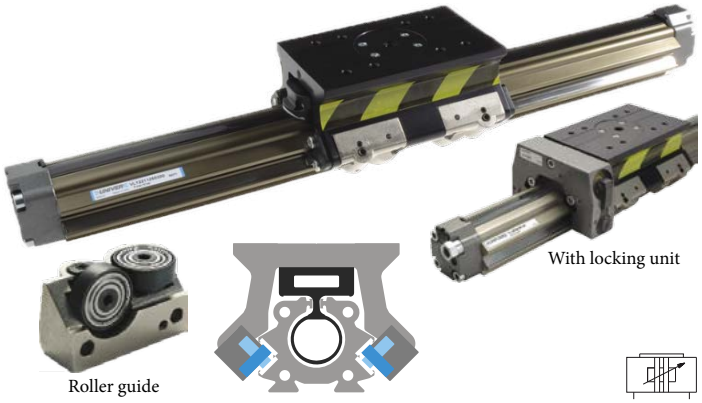
RODLESS PNEUMATIC CYLINDERS WITH ROLLER GUIDE SERIES VL1

STRÁNSKÝ A PETRŽÍK



The rodless cylinders of the VL1 series are particularly useful where there is no space for a standard cylinder. The piston rod does not extend from the cylinder. Thanks to their maximum stroke of up to 6 meters, they can also be used in applications where the use of a conventional cylinder would be impossible. This series uses the proven two-strip principle. The VL1 series includes roller guides on steel guide rails. The carriage can be equipped with a locking unit as an accessory.

Working pressure	0,6 MPa
Min. pressure	0,3 MPa
Max. pressure	1,0 MPa
Temp. range	-20°C to +80°C
Working medium	modified compressed air
Carriage speed	min. 20 mm.s^{-1} max. 2 m.s^{-1}

Piston diameter [mm]	25	40	50
Force at 0,6 MPa [N]	250	640	1050
Connection	G1/8“	G3/8“	G3/8“
Length of adjustable cushioning [mm]	25	41,5	52
Max. stroke [mm]	6000	6000	6000
Stroke tolerance [mm]	+2,5	+3,2	+3,2

Piston diameter [mm]		25	40	50
Weight	Carriage			
base - 0 mm of stroke [kg]	medium	2,10	6,34	10,85
	long	2,86	8,96	15,37
100 mm of stroke [kg]		0,300	0,670	1,020

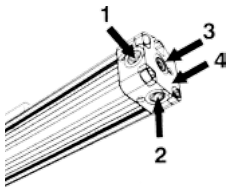
Order codes

A VL1 22 1 1 25 0500

Carriage	
22	medium (ø25, 40)
23	medium (ø50)
33	long (ø25, 40)
34	long (ø50)

Left end-cap supply port	
1	side
2	bottom
3	rear
0	no supply port (both chambers supplied from right end cap)

Right end-cap supply port	
1	side
2	bottom
3	rear
4	rear for both chambers on the right end cap



Piston diameter	
25	25 mm
40	40 mm
50	50 mm

Stroke	
xxxx	mm of stroke e.g.: 0500 = stroke 500 mm

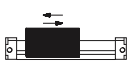
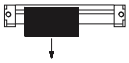
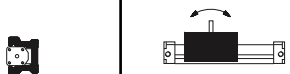
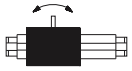
Construction / materials

- caps: ø16: zamak ø25-50: die-cast aluminium
- tube: anodized aluminium
- piston: aluminium
- piston guide slide: acetalic resin
- guide: ball bearings, steel guide rails
- sealings: NBR

For long-term and trouble-free operation, we recommend:
1) speed maximum 1 m.s^{-1}
2) use a hydraulic shock absorber if the efficiency of the internal cushioning approaches the limit value
3) if the cylinder is used vertically, the cushioning capacity is reduced by 40%
4) maintain a correct and constant lubrication

The pneumatic sealing is achieved through an axial elastomer stripseal reinforced with Kevlar. This system guarantees dimensional stability even with high speeds. The external protection seal consists of a thermoplastic stripseal reinforced with Kevlar.

Permissible static load and stress

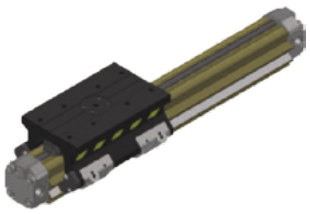
Cylinder force F	Static load			Static moment		
	P1	P2	P3	M1	M2	M3
						

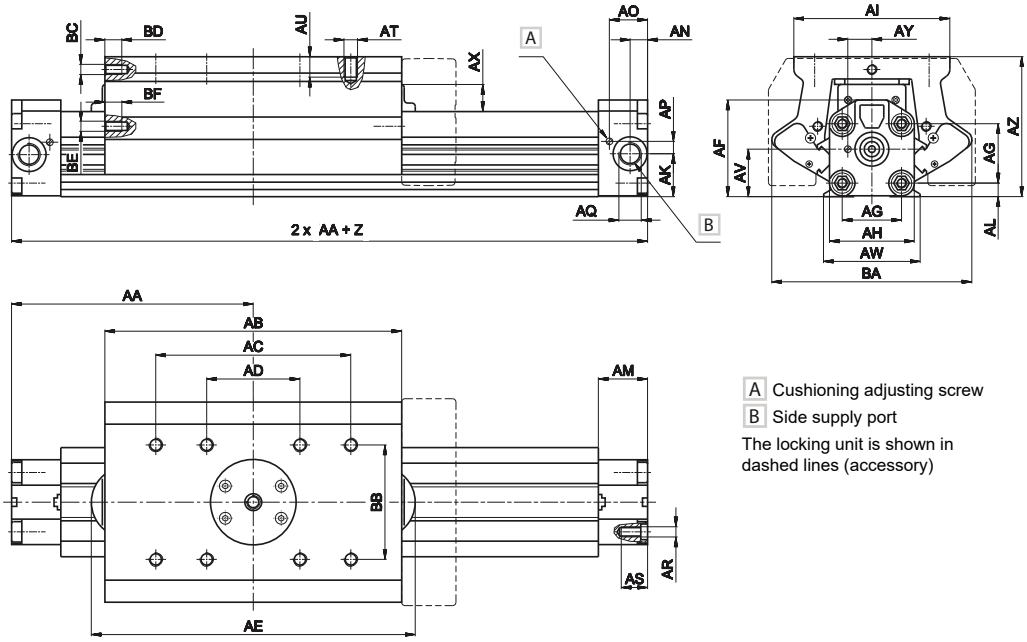
∅	F [N] at 0,6 MPa	Medium carriage						Long carriage					
		P1 [N]	P2 [N]	P3 [N]	M1 [Nm]	M2 [Nm]	M3 [Nm]	P1 [N]	P2 [N]	P3 [N]	M1 [Nm]	M2 [Nm]	M3 [Nm]
25	250	700	700	700	34	17	34	1000	1000	1000	63	25	63
40	640	1100	1100	1100	120	46	120	1600	1600	1600	230	69	230
50	1050	1500	1500	1500	170	85	170	2000	2000	2000	310	110	310

A moment is the product of the load (N) and the arm (m), i.e the distance between the centre of gravity of the load and the longitudinal axis of the piston. Please note that in dynamic conditions, the load must be reduced due to effects associated with the speed. Calculation of permissible dynamic stress and verification of internal damping efficiency can be found on page 1-49.

Dimensions

Medium carriage - 8 fixing holes





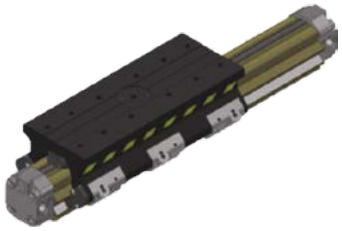
A Cushioning adjusting screw
B Side supply port
The locking unit is shown in dashed lines (accessory)

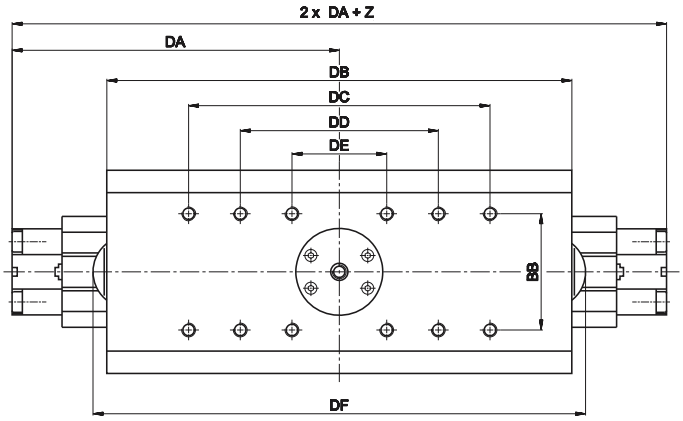
Z = stroke

∅	AA	AB	AC	AD	AE	AF	AG	AH	AI	AK	AL	AM	AN	AO	AP	AQ	AR
25	114,5	136	90	50	160	48,3	28	40,5	83,5	20,2	7	24	7,4	18,2	5,7	G1/8“	M5
40	169	205	180	75	215	74	44	64	125	33,8	11,8	33	12,5	26,5	8,7	G3/8“	M8
50	207	258	190	80	271	90,7	55	80	140	41,4	14,7	33	14,2	25,7	11,8	G3/8“	M10

∅	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF
25	12	M6	12	22,8	42,8	16	12,2	74,3	111	50	M6	10	10	M6
40	20	M8	14	37	67	19,5	16,5	106	158	65	M6	15	15	M6
50	20	M8	15	47,7	86	20,5	19,1	126,2	173	100	-	-	12	M6

Long carriage - 12 fixing holes

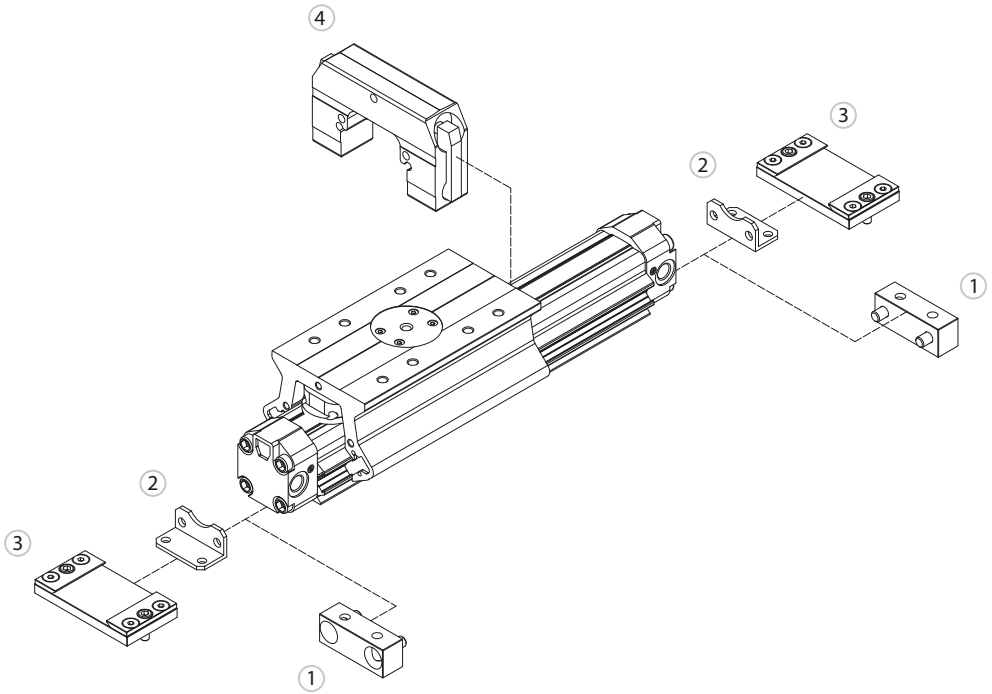




Z = stroke

∅	BB	DA	DB	DC	DD	DE	DF
25	50	147,5	201	130	90	50	225
40	65	225	317	280	185	75	327
50	100	277	398	320	200	80	411

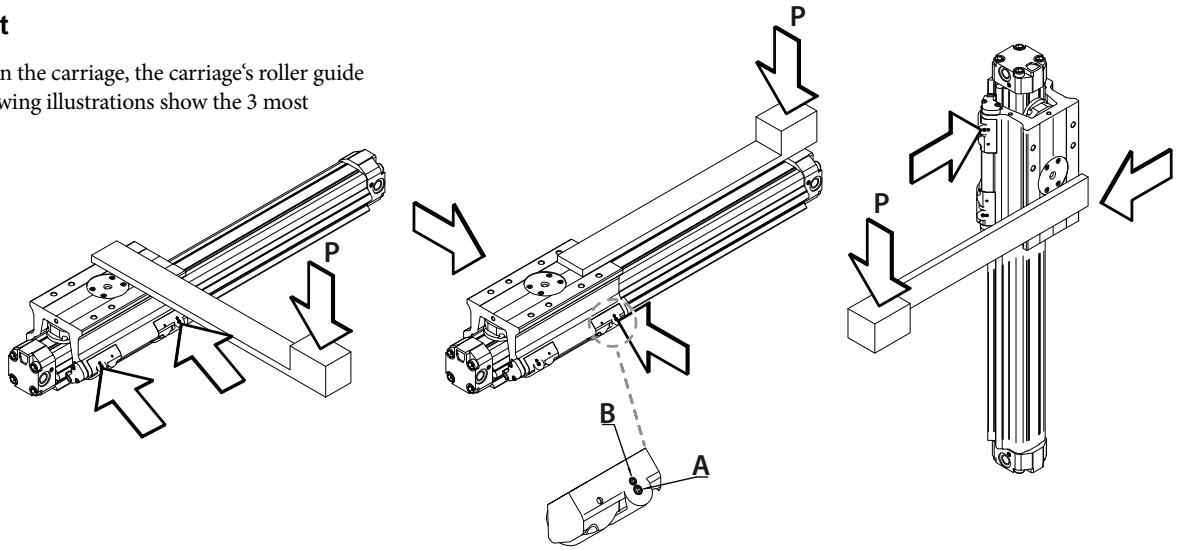
Mounting accessories



Mounting accessories		... see page
1	Bracket for ø40, 50	... 4-33
2	Bracket for ø25	... 4-33
3	Fixing plate	... 4-31
4	Locking unit	

Carriage adjustment

If the load is not centered on the carriage, the carriage's roller guide must be adjusted. The following illustrations show the 3 most common off-center loading patterns and each illustration shows which screws need to be adjusted. The arrows indicate the screws to be adjusted, based on the position of the load (P). Turn the screw (A) according to the load. Put a drop of Loctite 242 onto the screw (B) and tighten it all the way down. Finally loosen both screws by 90°.



Examination and verification of internal cushioning

In a system with moving masses, as in the case of rodless cylinders, it is essential to control the dissipation of the system's kinetc energy as it is brought to a stop. First of all, it is necessary to establish and verify the most suitable method for cushioning the system, in order to avoid the moving mass (carriage with load) striking against the end-caps and compromising the life of the cylinder.

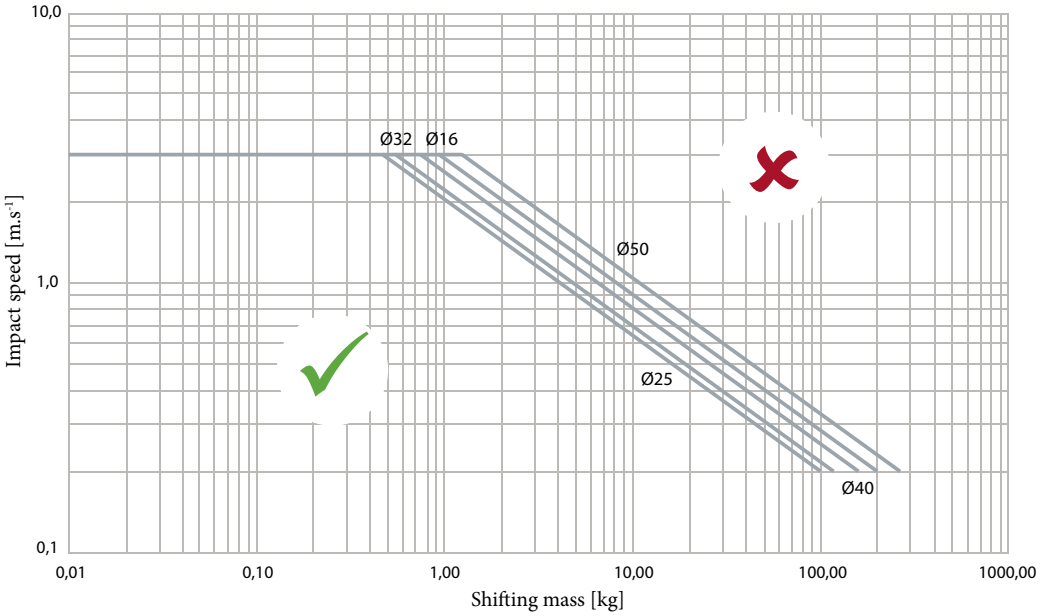
If the point corresponding to a given load and speed lies beneath the appropriate curve, the cushioning is able to absorb the kinetic energy of the system.

Vice versa if the point lies above the curve, the cushioning is not able to absorbe the kinetic energy. In that case you must:

a) decrease the load and mantain the translation speed
b) decrease the speed and mantain the load
c) select a cylinder with a bigger bore or with twin chambers
d) use external hydtŕaulic shock absorber (see page 9-1)

Attention: if the cylinder is mounted vertically, the damping efficiency is reduced by 40%.

Internal cushioning efficiency



Dynamic load capacity

Procedure for determining the permissible values for dynamic stress:

- determine the KRV coefficient according to the speed
- multiply the permissible values for static stress by the KRV coefficient and the value calculated in this way is the maximum permissible value for dynamic stress