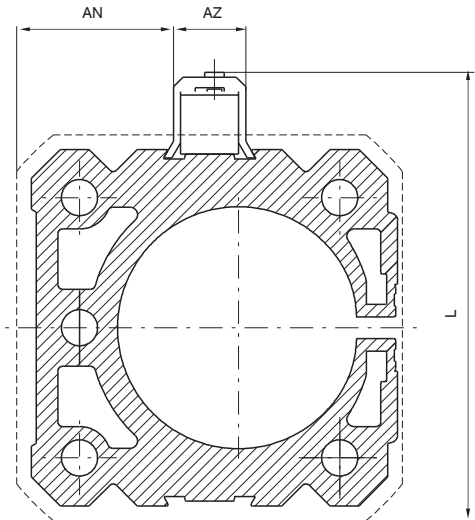
Recommended loads and moments in static conditions

Cylinder bore	Max. recommended load K (N)	Max. recommended bending moment M (Nm)	Max. recommended cross moment Ms (Nm)	Max. recommended twisting moment Mv (Nm)
$\varnothing 25$	300	20	1	4
$\varnothing 32$	450	35	3	6
$\varnothing 40$	750	70	5	9
$\varnothing 50$	1200	120	8	16
$\varnothing 63$	1600	155	9	25



SA series sensor bracket

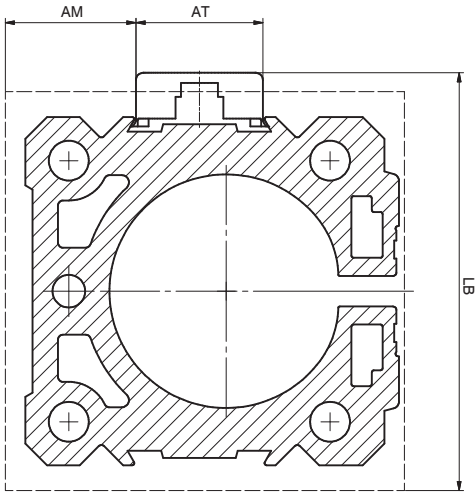
Coding: 1600.A



Bore		25	32	40	50	63
AN		12.5	20	25	32.5	40
AM		11	18	22	30	37.5
AZ		15				
AT		17.5				
L		55	68	79	94	110
LB		45	58	69	84	100
Weight (g)	1600.A	1				
	1600.C	2.5				

Bracket for sensor series SR - SU - SQ

Coding: 1600.C



Sensors

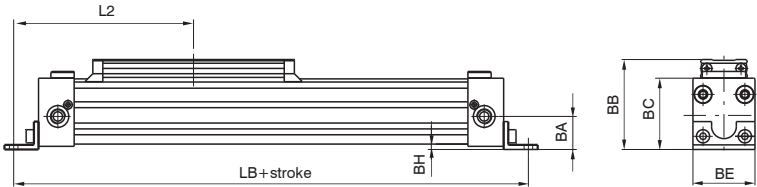
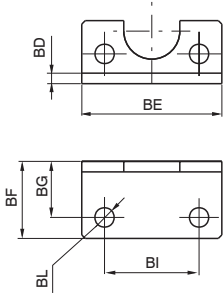
for technical characteristics and ordering codes see magnetic sensors section



Foot

Coding: 1600.Ø.01F
(1 piece)

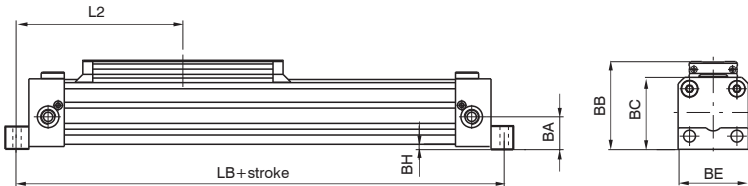
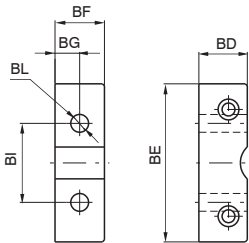
Bore Ø25, Ø32



Bore Ø40, Ø50, Ø63



Bore	25	32	40	50	63
BA	21,5	28	32,5	41	49
BB	58	72,5	81,5	100	116
BC	46	57,5	66,5	82	97,5
BD	3	3	20	25	30
BE	40	55	65	80	95
BF	22	25	25	25	30
BG	16	18	12,5	12,5	15
BH	3,5	6	4,5	5	5
BI	27	36	30	40	48
BL	5,5	6,6	9	9	11
L2	116	143	162,5	187,5	230
LB	232	286	32,5	375	460
Weight (g)	30	45	65	110	190

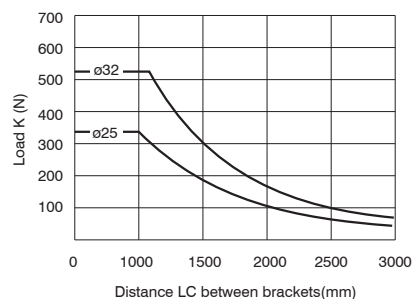
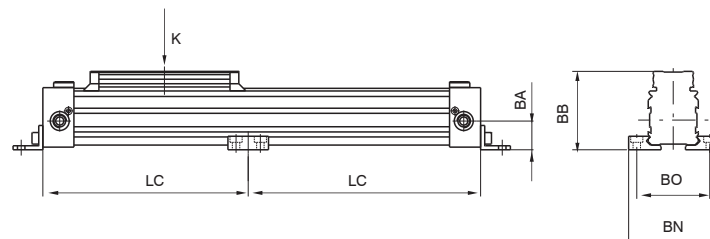
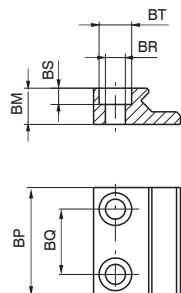




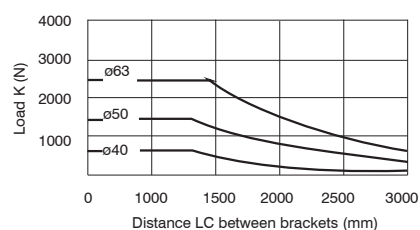
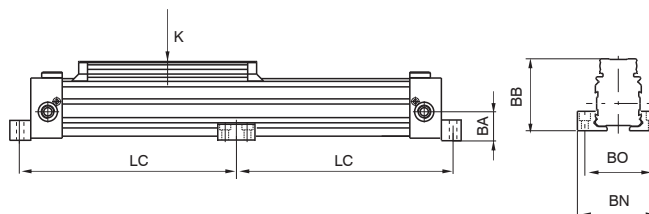
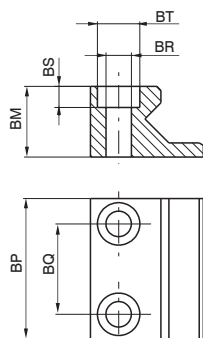
Intermediate support

Coding: 1600.Ø.02F

Bore Ø25, Ø32



Bore Ø40, Ø50, Ø63



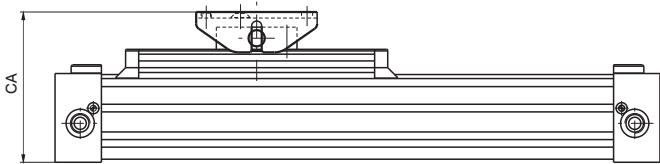
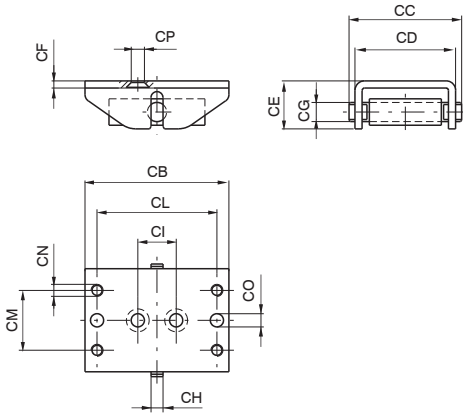
Bore	25	32	40	50	63
BA	21,5	28	32,5	41	49
BB	58	72,5	81,5	100	116
BM	10	18	18	25	30
BN	66	86	96	120	140
BO	54	70	80	100	120
BP	30	40	40	50	50
BQ	18	25	25	32	32
BR	5,5	6,6	6,6	9	9
BS	4,5	5,5	5,5	7,5	7,5
BT	9	11	11	15	15
Weight (g)	25	80	80	160	215



Oscillating hinge

Coding: 1600.Ø.03F

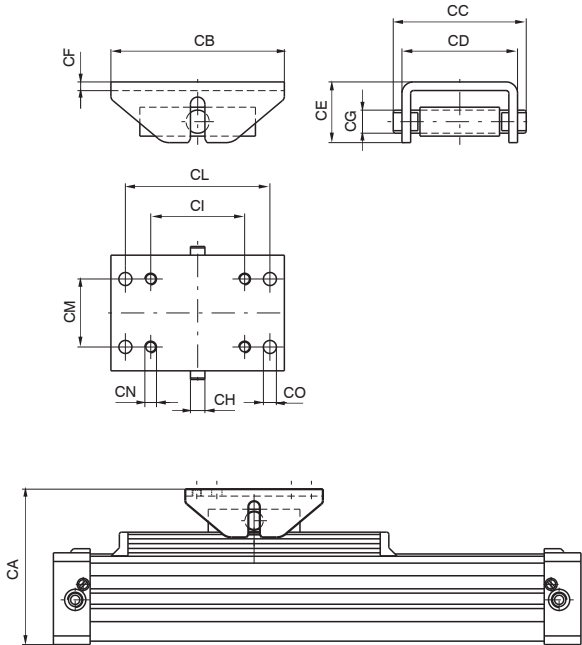
Bore Ø25, Ø32



Bore Ø40, Ø50, Ø63



Bore	25	32	40	50	63
CA (±5,5)	76	99,5	108,5	135,5	151
CB	60	100	100	120	120
CC	47	64	64	92	92
CD (±5)	42	56	56	80	80
CE	20	30	30	42	42
CF	3	4	4	6	6
CG	8	12	2	16	16
CH	5	8	8	10	10
CI	16	40	40	65	65
CL	50	80	80	100	100
CM	25	30	30	47	47
CN	M5	M6	M6	M8	M8
CO	5,5	6,5	6,5	9	9
CP	5,5	7	7	-	-
Weight (g)	130	380	380	990	990





Series 1605 - Ø16

Mechanically coupled cylinder based on the stainless steel strip sealing technology widely used and tested on bigger bore sizes.

Available versions: sliding shoe as standard ("MH"). This system ensures high resistance and long life as the carriage which supports the weight is not tied to the piston and therefore the piston only transfers the movement without bearing any force.

Air connections: M5 threaded connections. All air connections on one end cap version available. (side-back-bottom side)

Mountings:

- foot brackets and intermediate supports if needed (depending on the stroke)
- oscillating hinge
- Directly in position via the slot on the end caps- in this conditions the air supply can come directly from the mounting plate.

Magnetic sensors: sensors series (1590...., LRS.... and LHS....) can be used directly in the 2 slots on the barrel.

Construction characteristics

End caps	anodized aluminium
Barrel	anodized aluminium
Bands	stainless steel
Mounting place	anodized aluminium
Plain bearing guide	special technopolymer
Piston	acetal resin
Cushion bushings	aluminium
Piston seals	special NBR
Other seals	NBR

Operational characteristics

Fluid	filtered and lubricated air
Working pressure	1.5 ... 8 bar
Working temperature	-5 °C ... +70 °C
Max. speed	1 m/s (normal working conditions)
Max. stroke	2,5 meters
Cushioning lenght	18 mm

Please follow the suggestions below to ensure a long life for these cylinders:

- use clean and lubricated air.
- Please adequately evaluate the load involved and its direction, especially in respect to the moving carriage (also see tables for loads and admitted moments).
- avoid high speeds together with long strokes and heavy loads: this would produce kinetic energy which the cylinder cannot absorb, especially if used as a limit stop (in this case use mechanical stop device).
- evaluate the environmental characteristics of cylinder used (high temperature, hard atmosphere, dust, humidity etc.).

Please note: air must be dried for applications with lower temperature.

Use hydraulic oils H class (ISO VG32) for correct continued lubrication.

For applications where a low smooth uniform operations speed is required, you must specify this on your purchase order so that we can use the proper special grease.

Use and maintenance

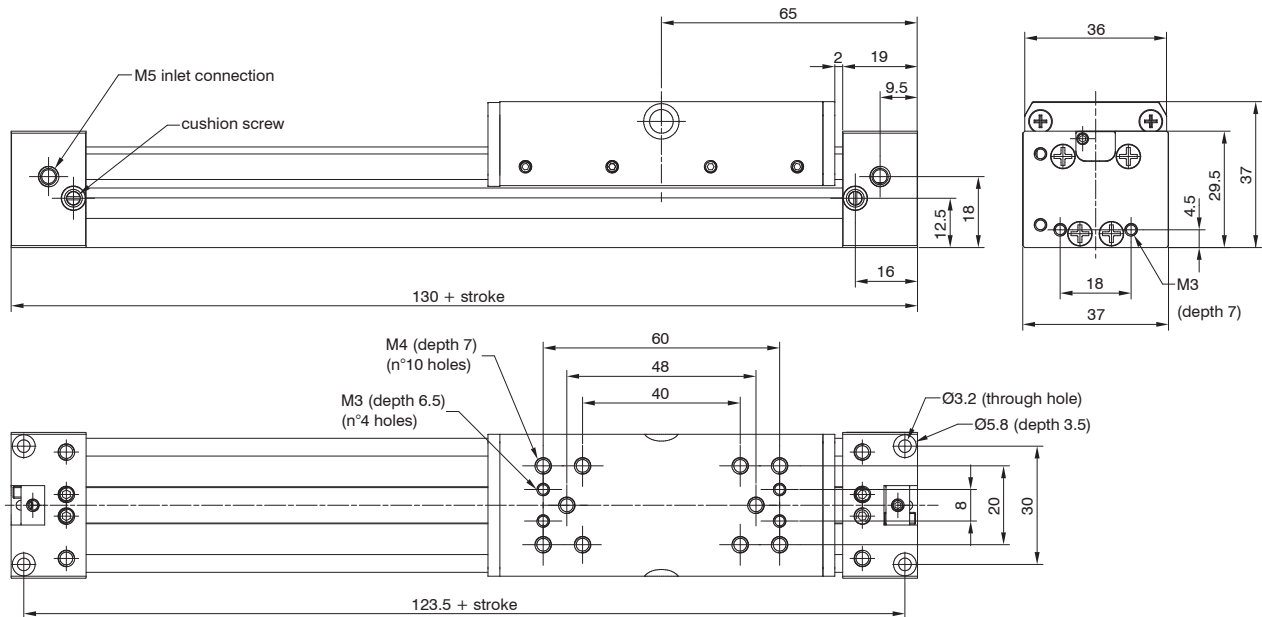
This type of cylinder, due to its characteristics, has to be used within certain criteria. Correct use will give long and troublefree operation.

Filtered and lubricated compressed air reduce seal wear. Verify that the load will not produce unforeseen stresses. Never combine high speed with heavy load. Always support the long stroke cylinder with intermediate brackets and never exceed the specified working conditions. If maintenance is required, follow the instructions supplied with the repair kit.

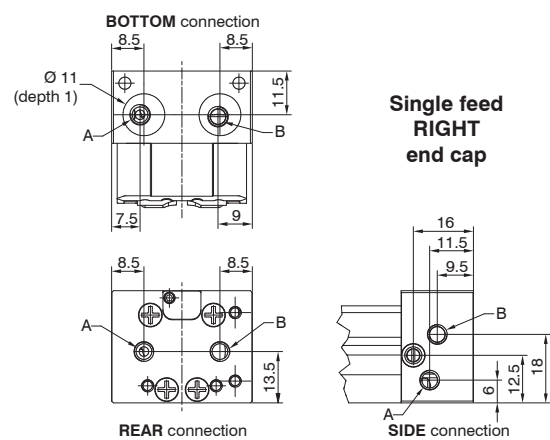
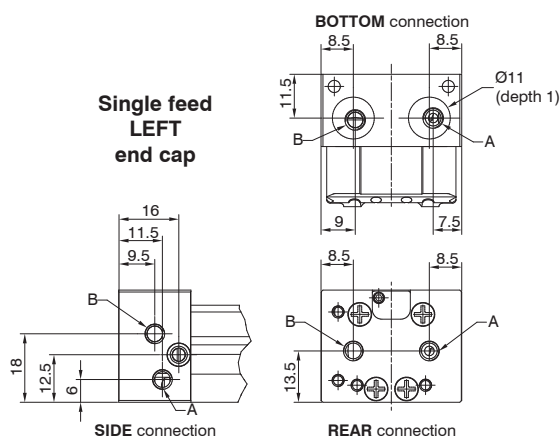
Coding: 1605.16.stroke.ⓧ.MH

	END COVERS
	01 = Basic version
	02 = Left end cap-side connection
	03 = Right end cap-side connection
	04 = Left end cap-rear connection*
	05 = Right end cap-rear connection*
	06 = Left end cap-bottom connection
	07 = Right end cap-bottom connection

* in case of mounting with 1600.16.01F bracket, use 4mm tube fitting

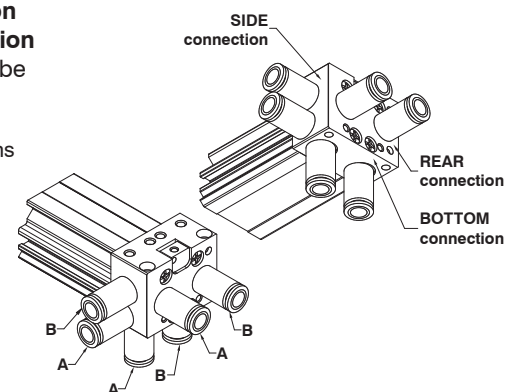
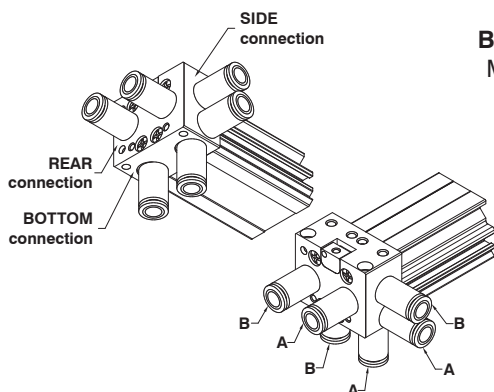


Possibility of a single feed right or left cylinder head and on 3 different end cap sides

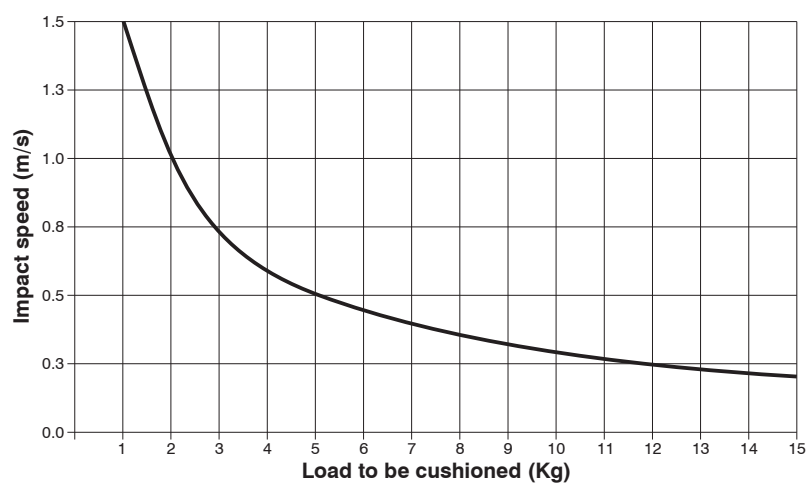


A = forward stroke connection
B = backwards stroke connection
 M5 tube Ø4 and Ø6 fittings can be
 used for air connections.

In case of use with 1600.16.01F mounting and REAR air connections use a 4mm pipe fitting.



Operating end stroke decelerator diagram

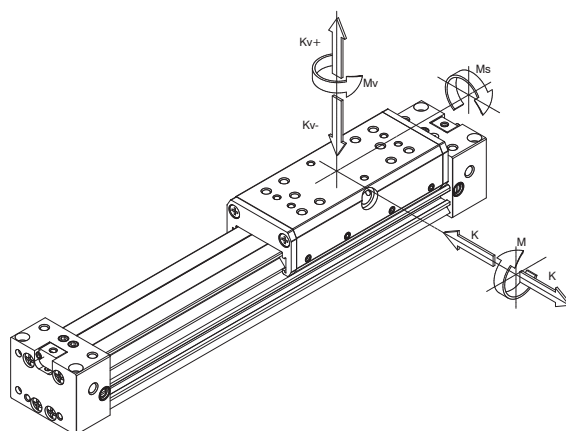


In case of extreme applications close to the maximum allowed values in the graph it is strongly recommended to add external damping systems.

Recommended loads and moments in static conditions

K1	K2	K3	M	Ms	Mv
200	250	100	10	2	3
(N)			(Nm)		

Maximum Load and moments allowed in static or dynamic conditions (max. speed 0,2 m/s)

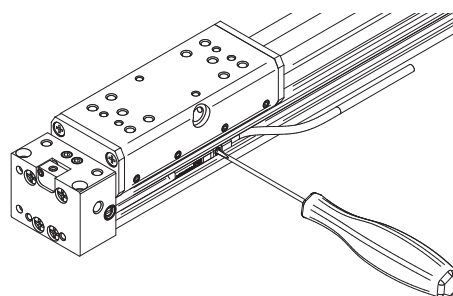


Magnetic sensors

Code
1590...
LRS...
LHS...



The two side slots allow the direct use of 1590....LRS... and LHS... sensors mounted from the top and positioned via the built in screw.

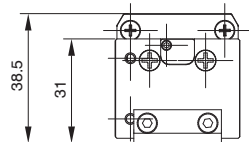
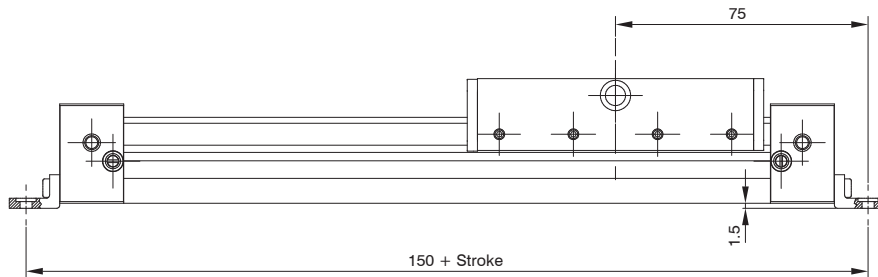
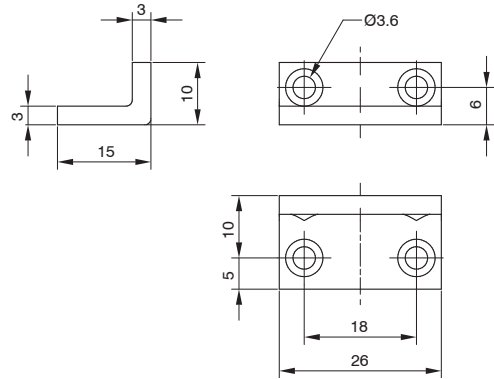


Foot

Coding: 1600.16.01F
(1 piece)

Attention: based on the stroke evaluate the need to use also side mounted supports. (see below)

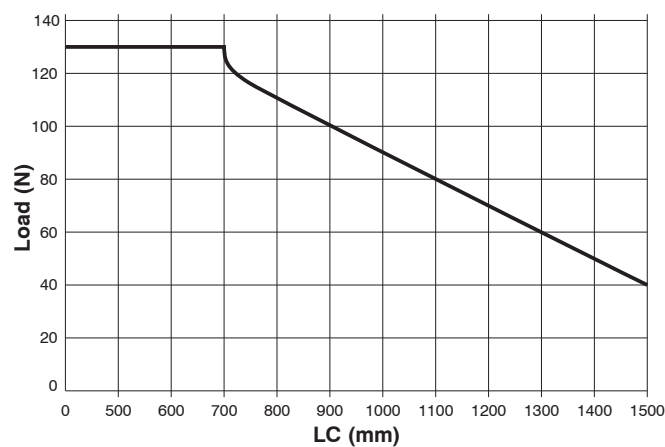
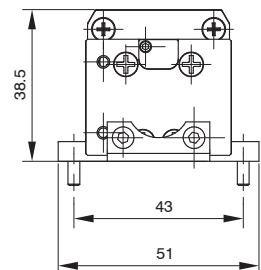
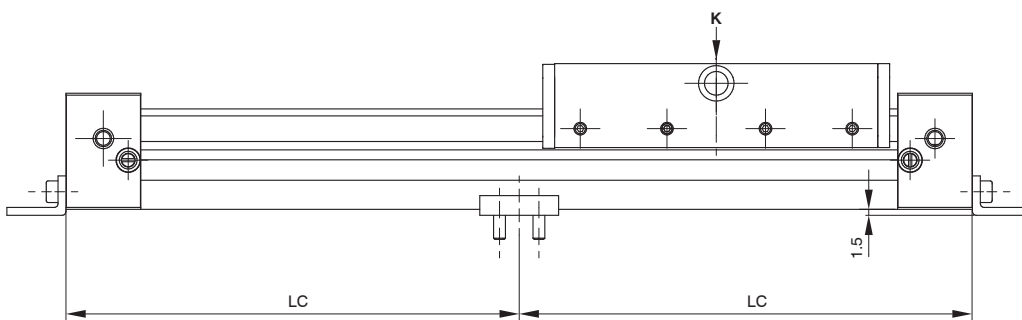
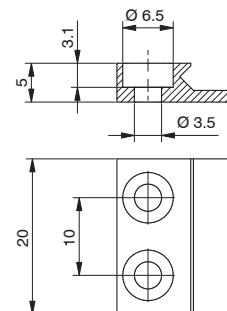
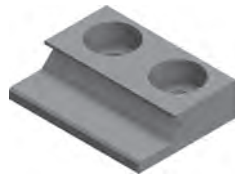
The kit comprises:
n° 1 foot (plated zinc steel)
n° 2 screws (plated zinc steel)



Intermediate support

Coding: 1600.16.02F
(1 piece)

The kit comprises:
n° 1 support (aluminium)
n° 2 screws (plated zinc steel)

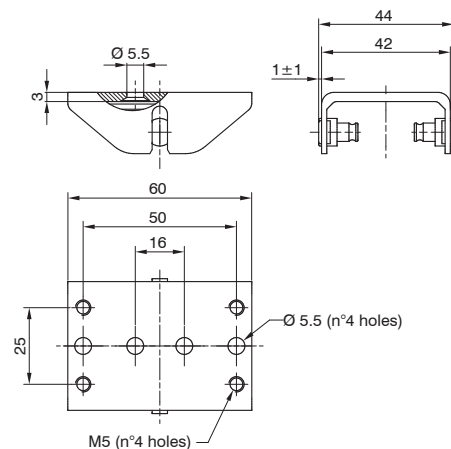
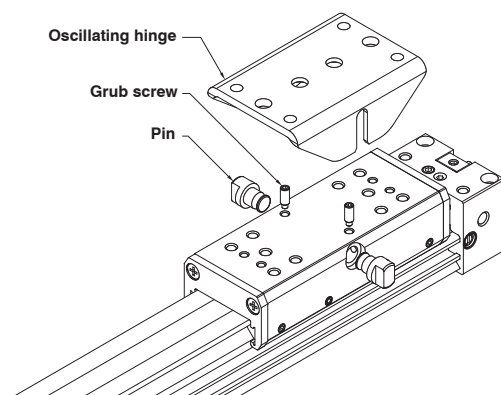


The graph shows the LC limit in conjunction with the applied load K beyond which it is necessary to mount an intermediate side support in order to prevent the barrel from bending

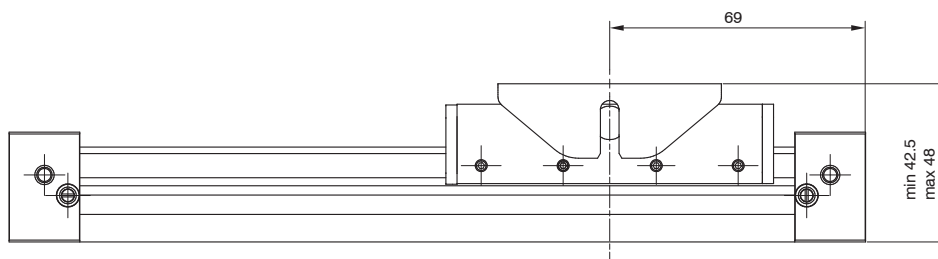
Oscillating hinge

Coding: 1600.16.03F
 (1 piece)

The kit comprises:
 n° 2 pins (plated zinc steel)
 n° 2 grub screw (steel)
 n° 1 oscillating hinge (plated zinc steel)



mounting sequence:
 mount the pin into the dedicated
 housing
 tighten the blocking grub screws in the
 dedicated housing



Direct mounting without brackets

Coding: 1600.16.04F
 (1 piece)

The kit comprises:
 n° 4 screws M3x35 (plated zinc steel)
 n° 2 O-Rings (NBR)

Direct mounting without brackets

Thanks to the mounting holes with counter bores on the end caps it is possible to mount the cylinder directly onto the mounting surface. Having the end caps and barrel flush and in contact with the mounting plate it is not necessary to use any intermediate mounting brackets even in case of long strokes. It is also possible to supply air to the cylinder directly through the mounting plate through the two air connection on the bottom side of the end cap (06.MH and 07.MH) which are machined with counterbores.

