MagSpring®

MagSpring – Magnetic Springs

Import Belgium & Luxembourg

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MagSpring, unlike mechanical springs, deliver a constant force over their entire working rang

**MagSpring, consists of only two components: a stator and a slider**

MagSprings are totally passive. Their operation is based entirely on a unique application of permanent magnets – no electricity at all.

The constant force spring technology for industrial applications

Magnetic Spring MagSpring

MagSpring products can best be described as "magnetic springs." The term "spring", however, is to be understood to mean that MagSpring components generate a constant force over their entire working range, while the characteristic curve for a typical mechanical spring shows an increase in force with increasing displacement (see Fig. Right). The generation of force that is independent of the stroke makes MagSprings preferable for balancing weight forces in vertical drive applications. MagSpring products can best be described as "magnetic-Since MagSprings are purely passive elements, a defined function or position of a device can be ensured in a power-off condition. For example, a gripper or press head on a vertical mount can be held up, or a slider can be pushed in or pulled out with a constant force.
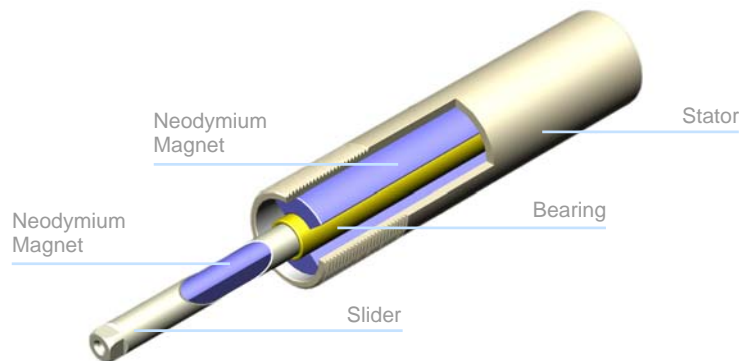

Mode of Operation

The mode of operation is based on the attractive force of permanent magnets. Accordingly, no energy source (electricity, compressed air, etc.) is needed, so that safety-related applications can also be addressed. The special design of the flow-guiding components and the magnets translates the strongly non-linear relationship between force and displacement in magnet-iron arrangements into a constant force curve. Depending on the strength class of the MagSpring, the peurmanent magnets are either in the stator, in the slider, or in both components. The slider is guided by an integrated plain bearing, so that MagSprings can be used comparably to gas pressure springs in a design.

MagSpring®

$F_{MagSpring}$

$F_{MagSpring}$

SP

Stroke

Mechanical Spring

F_{Spring}

Stroke
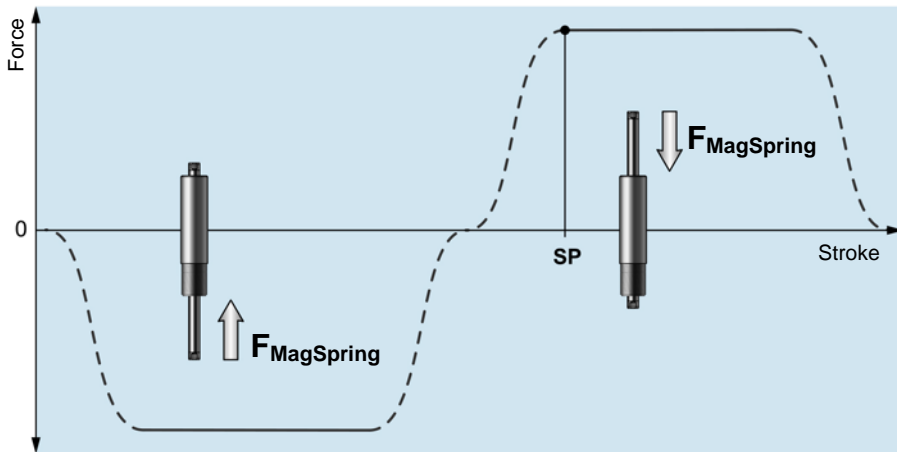
Working Range

In the relaxed state, the slider is approximately centered in the stator, while the working end of the slider extends somewhat out of the end of the stator. (Fundamentally, however, both ends of the slider can be used to mount loads.) From this rest position, the slider can be pulled or pushed out of the stator in both directions. The force increases from zero to the nominal force within a short stroke length. The working stroke then continues with a constant force. The start position (SP) describes the distance between the working end of the slider and the end of the stator at the beginning of the constant force range.
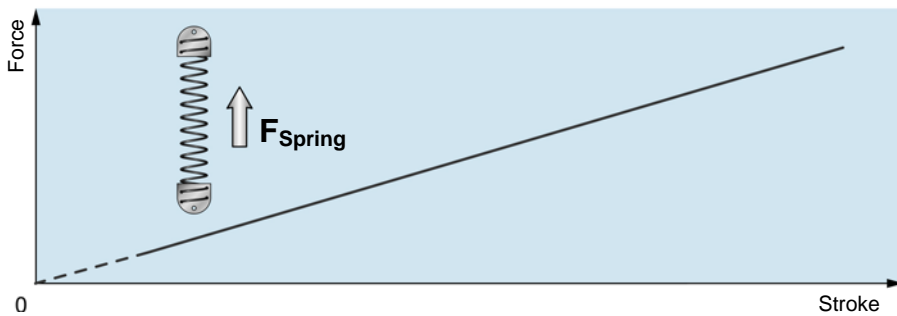
Application of Constant Force

Thanks to the constant force-displacement curve, many other applications are possible, such as the generation of a constant
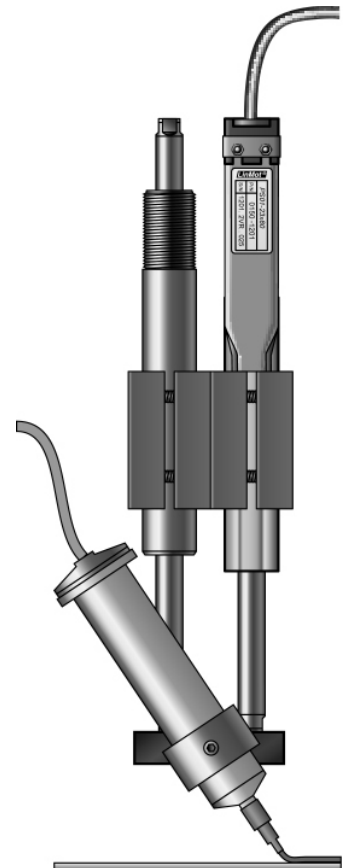
$F_{MagSpring}$

press force, regardless of position; application of a constant holding force across a large stroke range; or single-sided force support in drive applications.

The effective force is in the range of +/- 10% of the nominal force, due to material and manufacturing tolerances.

Holding Function (Power-off)

Since MagSprings are purely passive elements, a defined function or position of a device can be ensured in a power-off condition. For example, a gripper or press head on a vertical mount can be held up, or a slider can be pushed in or pulled out with a constant force.

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M01-20x60/50: Force 11-22N / Stroke 50mm
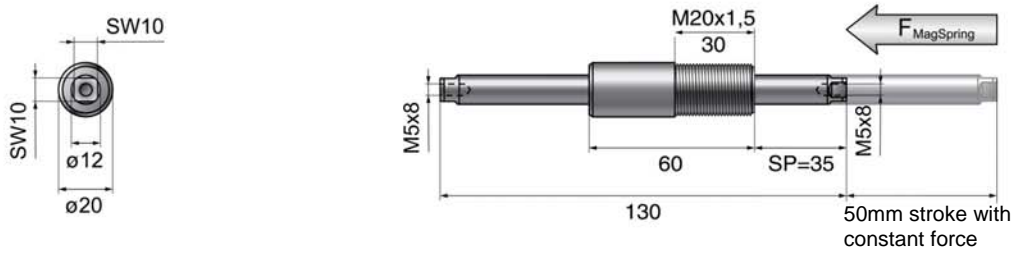
SW10
SW10
ø12
ø20

M20x1,5
30
M5x8
60
SP=35
M5x8
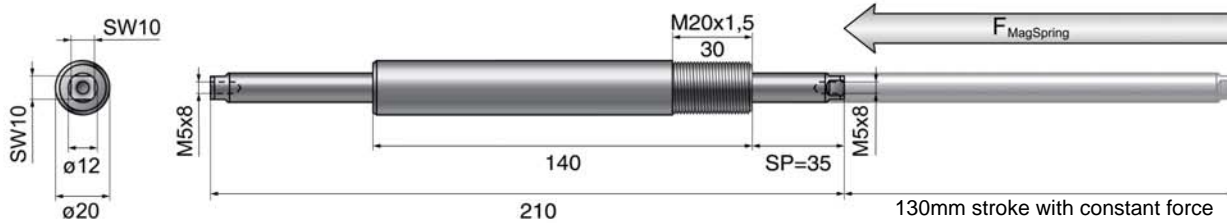130
50mm stroke with constant force
F MagSpring

Dimensions in mm

The MagSpring has a constant force, as soon as the slider has been pulled out or pushed by the distance SP.
The distance SP is measured between the unmarked slider end and the end of the stator (threaded end).

MagSpring	Constant force [N]	Stator mass [g (lb)]	Slider mass [g (lb)]
M01-20x60/50-11	11	75 (0.16)	75 (0.16)
M01-20x60/50-17	17	75 (0.16)	75 (0.16)
M01-20x60/50-22	22	75 (0.16)	75 (0.16)

M01-20x140/130: Force 11-22N / Stroke 130mm

SW10
SW10
ø12
ø20

M20x1,5
30
M5x8
140
SP=35
M5x8
210
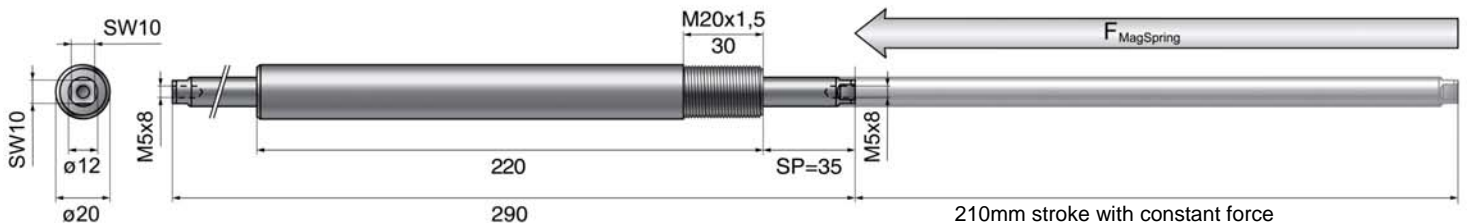130mm stroke with constant force
F MagSpring

Dimensions in mm

The MagSpring has a constant force, as soon as the slider has been pulled out or pushed by the distance SP.
The distance SP is measured between the unmarked slider end and the end of the stator (threaded end).

MagSpring	Constant force [N]	Stator mass [g (lb)]	Slider mass [g (lb)]
M01-20x140/130-11	11	180 (0.39)	155 (0.34)
M01-20x140/130-17	17	180 (0.39)	155 (0.34)
M01-20x140/130-22	22	180 (0.39)	155 (0.34)

M01-20x220/210: Force 11-22N / Stroke 210mm

SW10
SW10
ø12
ø20

M20x1,5
30
M5x8
220
SP=35
M5x8
290
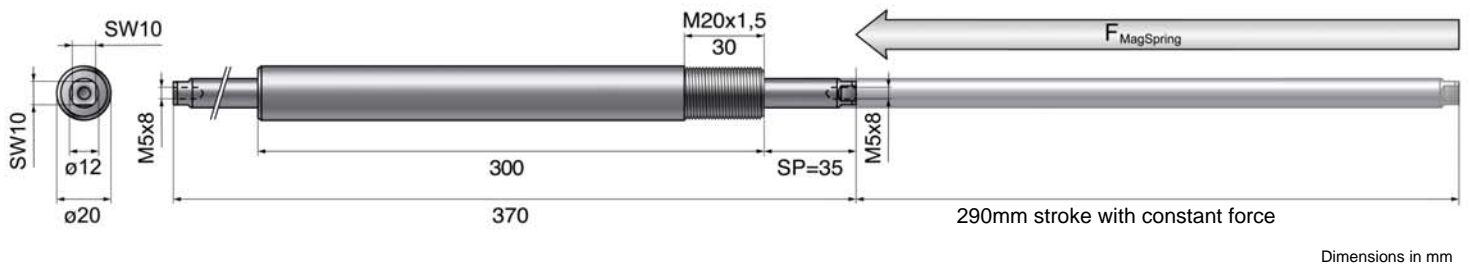210mm stroke with constant force
F MagSpring

Dimensions in mm

The MagSpring has a constant force, as soon as the slider has been pulled out or pushed by the distance SP.
The distance SP is measured between the unmarked slider end and the end of the stator (threaded end).

MagSpring	Constant force [N]	Stator mass [g (lb)]	Slider mass [g (lb)]
M01-20x220/210-11	11	285 (0.62)	220 (0.49)
M01-20x220/210-17	17	285 (0.62)	220 (0.49)
M01-20x220/210-22	22	285 (0.62)	220 (0.49)

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M01-20x300/290: Force 11-22N / Stroke 290mm

290mm stroke with constant force

Dimensions in mm

The MagSpring has a constant force, as soon as the slider has been pulled out or pushed by the distance SP.
The distance SP is measured between the unmarked slider end and the end of the stator (threaded end).
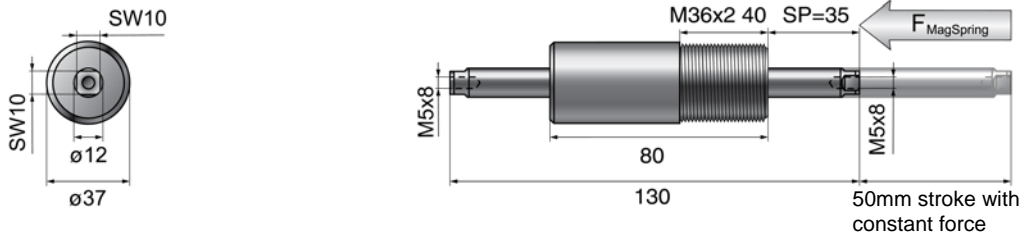
MagSpring	Constant force [N]	Stator mass [g (lb)]	Slider mass [g (lb)]
M01-20x300/290-11	11	388 (0.86)	520 (1.15)
M01-20x300/290-17	17	388 (0.86)	520 (1.15)
M01-20x300/290-22	22	388 (0.86)	520 (1.15)

Ordering Information

M01-20x60/50	MagSpring M01-20 with 50mm stroke			
	Stator	MS01-20x60	MagSpring Stator 20x60mm	0250-2200
	Slider	ML01-12x130/80-10	Slider for MagSpring M01-20x60/50, Force 11N	0250-2300
		ML01-12x130/80-15	Slider for MagSpring M01-20x60/50, Force 17N	0250-2308
		ML01-12x130/80-20	Slider for MagSpring M01-20x60/50, Force 22N	0250-2301
M01-20x140/130	MagSpring M01-20 with 130mm stroke			
	Stator	MS01-20x140	MagSpring Stator 20x140mm	0250-2201
	Slider	ML01-12x210/160-10	Slider for MagSpring M01-20x140/130, Force 11N	0250-2302
		ML01-12x210/160-15	Slider for MagSpring M01-20x140/130, Force 17N	0250-2309
		ML01-12x210/160-20	Slider for MagSpring M01-20x140/130, Force 22N	0250-2303
M01-20x220/210	MagSpring M01-20 with 210 mm stroke			
	Stator	MS01-20x220	MagSpring Stator 20x220mm	0250-2202
	Slider	ML01-12x290/240-10	Slider for MagSpring M01-20x220/210, Force 11N	0250-2304
		ML01-12x290/240-15	Slider for MagSpring M01-20x220/210, Force 17N	0250-2310
		ML01-12x290/240-20	Slider for MagSpring M01-20x220/210, Force 22N	0250-2305
M01-20x300/290	MagSpring M01-20 with 290mm stroke			
	Stator	MS01-20x300	MagSpring Stator 20x140mm	0250-2207
	Slider	ML01-12x370/320-10	Slider for MagSpring M01-20x300/290, Force 11N	0250-2311
		ML01-12x370/320-15	Slider for MagSpring M01-20x300/290, Force 17N	0250-2312
		ML01-12x370/320-20	Slider for MagSpring M01-20x300/290, Force 22N	0250-2313

M01-37x80/50: Force 40-60N / Stroke 50mm

SW10
SW10
ø12
ø37

M36x2 40 SP=35
M5x8
M5x8
80
130
F MagSpring
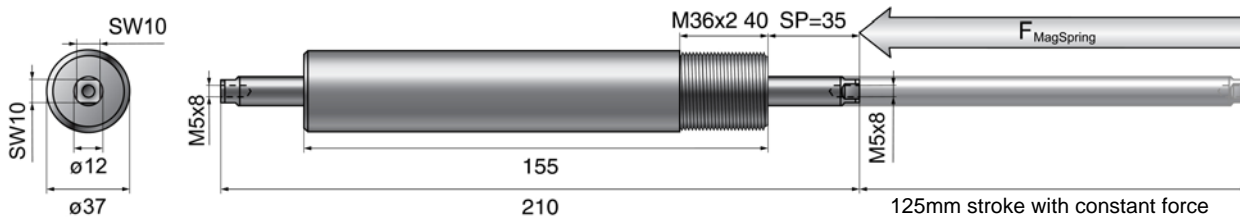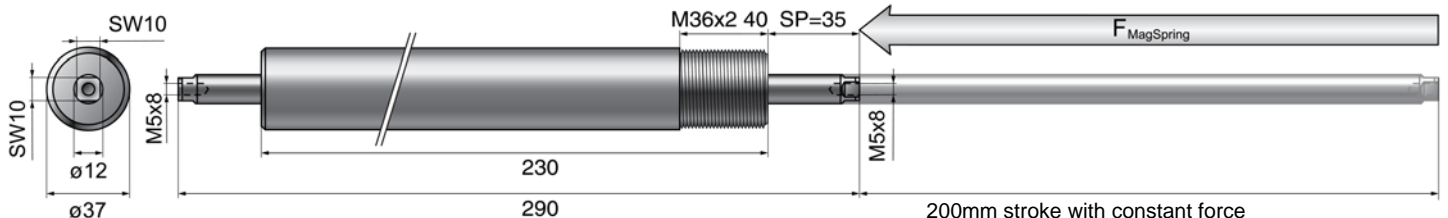50mm stroke with constant force

Dimensions in mm

The MagSpring has a constant force, as soon as the slider has been pulled out or pushed by the distance SP.
The distance SP is measured between the unmarked slider end and the end of the stator (threaded end).

MagSpring	Constant force [N]	Stator mass [g (lb)]	Slider mass [g (lb)]
M01-37x80/50-40	40	440 (0.90)	75 (0.16)
M01-37x80/50-50	50	440 (0.90)	75 (0.16)
M01-37x80/50-60	60	440 (0.90)	75 (0.16)

M01-20x140/130: Force 11-22N / Stroke 130mm

SW10
SW10
ø12
ø37

M36x2 40 SP=35
M5x8
M5x8
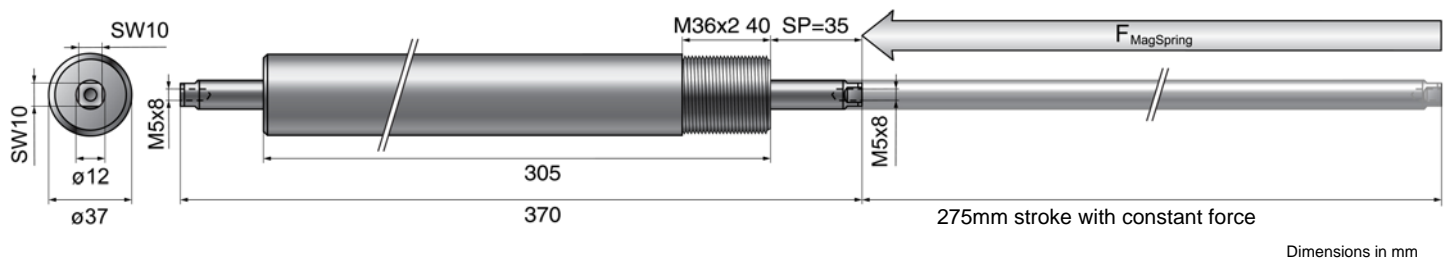155
210
F MagSpring
125mm stroke with constant force

Dimensions in mm

The MagSpring has a constant force, as soon as the slider has been pulled out or pushed by the distance SP.
The distance SP is measured between the unmarked slider end and the end of the stator (threaded end).

MagSpring	Constant force [N]	Stator mass [g (lb)]	Slider mass [g (lb)]
M01-37x155/125-40	40	880 (1.80)	155 (0.34)
M01-37x155/125-50	50	880 (1.80)	155 (0.34)
M01-37x155/125-60	60	880 (1.80)	155 (0.34)

M01-37x230/200: Force 40-60N / Stroke 200mm

SW10
SW10
ø12
ø37

M36x2 40 SP=35
M5x8
M5x8
230
290
F MagSpring
200mm stroke with constant force

Dimensions in mm

The MagSpring has a constant force, as soon as the slider has been pulled out or pushed by the distance SP.
The distance SP is measured between the unmarked slider end and the end of the stator (threaded end).

MagSpring	Constant force [N]	Stator mass [g (lb)]	Slider mass [g (lb)]
M01-37x230/200-40	40	1320 (2.70)	220 (0.49)
M01-37x230/200-50	50	1320 (2.70)	220 (0.49)
M01-37x230/200-60	60	1320 (2.70)	220 (0.49)

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M01-37x305/275: Force 40-60N / Stroke 275mm

275mm stroke with constant force

Dimensions in mm

The MagSpring has a constant force, as soon as the slider has been pulled out or pushed by the distance SP.
The distance SP is measured between the unmarked slider end and the end of the stator (threaded end).

MagSpring	Constant force [N]	Stator mass [g (lb)]	Slider mass [g (lb)]
M01-37x305/275-40	40	1800 (3.90)	280 (0.61)
M01-37x305/275-50	50	1800 (3.90)	280 (0.61)
M01-37x305/275-60	60	1800 (3.90)	280 (0.61)

Ordering Information

M01-37x80/50	MagSpring M01-37 with 50mm stroke		
Stator	MS01-37x80	MagSpring Stator 37x80mm	0250-2203
Slider	ML01-12x130/80-10	Slider for MagSpring M01-37x80/50, Force 40N	0250-2300
	ML01-12x130/80-15	Slider for MagSpring M01-37x80/50, Force 50N	0250-2308
	ML01-12x130/80-20	Slider for MagSpring M01-37x80/50, Force 60N	0250-2301

M01-37x155/125	MagSpring M01-37 with 125mm stroke		
Stator	MS01-37x155	MagSpring Stator 37x155mm	0250-2204
Slider	ML01-12x210/160-10	Slider for MagSpring M01-37x155/125, Force 40N	0250-2302
	ML01-12x210/160-15	Slider for MagSpring M01-37x155/125, Force 50N	0250-2309
	ML01-12x210/160-20	Slider for MagSpring M01-37x155/125, Force 60N	0250-2303

M01-37x230/200	MagSprings M01-37 with 200mm stroke		
Stator	MS01-37x230	MagSpring Stator 37x230mm	0250-2205
Slider	ML01-12x290/240-10	Slider for MagSpring M01-37x230/200, Force 40N	0250-2304
	ML01-12x290/240-15	Slider for MagSpring M01-37x230/200, Force 50N	0250-2310
	ML01-12x290/240-20	Slider for MagSpring M01-37x230/200, Force 60N	0250-2305

M01-37x305/275	MagSprings M01-37 with 275mm stroke		
Stator	MS01-37x305	MagSpring Stator 37x305mm	0250-2206
Slider	ML01-12x370/320-10	Slider for MagSpring M01-37x305/275, Force 40N	0250-2311
	ML01-12x370/320-15	Slider for MagSpring M01-37x305/275, Force 50N	0250-2312
	ML01-12x370/320-20	Slider for MagSpring M01-37x305/275, Force 60N	0250-2313

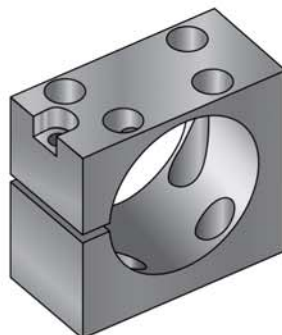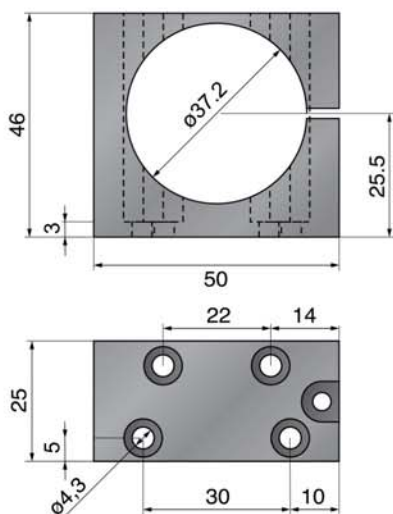## Flange and Adaptor for MagSpring

Flange for MagSpring M01-20
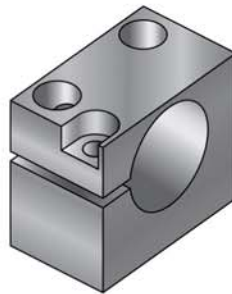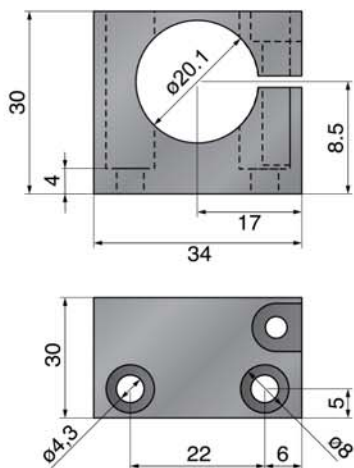
Material: Aluminum (AlMgSi), black anodized
Mass: approx. 30g (0.066lb)

Dimensions in mm

Item	Description	Part Number
MF01-20/H23	Flange MagSpring M01-20 - fits guides H01-23	0250-2306

Flange for MagSpring M01-37

Material: Aluminum (AlMgSi), black anodized
Mass: approx. 70g (0.15lb)

Dimensions in mm

Item	Description	Part Number
MF01-37/H37	Flange MagSpring M01-20 - fits guides H01-37 and B01-37 - fits guides H01-48 and B01-48	0250-2307

Adapters

MagSpring®

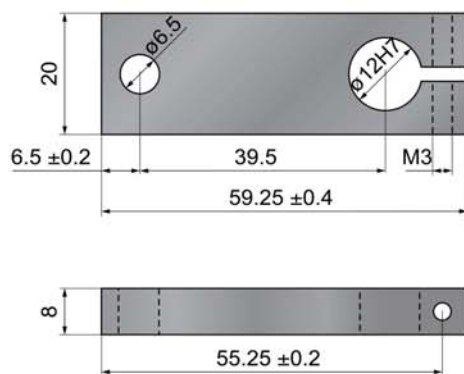## Adaptor for MagSpring M01-20 and Guides H01-23
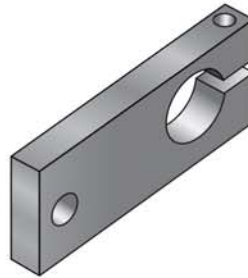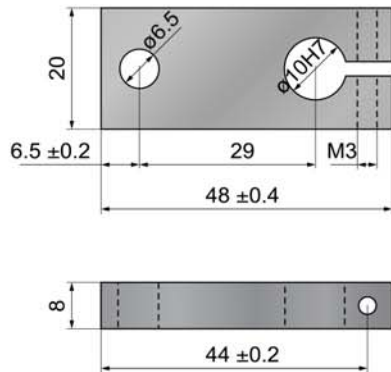
Material: Aluminum (AlMgSi), black anodized
Mass: approx. 18g (0.066lb)

Dimensions in mm

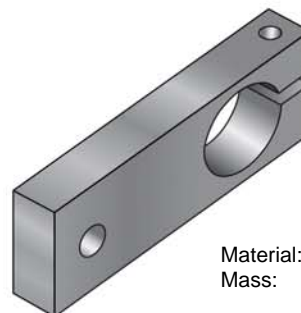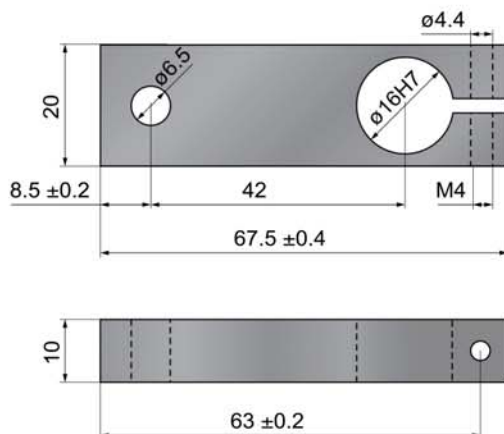| Item	Description	Part Number
MA01-20/H23	Adaptor MagSpring M01-20 / Guides H01-23	0250-0116

Adaptor for MagSpring M01-37 and Guides H01-37 / B01-37

Material: Aluminum (AlMgSi), black anodized
Mass: approx. 18g (0.066lb)

Dimensions in mm

Item	Description	Part Number
MA01-37/H37	Adaptor MagSpring M01-37 / Guides H01-37 and B01-37	0250-0117

Adaptor for MagSpring M01-37 and Guides H01-48 / B01-48

Material: Aluminum (AlMgSi), black anodized
Mass: approx. 32g (0.034lb)

Dimensions in mm

Item	Description	Part Number
MA01-37/H48	Adaptor MagSpring M01-37 / Guides H01-48 and B01-48	0250-0118

Mounting flanges and adapters are available for mounting MagSpring magnetic springs. Using these accessories, the magnetic springs can be mounted directly on an H01 linear guide or a B01 bridge guide.

The flange for mounting the MagSpring stators is secured with T-nuts in the T-slot provided for this purpose on the linear or bridge guide.

For weight balancing in vertical installations, the lower slider end of the MagSpring is attached to the guide shaft of the guide using the adapter.

Depending on the installation orientation of the guide, the adapter is attached to the guide shaft at the front mounting plate (motor on top) or the rear end of the guide shaft (motor on the bottom).

Flange MF01

Adapter MA01
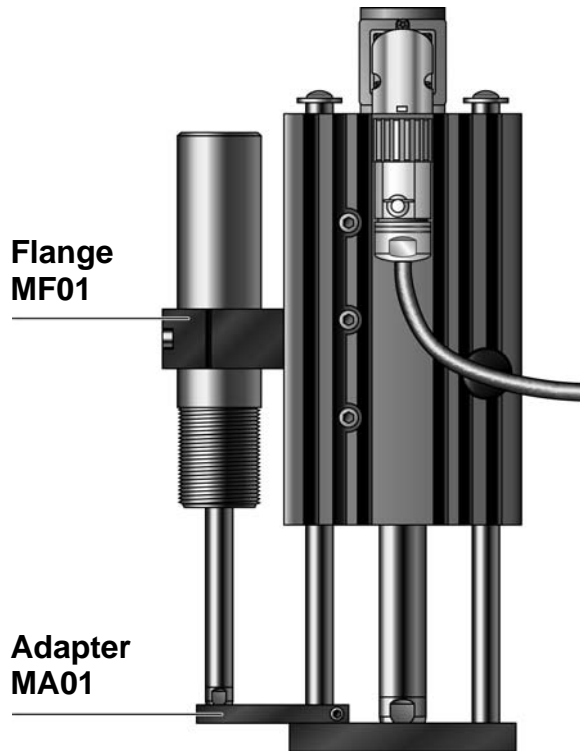
Motor on the top

Motor on the bottom

Combination with H-Guides

The illustration to the right shows a vertical arrangement of an H01 linear guide together with a MagSpring. The MagSpring presses upward with a constant force. The weight load is balanced by the MagSpring, and the linear motor thus bears less load.

If the electrical power supply is interrupted, the MagSpring supports the load, or moves it into a safe waiting position.

Materials

Slider:
Chromium-Nickel Steel 1.4301

Stator:
Iron, electroless nickel plated

Bearing:
POM based

Mounting

The stators can be mounted via the screw thread, or with a clamp, as desired. There are appropriate mounting flanges for both sizes. When attaching the slider to the load mass, care should be taken that any parallelism errors are compensated for with a flexible coupler.
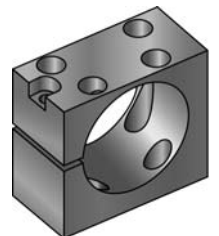
MagSpring®

Magnetic Springs

Remove Gravity from your Application

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