

Features

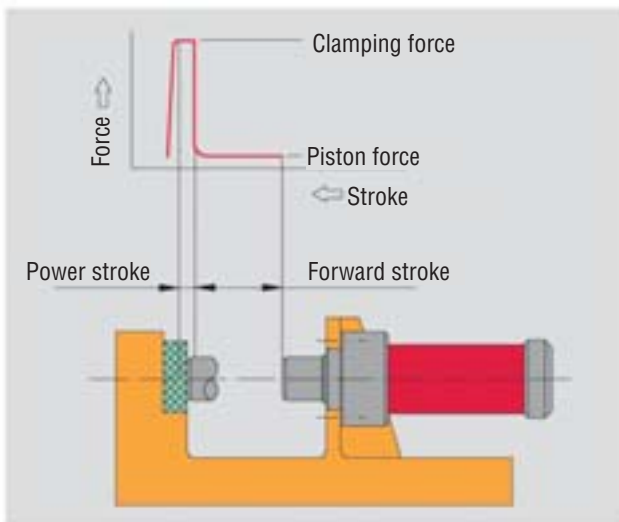
Your requirements

Power element of machines, tools and devices for the following applications:

- Clamping
- Coining
- Punching
- Riveting
- Stamping
- Pressing
- Notching
- Clinching

The solution

DE-STA-CO's double acting power cylinder, which is based on the wedge lever principle.



Special features

- Mechanical advantage: 10: 1
- Characteristic are the two steps of stroke: the **forward stroke** to move a certain distance and the **power stroke** with an amplified force on a short distance
- Exact positioning of cylinder by flange mount on cylinder's head
- Cylinder works in any position
- High durability because of solid and maintenance free wedge lever mechanics.
- End position control by magnetic field sensing

Technical Data

Power forces at 6 bar	4 – 60 kN
Forward strokes	15 – 200 mm
Power strokes	6 and 7 mm*
Air pressure	max. 6 bar, min 3 bar
Mechanical advantage	max. 10:1
Cylinders require clean, water- and oilfree air	

*power strokes up to max. 12 mm upon request

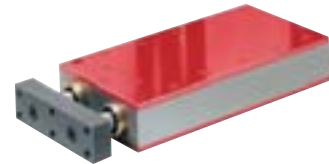
Round design: Type K and WK

- Piston rod with male thread (Type K) or ISO fit (Type WK)



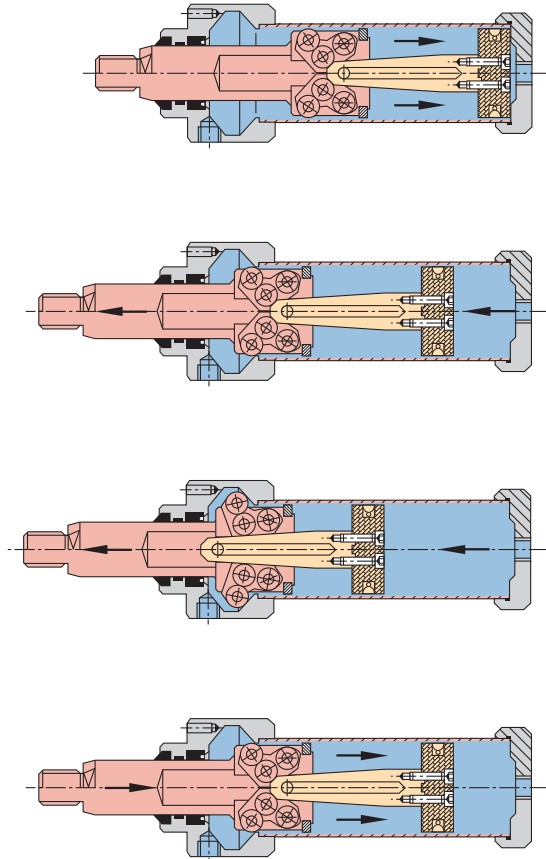
Rectangular design: Type WR

- Two piston rods prevent twisting



Application features

- Compressed air should be treated by filter, water separator and pressure regulator. Oiler is not allowed!
- For an adequate piston speed air hoses with 6mm I.D. should be used.
- Do not increase the max. air pressure of 6 bar, because this would reduce the cylinder's life cycle considerably.
- The piston rods of type K and WK are not secured against twisting, an external device should be provided.
- Piston rod should not be subjected to transversal forces. Force should always be exerted by coaxial force through the piston rod to the work piece.
- For Type WR, force must be transmitted via the centre of the pressure plate.
- Connection between rod and tool should be performed as frictional connection (coupling), not as form fitting connection.
- For punching operations we recommend a force reserve of approx. 30 %.
- If the cylinder is used for positioning in the extended rod position you should consider that a possible counter-force will cause an axial deflection of approx. 1 mm. This feature is due to the cylinder's design because after the nominal power stroke the clamping force drops down to the level of the piston force (see force-stroke diagram left side).
- Valves are not usable to avoid piston movement. If the piston should be positioned within the range of the forward stroke, both chambers of the cylinder have to be vented. If the cylinder should stay at a retracted position the piston rod chamber should be under pressure and the piston chamber should be vented.
- For further facts and additional applications features see operating instruction MAPnkz-2.



Basic position

Forward stroke

Piston force is identical to the force of a common pneumatic cylinder with adequate piston diameter

Power stroke

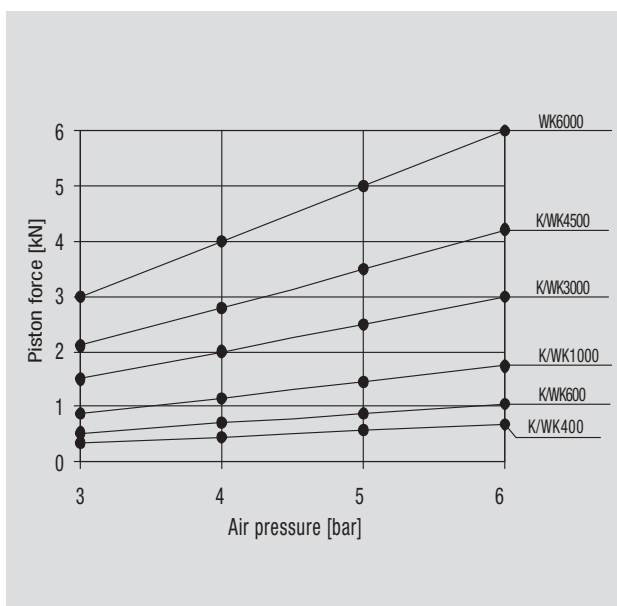
Beginning of mechanical force amplification. Mechanical advantage max. 10:1

Return stroke

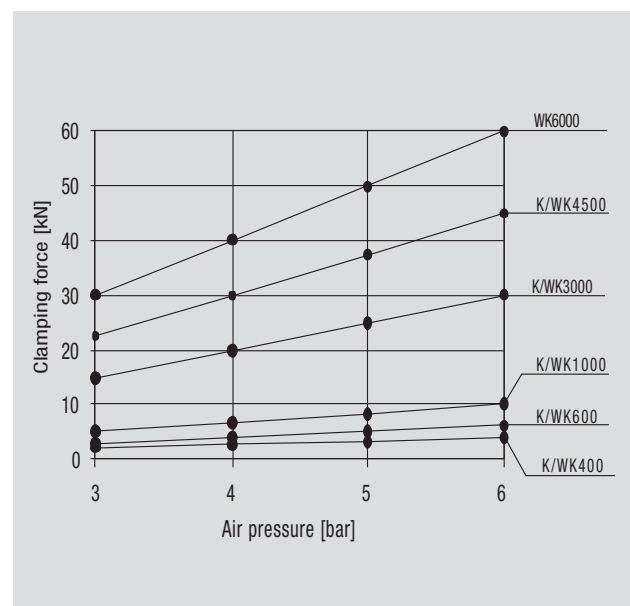
The return stroke can be initiated in any position of piston. The force during return stroke is approx. half of piston force.

Forces

Force within forward stroke



Clamping force within power stroke



Return stroke force: half of piston force

Type K



■ Piston rod with male thread

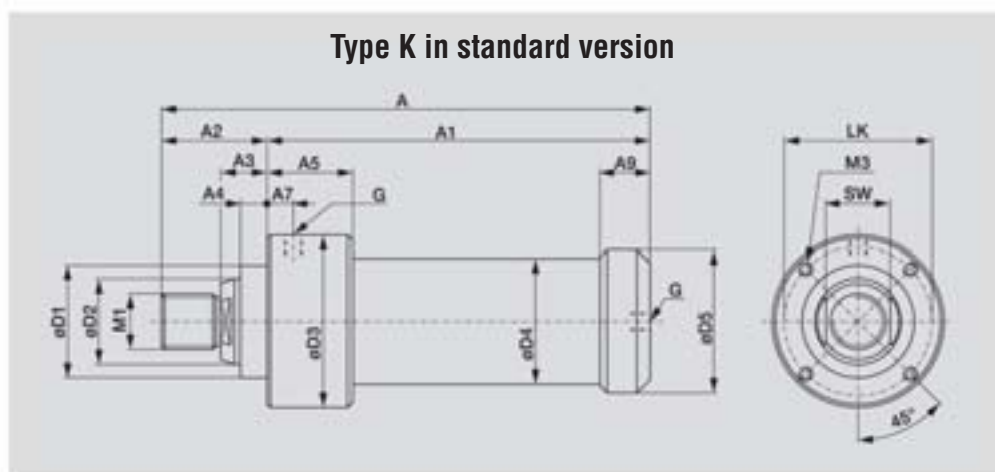
Note:

Operating pressure max. 6 bar, min 3 bar. Use only clean, water- and oilfree compressed air.

Piston rod is not secured against twisting and should not be loaded transversal. For further information see page 20.1!

Model no.	Piston force within forward stroke at 6 bar	Forward stroke	Clamping force within power stroke at 6 bar	Power stroke	Piston dia.	Air consumption per double stroke at 6 bar	Stroke frequency depending on total stroke	Temperature range	Weight
	[kN]	[mm]	[kN]	[mm]	[mm]	[dm ³]	[min ⁻¹]	[°C]	[kg]
K400-15-6-1	0,68	15	4	6	40	0,71	5 to 30	- 5 to +75	1,20
K400-30-6-1		30				0,89			1,25
K400-50-6-1		50				1,14			1,30
K400-70-6-1		70				1,38			1,35
K400-120-6-1		120				1,98			1,50
K400-200-6-1		200				2,94			1,70
K600-15-6-1	1,06	15	6	6	50	1,34	5 to 30	- 5 to +75	2,05
K600-30-6-1		30				1,65			2,15
K600-50-6-1		50				2,06			2,30
K600-70-6-1		70				2,47			2,40
K600-120-6-1		120				3,50			2,70
K600-200-6-1		200				5,15			3,20
K1000-15-7-1	1,75	15	10	7*	63	2,20	5 to 30	- 5 to +75	3,60
K1000-30-7-1		30				2,66			3,80
K1000-50-7-1		50				3,26			4,10
K1000-70-7-1		70				3,85			4,40
K1000-120-7-1		120				5,35			5,20
K1000-200-7-1		200				7,74			6,40
K3000-15-6-1	3	15	30	6*	85	4,48	5 to 25	- 5 to +75	11,80
K3000-30-6-1		30				5,20			12,50
K3000-50-6-1		50				6,17			13,40
K3000-70-6-1		70				7,13			14,30
K3000-120-6-1		120				9,54			16,60
K3000-200-6-1		200				13,40			20,20
K4500-15-6-1	4,2	15	45	6*	100	6,18	5 to 25	- 5 to +75	13,30
K4500-30-6-1		30				7,17			14,00
K4500-50-6-1		50				8,50			15,00
K4500-70-6-1		70				9,83			15,80
K4500-120-6-1		120				13,20			18,10
K4500-200-6-1		200				18,50			21,70

* Power strokes up to 12 mm and other forward strokes upon request



Model no.	Dimensions for standard version of type K																	
	Differences of dimensions for cylinder with magnet piston rings see chart on page 20.7																	
	A	A ₁	A ₂	A ₃	A ₄	A ₅	A ₇	A ₉	∅ D ₁	∅ D ₂	∅ D ₃	∅ D ₄	∅ D ₅	M ₁	M ₃	LK	SW	G
K400-15-6-1	186	145																
K400-30-6-1	201	160																
K400-50-6-1	221	180	41	21	12	39	10	23,5	40 _{h8}	25 _{h7}	63	44	49	M16 x 1,5	M5, 10mm deep	54	21	1/8
K400-70-6-1	241	200																
K400-120-6-1	291	250																
K400-200-6-1	371	330																
K600-15-6-1	201	160																
K600-30-6-1	216	175	41	21	12	39	10	23,5	40 _{h8}	25 _{h7}	73	54	59	M16 x 1,5	M6, 10mm deep	64	21	1/8
K600-50-6-1	236	195																
K600-70-6-1	256	215																
K600-120-6-1	306	265																
K600-200-6-1	386	345																
K1000-15-7-1	243	187	56	25	15	52	10	29	63 _{h8}	40 _{h7}	99,5	68	74,5	M24	M8, 12mm deep	85	32	1/8
K1000-30-7-1	258	202																
K1000-50-7-1	278	222																
K1000-70-7-1	298	242																
K1000-120-7-1	348	292																
K1000-200-7-1	428	372	80	35	20	70	20	45	85 _{h8}	65 _{h7}	130	95	108	M42	M10, 16mm deep	112	55	1/4
K3000-15-6-1	315	235																
K3000-30-6-1	330	250																
K3000-50-6-1	350	270																
K3000-70-6-1	370	290																
K3000-120-6-1	420	340	80	35	20	70	20	45	85 _{h8}	65 _{h7}	145	110	123	M42	M10, 16mm deep	127	55	1/4
K3000-200-6-1	500	420																
K4500-15-6-1	315	235																
K4500-30-6-1	330	250																
K4500-50-6-1	350	270																
K4500-70-6-1	370	290																
K4500-120-6-1	420	340	80	35	20	70	20	45	85 _{h8}	65 _{h7}	145	110	123	M42	M10, 16mm deep	127	55	1/4
K4500-200-6-1	500	420																

Type WK



■ Piston rod with iso fit

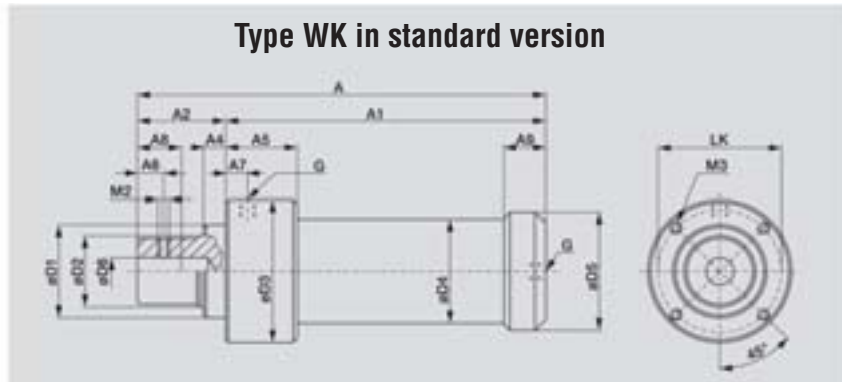
Note:

Operating pressure max. 6 bar, min 3 bar. Use only clean, water- and oilfree compressed air.

Piston rod is not secured against twisting and should not be loaded transversal. For further information see page 20.1!

Model no.	Piston force within forward stroke at 6 bar [kN]	Forward stroke* [mm]	Clamping force within power stroke at 6 bar [kN]	Power stroke* [mm]	Piston dia. [mm]	Air consumption per double stroke at 6 bar [dm ³]	Stroke frequency depending on total stroke [min ⁻¹]	Temperature range [°C]	Weight [kg]
WK400-15-6-1	0,68	15	4	6	40	0,71	5 to 30	- 5 to +75	1,20
WK400-30-6-1		30				0,89			1,25
WK400-50-6-1		50				1,14			1,30
WK400-70-6-1		70				1,38			1,35
WK400-120-6-1		120				1,98			1,50
WK400-200-6-1		200				2,94			1,70
WK600-15-6-1	1,06	15	6	6	50	1,34	5 to 30	- 5 to +75	2,05
WK600-30-6-1		30				1,65			2,15
WK600-50-6-1		50				2,06			2,30
WK600-70-6-1		70				2,47			2,40
WK600-120-6-1		120				3,50			2,70
WK600-200-6-1		200				5,15			3,20
WK1000-15-7-1	1,75	15	10	7*	63	2,20	5 to 30	- 5 to +75	3,60
WK1000-30-7-1		30				2,66			3,80
WK1000-50-7-1		50				3,26			4,10
WK1000-70-7-1		70				3,85			4,40
WK1000-120-7-1		120				5,35			5,20
WK1000-200-7-1		200				7,74			6,40
WK3000-15-6-1	3	15	30	6*	85	4,48	5 to 25	- 5 to +75	11,80
WK3000-30-6-1		30				5,20			12,50
WK3000-50-6-1		50				6,17			13,40
WK3000-70-6-1		70				7,13			14,30
WK3000-120-6-1		120				9,54			16,60
WK3000-200-6-1		200				13,40			20,20
WK4500-15-6-1	4,2	15	45	6*	100	6,18	5 to 25	- 5 to +75	13,30
WK4500-30-6-1		30				7,17			14,00
WK4500-50-6-1		50				8,50			15,00
WK4500-70-6-1		70				9,83			15,80
WK4500-120-6-1		120				13,20			18,10
WK4500-200-6-1		200				18,50			21,70
WK6000-30-6	6,0	30	60,0	6*	125,0	10,40	5 to 25	- 5 to +75	24,00
WK6000-50-6		50				12,85			24,50
WK6000-70-6		70				15,17			25,00
WK6000-120-6		120				21,15			26,50

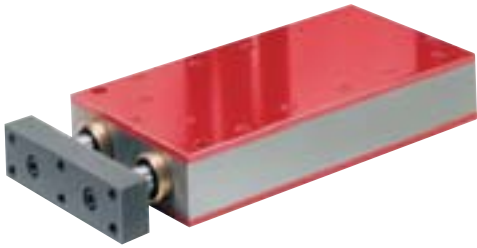
* Power strokes up to 12 mm and other forward strokes upon request



Model no.	Dimensions for standard version of type WK																		
	Differences of dimensions for cylinder with magnet piston rings see chart on page 20.7																		
	A	A ₁	A ₂	A ₃	A ₄	A ₅	A ₇	A _{8**}	A ₉	∅ D ₁	∅ D ₂	∅ D ₃	∅ D ₄	∅ D ₅	∅ D ₆	M ₂	M ₃	LK	G
WK400-15-6-1	186	145																	
WK400-30-6-1	201	160																	
WK400-50-6-1	221	180	41	21	12	39	10	25	23,5	40 _{h8}	25 _{h7}	63	44	49	10 ^{H7}	M6	M5, 10mm deep	54	1/8
WK400-70-6-1	241	200																	
WK400-120-6-1	291	250																	
WK400-200-6-1	371	330																	
WK600-15-6-1	201	160																	
WK600-30-6-1	216	175	41	21	12	39	10	25	23,5	40 _{h8}	25 _{h7}	73	54	59	10 ^{H7}	M6	M6, 10mm deep	64	1/8
WK600-50-6-1	236	195																	
WK600-70-6-1	256	215																	
WK600-120-6-1	306	265																	
WK600-200-6-1	386	345																	
WK1000-15-7-1	243	187	56	25	15	52	10	40	29	63 _{h8}	40 _{h7}	99,5	68	74,5	20 ^{H7}	M8	M8, 12mm deep	85	1/8
WK1000-30-7-1	258	202																	
WK1000-50-7-1	278	222																	
WK1000-70-7-1	298	242																	
WK1000-120-7-1	348	292																	
WK1000-200-7-1	428	372																	
WK3000-15-6-1	315	235	80	35	20	70	20	40	45	85 _{h8}	65 _{h7}	130	95	108	25 ^{H7}	M10	M10, 16mm deep	112	1/4
WK3000-30-6-1	330	250																	
WK3000-50-6-1	350	270																	
WK3000-70-6-1	370	290																	
WK3000-120-6-1	420	340																	
WK3000-200-6-1	500	420																	
WK4500-15-6-1	315	235	80	35	20	70	20	40	45	85 _{h8}	65 _{h7}	145	110	123	25 ^{H7}	M10	M10, 16mm deep	127	1/4
WK4500-30-6-1	330	250																	
WK4500-50-6-1	350	270																	
WK4500-70-6-1	370	290																	
WK4500-120-6-1	420	340																	
WK4500-200-6-1	500	420																	
WK6000-30-6	365	285	80	20	84	24	22	40	53	85 _{h8}	65 _{h7}	178	135	148	25 ^{H7}	M10	M10, 16mm deep	150	1/2
WK6000-50-6	385	305																	
WK6000-70-6	405	325																	
WK6000-120-6	455	375																	

** Usable depth of bore with ISO fit D6

Type WR



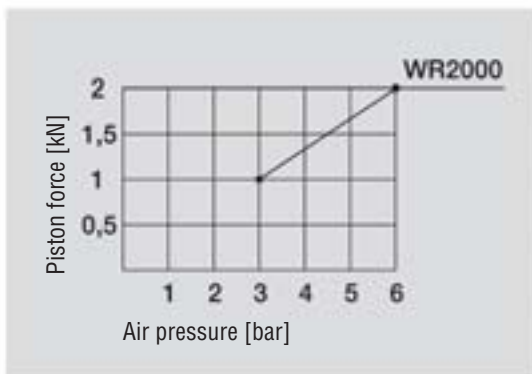
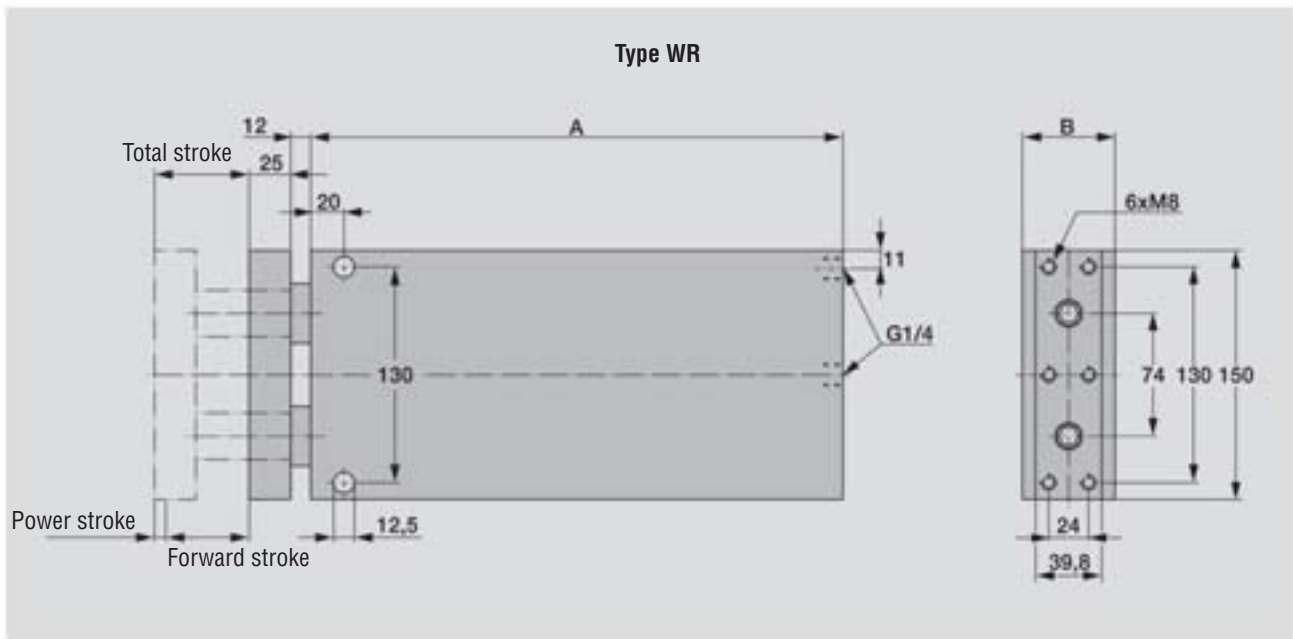
- Piston rods prevent twisting

Note

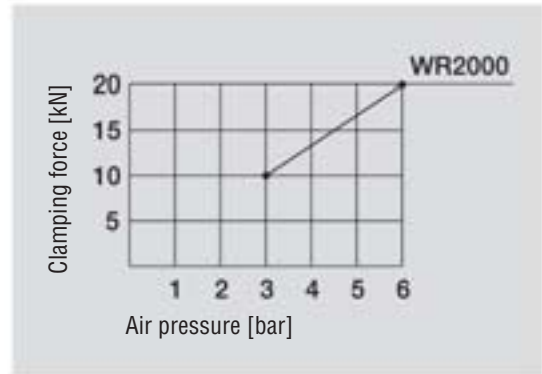
Use only clean, water- and oilfree compressed air. Force must be transmitted via the centre of the pressure plate. One-sided loading of the pressure plate should be avoided.

For punching applications contact our technical support!

For further information see page 20.1



Return stroke force: half of piston force



Air pressure: max. 6 bar; min. 3 bar

Model no.	Piston force within forward stroke at 6 bar [kN]	Forward stroke [mm]	Clamping force within power stroke at 6 bar [kN]	Power stroke [mm]	Piston area Δ piston dia. [mm]	Air consumption per double stroke at 6 bar [dm ³]	Stroke frequency depending on total stroke [min ⁻¹]	Temperature range [°C]	Weight [kg]	A ± 1	B ± 2
WR 2000-15-7		15				2.44			12.5	285	51.6
WR 2000-30-7		30				2.95			14.0	300	51.6
WR 2000-50-7	2	50	20	7	70	3.62	5 - 25	-5 up to +75	15.5	320	55.6
WR 2000-70-7		70				4.27			17.2	340	55.6
WR 2000-120-7		120				5.94			21.0	390	59.6

Pneumatic power cylinders Type K und WK with end position control by magnetic field sensors.

■ For the sizes

K and WK 400.... , K and WK 600... , K and WK 1000....

K and WK 3000..., K and WK 4500...

■ Change of model no.

Indicate „-A“ at the end of model no. instead of „-1“ for standard version!

Example: K400 – 15 – 6 – 1 change to K400 – 15 – 6 – A

WK 3000 – 50 – 6 – 1 change to WK 3000 - 50 – 6 – A

■ Change in construction

Only the dimensions Ø D4, Ø D5, A/A 1 and A9 are different to the standard version. See page 20.4 and 20.6.

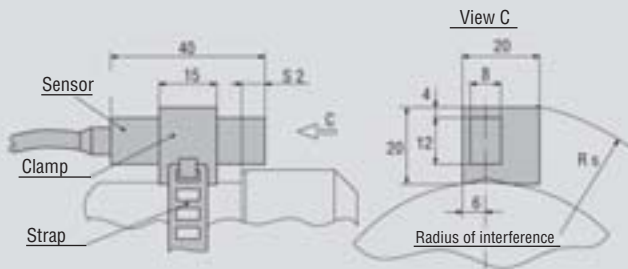
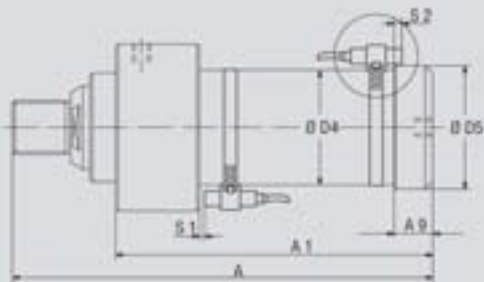


Technical data and differences of dimensions compared to standard version see tables below

■ Standard equipment (as shown above)

Pneumatic power cylinders with “-A” at the end of model no. are completely furnished with a magnetic piston ring and with two mounted sensor sets (model no. SMB-102157, consisting of magnetic field sensor with 3m cable, clamp and strap) See Page 20.4 and 20.6

Type K



Switching points of sensors

**Differences of dimensions compared with standard version

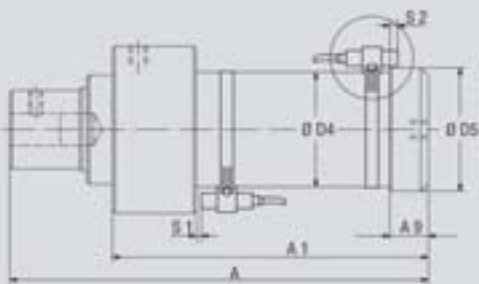
For sizes	S 1*	S 2*	Ø D4	Ø D5	A/A 1	A9	R _s
K 400...-A	5	12	-	-	+15	-	44
K 1000...-A	10	18	-	-	+15	-	56
K 3000...-A	5	14	90	97	-	30	67
K 4500...-A	5	12	106	113	-	28,5	75

* Approx. data, because of magnet field variations. S1 refers to the max. power stroke and enlarges up to 60 mm, when smaller power strokes are used.

Circuit diagram and technical data of sensor set model no. **SMB-102157**, consisting of magnetic field sensor with 3 m cable, clamp and strap (2 sets per cylinder are standard equipment).

	Switching voltage	10...250 VAC/DC
	Switching current	0,5 A
	Switching power	20 W/30 VA
	Function	normally open contact
	Protection class	IP 67 (DIN 40050)
	Indicator	LED

Type WK



Switching points of sensors

**Differences of dimensions compared with standard version

Für Größe	S 1*	S 2*	Ø D4	Ø D5	A/A 1	A9	R _s
WK 400...-A	5	12	-	-	+15	-	44
WK 1000...-A	10	18	-	-	+15	-	56
WK 3000...-A	5	14	90	97	-	30	67
WK 4500...-A	5	12	106	113	-	28,5	75

* Approx. data, because of magnet field variations. S1 refers to the max. power stroke and enlarges up to 60 mm, when smaller power strokes are used.

Magnetic field sensing -K



Sensor cage for T-slot proximity sensor

■ **For the sizes**

K and WK 400.... , K and WK 600... , K and WK 1000....
K and WK 3000..., K and WK 4500...

■ **Change of model no.**

Indicate „-K“ at the end of model no. instead of „-A“ for standard version!

Example: K400 – 15 – 6 – A change to K400 – 15 – 6 – K

WK 3000 – 50 – 6 – A change to WK 3000 - 50 – 6 – K

■ **Benefits:**

Small radii of interference!

Customer specific T-slot sensors are usable!

■ **Standard equipment:**

Pneumatic power cylinder with „-K“ at the end of model no. are supplied with mounted sensor cages but without T-slot sensors.

Proximity sensor SME-8F-DE-S

Proximity sensor for T-slot



Technische Daten:

Short circuit strenght	No
Measuring principle	Reed magnetic
Polarity protected	No
Switch-off time	0.03 ms
Switch-on time	< = 0,5 ms
Operating voltage AC / DC	10 – 30 V
Max. output current	500 mA
Max. switching output voltage AC / DC	30 V
Max. contact rating DC	10 W
Switch output	with contact, bipolar
Protection class	IP65 / IP67
Ambient temperature	-5 – 60 °C / -20 – 60 °C
Reproducibility of switching value	+/- 0.1 mm
Electrical connection	M8x1, Cabel with plug, 3-pin
Cable length	0.3 m
Materials information, housing	PA
Materials information, cable sheaths	PUR

Press frame PWK for pneumatic power cylinder

- Table top press frame
- For cylinder up to 30 kN (K/WK3000)
- For pressing, punching etc
- Tools supplied by the customer
- Could be supplied as a complete system (cylinder included)
- Adjustable working height
- Tough and flexible

Power stroke: 6 mm*

Forward stroke: 15 mm*

Adjustable range: 0-200 mm (by crack)

Worktop: 180 x 140 mm (W x D)

Throat: 90 mm

Dimensions: 494 (without crack) x 180 x 350 mm (H x W x D)

*Power strokes up to 12 mm and other forward strokes upon request



Flanges

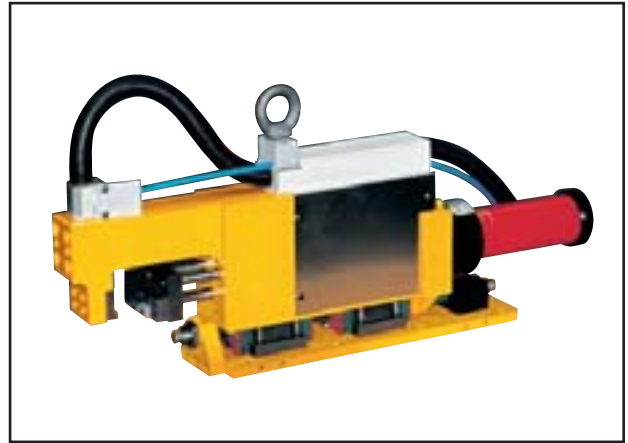
Flanges for lateral and frontal mounting.

- Design by customers preference
If you need a easy and low cost solution for mounting your pneumatic power cylinder – please ask us..

Application examples



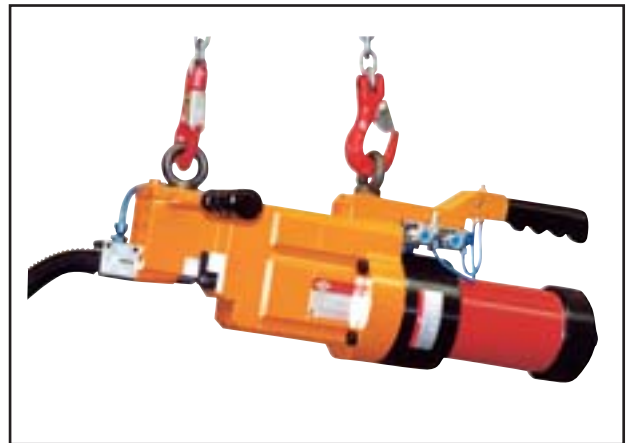
Radius clinching unit for profiled aluminium



Special punching unit for 2 holes Ø 3,4 in steel 0,9 mm



Special device for 2 holes Ø 12 in steel 1,2 mm



Mobile punching unit for holes Ø 6,2 in crossbeams



Device for holes Ø 8 in sheet metal



Stamping units placed in line



Stamping units placed in line



Welding fixture for exhaust components