

V-Lock SYSTEM

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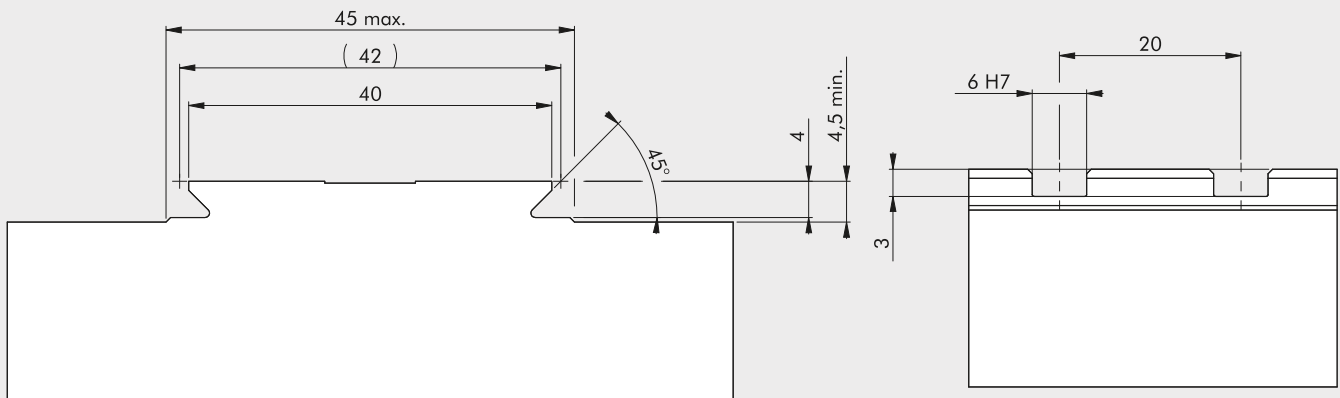
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ELECTRIC AXIS

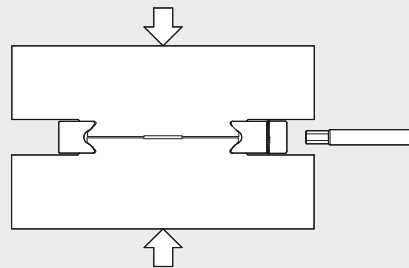
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The V-Lock system is a range of components for automation, fixing elements and accessories featuring a standard modular connecting system, easy assembly, rapid configuration, and the option of either precise repeatable connections or an adjustable mounting position.

Unlike the other components used with machinery and equipment, all V-Lock components have a 40 mm-wide dovetail in the coupling surfaces that extends the entire length of the component. There are precision-cut transversal grooves in the component that are 6^{H7} wide and have a 20 mm pitch.

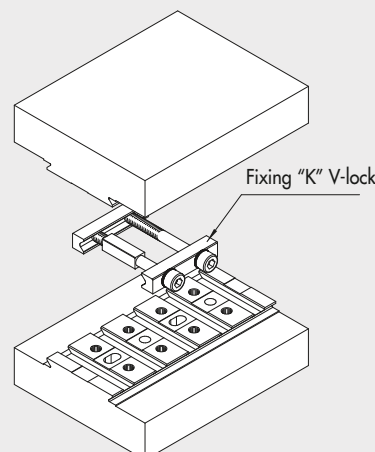


To connect two components, merely bring them into contact and tighten the M5 screws in the fixing elements, transversal to the body of the component. This system makes the assembly, disassembly and reconfiguration of numerous multiple components very quick and easy. Despite this, the parts are connected in a perfectly stable and precise manner.

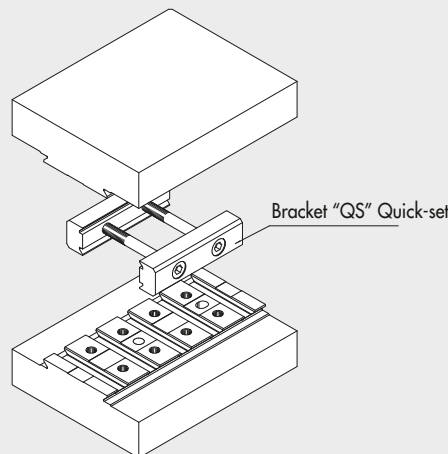


There are two types of fixing element for connecting V-Lock components, type K for highly compact, precise and repeatable fixing, and type QS to give a flexible system that can be regulated at the mounting stage.

When using K elements, insert the hollow square key (6^{H8}) in one of the transversal grooves (6^{H7}) and the M5 screw in the adjacent free-passage slot. This means the components will always be in the original position when the coupling is disassembled or reassembled.

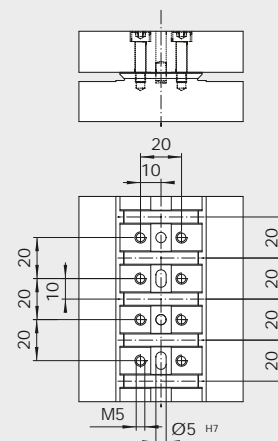
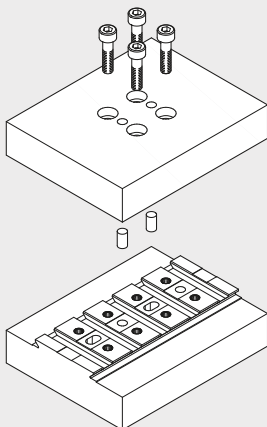


If you require mechanical adjustment of the position at the assembly stage, it is preferable to use QS elements, which form part of the Montech® Quick-set system. The distance between components allows free passage of the M5 screws, which do not affect the relative position of the components, which remain apart. The assembly position must be regulated whenever the components are disassembled.



The V-Lock system comes with a series of modules and accessories designed to allow free spatial positioning of the components. The range includes cross adaptors, 45° and 90° squares, which are described in detail in the catalogue. V-Lock components can be connected to Quick-set sections by Montech® using QS fixing elements because the dovetails in the two systems are the same. V-Lock components can also be connected to all the main extruded sections with a slot centre distance of 40 mm or 45 mm. There is also a universal adaptor for the longitudinal assembly of V-Lock components and one for transversal assembly.

Where physically possible, all the faces of V-Lock components have a series of M5 threaded holes, pitch 20 x 20 mm, and holes for Ø 5 pins to allow standard mounting of external elements on V-Lock components.

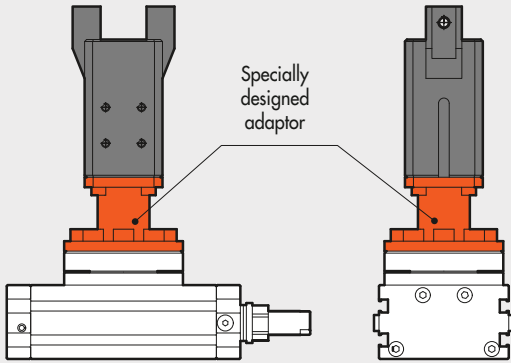


This standard and universal modular system makes the designer's work easier because it is not necessary to design adaptors, flanges, brackets and so on, and he can concentrate on the heart of the problem, namely the design of the machine. Likewise, the person who assembles the components is provided with a complete kit that is quick and easy to use, so the machine can be assembled, set up and reconfigured in a very short time.

In short, with the V-Lock system you can:

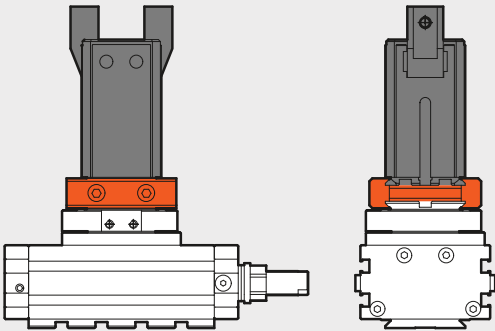
- connect anything to anything: grippers, slides, rotary actuators or guide units, or even aluminium structures of any make
- have any spatial orientation
- make a simple quick-to-lock connection that is accessible from all sides
- avoid adaptor plates between components
- obtain an extremely robust connection that can withstand high loads and vibration
- construct a system with precision to the hundredth of a millimetre and repeatable, so that when a component is removed for maintenance, it can be repositioned accurately.

NON-MODULAR SYSTEM



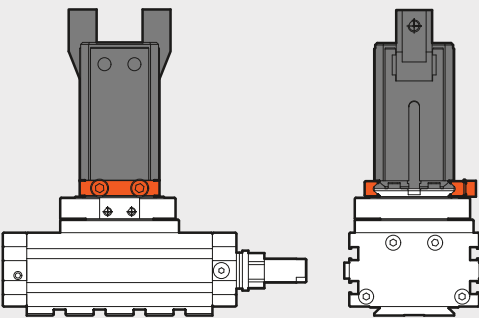
Adaptors have to be designed, produced and assembled.

Quick-set SYSTEM (Montech[®])



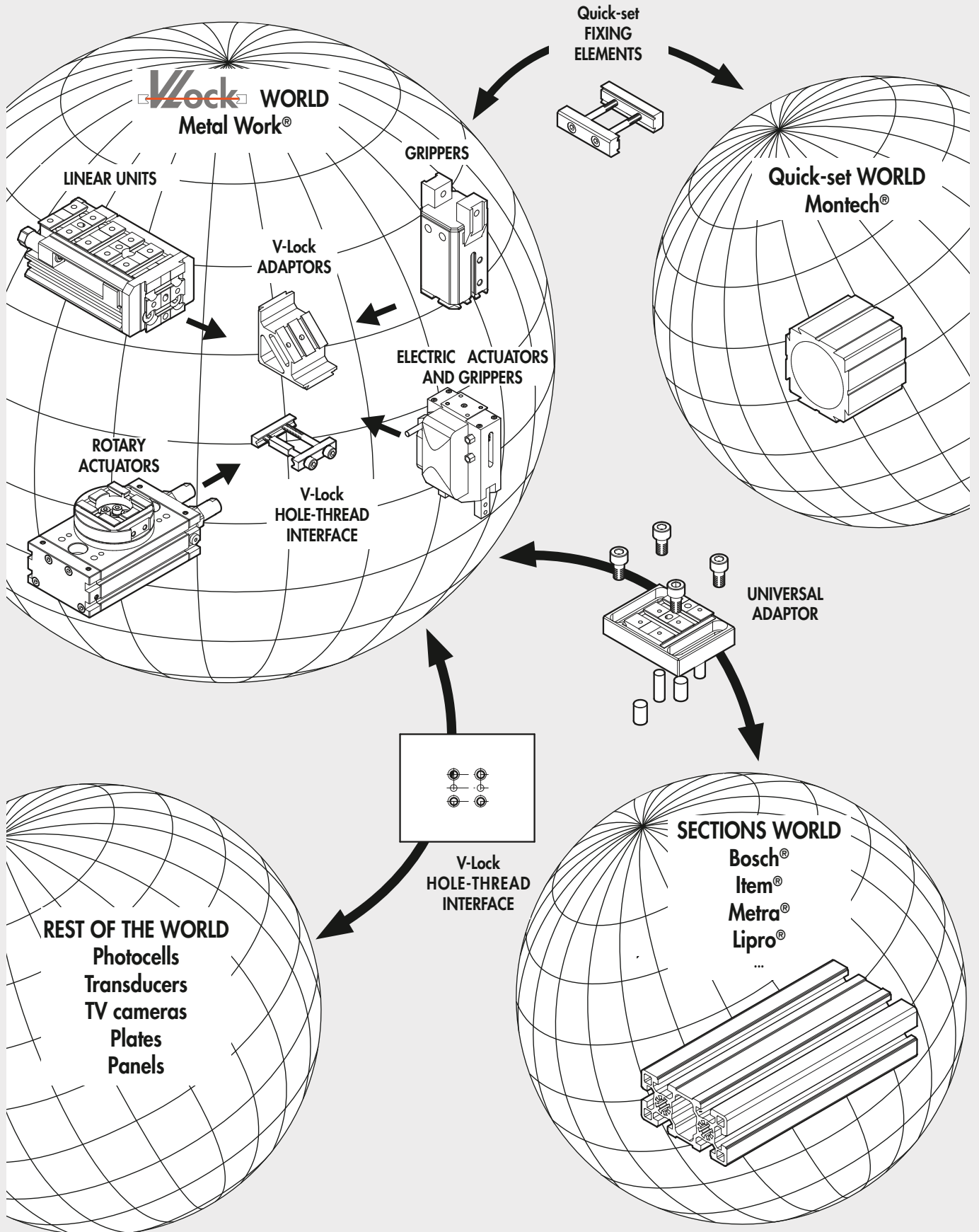
- ① ✓ No adaptors required
- ② ✓ High rigidity
- ③ ✓ Longitudinally adjustable position
- ④ /
- ⑤ /
- ⑥ /
- ⑦ ✓ Rapid assembly
- ⑧ ✓ Easy access to fastening screws

V-Lock System (Metal Work[®])



- ① ✓ No adaptors required
- ② ✓ Improved rigidity
- ③ /
- ④ ✓ Accurate positioning using a key
- ⑤ ✓ Positioning repeatability after disassembly
- ⑥ ✓ Reduced overall dimensions
- ⑦ ✓ Rapid assembly
- ⑧ ✓ Easy access to fastening screws

THE V-Lock WORLD CAN BE COMBINED WITH OTHER WORLDS OF AUTOMATION

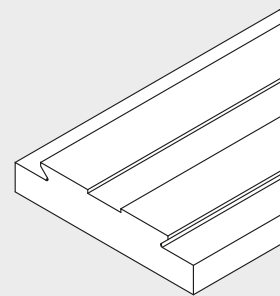
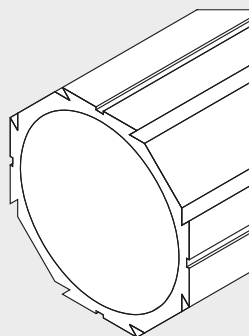
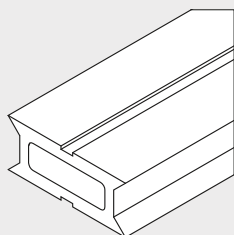
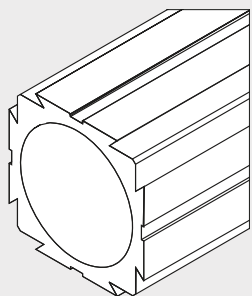


THE WORLD of Quick-set Montech[®]

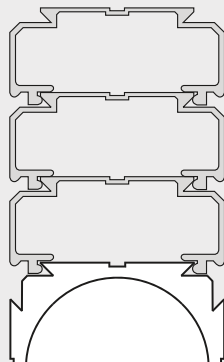
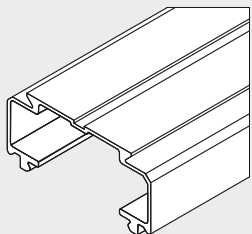
Quick-set is flexible system consisting of modular elements for the construction of assembly machines.

The system consists of:

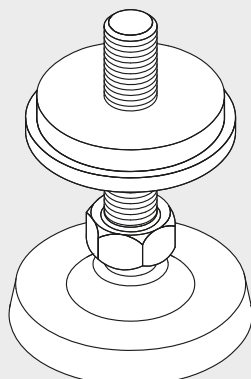
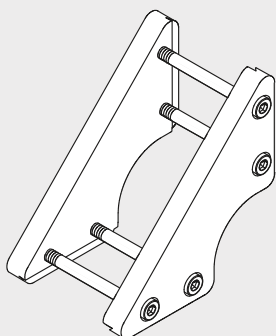
- bearing elements made of extruded aluminium, such as the following sections:



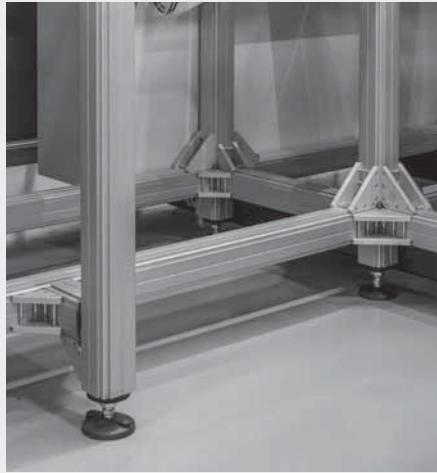
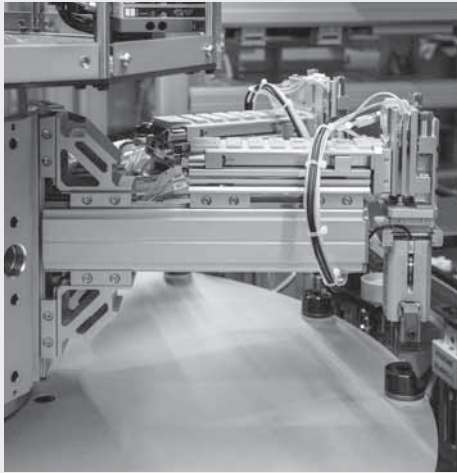
- accessories made of extruded aluminium, such as the cable trunk:



- accessories for various types of connection, such as angle brackets or legs:



The V-Lock components are easy to connect to elements in the Quick-set series, using Quick-set fixing elements, which means that complete assembly machines or parts thereof can be constructed quickly and modularly.
The Montech[®] components are not sold by Metal Work[®]: for further details, please log on to sito www.montech.com



NOTES

Metal Work products in the V-Lock series can be connected using either type K fixing system or QS fixing system, by Montech® Quick-Set.

Both modular systems are complementary and interchangeable.

The V-Lock system guarantees accurate and repeatable positioning, even longitudinally. A hollow key can be inserted in the transverse grooves in the dovetails in the components (f8/H7 coupling).

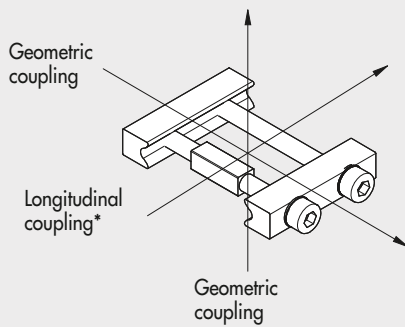
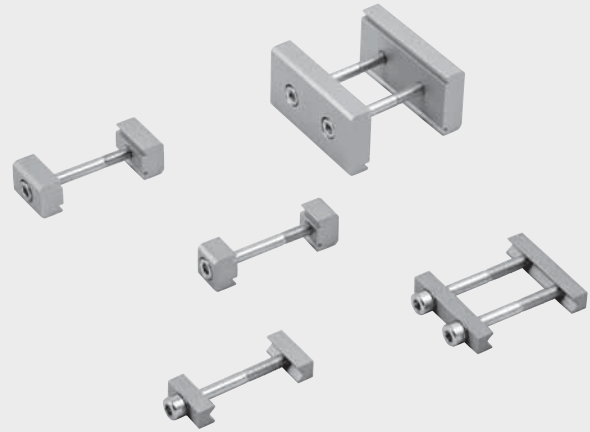
Components connected using K elements are slightly detached from each other (minimum 0.4 mm distance between the adjacent surfaces of two components) to allow self-centring during assembly.

QS fixing elements allow longitudinal adjustment during assembly, without limiting the fitter to a particular position. Here, too, the components are detached, but by more compared to the K system - 8 mm or 22 mm, depending on the connecting element chosen.

Both systems give rapid and accurate couplings that are very sturdy and vibration-resistant due to the dovetail joint and do not require specially designed adaptors.

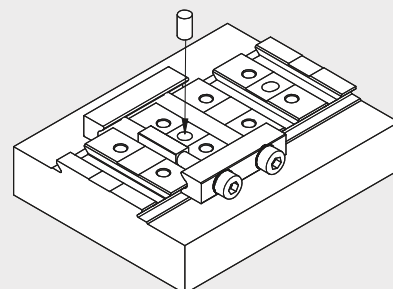
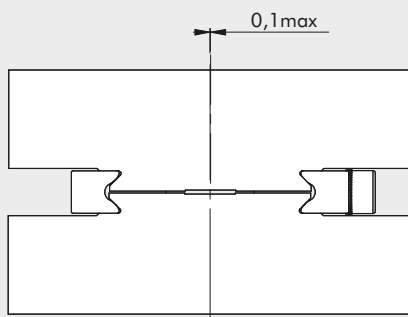
The screws all remain accessible, so the components are easy to disassemble.

For very high loads there is a 6 mm solid square key with f8 tolerance (see accessories) that can be positioned between the free grooves in adjacent V-Lock elements.



* Resistance to the reciprocal displacement of two components with a 6 Nm screw torque.

Tests conducted with intact and undamaged elements.

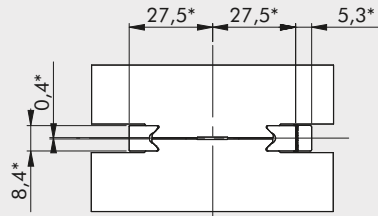


The V-Lock system allows transversal self-centring of the components. If the K blocks are mounted correctly, the alignment error is less than 0.1 mm.

If greater precision is required, one or two Ø 5 pins can be inserted in the slots provided.

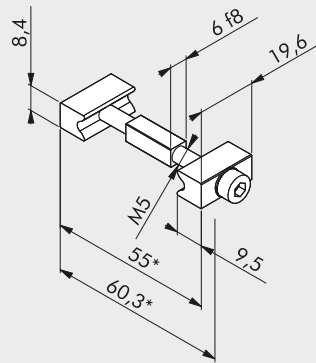
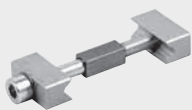
K FIXING ELEMENT

STANDARD TRANSVERSE DIMENSIONS



*dimensions with element fixed

K FIXING ELEMENT WITH ONE SCREW, CODE W0950005051K

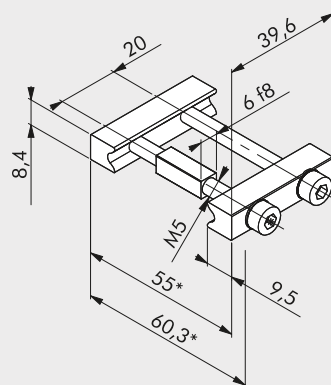
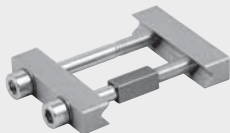


Short fixing element for low stress.

Resistance to longitudinal displacement	750 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.020 kg

*dimensions with element fixed

K FIXING ELEMENT WITH TWO SCREWS, CODE W0950005052K

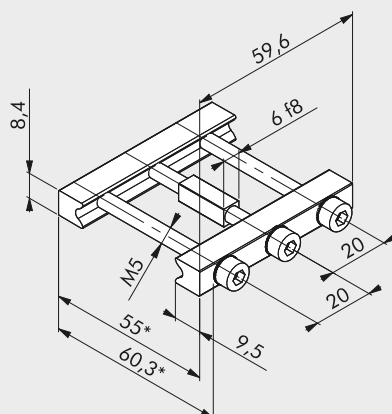
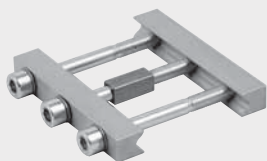


Fixing element for high stress.

Resistance to longitudinal displacement	3.000 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.037 kg

*dimensions with element fixed

K FIXING ELEMENT WITH THREE SCREWS, CODE W0950005053K

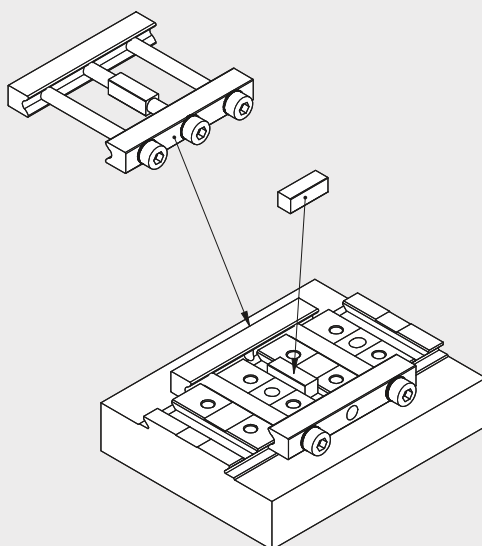


Fixing element for very high stress.

Resistance to longitudinal displacement	5.000 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.055 kg

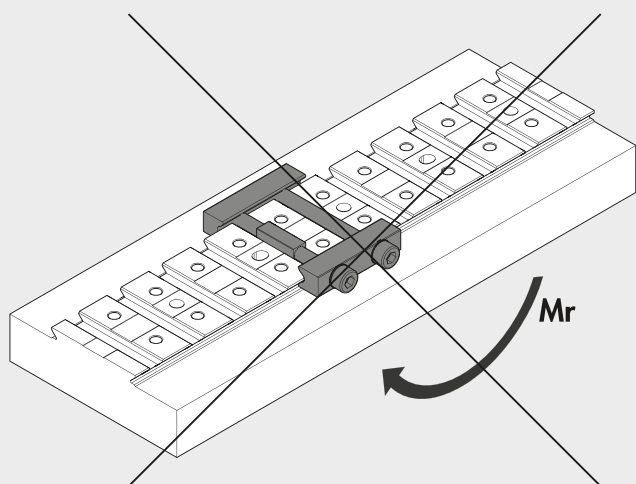
*dimensions with element fixed

For applications with high impacts, accelerations and masses, the resistance of the coupling system can be increased by inserting a solid key (code W0950005151K see accessories page 1-268) instead of a screw and hollow key.

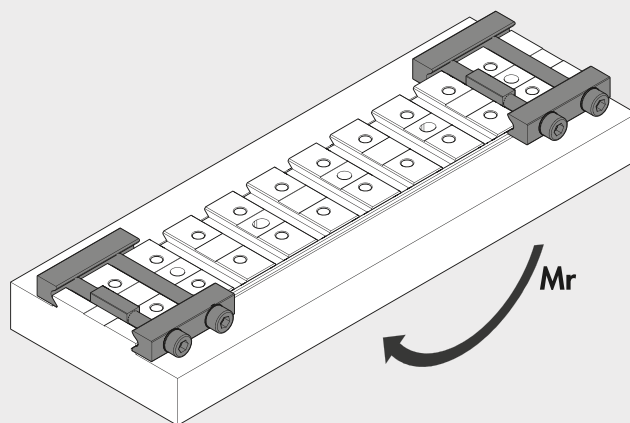


The number and size of fixing elements depend on the specific application. Under operating conditions of high speed, pressure and load, we recommend installing two elements with two screws as spaced as possible from each other.

NO

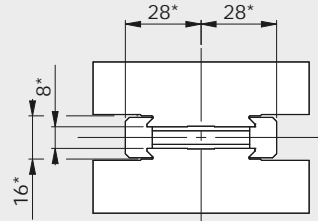


YES



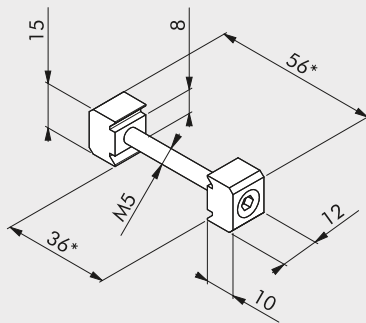
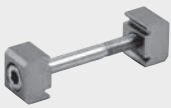
FIXING ELEMENT QS

QS HEIGHT 8 mm: STANDARD TRANSVERSE DIMENSIONS



*dimensions with element fixed

QS 12-8 FIXING ELEMENT, CODE W0950005000K

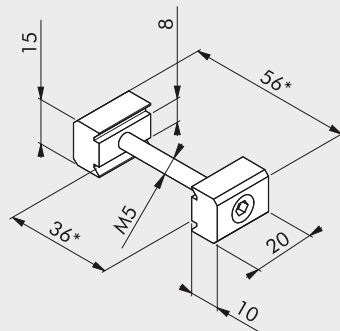
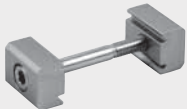


*dimensions with element fixed

Short fixing element for low stress.

Resistance to longitudinal displacement	750 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.016 kg

QS 20-8 FIXING ELEMENT, CODE W0950005001K

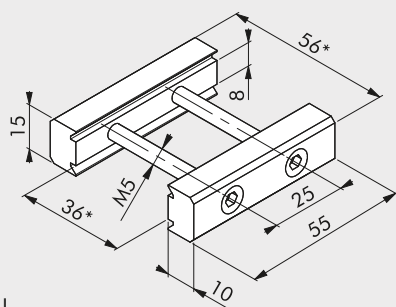
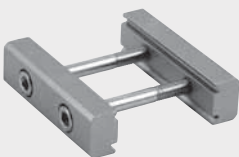


*dimensions with element fixed

Short fixing element for medium stress.

Resistance to longitudinal displacement	1.350 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.020 kg

QS 55-8 FIXING ELEMENT, CODE W0950005003K

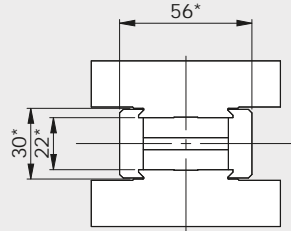


*dimensions with element fixed

Fixing element for high stress.

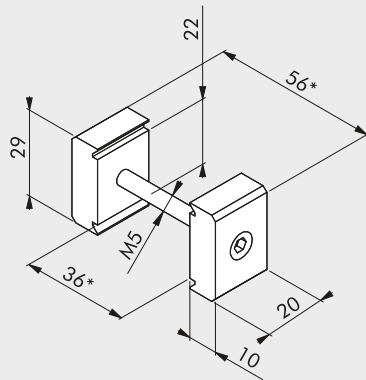
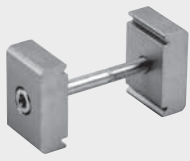
Resistance to longitudinal displacement	3.000 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.055 kg

QS HEIGHT 22 mm: STANDARD TRANSVERSE DIMENSIONS



*dimensions with element fixed

QS 20-22 FIXING ELEMENT, CODE W0950005002K

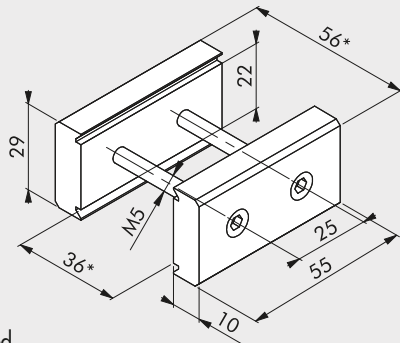
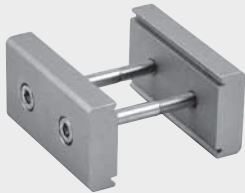


*dimensions with element fixed

Short fixing element for medium stress and greater distances.

Resistance to longitudinal displacement	1.350 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.022 kg

QS 55-22 FIXING ELEMENT, CODE W0950005004K



*dimensions with element fixed

Short fixing element for high stress and greater distances.

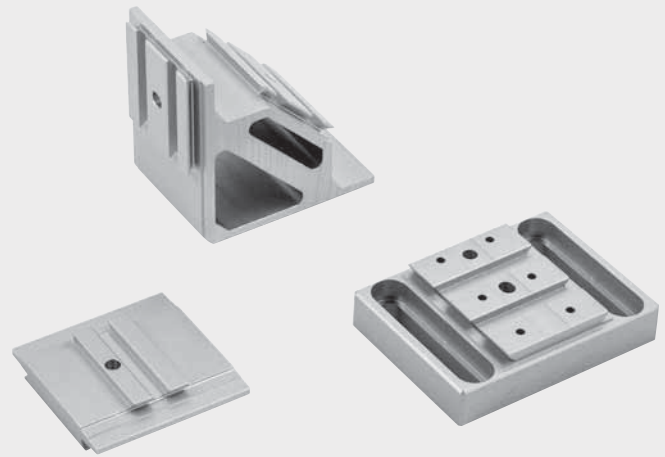
Resistance to longitudinal displacement	3.000 N
Recommended screw torque	6 Nm
Parallelism of locked surfaces	±0.02 mm
Material	Anodized aluminium
Weight	0.096 kg

NOTES

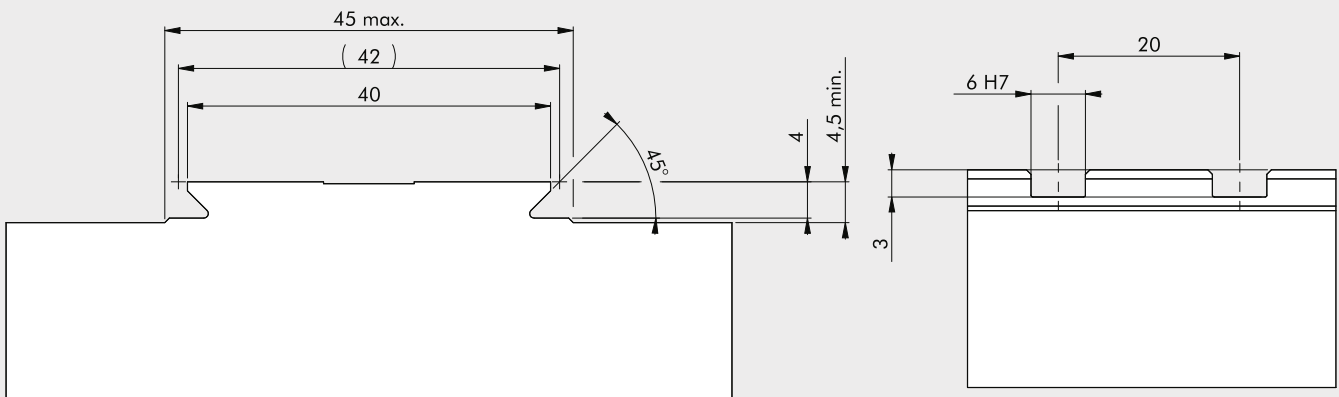
V-Lock adaptors can be used to connect various components quickly and securely when you require a rotated fixing or you need to adapt single-groove elements to multiple-groove elements.

All these adaptors have a 45° dovetail for connection using K and QS fixing elements.

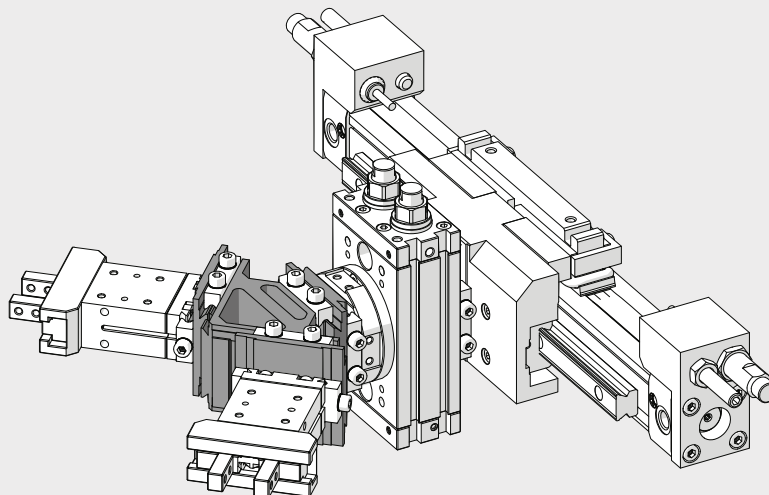
Where possible, pinholes have been drilled in the surfaces for interfacing with other components.



DIMENSIONS OF V-Lock DOVETAIL

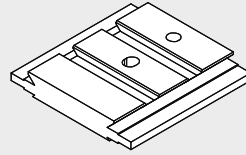
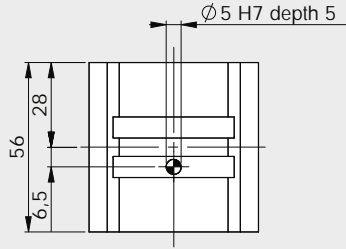
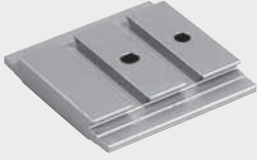


GENERAL APPLICATION OF V-Lock ADAPTORS



2-1 PARALLEL ADAPTOR, CODE W0950005100K

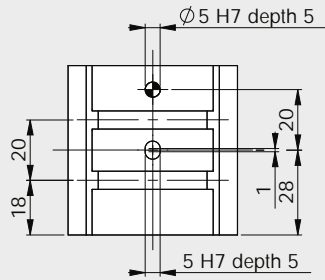
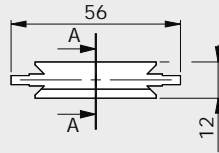
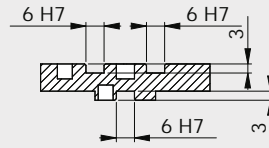
NOTE. For standard dovetail dimensions see page 1-257.



ACTUATORS

V-Lock ADAPTORS

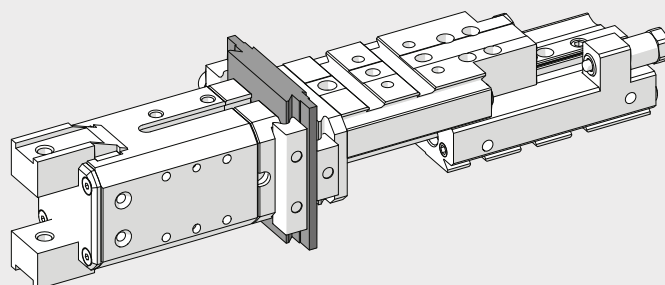
A-A



Adaptor suitable for parallel coupling of two V-Lock components, one with at least two grooves and the other with one groove only.

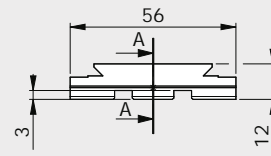
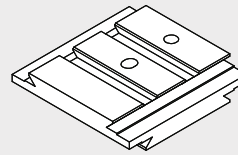
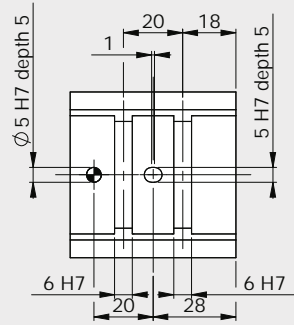
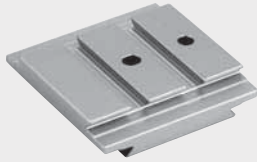
Material Anodized aluminium
Weight 0.060 kg

EXAMPLE OF APPLICATION

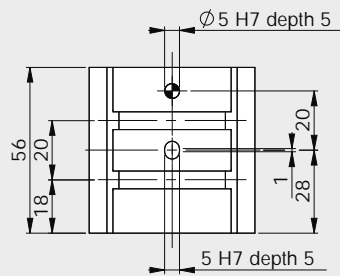
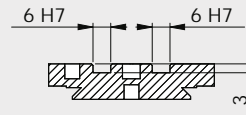


2-2 CROSS ADAPTOR, CODE W0950005110K

NOTE. For standard dovetail dimensions see page 1-257



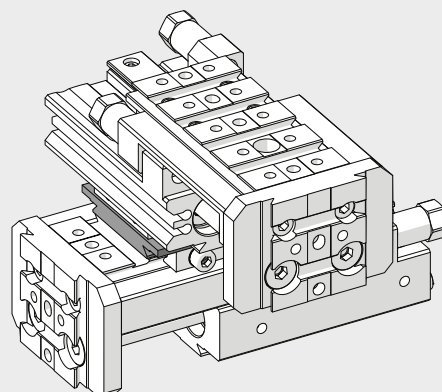
A-A



Adaptor suitable for cross-coupling two V-Lock components, both with at least two grooves.

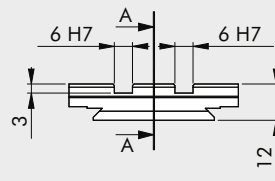
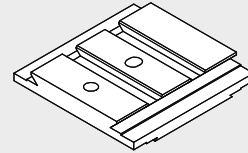
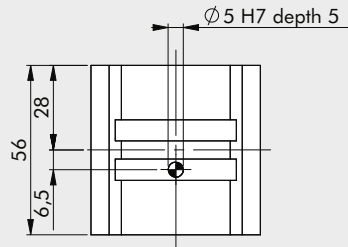
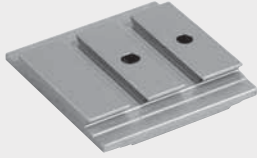
Material Anodized aluminium
Weight 0.069 kg

EXAMPLE OF APPLICATION

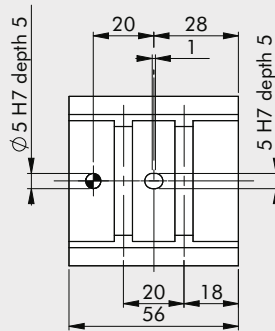
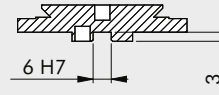


2-1 CROSS ADAPTOR, CODE W0950005120K

NOTE: For standard dovetail dimensions see page 1-257



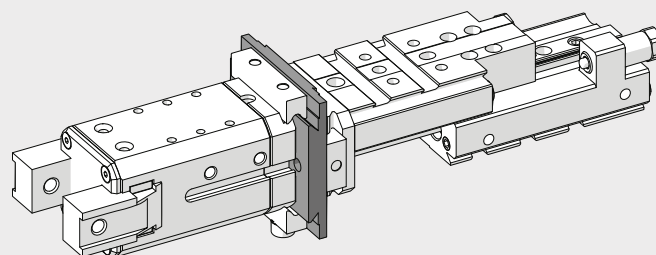
A-A



Adaptor suitable for cross-coupling of two V-Lock components, one with at least two grooves and the other with one groove only.

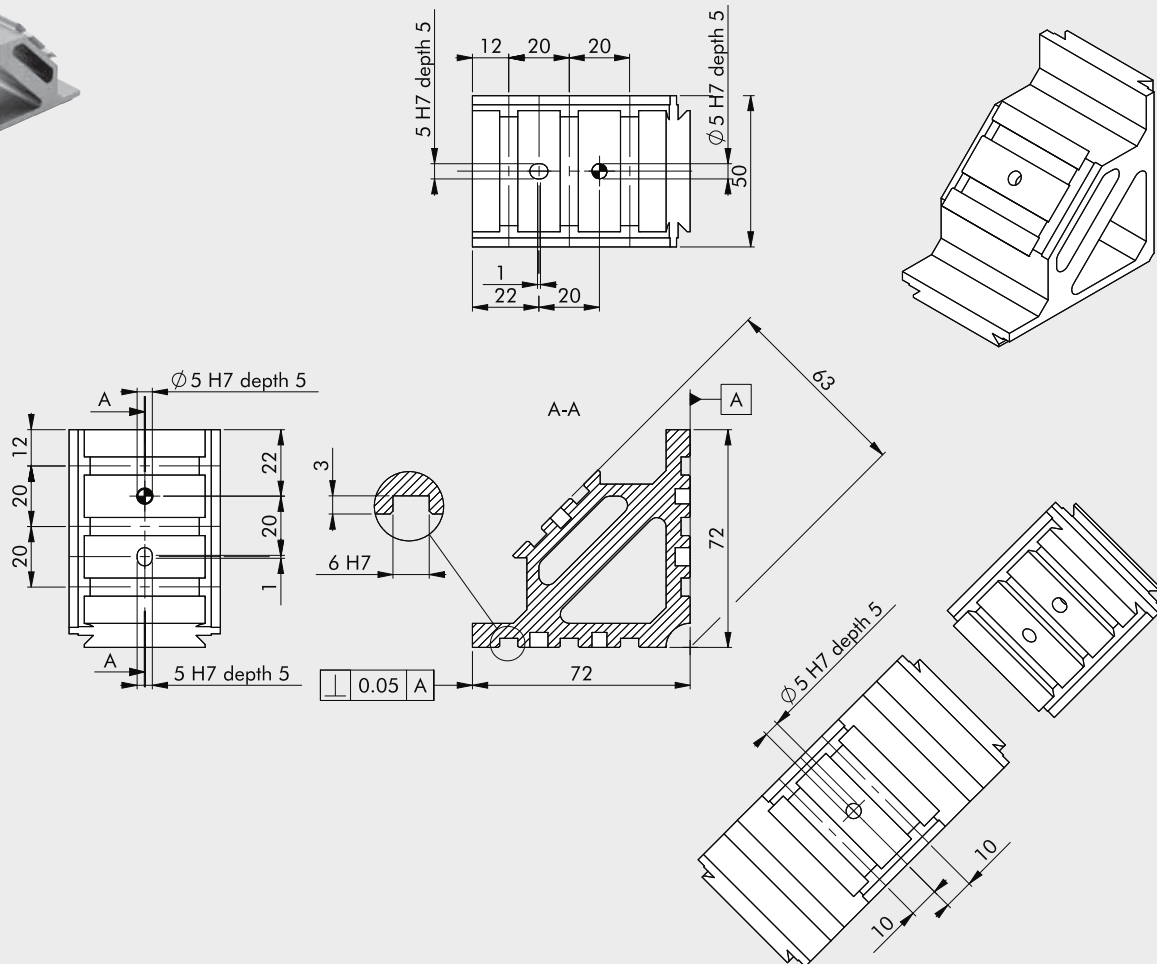
Material Anodized aluminium
Weight 0.060 kg

EXAMPLE OF APPLICATION



LONGITUDINAL BRACKET, CODE W0950005200K

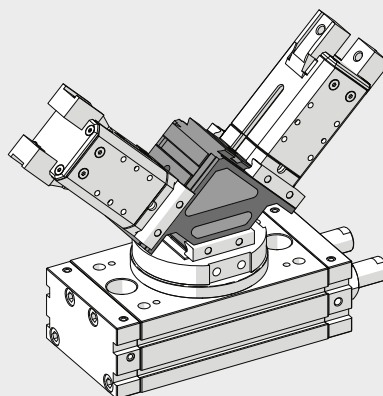
NOTE. For standard dovetail dimensions see page 1-257



Adaptor suitable for the rotated coupling of two or three V-Lock components, with two right-angle supporting surfaces and parallel grooves. The third surface is at 45° angle and the grooves are parallel to those in the other two faces.

Material Anodized aluminium
Weight 0.235 kg

EXAMPLE OF APPLICATION

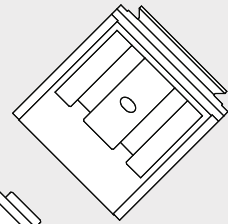
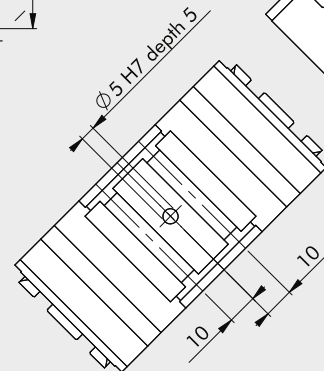
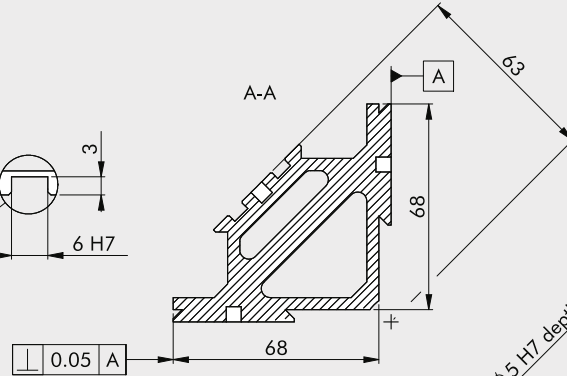
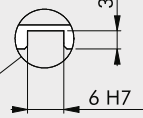
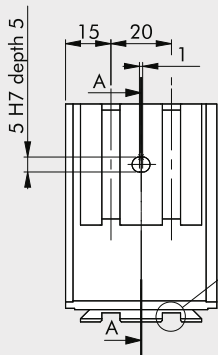
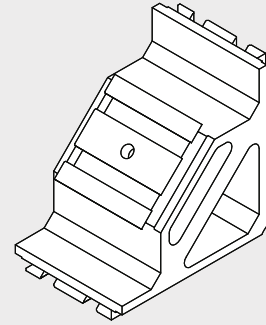
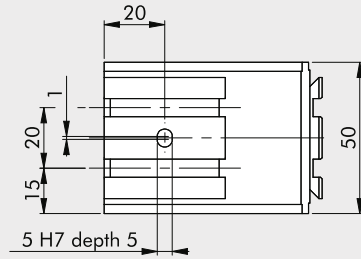
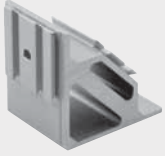


TRANSVERSAL BRACKET, CODE W0950005201K

NOTE: For standard dovetail dimensions see page 1-257

ACTUATORS

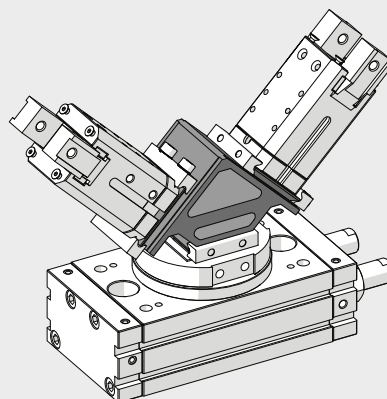
V-Lock ADAPTORS



Adaptor suitable for the rotated coupling of two or three V-Lock components, with two supporting surfaces at right angles. The third surface is at 45° angle. All the grooves are parallel.

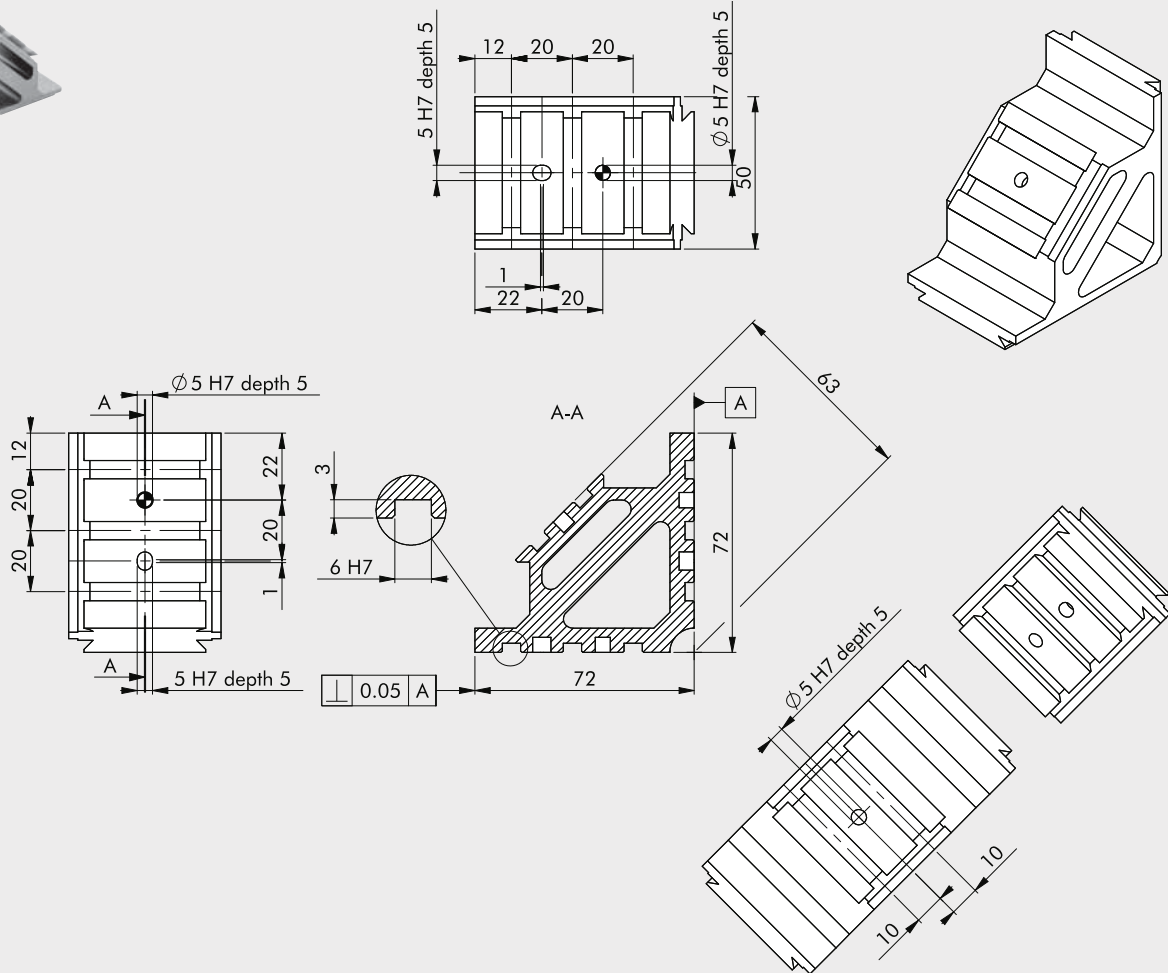
Material Anodized aluminium
Weight 0.218 kg

EXAMPLE OF APPLICATION



CROSS BRACKET, CODE W0950005202K

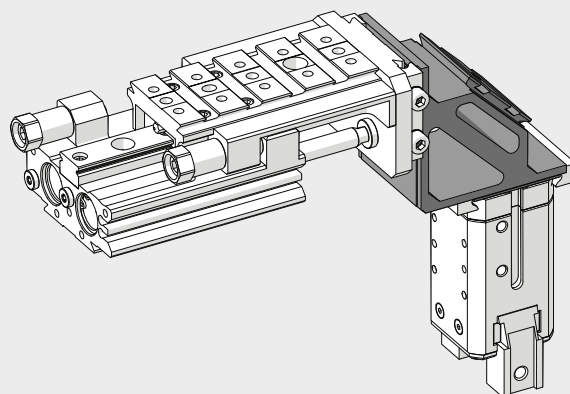
NOTE: For standard dovetail dimensions see page 1-257



Adaptor suitable for the rotated coupling of two or three V-Lock components, with two right-angled supporting surfaces and grooves at right angles. The third surface is at 45° angle.

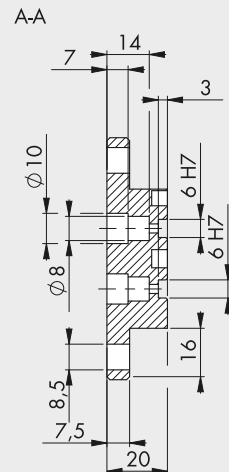
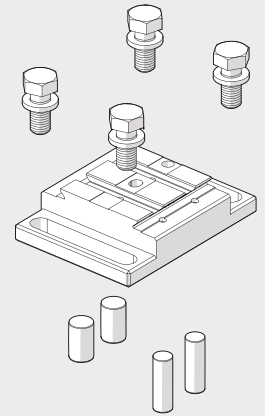
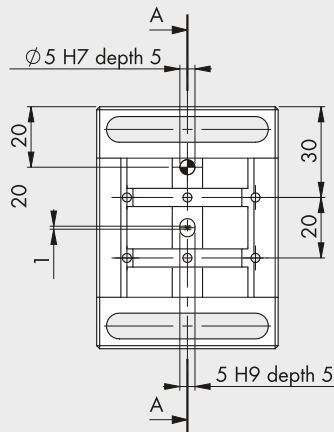
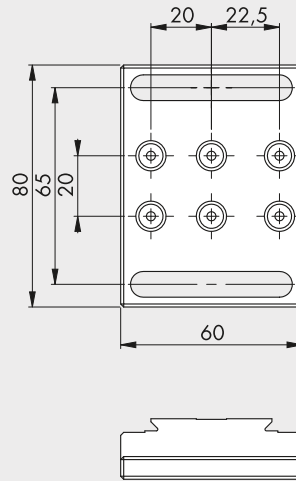
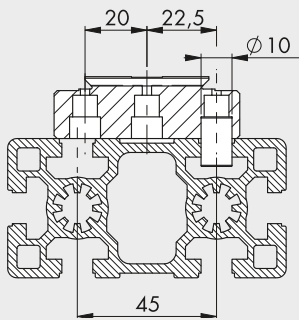
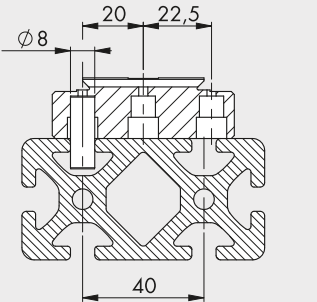
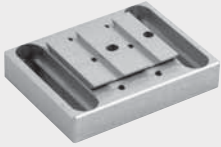
Material Anodized aluminium
Weight 0.218 kg

EXAMPLE OF APPLICATION



LONGITUDINAL ADAPTOR, CODE 0950008001K

NOTE: For standard dovetail dimensions see page 1-257

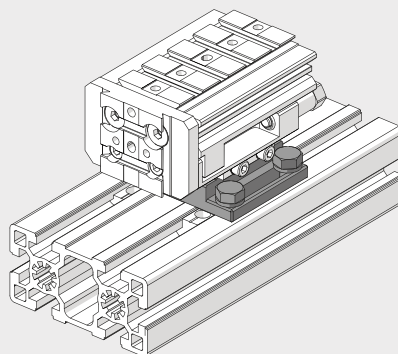


An adaptor for fixing V-Lock components longitudinally onto extruded sections, with slots with 40 or 45 mm centre distance or 8 or 10 mm width. If the slots have a 40 mm centre distance, insert two pins in the slots 20 mm from the axis of the adaptor and use them as an alignment reference. If the slots have a 45 mm centre distance, use the 22.5 mm pin slots.

Kit contents:

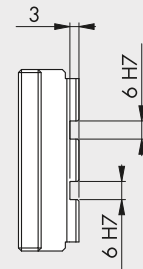
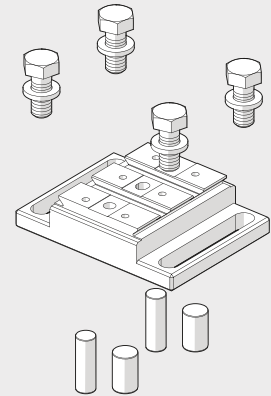
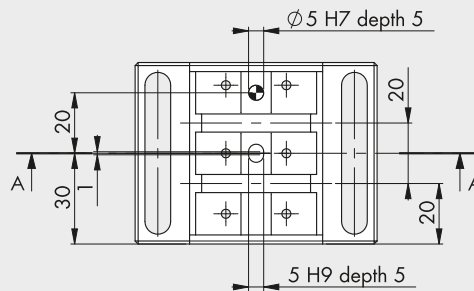
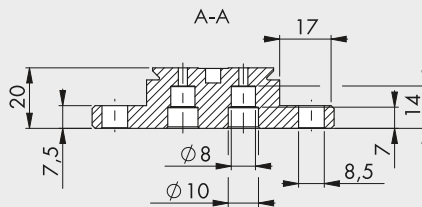
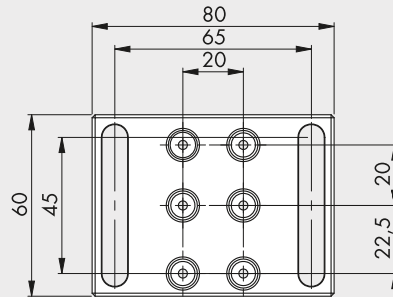
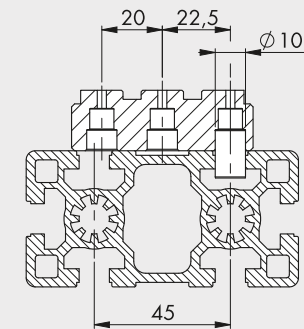
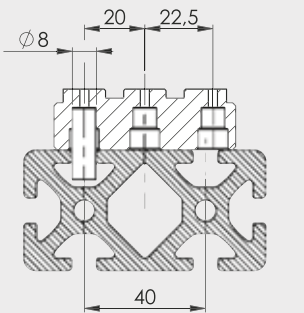
1 longitudinal adaptor	Material	Anodized aluminium
	Weight	0.164 kg
2 cylindrical pins $\varnothing 10 \times 16$		
2 cylindrical pins $\varnothing 8 \times 24$		
4 galvanised M8 x 16 screws		

EXAMPLE OF APPLICATION



TRANSVERSAL ADAPTOR, CODE 0950008002K

NOTE: For standard dovetail dimensions see page 1-257

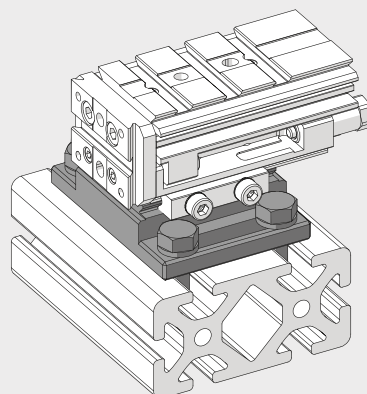


An adaptor for fixing V-Lock components transversally onto extruded sections, with slots with 40 or 45 mm centre distance or 8 or 10 mm width. If the slots have a 40 mm centre distance, insert two pins in the slots 20 mm from the axis of the adaptor and use them as an alignment reference. If the slots have a 45 mm centre distance, use the 22.5 mm pin slots.

Kit contents:

1 transversal adaptor:	Material	Anodized aluminium
	Weight	0.160 kg
2 cylindrical pins Ø 10 x 16		
2 cylindrical pins Ø 8 x 24		
4 galvanised M8 x 16 screws		

EXAMPLE OF APPLICATION



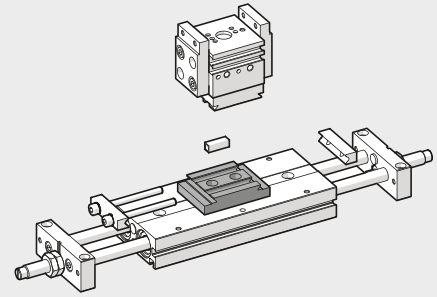
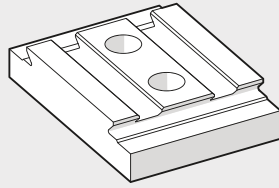
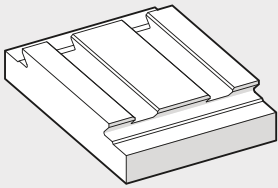
V-Lock TRANSFORMER

V-Lock transformers can be used to connect components other than V-Lock to the system or V-Lock components to other types of frames (e.g. bases, plates and walls). V-Lock transformers can be supplied without fixing screw holes or pinholes. This means that you can create the desired configuration. For other similar adapters, please refer to 1-424 and following pages. The example below shows how to transform an S11 slide into a V-Lock slide.

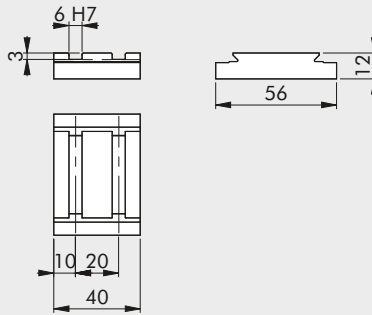
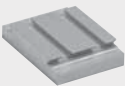
Start from V-Lock transformer

Drill a hole where required

Apply to the component



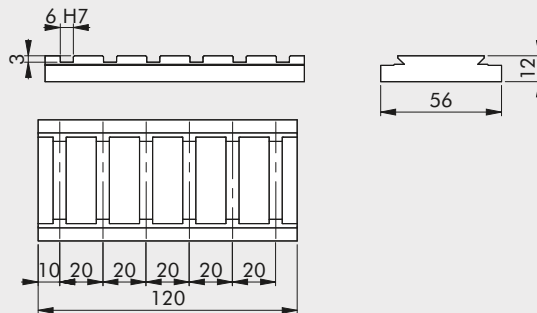
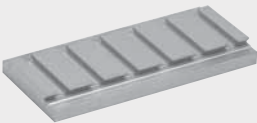
2-GROOVE V-Lock TRANSFORMER, CODE 0950008012K



Weight: 0.060 kg
Material: anodized aluminium

NOTE. For standard dovetail dimensions see page 1-257

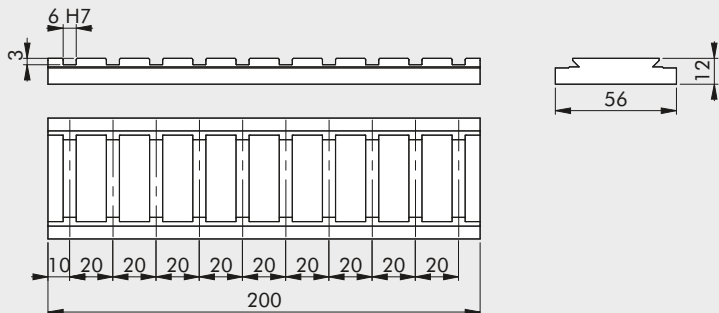
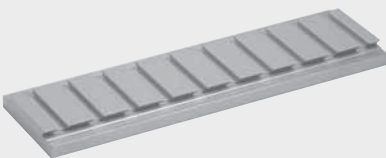
6-GROOVE V-Lock TRANSFORMER, CODE 0950008016K



Weight: 0.181 kg
Material: anodized aluminium

NOTE. For standard dovetail dimensions see page 1-257

10-GROOVE V-Lock TRANSFORMER, CODE 0950008020K



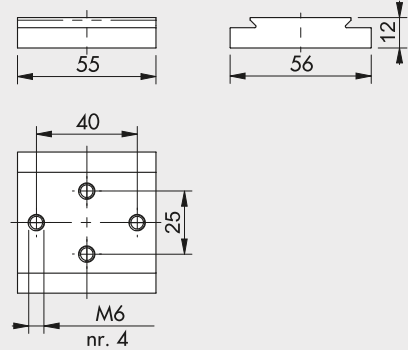
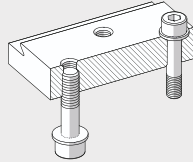
Weight: 0.301 kg
Material: anodized aluminium

NOTE. For standard dovetail dimensions see page 1-257

QS TRANSFORMER L = 55, CODE 0950008050K



Fixing from below with M6 screw, or from above with through M5 screw.



Weight: 0.087 kg
Material: anodized aluminium

NOTE. For standard dovetail dimensions see page 1-255 and 1-257.

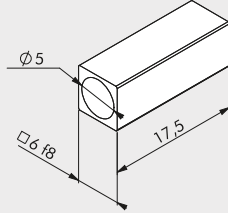
NOTE

ACCESSORIES

ACTUATORS

V-LOCK ACCESSORIES AND SPARE PARTS

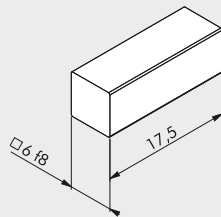
V-Lock HOLLOW KEY



Code	Description
W0950005150K	V-Lock hollow key kit

Note: Kit of 5 stainless steel 6 x 6 hollow keys

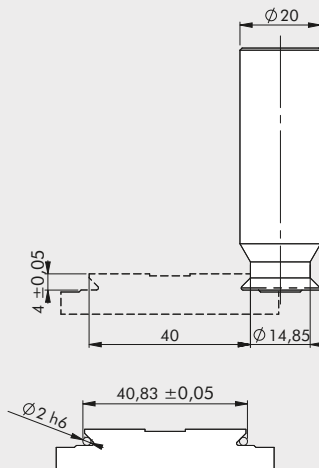
V-Lock SOLID KEY



Code	Description
W0950005151K	V-Lock key kit

Note: Kit of 5 stainless steel solid 6 x 6 keys

V-Lock profile tool



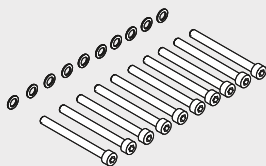
Code	Description
9000770	Tool for V-Lock profile

Workable materials: aluminium – steel

Note: This tool can be used to obtain the dovetail V-Lock profile on parts and/or components without it (e.g. plates, jibs and columns).

SPARE PARTS

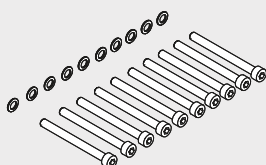
V-Lock SCREW KIT



Code	Description
W0950005170K	K screw kit

Note: Kit of 10 galvanised M5x5 screws (class 8.8) and 10 galvanised knurled M5 washers

Quick-Set SCREW KIT



Code	Description
W0950005171K	QS screw kit

Note: Kit of 10 galvanised M5x50 screws (class 8.8) and 10 galvanised knurled M5 washers

RODLESS CYLINDERS WITH BALL RECIRCULATING GUIDE SERIES



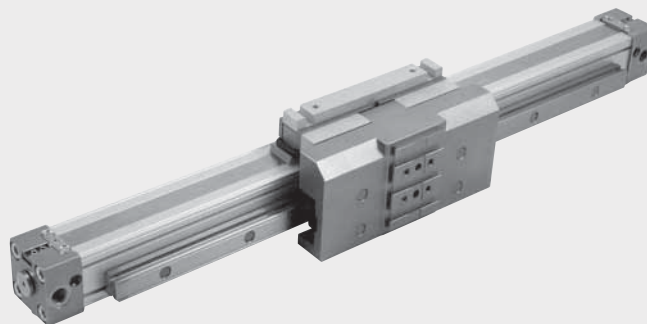
V-Lock rodless cylinders come with bores $\varnothing 16$, $\varnothing 25$ and $\varnothing 32$. Their main feature is that the carriage support has a dovetail with V-Lock grooves for mounting other components in the V-Lock family. The provision of threaded holes and centring pins allows non-V-Lock components to be fixed onto the carriage.

The fixing legs also use the V-Lock system, so the cylinder can be fixed onto something else using K or QS elements.

The carriage support is mounted on ball-recirculation pads that run on tempered guides and can withstand very high loads and moments.

Main features of V-Lock rodless cylinders:

- extruded anodized aluminium alloy cylinder liner;
- sensor grooves in the liner;
- longitudinal pneumatic seal system using stainless steel non-deformable strips;
- very high load capacities acting in any direction, without affecting the cylinder carriage in any way;
- tempered steel guide anchored firmly to the cylinder liner;
- ball-bearing pads made using special technology to allow very silent operation and long maintenance intervals;
- built-in adjustable pneumatic cushioning;
- provision for the application of adjustable stops and shock absorbers;
- with diameter 32 cylinders, the valves can be fixed onto the liner using the retracting sensor grooves, without the need for intermediate brackets.



ACTUATORS

RODLESS CYLINDERS WITH BALL RECIRCULATING GUIDE SERIES V-Lock

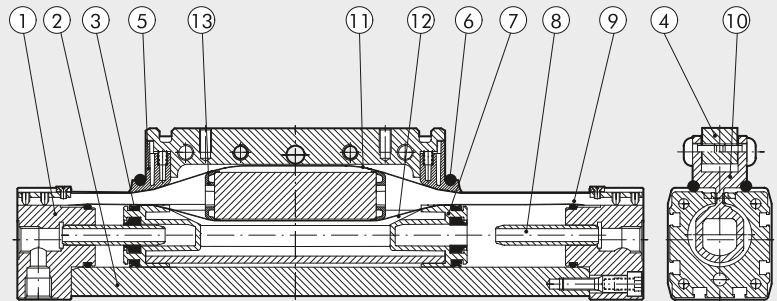
TECHNICAL DATA		
Operating pressure	bar	1 to 8
	MPa	0.1 to 0.8
Temperature range	psi	14.5 to 116
	$^{\circ}\text{C}$	-10 to +80
	$^{\circ}\text{F}$	14 to 176
Fluid		If unlubricated 50 μm unfiltered air is used, lubrication must be deactivated
Bore	mm	$\varnothing 16$; 25; 32
Design		Double-acting rodless cylinder with direct transmission system
Strokes	mm	$\varnothing 16$: from 100 to 1350 with intervals of 1
		$\varnothing 25$: from 100 to 2300 with intervals of 1
		$\varnothing 32$: from 100 to 2300 with intervals of 1
Threaded ports		M5, 1/8", 1/4"
Fixing position		Free
Max. speed with or without shock absorbers	m/s	≤ 1
Notes		For speeds lower than 0,2 m/s, to prevent bounce, use the non-stick/slip version with unlubricated. When operating conditions exceed the values shown in the "Diagram of speed and maximum cushionable load", it is advisable to use the version with external shock absorbers.
Lubrication		Every 2000 km or once a year (grease code 9910506)

WEIGHTS

\varnothing	Version 275		Version 276	
	Weight [g] Stroke = 0	CNK Weight [g] every mm	Weight [g] Stroke = 0	CNK Weight [g] every mm
16	500	1.79	758	1.79
25	1676	2.99	2208	2.99
32	3168	5.04	4381	5.04

COMPONENTS

- ① CYLINDER HEAD: aluminium alloy
- ② LINER: shaped anodized aluminium alloy
- ③ PISTON GASKET: NBR o FKM/FPM
- ④ CENTRAL ELEMENT: aluminium alloy
- ⑤ WIPER RING: Hostaform[®]
- ⑥ OR-SEAL: FKM/FPM
- ⑦ PISTON: Hostaform[®]
- ⑧ CUSHIONING CONE: aluminium alloy
- ⑨ STATIC OR-SEAL: NBR or FKM/FPM
- ⑩ CARRIAGE: aluminium alloy
- ⑪ BOUTER STRIP: stainless steel
- ⑫ INNER STRIP: stainless steel
- ⑬ BAND SUPPORT: Hostaform[®]



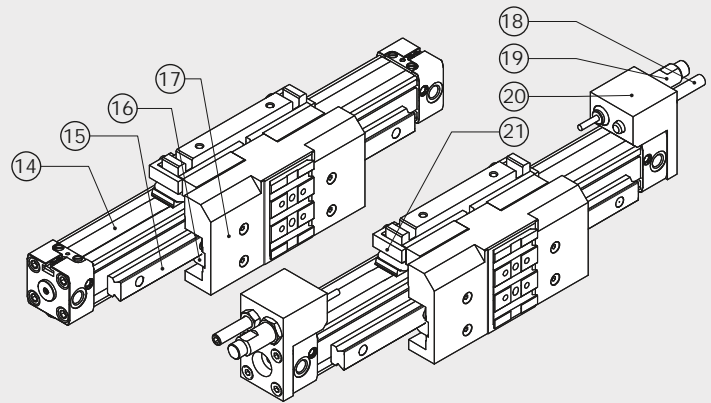
For version 275 _____ CNK

- ⑭ CYLINDER: see above
- ⑮ GUIDE: hardened steel
- ⑯ PAD: steel with hardened ball recirculation
- ⑰ CARRIAGE SUPPORT: anodized aluminium

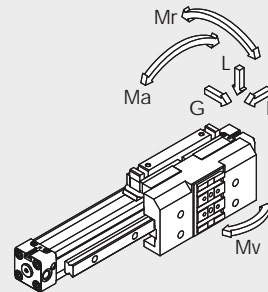
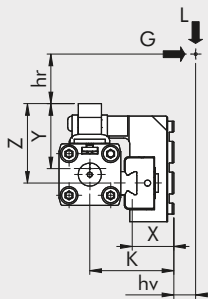
For version 276 _____ CNK

In addition to the above details:

- ⑱ END-OF-STROKE STUD PIN: galvanized steel, complete with 2 galvanised steel nuts
- ⑲ DECELERATOR: burnished steel, complete with 2 galvanised or burnished steel nuts
- ⑳ DECELERATOR SUPPORT: anodized aluminium
- ㉑ BRACKET: hardened-andtempered galvanized steel



DIMENSIONING - MOMENTS AND FORCES



Ø	Actual force F at 6 bar [N]	Cushioning stroke [mm]	K [mm]	X [mm]	Y [mm]	Z [mm]	Max. load L [N]	Max. load G [N]	Ma max [Nm]	Mr max [Nm]	Mv max [Nm]
16	110	15	35	16	29	33	500	500	16	15	16
25	250	21	50.5	21	44	51.5	1500	1500	100	50	100
32	420	26	59	22.5	53.5	70	3000	3000	200	100	200

N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.

$$Ma = F \cdot (hr + Y) \quad Mr = G \cdot (hr + z) + L \cdot (hv + X) \quad Mv = F \cdot (K + hv)$$

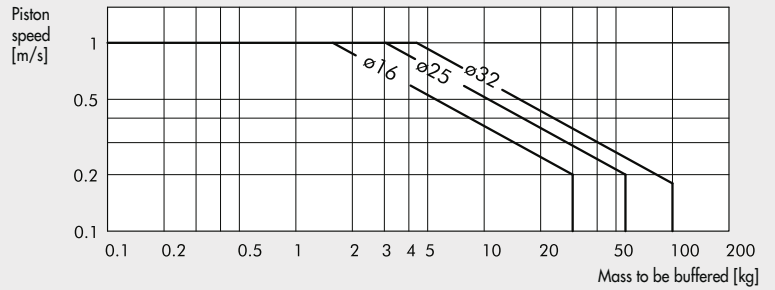
$$\frac{Ma}{Ma_{max}} + \frac{Mr}{Mr_{max}} + \frac{Mv}{Mv_{max}} + \frac{L}{L_{max}} + \frac{G}{G_{max}} \leq 1$$

DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

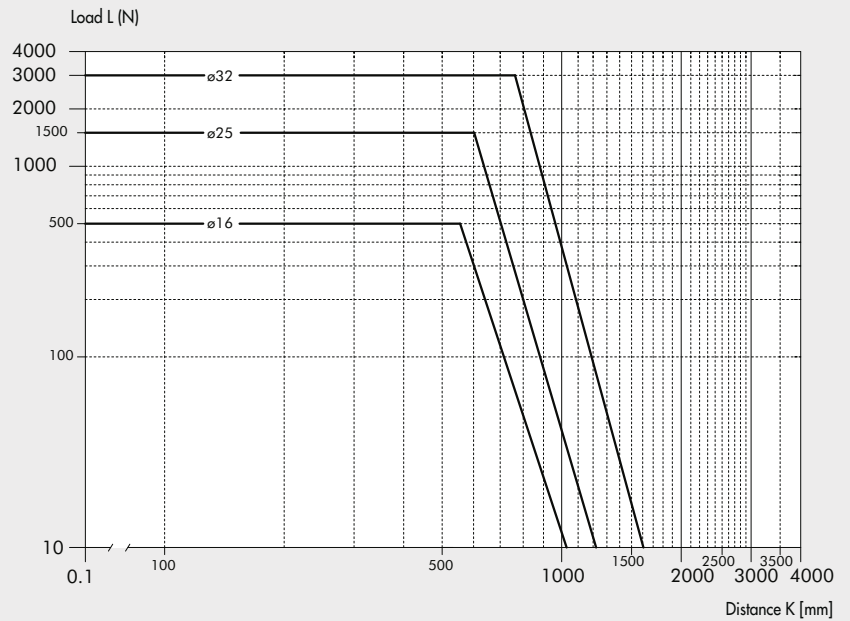
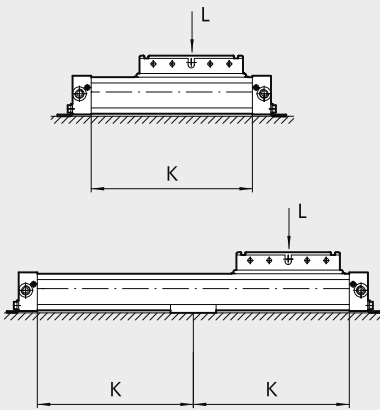
For the cylinder to reach the end-of-stroke position without intense or repeated impact, which would damage it, it is necessary to annul the kinetic energy of the moving mass and the energy generated.

The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders.

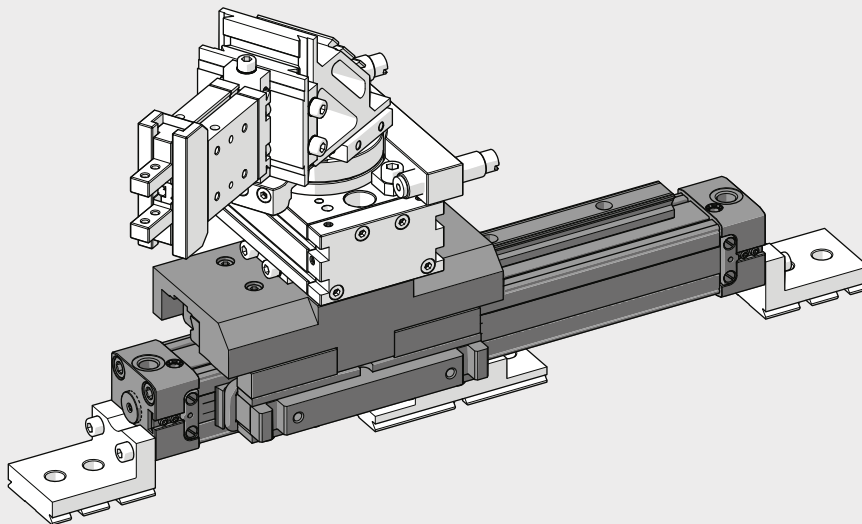
The diagram shows the speeds and cushionable masses for the various diameters at a pressure of 6 bar.



MAXIMUM LOAD BASED ON DISTANCE BETWEEN SUPPORTS

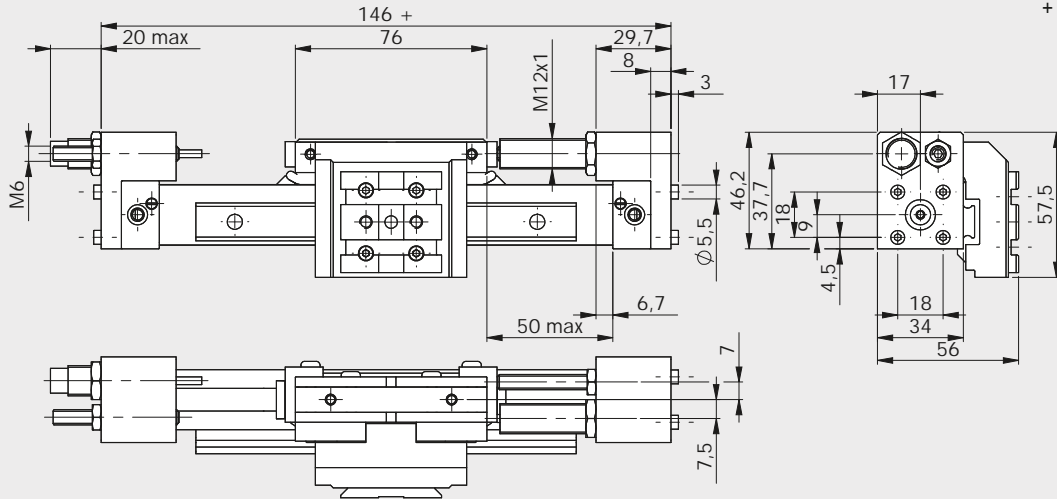


EXAMPLES OF APPLICATION



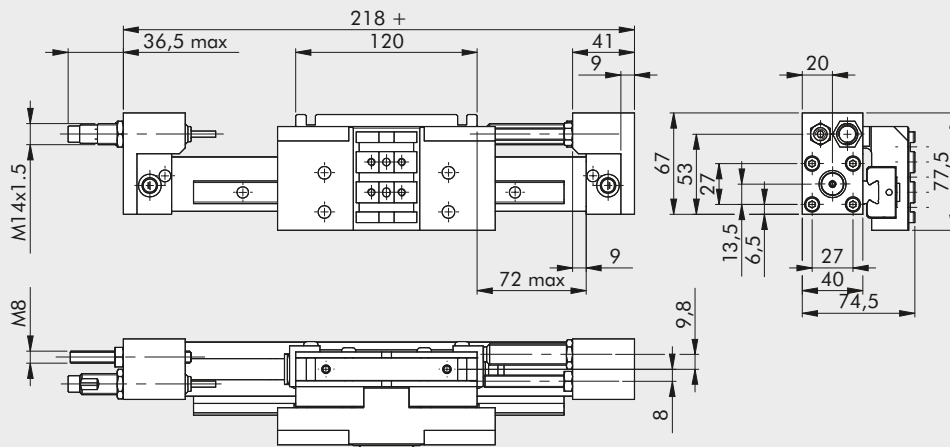
DIMENSIONS OF VERSION WITH DECELERATORS

Ø 16



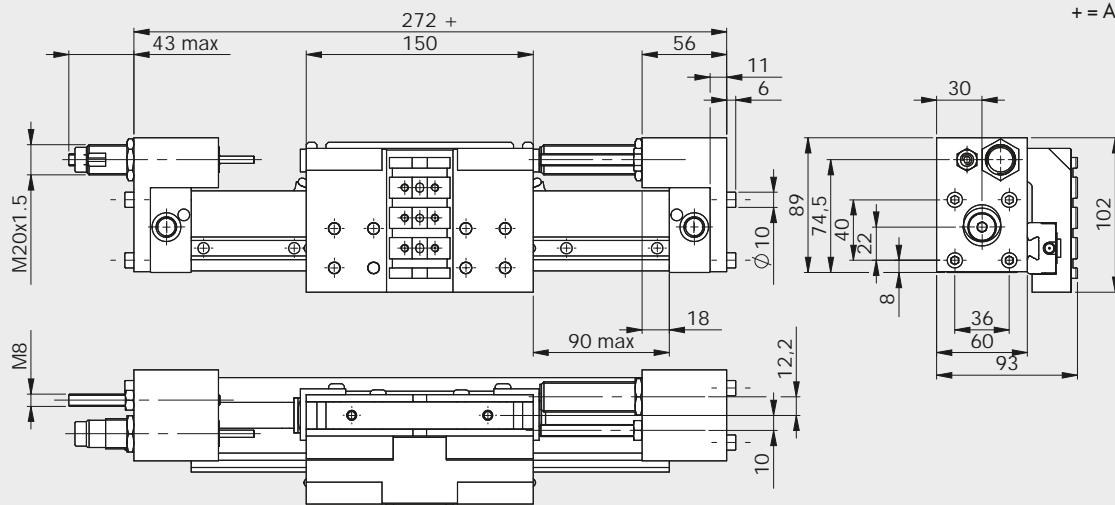
+ = ADD THE STROKE

Ø 25



+ = ADD THE STROKE

Ø 32

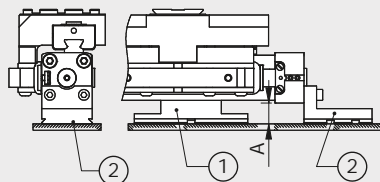


+ = ADD THE STROKE

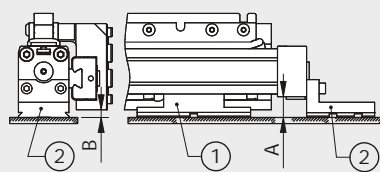
Ø	Stroke	Max. cushioning		Max. impact force [N]	Max. thrust force [N]
		For stroke [J]	For hour [J]		
16	10	4.5	14125	1000	220
25	16	18	34000	2800	530
32	22	40	53700	3750	890

ASSEMBLY DIAGRAMS

275 (horizontal)

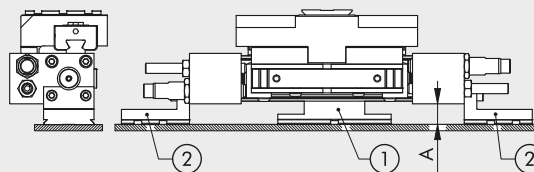


275/276 (vertical)

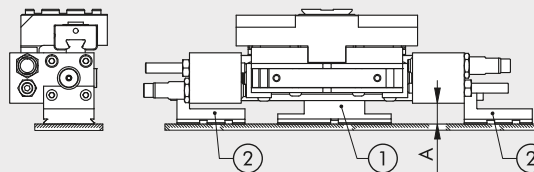


276 (horizontal)

Ø 16 - 25



Ø 32



Ø	Horizontal		A	B	Vertical		
	Intermediate support code (1)	Leg code (2)			Intermediate support code (1)	Leg code (2)	
16	17	W0950164004K	W0950167001K	17	5.7	W0950164004K	W0950167001K
25	16.5	W0950254004K	W0950257001K	16.5	6	W0950254004K	W0950257001K
32	17.5	W0950324004K	W0950327001K	17.5	4.5	W0950324004K	W0950327001K

KEY TO CODES

CYL	2 7	5	0	3 2	0 1 0 0	C	N	K
	TYPE			BORE	STROKE		GASKETS	FAMILY
	27 Rodless cylinder	5 Dual-acting, cushioned, magnetic, with ball recirculation guides ▲ 6 Dual-acting, cushioned, with ball recirculation guides + adjustable stops and decelerators	0 Magnetic S Non-magnetic ■ G Nonn-stick-slip	16 25 32	Ø 16: 100 to 1350 mm Ø 25 and 32: 100 to 2300 mm		N NBR gaskets	K V-Lock

■ Use at speeds lower than 0.2 m/s to prevent bounce. Use unlubricated air only.

▲ For use in conditions exceeding those shown in the "Diagram of speed and maximum cushionable load" on page 1-271.

NOTES

ACCESSORIES: FIXINGS

FOOT Ø 16, CODE W0950167001K

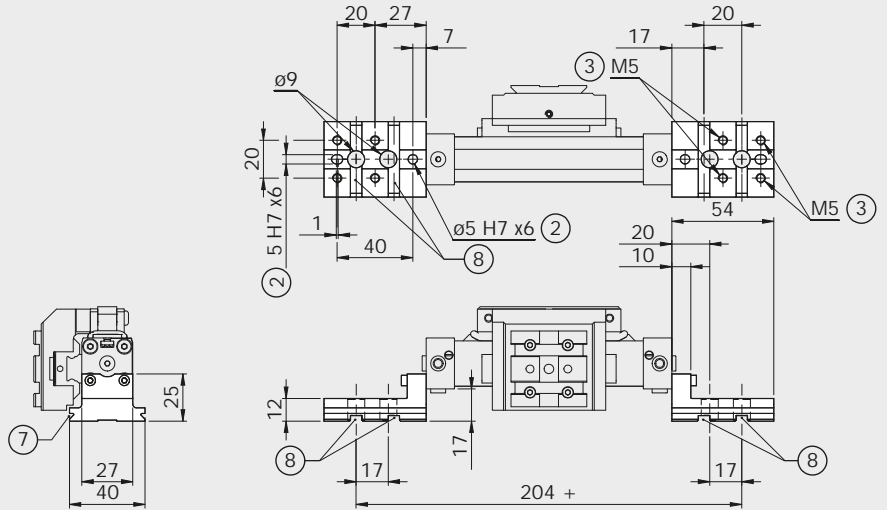


+ = ADD THE STROKE

- ② Holes for centring pins
- ③ Threaded holes for fixing
- ⑦ Dovetail for "V-Lock" fixing.
- For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

Weight: 68 g

Note: One element per pack, complete with 2 short screws for fixing to the head and 2 long screws for use when a decelerator support is present



FOOT Ø 25, CODE W0950257001K

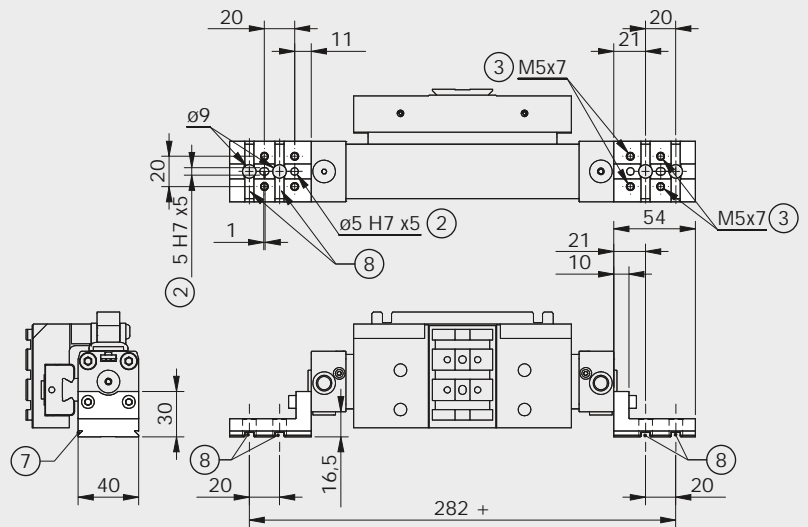


+ = ADD THE STROKE

- ② Holes for centring pins
- ③ Threaded holes for fixing
- ⑦ Dovetail for "V-Lock" fixing.
- For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

Weight: 94 g

Note: One element per pack, complete with 2 short screws for fixing to the head and 2 long screws for use when a decelerator support is present



FOOT Ø 32, CODE W0950327001K

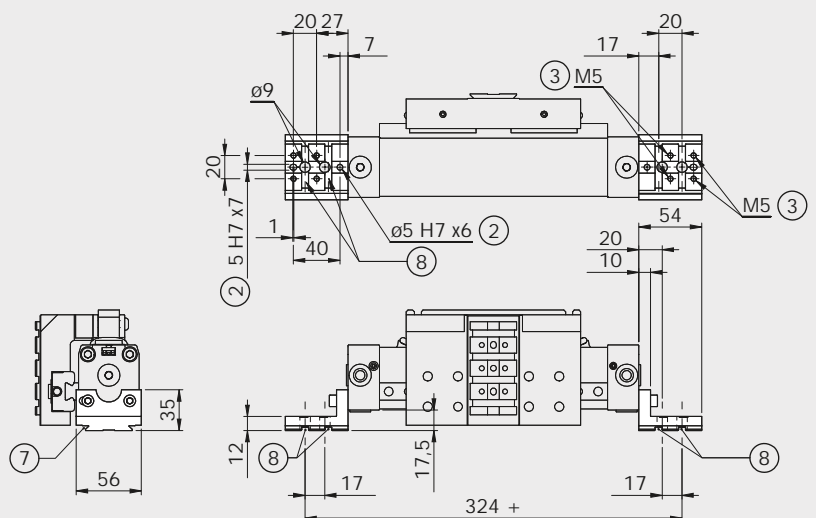


+ = ADD THE STROKE

- ② Holes for centring pins
- ③ Threaded holes for fixing
- ⑦ Dovetail for "V-Lock" fixing.
- For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

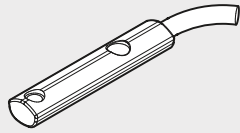
Weight: 148 g

Note: One element per pack, complete with 2 short screws for fixing to the head and 2 long screws for use when a decelerator support is present



ACCESSORIES: MAGNETIC SENSORS

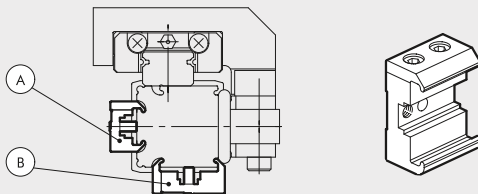
RETRACTING SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952225390	HALL N.O. sensor, vertical insertion 2.5 m robotics
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8 robotics
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952222180	REED N.O. sensor, vertical insertion 2.5 m robotics
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8 robotics
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metallic masses.
For technical details see page 1-580

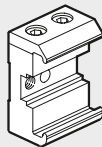
Ø 16 SENSOR SUPPORT



Code	Description	Type	Mounting on the carriage opposite side	Mounting on the guide opposite side
0950164003	Sensor support short	A	•	
0950164001	Sensor support std	B		•

Note: Supplied complete with 2 screw, 1 pin

Ø 25 SENSOR SUPPORT

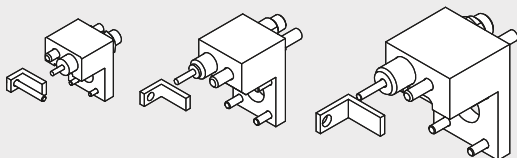


Code	Description
0950164001	Sensor support STD

Note: Supplied with 1 stud pin, 2 screws

ACCESSORIES: DECELERATORS

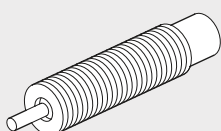
ADJUSTABLE LIMIT SWITCH AND SHOCK ABSORBERS KIT



Code	Description	Weight [g]
0950164002K	Rodless cylinder limit switch and shock absorbers Ø 16 V-Lock	133
0950254002K	Rodless cylinder limit switch and shock absorbers Ø 25 V-Lock	267
0950324002K	Rodless cylinder limit switch and shock absorbers Ø 32 V-Lock	610

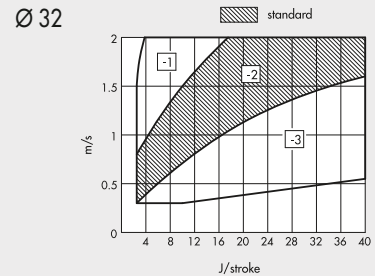
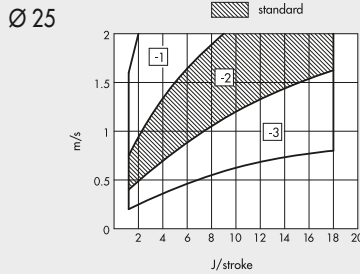
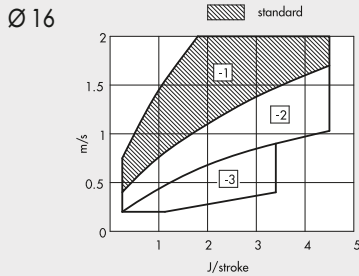
Note: Kit contents: 1 decelerator support, 1 decelerator, 1 decelerator nut, 1 stop grub screw, 1 grub screw nut, 1 bracket, 1 bracket screw (for Ø 16 only), 4 support locking screws.

SHOCK ABSORBERS



Code	Description	Ø
0950004003	Shock absorbers ECO15 MF1 + nut M12x1	16
0950004004	Shock absorbers ECO25 MC2 + nut M14x1.5	25
0950004005	Shock absorbers ECO50 MC2 + nut M20x1.5	32

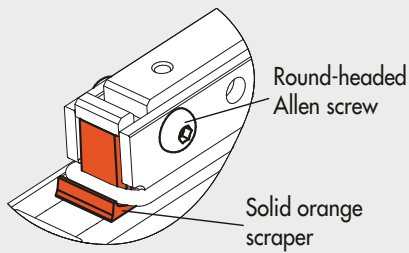
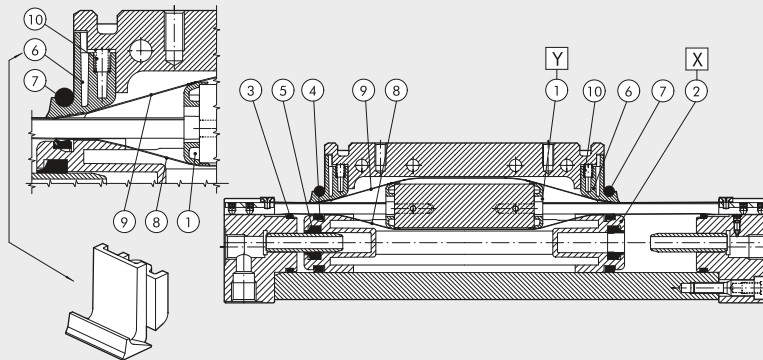
GRAPHS TO HELP CHOOSE THE RIGHT SHOCK ABSORBERS



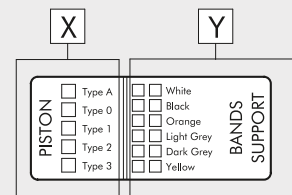
The dotted areas indicate that the SHOCK ABSORBERS is supplied standard. Other options can be selected depending on the speed [m/sec] and the maximum work force [J/stroke] to dissipate at each stroke. Refer to the diagrams above to select the correct option.

SPARES

- ① Band support kit
- ② Piston kit
- ③ ④ ⑤ ⑥ ⑦ ⑩ NBR gaskets Kit (FKM/FPM for ⑦)
- ⑧ ⑨ Bands Kit (inner/outer)



Spare parts label on one cylinder side



BANDS SUPPORT KIT POS 1 (Y)

Ø	Code White	Code Black	Code Orange	Code Light grey	Code Dark grey	Code Yellow
16	0090165080	0090165081	0090165082	0090165083	0090165084	0090165085
25	0090255080	0090255081	0090255082	0090255083	0090255084	0090255085
32	0090325080	0090325081	0090325082	0090325083	0090325084	0090325085

PISTON KIT POS 2 (X)

Ø	Code Type 0 (0 rings)	Code Type 1 (1 rings)	Code Type 2 (2 rings)	Code Type 3 (3 rings)	Code Type A (4 rings)	Code Yellow
16	0090165015	0090165016	0090165017	0090165018	-	0090165085
25	0090255015	0090255016	0090255017	0090255018	0090255019	0090255085
32	0090325015	0090325016	0090325017	0090325018	0090325019	0090325085

BANDS KIT (INNER AND OUTER) POS. 8-9

Ø	Code
16	0090166_ _ _ _
25	0090256_ _ _ _
32	0090326_ _ _ _

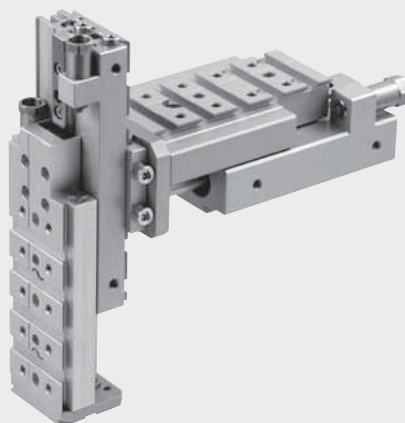
Complete the code with the 4 figure cylinder stroke.

NBR GASKET KIT POS. 3-4-5-6-7-10

Ø	Code
16	0090165022
25	0090255022
32	0090325022

COMPACT PRECISION SLIDES SERIES S14K

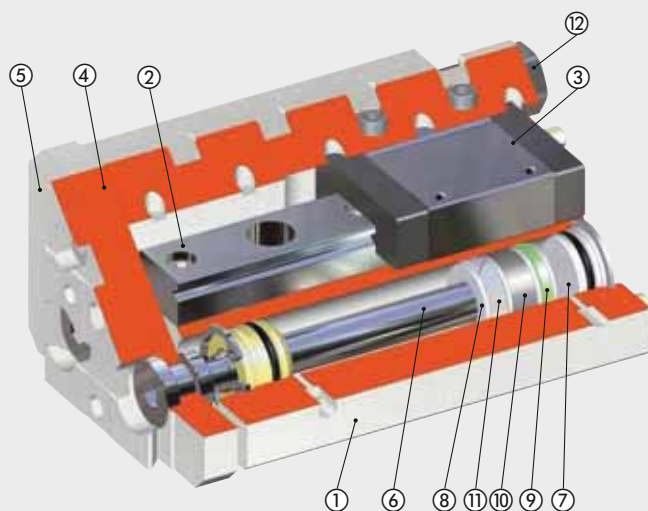
Flat, compact precision slides with two cylinders.
The fixed and moving parts are moved by a sturdy ball recirculation carriage running on hardened guides. Elastic mechanical stop or shock absorbers are used to achieve adjustable stop at the end of the stroke. A three-position version is available allowing an intermediate stop. Slots are provided in the body for end-of-stroke sensors.



TECHNICAL DATA		S14K-8	S14K-16	S14K-25
Operating pressure	bar psi		2 to 8 29 to 116	
Temperature range	°C		-10 to +80	
Fluid		Dry or lubricated 10 µm filtered compressed air. Lubrication, if used, must be continuous.		
Maximum speed	m/s	0.8 (we always suggest to use micro regulator)	0.8	0.8
Versions		With shock absorbers – With elastic mechanical stop		
Bore		2 x Ø 8	2 x Ø 16	2 x Ø 25
Piston rod diameter	mm	4	8	12
Strokes	mm	10, 20, 30, 40, 50, 80, 100	10, 20, 30, 40, 50, 80, 100, 125, 150	10, 20, 30, 40, 50, 80, 100, 125, 150, 200
Stroke reduction by adjusting the decelerators retraction	mm	16 extension / 16 retraction	12 extension / 12 retraction	30 extension / 30 retraction
Stroke reduction by adjusting the buffers retraction	mm	8 extension / 8 retraction	10 extension / 10 retraction	15 extension / 15 retraction
Maximum impact energy with hydraulic decelerators	J	2	5	20
Maximum impact energy with buffers	J	0.15	0.25	0.5
Sensors		Sensors Magnetic Hall or Reed		
Theoretical thrust force at 6 bar	N	60	240	589
Theoretical pull force at 6 bar	N	46	180	453
Repeatability in stop positions	mm	0.02 (with shock absorbers); 0.02 (with buffers and 5 bar minimum pressure)		
Monitoring position		Any		
Notes		Lubrication recommended: every 2 million cycles for strokes below 100 mm and 1 million for longer strokes (grease code 9910506)		

COMPONENTS

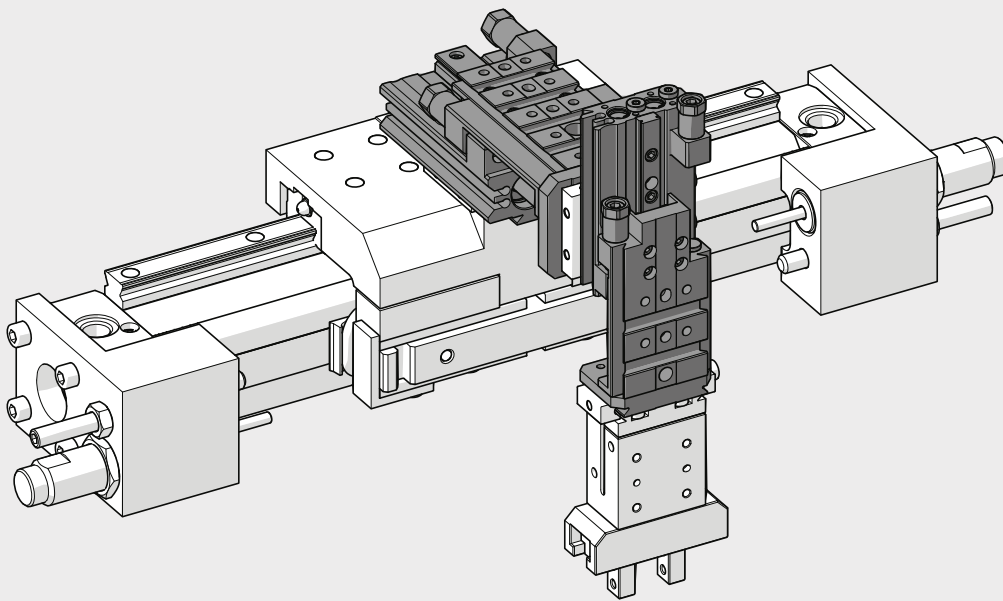
- ① SLIDE BODY: anodised aluminium
- ② GUIDE: hardened steel
- ③ CARRIAGE: recirculating ball bearings
- ④ MOVING PART: anodised aluminium
- ⑤ FRONT PLATE: anodised aluminium
- ⑥ PISTON ROD: stainless steel
- ⑦ END CAP: brass
- ⑧ PISTON: aluminium
- ⑨ GASKETS: polyurethane/NBR
- ⑩ MAGNET: plastoferrite/plastoneodymium
- ⑪ GUIDE STRIP: special technopolymer
- ⑫ STOP: stainless steel



WEIGHTS OF SLIDES AND OF MOVING MASSES

S14K Ø 8			S14K Ø 16			S14K Ø 25		
Stroke [mm]	Total slide weight [kg]	Masses in movement [kg]	Stroke [mm]	Total slide weight [kg]	Masses in movement [kg]	Stroke [mm]	Total slide weight [kg]	Masses in movement [kg]
10	0.341	0.162	10	0.783	0.386	10	2.582	1.137
20	0.337	0.162	20	0.777	0.386	20	2.570	1.137
30	0.335	0.162	30	0.773	0.386	30	2.561	1.137
40	0.369	0.178	40	0.839	0.413	40	2.548	1.137
50	0.430	0.208	50	0.905	0.436	50	2.705	1.198
80	0.526	0.148	80	1.110	0.531	80	3.143	1.367
100	0.591	0.174	100	1.363	0.648	100	3.434	1.469
			125	1.533	0.721	125	3.788	1.608
			150	1.678	0.773	150	4.180	1.748
						200	4.914	2.026

EXAMPLES OF APPLICATION



MAXIMUM LOADS AND SPEEDS

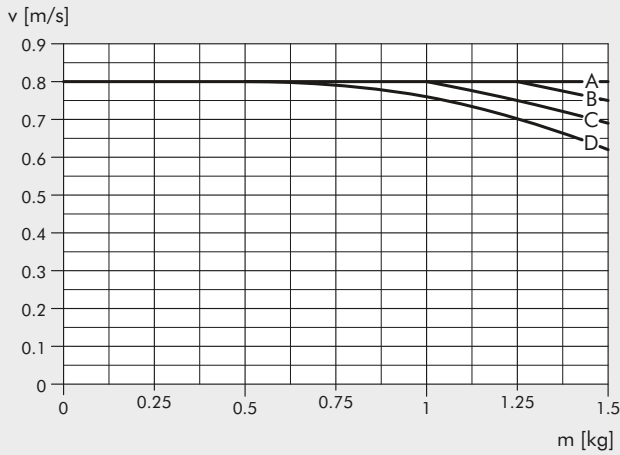
The graphs below show the maximum recommended movable loads (masses) [kg] as a function of the average traverse speed [m/s], defined as stroke/time, slide position (horizontal/vertical) and supply pressure.

The following stop versions are available:

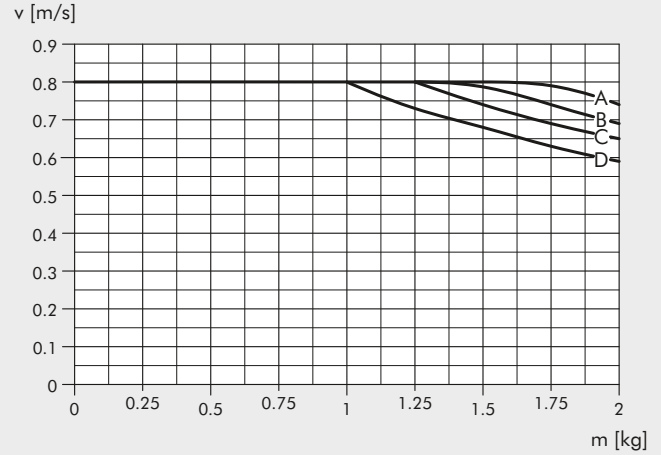
- buffer: for lightweight applications, with a lower amount of energy to cushion (relatively low speeds and loads);
- shock absorbers: for heavy-duty applications, with more energy to cushion.

MAXIMUM LOADS: VERSIONS WITH SHOCK ABSORBERS

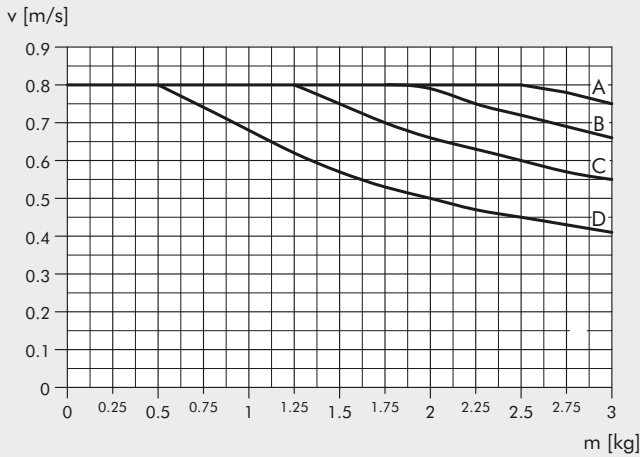
S14K Ø 8 - Vertical orientation



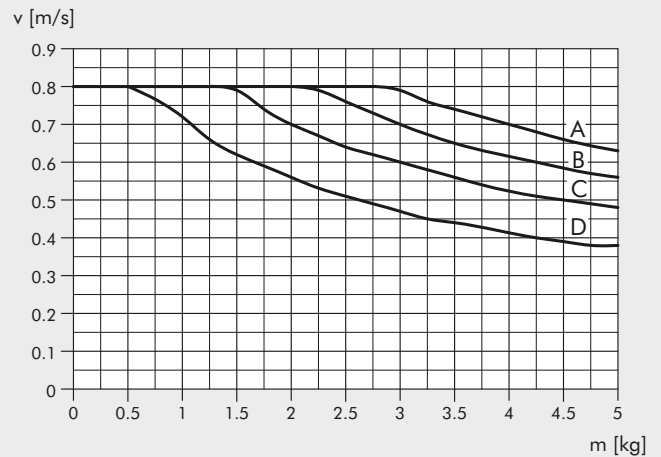
S14K Ø 8 - Horizontal orientation



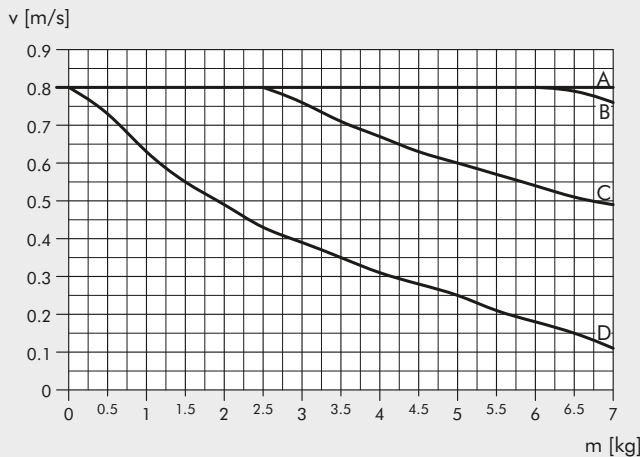
S14K Ø 16 - Vertical orientation



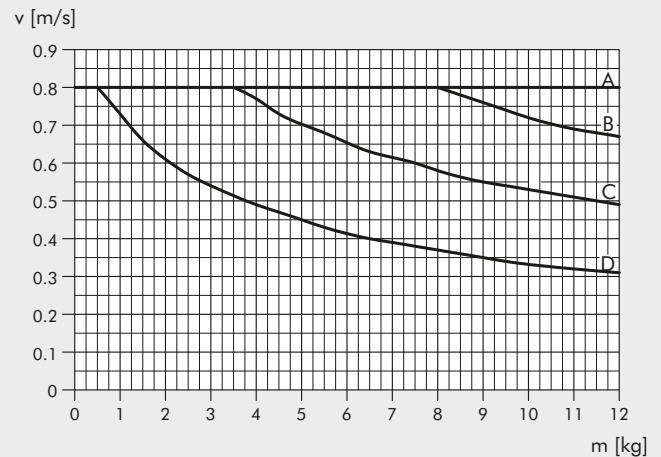
S14K Ø 16 - Horizontal orientation



S14K Ø 25 - Vertical orientation



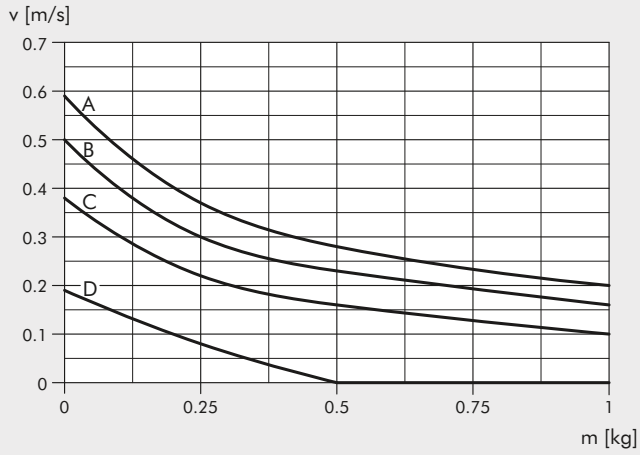
S14K Ø 25 - Horizontal orientation



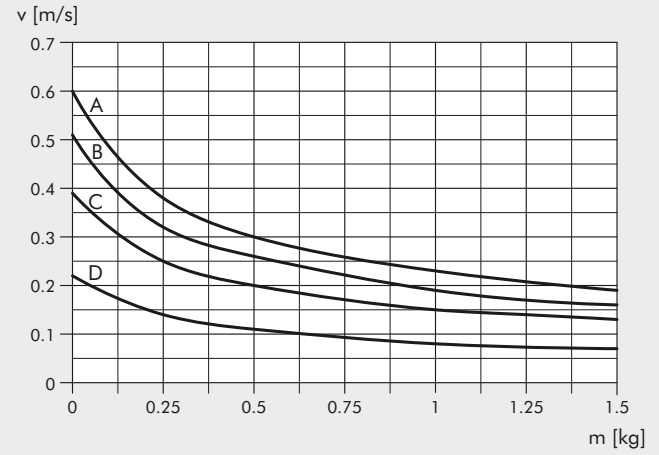
A = 2 bar B = 4 bar C = 6 bar D = 8 bar

MAXIMUM LOADS: VERSIONS WITH ELASTIC MECHANICAL STOP

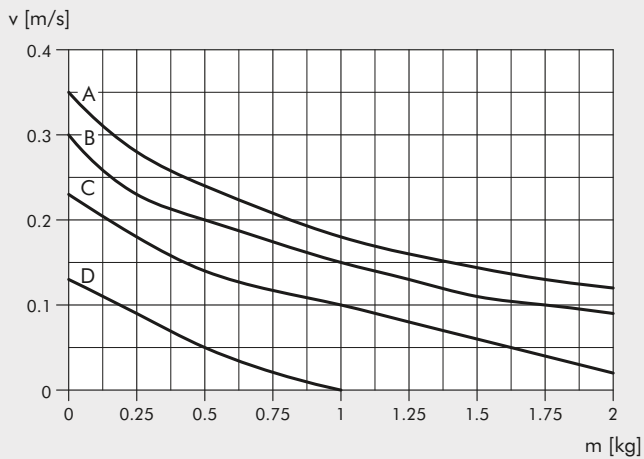
S14K Ø 8 - Vertical orientation



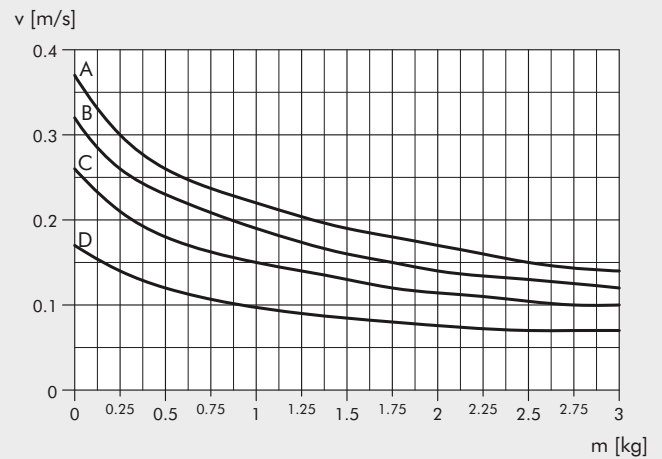
S14K Ø 8 - Horizontal orientation



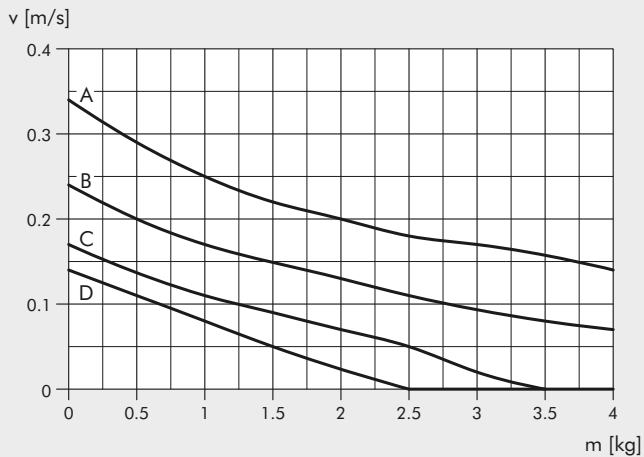
S14K Ø 16 - Vertical orientation



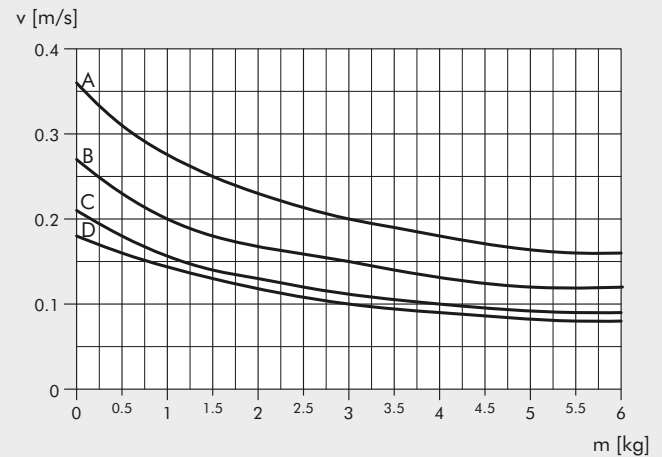
S14K Ø 16 - Horizontal orientation



S14K Ø 25 - Vertical orientation



S14K Ø 25 - Horizontal orientation

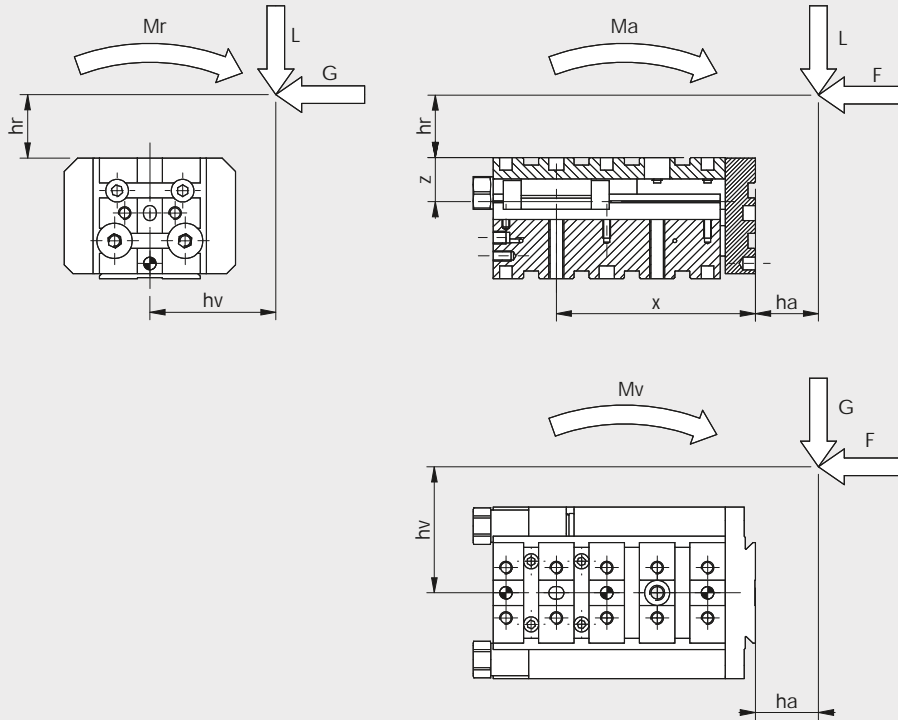


A = 2 bar B = 4 bar C = 6 bar D = 8 bar

STATIC FORCES AND MOMENTS

To prevent the recirculating ball guide from getting damaged, the maximum static loads and moments applied must meet the following equations, where the lengths have to be given in metres.

$$\frac{Ma_{\max}}{Ma_{\max}} + \frac{Mr_{\max}}{Mr_{\max}} + \frac{Mv_{\max}}{Mv_{\max}} + \frac{L}{L_{\max}} + \frac{G}{G_{\max}} \leq 1$$



Sum of the moments, with the signs shown in the example:

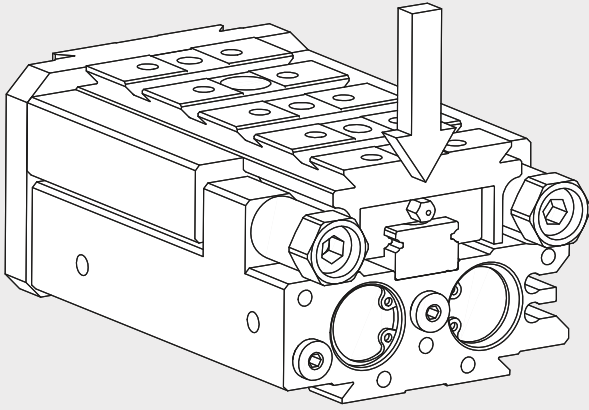
$$Mr = L \cdot hv - G \cdot (hr+z)$$

$$Ma = -F \cdot (hr+z) + L \cdot (ha+x)$$

$$Mv = -F \cdot hv + G \cdot (ha+x)$$

Ø	Stroke [mm]	X [mm]	Z [mm]	G max [N]	L max [N]	Mr max [Nm]	Ma max [Nm]	Mv max [Nm]
8	10	61	14	309.1	368.0	1.8	1.3	1.1
	20	61	14	309.1	368.0	1.8	1.3	1.1
	30	61	14	309.1	368.0	1.8	1.3	1.1
	40	71	14	309.1	368.0	1.8	1.3	1.1
	50	83.5	14	398.2	474.1	2.7	2.7	2.2
	80	113.5	14	398.2	474.1	2.7	2.7	2.2
	100	133.5	14	398.2	474.1	2.7	2.7	2.2
16	10	67	17.5	962.6	1145.9	10.7	9.1	7.7
	20	67	17.5	962.6	1145.9	10.7	9.1	7.7
	30	67	17.5	962.6	1145.9	10.7	9.1	7.7
	40	79	17.5	962.6	1145.9	10.7	9.1	7.7
	50	79	17.5	962.6	1145.9	10.7	9.1	7.7
	80	119	17.5	962.6	1145.9	10.7	9.1	7.7
	100	146.5	17.5	962.6	1145.9	10.7	9.1	7.7
	125	171.5	17.5	962.6	1145.9	10.7	9.1	7.7
150	196.5	17.5	962.6	1145.9	10.7	9.1	7.7	
25	10	98	22	1423.1	1694.1	43.6	18	15.1
	20	98	22	1423.1	1694.1	43.6	18	15.1
	30	98	22	1423.1	1694.1	43.6	18	15.1
	40	98	22	1423.1	1694.1	43.6	18	15.1
	50	108	22	1423.1	1694.1	43.6	18	15.1
	80	138	22	1423.1	1694.1	43.6	18	15.1
	100	158	22	1423.1	1694.1	43.6	18	15.1
	125	183	22	1423.1	1694.1	43.6	18	15.1
	150	208	22	1423.1	1694.1	43.6	18	15.1
	200	258	22	1423.1	1694.1	43.6	18	15.1

LUBRICATION INSTRUCTIONS



Ball recirculation carriages are supplied pre-lubricated. They can be re-greased when necessary using the hole ($\varnothing 8$) or greasing Nipple ($\varnothing 16$ and $\varnothing 25$) provided.

The lubrication frequency depends on the environmental and operating conditions.

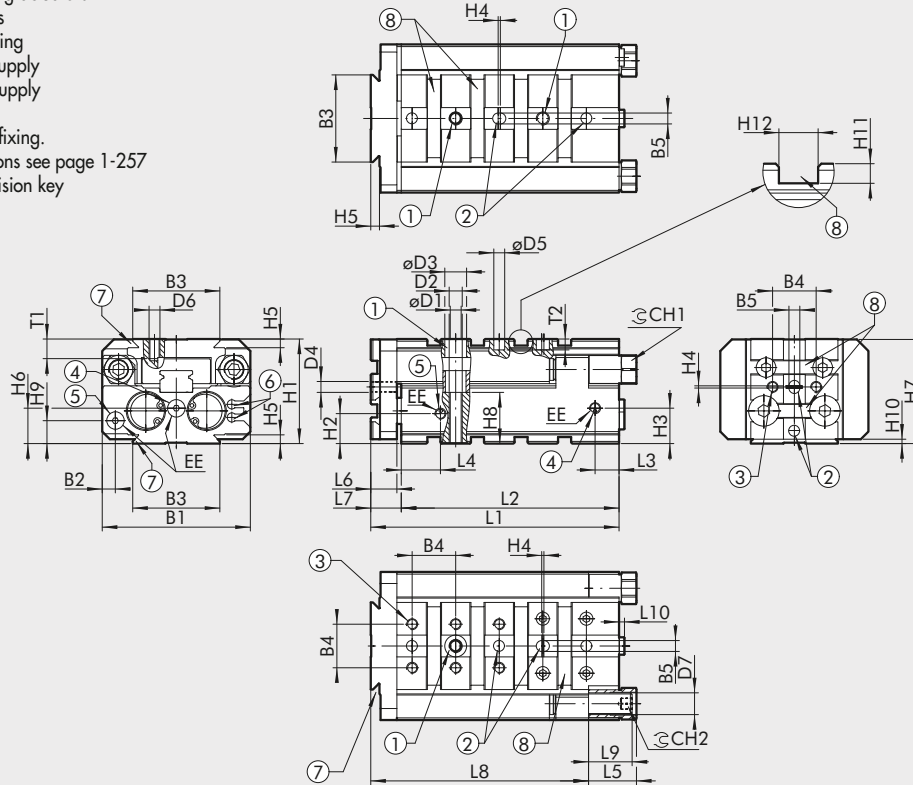
To ensure smooth movement and long life, we recommend an average lubrication interval of 2 million cycles for strokes less than 100 mm and 1 million for longer strokes.

A suitable bearing lubrication grease must be used (code 9910506).

NOTES

DIMENSIONS

- ① Through holes for fixing actuators
 - ② Holes for centring pins
 - ③ Threaded holes for fixing
 - ④ Piston rod extension supply
 - ⑤ Piston rod retraction supply
 - ⑥ Sensor fixing slots
 - ⑦ Dovetail for "V-Lock" fixing.
 - ⑧ Slot for "V-Lock" precision key
- For standard dimensions see page 1-257

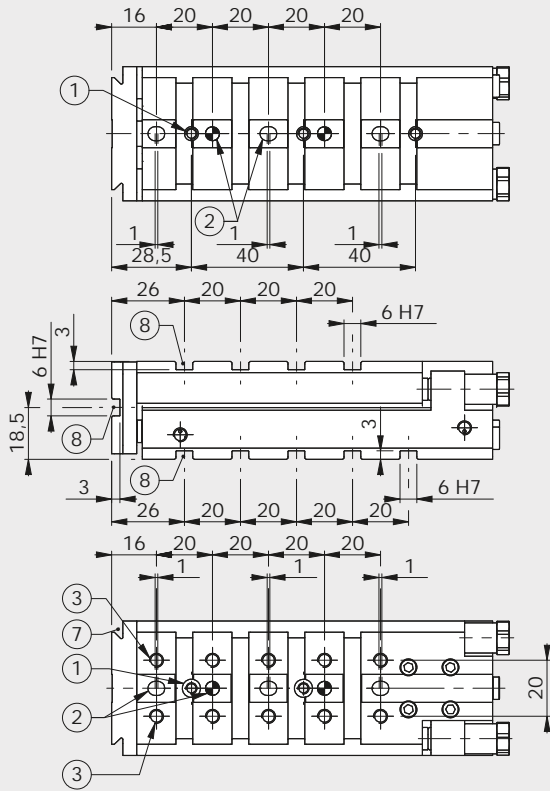


Ø	B1	B2	B3	B4	B5 ^{H7}	ØD1	D2	ØD3	D4	ØD5 ^{H7}	D6	D7	EE	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12 ^{H7}	T1	T2	CH1	CH2
8	48	7	40	-	5	3.3	M4	6	-	5	M5	M8x1	M5	35	8.8	11.3	1	4	10	34.8	17	7.5	2	3	6	6	5	11	4
16	68	6	40	20	5	5	M6	9.5	M5	5	M5	M10x1	M5	48	13.8	16.3	1	4	16.3	47.8	23.5	10.5	2	3	6	9	5	13	5
25	106	7.5	40	20	5	6.8	M8	11	M5	5	M5	M14x1.5	1/8"	64	17.3	23	1	4	17	63.8	35	12	2	3	6	10	5	18	6

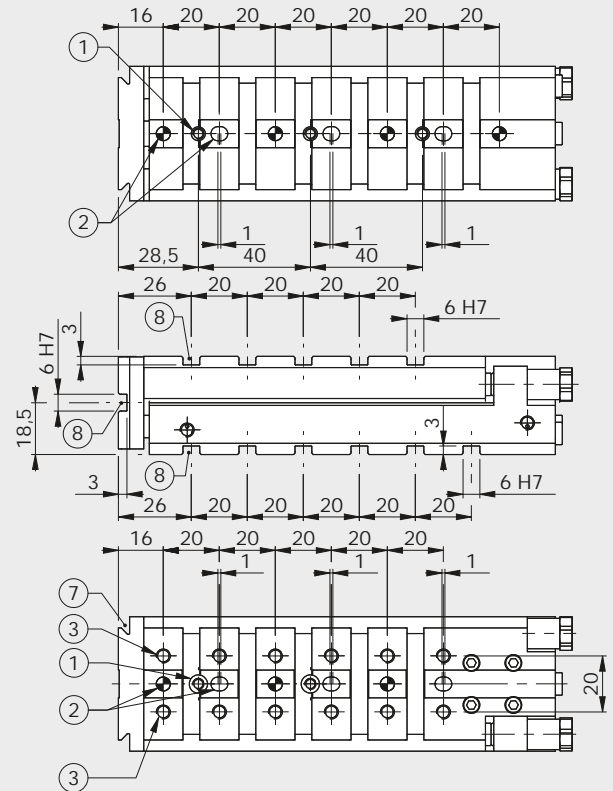
ACCORDING TO THE STROKE

Ø	Stroke	L1	L2	L3	L4	L5	L6	L7	L8	L9		L10
										buffer decel.	shock absorbers	
8	10	81	70	10	13.5	16	9	11	71	15	27.9	2.5
	20	81	70	10	13.5	16	9	11	71	15	27.9	2.5
	30	81	70	10	13.5	16	9	11	71	15	27.9	2.5
	40	91	80	10	13.5	16	9	11	81	15	27.9	2.5
	50	106	95	10	13.5	16	9	11	96	15	27.9	2.5
	80	136	125	10	13.5	16	9	11	126	15	27.9	2.5
16	100	156	145	10	13.5	16	9	11	146	15	27.9	2.5
	10	109	95	11	18	22	12	14	95	20	30.7	2.5
	20	109	95	11	18	22	12	14	95	20	30.7	2.5
	30	109	95	11	18	22	12	14	95	20	30.7	2.5
	40	119	105	11	18	22	12	14	105	20	30.7	2.5
	50	129	115	11	18	22	12	14	115	20	30.7	2.5
25	80	159	145	11	18	22	12	14	145	20	30.7	2.5
	100	179	165	11	18	22	12	14	165	20	30.7	2.5
	125	204	190	11	18	22	12	14	190	20	30.7	2.5
	150	229	215	11	18	22	12	14	215	20	30.7	2.5
	10	138	120	16.5	25	30	16	18	118	28	65.7	2.5
	20	138	120	16.5	25	30	16	18	118	28	65.7	2.5
25	30	138	120	16.5	25	30	16	18	118	28	65.7	2.5
	40	138	120	16.5	25	30	16	18	118	28	65.7	2.5
	50	148	130	16.5	25	30	16	18	128	28	65.7	2.5
	80	178	160	16.5	25	30	16	18	158	28	65.7	2.5
	100	198	180	16.5	25	30	16	18	178	28	65.7	2.5
	125	223	205	16.5	25	30	16	18	203	28	65.7	2.5
150	248	230	16.5	25	30	16	18	228	28	65.7	2.5	
200	298	280	16.5	25	30	16	18	278	28	65.7	2.5	

Ø 8 stroke 80 mm



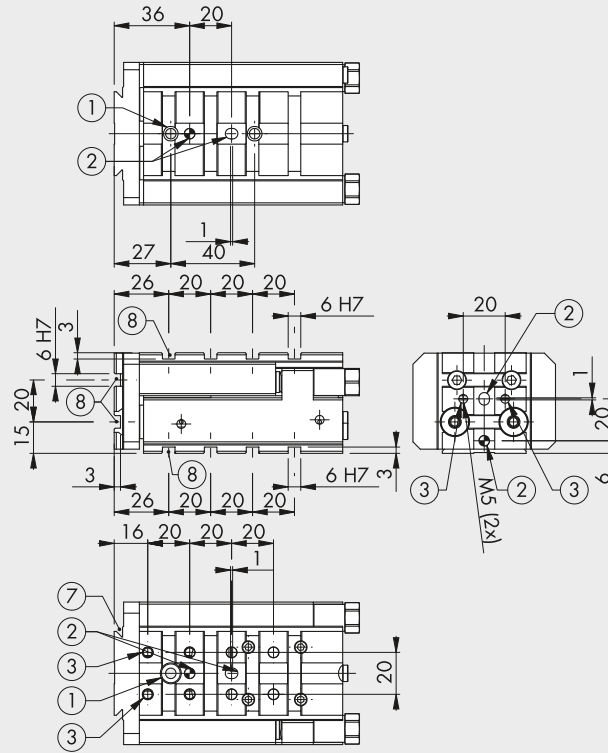
Ø 8 stroke 100 mm



NOTES

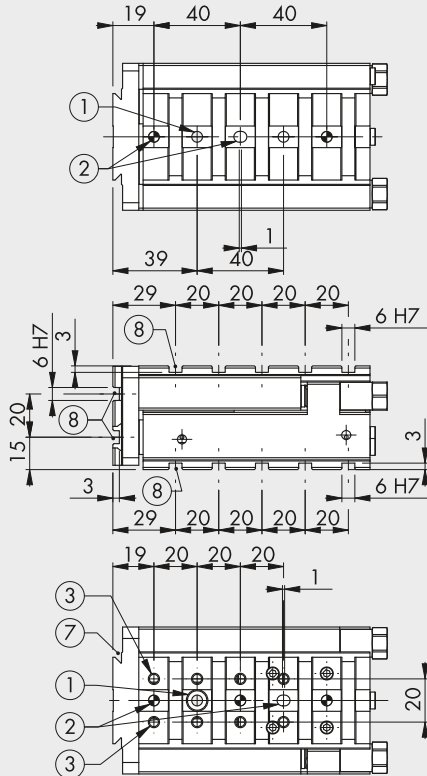
DIMENSIONS OF SLIDE S14K Ø 16

Ø 16 stroke 10; 20; 30 mm

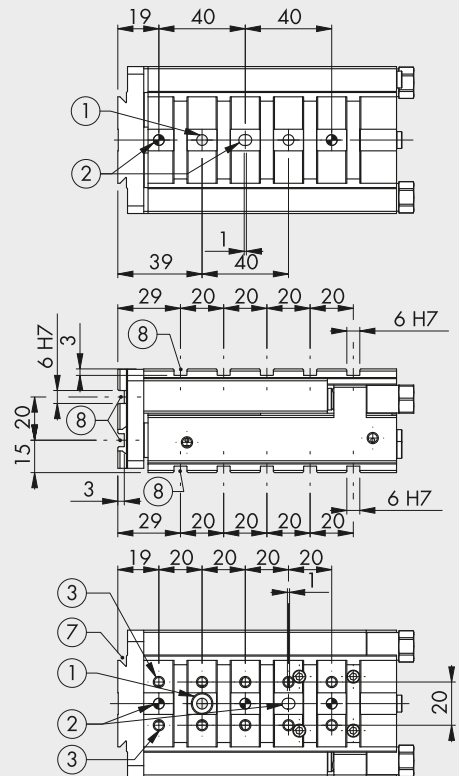


- ① Through holes for fixing actuators
- ② Holes for centring pins
- ③ Threaded holes for fixing
- ⑦ Dovetail for "V-Lock" fixing.
- For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

Ø 16 stroke 40 mm

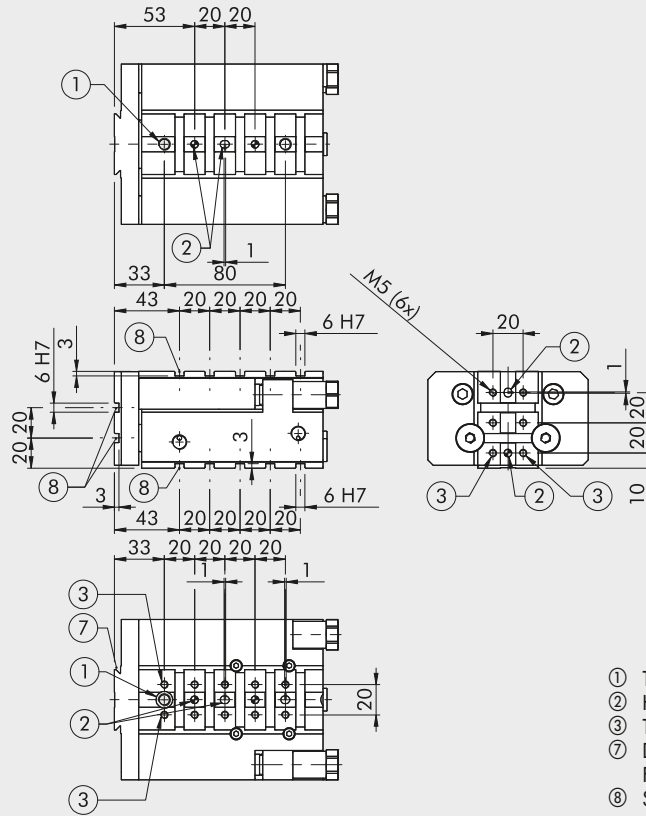


Ø 16 stroke 50 mm



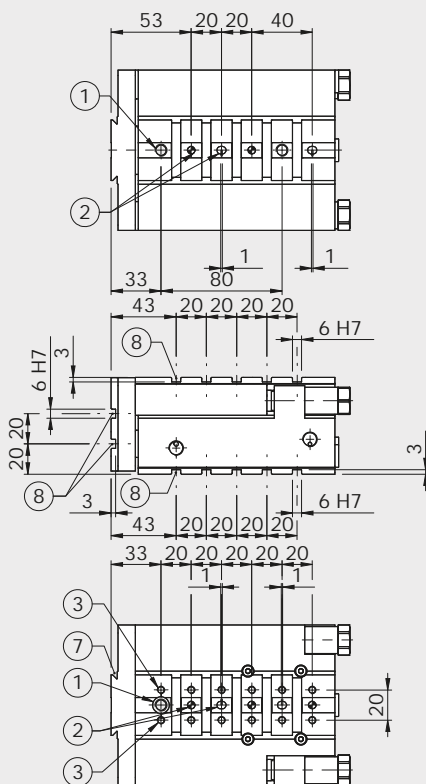
DIMENSIONS OF SLIDE S14K Ø 25

Ø 25 stroke 10; 20; 30; 40 mm

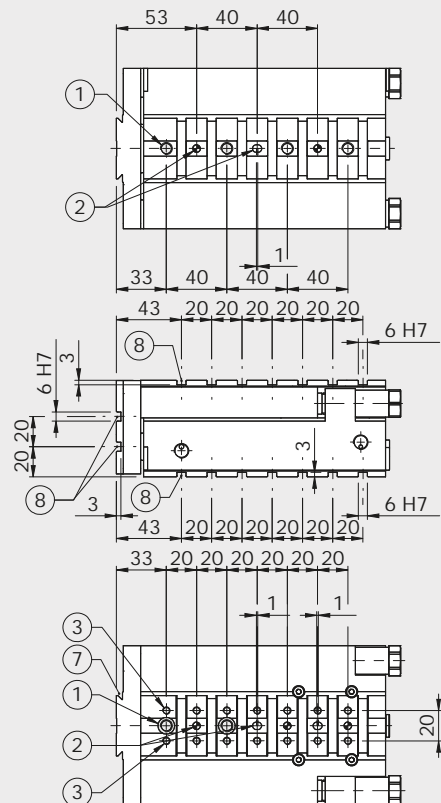


- ① Through holes for fixing actuators
- ② Holes for centring pins
- ③ Threaded holes for fixing
- ⑦ Dovetail for "V-Lock" fixing.
- For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

Ø 25 stroke 50 mm



Ø 25 stroke 80 mm

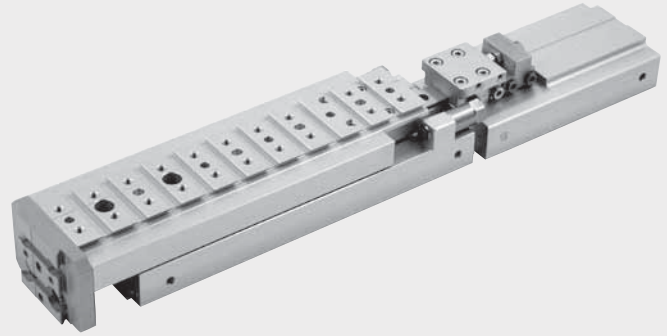


THIRD-POSITION STOP DEVICE

Slide S14 can be supplied in a version with a third-position stop device for application where the slide needs to stop in an intermediate position (e.g. for depositing a workpiece).

A stop device is mounted in series with the slide and partialises the total stroke when supplied with compressed air.

The third-position stop device comes with a magnet on the piston and slots for sensors to monitor the position of the piston rod.



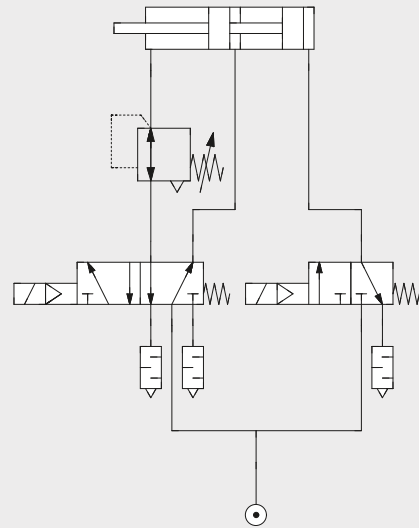
This device can be ordered with a free nominal stroke, up to the total length of the slide on which it is mounted, with 1 mm interval. The stop position can be adjusted mechanically within ± 1.5 mm of the nominal stroke. For example, a stop device with a 30 mm stroke can limit the stroke of the slide by an adjustable length ranging from 28.5 to 31.5 mm.

	S14K-8	S14K-16	S14K-25
Maximum impact energy in intermediate position [J]	0.05	0.15	0.25

PNEUMATIC SYSTEM DIAGRAM

The third-position stop device can be operated by a 3/2 valve, as shown in the diagram.

The optional pressure regulator can be used to regulate the backpressure, and hence the useful force, in the first section of the stroke.



PNEUMATIC THRUST CHART

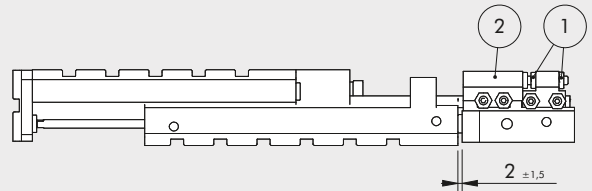
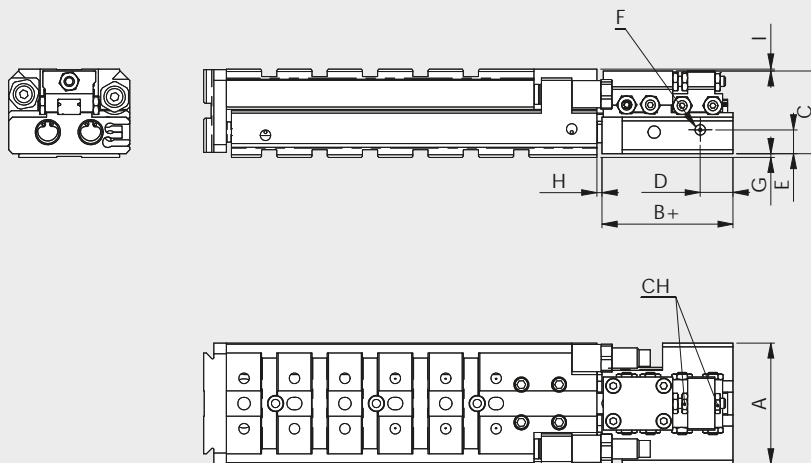
Supply diagram	Useful theoretical thrust [N] depending on pressure [bar]		
	S14K-8	S14K-16	S14K-25
<p>Piston rod retracted position</p>	$p1 \times 7.5$	$p1 \times 30$	$p1 \times 75.5$
<p>Intermediate position</p>	$p3 \times 10 - p1 \times 7.5$	$p3 \times 40 - p1 \times 30$	$p3 \times 98 - p1 \times 75.5$
<p>Piston rod extended position</p>	$p2 \times 10$	$p2 \times 40$	$p2 \times 98$

c = Slide S14K stroke
t = Third-position stop device stroke

FINE ADJUSTMENT

How to adjust the third position:

- Unscrew the lock nuts on the adjusting grub screw ①
- Regulate the position of the stop by adjusting the moving unit ②
- Tighten the lock nuts on the adjusting grub screw ①


DIMENSIONS OF THE THIRD-POSITION DEVICE FOR SLIDE S14K Ø 8 - Ø 16 - Ø 25


+ = Add the stroke of the third position
H = Adjusting the third position

Ø	A	B	C	D	E	F	G	H max	I	CH
8	48	52	33.3	13	9	M5	1	4	0.7	7
16	68	60	42	13	12	M5	3	4	3	8
25	106	85	59.5	16	16	1/8"	4	4	0.5	13

KEY TO CODES - STANDARD VERSION

W147	2	08	3	050	K
TYPE	MODEL	BORE	STOP	STROKE	FAMILY
Precision slide	2 S14K	08 16 25	3 with mechanical stop 5 with shock absorbers	See general technical data	K V-Lock

KEY TO CODES - VERSION WITH THIRD-POSITION STOP DEVICE

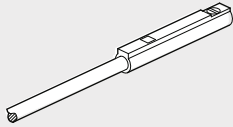
W147	2	08	3	050	020	K
TYPE	MODEL	BORE	STOP	STROKE	THIRD POSITION STROKE	FAMILY
Precision slide	2 S14K	08 16 25	3 with mechanical stop 5 with shock absorbers	See general technical data		K V-Lock

S14K SLIDE ACCESSORIES

V-Lock ACCESSORIES

See page 1-268.

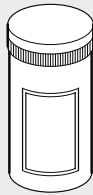
SENSOR Ø 4



Code	Description
W0950044180	Sensor REED 2 wires 2.5 m robotics
W0950045390	Sensor HALL 3 wires 2.5 m robotics

For technical data see page 1-581

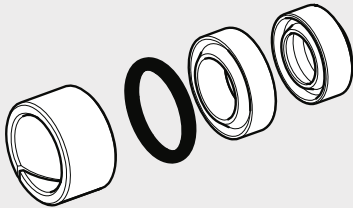
GREASE



Code	Description	Weight [g]
9910506	Tube of RHEOLUBE 363 AX1 grease	400

S14K SLIDE SPARE PARTS

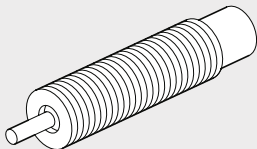
GASKET SPARE PARTS KIT



Code	Description
W1472089001K	S14K gasket kit Ø 8
W1472169001K	S14K gasket kit Ø 16
W1472259001K	S14K gasket kit Ø 25

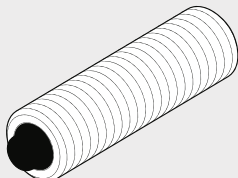
NOTE: kit contents: 1 guide strip, 1 piston rod gasket, 1 piston gasket, 1 end cap O-ring

SHOCK ABSORBERS



Code	Ø	Description
W0950005300	8	Shock absorbers - 2 M8 x 1
W0950005301	16	Shock absorbers - 2 M10 x 1
W0950005303	25	Shock absorbers - 2 M14 x 1.5

ELASTIC MECHANICAL STOP



Code	Ø	Description
W0950005400K	8	Elastic mechanical stop M8 x 1
W0950005401K	16	Elastic mechanical stop M10 x 1
W0950005402K	25	Elastic mechanical stop M14 x 1.5

COMPACT GUIDED CYLINDERS SERIES CMPGK



The CMPGK is a functional, sturdy guided compact cylinder with a built-in guide unit.

The piston rod guide bushings are mounted directly in the anodised aluminium alloy cylinder liner.

Two different types of guides can be mounted as required: sintered bronze bushings coupled with chromed and ground carbon steel piston rods, or ball recirculation bushings with chromed and ground hardened steel piston rods.

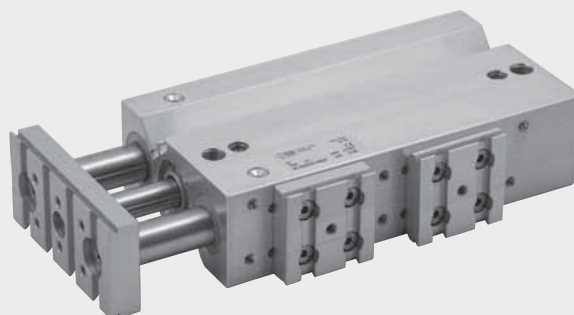
Grooves are provided on one side of the body to accommodate retractable sensors.

Currently available is either a non-cushioned version with the end-of-stroke stop cushioned by NBR front gaskets, or a cushioned one with pins that can be adjusted to regulate progressive braking.

The front plate features the typical V-lock dovetail with grooves and holes.

V-Lock fixing elements can be fitted to the main body on any of the three surfaces identified as UP, SIDE and DOWN. The chosen surface has a grid of threaded holes and pinholes with one or two V-Lock plates, depending on the stroke.

The plates are mounted in a preset position, but they can be moved on the grid as required.



ACTUATORS

COMPACT GUIDED CYLINDERS SERIES CMPGK

TECHNICAL DATA		CUSHIONED	NON-CUSHIONED
Operating pressure	bar	1 to 10	
	MPa	0.1 to 1	
Temperature range	psi	14.5 to 145	
	°C	-10 to +80	
	°F	14 to 176	
Fluid		Filtered air without lubrication; lubrication, if used, must be continuous	
Bore	mm	16, 20, 25, 32, 40	
Standard stroke	mm	Ø 16: 20, 30, 40, 50	
		Ø 20: 20, 30, 40, 50, 75, 100, 150, 200	Ø 16: 30*, 40, 50, 75, 100, 150, 200
		Ø 25: 20, 30, 40, 50, 75, 100, 150	Ø 20: 25, 30, 40, 50, 75, 100, 150, 200
		Ø 32: 25, 50, 75, 100, 150, 175	Ø 25: 25, 30, 40, 50, 75, 100, 150, 200
		Ø 40: 25*, 50, 75, 100, 150, 175	Ø 32: 25, 50, 75, 100, 150, 200
Version		With bronze bushings - With ball bearings	
Sensor magnet		Standard	
Maximum impact energy	J	See graph page 1-296	Ø 16: 0.06 Ø 20: 0.14 Ø 25: 0.2 Ø 32: 0.4 Ø 40: 0.6
Notes		* Side and Down versions only	

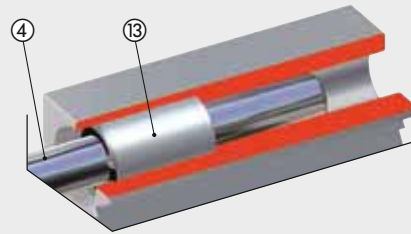
WEIGHTS

Ø	Non-cushioned		Cushioned	
	Weight [g] Stroke = 0	Weight [g] each mm	Weight [g] Stroke = 0	Weight [g] each mm
16	395	5.77	514	5.77
20	586	7.38	643	7.38
25	650	11.01	835	11.01
32	1042	17.51	1454	17.51
40	1128	19.04	1579	19.04

COMPONENTS

- ① BARREL: anodized aluminium alloy
- ② PISTON ROD: grinded chrome steel
- ③ GUIDE ROD: grinded chrome steel
- ④ GUIDE ROD: hardened and tempered chrome steel, grinded
- ⑤ REAR BASE: anodized aluminium alloy
- ⑥ FRONT BASE: anodized aluminium alloy
- ⑦ PISTON ROD GASKET: polyurethane
- ⑧ CUSHIONING GASKET: NBR
- ⑨ PISTON: aluminium alloy
- ⑩ MAGNET: plastoferrite
- ⑪ PISTON GASKET: NBR
- ⑫ SLIDE BUSHING: sintered bronze
- ⑬ BALL BEARINGS
- ⑭ DUST SCRAPER RING: NBR or FKM/FPM
- ⑮ GREASE NIPPLES: zinc-plated or stainless steel
- ⑯ FLANGE: anodized aluminium alloy
- ⑰ CUSHIONING NEEDLE: OT58 brass

Ball Bearings versions



Bronze bushings version

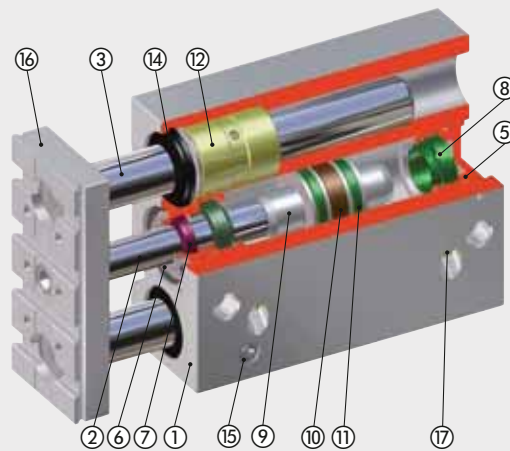
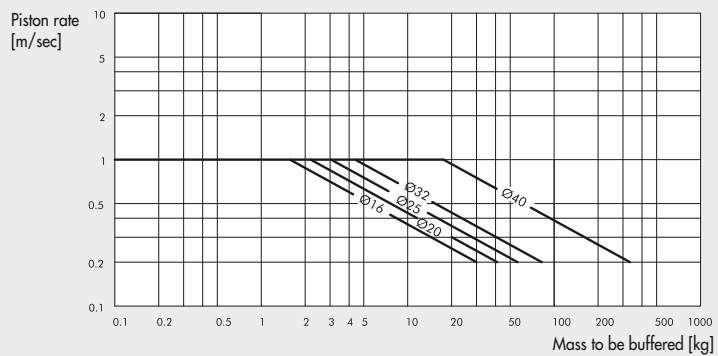
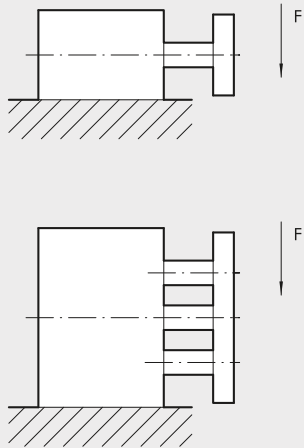


DIAGRAM OF SPEED AND MAXIMUM CUSHIONABLE LOAD

For the cylinder to reach the end-of-stroke position without intense or repeated impact which would damage it, it is necessary to annul the kinetic energy of the moving mass and the work generated. The maximum cushionable load depends on the traversing speed and the absorption of the air buffer supplied standard with the various cylinders. The diagram shows the speeds and cushionable mass for the various diameters at a pressure of 6 bar.



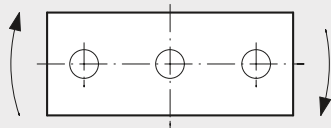
MAXIMUM SIDE LOAD



Ø mm	Guide unit	Stroke (mm)									
		20	25	30	40	50	75	100	150	175	200
16	Bushes	29	-	26	23	20	16	14	10	-	8
	Balls	31	-	27	38	34	29	24	12	-	8
20	Bushes	52	50	45	39	35	58	49	38	-	31
	Balls	56	-	48	79	70	54	50	27	-	32
25	Bushes	71	67	61	54	48	78	66	50	-	41
	Balls	72	68	62	78	73	60	52	37	-	30
32	Bushes	-	197	-	-	168	138	109	78	70	65
	Balls	-	89	-	-	60	276	217	138	122	110
40	Bushes	-	197	-	-	168	138	109	78	70	65
	Balls	-	89	-	-	60	276	217	138	122	110

NB: Forces are expressed in N

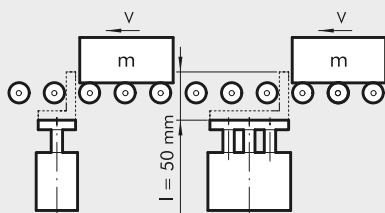
MAXIMUM TORQUE ON PLATE



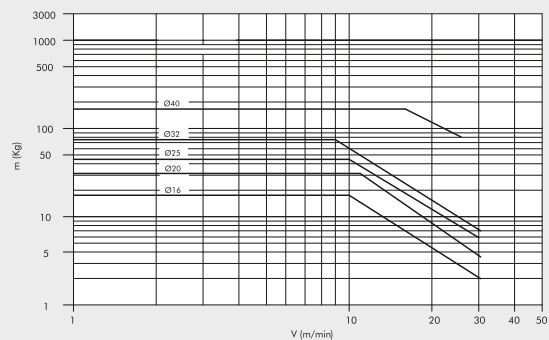
Ø mm	Guide unit	Stroke (mm)									
		20	25	30	40	50	75	100	150	175	200
16	Bushes	0.45	-	0.36	0.32	0.28	0.24	0.20	0.46	-	0.12
	Balls	0.60	-	0.50	0.72	0.65	0.54	0.45	0.35	-	0.25
20	Bushes	0.92	0.85	0.79	0.72	0.64	1.05	0.90	0.69	-	0.56
	Balls	1.28	-	1.08	1.78	1.59	1.24	1	0.61	-	0.49
25	Bushes	1.55	1.42	1.32	1.18	1.04	1.70	1.44	1.10	-	0.90
	Balls	1.98	1.78	1.70	2.16	2.20	1.66	1.4	1.02	-	0.82
32	Bushes	-	3.94	-	-	2.95	2.46	1.97	1.55	1.38	1.24
	Balls	-	1.97	-	-	1	2.96	2.44	2.40	2.43	2.18
40	Bushes	-	4.40	-	-	3.45	2.96	2.46	1.70	1.55	1.40
	Balls	-	2.46	-	-	1.45	6.38	5.4	3	2.73	2.40

NB: Forces are expressed in Nm

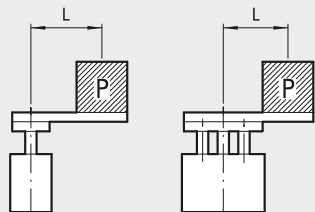
STOPPER FUNCTIONS



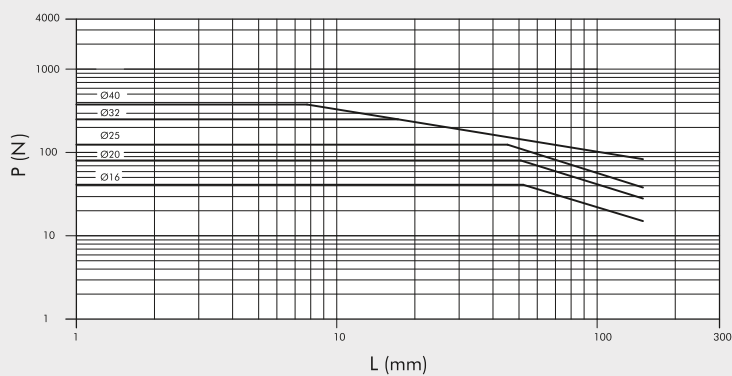
The graph refers to a 50 mm-stroke cylinder.



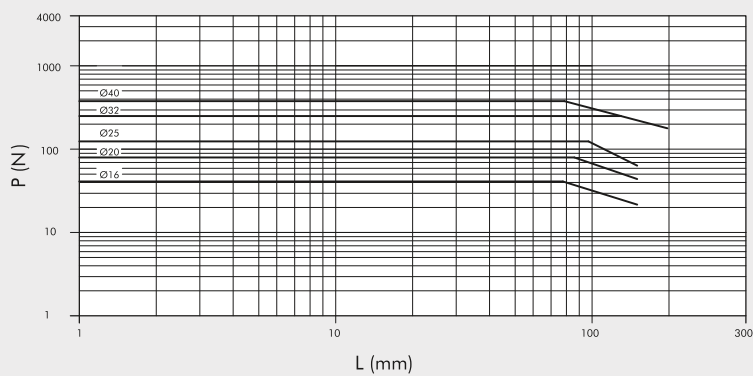
LIFTING FUNCTIONS



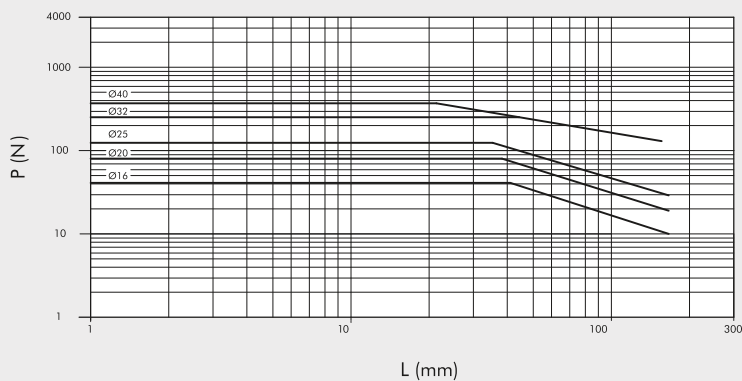
The graph refers from 25 to 50 mm-stroke cylinders with ball re-circulation guide unit



The graph refers from 75 to 100 mm-stroke cylinders with ball re-circulation guide unit

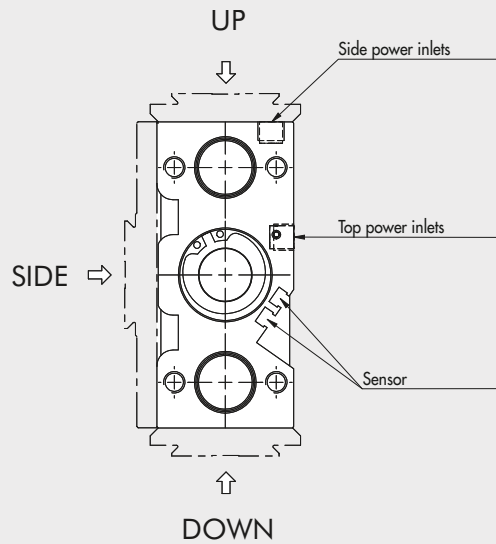


The graph refers to 50 mm-stroke cylinders with bushing guide unit



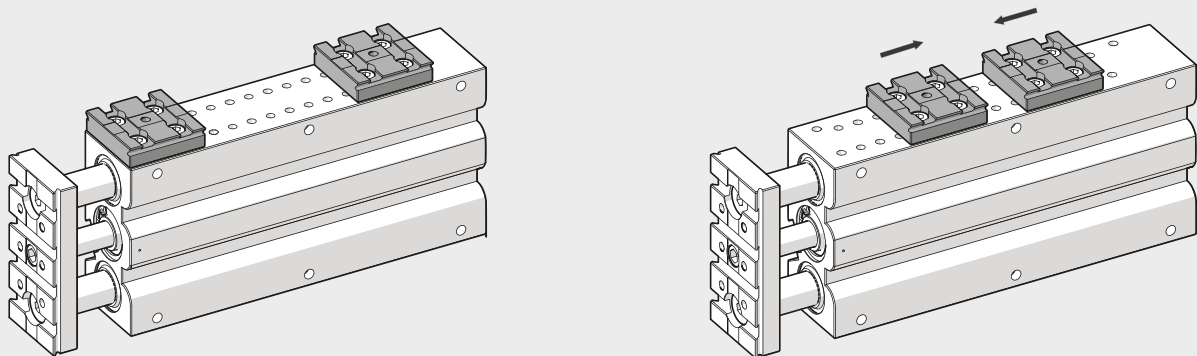
MOUNTING OPTIONS

The surface of the body on which to mount the V-Lock plates must be specified at the coding stage. The surface is identified by a letter **U** (Up), **S** (Side) or **D** (Down).

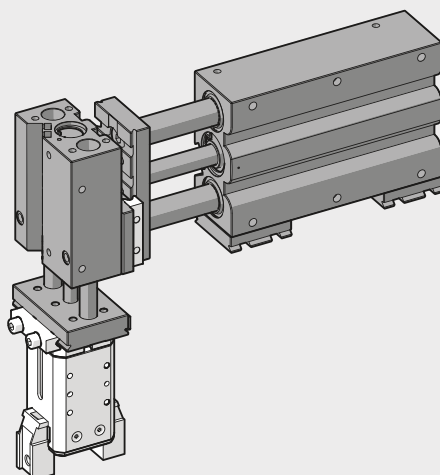


The chosen side of the CMPGK cylinder has a series of threaded holes and pinholes, and one or more V-Lock plates, depending on the stroke. The cylinder is delivered with a plate mounted in the foremost position and another, if provided, in the rearmost position.

The V-Lock plates can be moved as required and fixed to any of the threaded holes.

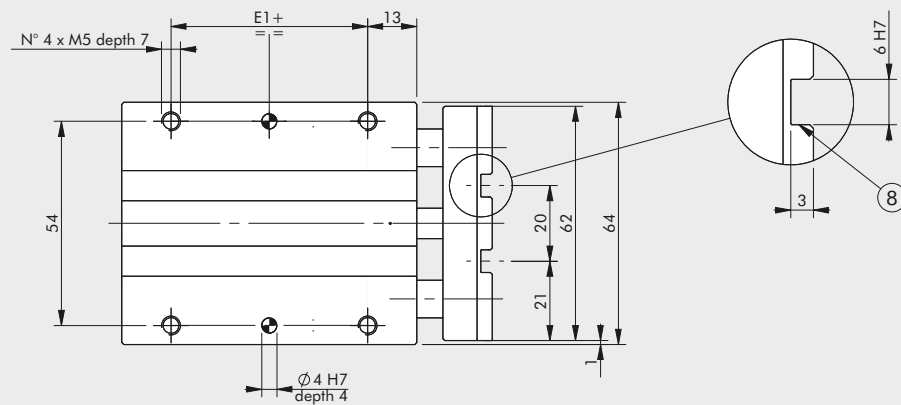
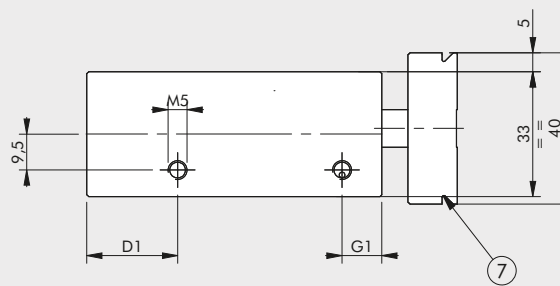
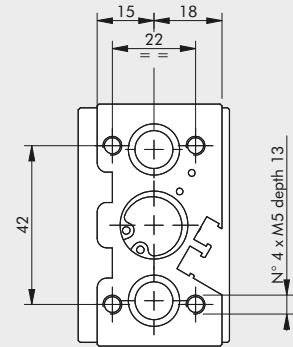
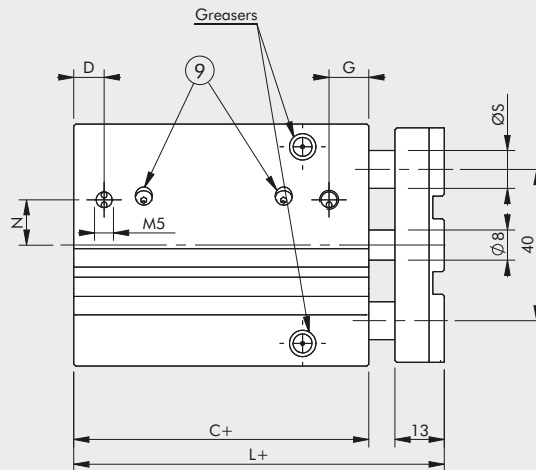
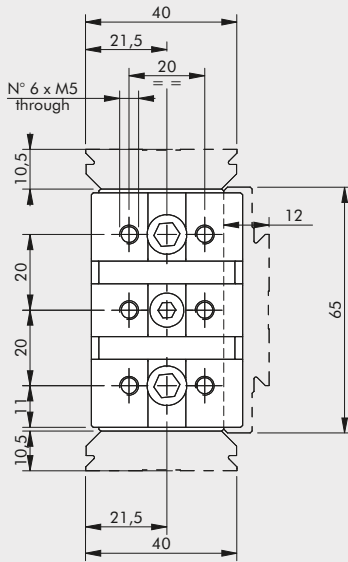


EXAMPLES OF APPLICATION



DIMENSIONS OF Ø 16, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 16, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



- ⑦ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key
- ⑨ Cushioning pins (in the cushioned version only)

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	Ø S	
						BA*	BB**		BA*	BB**
33	8.5	20	7	11.5	11.5	48	48	6.5	10	10

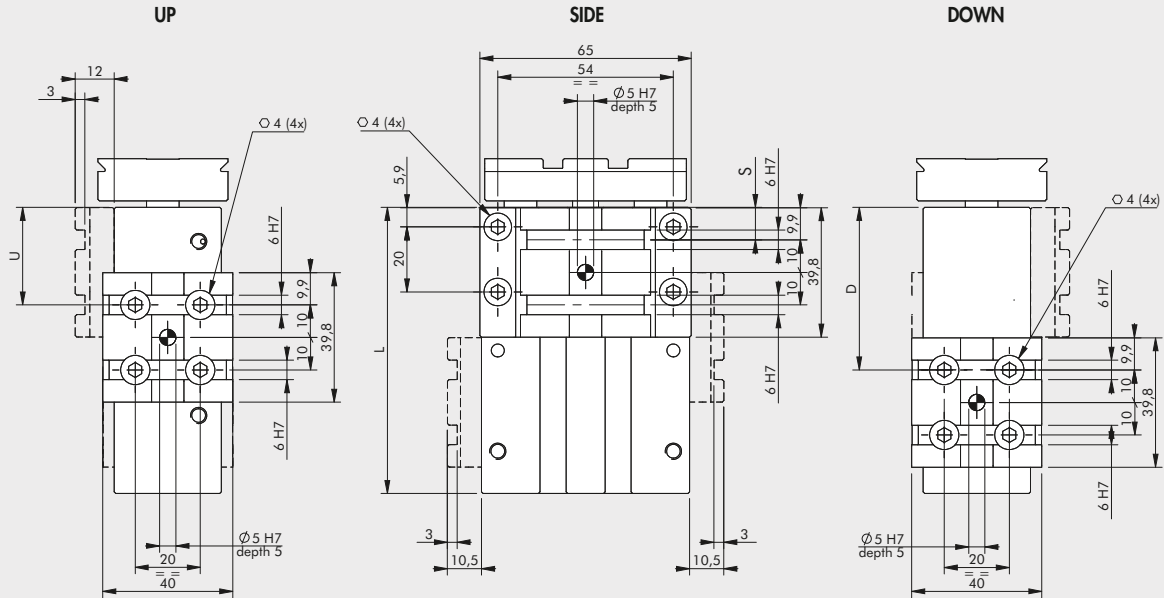
CUSHIONED

C	D	D1	E1	G	G1	L		N	Ø S	
						BA*	BB**		BA*	BB**
58	8	24	32	10.5	10.5	76	76	12	10	10

* Version BA (Bronze Bushings)

** Version BB (Ball Bearings)

POSITION OF Ø 16 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 16 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

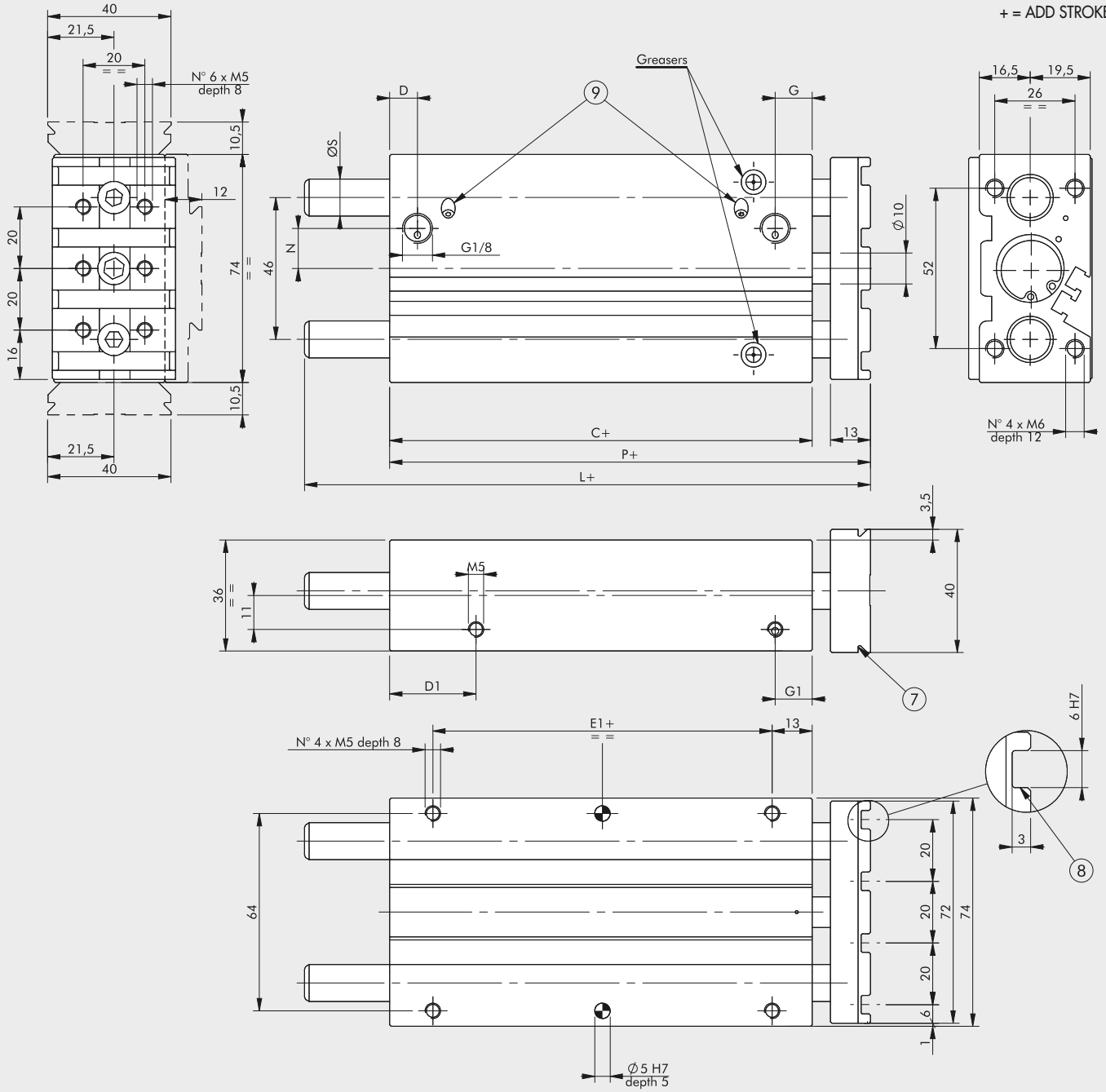
Stroke [mm]	30			40			50			75			100			150			200					
	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D			
Position	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	10		
Possible positions (see page 1-299)	-	-	30	30	30	30	30	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
									50	50	50	50	50	50	50	50	50	50	50	50	50	50		
									70	70	70	70	70	70	70	70	70	70	70	70	70	70		
													90	90	90	90	90	90	90	90	90	90		
																110	110	110	110	110	110	110		
																130	130	130	130	130	130	130		
																-	-	150	150	150	150	150		
																		170	170	170	170	170		
																		190	190	190	190	190		
No. of V-Lock plates supplied	1			1			1			2			2			2			2					
L	63			73			83			108			133			183			233					

CUSHIONED

Stroke [mm]	20			30			40			50					
	U	S	D	U	S	D	U	S	D	U	S	D			
Position	-	10	-	-	10	-	-	10	-	-	10	-			
Possible positions (see page 1-299)	30	30	30	30	-	30	30	-	30	30	30	30			
	-	-	50	-	-	50	50	-	50	50	50	50			
									70	-	70	70			
No. of V-Lock plates supplied	1			1			1			2					
L	78			88			98			108					

DIMENSIONS OF Ø 20, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 20, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



- ⑦ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key
- ⑨ Cushioning pins (in the cushioned version only)

Stroke	L
0 to 50	52
75 to 200	82

Stroke	L
0 to 50	81
75 to 200	108.5

NON-CUSHIONED

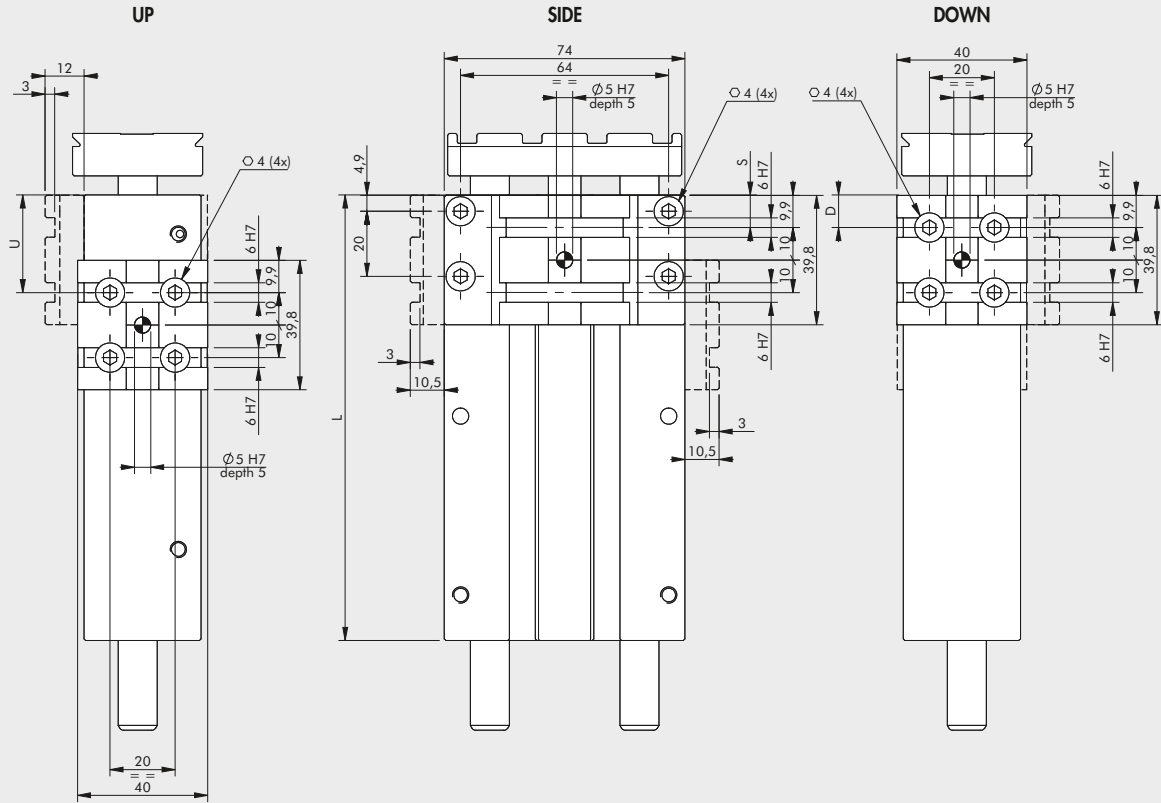
C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
37	9	20	10	11	11	see above	8.5	52	12	10	

CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
62	9	28	35	12	12	see above	13	81	12	10	

* Version BA (Bronze Bushings)
 ** Version BB (Ball Bearings)

POSITION OF Ø 20 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 20 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

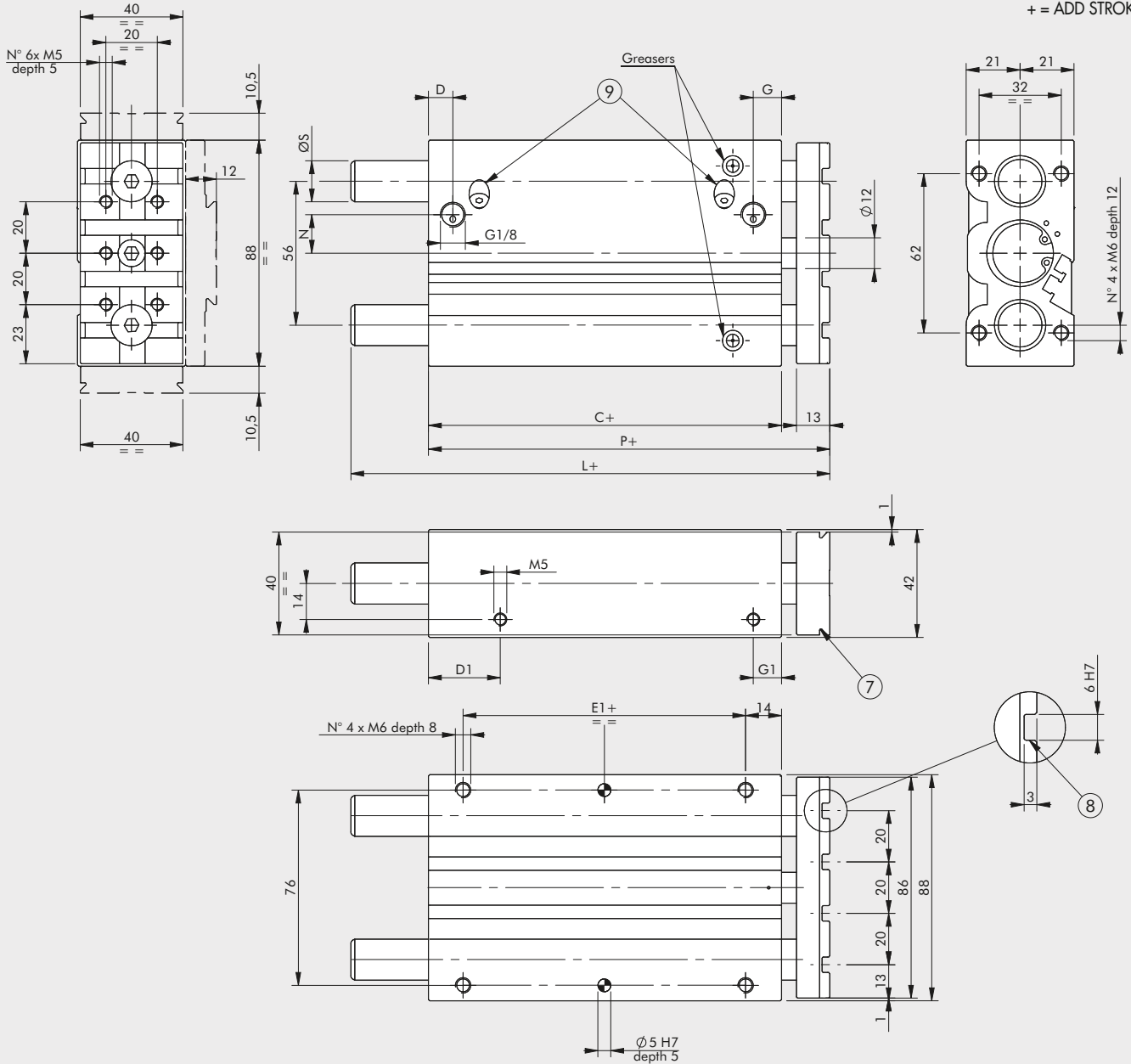
Stroke [mm]	25			30			40			50			75			100			150			200			
	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	
Position	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Possible positions (see page 1-299)	-	-	30	-	30	30	30	30	30	30	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30
													50	50	50	50	-	50	50	50	50	50	50	50	50
														70	70	70	70	-	70	70	70	70	70	70	70
No. of V-Lock plates supplied	1			1			1			1			2			2			2			2			
L	62			67			77			87			112			137			187			237			

CUSHIONED

Stroke [mm]	20			30			40			50			75			100			150			200			
	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	
Position	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10	-
Possible positions (see page 1-299)	30	-	30	30	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	-	-	50	-	-	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
No. of V-Lock plates supplied	1			1			1			1			2			2			2			2			
L	82			92			102			112			137			162			212			262			

DIMENSIONS OF Ø 25, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 25, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



- ⑦ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key
- ⑨ Cushioning pins (in the cushioned version only)

Stroke	L
0 to 50	52.5
75 to 200	82.5

Stroke	L
0 to 50	81.5
75 to 200	111.5

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
37.5	9	23	10	11	11	see above	8	52.5	16	16	

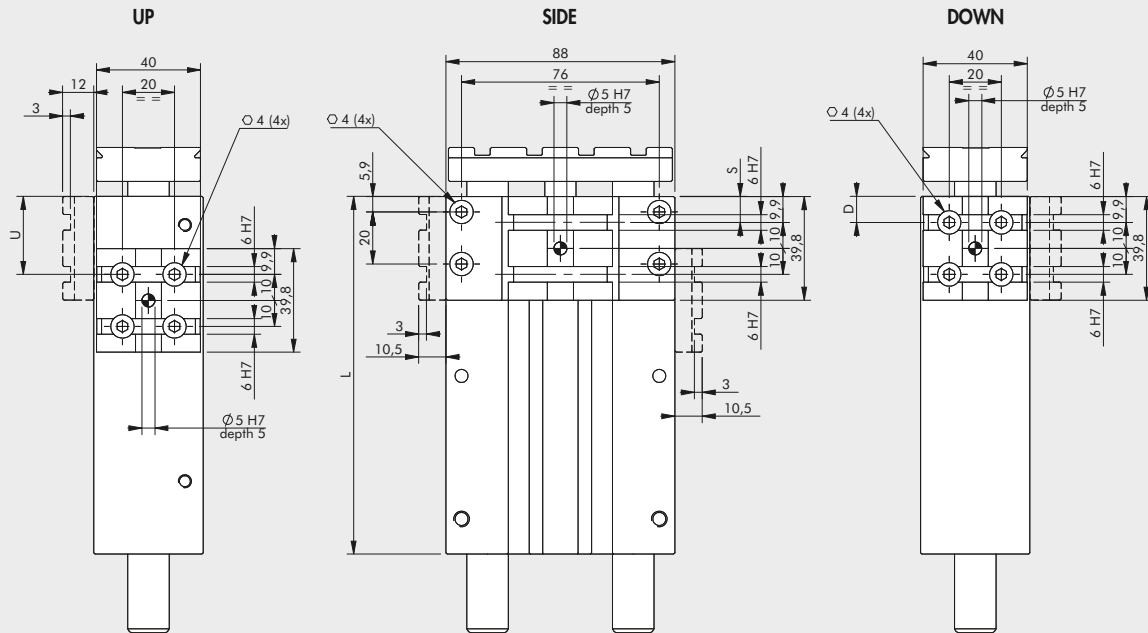
CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
62.5	9.5	28	35	11	11	see above	15	81.5	16	16	

* Version BA (Bronze Bushings)

** Version BB (Ball Bearings)

POSITION OF Ø 25 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 25 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

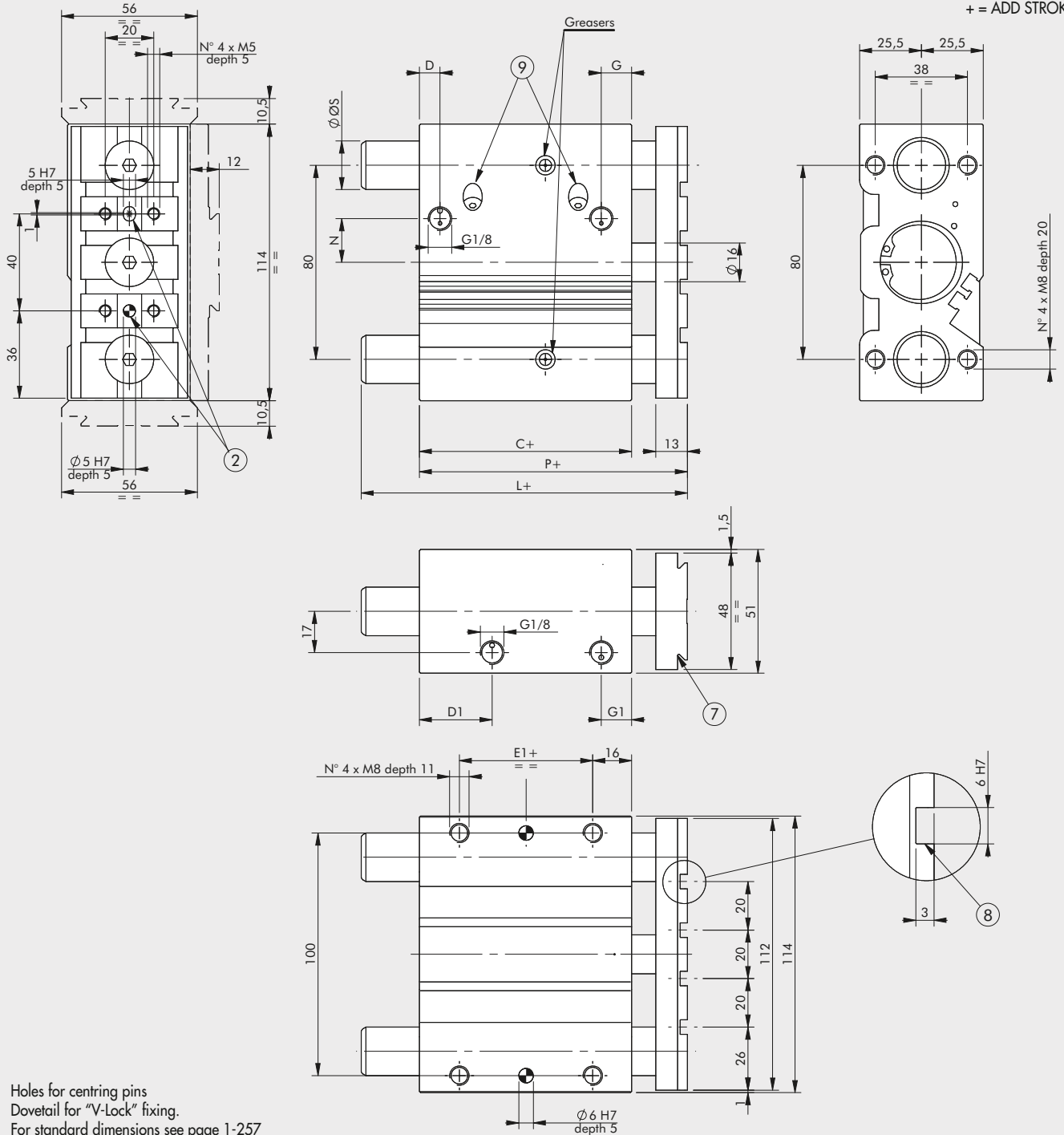
Stroke [mm]	25			30			40			50			75			100			150			200					
	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D			
Position	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Possible positions (see page 1-299)	-	-	30	-	30	30	30	30	30	30	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
							50	-	50	-	-	50	50	50	50	50	-	50	50	50	50	50	50	50	50	50	50
													70	70	70	70	-	70	70	70	70	70	70	70	70	70	70
																90	90	90	90	90	90	90	90	90	90	90	90
																-	-	110	110	110	110	110	110	110	110	110	110
																			130	130	130	130	130	130	130	130	130
																			-	150	150	150	150	150	150	150	150
																						170	170	170	170	170	170
																						190	190	190	190	190	190
																						-	-	210	-	-	210
No. of V-Lock plates supplied	1			1			1			1			2			2			2			2					
L	62.5			67.5			77.5			87.5			112.5			137.5			187.5			237.5					

CUSHIONED

Stroke [mm]	20			30			40			50			75			100			150					
	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D			
Position	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Possible positions (see page 1-299)	30	-	30	30	-	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	-	-	50	-	-	50	50	50	50	50	50	50	50	-	50	50	50	50	50	50	50	50	50	50
							-	-	70	-	70	70	70	-	70	70	-	70	70	70	70	70	70	70
													90	90	90	90	-	90	90	-	90	90	-	90
													110	-	110	110	110	110	110	-	110	110	-	110
																-	-	130	130	130	130	130	130	130
																			-	150	150	150	150	150
																			-	170	170	170	170	170
No. of V-Lock plates supplied	1			1			1			1			2			2			2					
L	82.5			92.5			102.5			112.5			137.5			162.5			212.5					

DIMENSIONS OF Ø 32, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 32, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



- ② Holes for centring pins
- ⑦ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key
- ⑨ Cushioning pins (in the cushioned version only)

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
37.5	9	26.5	5	12.5	12.5	76.5	76.5	14	52.5	20	20

CUSHIONED

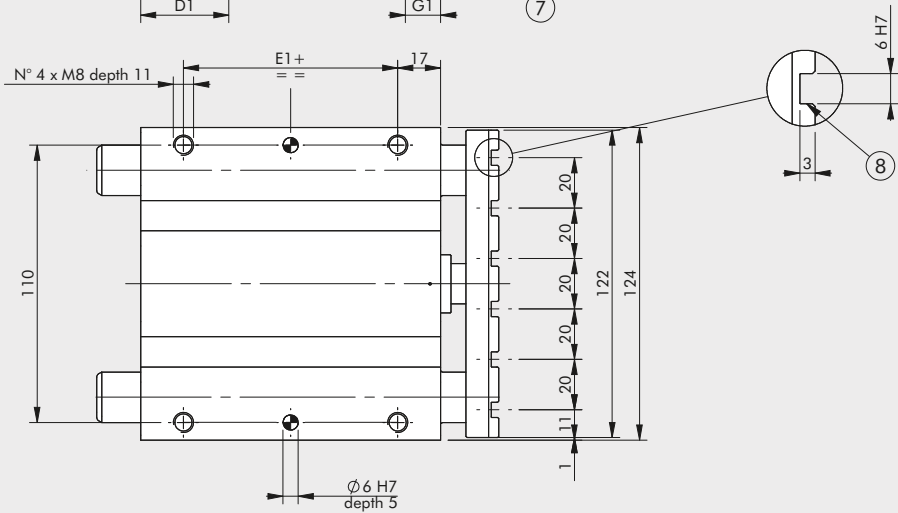
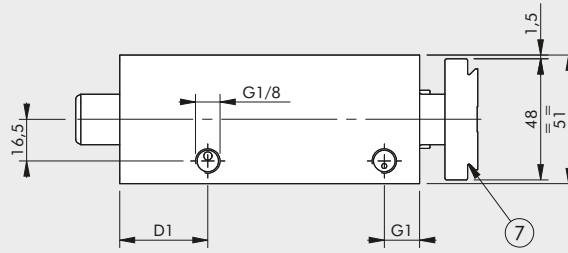
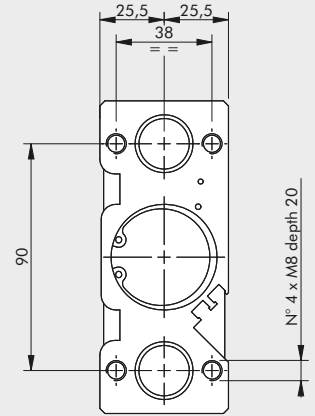
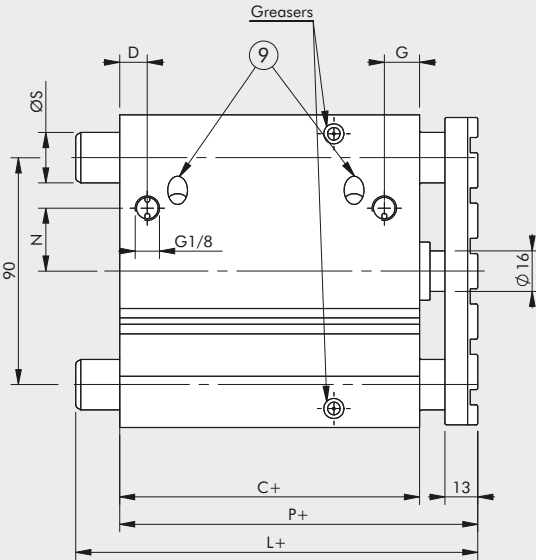
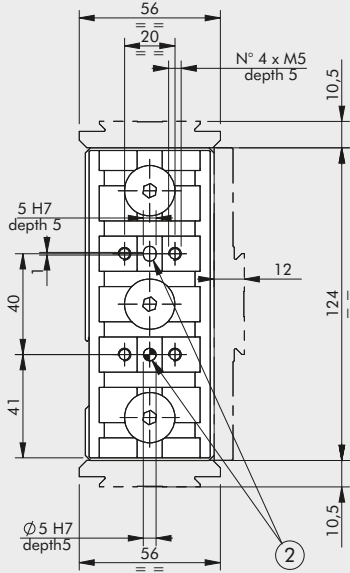
C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
62.5	8.5	25	30	12.5	12.5	109.5	109.5	18	85.5	20	20

* Version BA (Bronze Bushings)

** Version BB (Ball Bearings)

DIMENSIONS OF Ø 40, BA AND BB NON-CUSHIONED VERSION
DIMENSIONS OF Ø 40, BA AND BB CUSHIONED VERSION

+ = ADD STROKE



- ② Holes for centring pins
- ⑦ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key
- ⑨ Cushioning pins (in the cushioned version only)

NON-CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
44	10	35	10	14	14	76.5	76.5	21	59	20	20

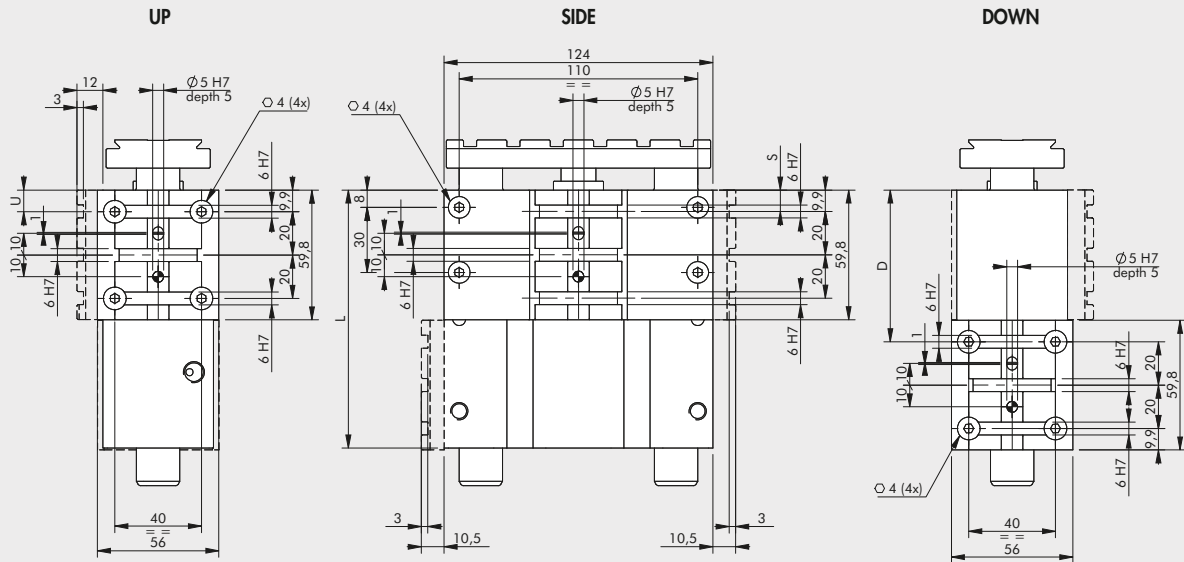
CUSHIONED

C	D	D1	E1	G	G1	L		N	P	Ø S	
						BA*	BB**			BA*	BB**
69	11	35	35	14	14	109.5	109.5	25	92	20	20

* Version BA (Bronze Bushings)

** Version BB (Ball Bearings)

POSITION OF Ø 40 PLATES, BA AND BB NON-CUSHIONED VERSION
POSITION OF Ø 40 PLATES, BA AND BB CUSHIONED VERSION



NON-CUSHIONED

Stroke [mm]	50			75			100			150			200		
	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D
Position	-	10	10	-	10	10	-	10	10	-	10	10	-	10	10
Possible positions (see page 1-299)	30	-	-	30	-	-	30	-	-	30	-	-	30	-	-
	-	-	-	-	30	-	-	30	-	-	30	-	-	30	-
	-	-	-	-	50	-	-	-	-	-	50	-	-	50	-
	-	70	-	-	70	70	-	-	-	70	70	-	-	70	70
	-	-	-	-	-	-	-	-	-	90	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	90	-	-	90	90	-
									-	110	-	-	110	-	
									-	130	130	-	130	130	
									150	-	-	150	-	-	
									-	150	-	-	150	-	
													-	170	-
													-	190	190
No. of V-Lock plates supplied	1			1			1			2			2		
L	94			119			144			194			244		

CUSHIONED

Stroke [mm]	25			50			75			100			150			175		
	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D	U	S	D
Position	-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Possible positions (see page 1-299)	-	40	-	-	40	-	-	-	-	-	40	-	-	40	-	-	40	-
	-	-	-	-	-	70	70	-	70	70	70	70	70	70	70	70	70	70
	-	-	-	-	-	-	-	-	-	-	100	-	-	100	-	-	100	-
	-	-	-	-	-	-	-	-	-	-	-	-	130	130	130	130	130	130
	-	-	-	-	-	-	-	-	-	-	-	-	-	160	-	-	160	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190	190
No. of V-Lock plates supplied	1			1			1			2			2			2		
L	94			119			144			169			219			244		

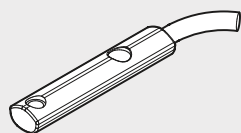
KEY TO CODES

CYL	W143	032	2	050	U	K
	TYPE	DIAMETER	VERSION	STROKE	FIXING SIDE	FAMILY
	Compact guided cylinder	016 Ø 16 020 Ø 20 025 Ø 25 032 Ø 32 040 Ø 40	2 Non-cushioned with bronze bushings 3 Non-cushioned with ball bearings 4 Cushioned with bronze bushings 5 Cushioned with ball bearings	CUSHIONED VERSION Ø 16: 20, 30, 40, 50 Ø 20: 20, 30, 40, 50, 75, 100, 150, 200 Ø 25: 20, 30, 40, 50, 75, 100, 150 Ø 32: 25, 50, 75, 100, 150, 175 Ø 40: 25*, 50, 75, 100, 150, 175 NOT CUSHIONED VERSION ♦ Ø 16: 30*, 40, 50, 75, 100, 150, 200 Ø 20: 25, 30, 40, 50, 75, 100, 150, 200 Ø 25: 25, 30, 40, 50, 75, 100, 150, 200 Ø 32: 25, 50, 75, 100, 150, 200 Ø 40: 50, 75, 100, 150, 200	U Up S Side D Down	K V-Lock

* Side and Down versions only
 ♦ Other strokes on request but with the same cylinder dimensions as the standard stroke immediately above.

ACCESSORIES

RETRACTABLE SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952225390	HALL N.O. sensor, vertical insertion 2.5 m robotics
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8 robotics
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952222180	REED N.O. sensor, vertical insertion 2.5 m robotics
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8 robotics
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
 NB: For technical data see page 1-580

NOTES

GUIDE UNITS SERIES GDHK AND GDMK

Guide units GDHK and GDMK guarantee excellent alignment and anti-rotation of the pneumatic cylinder connected to them. They can be used either singly or in combination to obtain complete handling units. The typical dovetail profile with V-Lock slots allows assembly with other elements in the V-Lock series.

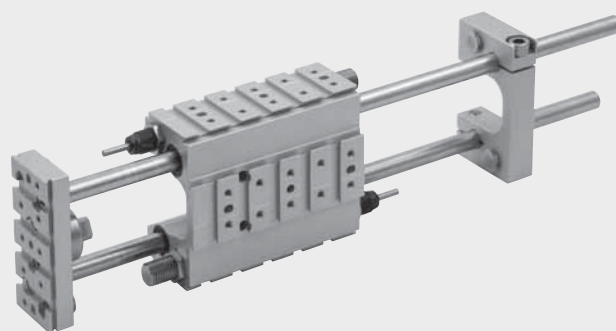
Guide units can be coupled with:

- ISO 6432 cylinders Ø 12, 16, 20 and Ø 25. **You can not use sensor circlip mod. DSW;**
- ISO 15552 series 3 cylinders Ø 32 and 40;
- ISO 15552 STD and type A cylinders Ø 32 and 40. **You can not apply position sensors.**
- Electric cylinder series Elektro ISO 15552 Ø32. It is a version with shorter columns; the cylinder must be an anti-rotation type because the guide coupling is rotary and cannot prevent piston rod rotation.

Series GDHK has bronze bushes and is more suitable for high loads. Series GDMK has recirculating ball bushes and is more suitable for high speeds.

Guide units are available with 5 types of stop mechanism:

- without stops (stop is provided by the cylinder);
- with buffers for piston rod retraction;
- with a hydraulic shock absorber for piston rod retraction;
- with buffers for piston rod extension and retraction;
- with hydraulic shock absorbers for piston rod extension and retraction.

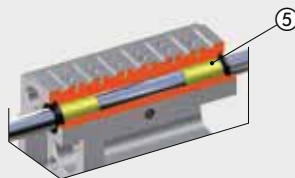


TECHNICAL DATA		Ø 12	Ø 16	Ø 20	Ø 25	Ø 32	Ø 40
Strokes	mm	From 1 to 600					
		The total stroke can be shortened using adjusting stops and/or the rear plate.					
Stroke reduction via stop adjustment	mm	-14 per side		-22 per side		-40 per side	-35 per side
Temperature range	°C	-10 to +80					
Recommended maximum speed	m/s	1					
Rear plate torques	Nm	7 ±1		22 ±2			35 ±2
Guide column diameter	mm	10		12		16	20
Maximum impact energy		refer to the diagram on page 1-312					
with shock absorbers	Ec [J]	5		20		25	70
with buffers	Ec [J]	0.5		1		2	2
without stops		refer to the diagram on page 1-312					
Repeatability (at 6 bar)		±0.02 (with minimum pressure 5 bar)					
Versions with buffers	mm	±0.02					
Versions with shock absorbers	mm	±0.02					
Lubrication		The guides are supplied lubricated. There are two greasers on the guide bodies (one per column) for periodic lubrication using a pump with a nozzle. The following greases are recommended: - version GDHK: code 9910502 (RHEOLUBE 362 HB) - version GDMK: code 9910506 (RHEOLUBE 363AX1) The lubrication interval depends on numerous factors such as load, temperature, speed, stroke, lubricant, environmental conditions and assembly position. As a general rule, lubrication is recommended every 500.000 – 1.000.000 cycles.					

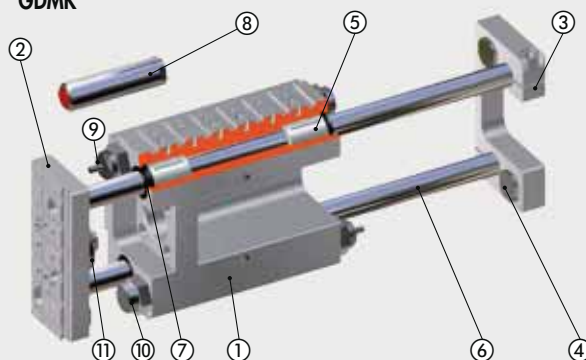
COMPONENTS

- ① BODY: anodised aluminium
- ② FRONT PLATE: anodised aluminium
- ③ REAR PLATE: anodised aluminium
- ④ STOP: tempered steel
- ⑤ COLUMN GUIDES:
 - sintered bronze (for GDH version)
 - recirculation ball bushes (for GDM version)
- ⑥ GUIDE COLUMNS:
 - C45 grinded chrome steel (for GDH version)
 - tempered steel (for GDM version)
- ⑦ DUST SCRAPER RING: polyurethane or NBR
- ⑧ BUFFER
- ⑨ DECELERATOR
- ⑩ ADJUSTABLE STOP: tempered steel (for versions with shock absorbers)
- ⑪ COUPLING: C45 steel

GDHK

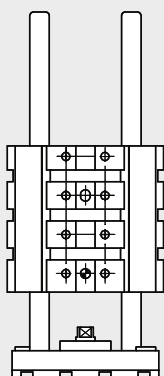


GDMK



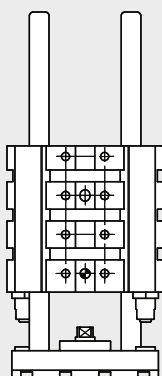
EXECUTIONS

00



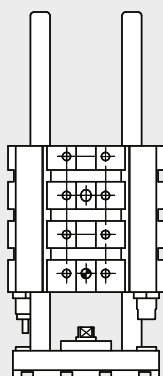
without stop

01



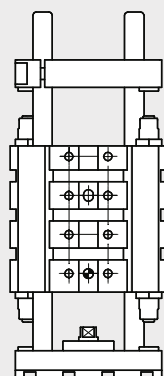
with front stop and buffers

02



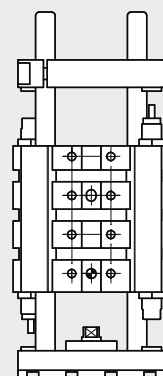
with front stop and shock absorber

03



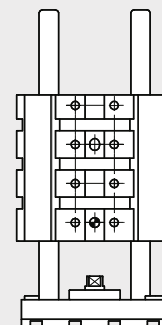
with front and rear stop and buffers

04



with front and rear stop and shock absorbers

05



with short columns for Elektro cylinder

WEIGHTS AND MOVING MASSES

TOTAL WEIGHTS

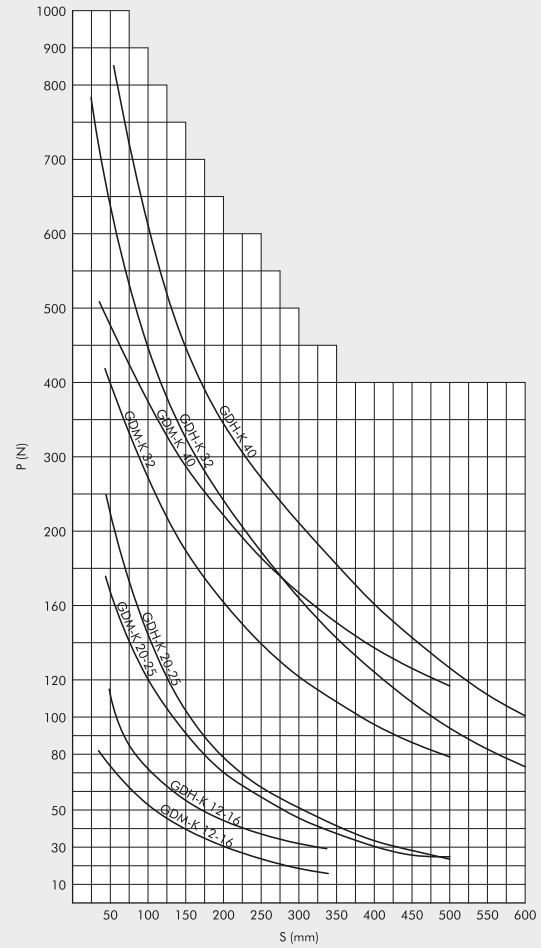
Ø mm	Weight [g] for Stroke = 0 mm						Weight [g] every mm
	Execution						
	00	01	02	03	04	05	
12-16	779	817	823	953	965	-	1.2
20-25	1412	1520	1534	1809	1837	-	1.8
32	2262	2582	2558	3161	3113	2137	3.1
40	4316	4836	4873	5864	5938	-	4.9

TOTAL MOVING MASSES

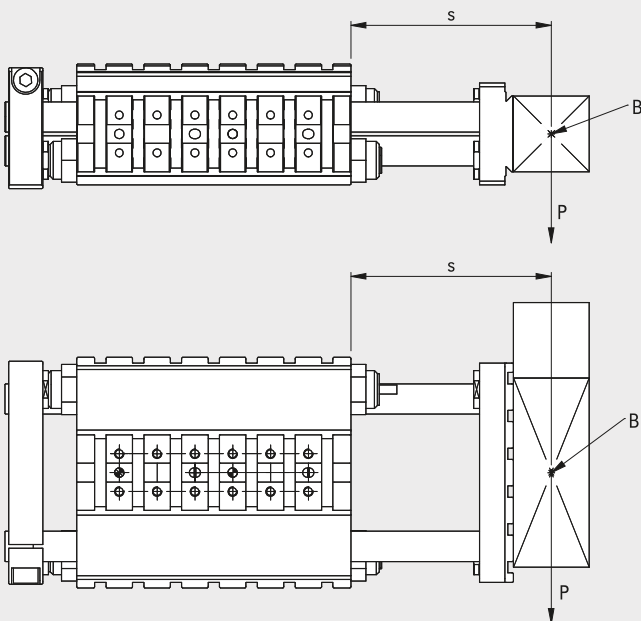
Ø mm	Weight [g] for Stroke = 0 mm						Weight [g] every mm
	Execution						
	00	01	02	03	04	05	
12-16	293	293	293	391	391	-	1.2
20-25	518	518	518	699	699	-	1.8
32	667	667	667	926	926	542	3.1
40	1670	1670	1670	2178	2178	-	4.9

LOAD DIAGRAM

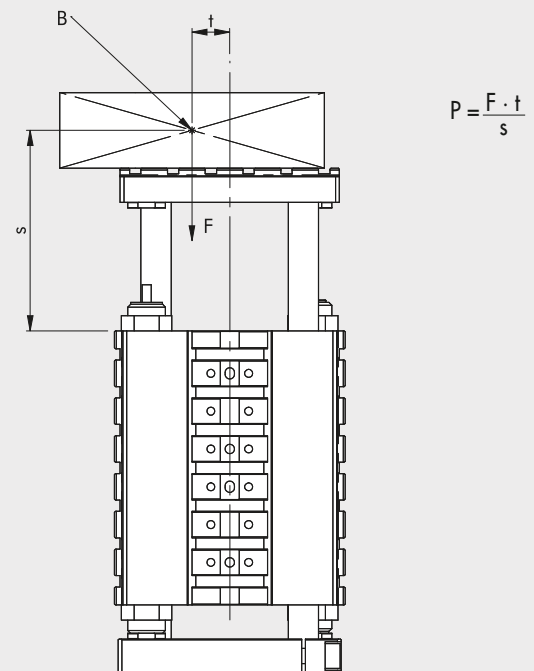
The graph on the right shows the maximum static load that can be applied to the guides as a function of the distance between the body of the guide and the barycenter of the load (with the piston rod extended).



HORIZONTAL APPLICATIONS



VERTICAL APPLICATIONS

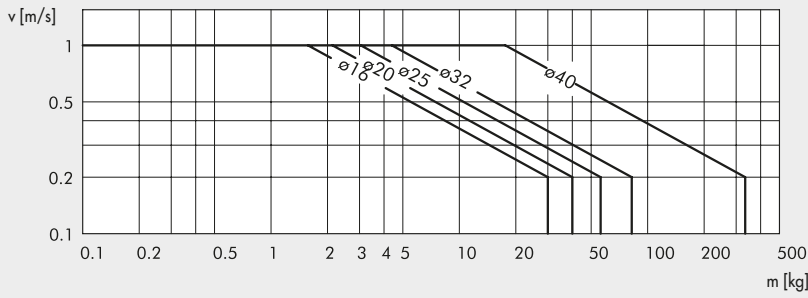


B = Barycentre; S = Projection; P = Useful load

MAXIMUM LOADS AND SPEEDS

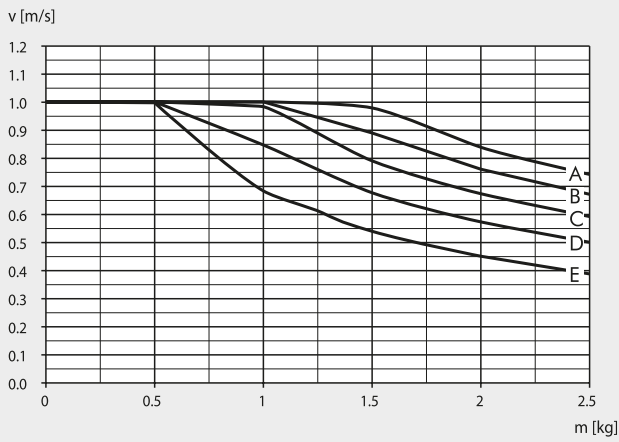
The graphs below show the maximum recommended movable loads "m" (masses) [kg] as a function of the average traverse speed "v" [m/s], defined as stroke/time, slide position (horizontal/vertical) and supply pressure.

MAXIMUM LOADS: VERSIONS WITHOUT STOPS

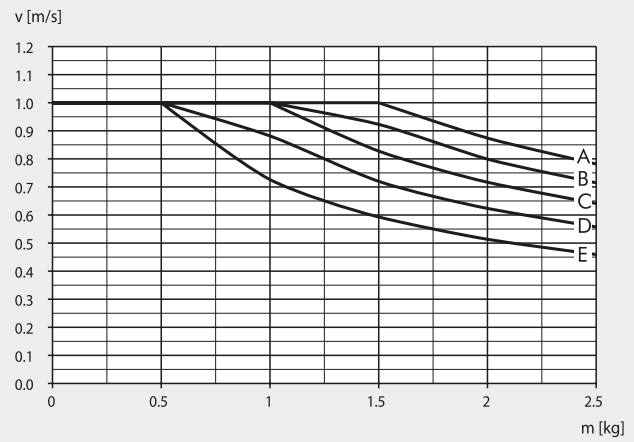


MAXIMUM LOADS: VERSIONS WITH SHOCK ABSORBERS

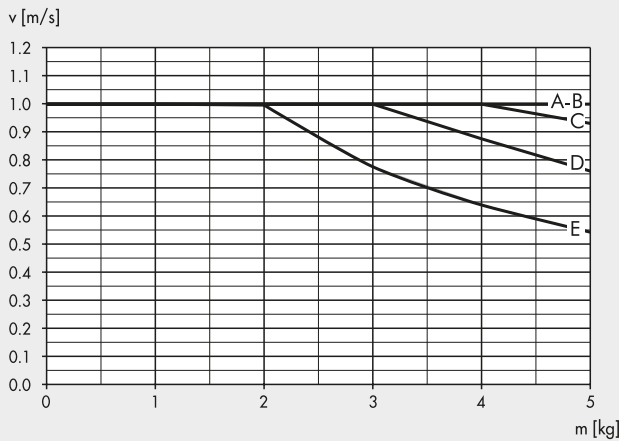
Ø 12-16 - Vertical orientation



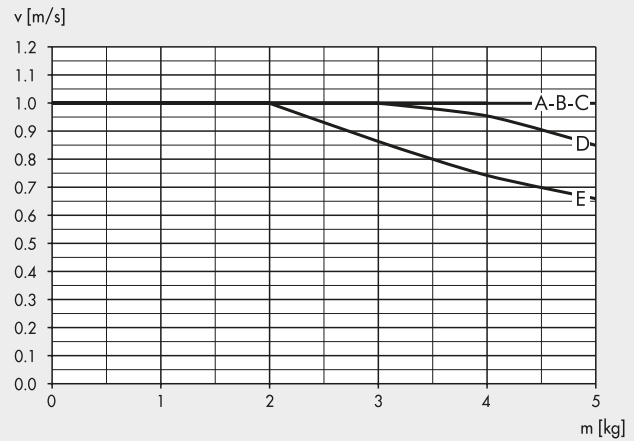
Ø 12-16 - Horizontal orientation



Ø 20-25 - Vertical orientation

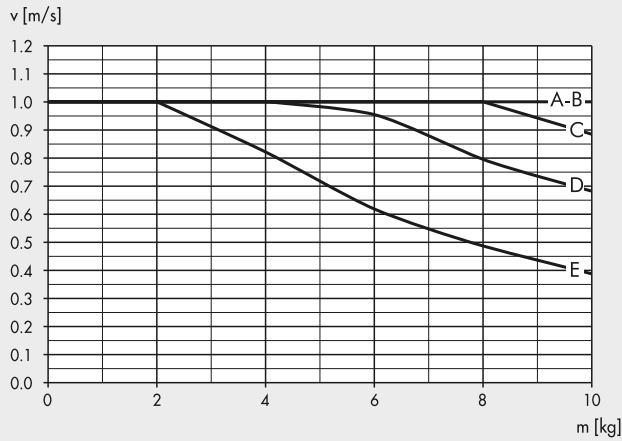


Ø 20-25 - Horizontal orientation

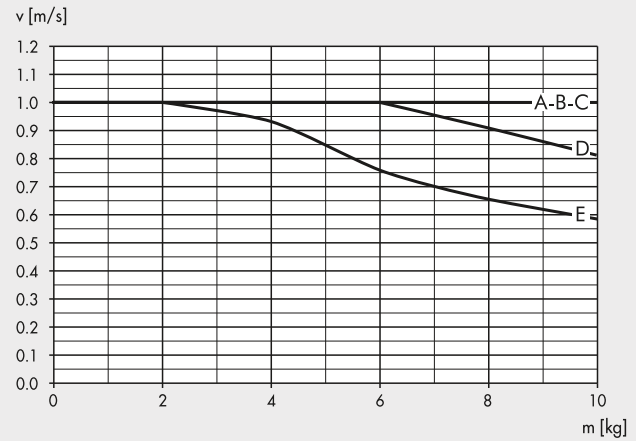


A = 2 bar B = 4 bar C = 6 bar D = 8 bar E = 10 bar

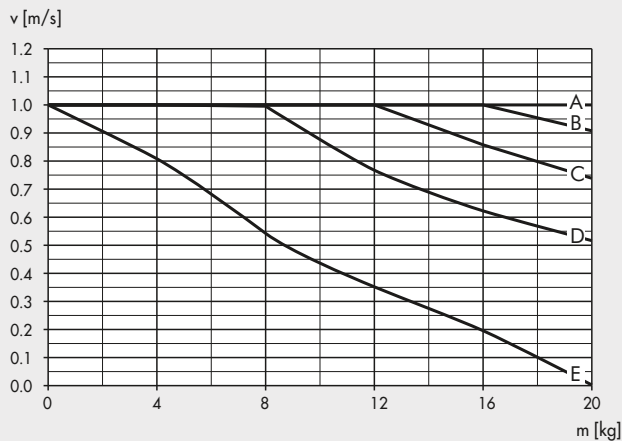
Ø 32 - Vertical orientation



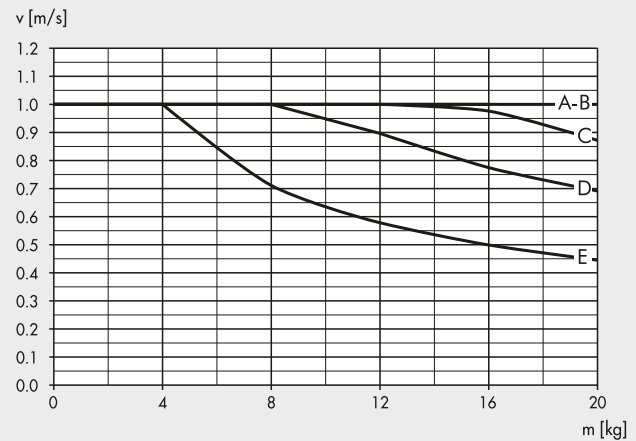
Ø 32 - Horizontal orientation



Ø 40 - Vertical orientation



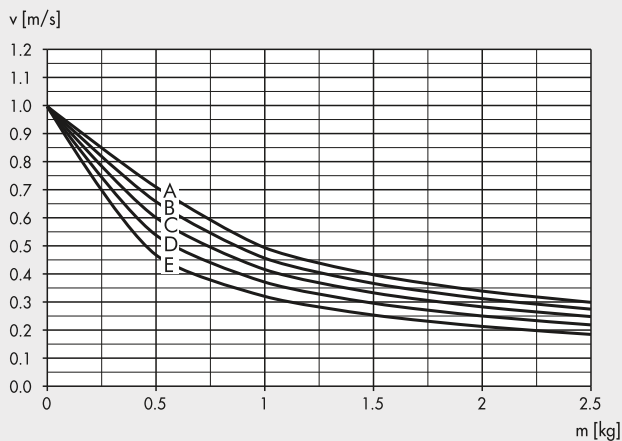
Ø 40 - Horizontal orientation



A = 2 bar B = 4 bar C = 6 bar D = 8 bar E = 10 bar

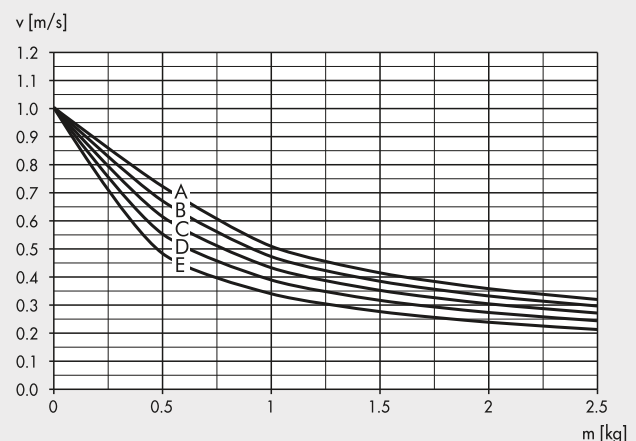
MAXIMUM LOADS: VERSIONS WITH BUFFERS

Ø 12-16 - Vertical orientation

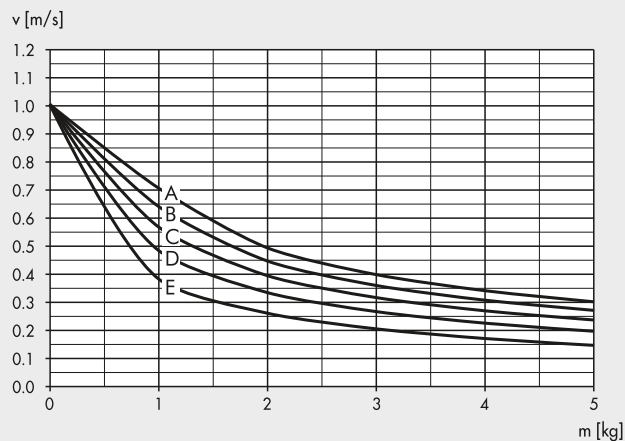


A = 2 bar B = 4 bar C = 6 bar D = 8 bar E = 10 bar

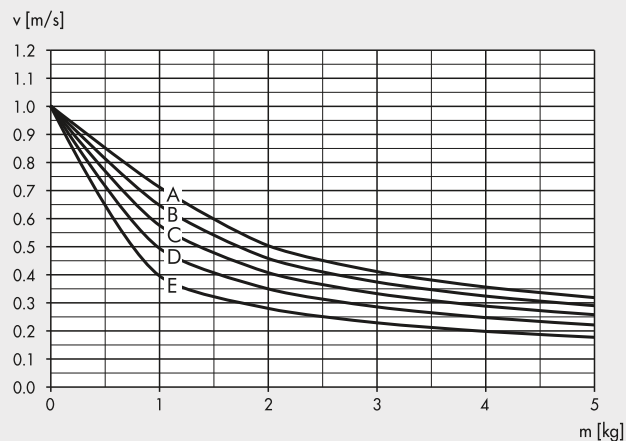
Ø 12-16 - Horizontal orientation



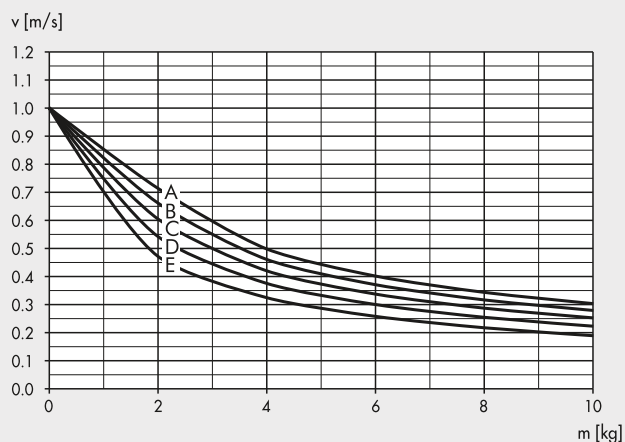
Ø 20-25 - Vertical orientation



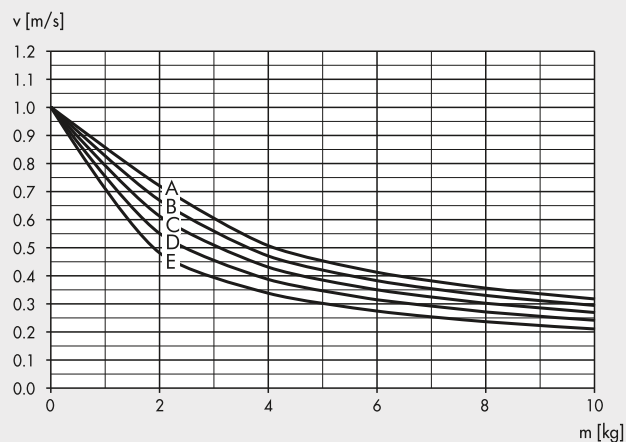
Ø 20-25 - Horizontal orientation



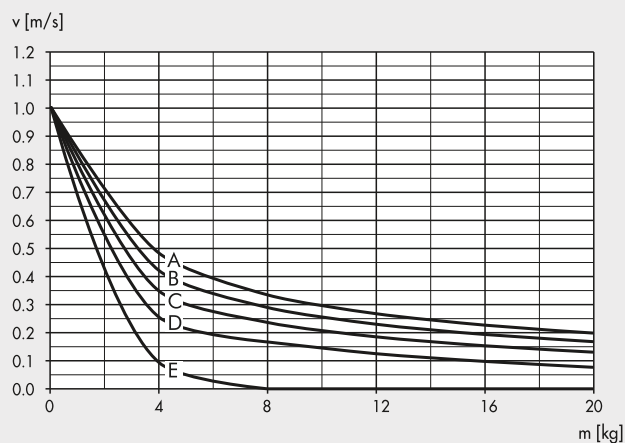
Ø 32 - Vertical orientation



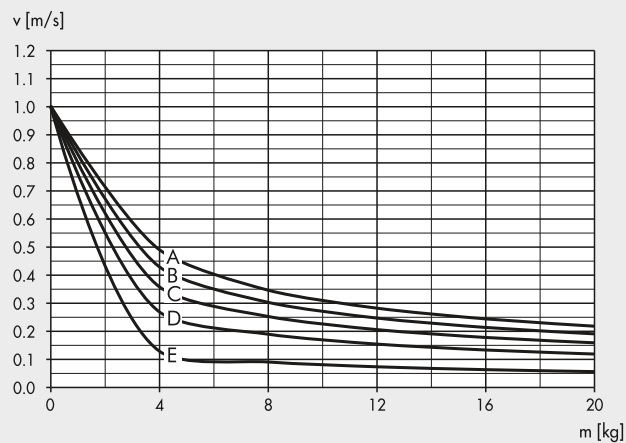
Ø 32 - Horizontal orientation



Ø 40 - Vertical orientation



Ø 40 - Horizontal orientation

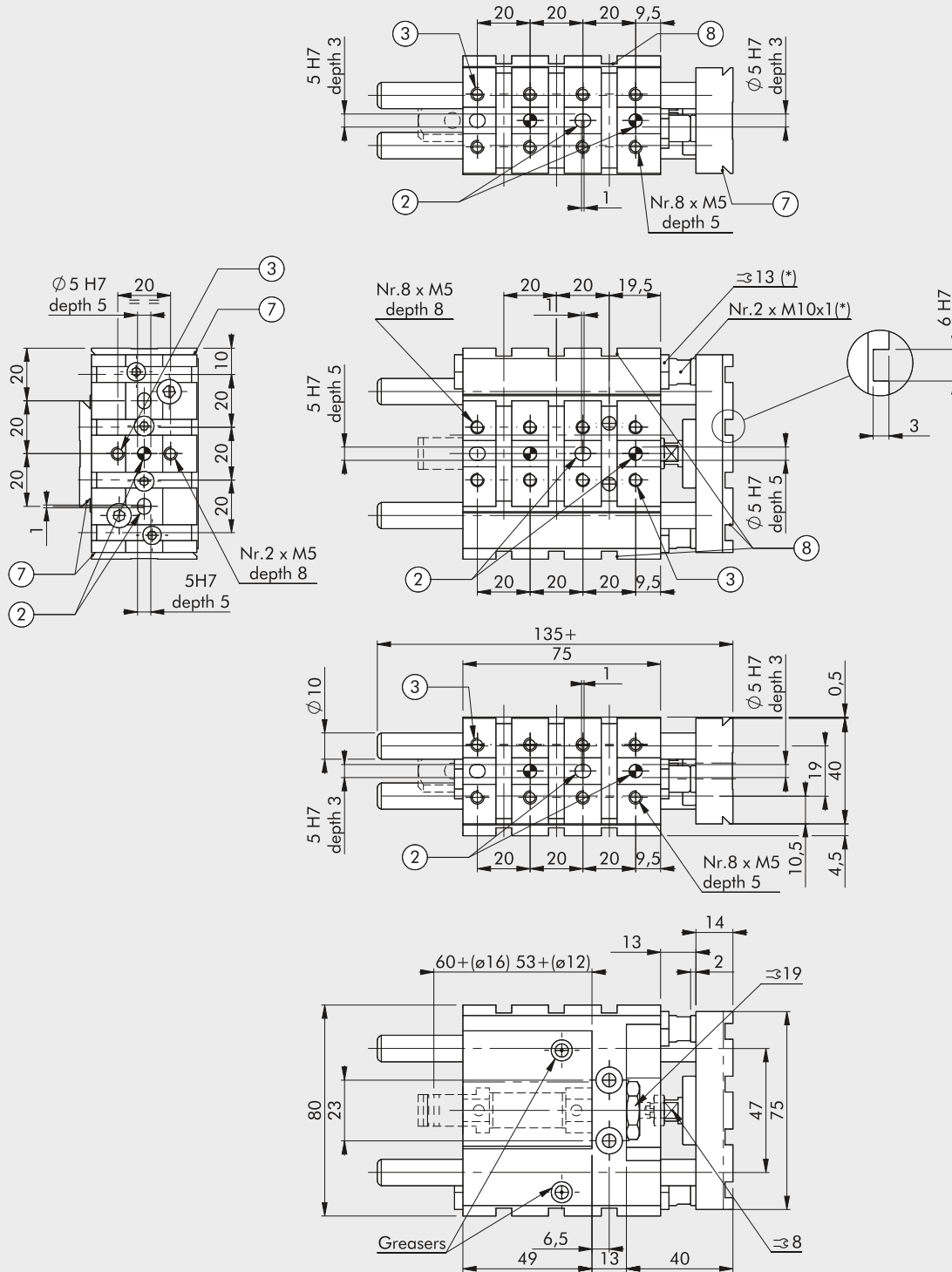


A = 2 bar B = 4 bar C = 6 bar D = 8 bar E = 10 bar

DIMENSIONS Ø 12-16

Versions 00-01-02

+ = ADD THE STROKE

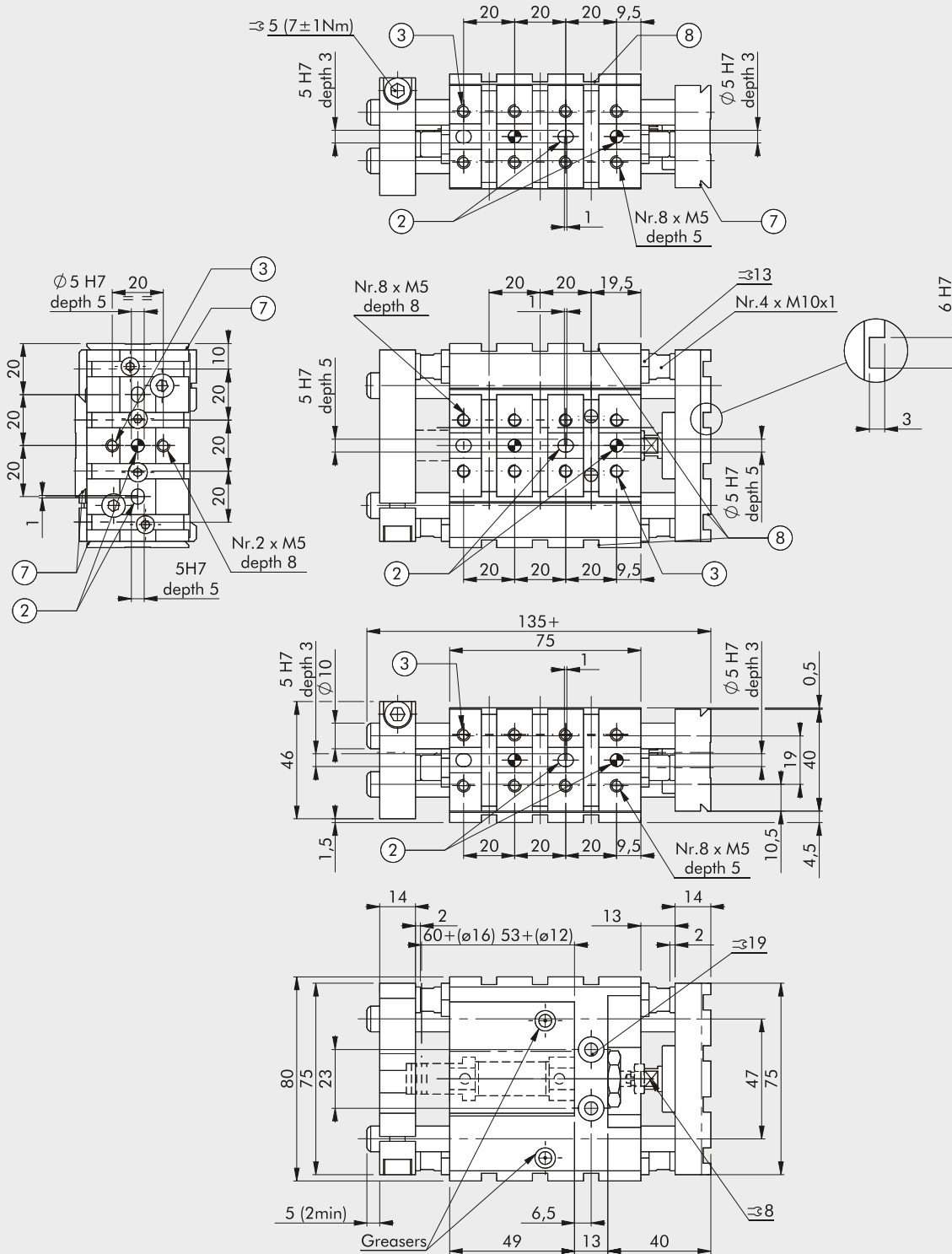


- * Not present in version 00
 - ② Holes for centring pins
 - ③ Threaded holes for fixing
 - ⑦ Dovetail for "V-Lock" fixing.
- For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

DIMENSIONS Ø 12-16

Versions 03-04

+ = ADD THE STROKE

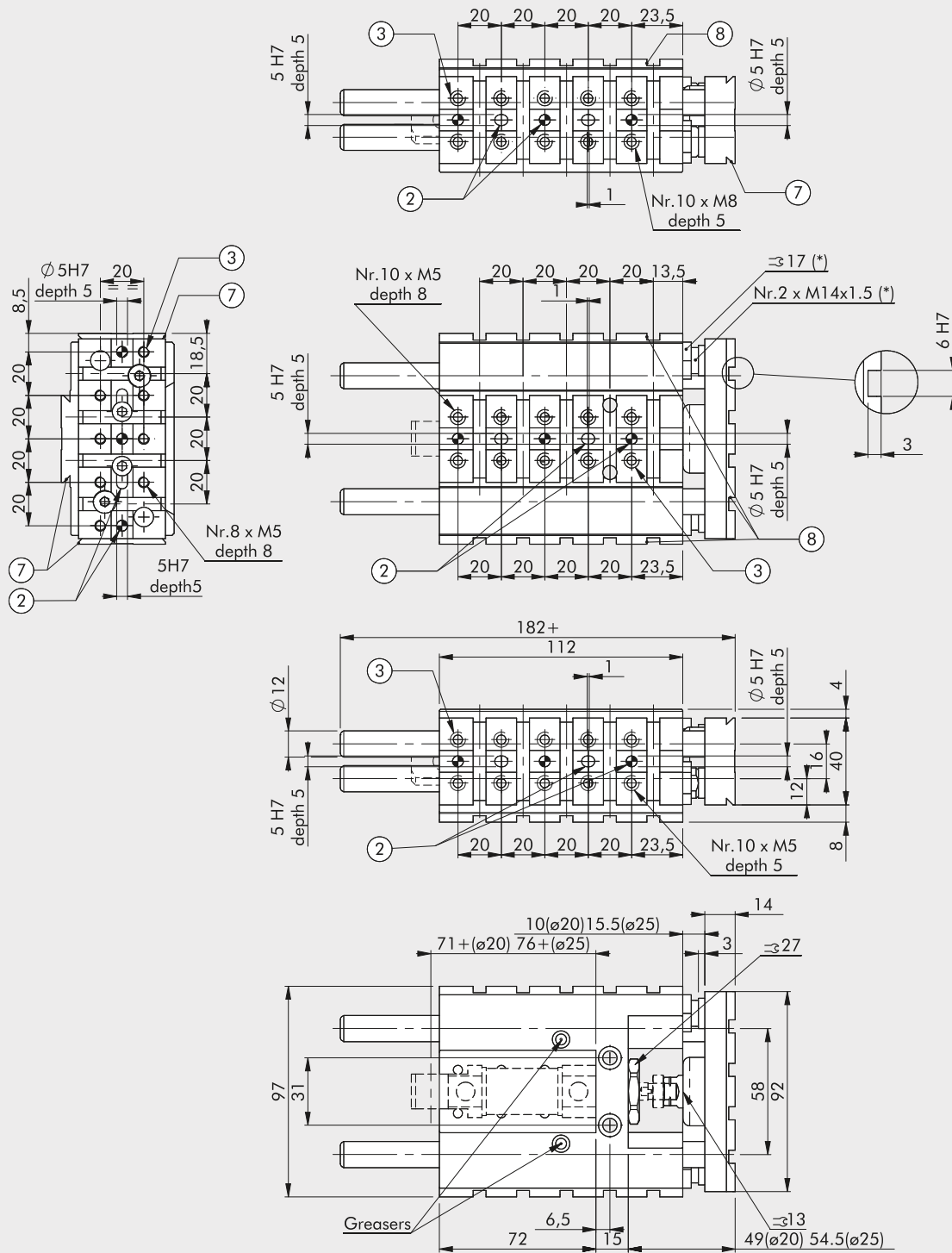


- ② Holes for centring pins
- ③ Threaded holes for fixing
- ⑦ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

DIMENSIONS Ø 20-25

Versions 00-01-02

+ = ADD THE STROKE

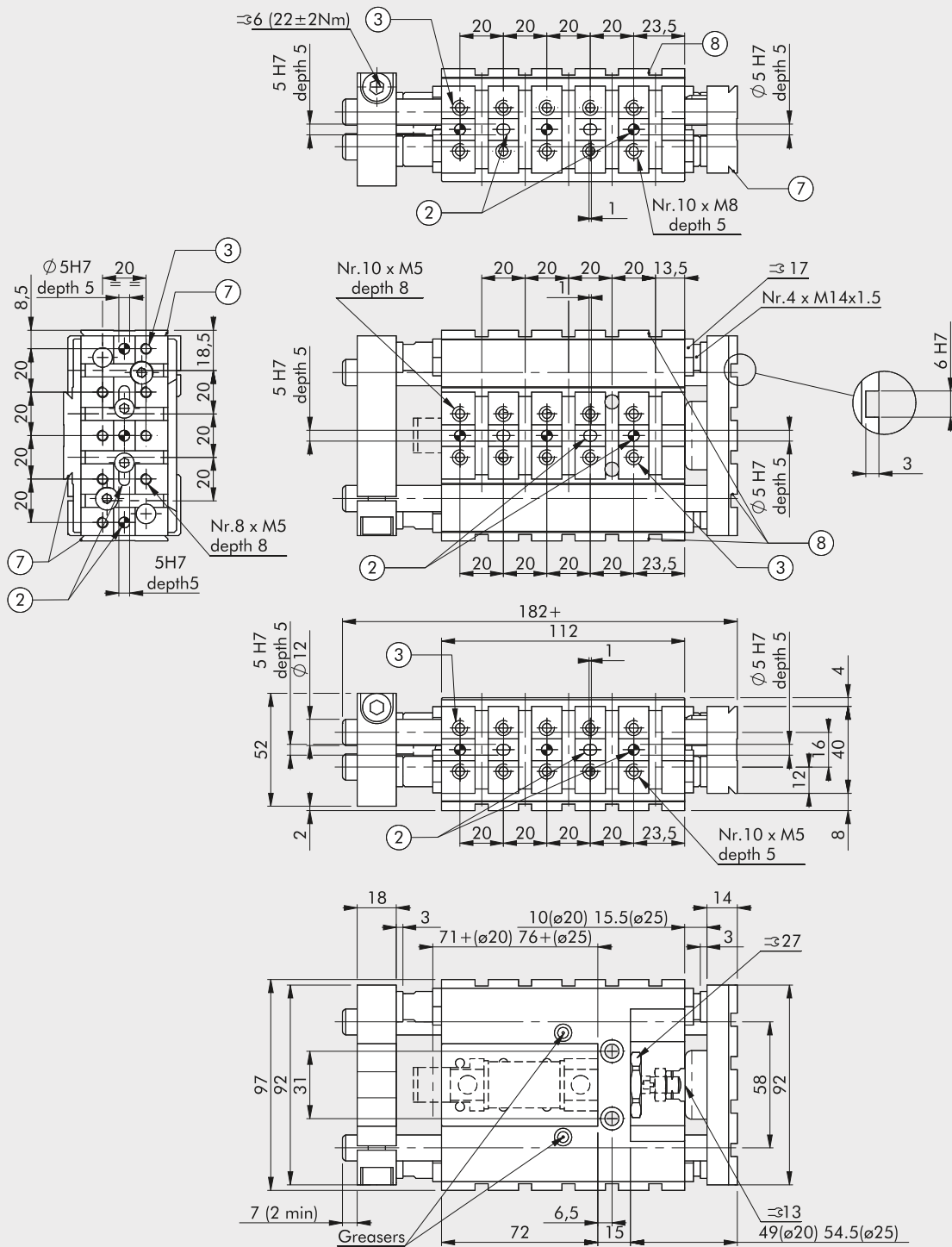


* Not present in version 00
 ② Holes for centring pins
 ③ Threaded holes for fixing
 ⑦ Dovetail for "V-Lock" fixing.
 For standard dimensions see page 1-257
 ⑧ Slot for "V-Lock" precision key

DIMENSIONS Ø 20-25

Versions 03-04

+ = ADD THE STROKE

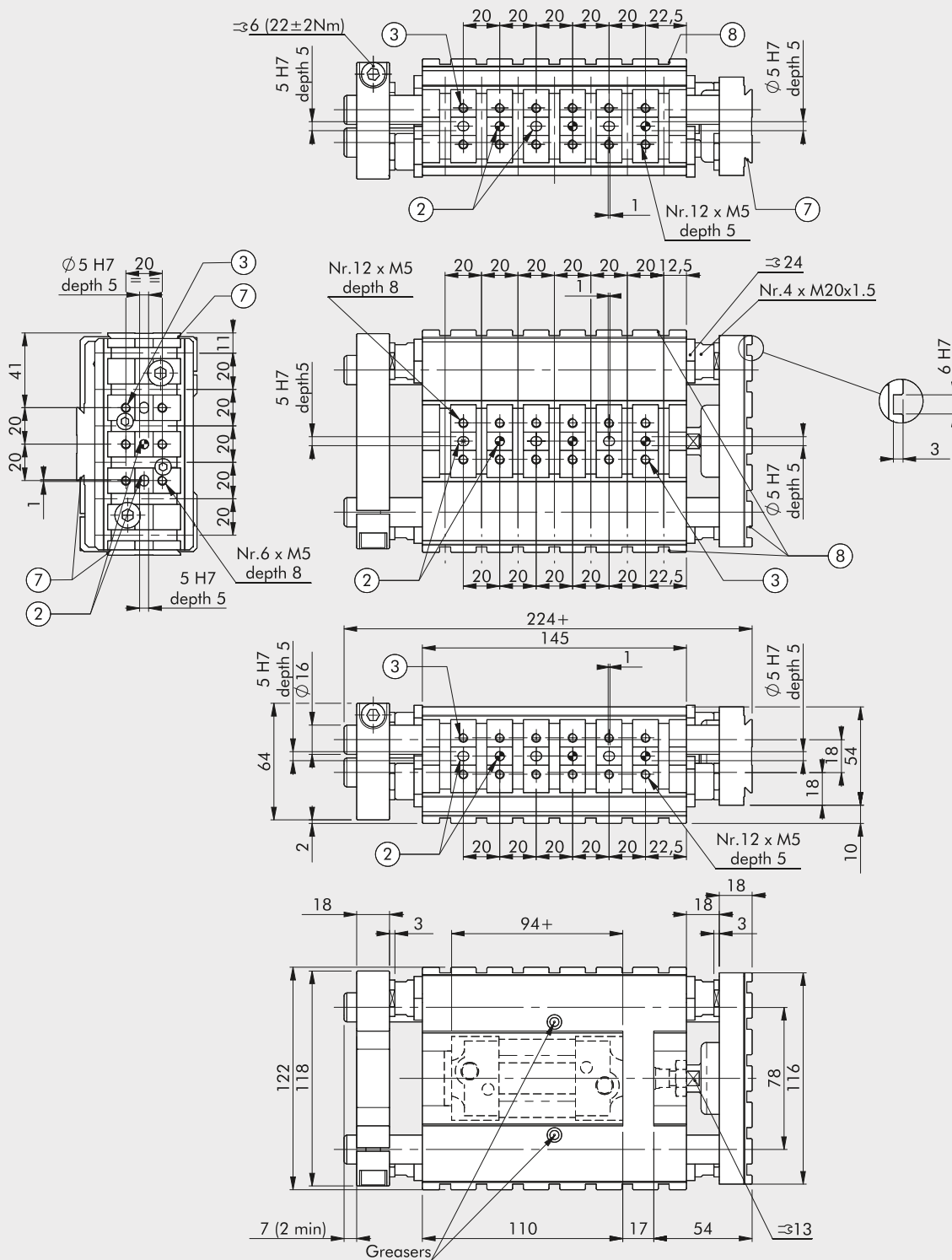


- ② Holes for centring pins
- ③ Threaded holes for fixing
- ⑦ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

DIMENSIONS Ø 32

Versions 03-04

+ = ADD THE STROKE

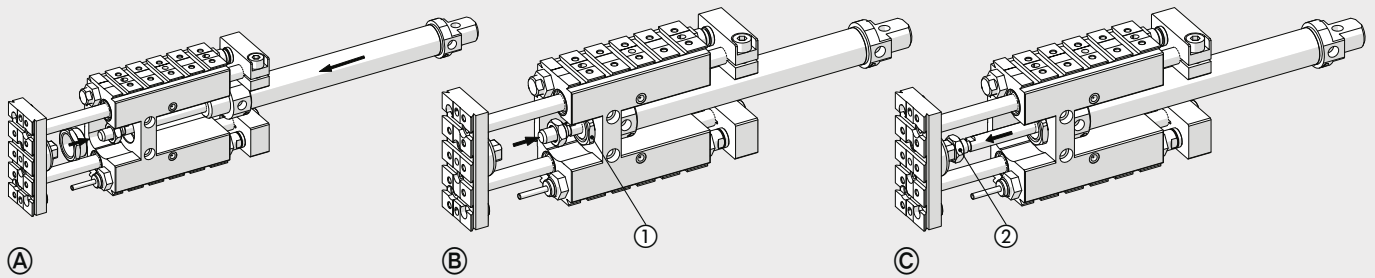


- ② Holes for centring pins
- ③ Threaded holes for fixing
- ⑦ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑧ Slot for "V-Lock" precision key

MOUNTING ON ISO 6432 CYLINDERS

For mounting on the body of ISO 6432 cylinders:

- Ⓐ Insert the cylinder in the guide.
- Ⓑ Retract the piston rod and tighten the nut ① from the front using a wrench, holding the front end of the cylinder firmly.
- Ⓒ Screw the piston rod onto the coupling and tighten the nut ②.

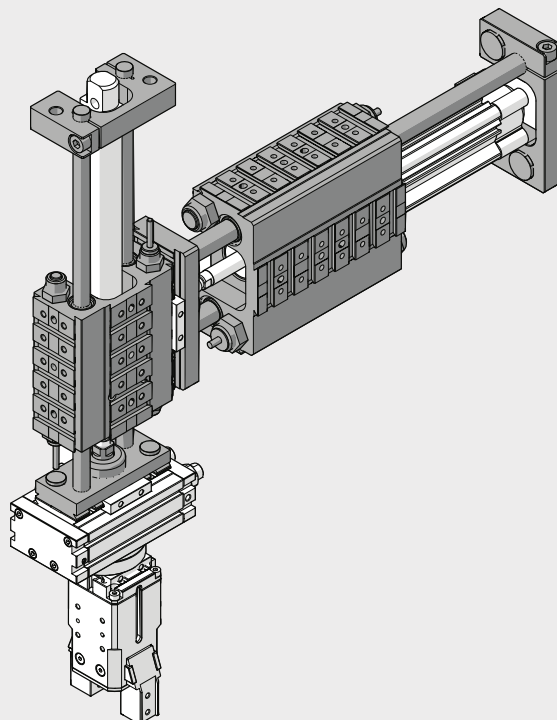


KEY TO CODES

W070	012	2	050	00	K
TYPE	BORE	VERSION	STROKE	EXECUTION	FAMILY
Guide unit	012 12 012 16 020 20 025 25 032 32 040 40	2 Version H 3 Version M	See general technical data	00 Without stop 01 With front stop and buffers 02 With front stop and shock absorber 03 With front and rear stops and buffers 04 With front and rear stops and shock absorbers ■ 05 With short columns for Elektro cylinder	K V-Lock

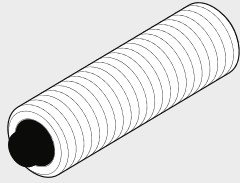
■ For Ø 32 only

EXAMPLES OF APPLICATION



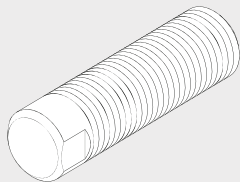
ACCESSORIES AND SPARE PARTS FOR GUIDE UNITS SERIES GDHK AND GDMK

ELASTIC MECHANICAL STOP



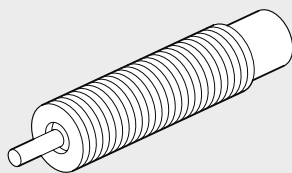
Code	Ø	Description
W0950005401K	12-16	Elastic mechanical stop M10x1 + nut
W0950005402K	20-25	Elastic mechanical stop M14x1.5 + nut
W0950005403K	32	Elastic mechanical stop M20x1.5 + nut
W0950005404K	40	Elastic mechanical stop M25x1.5 + nut

MECHANICAL STOPS



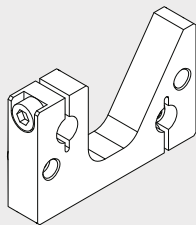
Code	Ø	Description
W0950005501K	12-16	Mechanical stop M10x1 + nut
W0950005502K	20-25	Mechanical stop M14x1.5 + nut
W0950005503K	32	Mechanical stop M20x1.5 + nut
W0950005504K	40	Mechanical stop M25x1.5 + nut

SHOCK ABSORBERS



Code	Ø	Description
W0950005301	12-16	Shock absorbers 2 M10x1 + nut
0950004004	20-25	Shock absorbers ECO25 MC2 + nut M14x1.5
0950004005	32	Shock absorbers ECO50 MC2 + nut M20x1.5
0950004006	40	Shock absorbers ECO100 MF2 + nut M25x1.5

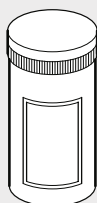
REAR PLATE KITS



Code	Ø	Description
W0950005600K	12-16	Rear plate kit GD_K
W0950005601K	20-25	Rear plate kit GD_K
W0950005602K	32	Rear plate kit GD_K
W0950005603K	40	Rear plate kit GD_K

Note: individually packed with 2 screws

GREASE



Code	Description	Weight [g]
9910502	Tube of RHEOLUBE 362 grease (for GDHK version)	1000
9910506	Tube of RHEOLUBE 363 AX1 grease (for GDMK version)	400

LINEAR UNITS SERIES LEPK

The LEPK linear units are designed for horizontal or vertical mounting. They are driven by an ISO 6432 pneumatic cylinder that can be easily removed when it needs to be replaced.

The precision round bars, which are hardened and incorporated in the rectangular section enclosed by the body, provide a reliable guide system without any backlash, jointly with the adjustable casters.

The stroke is limited by mechanical stops that are provided with a fine adjustment device and hydraulic shock-absorbers.

A LED visible through the openings in the body indicates the switching status. The final positions are controlled by inductive sensors (included in the supply). The front plate comes with V-Lock connections. Dovetail guides are provided on both sides of the body for the connection of the V-Lock or QS system.

The area of the body where to make the transversal grooves for connection with type K fixing elements can be specified at the time of the order. The encapsulated construction ensures the elimination of any points of hazard and increased silent operation.

The linear units are available in two versions:

- version A comes with a retracted position and an adjustable extended position;
- version B is designed to achieve a second supplementary adjustable extended position.

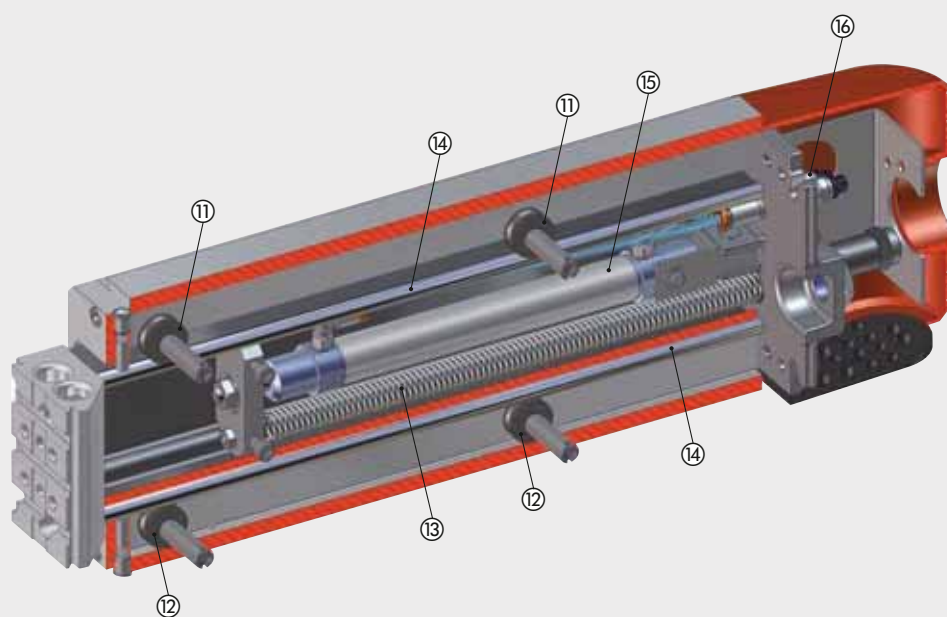
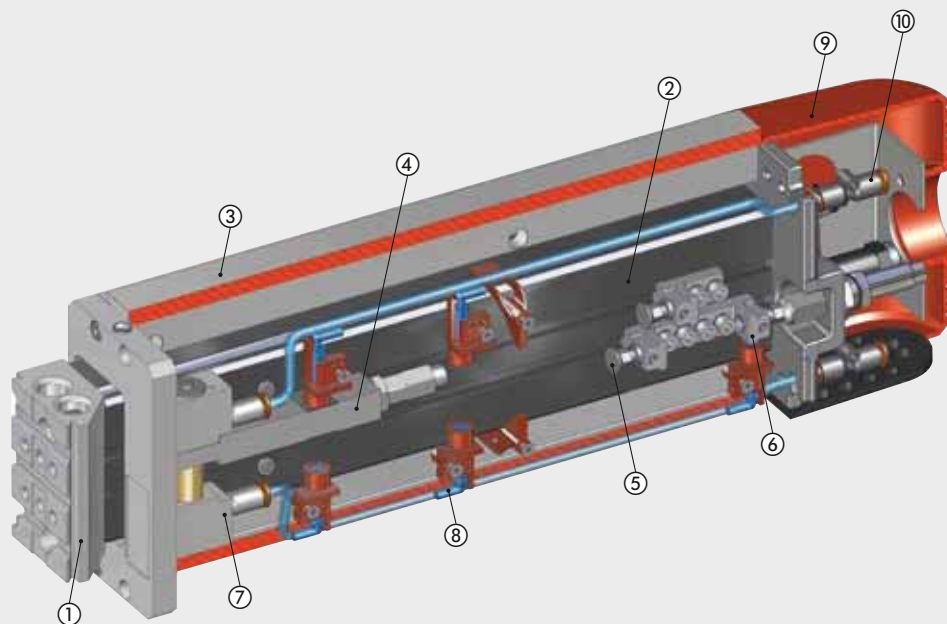
The LEPK units for vertical mounting can be equipped with a return spring to balance the weights. In the event of an emergency or a drop in pressure, the vertical slide is automatically pulled into the upper end-of-stroke position (slide fully retracted). For the orderly arrangement of cables and pipes, a hose pipe can be ordered. The linear unit for horizontal mounting can be supplied complete with an electrical terminal board.



TECHNICAL DATA	LEPK-1-90-H		LEPK-1-160-H		LEPK-1-225-H		LEPK-2-320-H		LEPK-2-450-H		LEPK-1-60-V		LEPK-1-90-V		LEPK-1-160-V			
	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B	Type A	Type B		
Number of positions	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3		
Orientation	Horizontal										Vertical							
Operating pressure	bar		3 to 7															
	MPa		0.3 to 0.7															
	psi		43.5 to 101															
Temperature range	°C		-10 to 50															
	°F		14 to 122															
Fluid	Lubricated or unlubricated 20 µm filtered air. If lubricated air is used, lubrication must be continuous.																	
End position stop shock-absorption	mm		Hydraulic shock-absorbers															
End-position control	Inductive sensors with a LED visible from the outside																	
Repeatability	mm		< 0.005															
(on 100 strokes at constant conditions)																		
Piston diameter / Piston rod diameter	mm		16 / 6				20 / 8		25 / 10		16 / 6							
Stroke (min / max)	mm		15 to 90		15 to 160		15 to 225		50 to 320		50 to 450		15 to 60		15 to 90		15 to 160	
Intermediate useful stroke	mm		- 0 to 80		- 0 to 100		- 0 to 100		- 0 to 150		- 0 to 150		- 0 to 50		- 0 to 80		- 0 to 100	
Theoretic force at 6 bar:																		
in thrust	N		106		106		106		165		260		Max. 90 (see table on page 1-333/334)					
in traction	N		90		90		90		137		218		Max. 150 (see table on page 1-333/334)					
Weight	kg		2.5 3.1		3.2 3.8		4.5 4.6		8 9.6		10.5 11		2.15 2.5		2.35 3		3.1 3.7	
Weight of the moving mass	kg		0.68		0.83		1.25		2.29		3.12		0.61		0.68		0.83	
Maximum kinetic energy	J/stroke		5.88				19.6				5.88							
	J/h		25000				53000				25000							
Electrical protection class with PG29 pipe mounted (only for versions with a terminal board)	IP 42																	
Relative air humidity (only for versions with a terminal board)	< 95 %																	
Power connection cable (only for versions with a terminal board)	Max. 17 wires 0.14 - 0.5 mm ² for max. 15 proximity switches +0 V +24 V																	
Pneumatic connection	Pipe Ø 4																	
Speed control	Flow regulators Ø 4 - M5																	

IMPORTANT: for maximum forces and moments, see page 1-335.

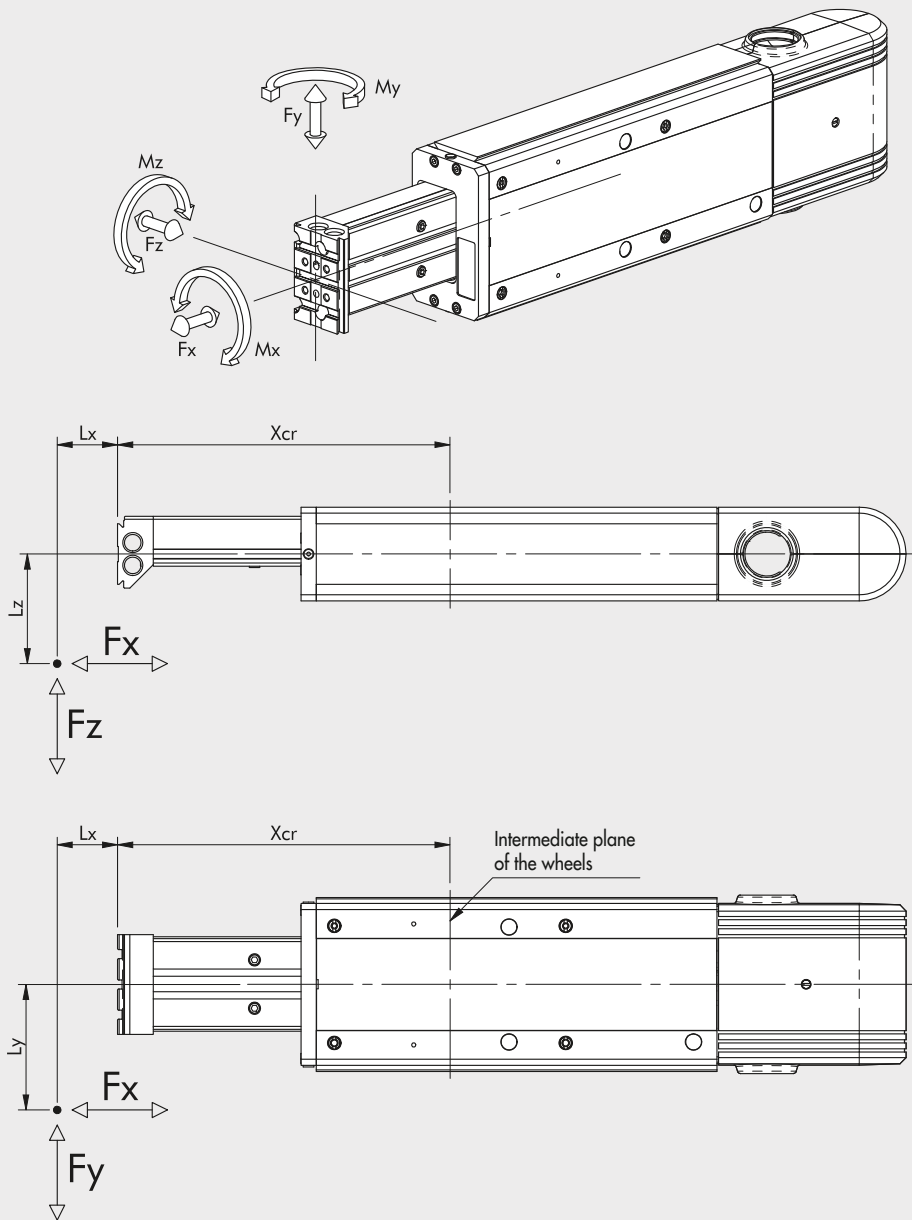
COMPONENTS



- ① FRONTAL INTERFACE: anodized aluminium
- ② SLIDING GUIDE: burnished aluminium
- ③ BODY: anodized aluminium
- ④ 3rd POSITION STOP: aluminium
- ⑤ ADJUSTABLE STOP: galvanized steel
- ⑥ FIXED STOP: galvanized steel
- ⑦ CONTROL CYLINDER, 3rd POSITION
- ⑧ INDUCTIVE SENSOR
- ⑨ GUARD: technopolymer

- ⑩ CYLINDER AIR SUPPLY FITTING, 3rd POSITION
- ⑪ ECCENTRIC ROLLER
- ⑫ CENTRIC ROLLER
- ⑬ RETURN SPRING: steel (optional for vertical versions only)
- ⑭ HARDENED GUIDE: hardened ground chromed steel
- ⑮ PNEUMATIC CYLINDER FOR HANDLING
- ⑯ FLOW REGULATOR FOR PNEUMATIC CYLINDER

DIAGRAM OF FORCES AND MOMENTS



Type	Xcr [mm]
LEPK-1-90-H-A	100
LEPK-1-90-H-B	128.5
LEPK-1-160-H-A	100
LEPK-1-160-H-B	134
LEPK-1-225-H-A	165
LEPK-1-225-H-B	165
LEPK-1-60-V-A	100
LEPK-1-60-V-B	115.5
LEPK-1-90-V-A	100
LEPK-1-90-V-B	128.5
LEPK-1-160-V-A	100
LEPK-1-160-V-B	134
LEPK-2-320-H-A	132
LEPK-2-320-H-B	179.5
LEPK-2-450-H-A	179.5
LEPK-2-450-H-B	179.5

Size	Fy [N]	Fz [N]	Mx [Nm]	My [Nm]	Mz [Nm]
LEPK-1	550	270	11	20	40
LEPK-2	1000	600	50	60	100

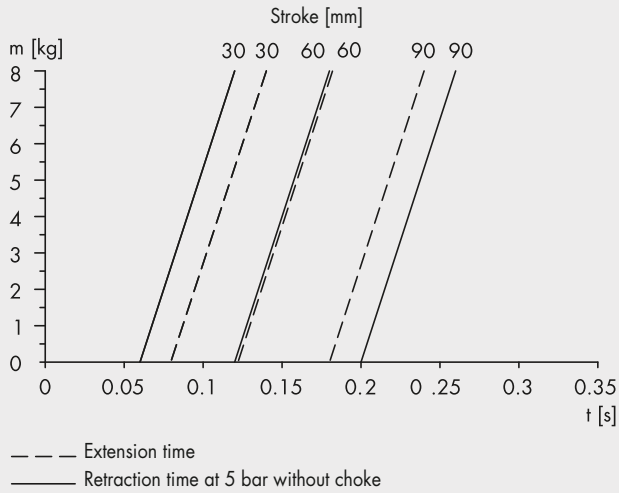
N.B. The values are calculated on the basis of theoretical useful life of 10,000 km.

N.B.: When the cylinder is subjected simultaneously to torque and force, keep to the following equations, where the lengths have to be given in metres.
 $M_x = F_z \cdot L_y + F_y \cdot L_z$ $M_y = F_z \cdot (L_x + X_{cr}) + F_x \cdot L_z$ $M_z = F_y \cdot (L_x + X_{cr}) + F_x \cdot L_y$

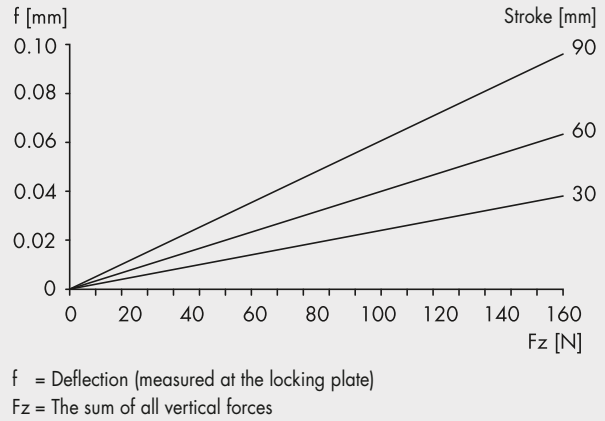
$$\frac{[M_x]}{M_{x \max}} + \frac{[M_y]}{M_{y \max}} + \frac{[M_z]}{M_{z \max}} + \frac{[F_y]}{F_{y \max}} + \frac{[F_z]}{F_{z \max}} \leq 1$$

HORIZONTAL LAYOUT

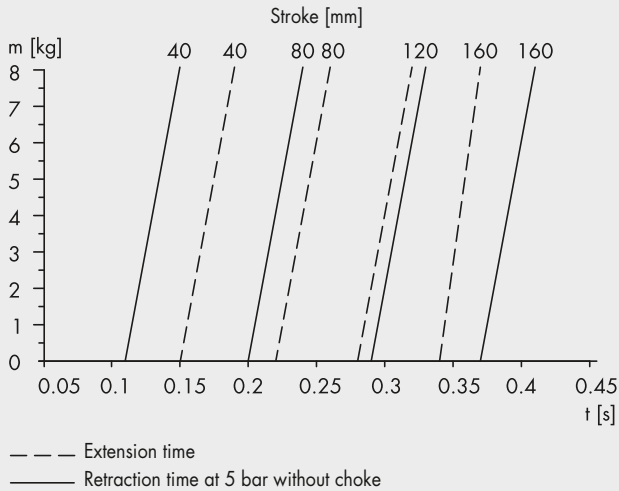
LEPK-1-90-H-A/B - Diagram of traverse times



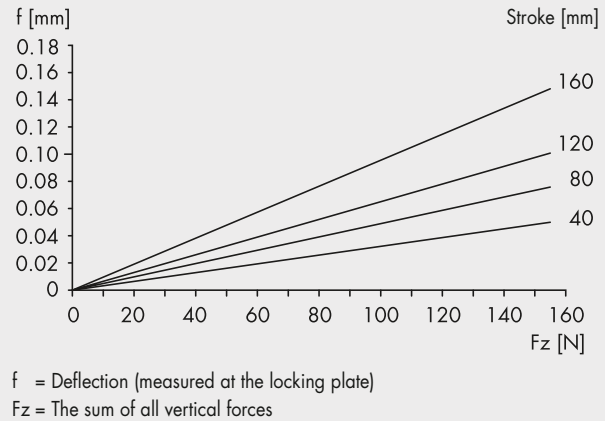
LEPK-1-90-H-A/B - Stress-deformation diagram



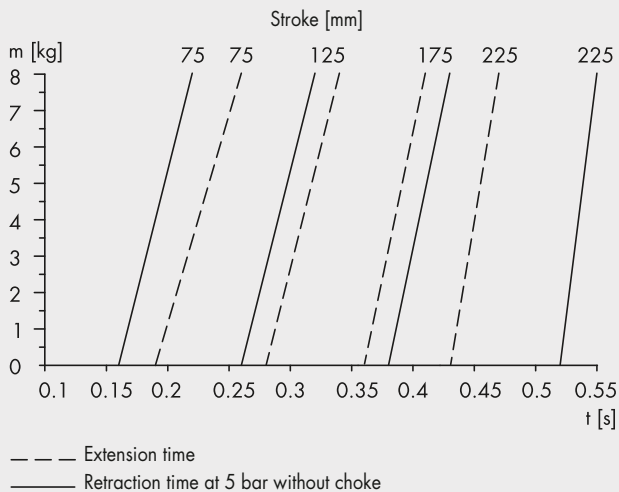
LEPK-1-160-H-A/B - Diagram of traverse times



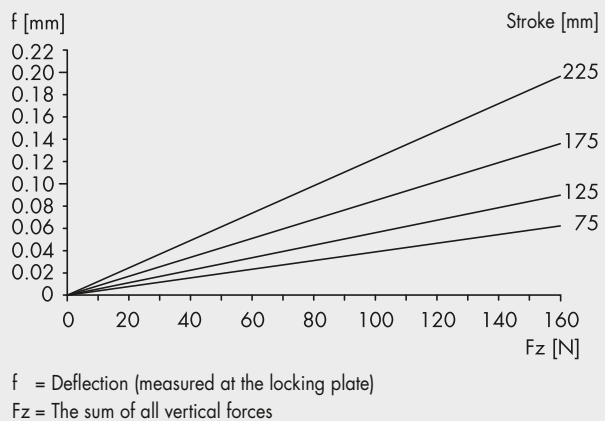
LEPK-1-160-H-A/B - Stress-deformation diagram



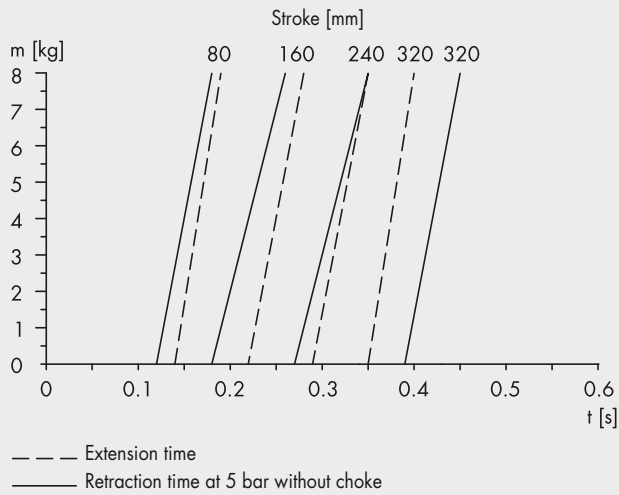
LEPK-1-225-H-A/B - Diagram of traverse times



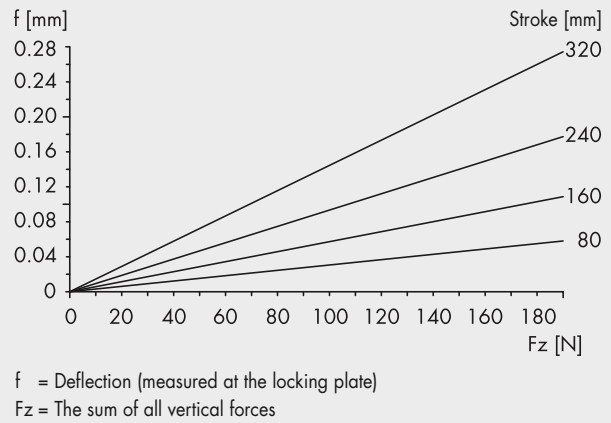
LEPK-1-225-H-A/B - Stress-deformation diagram



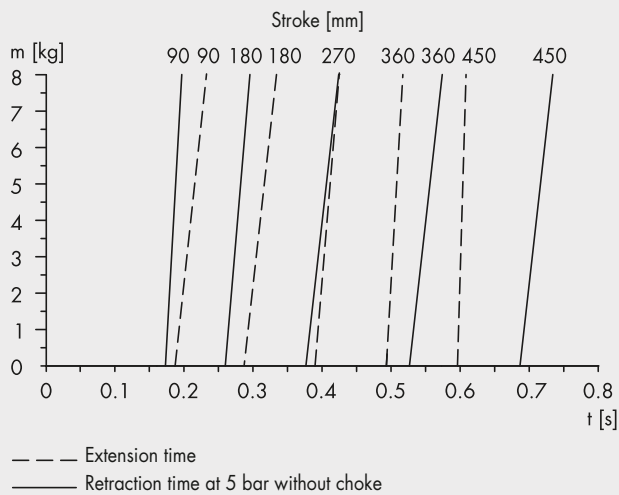
LEPK-2-320-H-A/B - Diagram of traverse times



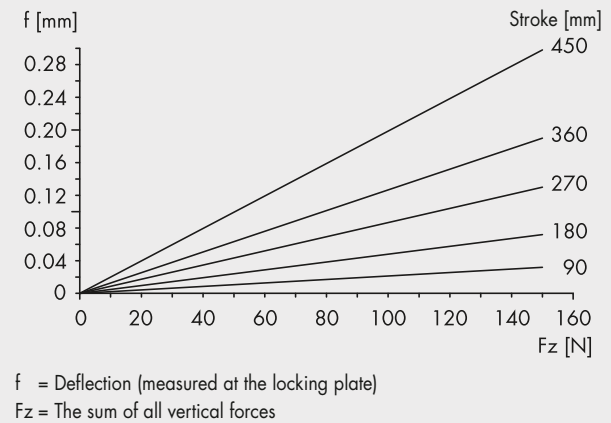
LEPK-2-320-H-A/B - Stress-deformation diagram



LEPK-2-450-H-A/B - Diagram of traverse times



LEPK-2-450-H-A/B - Stress-deformation diagram



VERTICAL LAYOUT

EXAMPLE

LEPK-1-60-V-A/B - Traverse times

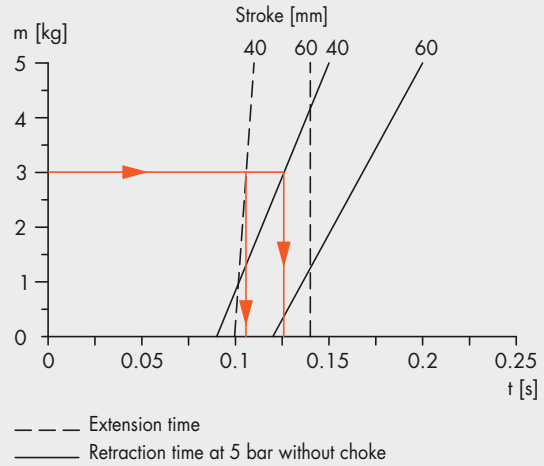
Extension time

$m = 3 \text{ kg}$
 Stroke = 40 mm
 Result: $t = 0.11 \text{ s}$

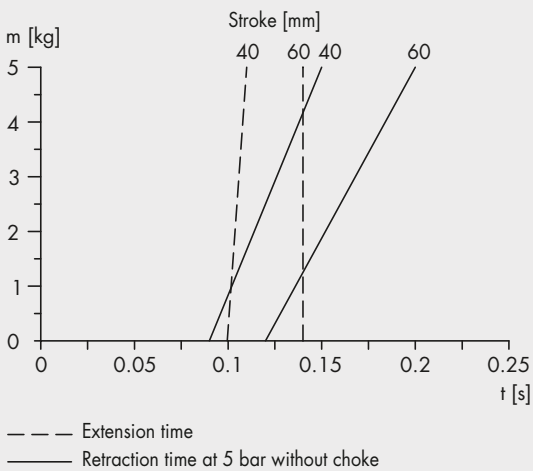
Retraction time

$m = 3 \text{ kg}$
 Stroke = 40 mm
 Result: $t = 0.13 \text{ s}$

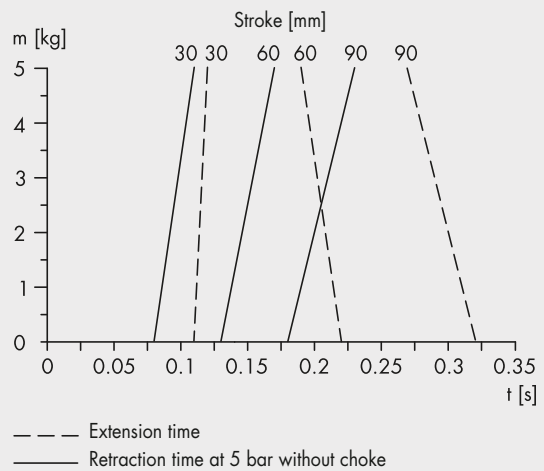
m = Mass applied [kg]
 t = Traverse times [s]
 Stroke = Traverse stroke [mm]



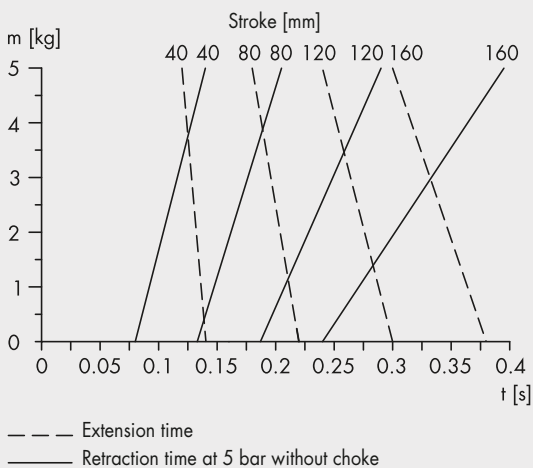
LEPK-1-60-V-A/B - Diagram of traverse times



LEPK-1-90-V-A/B - Diagram of traverse times



LEPK-1-160-V-A/B - Diagram of traverse times

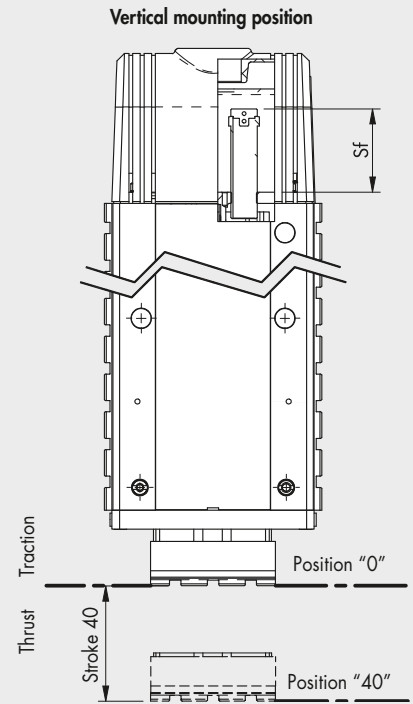
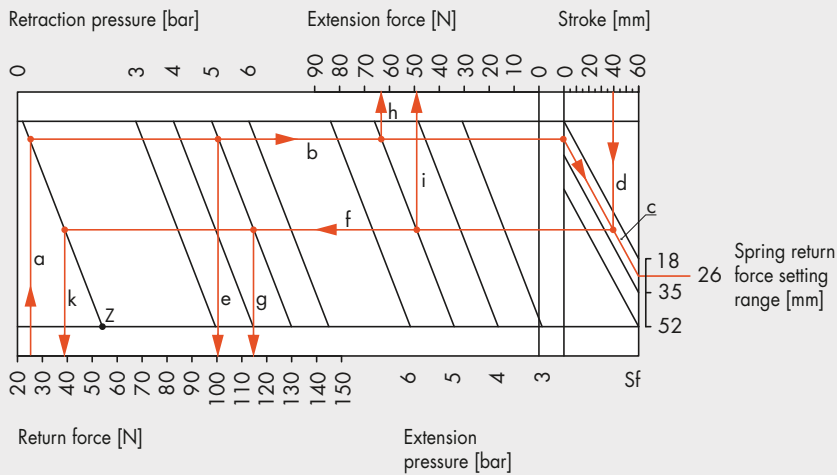


FORCES RELATING TO LEPK VERTICAL UNITS WITH SPRING

EXAMPLE

LEPK-1-60-V-A/B – Diagram of forces – Interpretation of the diagram of LEPK vertical unit forces

Stroke = 40 mm
 Operating pressure = 5 bar
 Mass applied = 2.5 kg (about 25 N)
 Requirement = in no-pressure conditions (0 bar), the mass applied (2.5 kg) must move to the upper end-of-stroke position ("0")



1) Maintenance of the LEPK in position "0" with no pressure (stroke = 0 mm, pressure = 0 bar): starting from the weight force of the mass to be lifted (25 N), and following the lines **a - b - c**, you can set the Sf = 26 mm and the following force values:

- **line e**: tractive force in position "0" and with a pressure of 5 bar in the cylinder on the front side (stroke = 0 mm, pressure = 5 bar): in the case in point, it is around 100 N.
The mass applied must now be subtracted:
 $F = 100 \text{ N} - 25 \text{ N} = 75 \text{ N}$
- **line h**: thrust force in position "0" and with a pressure of 5 bar in the cylinder on the back side (stroke = 0 mm, pressure = 5 bar): in the case in point, it is about 65 N.
The mass applied must now be added up, which gives:
 $F = 65 \text{ N} + 25 \text{ N} = 90 \text{ N}$

Traction position "0" p = 5 bar



Thrust position "0" p = 5 bar



N.B. As can be seen in the graph, for the LEPK-1-60-V, the maximum weight sustainable by the spring alone without pressure is about 55 N (with Sf = 52 mm). See point "Z" in the graph.

2) Verification of the forces with stroke setting to 40 mm: starting from the 40 mm stroke and following the line **d - f** the following values of force are obtained:

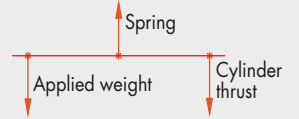
- **line g**: traction force in position "40" and with a pressure of 5 bar in the cylinder on the front side (stroke = 0 mm, pressure = 5 bar): in the case in point, it is around 115 N.
The mass applied must now be subtracted, which gives:
 $F = 115 \text{ N} - 25 \text{ N} = 90 \text{ N}$

Traction position "40" p = 5 bar



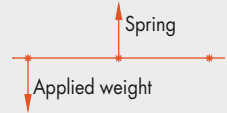
- **line i:** thrust force in position "40" and with a pressure of 5 bar in the cylinder on the back side (stroke = 40 mm, pressure = 5 bar): in the case in point, it is about 50 N. The mass applied must now be added up, which gives:
 $F = 50 \text{ N} + 25 \text{ N} = 75 \text{ N}$

Thrust position "40" p = 5 bar

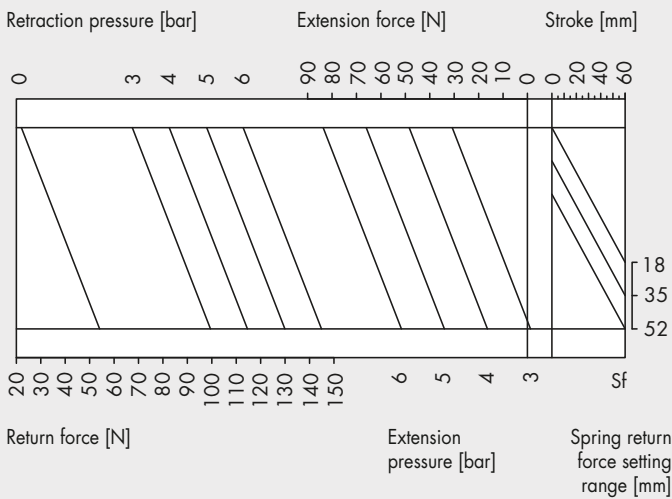


- **line k:** tractive force of the spring in position "40" and without pressure (stroke = 40 mm, pressure = 0 bar): in the case in point it is about 39 N. The mass applied must now be subtracted, which gives:
 $F = 39 \text{ N} - 25 \text{ N} = 14 \text{ N}$

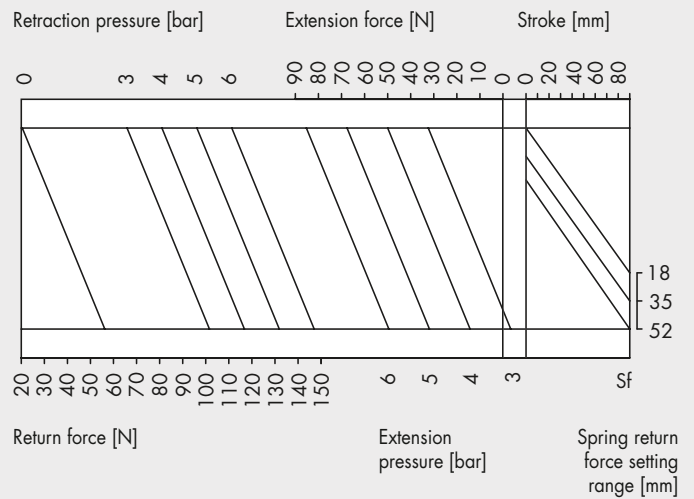
Traction position "40" p = 0 bar



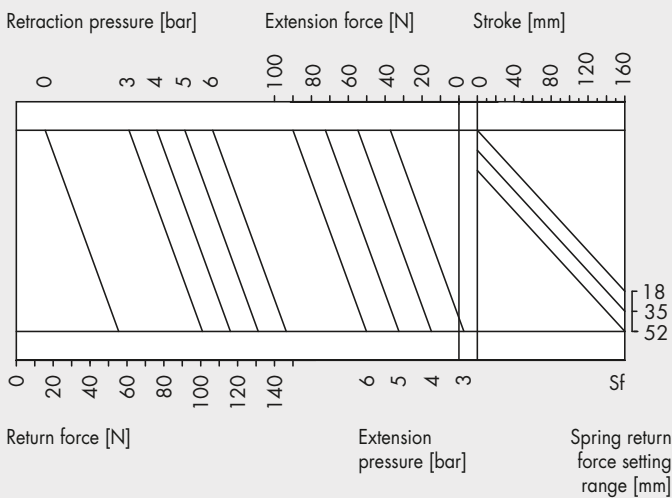
LEPK-1-60-V-A/B - Diagram of forces



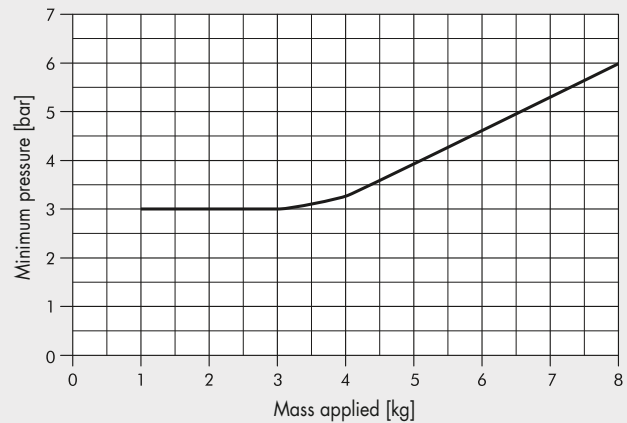
LEPK-1-90-V-A/B - Diagram of forces



LEPK-1-160-V-A/B - Diagram of forces

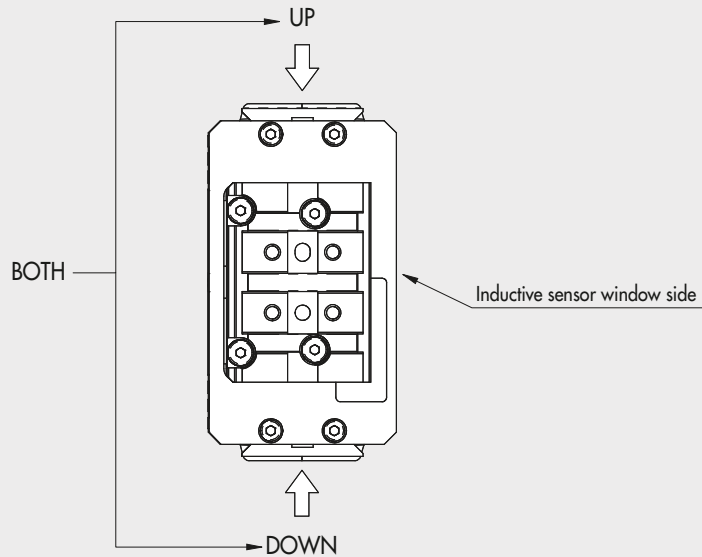


Minimum vertical retraction actuation pressure without spring



MOUNTING OPTIONS

At the encoding stage, you need to determine whether to make the V-Lock grooves and on what side. Number "0" (Zero) identifies the no machining condition, while the letters "U" (Up), "D" (Down) and "B" (Both) identify the side where V-Lock connections must be provided. The letters identify the position of machining in accordance with the diagram shown in the drawing below.



After determining the side of machining, you need to establish the point at which to perform the first V-Lock machining (the reference is the front plane).

The position of the first machining shall be in accordance with the following rules:

- minimum distance from the front reference plane: 25 mm;
- subsequent distances: starting from 25 mm, the distance is increased by 20 mm steps at a time (i.e. 25, 45, 65, 85, etc.).

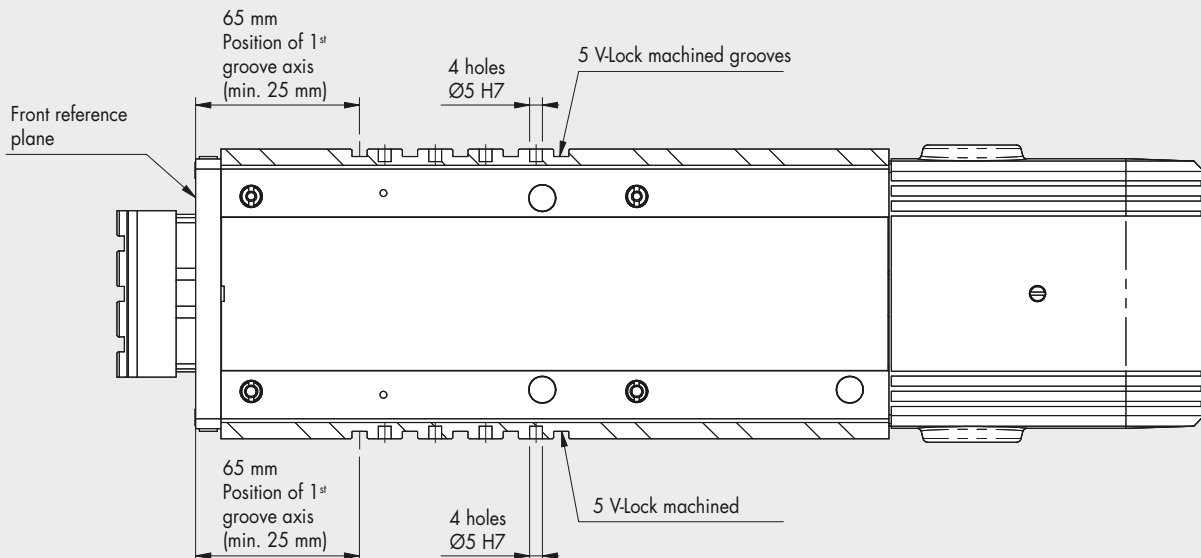
The number of the V-Lock grooves to be machined is then indicated (the number of $\text{Ø}5 \text{ H7}$ pinholes coincides with the number of grooves less 1).

IMPORTANT!

If you decide for version "B", i.e. the one with the grooves machined on both sides of the body, the distance values and the number of grooves shall apply to both sides.

EXAMPLE

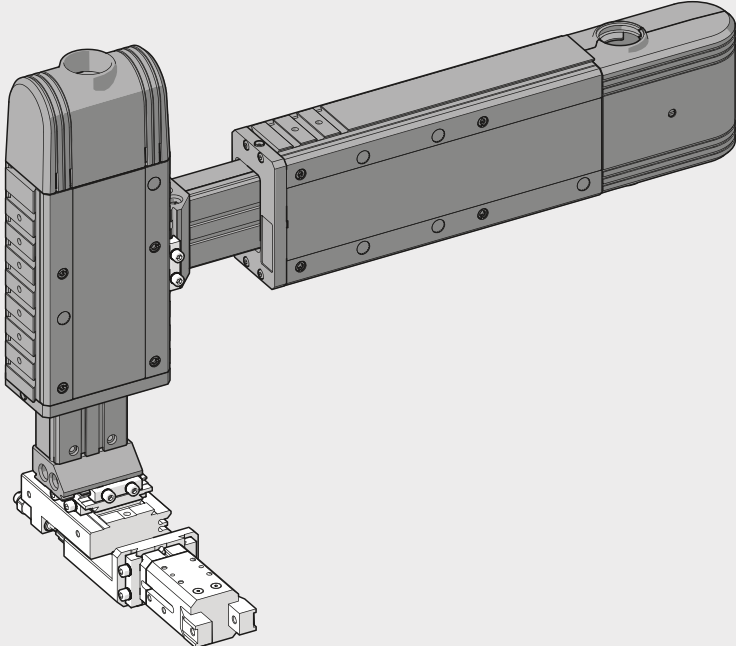
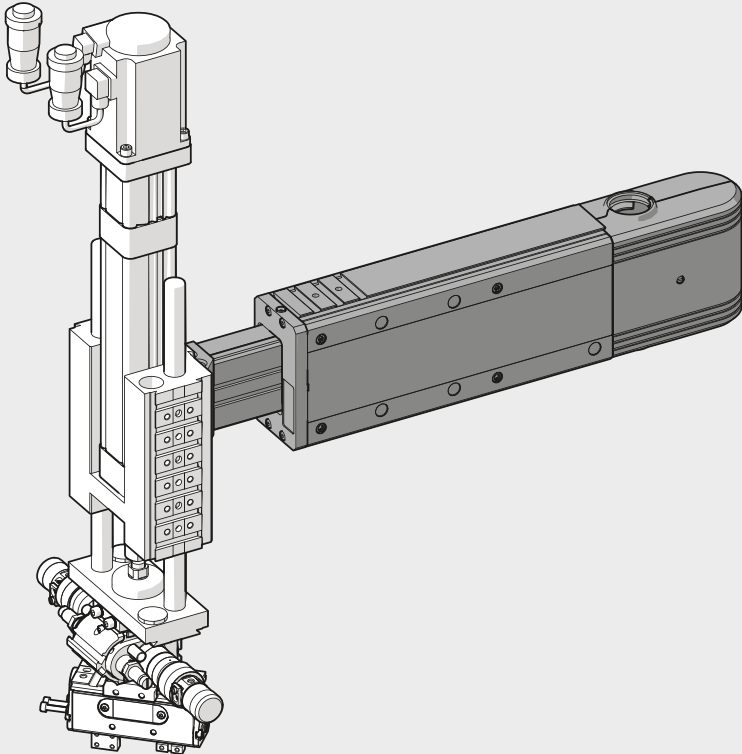
If you order an LEPK unit encoded **K1012H00090B06505K** the part ordered will be as follows:



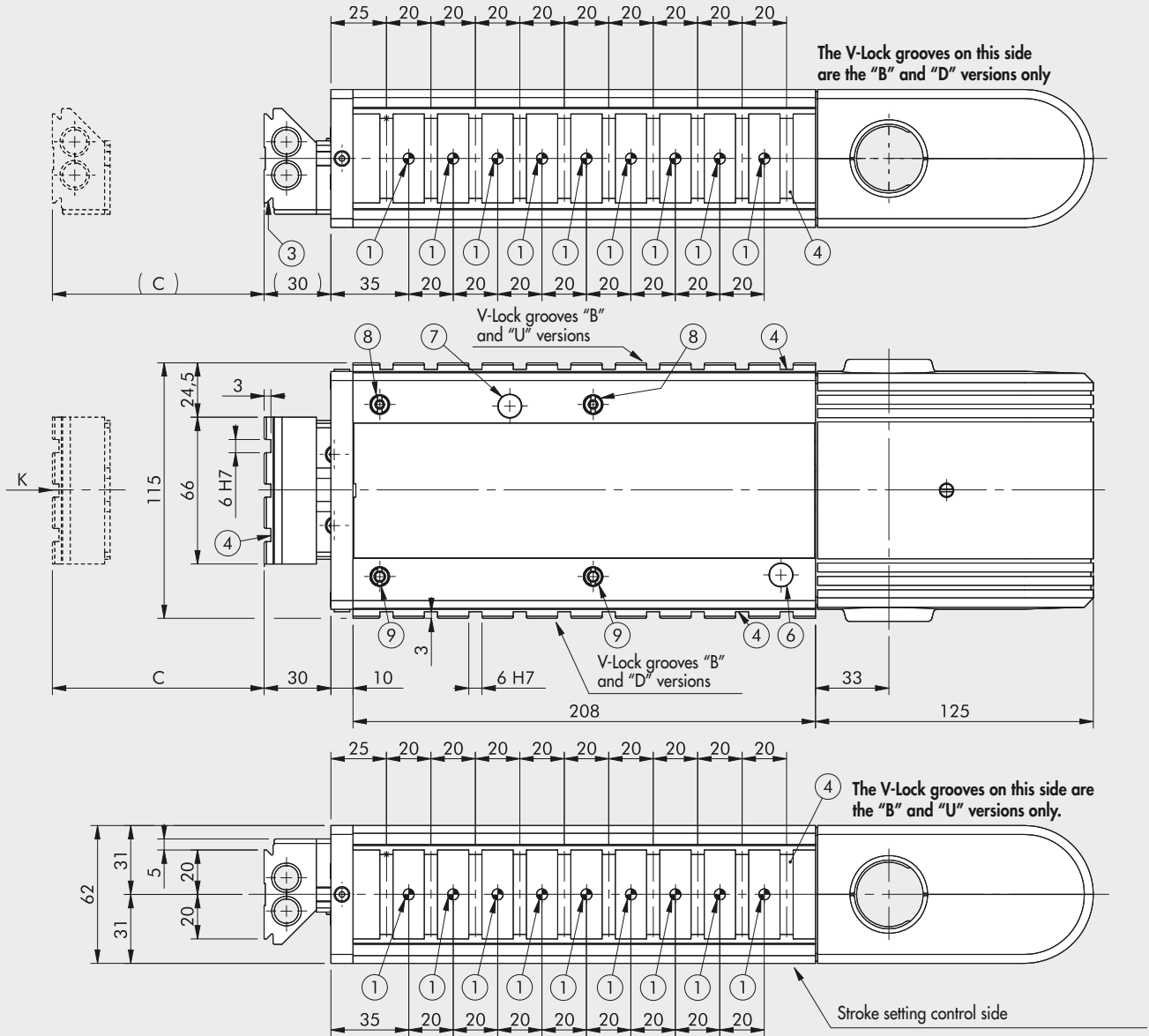
EXAMPLES OF APPLICATION

ACTUATORS

LINEAR UNITS SERIES LEPK



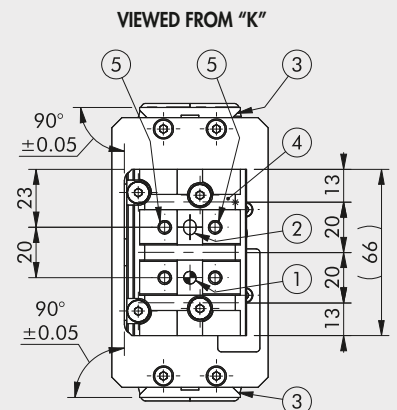
DIMENSIONS OF THE LEPK-1-90-H-A LINEAR UNIT (horizontal, 2 positions)



- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod

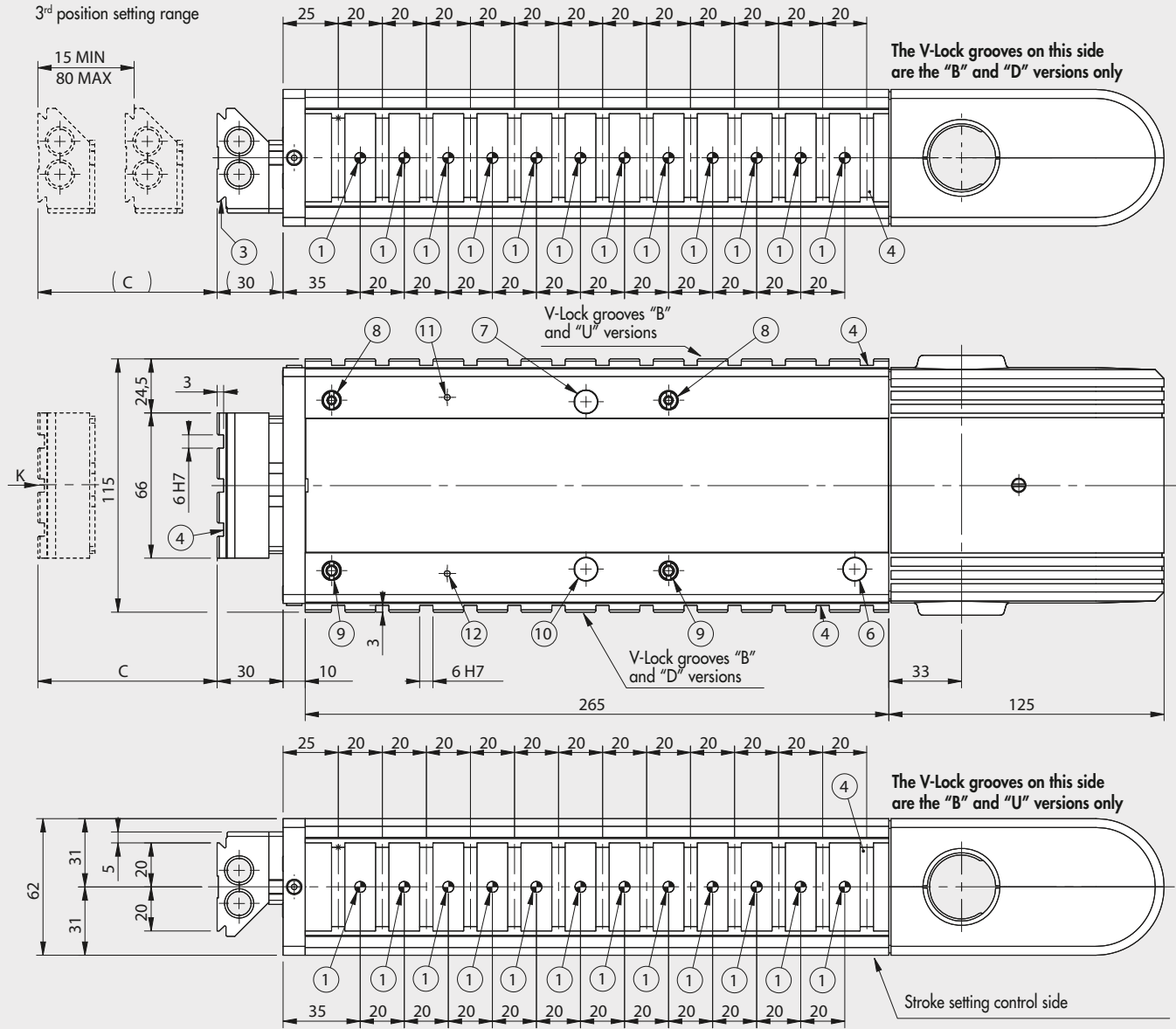
IMPORTANT!
The drawing shows the code K101AH00090B02510K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101AH00090000000K		15 to 90
K101AH00090B-----K	LEPK-1-90-H-A	
K101AH00090D-----K		
K101AH00090U-----K		
K101AH200900000000K		
K101AH20090B-----K	LEPK-1-90-H-A without terminal board	
K101AH20090D-----K		
K101AH20090U-----K		



IMPORTANT. The LEPK-1-90-H-A can hold maximum 10 V-Lock grooves and hence a maximum of 9 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-90-H-B LINEAR UNIT (horizontal, 3 positions)



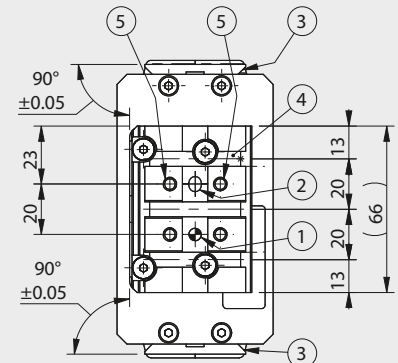
- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod
- ⑩ Sensor LED inspection hole for 3rd position
- ⑪ Sensor LED inspection hole for 3rd position DISABLED
- ⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!

The drawing shows the code K101BH00090B02513K with the maximum number of V-Lock grooves (version BOTH)

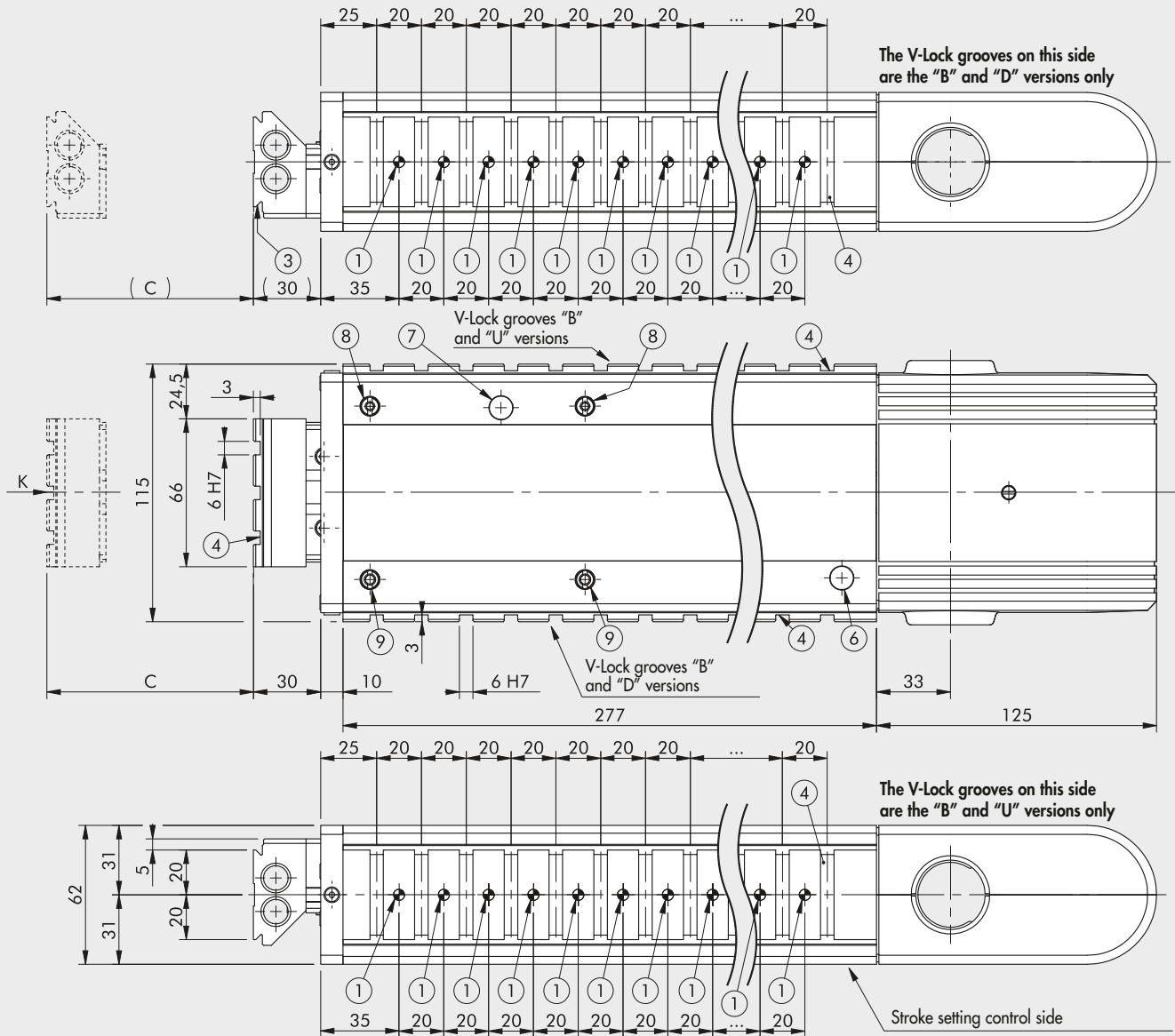
Code	Description	C
K101BH00090000000K		15 to 90
K101BH00090B	LEPK-1-90-H-B	
K101BH00090D		
K101BH00090U		
K101BH20090000000K		15 to 90
K101BH20090B	LEPK-1-90-H-B without terminal board	
K101BH20090D		
K101BH20090U		

VIED FROM "K"



IMPORTANT. The LEPK-1-90-H-B can hold maximum 13 V-Lock grooves and hence a maximum of 12 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-160-H-A LINEAR UNIT (horizontal, 2 positions)

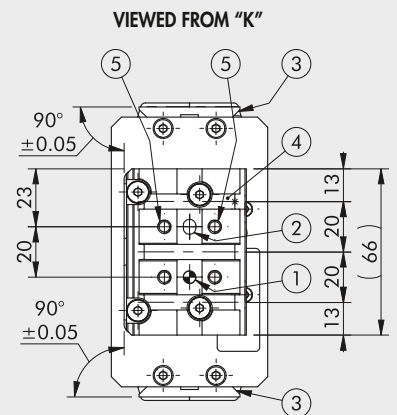


ACTUATORS
LINEAR UNITS SERIES LEPK

- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod

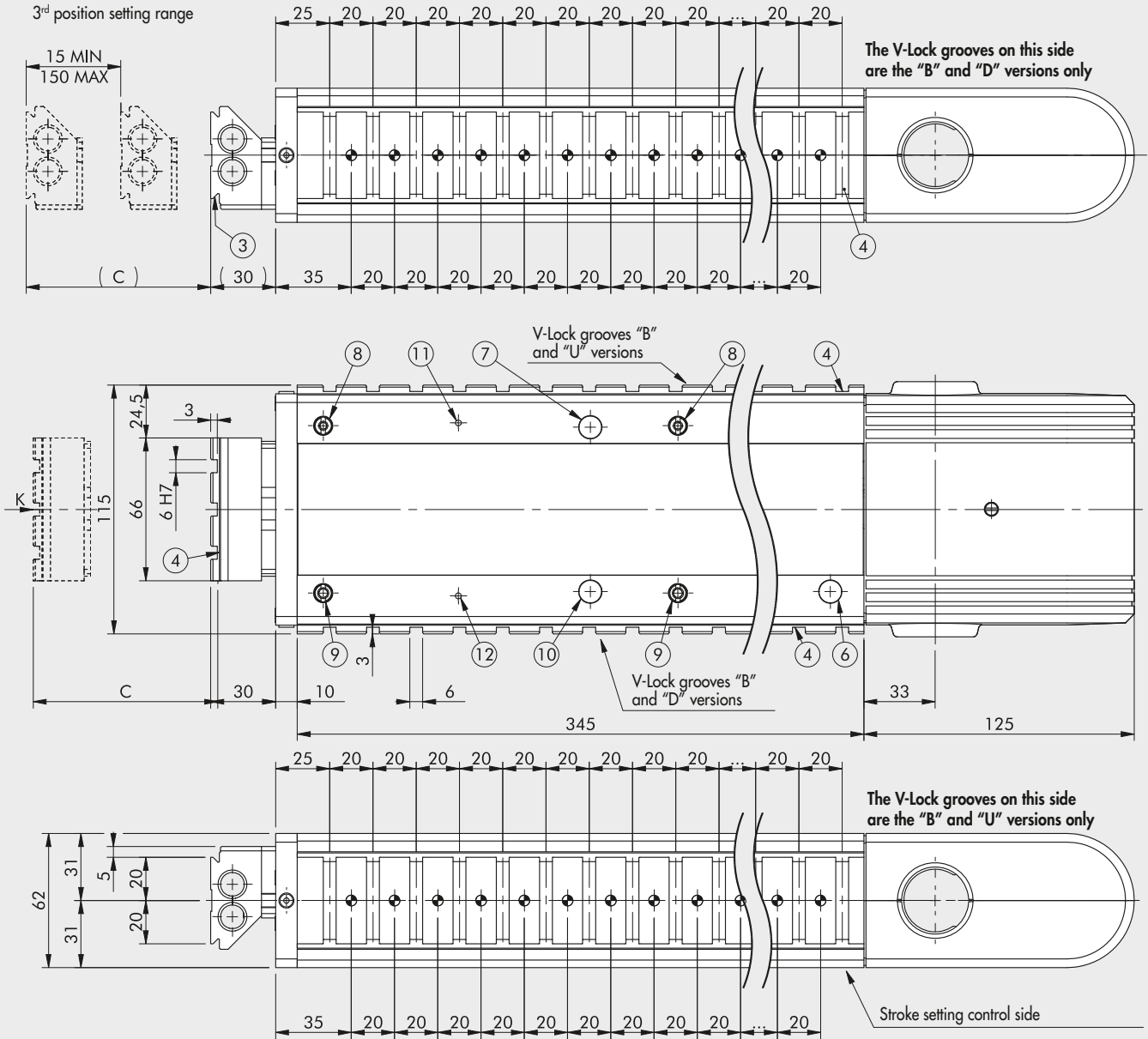
IMPORTANT!
The drawing shows the code K101AH00160B02513K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101AH00160000000K		
K101AH00160B	LEPK-1-160-H-A	15 to 160
K101AH00160D		
K101AH00160U		
K101AH20160000000K		
K101AH20160B	LEPK-1-160-H-A without terminal board	
K101AH20160D		
K101AH20160U		
K101AH20160U		



IMPORTANT. The LEPK-1-160-H-A can hold maximum 13 V-Lock grooves and hence a maximum of 12 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-160-H-B LINEAR UNIT (horizontal, 3 positions)



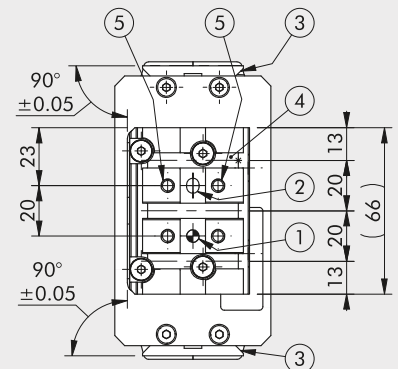
- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod
- ⑩ Sensor LED inspection hole for 3rd position
- ⑪ Sensor LED inspection hole for 3rd position DISABLED
- ⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!

The drawing shows the code K101BH00160B02517K with the maximum number of V-Lock grooves (version BOTH)

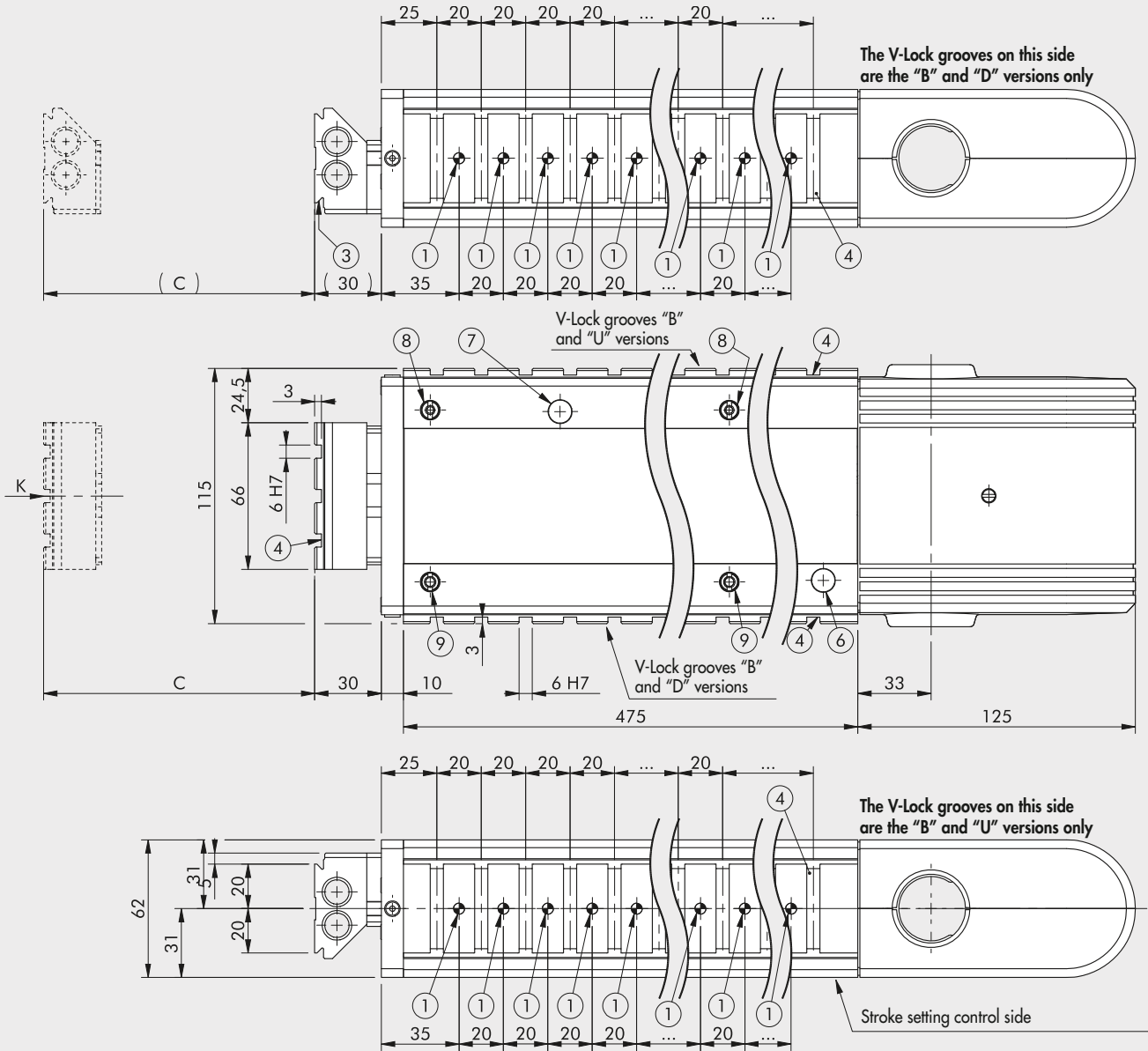
Code	Description	C
K101BH00160000000K		15 to 160
K101BH00160B-----K	LEPK-1-160-H-B	
K101BH00160D-----K		
K101BH00160U-----K		
K101BH201600000000K		
K101BH20160B-----K	LEPK-1-160-H-B without terminal board	
K101BH20160D-----K		
K101BH20160U-----K		

VIEWED FROM "K"



IMPORTANT. The LEPK-1-160-H-B can hold maximum 17 grooves and hence a maximum of 16 Ø5 H7 pinholes.

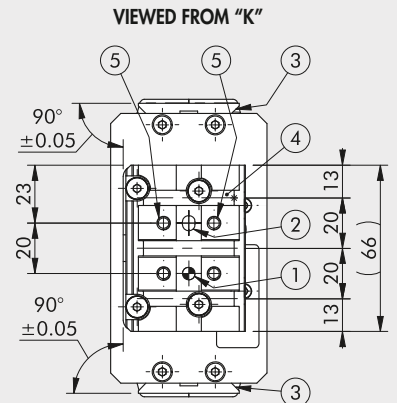
DIMENSIONS OF THE LEPK-1-225-H-A LINEAR UNIT (horizontal, 2 positions)



- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod

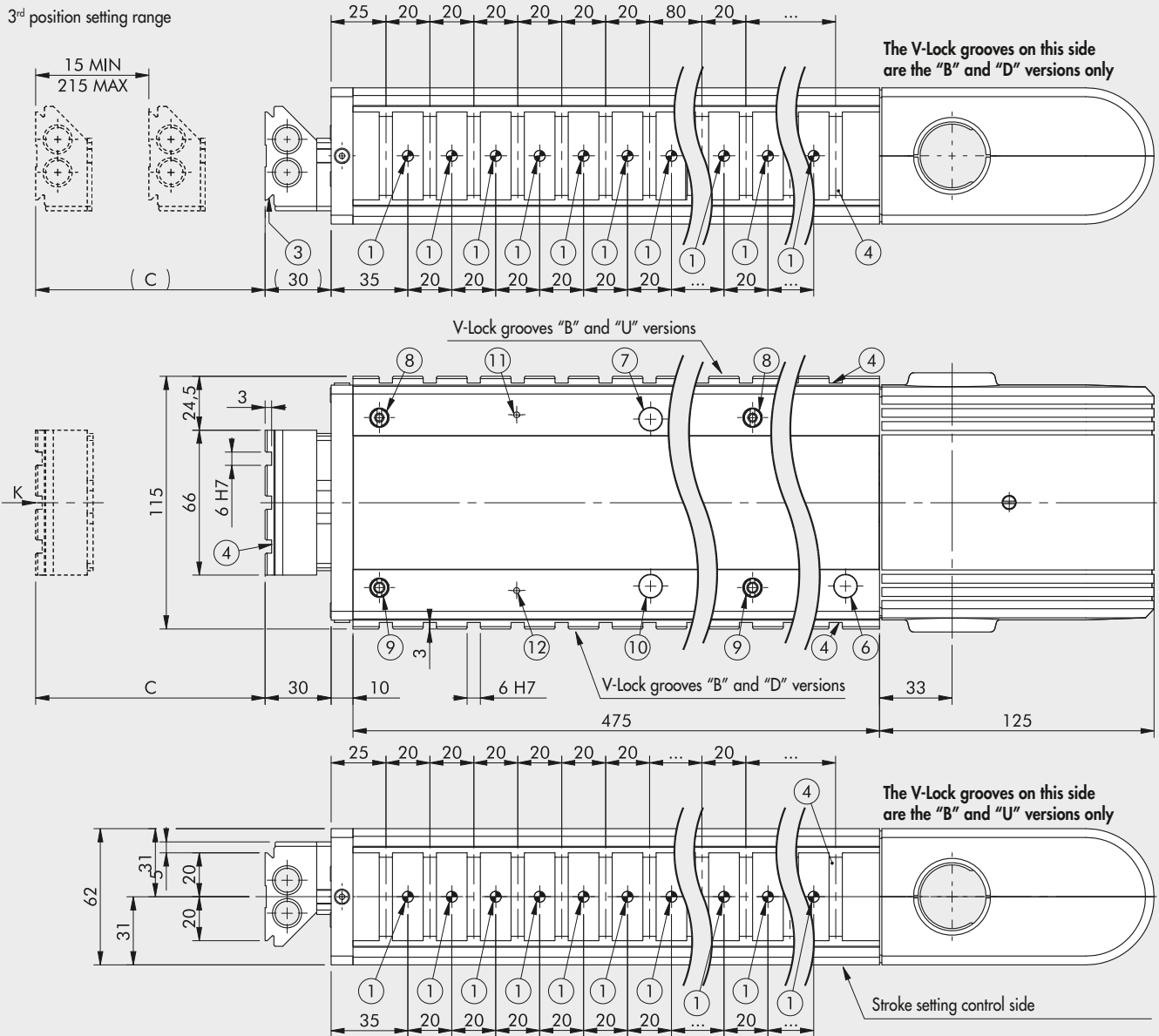
IMPORTANT!
The drawing shows the code K101AH00225B02523K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101AH00225000000K		15 to 225
K101AH00225B-----K	LEPK-1-225-H-A	
K101AH00225D-----K		
K101AH00225U-----K		
K101AH20225000000K		
K101AH20225B-----K	LEPK-1-225-H-A without terminal board	
K101AH20225D-----K		
K101AH20225U-----K		
K101AH20225U-----K		



IMPORTANT. The LEPK-1-225-H-A can hold maximum 23 grooves and hence a maximum of 22 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-225-H-B LINEAR UNIT (horizontal, 3 positions)



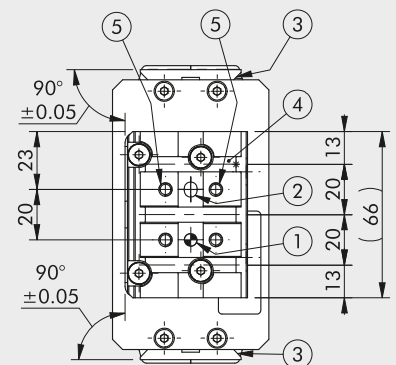
- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod
- ⑩ Sensor LED inspection hole for 3rd position
- ⑪ Sensor LED inspection hole for 3rd position DISABLED
- ⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!

The drawing shows the code K101BH00225B02523K with the maximum number of V-Lock grooves (version BOTH)

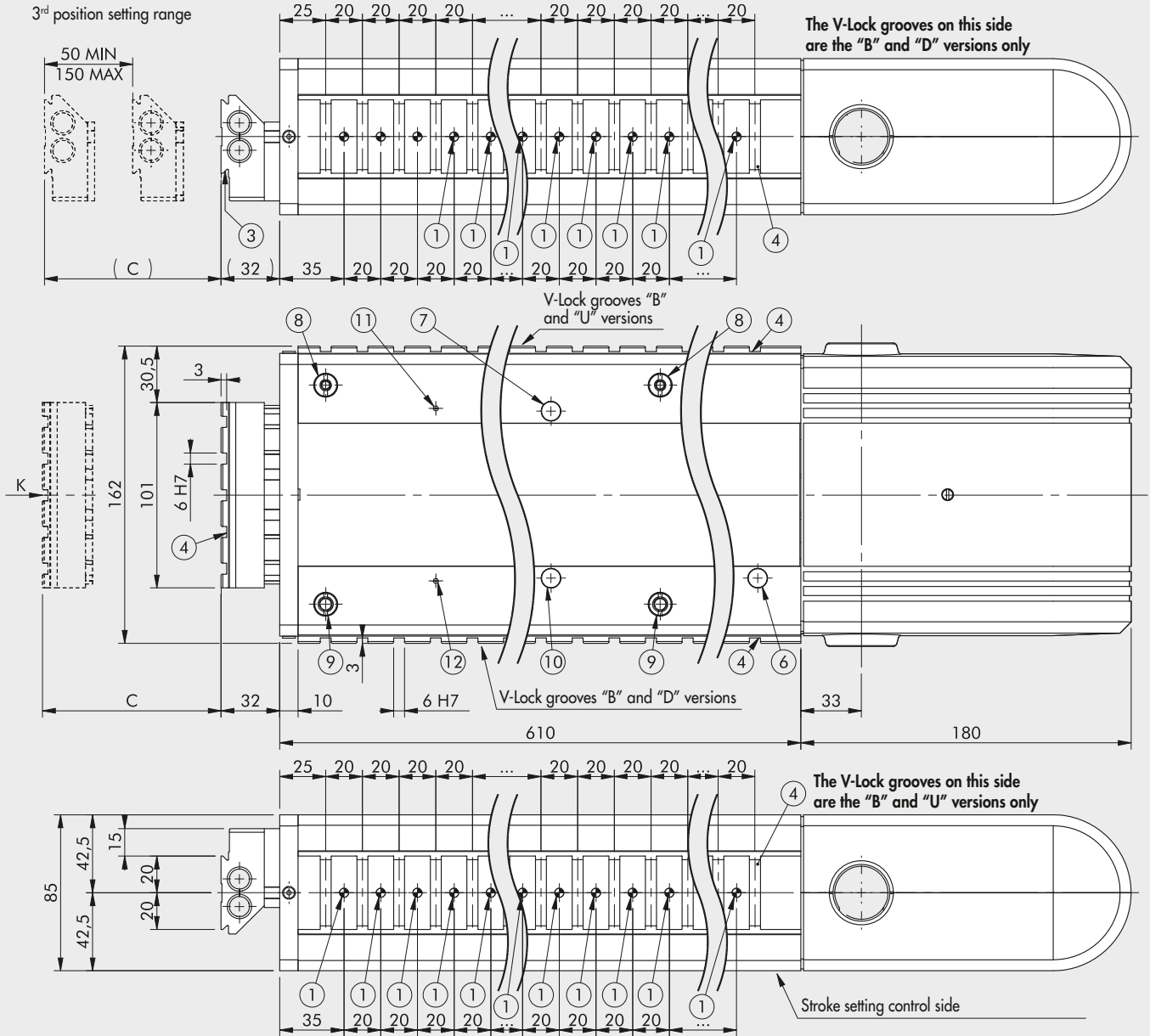
Code	Description	C
K101BH00225000000K		15 to 225
K101BH00225B-----K	LEPK-1-225-H-B	
K101BH00225D-----K		
K101BH00225U-----K		
K101BH202250000000K	LEPK-1-225-H-B without terminal board	
K101BH20225B-----K		
K101BH20225D-----K		
K101BH20225U-----K		

VIED FROM "K"



IMPORTANT. The LEPK-1-225-H-B can hold maximum 23 V-Lock grooves and hence a maximum of 22 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-2-320-H-B LINEAR UNIT (horizontal, 3 positions)



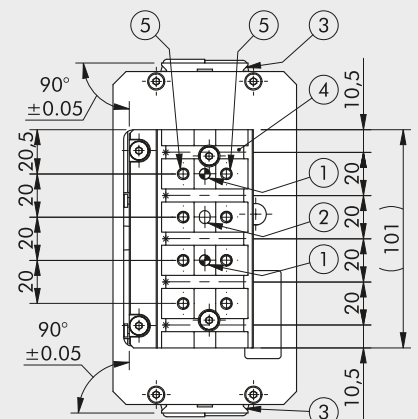
- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod
- ⑩ Sensor LED inspection hole for 3rd position
- ⑪ Sensor LED inspection hole for 3rd position DISABLED
- ⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!

The drawing shows the code K102BH00320B02529K with the maximum number of V-Lock grooves (version BOTH)

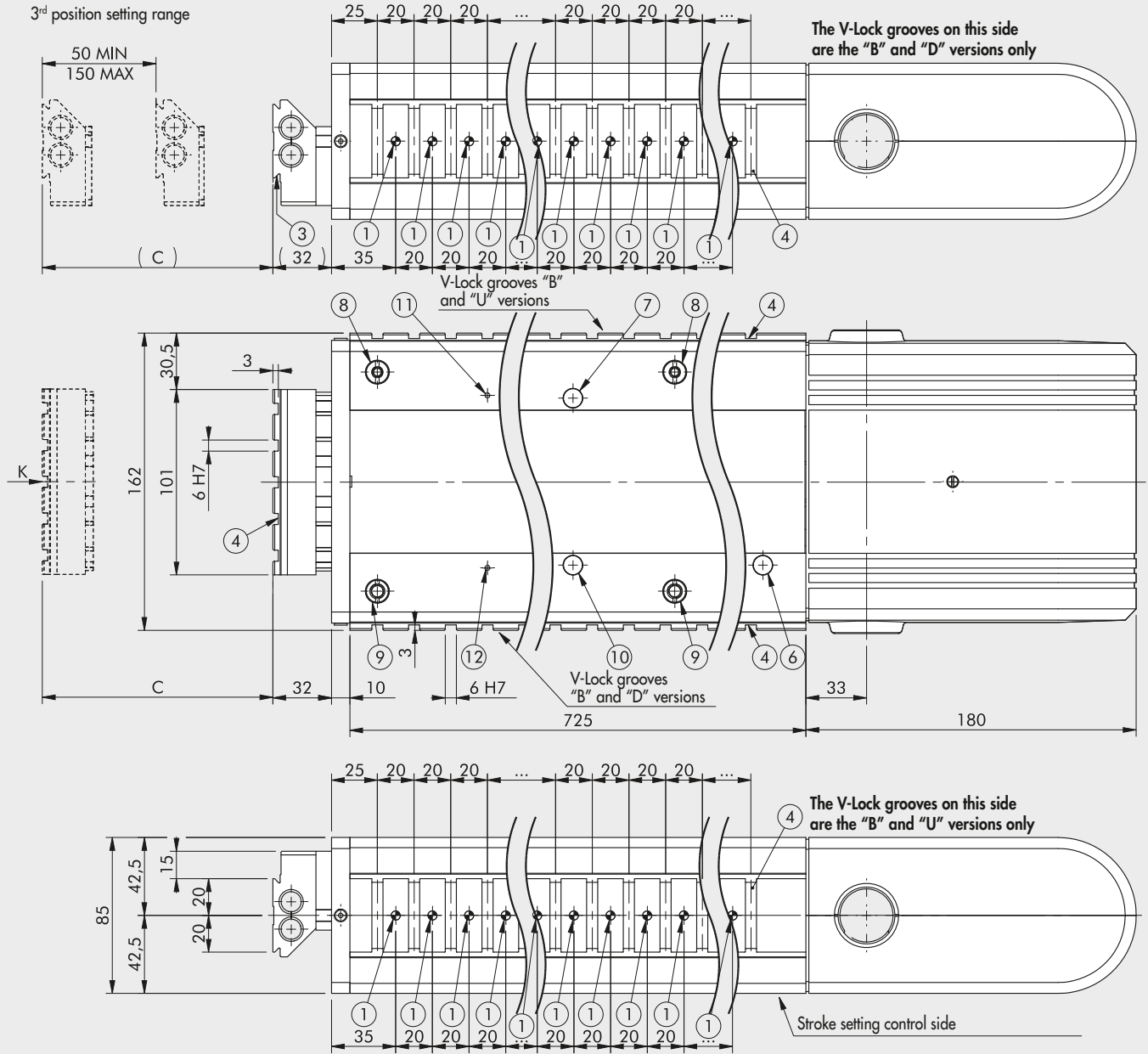
Code	Description	C
K102BH00320000000K		50 to 320
K102BH00320B	LEPK-2-320-H-B	
K102BH00320D		
K102BH00320U		
K102BH20320000000K		without terminal board
K102BH20320B	LEPK-2-320-H-B	
K102BH20320D		
K102BH20320U		

VIEWED FROM "K"



IMPORTANT. The LEPK-2-320-H-B can hold maximum 29 V-Lock grooves and hence a maximum of 28 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-2-450-H-B LINEAR UNIT (horizontal, 3 positions)



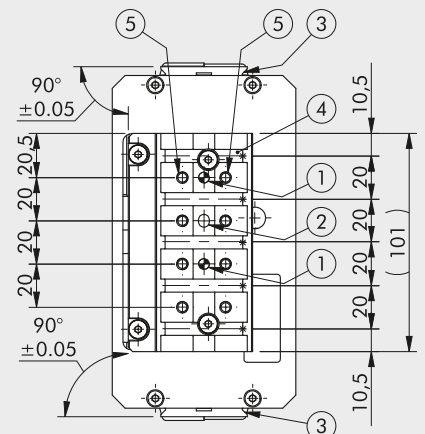
- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod
- ⑩ Sensor LED inspection hole for 3rd position
- ⑪ Sensor LED inspection hole for 3rd position DISABLED
- ⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!

The drawing shows the code K102BH00450B02535K with the maximum number of V-Lock grooves (version BOTH)

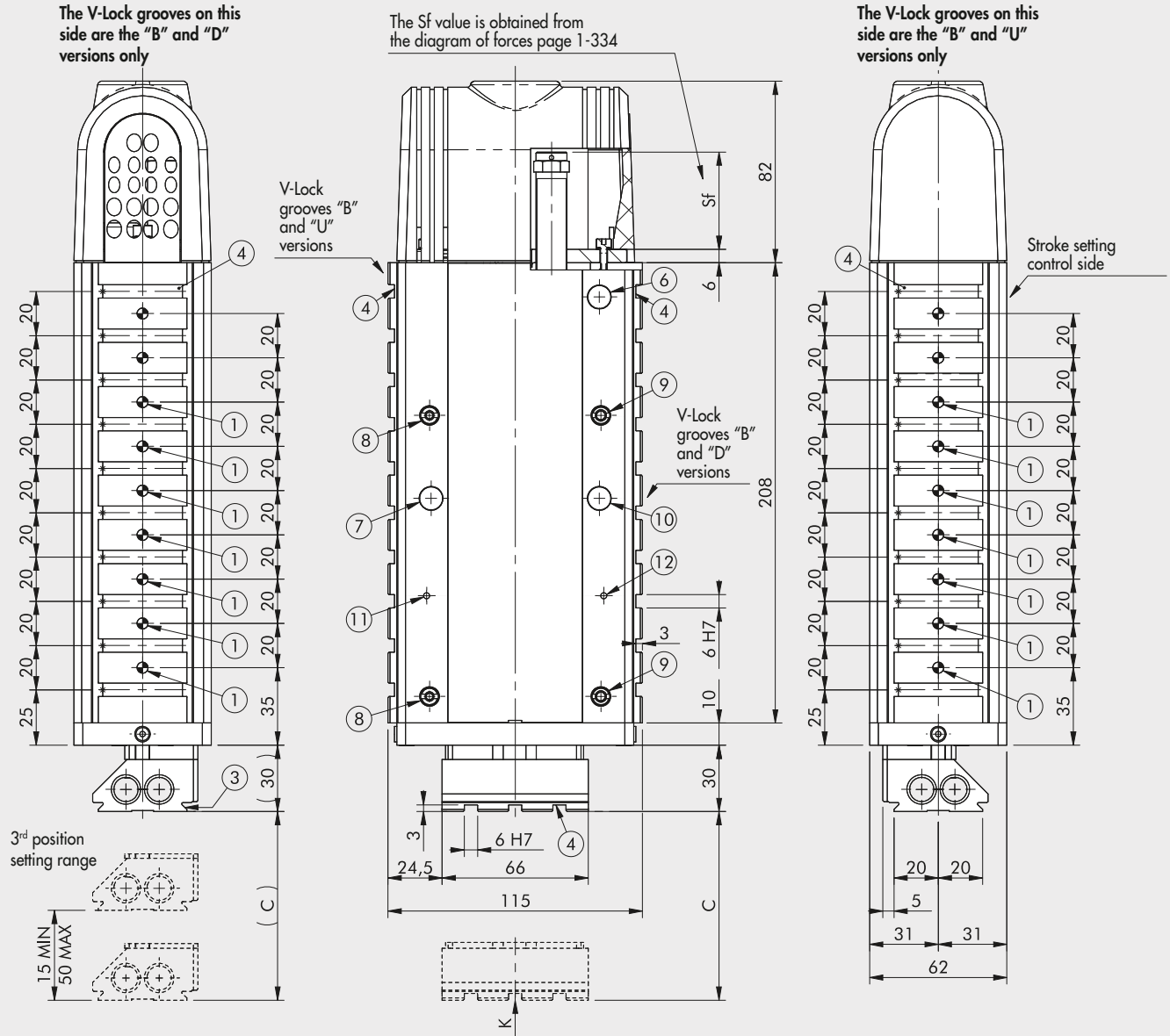
Code	Description	C
K102BH00450000000K	LEPK-2-450-H-B	50 to 450
K102BH00450B		
K102BH00450D		
K102BH00450U		
K102BH20450000000K	LEPK-2-450-H-B without terminal board	50 to 450
K102BH20450B		
K102BH20450D		
K102BH20450U		

VIEWED FROM "K"



IMPORTANT. The LEPK-2-450-H-B can hold maximum 35 V-Lock grooves and hence a maximum of 34 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-60-V-B LINEAR UNIT (Vertical, 3 positions)



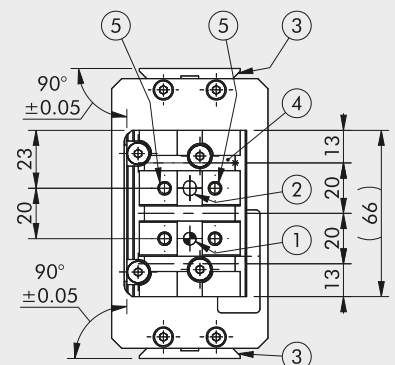
- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod
- ⑩ Sensor LED inspection hole for 3rd position
- ⑪ Sensor LED inspection hole for 3rd position DISABLED
- ⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!

The drawing shows the code K101BV00060B02510K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101BV00060000000K		15 to 60
K101BV00060B --- K	LEPK-1-60-V-B	
K101BV00060D --- K		
K101BV00060U --- K		
K101BV20060000000K		15 to 60
K101BV20060B --- K	LEPK-1-60-V-B	
K101BV20060D --- K	without spring	
K101BV20060U --- K		

VIEWS FROM "K"



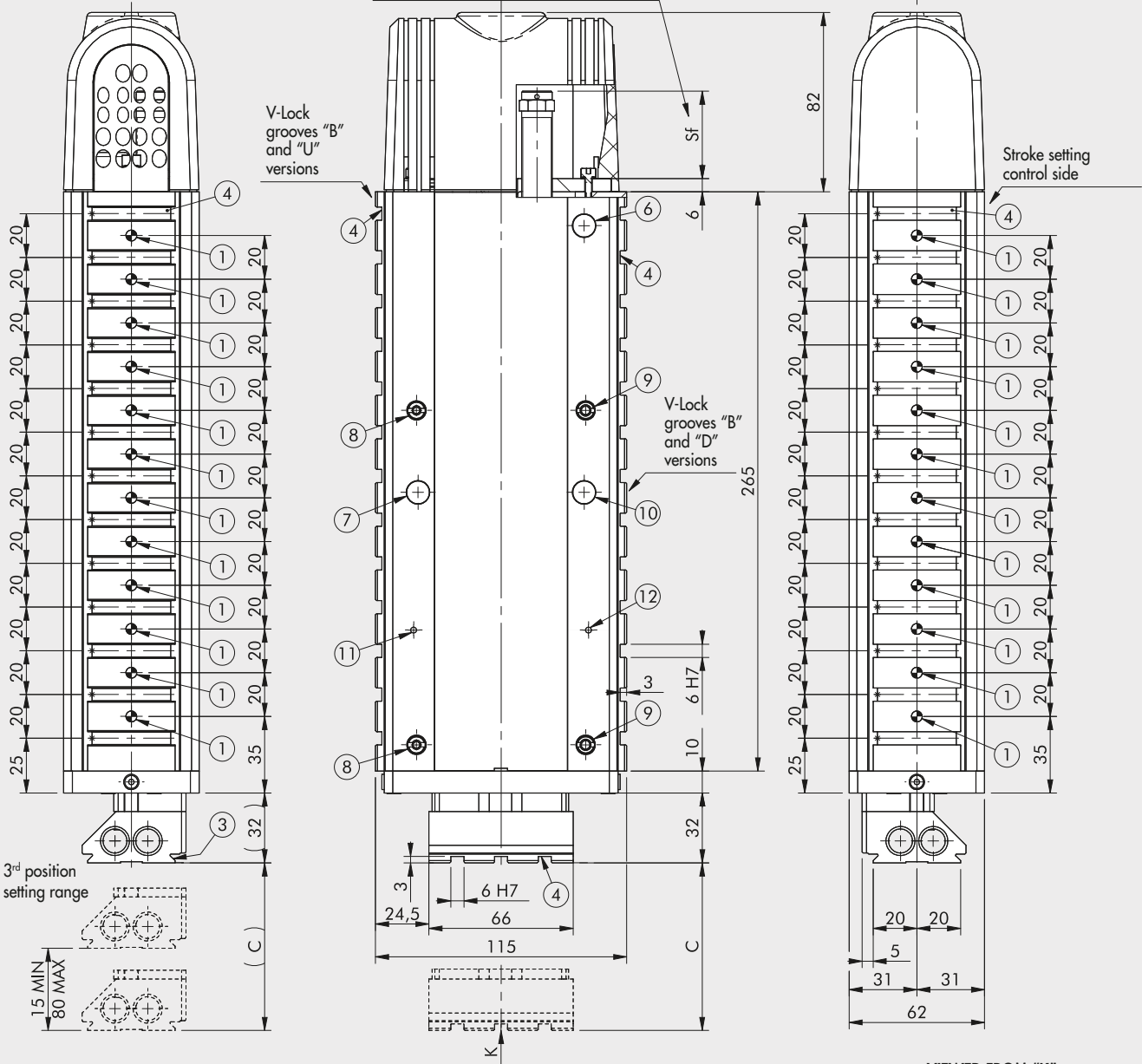
IMPORTANT. The LEPK-1-60-V-B can hold maximum 10 V-Lock grooves and hence a maximum of 9 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-90-V-B LINEAR UNIT (Vertical, 3 positions)

The V-Lock grooves on this side are the "B" and "D" versions only

The Sf value is obtained from the diagram of forces page 1-334

The V-Lock grooves on this side are the "B" and "U" versions only



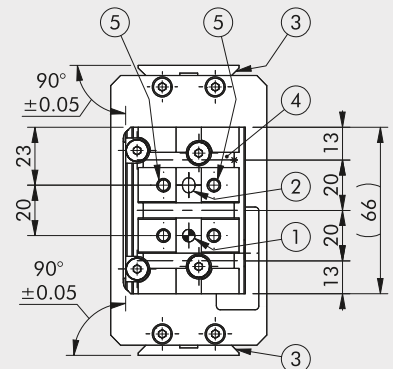
- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod
- ⑩ Sensor LED inspection hole for 3rd position
- ⑪ Sensor LED inspection hole for 3rd position DISABLED
- ⑫ Sensor LED inspection hole for 3rd position ENABLED

IMPORTANT!

The drawing shows the code K101BV00090B02513K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101BV00090000000K		15 to 90
K101BV00090B --- K	LEPK-1-90-V-B	
K101BV00090D --- K		
K101BV20090000000K		15 to 90
K101BV20090B --- K	LEPK-1-90-V-B	
K101BV20090D --- K	without spring	
K101BV20090U --- K		

VIEWED FROM "K"



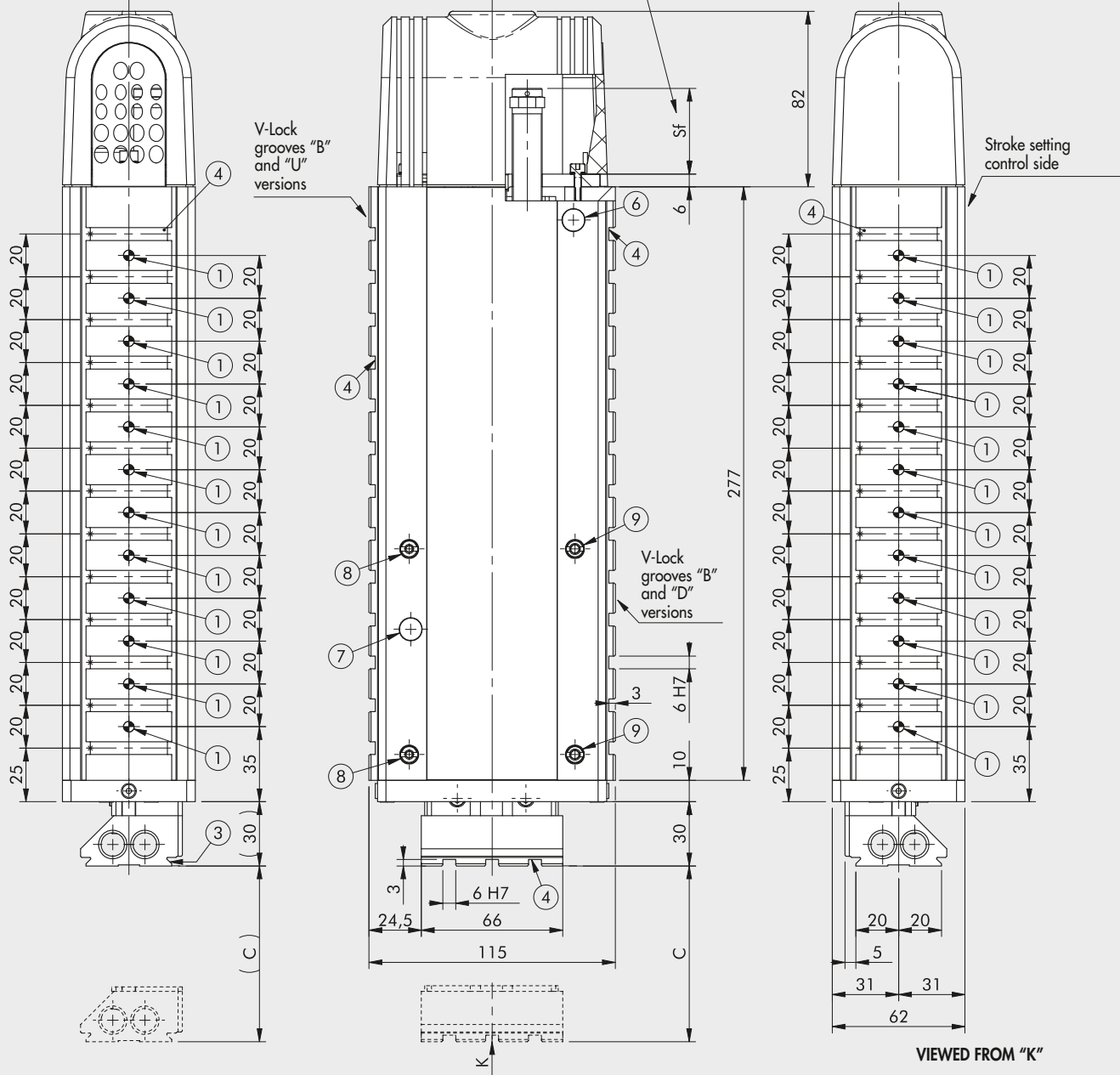
IMPORTANT. The LEPK-1-90-V-B can hold maximum 13 V-Lock grooves and hence a maximum of 12 Ø5 H7 pinholes.

DIMENSIONS OF THE LEPK-1-160-V-A LINEAR UNIT (Vertical, 2 positions)

The V-Lock grooves on this side are the "B" and "D" versions only

The Sf value is obtained from the diagram of forces page 1-334

The V-Lock grooves on this side are the "B" and "U" versions only

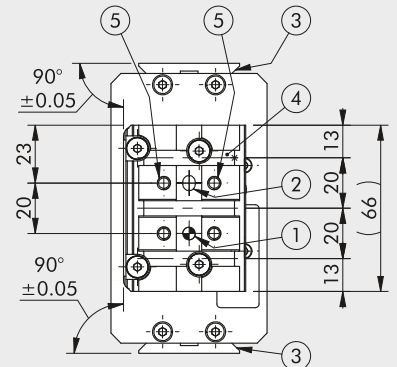


- ① Holes for centring pins
- ② Centring slot
- ③ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ④ Slot for "V-Lock" precision key
- ⑤ Threaded holes for fixing
- ⑥ Sensor LED inspection hole for the retracted position ("0")
- ⑦ Sensor LED inspection hole for the extended position
- ⑧ Eccentric rod for backlash take-up
- ⑨ Centric rod

IMPORTANT!

The drawing shows the code K101AV00160B02513K with the maximum number of V-Lock grooves (version BOTH)

Code	Description	C
K101AV00160000000K		
K101AV00160B	LEPK-1-160-V-A	15 to 160
K101AV00160D		
K101AV00160U		
K101AV20160000000K		
K101AV20160B	LEPK-1-160-V-A	without spring
K101AV20160D		
K101AV20160U		



IMPORTANT. The LEPK-1-160-V-A can hold maximum 13 grooves and hence a maximum of 12 Ø5 H7 pinholes.

KEY TO CODES

K10	1	A	H	0	0	090	0	000	00	K
	SIZE	POSITION	ORIENTATION			STROKE	V-Lock CONNECTION	V-Lock POSITION	Number of V-Lock GROOVES	FAMILY
Linear units series LEPK	1 Size 1 ◀ 2 Size 2	A 2 positions B 3 positions	H Horizontal V Vertical (with return spring) S Vertical (without return spring)	0 Inductive sensors (with terminal board) ● 2 Inductive sensors (without terminal board)		▼ 060 ◆ 090 ◆ 160 + 225 * 320 * 450	0 None B Grooves above and below D Grooves below U Grooves above	□ 000 None ▲ --- Position	□ 00 None ■ -- Number of grooves	K V-Lock

◀ Available only in horizontal orientation (H).

● Standard for the version with vertical orientation (V).

▼ Only size 1 - V/S

◆ Only size 1 - V/S/H

+ Only size 1 - H

* Only size 2 - H

□ Always use when "V-Lock connection" is equal to "0" (none)

▲ For connecting V-Lock "B" - "D" - "U" minimum value "025", the following values vary by steps of 20 mm (e.g. "045", "065" and "085").

For mounting options, see page 1-335.

■ The maximum number of possible grooves is:

LEPK 1-60-V/S-A = n. 08

LEPK 1-60-V/S-B = n. 10

LEPK 1-90-V/S-A = n. 10

LEPK 1-90-V/S-B = n. 13

LEPK 1-90-H-A = n. 10

LEPK 1-90-H-B = n. 13

LEPK 1-160-H-A = n. 13

LEPK 1-160-H-B = n. 17

N.B. The number of Ø5 H7 pinholes always coincides with the number of grooves ordered less 1.

For mounting options, see page 1-335.

LEPK 1-160-V/S-A = n. 13

LEPK 1-160-V/S-B = n. 17

LEPK 1-225-H-A = n. 23

LEPK 1-225-H-B = n. 23

LEPK 2-320-H-A = n. 24

LEPK 2-320-H-B = n. 29

LEPK 2-450-H-A = n. 35

LEPK 2-450-H-B = n. 35

ORDERING CODES

Code	Description	Code	Description
LEPK-1 HORIZONTAL			
K101AH00090000000K	LEPK-1-90-H-A without V-Lock	K101AH20225U__K	LEPK-1-225-H-A V-Lock below
K101AH00090B__K	LEPK-1-90-H-A V-Lock above and below	K101BH00225000000K	LEPK-1-225-H-B without V-Lock
K101AH00090D__K	LEPK-1-90-H-A V-Lock above	K101BH00225B__K	LEPK-1-225-H-B V-Lock above and below
K101AH00090U__K	LEPK-1-90-H-A V-Lock below	K101BH00225D__K	LEPK-1-225-H-B V-Lock above
K101AH20090000000K	LEPK-1-90-H-A without V-Lock	K101BH00225U__K	LEPK-1-225-H-B V-Lock below
K101AH20090B__K	LEPK-1-90-H-A V-Lock above and below	K101BH20225000000K	LEPK-1-225-H-B without V-Lock
K101AH20090D__K	LEPK-1-90-H-A V-Lock above	K101BH20225B__K	LEPK-1-225-H-B V-Lock above and below
K101AH20090U__K	LEPK-1-90-H-A V-Lock below	K101BH20225D__K	LEPK-1-225-H-B V-Lock above
K101BH00090000000K	LEPK-1-90-H-B without V-Lock	K101BH20225U__K	LEPK-1-225-H-B V-Lock below
K101BH00090B__K	LEPK-1-90-H-B V-Lock above and below	LEPK-1 VERTICAL	
K101BH00090D__K	LEPK-1-90-H-B V-Lock above	K101AS20060000000K	LEPK-1-60-S-A without V-Lock
K101BH00090U__K	LEPK-1-90-H-B V-Lock below	K101AS20060B__K	LEPK-1-60-S-A V-Lock above and below
K101BH20090000000K	LEPK-1-90-H-B without V-Lock	K101AS20060D__K	LEPK-1-60-S-A V-Lock above
K101BH20090B__K	LEPK-1-90-H-B V-Lock above and below	K101AS20060U__K	LEPK-1-60-S-A V-Lock below
K101BH20090D__K	LEPK-1-90-H-B V-Lock above	K101AV20060000000K	LEPK-1-60-V-A without V-Lock
K101BH20090U__K	LEPK-1-90-H-B V-Lock below	K101AV20060B__K	LEPK-1-60-V-A V-Lock above and below
K101AH00160000000K	LEPK-1-160-H-A without V-Lock	K101AV20060D__K	LEPK-1-60-V-A V-Lock above
K101AH00160B__K	LEPK-1-160-H-A V-Lock above and below	K101AV20060U__K	LEPK-1-60-V-A V-Lock below
K101AH00160D__K	LEPK-1-160-H-A V-Lock above	K101BS20060000000K	LEPK-1-60-S-B without V-Lock
K101AH00160U__K	LEPK-1-160-H-A V-Lock below	K101BS20060B__K	LEPK-1-60-S-B V-Lock above and below
K101AH20160000000K	LEPK-1-160-H-A without V-Lock	K101BS20060D__K	LEPK-1-60-S-B V-Lock above
K101AH20160B__K	LEPK-1-160-H-A V-Lock above and below	K101BS20060U__K	LEPK-1-60-S-B V-Lock below
K101AH20160D__K	LEPK-1-160-H-A V-Lock above	K101BV20060000000K	LEPK-1-60-V-B without V-Lock
K101AH20160U__K	LEPK-1-160-H-A V-Lock below	K101BV20060B__K	LEPK-1-60-V-B V-Lock above and below
K101BH00160000000K	LEPK-1-160-H-B without V-Lock	K101BV20060D__K	LEPK-1-60-V-B V-Lock above
K101BH00160B__K	LEPK-1-160-H-B V-Lock above and below	K101BV20060U__K	LEPK-1-60-V-B V-Lock below
K101BH00160D__K	LEPK-1-160-H-B V-Lock above	K101AS20090000000K	LEPK-1-90-S-A without V-Lock
K101BH00160U__K	LEPK-1-160-H-B V-Lock below	K101AS20090B__K	LEPK-1-90-S-A V-Lock above and below
K101BH20160000000K	LEPK-1-160-H-B without V-Lock	K101AS20090D__K	LEPK-1-90-S-A V-Lock above
K101BH20160B__K	LEPK-1-160-H-B V-Lock above and below	K101AS20090U__K	LEPK-1-90-S-A V-Lock below
K101BH20160D__K	LEPK-1-160-H-B V-Lock above	K101AV20090000000K	LEPK-1-90-V-A without V-Lock
K101BH20160U__K	LEPK-1-160-H-B V-Lock below	K101AV20090B__K	LEPK-1-90-V-A V-Lock above and below
K101AH00225000000K	LEPK-1-225-H-A without V-Lock	K101AV20090D__K	LEPK-1-90-V-A V-Lock above
K101AH00225B__K	LEPK-1-225-H-A V-Lock above and below	K101AV20090U__K	LEPK-1-90-V-A V-Lock below
K101AH00225D__K	LEPK-1-225-H-A V-Lock above	K101BS20090000000K	LEPK-1-90-S-B without V-Lock
K101AH00225U__K	LEPK-1-225-H-A V-Lock below	K101BS20090B__K	LEPK-1-90-S-B V-Lock above and below
K101AH20225000000K	LEPK-1-225-H-A without V-Lock	K101BS20090D__K	LEPK-1-90-S-B V-Lock above
K101AH20225B__K	LEPK-1-225-H-A V-Lock above and below	K101BS20090U__K	LEPK-1-90-S-B V-Lock below
K101AH20225D__K	LEPK-1-225-H-A V-Lock above		

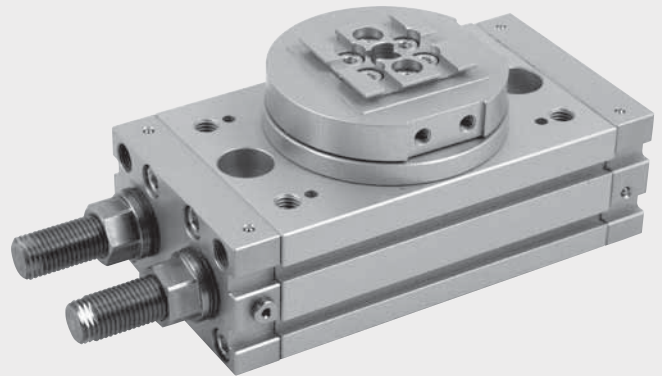
NOTES

ROTARY ACTUATOR SERIES R3K



An actuator with a double rack and play take-up.
 Angle of rotation adjustable from 0° to 180°.
 These rotary actuators can be supplied with a mechanical stop or, for some sizes, a hydraulic decelerator.
 There is also a version with external hydraulic decelerators with more kinetic energy.
 The typical V-Lock dovetail and grooves are present on the turntable and the lower part of the body.
 There are two grooves on either side for inserting retracting magnetic sensors.
 There is a hole in the flange for air pipes or power cables.

N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.



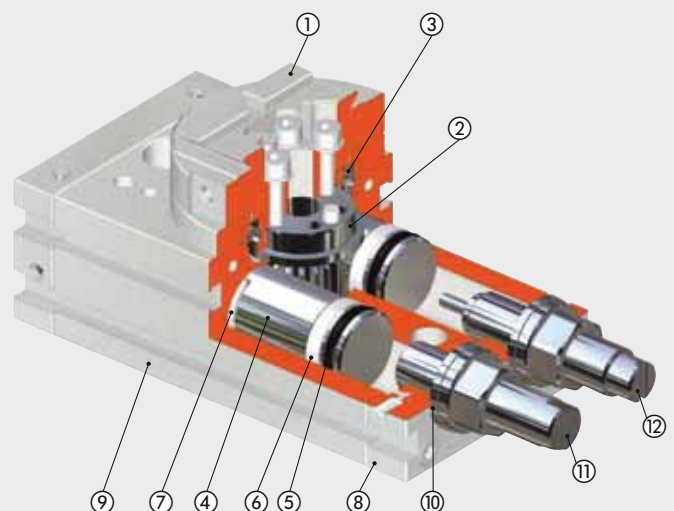
TECHNICAL DATA		R3K-16	R3K-20	R3K-25
Operating pressure	bar		3 to 7	
	MPa		0.3 to 0.7	
	psi		43 to 101	
Temperature range	°C		-10 to 80	
Fluid		Lubricated or unlubricated 20 µm filtered air. If lubricated air is used, lubrication must be continuous.		
Bore	mm	2 x 16	2 x 20	2 x 25
Theoretical torque at 6 bar	Nm	0.9	1.8	4.6
Maximum axial load	N	74	135	300
Maximum radial load	N	78	137	450
Maximum overturning moment	Nm	2.4	4	9.7
Rotation time without load	s	0.2	0.2	0.2
Maximum kinetic energy:				
with mechanical stop	Joule	0.007	0.025	0.082
with inner decelerators	Joule	-	-	0.29
Weight	kg	0.66	1.13	2.17

COMPONENTS

- ① ROTARY FLANGE: anodised aluminium
- ② PINION: hardened and tempered steel
- ③ BALL BEARING
- ④ PISTON / RACK: hardened and tempered steel
- ⑤ CUSHIONING GASKET: NBR
- ⑥ GUIDE SHOE: PTFE
- ⑦ MAGNET: neodymium
- ⑧ HEAD: anodised aluminium
- ⑨ BARREL: anodised aluminium
- ⑩ GASKET: NBR

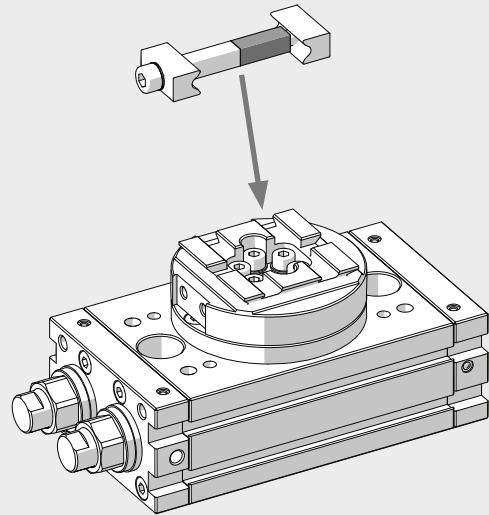
VERSIONS:

- ⑪ Stroke adjustment
- ⑫ Stroke adjustment with inside hydraulic shock absorbers (available from Ø 25)

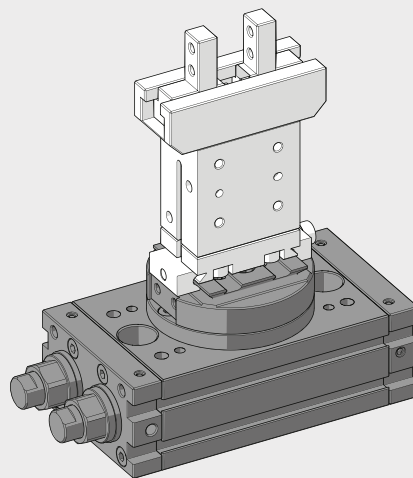


KEY DIAGRAM

Due to the design of turntables for R3K actuators, and to allow precision assembly with the K fixing elements, it is necessary to add a second key code W0950005151K to the one already present on the standard element.



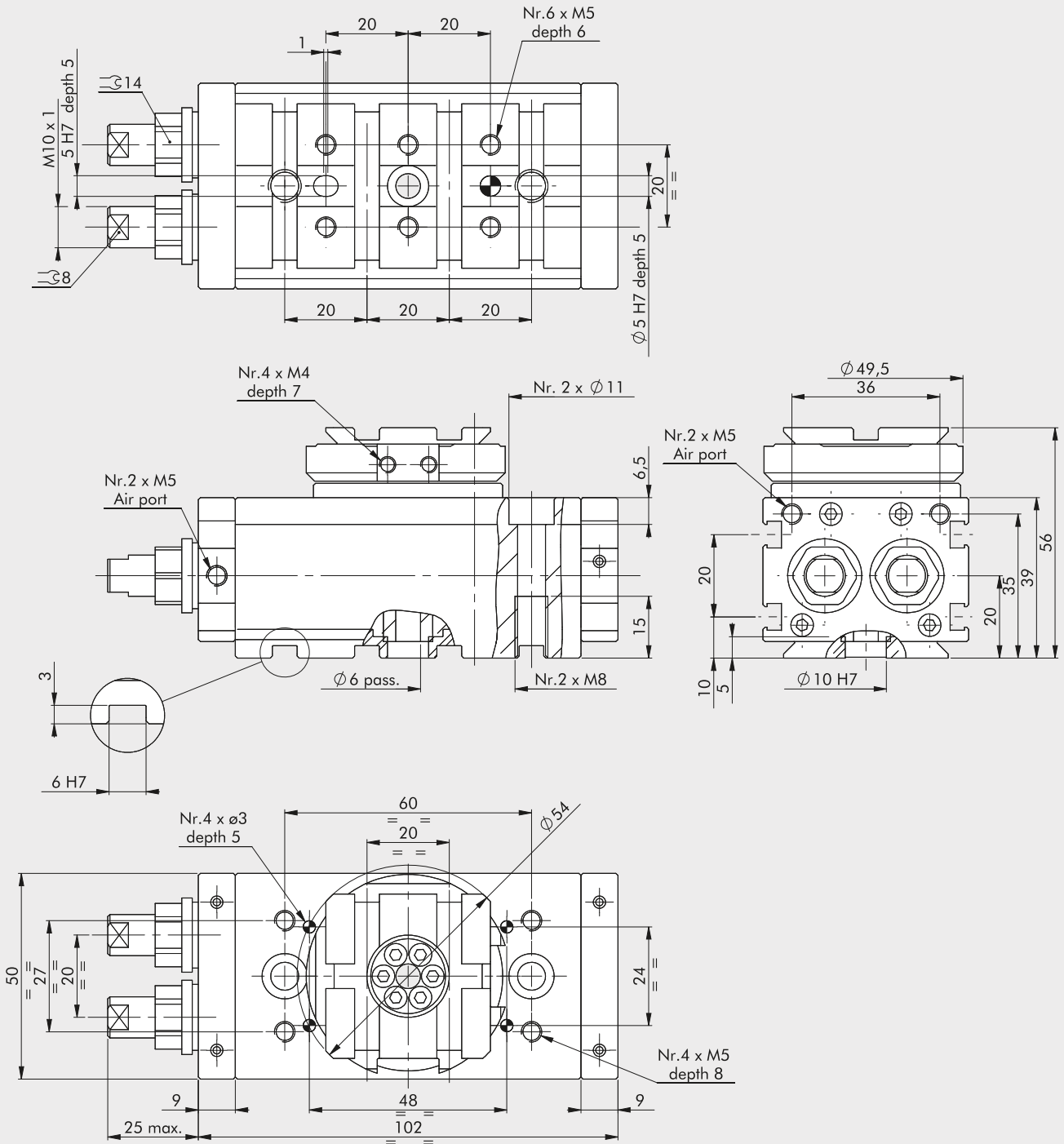
EXAMPLES OF APPLICATION



NOTES

ROTARY ACTUATOR R3K-16

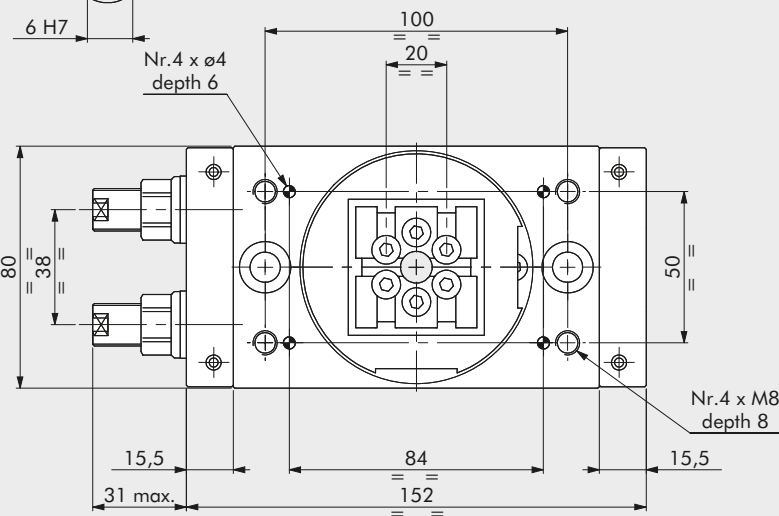
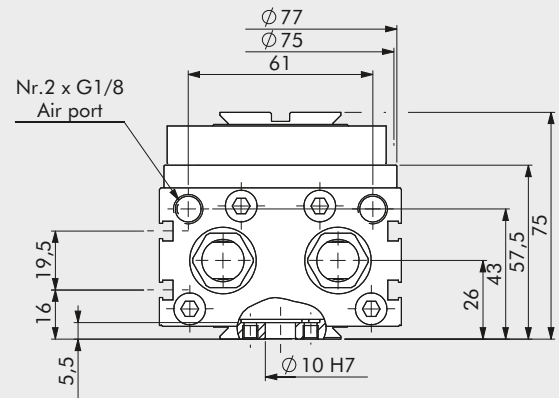
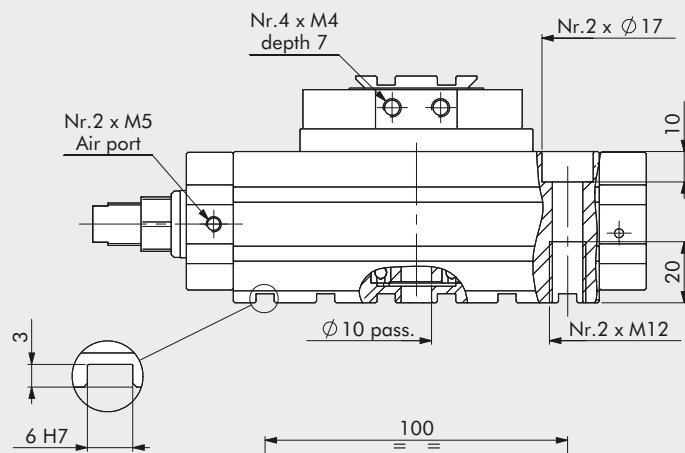
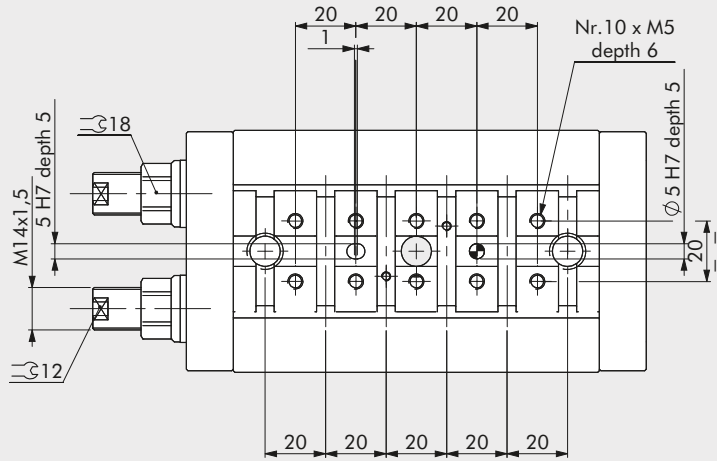
NOTE: For standard dovetail dimensions see page 1-257



Code	Description
W1630162180K	Rotary actuator R3K-16

ROTARY ACTUATOR R3K-25

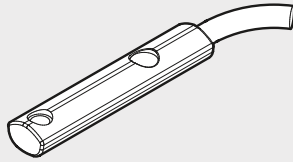
NOTE: For standard dovetail dimensions see page 1-257



Code	Description
W1630252180K	Rotary actuator R3K-25
W1630253180K	Rotary actuator + shock absorbers R3K-25

ACCESSORIES

RETRACTING SENSOR WITH INSERTION FROM ABOVE

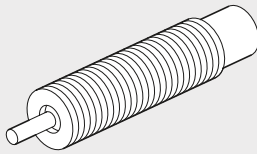


Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952225390	HALL N.O. sensor, vertical insertion 2.5 m robotics
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8 robotics
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952222180	REED N.O. sensor, vertical insertion 2.5 m robotics
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8 robotics
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
NB: For technical data see page 1-580

SPARE PARTS

SHOCK ABSORBERS



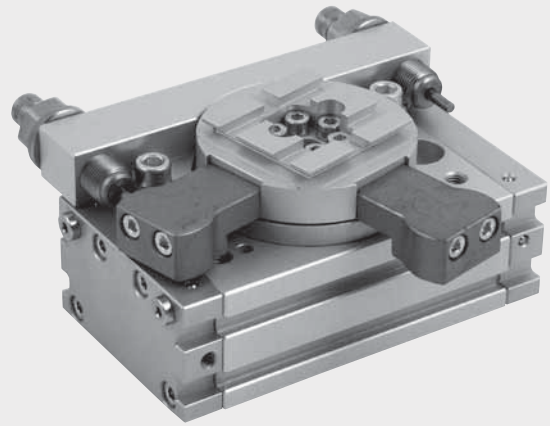
Code	Ø	Description
0950004015	Ø 25	Shock absorbers ECO S 25 MC2 short M14 x 1.5

NOTES

ROTARY ACTUATOR SERIES R3K WITH EXTERNAL SHOCK ABSORBERS

An actuator with a double rack and play take-up. The hydraulic decelerators are mounted externally and act at a greater distance from the rotation axis compared to internal decelerators. This means the amount of kinetic energy absorbed is 4-8 times greater than with internal decelerators. Reduced longitudinal dimensions as there are no adjusting screws. Available in versions with 90° and 180° rotation. The typical V-Lock dovetail and grooves are present on the turntable and the lower part of the body. There are two grooves on either side for inserting retracting magnetic sensors. There is a hole in the flange for air pipes or power cables.

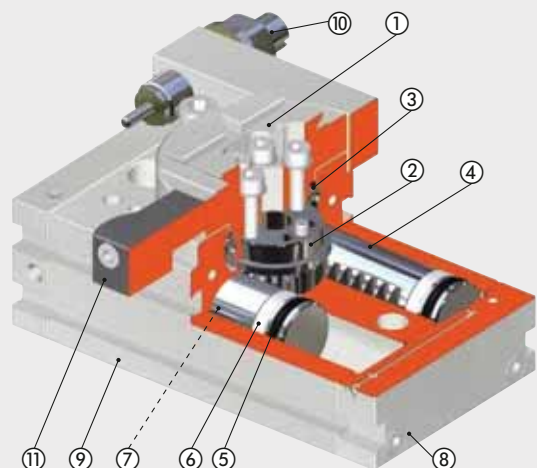
N.B.: The use of flow microregulators is recommended. During setup, start with the microregulator CLOSED, then open it gradually until the desired speed is reached.



TECHNICAL DATA		R3K-16	R3K-20	R3K-25
Operating pressure	bar		3 to 7	
	MPa		0.3 to 0.7	
	psi		43 to 101	
Temperature range	°C		-10 to 80	
	Fluid	Fluid Lubricated or unlubricated 20 µm filtered air. If lubricated air is used, lubrication must be continuous.		
Bore	mm	2 x 16	2 x 20	2 x 25
Theoretical torque at 6 bar	Nm	0.9	1.8	4.6
Maximum axial load	N	74	135	300
Maximal radial load	N	78	137	450
Maximum overturning moment	Nm	2.4	4	9.7
Rotation time without load	s	0.2	0.2	0.2
Maximum kinetic energy	Joule	0.16	0.55	1.40
Weight	kg	0.76	1.43	2.86

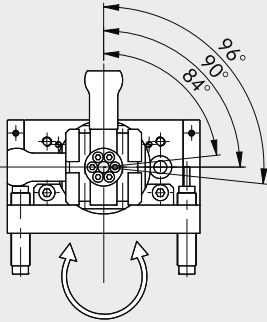
COMPONENTS

- ① ROTARY FLANGE: anodised aluminium
- ② PINION: hardened and tempered steel
- ③ BALL BEARING
- ④ PISTON / RACK: hardened and tempered steel
- ⑤ CUSHIONING GASKET: NBR
- ⑥ GUIDE SHOE: PTFE
- ⑦ MAGNET: neodymium
- ⑧ HEAD: anodised aluminium
- ⑨ BARREL: anodised aluminium
- ⑩ STROKE REGULATOR WITH HYDRAULIC SHOCK ABSORBERS
- ⑪ Block for 90° version



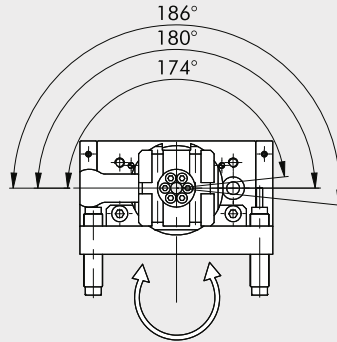
ANGLES OF ROTATION

90°



Hole position
for bottom pins

180°



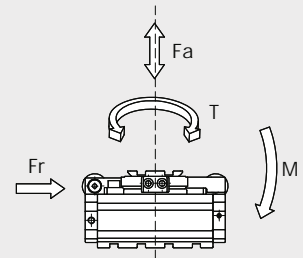
Hole position
for bottom pins

MAXIMUM KINETIC ENERGY Joule [J]

Ø	With flange, 90° rotation: W1630_4090K With flange, 180° rotation: W1630_4180K
16	0.16
20	0.55
22	0.85
25	1.40
30	1.85
40	3.35

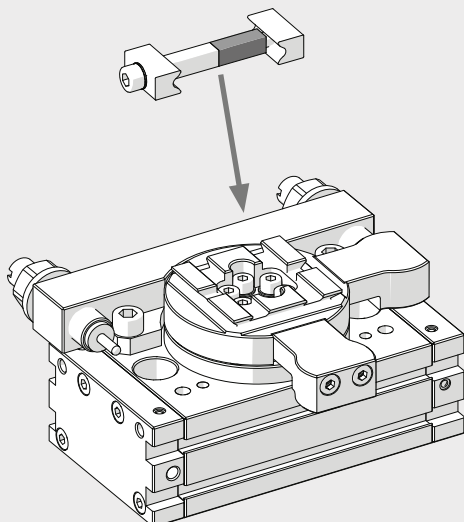
DIMENSIONS - FORCES AND MOMENTS

Ø	T Theoretical torque at 6 bar [Nm]	FA Max axial load [N]	FR Max radial load [N]	M Overturning moment [Nm]
16	0.9	74	78	2.4
20	1.8	135	137	4
22	2.7	195	360	5.3
25	4.6	300	450	9.7
30	9.3	340	490	12
40	22	360	560	18

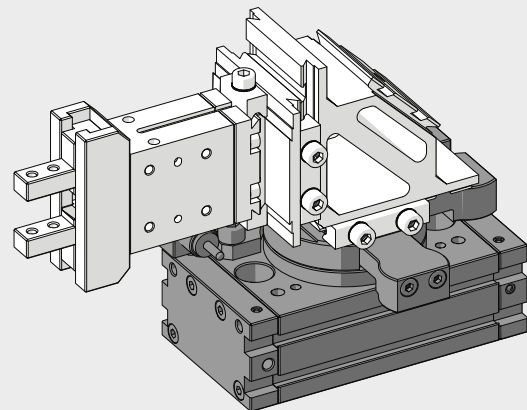


KEY DIAGRAM

Due to the design of turntables for R3K actuators, and to allow precision assembly with the K fixing elements, it is necessary to add a second key code W0950005151K to the one already present on the standard element.



EXAMPLES OF APPLICATION

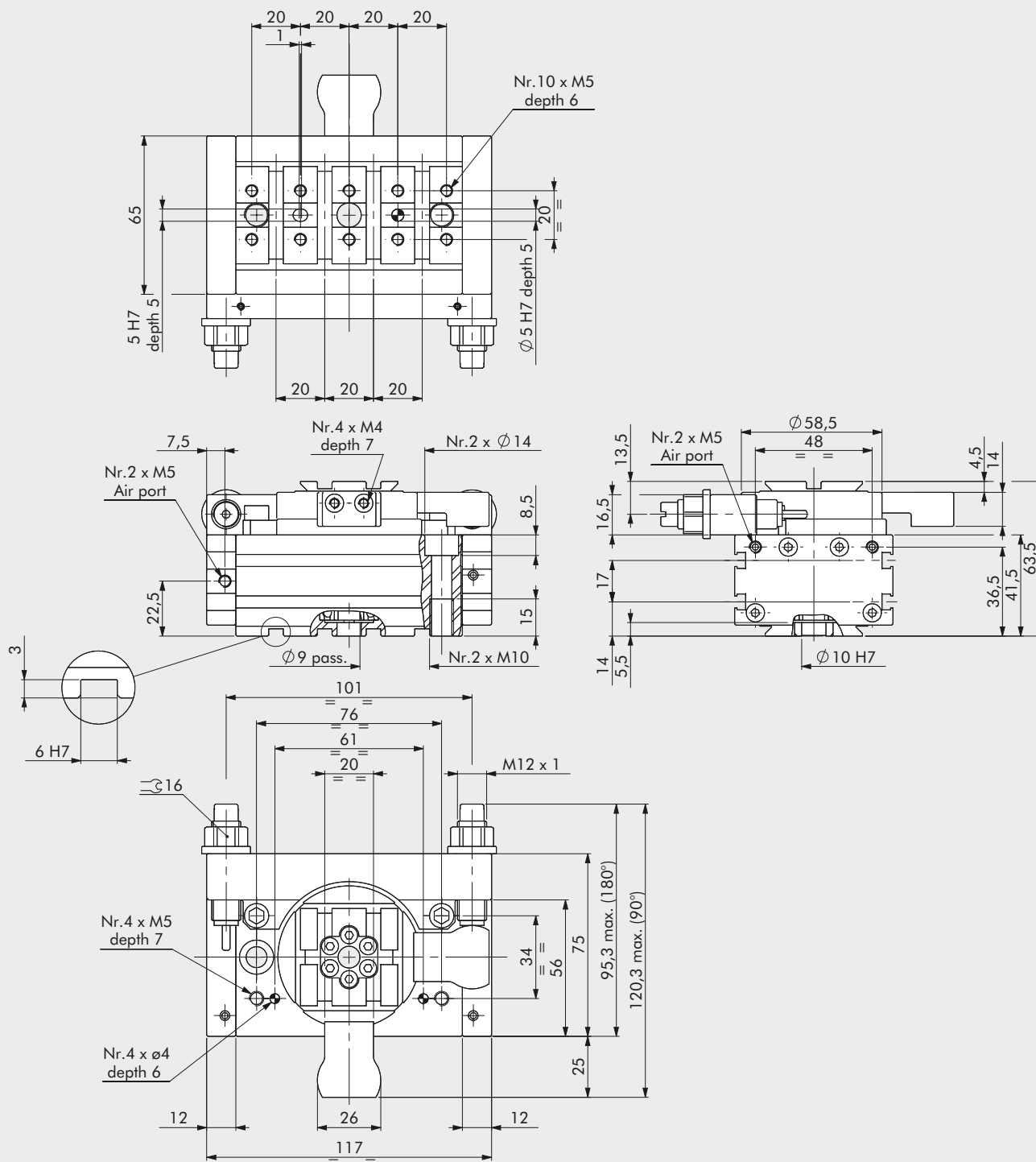


ROTARY ACTUATOR WITH EXTERNAL SHOCK ABSORBERS R3K-20 90/180°

NOTE: For standard dovetail dimensions see page 1-257

ACTUATORS

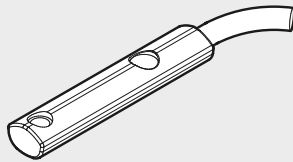
ROTARY ACTUATOR SERIES R3K WITH EXTERNAL SHOCK ABSORBERS



Code	Description
W1630204090K	Rotary actuator with external shock absorbers R3K-20-90
W1630204180K	Rotary actuator with external shock absorbers R3K-20-180

ACCESSORIES

RETRACTING SENSOR WITH INSERTION FROM ABOVE

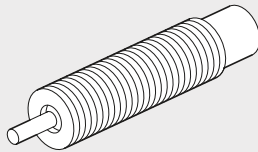


Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952225390	HALL N.O. sensor, vertical insertion 2.5 m robotics
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8 robotics
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952222180	REED N.O. sensor, vertical insertion 2.5 m robotics
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8 robotics
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
NB: For technical data see page 1-580

SPARE PARTS

SHOCK ABSORBERS



Code	Ø	Description
0950004009	Ø 16	Shock absorbers ECO 10 MF3 M10 x 1
0950004010	Ø 20	Shock absorbers ECO 15 MF4 M12 x 1
0950004015	Ø 25	Shock absorbers ECO S 25 MC2 short M14 x 1.5

NOTES

ROTARY ACTUATOR SERIES DAPK



The DAPK rotary actuator is characterised by an exceptionally high level of performance, great ease of use, positioning accuracy and long life. It features a patented rack and pinion slack adjustment mechanism.

The angle of rotation can be adjusted between 0° and 180°.

A 3° overrun beyond 180° is also provided at each side.

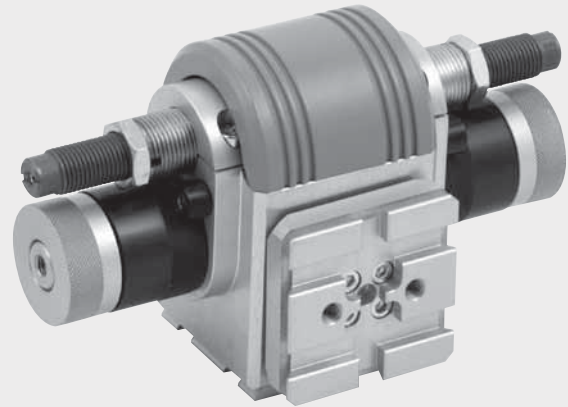
The end position stops can be either elastic mechanical stop (for application with reduced mass and velocity) or hydraulic shock absorbers.

The end position can be detected using either the magnetic version, which is suitable for magnetic sensors, or the version suitable for inductive sensors. Versions with two, three and four positions are also available. The third and fourth position can be added at a later stage by installing the accessory provided. The versions with a pneumatic rotary distributor can be used to supply compressed air to the rotating plate from the inside, thus avoiding using external rotating pipes.

In this case the rotating plate can be chosen among the one mounted in-line and that tilted by 90°.

N.B.: We always suggest to use flow microregulators.

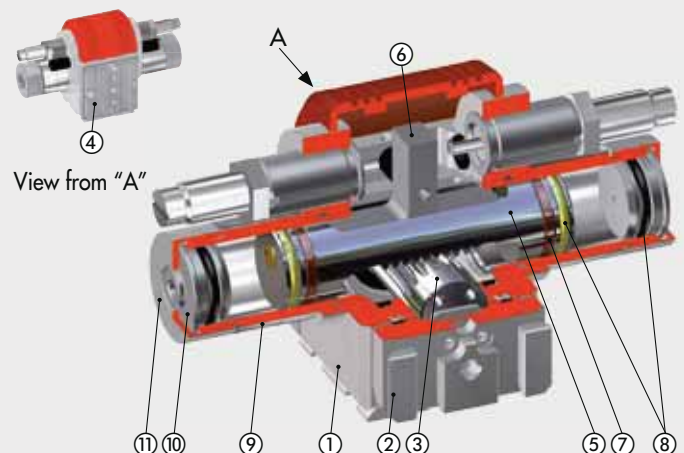
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.



TECHNICAL DATA	DAPK-1	DAPIK-1	DAPK-2	DAPIK-2
Internal air flows	NO	YES	NO	YES
Operating pressure	2 to 7 bar 0.2 to 0.7 MPa 29 to 101 psi			
Temperature range	-10 to 80 °C 14 to 176 °F			
Fluid	Lubricated or unlubricated 20 µm filtered air. If lubricated air is used, lubrication must be continuous.			
End position stop shock-absorption	Hydraulic shock-absorbers or elastic mechanical stop.			
End-position control	Inductive sensors, magnetic sensors.			
Rotation angle	Adjustable from 0 to 180 °			
Bore	20 mm		32 mm	
Moment of inertia around the central axis	0.004 kg.m ²		0.030 kg.m ²	
Theoretical torque at 6 bar	1.1 Nm		3.8 Nm	
Maximum overturning moment	5 Nm		15 Nm	
Allowable axial tensile stress/compression	90 / 120 N		240 / 460 N	
Allowable critical strain energy:				
with elastic mechanical stop	0.02 Joule		0.06 Joule	
with shock absorbers	0.20 Joule		0.60 Joule	
Repeatability (on 100 strokes at constant conditions)	≤ 0.01 °		≤ 0.01 - 0.02 °	
Weight of the 2-position version	0.56 kg	0.71 kg	1.50 kg	1.73 kg
Weight of the 3-position version	0.66 kg	0.80 kg	1.67 kg	1.90 kg
Weight of the 4-position version	0.76 kg	0.89 kg	1.84 kg	2.07 kg

COMPONENTS

- ① BODY: blank anodised aluminium
- ② PLATE: blank anodised aluminium
- ③ PINION: steel
- ④ INTERFACE COVER: blank anodised aluminium
- ⑤ RACK: steel
- ⑥ SECONDARY RACK: steel
- ⑦ GUIDE RING: special technopolymer
- ⑧ GASKETS: NBR
- ⑨ TUBE: hard-anodised aluminium
- ⑩ END CAP: blank anodised aluminium
- ⑪ COVER: blank anodised aluminium



CHOOSING THE SHOCK-ABSORBER

For the correct use of the DAPK-1/DAPIK-1 and DAPK-2/DAPIK-2, use the shock-absorber that best suits the application.

For the DAPK-1/DAPIK-1, you can select only one shock-absorber.

For the DAPK-2/DAPIK-2, you can choose three types of shock-absorbers according to the following procedure:

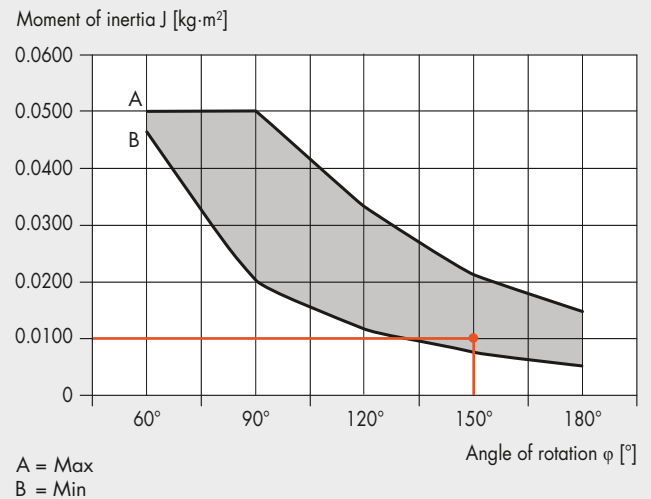
EXAMPLE

DAPK-2 with:

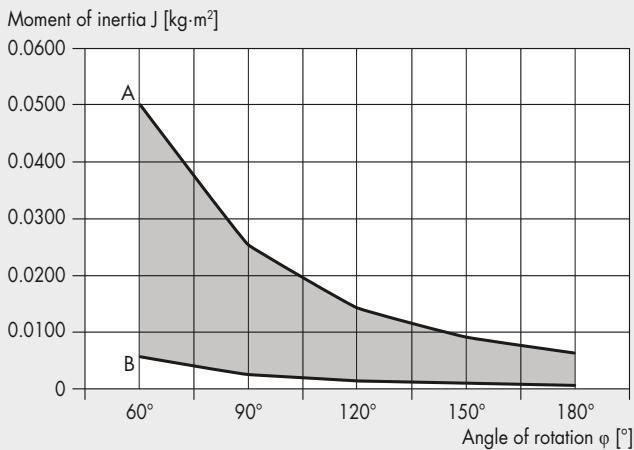
- Moment of inertia applied to the rotary actuator: $J = 0.0100 \text{ kg.m}^2$
- Set angle of rotation: $\varphi = 150^\circ$

Requirement: Determine the shock-absorber that best suits the application:

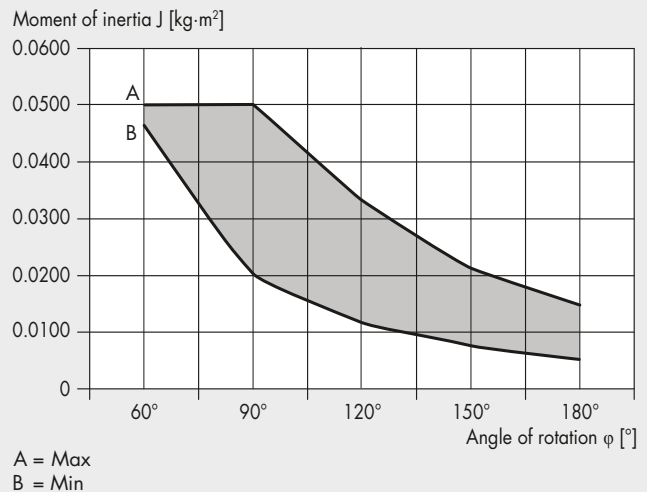
1. Calculate the moment of inertia of the component applied to the DAPK-2/DAPIK-2 rotary actuator.
In our case the value is $J = 0.0100 \text{ kg.m}^2$
2. Determine the angle of rotation that the rotary actuator must perform.
In our case the value is $\varphi = 150^\circ$
3. Intersect the angle and moment of inertia in the diagrams "shock-absorber range of use" of the three types of shock-absorbers used. The shock-absorber whose point is inside the grey area shall be chosen.
In our case the shock-absorber obtained is the "Shock-absorber on request" MC150EUMH2 average hardness (see encryption key).



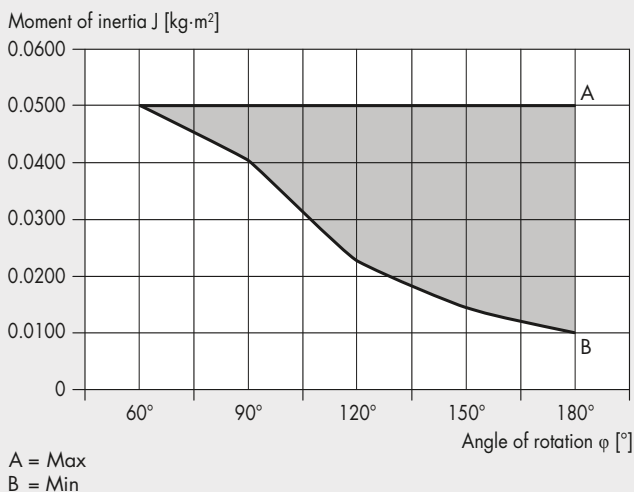
MC150EUMH STD shock-absorber range of use



MC150EUMH2 medium hardness shock-absorber range of use



SC190EUM7 hard shock-absorber range of use



PERFORMANCE

The method used to determine the maximum theoretical number of cycles and theoretical time of a rotation is the same for both sizes of the DAPK/DAPIK, which involves the use of:

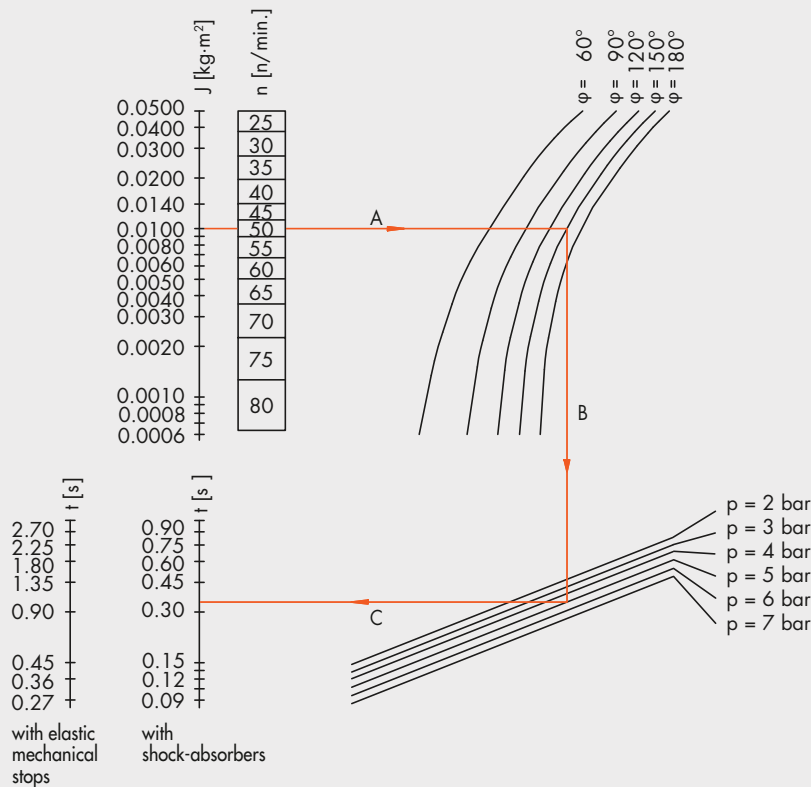
- "performance chart of DAPK-1/DAPIK-1 with hydraulic shock-absorbers and buffers";
- "performance chart of DAPK-2/DAPIK-2 with hydraulic shock-absorbers and buffers".

EXAMPLE

DAPK-2 with:

- Moment of inertia applied to the rotary actuator: $J = 0.0100 \text{ kg.m}^2$
- Set angle of rotation: $\varphi = 150^\circ$
- Supply pressure: $p = 5 \text{ bar}$

Requirement: Determine the maximum theoretical number of cycles and theoretical time of a rotation:



Applicability:

- Centre of gravity of the rotating mass on the axis of rotation. Axis of rotation in any position.
- Centre of gravity of the rotating mass outside the axis of rotation. Axis of rotation in a vertical position.

Example of hydraulic with shock-absorbers:

$J = 0.010 \text{ kg.m}^2$
 $\varphi = 150^\circ$
 $p = 5 \text{ bar}$

Results:

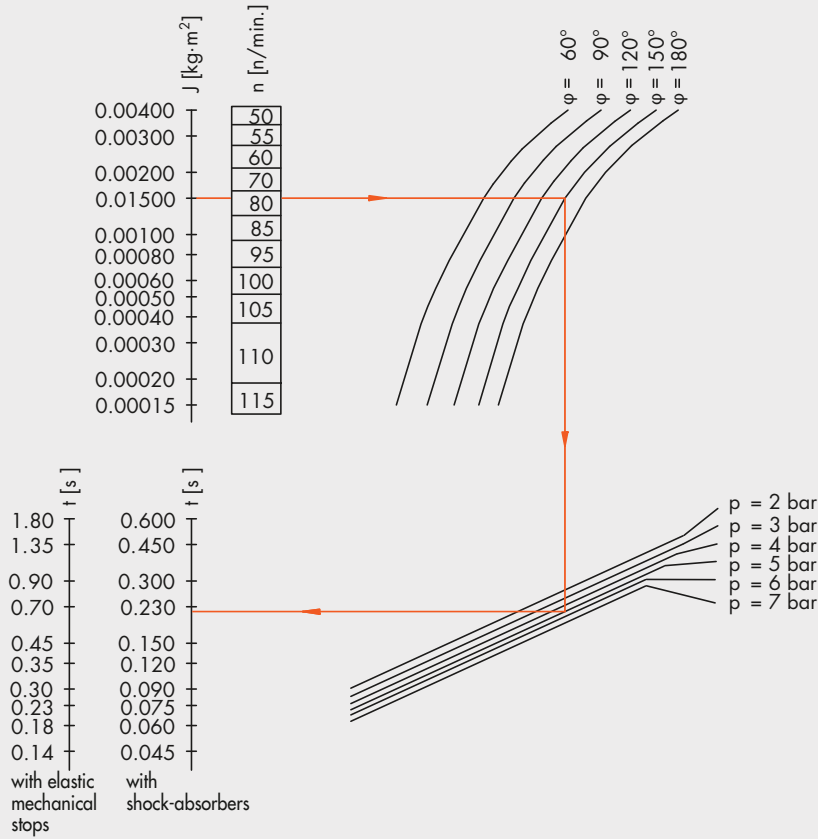
$n_{\text{max}} = 50 \text{ double strokes per minute}$
 $t = 0.34 \text{ s standard shock absorber}$

J = moment of inertia of mass
 n = max. number of double strokes per minute for the version with shock-absorbers
 p = pneumatic drive pressure
 t = traverse time per stroke
 φ = angle of rotation

1. Starting from the moment of inertia applied to the rotary actuator, the maximum number of settable theoretical cycles is determined (line A).
In our case the value is = 50 cycles/min
2. When the line of the desired angle of rotation is intercepted, move down to the supply pressure (line B) and, by crossing the indexed scale "t" (line C), you obtain the theoretical time of a rotation.
3. In our case the value is $t \approx 0.35 \text{ sec}$.

IMPORTANT: the maximum number of cycles and the time of a rotation are theoretical data and as such, for particular applications, these values are unlikely to be achieved.

PERFORMANCE GRAPHS FOR DAPK-1, DAPIK-1 WITH HYDRALIC SHOCK-ABSORBERS AND ELASTIC MECHANICAL STOPS



Applicability:

- Centre of gravity of the rotating mass on the axis of rotation. Axis of rotation in any position.
- Centre of gravity of the rotating mass outside the axis of rotation. Axis of rotation in a vertical position.

Example of hydraulic with shock-absorbers:

$J = 0.0015 \text{ kg}\cdot\text{m}^2$

$\varphi = 150^\circ$

$p = 5 \text{ bar}$

Results:

$n_{\text{max}} = 80 \text{ double strokes per minute}$

$t = 0.22 \text{ s}$

J = moment of inertia of mass

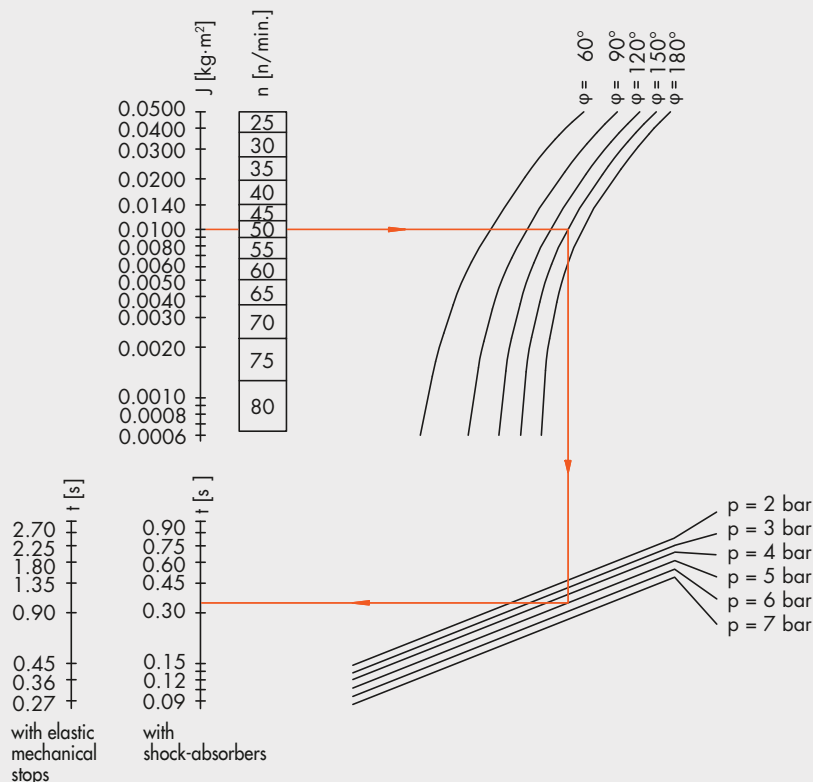
n = max. number of double strokes per minute for the version with shock-absorbers

p = pneumatic drive pressure

t = traverse time per stroke

φ = angle of rotation

PERFORMANCE GRAPHS FOR DAPK-2, DAPIK-2 WITH HYDRALIC SHOCK-ABSORBERS AND ELASTIC MECHANICAL STOPS



Applicability:

- Centre of gravity of the rotating mass on the axis of rotation. Axis of rotation in any position.
- Centre of gravity of the rotating mass outside the axis of rotation. Axis of rotation in a vertical position.

Example of hydraulic with shock-absorbers:

$J = 0.010 \text{ kg}\cdot\text{m}^2$

$\varphi = 150^\circ$

$p = 5 \text{ bar}$

Results:

$n_{\text{max}} = 50 \text{ double strokes per minute}$

$t = 0.34 \text{ s standard shock absorber}$

J = moment of inertia of mass

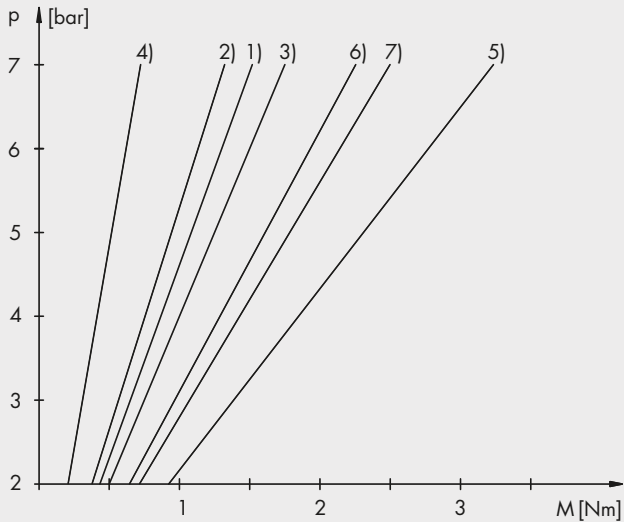
n = max. number of double strokes per minute for the version with shock-absorbers

p = pneumatic drive pressure

t = traverse time per stroke

φ = angle of rotation

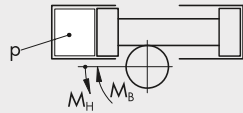
PRESSURE / TORQUE CHART DAPK-1, DAPIK-1, DZAK-1



p = drive pressure
 M_H = moment of holding, i.e. the moment applicable from the outside to the stationary pinion shaft, with no pinion movement.
 M_B = moment of movement, i.e. the moment available for the moving pinion shaft due to the effect of pneumatic drive.

2-POSITION VERSIONS

DAPK left /right end position

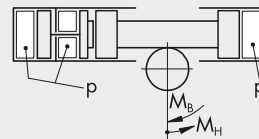


$$M_H = p \cdot 0.21 \rightarrow 1)$$

$$M_B = p \cdot 0.18 \rightarrow 2)$$

3-POSITION VERSIONS (DZAK)

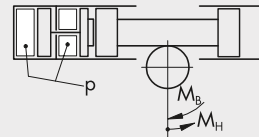
DAPK against DZAK on the outlet



$$M_H = p \cdot 0.25 \rightarrow 3)$$

$$M_B = p \cdot 0.10 \rightarrow 4)$$

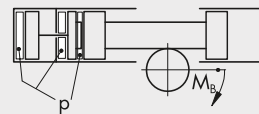
DZAK outlet, DAPK without pressure



$$M_H = p \cdot 0.46 \rightarrow 5)$$

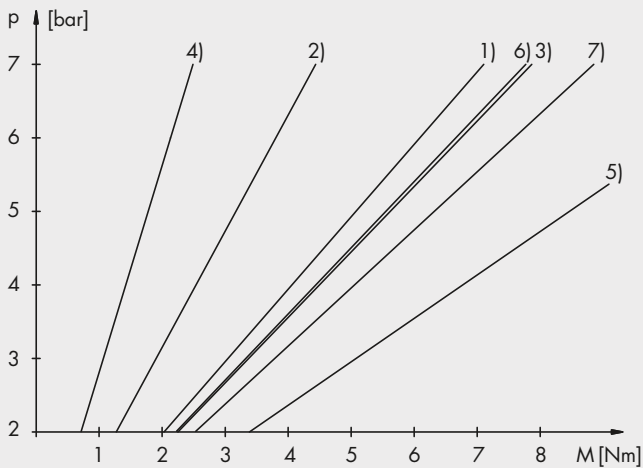
$$M_B = p \cdot 0.32 \rightarrow 6)$$

DAPK + DZAK



$$M_B = p \cdot 0.35 \rightarrow 7)$$

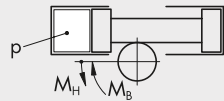
PRESSURE / TORQUE CHART DAPK-2, DAPIK-2, DZAK-2



p = drive pressure
 M_H = moment of holding, i.e. the moment applicable from the outside to the stationary pinion shaft, with no pinion movement.
 M_B = moment of movement, i.e. the moment available for the moving pinion shaft due to the effect of pneumatic drive.

2-POSITION VERSIONS

DAPK left /right end position

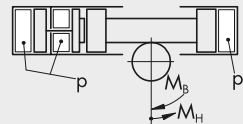


$$M_H = p \cdot 1.01 \rightarrow 1)$$

$$M_B = p \cdot 0.63 \rightarrow 2)$$

3-POSITION VERSIONS (DZAK)

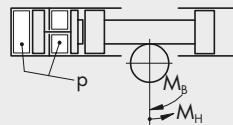
DAPK against DZAK on the outlet



$$M_H = p \cdot 1.12 \rightarrow 3)$$

$$M_B = p \cdot 0.35 \rightarrow 4)$$

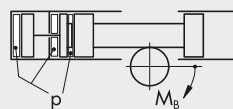
DZAK outlet, DAPK without pressure



$$M_H = p \cdot 1.69 \rightarrow 5)$$

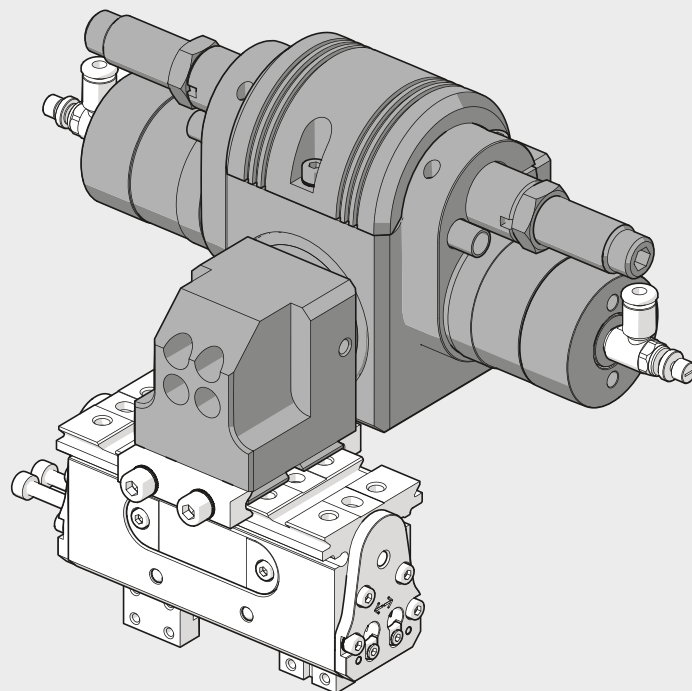
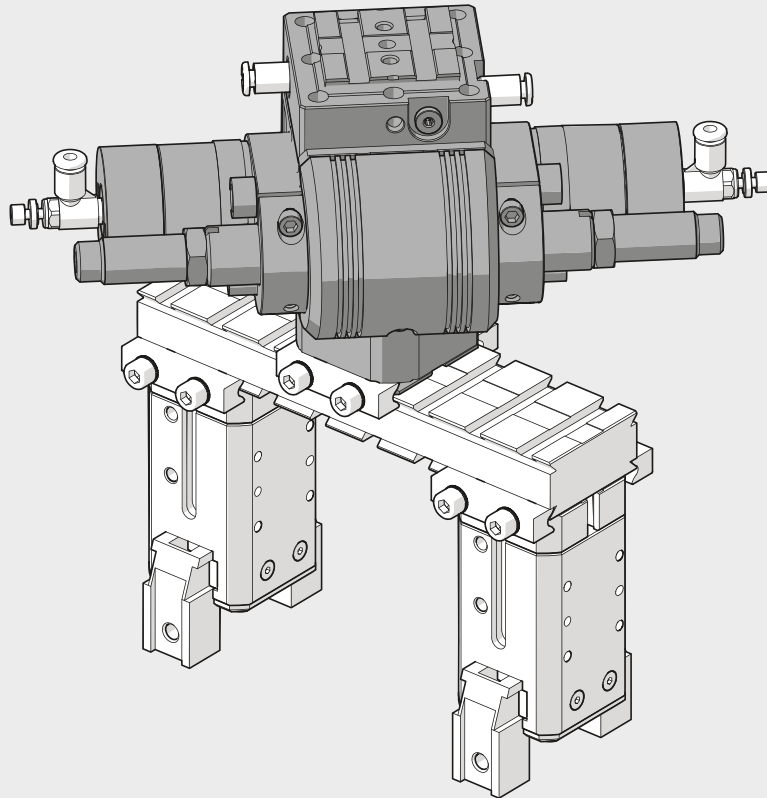
$$M_B = p \cdot 1.10 \rightarrow 6)$$

DAPK + DZAK

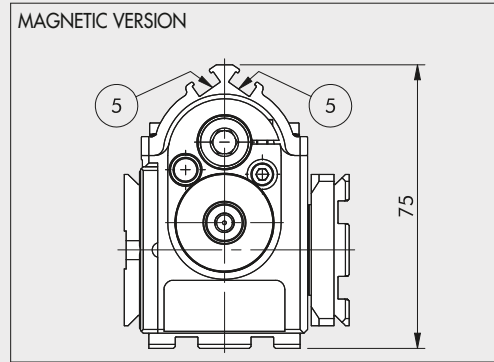
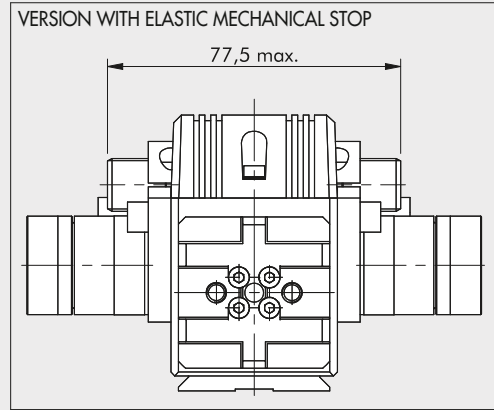
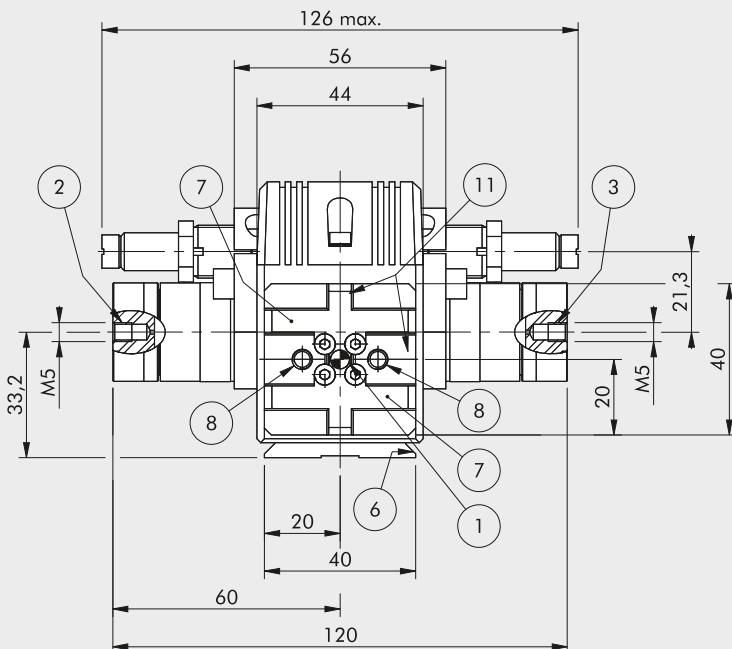
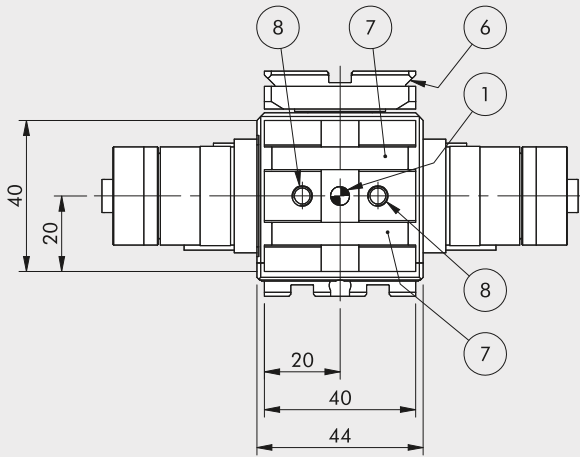
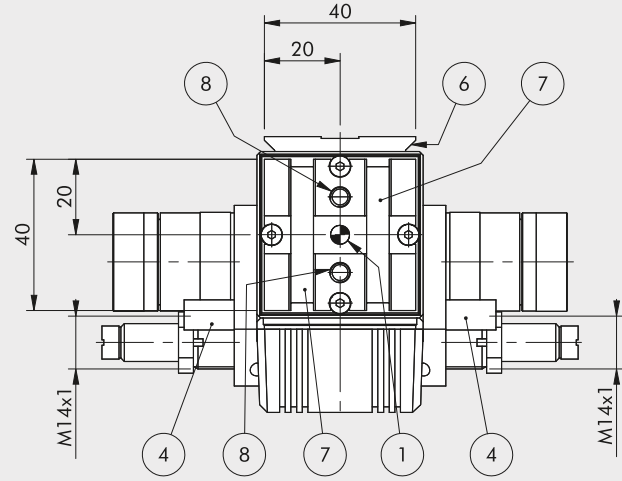


$$M_B = p \cdot 1.26 \rightarrow 7)$$

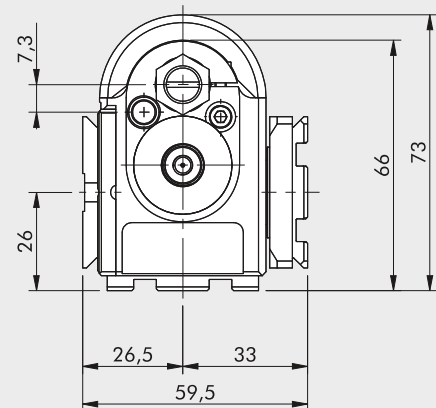
EXAMPLES OF APPLICATION



DIMENSIONS OF THE DAPK-1 ROTARY ACTUATOR

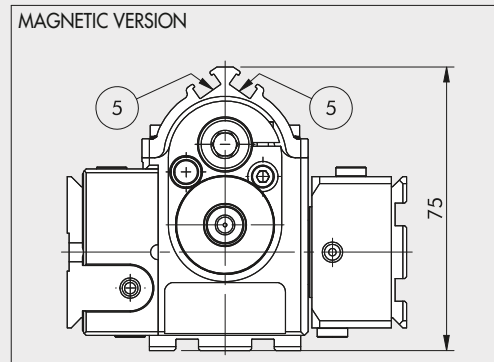
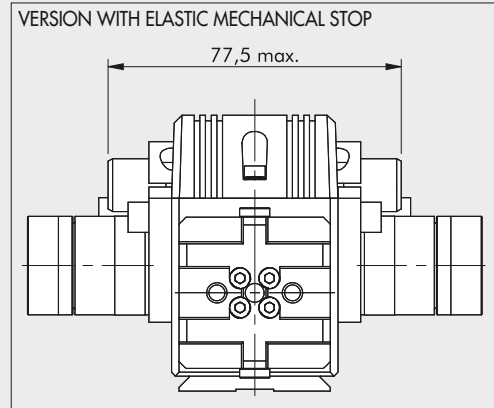
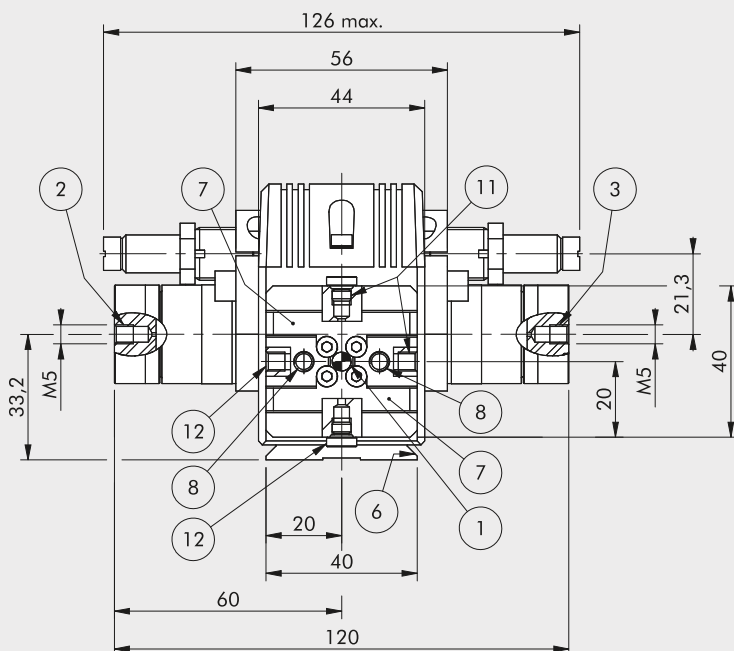
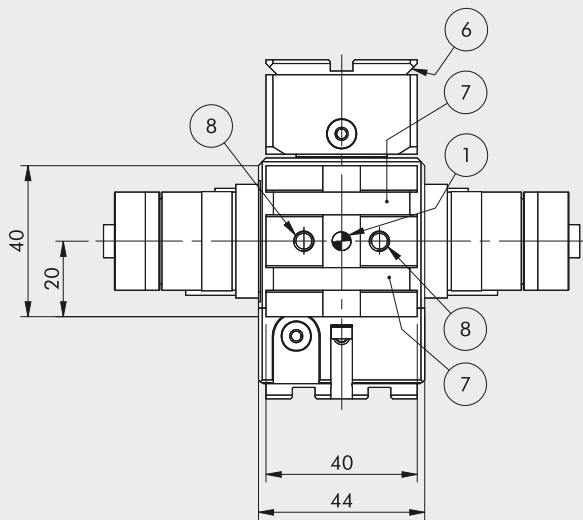
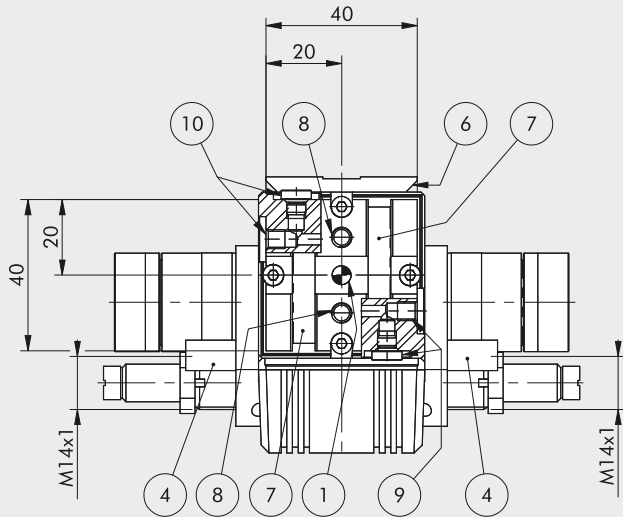


- ① Holes for centring pins
 - ② Right-hand rotation supply
 - ③ Left-hand rotation supply
 - ④ Bushing for inductive sensors
 - ⑤ Magnetic sensor or position sensor fixing slots
 - ⑥ Dovetail for "V-Lock" fixing.
 - ⑦ Slot for "V-Lock" precision key
 - ⑧ Threaded holes for fixing
- For standard dimensions see page 1-257

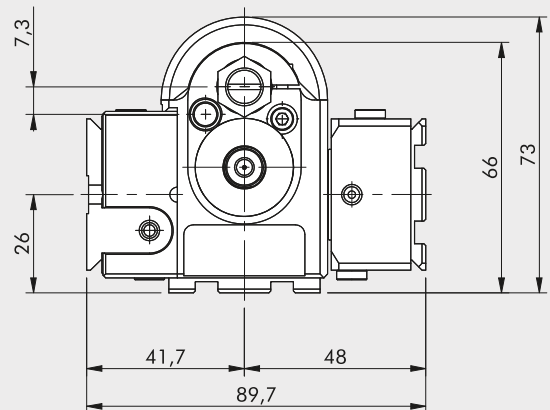


IMPORTANT: 1° of rotation corresponds to a linear movement of $\Delta = 0.126$ mm

DAPIK-1 ROTARY ACTUATOR DIMENSIONS WITH INTERNAL AIR FLOWS

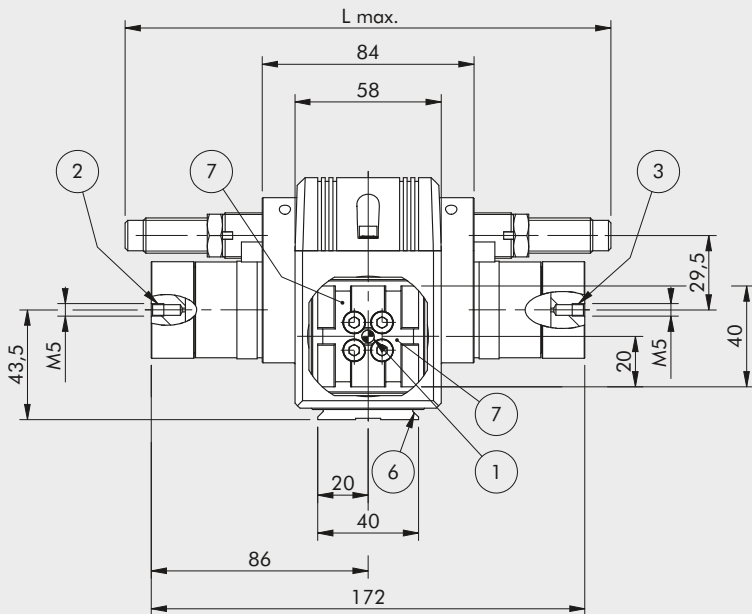
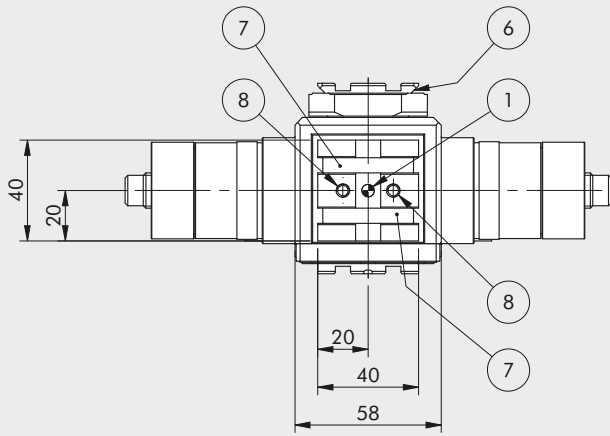
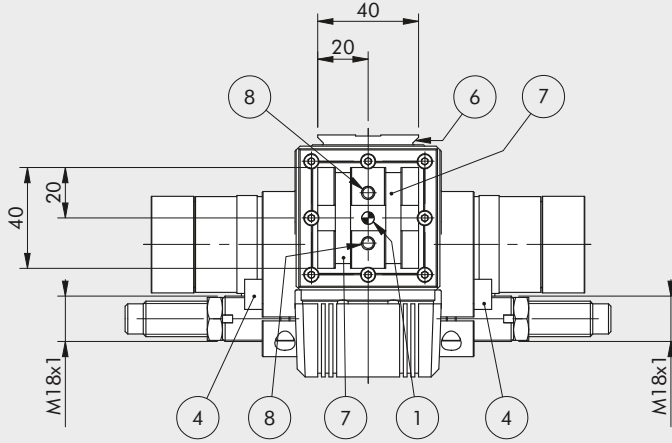


- ① Holes for centring pins
- ② Right-hand rotation supply
- ③ Left-hand rotation supply
- ④ Bushing for inductive sensors
- ⑤ Magnetic sensor or position sensor fixing slots
- ⑥ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑦ Slot for "V-Lock" precision key
- ⑧ Threaded holes for fixing
- ⑨ Air inlets on the right (M5 thread)
- ⑩ Air inlets on the left (M5 thread)
- ⑪ Air outlets on the right (M5 thread)
- ⑫ Air outlets on the left (M5 thread)

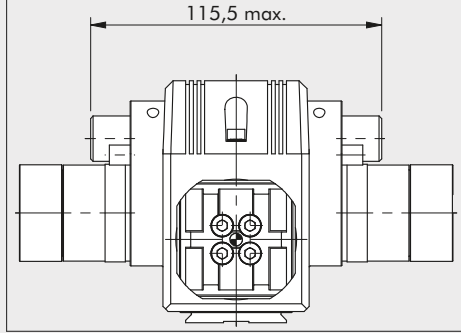


IMPORTANT: 1° of rotation corresponds to a linear movement of $\Delta = 0.126 \text{ mm}$

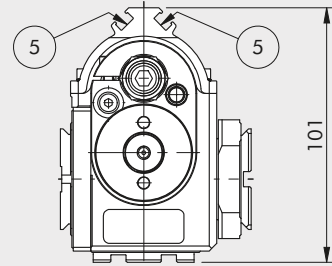
DIMENSIONS OF THE DAPK-2 ROTARY ACTUATOR



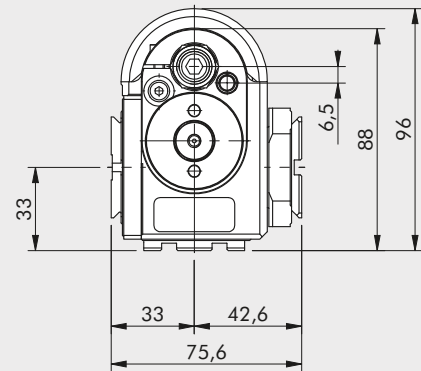
VERSION WITH ELASTIC MECHANICAL STOP



MAGNETIC VERSION



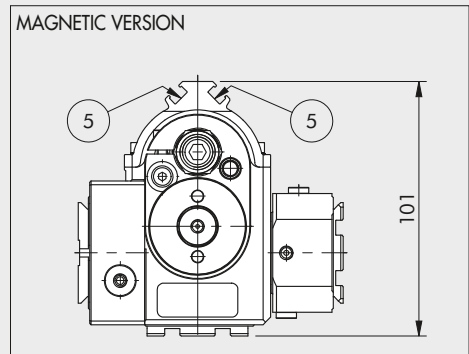
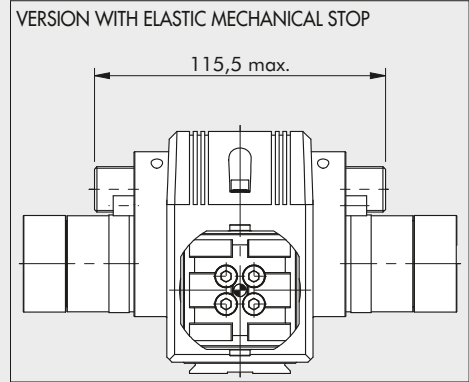
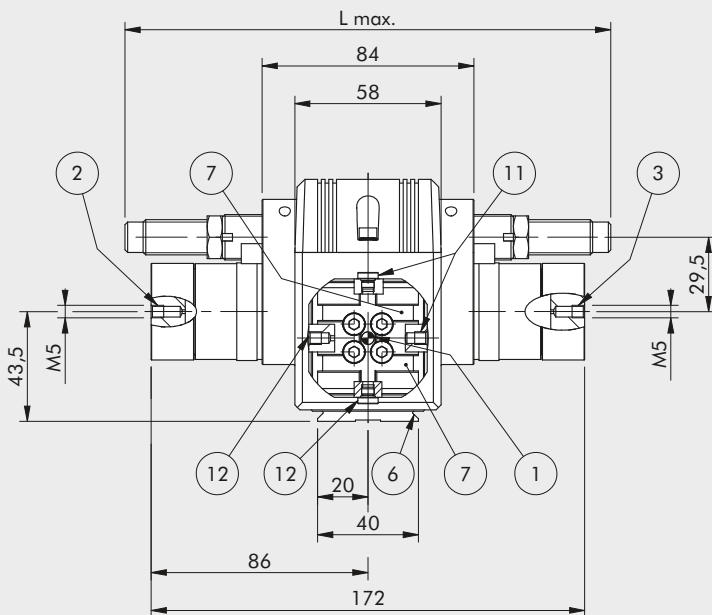
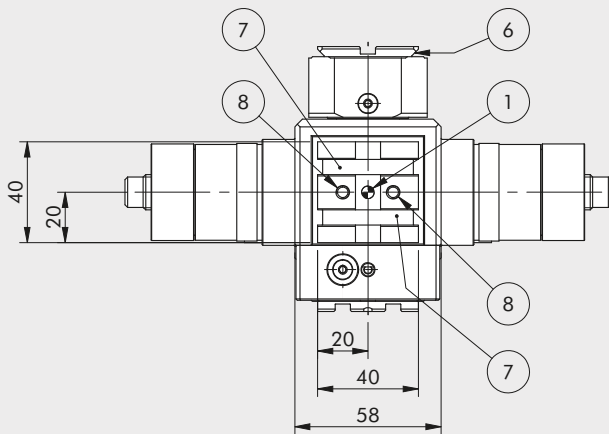
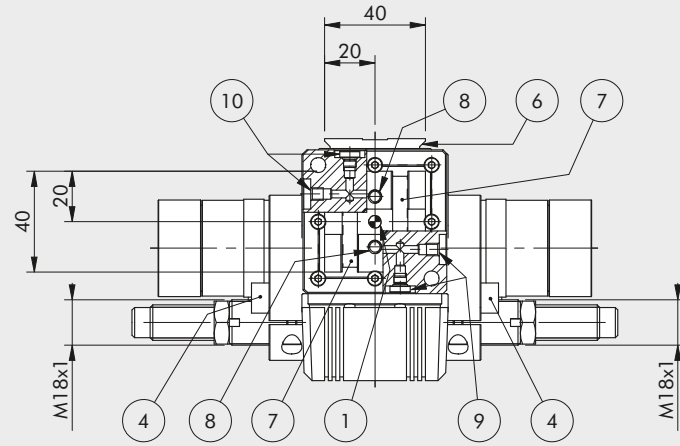
- ① Holes for centring pins
- ② Right-hand rotation supply
- ③ Left-hand rotation supply
- ④ Bushing for inductive sensors
- ⑤ Magnetic sensor or position sensor fixing slots
- ⑥ Dovetail for "V-Lock" fixing.
- For standard dimensions see page 1-257
- ⑦ Slot for "V-Lock" precision key
- ⑧ Threaded holes for fixing



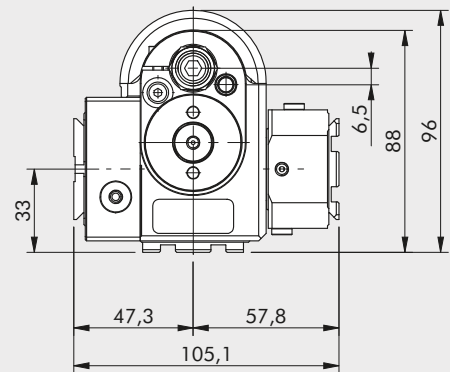
Shock-absorbers	L
Standard (H)	192.7 mm
Medium hardness (H2)	192.7 mm
Hard (M7)	209.5 mm

IMPORTANT: 1° of rotation corresponds to a linear movement of $\Delta = 0.183$ mm

DAPIK-2 ROTARY ACTUATOR DIMENSIONS WITH INTERNAL AIR FLOWS



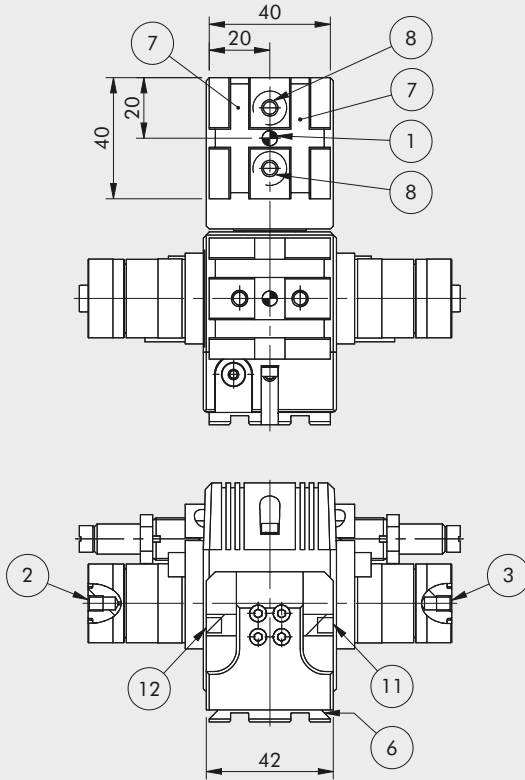
- ① Holes for centring pins
- ② Right-hand rotation supply
- ③ Left-hand rotation supply
- ④ Bushing for inductive sensors
- ⑤ Magnetic sensor or position sensor fixing slots
- ⑥ Dovetail for "V-Lock" fixing.
- For standard dimensions see page 1-257
- ⑦ Slot for "V-Lock" precision key
- ⑧ Threaded holes for fixing
- ⑨ Air inlets on the right (M5 thread)
- ⑩ Air inlets on the left (M5 thread)
- ⑪ Air outlets on the right (M5 thread)
- ⑫ Air outlets on the left (M5 thread)



Shock-absorbers	L
Standard (H)	192.7 mm
Medium hardness (H2)	192.7 mm
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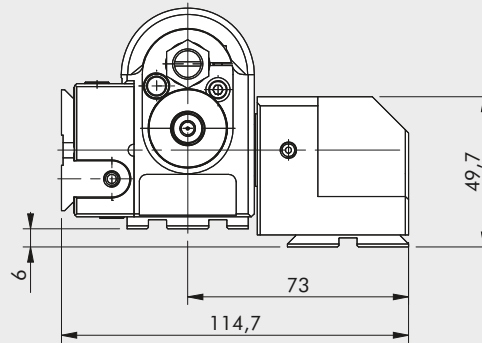
IMPORTANT: 1° of rotation corresponds to a linear movement of $\Delta = 0.183 \text{ mm}$

DIMENSIONS OF DAPIK-1 + WAK-1 ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN

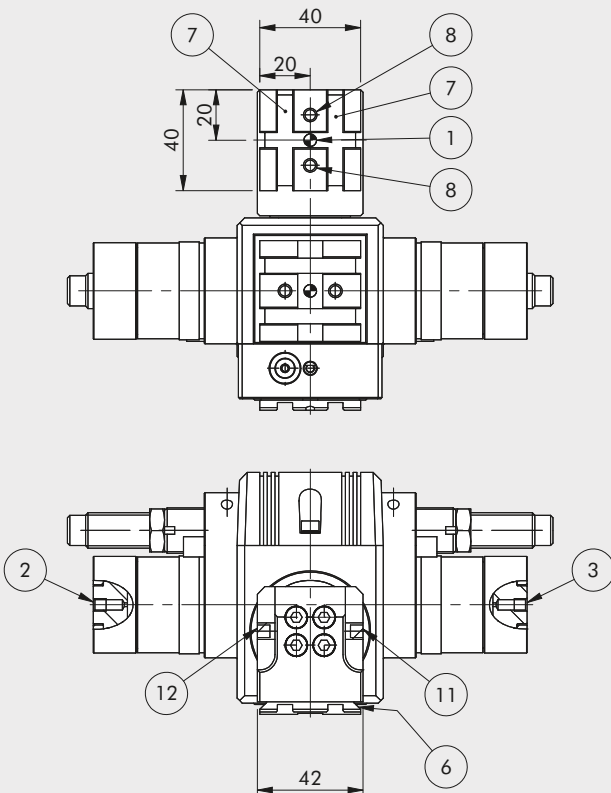


- ① Holes for centring pins
- ② Right-hand rotation supply
- ③ Left-hand rotation supply
- ⑥ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑦ Slot for "V-Lock" precision key
- ⑧ Threaded holes for fixing
- ⑪ Air outlets on the right (M5 thread)
- ⑫ Air outlets on the left (M5 thread)

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 rotary actuator on page 1-375.

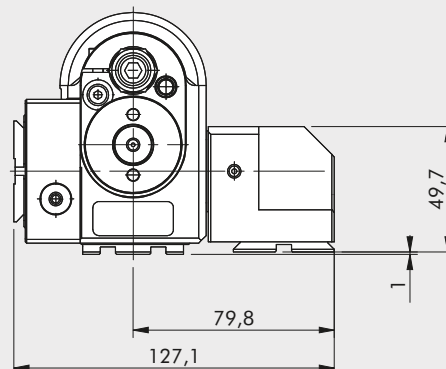


DIMENSIONS OF DAPIK-2 + WAK-2 ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN

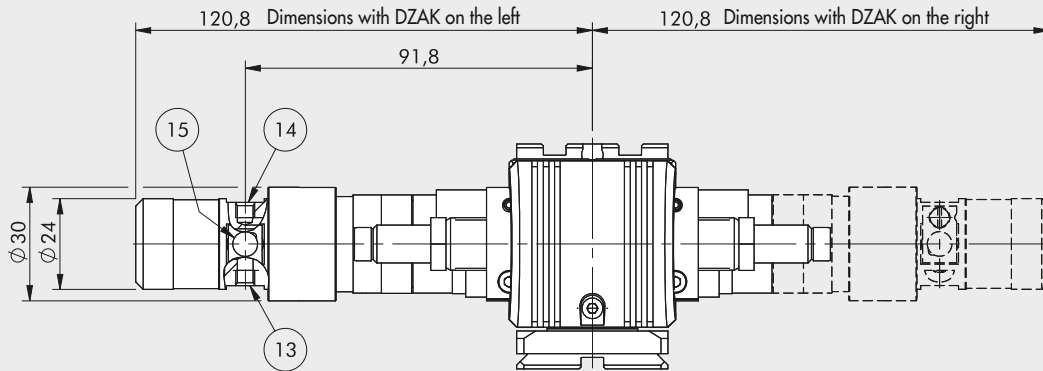


- ① Holes for centring pins
- ② Right-hand rotation supply
- ③ Left-hand rotation supply
- ⑥ Dovetail for "V-Lock" fixing.
For standard dimensions see page 1-257
- ⑦ Slot for "V-Lock" precision key
- ⑧ Threaded holes for fixing
- ⑪ Air outlets on the right (M5 thread)
- ⑫ Air outlets on the left (M5 thread)

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 rotary actuator on page 1-377.



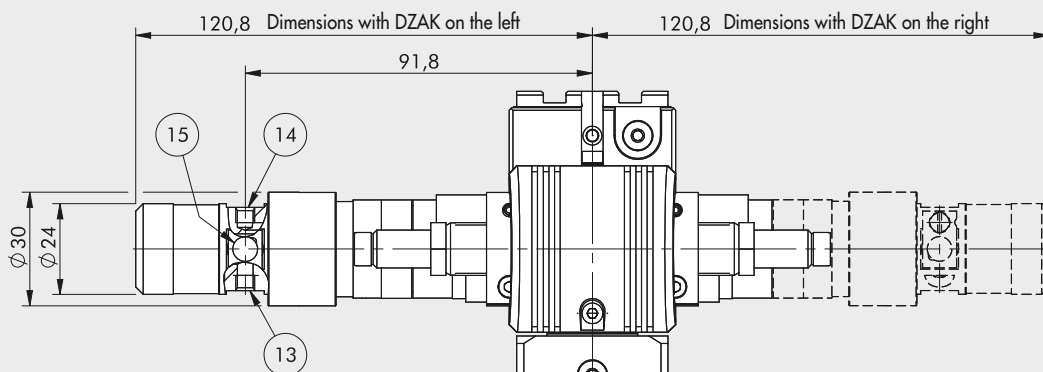
DIMENSIONS OF DAPK-1 + DZAK-1 THREE-POSITION ROTARY ACTUATOR (right or left)



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPK-1 rotary actuator on page 1-374.

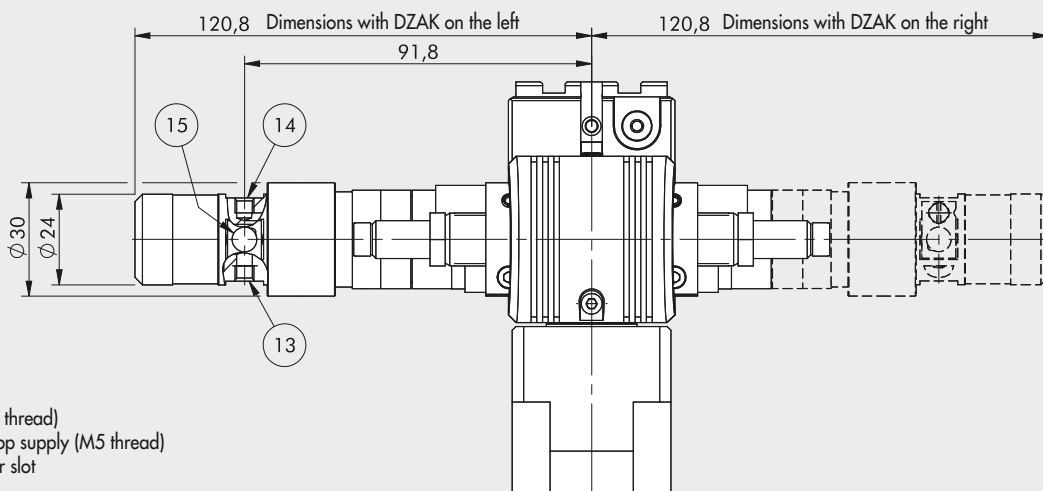
DIMENSIONS OF DAPIK-1 + DZAK-1 THREE-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS (right or left)



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 rotary actuator on page 1-375.

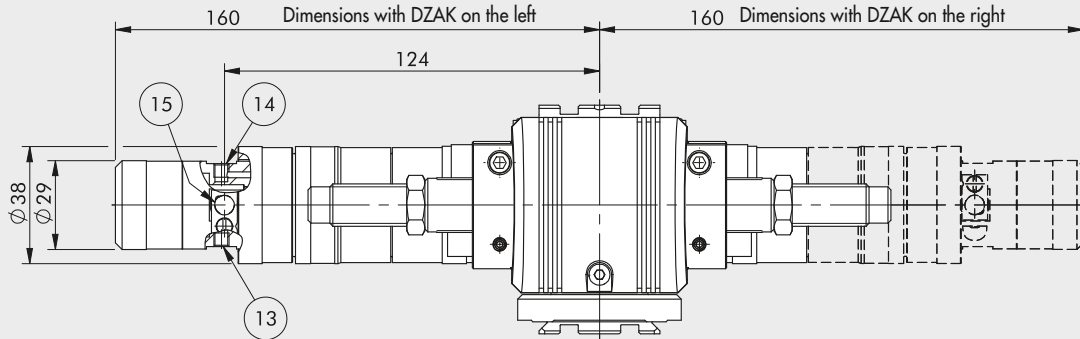
DIMENSIONS OF DAPIK-1 + WAK-1 + DZAK-1 THREE-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN (right or left)



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 + WAK-1 rotary actuator on page 1-374.

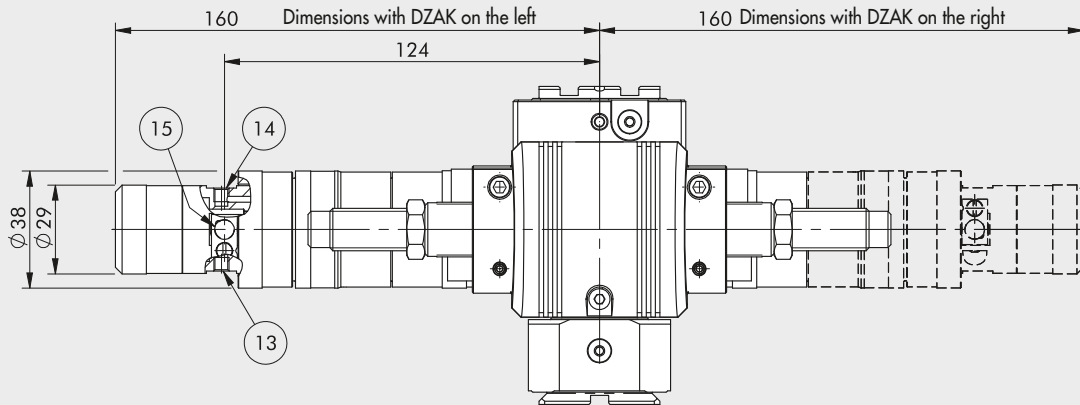
DIMENSIONS OF DAPK-2 + DZAK-2 THREE-POSITION ROTARY ACTUATOR (right or left)



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPK-2 rotary actuator on page 1-376.

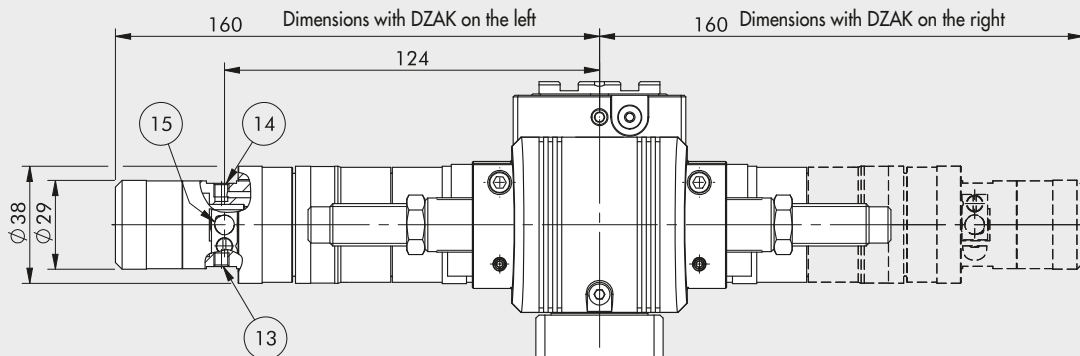
DIMENSIONS OF DAPIK-2 + DZAK-2 THREE-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS (right or left)



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 rotary actuator on page 1-377.

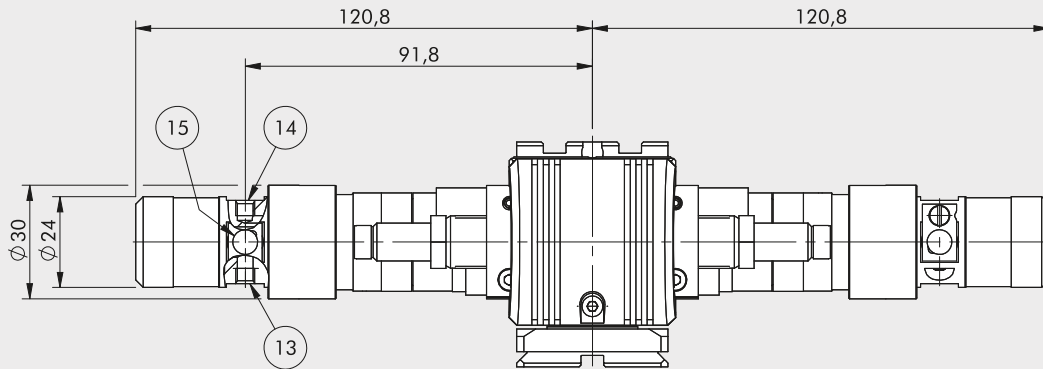
DIMENSIONS OF DAPIK-2 + WAK-2 + DZAK-2 THREE-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN (right or left)



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 + WAK-2 rotary actuator on page 1-378.

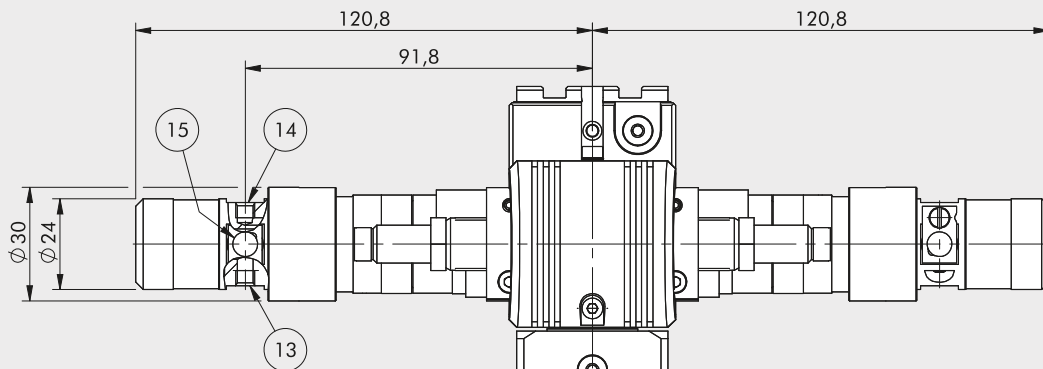
DIMENSIONS OF DAPK-1 + 2 DZAK-1 FOUR-POSITION ROTARY ACTUATOR



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPK-1 rotary actuator on page 1-374.

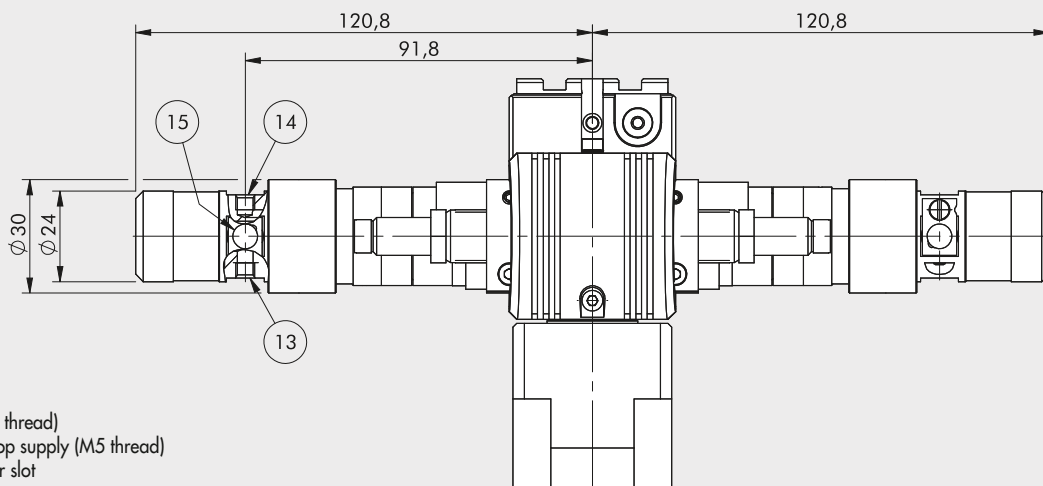
DIMENSIONS OF DAPIK-1 + 2 DZAK-1 FOUR-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 rotary actuator on page 1-375.

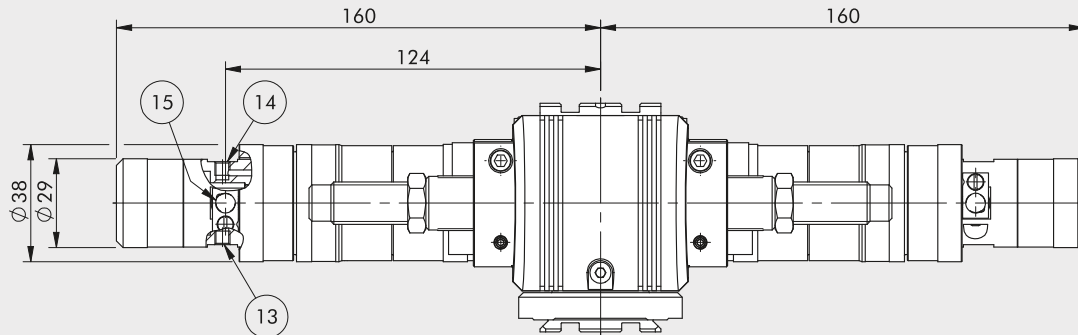
DIMENSIONS OF DAPIK-1 + WAK-1 + 2 DZAK-1 FOUR-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-1 + WAK-1 rotary actuator on page 1-374.

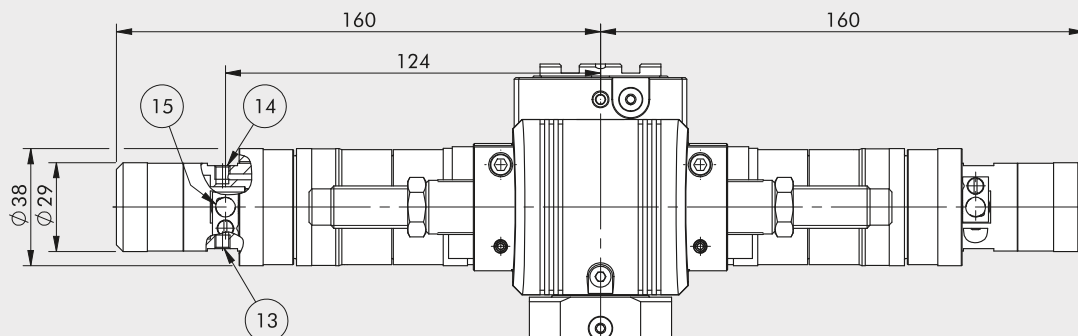
DIMENSIONS OF DAPK-2 + 2 DZAK-2 FOUR-POSITION ROTARY ACTUATOR



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPK-2 rotary actuator on page 1-376.

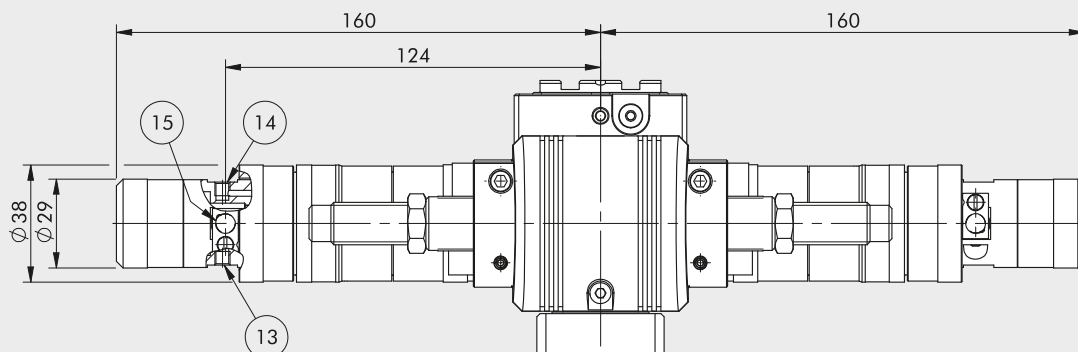
DIMENSIONS OF DAPK-2 + 2 DZAK-2 FOUR-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 rotary actuator on page 1-377.

DIMENSIONS OF DAPIK-2 + WAK-2 + 2 DZAK-2 FOUR-POSITION ROTARY ACTUATOR WITH INTERNAL AIR FLOWS AND 90° RETURN



- ⑬ Air supply (M5 thread)
- ⑭ Intermediate stop supply (M5 thread)
- ⑮ Inductive sensor slot

IMPORTANT: for any missing dimensions, please refer to the DAPIK-2 + WAK-2 rotary actuator on page 1-378.

KEY TO CODES

K20	1	02	0	3	0	00	K
	SIZE	POSITION		END POSITION			FAMILY
Rotary actuator series DAPK / DAPIK	1 Size 1 2 Size 2	02 2 position (DAPK) ▲ S3 3 position (DAPK + DZAK) ■ D3 3 position (DAPK + DZAK) 04 4 position (DAPK + n.2 DZAK)	0 without internal air flow 1 with internal in-line air flow (DAPIK) 2 with 90° in-line air flow (DAPIK + WAK)	3 with elastic mechanical stop 5 with standard shock absorbers (STD) On request ● 6 with medium hardness shock-absorbers (H2) ● 7 with hard shock-absorbers (M7)	0 magnetic S Non-magnetic		K V-Lock

▲ On the left viewed from the rotating plate.

■ On the right viewed from the rotating plate.

● Only for size 2.

ORDERING CODES

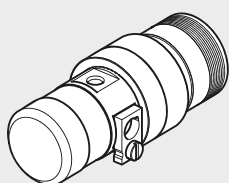
Code	Description	Code	Description
DAPK-1		DAPK-2	
K2010203000K	DAPK-1 magnetic with elastic mechanical stop	K2020203000K	DAPK-2 magnetic with elastic mechanical stop
K2010203500K	DAPK-1 NON-magnetic with elastic mechanical stop	K2020203500K	DAPK-2 NON-magnetic with elastic mechanical stop
K2010205000K	DAPK-1 magnetic with shock absorbers	K2020205000K	DAPK-2 magnetic with STD shock absorbers
K2010205500K	DAPK-1 NON-magnetic with shock absorbers	K2020205500K	DAPK-2 NON-magnetic with STD shock absorbers
K2010213000K	DAPIK-1 magnetic with elastic mechanical stop	K2020213000K	DAPIK-2 magnetic with elastic mechanical stop
K2010213500K	DAPIK-1 NON-magnetic with elastic mechanical stop	K2020213500K	DAPIK-2 NON-magnetic with elastic mechanical stop
K2010215000K	DAPIK-1 magnetic with shock absorbers	K2020215000K	DAPIK-2 magnetic with STD shock absorbers
K2010215500K	DAPIK-1 NON-magnetic with shock absorbers	K2020215500K	DAPIK-2 NON-magnetic with STD shock absorbers
K2015303000K	DAPK-1 + DZAK-1 (SX) magnetic with elastic mechanical stop	K2025303000K	DAPK-2 + DZAK-2 (SX) magnetic with elastic mechanical stop
K2015303500K	DAPK-1 + DZAK-1 (SX) NON-magnetic with elastic mechanical stop	K2025303500K	DAPK-2 + DZAK-2 (SX) NON-magnetic with elastic mechanical stop
K2015305000K	DAPK-1 + DZAK-1 (SX) magnetic with shock absorbers	K2025305000K	DAPK-2 + DZAK-2 (SX) magnetic with STD shock absorbers
K2015305500K	DAPK-1 + DZAK-1 (SX) NON-magnetic with shock absorbers	K2025305500K	DAPK-2 + DZAK-2 (SX) NON-magnetic with STD shock absorbers
K201D303000K	DAPK-1 + DZAK-1 (DX) magnetic with elastic mechanical stop	K202D303000K	DAPK-2 + DZAK-2 (DX) magnetic with elastic mechanical stop
K201D303500K	DAPK-1 + DZAK-1 (DX) NON-magnetic with elastic mechanical stop	K202D303500K	DAPK-2 + DZAK-2 (DX) NON-magnetic with elastic mechanical stop
K201D305000K	DAPK-1 + DZAK-1 (DX) magnetic with shock absorbers	K202D305000K	DAPK-2 + DZAK-2 (DX) magnetic with STD shock absorbers
K201D305500K	DAPK-1 + DZAK-1 (DX) NON-magnetic with shock absorbers	K202D305500K	DAPK-2 + DZAK-2 (DX) NON-magnetic with STD shock absorbers
K2010403000K	DAPK-1 + n°2 DZAK-1 magnetic with elastic mechanical stop	K2020403000K	DAPK-2 + n°2 DZAK-2 magnetic with elastic mechanical stop
K2010403500K	DAPK-1 + n°2 DZAK-1 NON-magnetic with elastic mechanical stop	K2020403500K	DAPK-2 + n°2 DZAK-2 NON-magnetic with elastic mechanical stop
K2010405000K	DAPK-1 + n°2 DZAK-1 magnetic with shock absorbers	K2020405000K	DAPK-2 + n°2 DZAK-2 magnetic with STD shock absorbers
K2010405500K	DAPK-1 + n°2 DZAK-1 NON-magnetic with shock absorbers	K2020405500K	DAPK-2 + n°2 DZAK-2 NON-magnetic with STD shock absorbers
K2015313000K	DAPIK-1 + DZAK-1 (SX) magnetic with elastic mechanical stop	K2025313000K	DAPIK-2 + DZAK-2 (SX) magnetic with elastic mechanical stop
K2015313500K	DAPIK-1 + DZAK-1 (SX) NON-magnetic with elastic mechanical stop	K2025313500K	DAPIK-2 + DZAK-2 (SX) NON-magnetic with elastic mechanical stop
K2015315000K	DAPIK-1 + DZAK-1 (SX) magnetic with shock absorbers	K2025315000K	DAPIK-2 + DZAK-2 (SX) magnetic with STD shock absorbers
K2015315500K	DAPIK-1 + DZAK-1 (SX) NON-magnetic with shock absorbers	K2025315500K	DAPIK-2 + DZAK-2 (SX) NON-magnetic with STD shock absorbers
K201D313000K	DAPIK-1 + DZAK-1 (DX) magnetic with elastic mechanical stop	K202D313000K	DAPIK-2 + DZAK-2 (DX) magnetic with elastic mechanical stop
K201D313500K	DAPIK-1 + DZAK-1 (DX) NON-magnetic with elastic mechanical stop	K202D313500K	DAPIK-2 + DZAK-2 (DX) NON-magnetic with elastic mechanical stop
K201D315000K	DAPIK-1 + DZAK-1 (DX) magnetic with shock absorbers	K202D315000K	DAPIK-2 + DZAK-2 (DX) magnetic with STD shock absorbers
K201D315500K	DAPIK-1 + DZAK-1 (DX) NON-magnetic with shock absorbers	K202D315500K	DAPIK-2 + DZAK-2 (DX) NON-magnetic with STD shock absorbers
K2010413000K	DAPIK-1 + n°2 DZAK-1 magnetic with elastic mechanical stop	K2020413000K	DAPIK-2 + N°2 DZAK-2 magnetic with elastic mechanical stop
K2010413500K	DAPIK-1 + n°2 DZAK-1 NON-magnetic with elastic mechanical stop	K2020413500K	DAPIK-2 + N°2 DZAK-2 NON-magnetic with elastic mechanical stop
K2010415000K	DAPIK-1 + n°2 DZAK-1 magnetic with shock absorbers	K2020415000K	DAPIK-2 + N°2 DZAK-2 magnetic with STD shock absorbers
K2010415500K	DAPIK-1 + n°2 DZAK-1 NON-magnetic with shock absorbers	K2020415500K	DAPIK-2 + N°2 DZAK-2 NON-magnetic with STD shock absorbers
K2010223000K	DAPIK-1 + WAK-1 magnetic with elastic mechanical stop	K2020223000K	DAPIK-2 + WAK-2 magnetic with elastic mechanical stop
K2010223500K	DAPIK-1 + WAK-1 NON-magnetic with elastic mechanical stop	K2020223500K	DAPIK-2 + WAK-2 NON-magnetic with elastic mechanical stop
K2010225000K	DAPIK-1 + WAK-1 magnetic with shock absorbers	K2020225000K	DAPIK-2 + WAK-2 magnetic with STD shock absorbers
K2010225500K	DAPIK-1 + WAK-1 NON-magnetic with shock absorbers	K2020225500K	DAPIK-2 + WAK-2 NON-magnetic with STD shock absorbers
K2015323000K	DAPIK-1 + WAK-1 + DZAK-1 (SX) magnetic with elastic mechanical stop	K2025323000K	DAPIK-2 + WAK-2 + DZAK-2 (SX) magnetic with elastic mechanical stop
K2015323500K	DAPIK-1 + WAK-1 + DZAK-1 (SX) NON-magnetic with elastic mechanical stop	K2025323500K	DAPIK-2 + WAK-2 + DZAK-2 (SX) NON-magnetic with elastic mechanical stop
K2015325000K	DAPIK-1 + WAK-1 + DZAK-1 (SX) magnetic with shock absorbers	K2025325000K	DAPIK-2 + WAK-2 + DZAK-2 (SX) magnetic with STD shock absorbers
K2015325500K	DAPIK-1 + WAK-1 + DZAK-1 (SX) NON-magnetic with shock absorbers	K2025325500K	DAPIK-2 + WAK-2 + DZAK-2 (SX) NON-magnetic with STD shock absorbers
K201D323000K	DAPIK-1 + WAK-1 + DZAK-1 (DX) magnetic with elastic mechanical stop	K202D323000K	DAPIK-2 + WAK-2 + DZAK-2 (DX) magnetic with elastic mechanical stop
K201D323500K	DAPIK-1 + WAK-1 + DZAK-1 (DX) NON-magnetic with elastic mechanical stop	K202D323500K	DAPIK-2 + WAK-2 + DZAK-2 (DX) NON-magnetic with elastic mechanical stop
K201D325000K	DAPIK-1 + WAK-1 + DZAK-1 (DX) magnetic with shock absorbers	K202D325000K	DAPIK-2 + WAK-2 + DZAK-2 (DX) magnetic with STD shock absorbers
K201D325500K	DAPIK-1 + WAK-1 + DZAK-1 (DX) NON-magnetic with shock absorbers	K202D325500K	DAPIK-2 + WAK-2 + DZAK-2 (DX) NON-magnetic with STD shock absorbers
K2010423000K	DAPIK-1 + WAK-1 + n°2 DZAK-1 magnetic with elastic mechanical stop	K2020423000K	DAPIK-2 + WAK-2 + n°2 DZAK-2 magnetic with elastic mechanical stop
K2010423500K	DAPIK-1 + WAK-1 + n°2 DZAK-1 NON-magnetic with elastic mechanical stop	K2020423500K	DAPIK-2 + WAK-2 + n°2 DZAK-2 NON-magnetic with elastic mechanical stop
K2010425000K	DAPIK-1 + WAK-1 + n°2 DZAK-1 magnetic with shock absorbers	K2020425000K	DAPIK-2 + WAK-2 + n°2 DZAK-2 magnetic with STD shock absorbers
K2010425500K	DAPIK-1 + WAK-1 + n°2 DZAK-1 NON-magnetic with shock absorbers	K2020425500K	DAPIK-2 + WAK-2 + n°2 DZAK-2 NON-magnetic with STD shock absorbers

ACCESSORIES

V-Lock ACCESSORIES

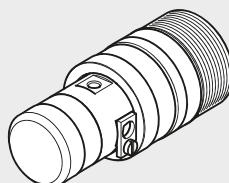
See page 1-268.

DZAK-1 INTERMEDIATE STOP



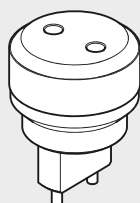
Code	Description	Weight [g]
095K2000100K	DZAK-1 intermediate stop	105

DZAK-2 INTERMEDIATE STOP



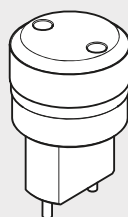
Code	Description	Weight [g]
095K2000110K	DZAK-2 intermediate stop	214

DZAK-1 ADJUSTING WRENCH



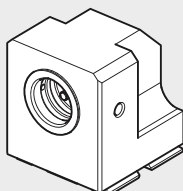
Code	Description	Weight [g]
095K2000250K	DZAK-1 adjusting wrench	25

DZAK-2 ADJUSTING WRENCH



Code	Description	Weight [g]
095K2000260K	DZAK-2 adjusting wrench	30

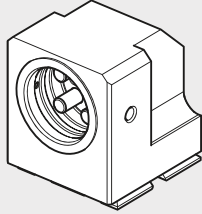
WAK-1



Code	Description	Weight [g]
095K2000150K	WAK-1 angle adaptor	190

Note: Individually packed with 4 screws, 4 washers

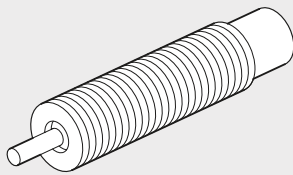
WAK-2



Code	Description	Weight [g]
095K2000160K	WAK-2 angle adaptor	175

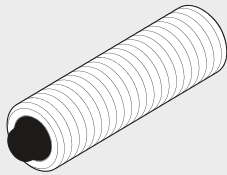
Note: Individually packed with 4 screws, 4 washers

SHOCK ABSORBERS



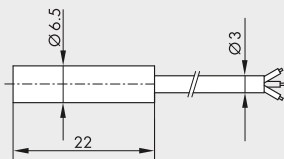
Code	Description	For
W0950005301	Shock absorbers - 2 M10 x 1	DAPK-1/DAPIK-1
0950004012	Shock absorbers standard MC150EUMH M14 x 1.5	DAPK-2/DAPIK-2
0950004013	Medium hardness shock absorber MC150EUMH2 M14 x 1.5	DAPK-2/DAPIK-2
0950004014	Hard shock absorber SC190EUM7 M14 x 1.5	DAPK-2/DAPIK-2

ELASTIC MECHANICAL STOP



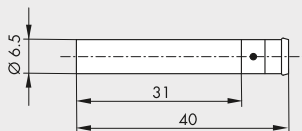
Code	Description	For
095K2000200K	Elastic mechanical stop M10 x 1	DAPK-1/DAPIK-1
095K2000210K	Elastic mechanical stop M14 x 1.5	DAPK-2/DAPIK-2

INDUCTION SENSOR Ø 6.5



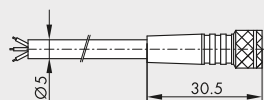
Code	Description
W095K030006	PNP Ø 6.5 PNP inductive sensor with LED 2 m
W095K031006	NPN Ø 6.5 NPN inductive sensor with LED 2 m

QUICK-FIT INDUCTIVE SENSOR Ø 6.5



Code	Description
W095K030009	PNP Ø 6.5 inductive sensor with push-in LED

CABLE WITH STRAIGHT CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)

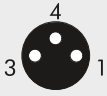
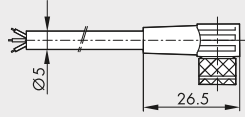


Code	Description
W095K000005	Push-in cable female straight connector 5 m
W095K000010	Push-in cable female straight connector 10 m



Pin	Cable color
1	Brown
3	Blue
4	Black

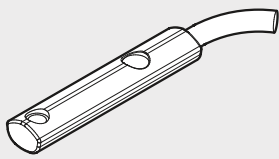
CABLE WITH 90° CONNECTOR FOR Ø 6.5 PUSH-IN INDUCTIVE SENSOR (MOBILE INSTALLATION)



Pin	Cable color
1	Brown
3	Blue
4	Black

Code	Description
W095K010005	Push-in cable female elbow connector 5 m
W095K010010	Push-in cable female elbow connector 10 m

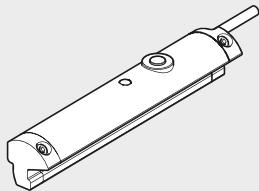
RETRACTING SENSOR WITH INSERTION FROM ABOVE



Code	Description
W0952025390	HALL N.O. sensor, vertical insertion 2.5 m
W0952225390	HALL N.O. sensor, vertical insertion 2.5 m robotics
W0952029394	HALL N.O. sensor, vertical insertion 300 mm M8 robotics
W0952022180	REED N.O. sensor, vertical insertion 2.5 m
W0952222180	REED N.O. sensor, vertical insertion 2.5 m robotics
W0952028184	REED N.O. sensor, vertical insertion 300 mm M8 robotics
W0952125556	HALL N.O. sensor, vertical insertion 2 m ATEX
W0952025500*	HALL N.O. sensor, vertical insertion HS 2.5 m
W0952029504*	HALL N.O. sensor, vertical insertion HS 300 mm M8
W0952022500*	REED N.O. sensor, vertical insertion HS 2.5 m
W0952128184*	REED N.O. sensor, vertical insertion HS 300 mm M8

* For use when standard sensors do not detect the magnet, e.g. near metal masses.
For technical data see page 1-583

POSITION SENSOR



Code	Description	For
W0950000470	LTS-032 position sensor with M8 4-PIN 0.3 m connector	DAPK-1/ DAPIK-1
W0950000471	LTS-064 position sensor with M8 4-PIN 0.3 m connector	DAPK-2/DAPIK-2

For technical data see page 1-583

OIL



Code	Description	Volume
9910490	PARALIQ P 460	80 ml

NOTES