

TOX®-Powerpackage:

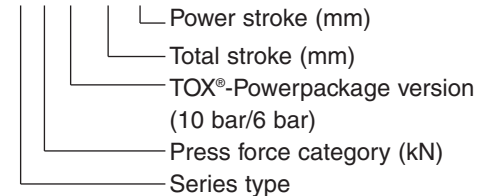
The complete drive family for press forces from 2 – 2000 kN

The TOX®-Powerpackage is available with different press forces, strokes and structural shapes.

Selection criteria:

- 1) Press force required for the application
- 2) Available air pressure
- 3) Required total stroke of the TOX®-Powerpackage
- 4) Required power stroke of the TOX®-Powerpackage
- 5) Type of application as e.g. punching, embossing etc.
- 6) Available installation space

Description for ordering the TOX®-Powerpackage
S 4.30.50.6



Data sheet 10.00

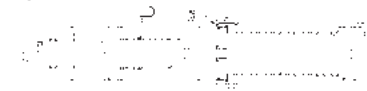
2012/10

A series overview

Type S (standard) and version S 50 with power stroke adjustment

2 bar – 6 bar series	2 bar – 10 bar series
up to 1740 kN press force up to 300 mm total stroke up to 20 mm power stroke	up to 1680 kN press force up to 400 mm total stroke up to 80 mm power stroke

Type S 6/10 bar



Version .50 with power stroke adjustment



see page 2 – 10

Patented power bypass with integrated retract hydraulic cushion

is a standard feature for all TOX®-Powerpackages type S 4 to S 170.

For further executions see our data sheets 10.06 and 10.08.

Type K (compact) and version K 51 with total stroke adjustment

2 bar – 6 bar series	2 bar – 10 bar series
up to 1600 kN press force up to 200 mm total stroke up to 10 mm power stroke	up to 1710 kN press force up to 400 mm total stroke up to 50 mm power stroke

Type K 6/10 bar



Version .51 with total stroke adjustment



see page 11 – 15

Patented power bypass with integrated retract hydraulic cushion is available on request.

For further executions see our data sheet 10.06.

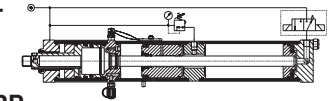
Type T, the turbo cylinder: up to 550 strokes/min, only power stroke

3 bar – 10 bar series type T
up to 120 kN press force up to 12 mm total stroke up to 12 mm power stroke

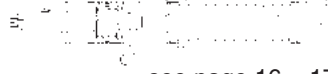
Type RP embossing cylinder with anti-rotation lock

3 bar – 10 bar series type RP
up to 159 kN press force up to 32 mm total stroke up to 3 mm power stroke

Type T



Type RP



see page 16 – 17

Accessories/specials

Mounting instructions / tables / notes

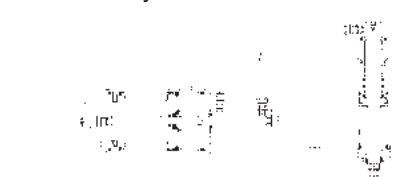
Accessories/special version

see page 18 – 35

Type KT flexible solution for small mounting dimensions, long power strokes

2 bar – 6 bar series	2 bar – 10 bar series
up to 1994 kN press force up to 400 mm total stroke up to 400 mm power stroke	up to 1994 kN press force up to 400 mm total stroke up to 400 mm power stroke

Type KT, see TOX® Pneumo-Hydraulic Intensifier System leaflet.



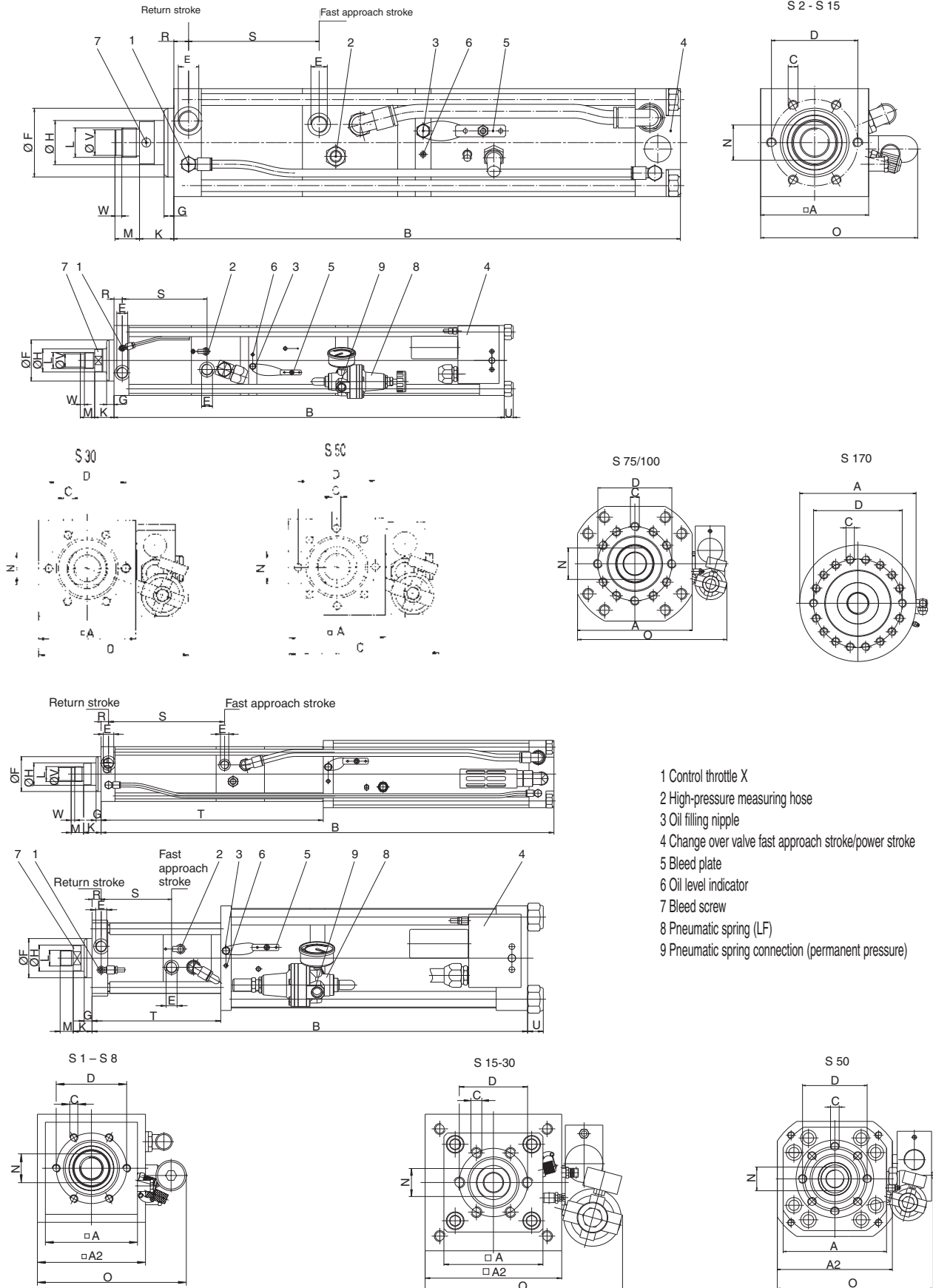
The TOX®-Powerpackage welding cylinder

Please ask for our information material.

TOX®-Powerpackage type S 6 bar

Version .30, 11 – 1740 kN

Patented power bypass with integrated retract hydraulic cushion is a standard feature for all TOX®-Powerpackages type S 4 to S 170.

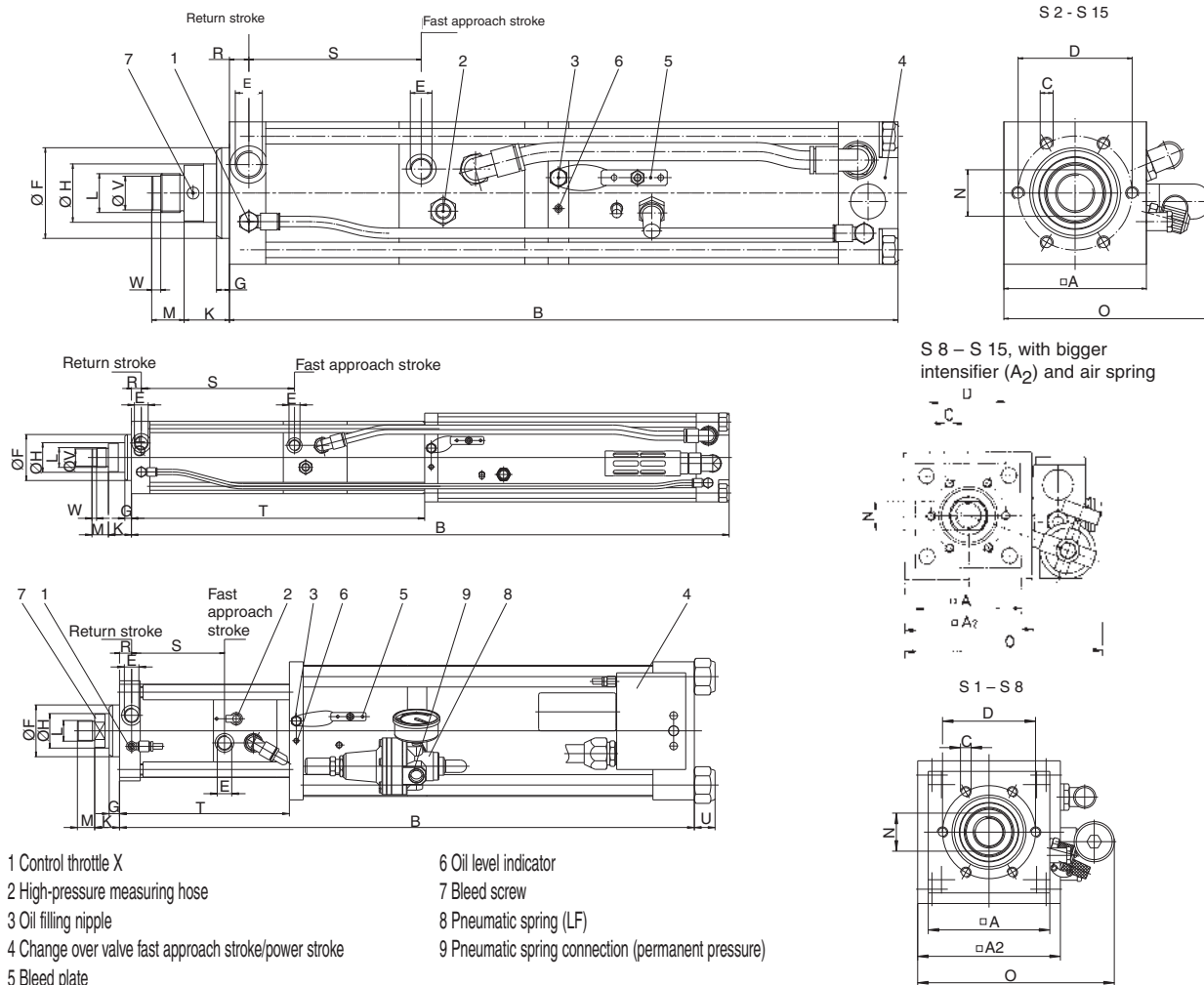


- 1 Control throttle X
- 2 High-pressure measuring hose
- 3 Oil filling nipple
- 4 Change over valve fast approach stroke/power stroke
- 5 Bleed plate
- 6 Oil level indicator
- 7 Bleed screw
- 8 Pneumatic spring (LF)
- 9 Pneumatic spring connection (permanent pressure)

TOX®-Powerpackage type S 10 bar

10 – 150 kN

Patented power bypass with integrated retract hydraulic cushion is a standard feature for all TOX®-Powerpackages type S 4 to S 170.



- 1 Control throttle X
- 2 High-pressure measuring hose
- 3 Oil filling nipple
- 4 Change over valve fast approach stroke/power stroke
- 5 Bleed plate
- 6 Oil level indicator
- 7 Bleed screw
- 8 Pneumatic spring (LF)
- 9 Pneumatic spring connection (permanent pressure)

Order no.	incl. total stroke	power stroke	fast ap- retract-		Preferred series																														
			max. force at 6 bar	retract-approach ing force at 10 bar	A	A ₂	B	C	D	E	F ₁₇	G	H	K	L	M	N	O	R	S	T	U	Vg6	W	*LF	**IV									
S 1.	32.	6	5,6	9,8	115	123	50	-	360	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	11,5	88,5	-	-	-	-	-	-	-	-	-	-	-	x	
S 1.	100.	6	5,6	9,8	115	123	50	-	527	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	11,5	156,5	-	-	-	-	-	-	-	-	-	-	-	x	
S 1.	150.	6	5,6	9,8	115	123	50	-	647	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	11,5	206,5	-	-	-	-	-	-	-	-	-	-	-	x	
S 1.	200.	6	5,6	9,8	115	123	50	-	767	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	11,5	256,5	-	-	-	-	-	-	-	-	-	-	-	x	
S 1.	50.	12	5,6	9,8	115	123	50	-	434	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	11,5	106,5	-	-	-	-	-	-	-	-	-	-	-	x	
S 1.	100.	12	5,6	9,8	115	123	50	-	565	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	11,5	156,5	-	-	-	-	-	-	-	-	-	-	-	x	
S 1.	150.	12	5,6	9,8	115	123	50	-	685	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	11,5	206,5	-	-	-	-	-	-	-	-	-	-	-	x	
S 1.	200.	12	5,6	9,8	115	123	50	-	805	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	11,5	256,5	-	-	-	-	-	-	-	-	-	-	-	x	
S 1.	250.	12	7,1	12,6	115	123	50	70	880	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	102	11,5	306,5	597	-	-	-	-	-	-	-	-	-	-	x	
S 1.	50.	24	7,1	12,6	115	123	50	70	479	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	102	11,5	106,5	197	-	-	-	-	-	-	-	-	-	-	x	
S 1.	100.	24	7,1	12,6	115	123	50	70	589	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	102	11,5	156,5	297	-	-	-	-	-	-	-	-	-	-	-	x
S 1.	150.	24	7,1	12,6	115	123	50	70	694	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	102	11,5	206,5	397	-	-	-	-	-	-	-	-	-	-	-	x
S 1.	200.	24	7,1	12,6	115	123	50	70	794	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	102	11,5	256,5	497	-	-	-	-	-	-	-	-	-	-	-	x

*LF: Series incorporating pneumatic spring. See page 8.

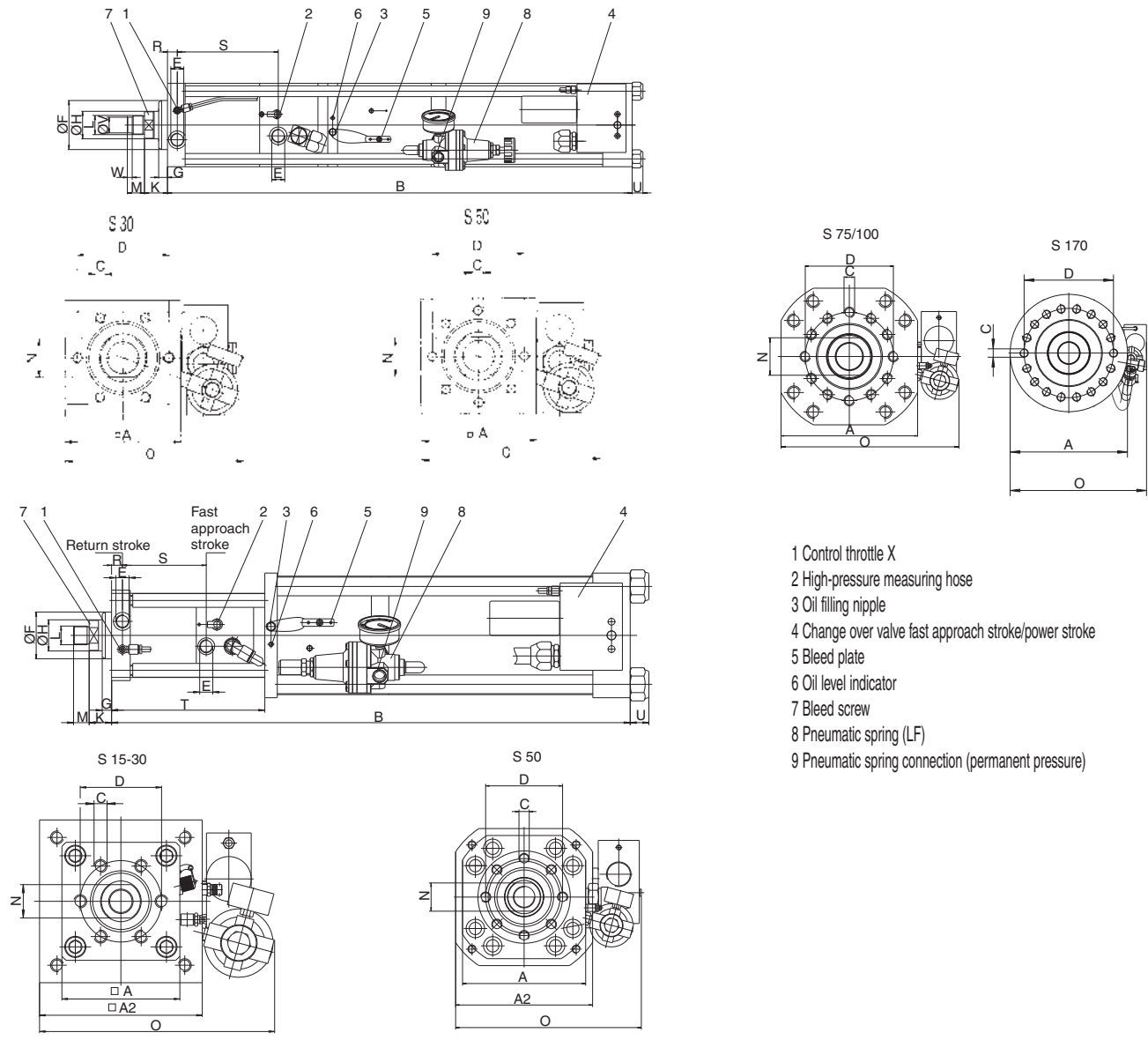
**IV: Integrated valve

See data sheet 10.06 for a comprehensive TOX®-Powerpackage program type EL with pneumatic spring.

TOX®-Powerpackage type S 10 bar

297 – 1680 kN

Patented power bypass with integrated retract hydraulic cushion is a standard feature for all TOX®-Powerpackages type S 4 to S 170.



- 1 Control throttle X
- 2 High-pressure measuring hose
- 3 Oil filling nipple
- 4 Change over valve fast approach stroke/power stroke
- 5 Bleed plate
- 6 Oil level indicator
- 7 Bleed screw
- 8 Pneumatic spring (LF)
- 9 Pneumatic spring connection (permanent pressure)

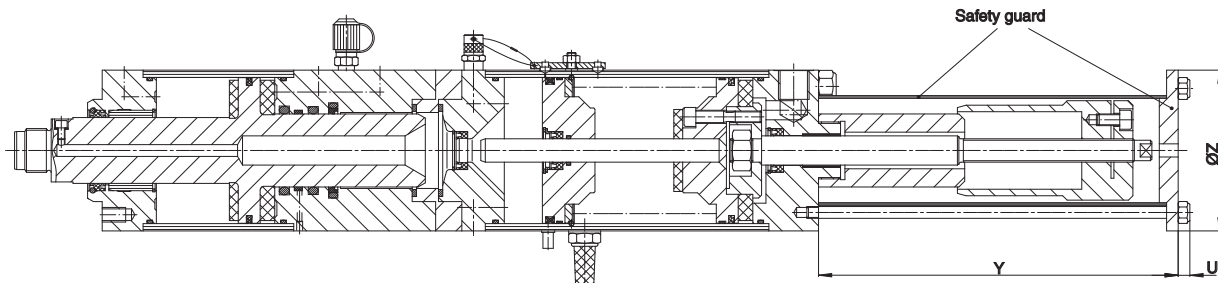
Order no.	incl. total stroke	power stroke	fast ap- retract- max. force at compressed air		proach ing force force		Preferred series																	*LF	
			6 bar	10 bar	daN	daN	A	A ₂	B	C	D	E	F ₁₇	G	H	K	L	M	N	O	R	S	T		U
S 30.	50.	6 D	171,6	297,7	1149	1509	170	-	788	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	290	20	186	-	22	x
S 30.	100.	6 D	171,6	297,7	1149	1509	170	-	958	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	290	20	236	-	22	x
S 30.	150.	6 D	171,6	297,7	1149	1509	170	-	1114	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	290	20	286	-	22	x
S 30.	200.	6 D	171,6	297,7	1149	1509	170	-	1284	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	290	20	336	-	22	x
S 30.	70.	12 D	171,6	297,7	1149	1509	170	-	948	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	290	20	206	-	22	x
S 30.	100.	12 D	171,6	297,7	1149	1509	170	-	1048	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	290	20	236	-	22	x
S 30.	150.	12 D	171,6	297,7	1149	1509	170	-	1204	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	290	20	286	-	22	x
S 30.	200.	12 D	171,6	297,7	1149	1509	170	-	1374	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	290	20	336	-	22	x
S 30.	300.	12 D	170,8	300,8	1149	1509	200	-	1611	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	320	20	436	787	30	x
S 30.	400.	12 D	170,8	300,8	1149	1509	200	-	1931	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	320	20	536	987	30	x
S 30.	70.	20 D	170,8	300,8	1149	1509	200	-	1002	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	320	20	206	327	30	x
S 30.	100.	20 D	170,8	300,8	1149	1509	200	-	1072	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	320	20	236	387	30	x
S 30.	150.	20 D	170,8	300,8	1149	1509	200	-	1248	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	320	20	286	487	30	x

*LF: Series incorporating pneumatic spring. See page 8. D: Patented power bypass with integrated hydraulic end position cushion is standard. Available on request for other units. See data sheet 10.06 for a comprehensive TOX®-Powerpackage program type EL with pneumatic spring.

TOX®-Powerpackage type S 10 bar and 6 bar

version .50, with power stroke adjustment 10 – 1000 kN (6 bar on request, version .80)

Patented power bypass with integrated retract hydraulic cushion is a standard feature for all TOX®-Powerpackages type S 4 to S 170.



Function:

The intensifier piston of the TOX®-Powerpackage has a spindle attached to it. On this spindle there is an adjusting nut, which accurately limits the stroke of the intensifier piston and hence the power stroke, irrespective of the fast approach stroke.

Applications:

Engraving of wear marks with tolerances within the hundredth-of-a-millimetre range. Stamping of parts with

varying heights or a large height tolerance at a constant stamping depth. Pressing-in of bushes with an accurately defined depth.

Advantage:

The adjustment or limitation relates to the power stroke only, i.e. directly to the application, and not to the approach stroke. This means that the height differences and tolerances of the component are irrelevant. The repeating accuracy is extremely exact.

Quality/monitoring:

Due to the intensification ratio, the intensifier piston and the adjustment spindle travel proportionally to the working stroke travel (ratio approximately 1 : 10). The working stroke travel can be monitored very accurately with a travel sensor on the adjustment spindle.

Order no.	ver-	total	incl.				Order no.	ver-	total	incl.				Order no.	ver-	total	incl.				
type	sion	stroke	power	Y	Z	U	type	sion	stroke	power	Y	Z	U	type	sion	stroke	power	Y	Z	U	
S 1.	50.	32.	6	202	55	5	S 2.	50.	32.	6	216	75	8	S 4.	50.	32.	6	D	261	78	8
S 1.	50.	100.	6	234	55	5	S 2.	50.	100.	6	246	75	8	S 4.	50.	100.	6	D	301	78	8
S 1.	50.	150.	6	254	55	5	S 2.	50.	150.	6	266	75	8	S 4.	50.	150.	6	D	331	78	8
S 1.	50.	200.	6	274	55	5	S 2.	50.	200.	6	286	75	8	S 4.	50.	200.	6	D	361	78	8
S 1.	50.	50.	12	278	55	5	S 2.	50.	50.	12	290	75	8	S 4.	50.	50.	12	D	379	78	8
S 1.	50.	100.	12	310	55	5	S 2.	50.	100.	12	320	75	8	S 4.	50.	100.	12	D	409	78	8
S 1.	50.	150.	12	330	55	5	S 2.	50.	150.	12	340	75	8	S 4.	50.	150.	12	D	439	78	8
S 1.	50.	200.	12	350	55	5	S 2.	50.	200.	12	360	75	8	S 4.	50.	200.	12	D	469	78	8
S 1.	50.	250.	12	308	75	8	S 2.	50.	250.	12	341	78	8	S 4.	50.	300.	12	D	398	110	8
S 1.	50.	50.	24	326	75	8	S 2.	50.	50.	24	333	78	8	S 4.	50.	400.	12	D	436	110	8
S 1.	50.	100.	24	346	75	8	S 2.	50.	100.	24	393	78	8	S 4.	50.	50.	24	D	412	110	8
S 1.	50.	150.	24	356	75	8	S 2.	50.	150.	24	409	78	8	S 4.	50.	100.	24	D	412	110	8
S 1.	50.	200.	24	356	75	8	S 2.	50.	200.	24	423	78	8	S 4.	50.	150.	24	D	482	110	8
S 1.	50.	100.	48	445	78	8	S 2.	50.	100.	44	412	110	8	S 4.	50.	200.	24	D	482	110	8
S 1.	50.	150.	48	445	78	8	S 2.	50.	150.	44	412	110	8	S 4.	50.	100.	44	D	498	138	8
S 1.	50.	200.	48	445	78	8	S 2.	50.	200.	44	412	110	8	S 4.	50.	150.	44	D	498	138	8
S 1.	50.	150.	60	509	78	8	S 2.	50.	150.	65	532	110	8	S 4.	50.	200.	44	D	498	138	8
S 1.	50.	200.	60	509	78	8	S 2.	50.	200.	65	532	110	8	S 4.	50.	300.	44	D	538	138	8
S 1.	50.	250.	60	509	78	8	S 2.	50.	250.	65	532	110	8	S 4.	50.	400.	44	D	538	138	8
														S 4.	50.	200.	65	D	652	138	8
														S 4.	50.	300.	65	D	692	138	8
														S 4.	50.	400.	65	D	692	138	8

For all other dimensions see type S.

D: Patented power bypass with integrated hydraulic end position cushion is standard. Available on request for other units. See data sheet 10.06 for a comprehensive TOX®-Powerpackage program type EL with pneumatic spring.

TOX®-Powerpackage type S 10 bar and 6 bar

version .50, with power stroke adjustment, 10 – 1000 kN (6 bar on request, version .80)

Order no.	ver-	total	incl.				Order no.	ver-	total	incl.				Order no.	ver-	total	incl.			
type	sion	stroke	power	Y	Z	U	type	sion	stroke	power	Y	Z	U	type	sion	stroke	power	Y	Z	U
S 8.	50.	32.	6 D	286	110	8	S 15.	50.	32.	6 D	344	138	8	S 30.	50.	50.	6 D	411	138	8
S 8.	50.	100.	6 D	326	110	8	S 15.	50.	100.	6 D	394	138	8	S 30.	50.	100.	6 D	451	138	8
S 8.	50.	150.	6 D	356	110	8	S 15.	50.	150.	6 D	428	138	8	S 30.	50.	150.	6 D	491	138	8
S 8.	50.	200.	6 D	386	110	8	S 15.	50.	200.	6 D	464	138	8	S 30.	50.	200.	6 D	531	138	8
S 8.	50.	50.	12 D	421	110	8	S 15.	50.	50.	12 D	498	138	8	S 30.	50.	70.	12 D	611	138	8
S 8.	50.	100.	12 D	442	110	8	S 15.	50.	100.	12 D	548	138	8	S 30.	50.	100.	12 D	631	138	8
S 8.	50.	150.	12 D	472	110	8	S 15.	50.	150.	12 D	578	138	8	S 30.	50.	150.	12 D	671	138	8
S 8.	50.	200.	12 D	502	110	8	S 15.	50.	200.	12 D	618	138	8	S 30.	50.	200.	12 D	707	138	8
S 8.	50.	300.	12 D	454	138	8	S 15.	50.	300.	12 D	481	138	8	S 30.	50.	300.	12 D	751	138	8
S 8.	50.	400.	12 D	504	138	8	S 15.	50.	400.	12 D	521	138	8	S 30.	50.	400.	12 D	871	138	8
S 8.	50.	50.	24 D	488	138	8	S 15.	50.	50.	24 D	697	138	8	S 30.	50.	70.	20 D	621	138	8
S 8.	50.	100.	24 D	518	138	8	S 15.	50.	100.	24 D	617	138	8	S 30.	50.	100.	20 D	795	138	8
S 8.	50.	150.	24 D	548	138	8	S 15.	50.	150.	24 D	617	138	8	S 30.	50.	150.	20 D	831	138	8
S 8.	50.	200.	24 D	578	138	8	S 15.	50.	200.	24 D	617	138	8	S 30.	50.	200.	20 D	891	138	8
S 8.	50.	100.	48 D	611	138	8	S 15.	50.	100.	40 D	801	138	8	S 30.	50.	300.	20 D	971	138	8
S 8.	50.	150.	48 D	611	138	8	S 15.	50.	150.	40 D	801	138	8	S 30.	50.	400.	20 D	1091	138	8
S 8.	50.	200.	48 D	611	138	8	S 15.	50.	200.	40 D	801	138	8	S 30.	50.	150.	28 D	560	185	10
S 8.	50.	300.	48 D	655	138	8	S 15.	50.	300.	40 D	837	138	8	S 30.	50.	200.	28 D	640	185	10
S 8.	50.	400.	48 D	705	138	8	S 15.	50.	400.	40 D	891	138	8	S 30.	50.	300.	44 D	800	185	10
S 8.	50.	200.	80 D	801	138	8	S 15.	50.	150.	60 D	1001	138	8	S 30.	50.	400.	44 D	800	185	10
S 8.	50.	300.	80 D	801	138	8	S 15.	50.	200.	80 D	1201	138	8							
S 8.	50.	400.	80 D	801	138	8	S 15.	50.	300.	80 D	1337	138	8							
							S 15.	50.	400.	80 D	1391	138	8							
S 50.	50.	50.	6 D	479	138	8	S 75.	50.	100.	12 D	740	185	8	S100.	50.	300.	8 D	860	185	10
S 50.	50.	100.	6 D	545	138	8	S 75.	50.	200.	12 D	860	185	8	S100.	50.	100.	10 D	740	185	10
S 50.	50.	150.	6 D	599	138	8	S 75.	50.	300.	12 D	860	185	8	S100.	50.	200.	10 D	1060	185	10
S 50.	50.	200.	6 D	659	138	8	S 75.	50.	300.	20 D	1260	185	8	S100.	50.	100.	18 D	1260	185	10
S 50.	50.	70.	12 D	747	138	8	S 75.	50.	100.	22 D	1060	185	8	S100.	50.	300.	18 D	1460	185	10
S 50.	50.	100.	12 D	783	138	8	S 75.	50.	200.	30 D	1460	185	8	S100.	50.	200.	24 D	1860	185	10
S 50.	50.	150.	12 D	837	138	8	S 75.	50.	300.	40 D	1860	185	8	S100.	50.	300.	30 D	1860	185	10
S 50.	50.	200.	12 D	897	138	8														
S 50.	50.	300.	12 D	660	185	8														
S 50.	50.	400.	12 D	660	185	8														
S 50.	50.	70.	20 D	660	185	8														
S 50.	50.	100.	20 D	660	185	8														
S 50.	50.	150.	20 D	740	185	8														
S 50.	50.	200.	20 D	740	185	8														
S 50.	50.	300.	20 D	860	185	8														
S 50.	50.	400.	20 D	860	185	8														
S 50.	50.	300.	30 D	792	185	8														
S 50.	50.	400.	40 D	974	185	8														

For all other dimensions see type S.

D: Patented power bypass with integrated hydraulic end position cushion is standard. Available on request for other units.

See data sheet 10.06 for a comprehensive TOX®-Powerpackage program type EL with pneumatic spring.

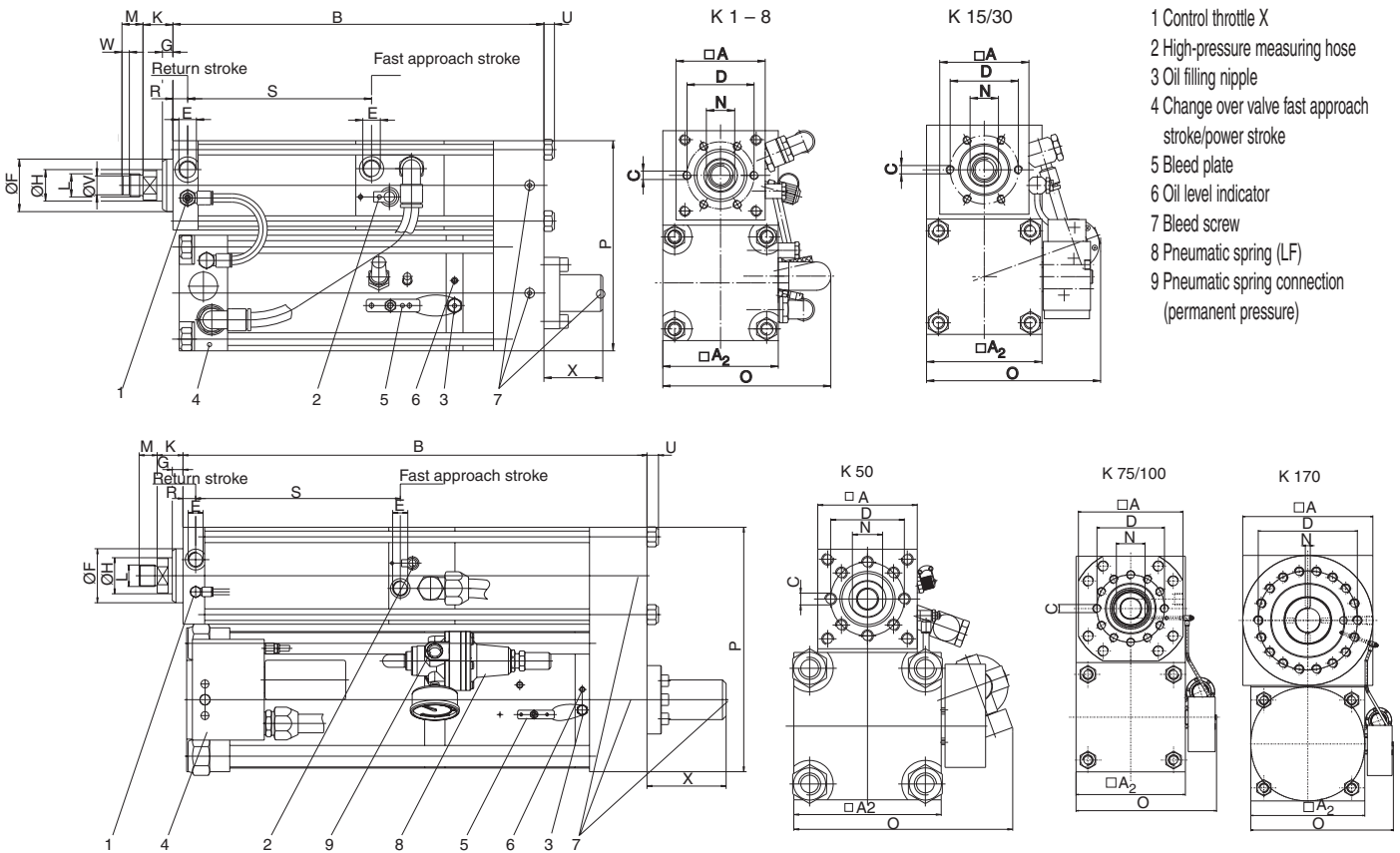
Note:

TOX®-Powerpackages version .50 with long power strokes have a great overall length due to design reasons. If this is inconvenient for your application we recommend to use a KT-system with intensifier model .50 and working cylinder AT or hydraulic cylinder HZ.

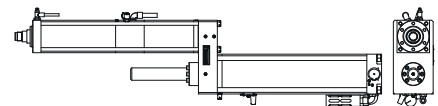
TOX®-Powerpackage type K 6 bar

version .30, compact design, 10 – 1600 kN

Patented power bypass with integrated retract hydraulic cushion is available on request and in varying assembly versions.



Example Z-shape assembly option.
Mounting flange and air connection can be delivered mounted in multiple positions. See the internet for more information: www.tox-en.com



Order no.	type	incl. total stroke	incl. power stroke	max. force at 6 bar compressed air	fast approach force at 6 bar	retracting force at 6 bar	NEW: these cylinders can be substituted with our line-Q. Short lead time, favorable price, with stroke inquiry (see leaflet line-Q)																						
							Preferred series																						
							A	A ₂	B	C	D	E	F ₁₇	G	H	K	L	M	N	O	P	R	S	U	Vg6	W	X	*LF	**IV
K 1.30.	100.	6	10,7	69	73	50	70	322	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	106	124	11,5	156,5	6	-	-	23	-	x	
K 1.30.	200.	10	10,7	69	73	50	70	514	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	106	124	11,5	256,5	6	-	-	-	-	x	
K 2.30.	100.	5	15,7	142	148	70	85	327	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	166	8	-	-	25	-	x	
K 2.30.	200.	12	15,7	142	148	70	85	527	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	266	8	-	-	-	-	x	
K 4.30.	100.	5	38,5	184	195	85	110	353	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	175	10	18	7	23	-	x	
K 4.30.	200.	10	38,5	184	195	85	110	553	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	275	10	18	7	-	-	x	
K 8.30.	100.	5	69,0	321	327	110	135	365	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	176	250	15	183	12	26	7	56	-	x	
K 8.30.	200.	10	69,0	321	327	110	135	565	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	176	250	17	283	12	26	7	30	-	x	
K 15.30.	100.	10	129,6	477	518	135	200	585	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	184,5	16	26	7	110	x	-	
K 15.30.	200.	10	129,6	477	518	135	200	645	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	284,5	16	26	7	110	x	-	
K 30.30.	200.	10	320,8	708	874	170	267	740	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	336	22	-	-	175	x	-	
K 50.30.	100.	10	394,9	785	1083	200	324	715	8xM20x30	150	G3/4	115	25	63	52	M42x2	40	55	540	530	23	243	30	-	-	140	x	-	
K 50.30.	200.	10	394,9	785	1083	200	324	785	8xM20x30	150	G3/4	115	25	63	52	M42x2	40	55	540	530	23	343	30	-	-	160	x	-	
K 75.30.	200.	10D	806,7	1429	1972	310	368	979	12xM24x40	200	G1"	150	20	100	60	M64x2	60	85	589,5	681	35	353	30	-	-	147	x	x	
K 100.30.	200.	10D	1000,1	1429	1972	310	368	1109	12xM24x40	200	G1"	150	20	100	60	M64x2	60	85	589,5	681	35	353	30	-	-	236	x	x	
K 170.30.	200.	10D	1627,8	1822	2447	420	368	1404	18xM30x55	320	G1"	240	35	150	70	M80x2	80	4xØ16	589,5	792	99	843	30	-	-	433	x	x	

*LF: Series incorporating pneumatic spring. See page 8.

**IV: Integrated valve

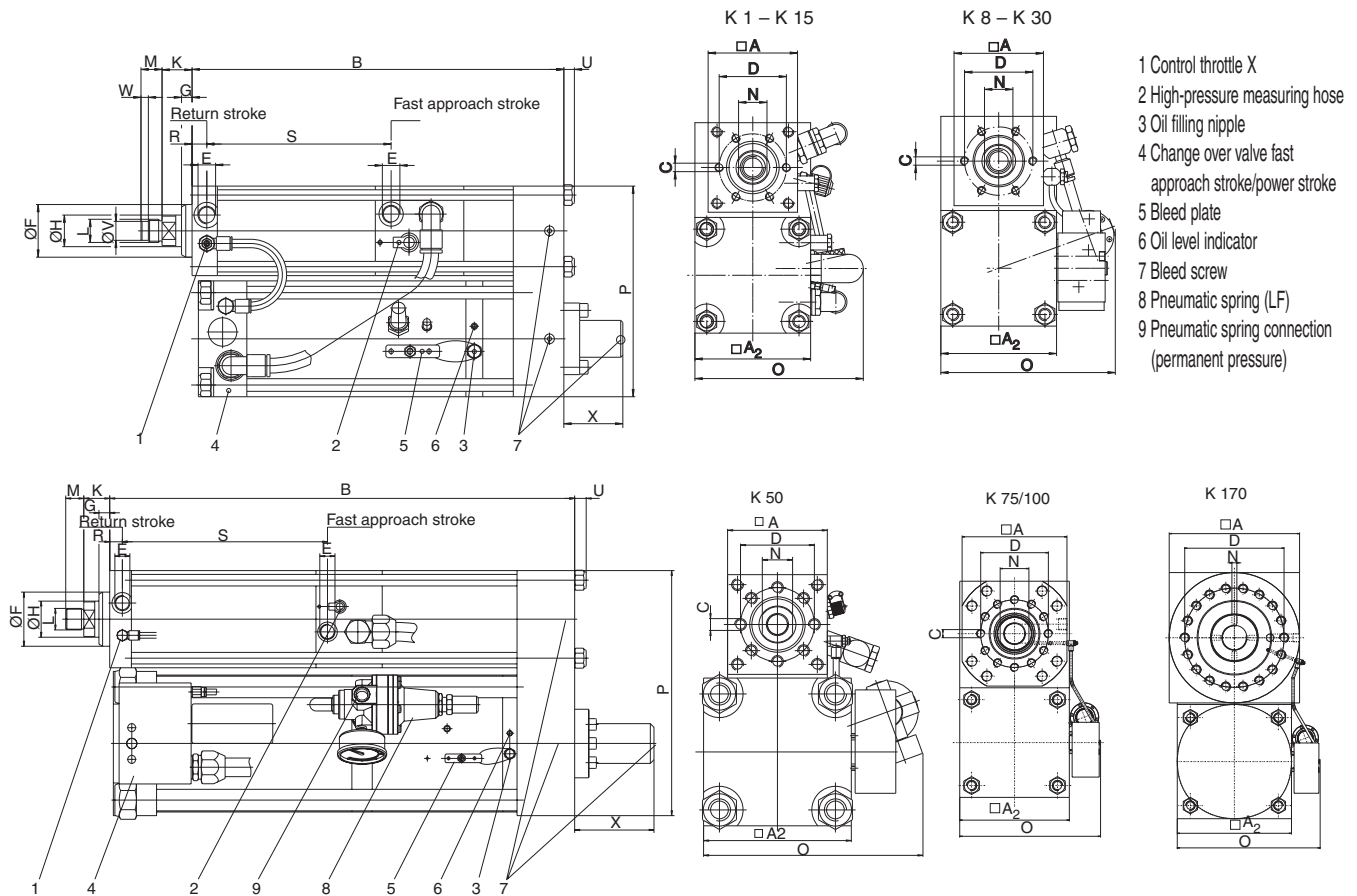
D: Patented power bypass with integrated hydraulic end position cushion is standard. Available on request for other units.

See data sheet 10.06 for a comprehensive TOX®-Powerpackage program type EL with pneumatic spring.

TOX®-Powerpackage type K 10 bar

compact design, 10 – 1710 kN

Patented power bypass with integrated retract hydraulic cushion is available on request and in varying assembly versions.



Order no.	incl. total stroke	power stroke	fast ap- retract-		Preferred series																						
			max. force at 6 bar	max. force at 10 bar	max. force at 10 bar	max. force at 10 bar	A	A ₂	B	C	D	E	F ₁₇	G	H	K	L	M	N	O	P	R	S	U	Vg6	W	X
K 1. 50. 5	5,6	9,8	115	123	50	-	219	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	104	11,5	106,5	-	-	-	17	-	x
K 1. 100. 10	5,6	9,8	115	123	50	-	319	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	104	11,5	156,5	-	-	-	30	-	x
K 1. 150. 10	5,6	9,8	115	123	50	-	411	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	104	11,5	206,5	-	-	-	-	-	x
K 1. 200. 10	5,6	9,8	115	123	50	-	511	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	104	11,5	256,5	-	-	-	-	-	x
K 1. 100. 15	7,1	12,6	115	123	50	70	322	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	106	124	11,5	156,5	6	-	-	23	-	x
K 1. 150. 20	7,1	12,6	115	123	50	70	414	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	106	124	11,5	206,5	6	-	-	-	-	x
K 1. 200. 20	7,1	12,6	115	123	50	70	514	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	106	124	11,5	256,5	6	-	-	-	-	x
K 1. 250. 20	7,1	12,5	115	123	50	70	614	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	116	124	11,5	306,5	6	-	-	-	-	x
K 1. 250. 40	7,1	12,5	115	123	50	85	620	6xM6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	116	140	11,5	306,5	6	-	-	-	-	x
K 2. 50. 4	11,5	20,3	236	250	70	-	227	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	106	145	13	116	8	-	-	23	-	x
K 2. 100. 8	11,5	20,3	236	250	70	-	327	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	106	145	13	166	8	-	-	30	-	x
K 2. 100. 12	11,5	20,0	237	249	70	85	327	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	166	8	-	-	25	-	x
K 2. 150. 12	11,5	20,3	236	250	70	-	427	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	106	145	13	216	8	-	-	30	-	x
K 2. 200. 12	11,5	20,3	236	250	70	-	527	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	106	145	13	266	8	-	-	30	-	x
K 2. 150. 20	11,5	20,0	237	249	70	85	427	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	216	8	-	-	23	-	x
K 2. 200. 24	11,5	20,0	237	249	70	85	527	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	266	8	-	-	-	-	x
K 2. 300. 20	11,5	20,0	237	249	70	85	727	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	366	8	-	-	-	-	x
K 2. 300. 50	11,7	20,3	236	249	70	110	740	6xM8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	165	185	13	366	8	-	-	-	-	x
K 4. 100. 6	22,7	39,7	307	328	85	-	345	6xM8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	116	175	14	175	10	18	7	43	-	x
K 4. 150. 8	22,7	39,7	307	328	85	-	445	6xM8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	116	175	14	225	10	18	7	43	-	x
K 4. 200. 12	22,7	39,7	307	328	85	-	545	6xM8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	116	175	14	275	10	18	7	56	-	x
K 4. 100. 10	23,2	40,2	307	328	85	110	353	6xM8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	175	10	18	7	23	-	x
K 4. 150. 20	23,2	40,2	307	328	85	110	453	6xM8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	225	10	18	7	23	-	x

*LF: Series incorporating pneumatic spring. See page 8.

**IV: Integrated valve

See data sheet 10.06 for a comprehensive TOX®-Powerpackage program type EL with pneumatic spring.

TOX[®]-Powerpackage type K 10 bar

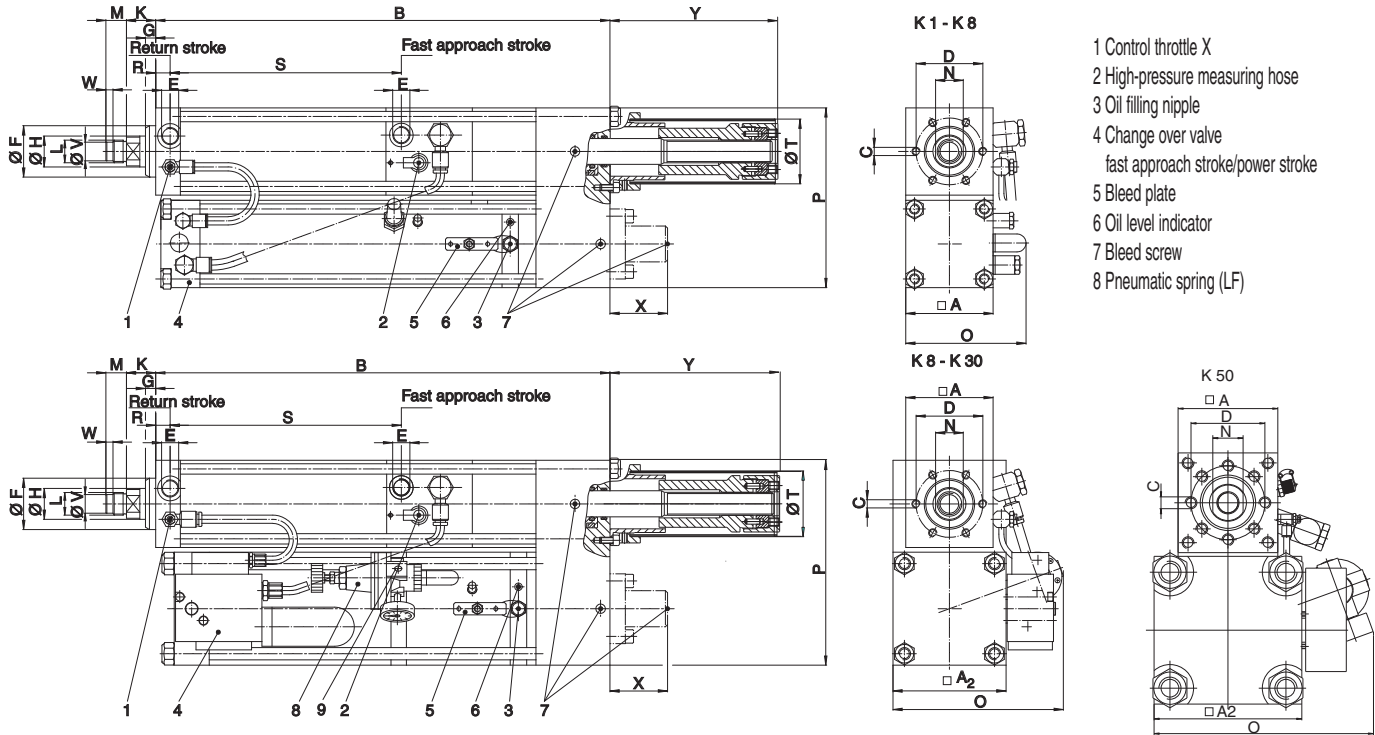
compact design, 10 – 1710 kN

Order no.	incl.		max. force				fast ap- retract-				Preferred series																								
	total	power	at com-		proach-		ing		force																			force							
type	stroke	stroke	6 bar	10 bar	at 10 bar		daN		daN		daN		A	A ₂	B	C	D	E	F ₁₇	G	H	K	L	M	N	O	P	R	S	U	Vg6	W	X	*LF**IV	
K 4. 200. 20	23,2	40,2	307	328	85	110	553	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	275	10	18	7	-	-	x								
K 4. 300. 20	23,2	40,2	307	328	85	110	753	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	375	10	18	7	-	-	x								
K 4. 400. 20	23,2	40,2	307	328	85	110	953	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	475	10	18	7	-	-	x								
K 4. 300. 50	23,2	40,2	307	328	85	135	759	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	176	225	14	375	10	18	7	-	-	x								
K 4. 400. 50	23,2	40,2	307	328	85	135	959	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	176	225	14	475	10	18	7	-	-	x								
K 8. 100. 5	44,4	77,0	532	553	110	-	371	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	165	225	15	183	-	26	7	23	-	x								
K 8. 100. 10	44,4	77,0	533	552	110	135	365	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	176	250	15	183	12	26	7	56	-	x								
K 8. 150. 5	44,4	77,0	532	553	110	-	471	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	165	225	15	233	-	26	7	23	-	x								
K 8. 200. 10	44,4	77,0	532	553	110	-	571	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	165	225	15	283	-	26	7	23	-	x								
K 8. 150. 15	44,4	77,0	533	552	110	135	465	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	176	250	15	233	12	26	7	35	-	x								
K 8. 200. 20	44,4	77,0	533	552	110	135	565	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	176	250	15	283	12	26	7	30	-	x								
K 8. 300. 20	44,4	77,0	533	552	110	135	765	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	176	250	15	383	12	26	7	-	-	x								
K 8. 400. 20	44,4	77,0	533	552	110	135	965	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	176	250	15	483	12	26	7	-	-	x								
K 8. 300. 50	44,4	77,0	541	544	110	170	765	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	290	285	15	383	12	26	7	143	x	-								
K 8. 400. 50	44,4	77,0	541	544	110	170	965	6xM10x16	88	G1/2	70	10	45	35	M30x2	25	36	290	285	15	483	12	26	7	-	x	-								
K 15. 150. 5	85,4	148,0	764	905	135	-	470	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	176	275	17,5	234,5	16	26	7	46	-	x								
K 15. 200. 5	85,4	148,0	764	905	135	-	570	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	176	275	17,5	284,5	16	26	7	46	-	x								
K 15. 100. 10	85,0	149,5	781	889	135	200	525	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	184,5	16	26	7	40	x	-								
K 15. 200. 10	85,0	149,5	781	889	135	200	585	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	284,5	16	26	7	40	x	-								
K 15. 300. 10	85,0	149,5	781	889	135	200	785	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	384,5	16	26	7	26	x	-								
K 15. 400. 10	85,0	149,5	781	889	135	200	985	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	484,5	16	26	7	26	x	-								
K 15. 100. 20	85,0	149,5	781	889	135	200	585	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	184,5	16	26	7	110	x	-								
K 15. 200. 20	85,0	149,5	781	889	135	200	645	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	284,5	16	26	7	110	x	-								
K 15. 300. 20	85,0	149,5	781	889	135	200	785	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	384,5	16	26	7	105	x	-								
K 15. 400. 20	85,0	149,5	781	889	135	200	985	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	320	340	17,5	484,5	16	26	7	26	x	-								
K 15. 100. 40	84,6	155,7	781	889	135	267	670	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	470	410	17,5	184,5	16	26	7	150	x	-								
K 15. 200. 40	84,6	155,7	781	889	135	267	670	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	470	410	17,5	284,5	16	26	7	150	x	-								
K 15. 300. 40	84,6	155,7	781	889	135	267	785	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	470	410	17,5	384,5	16	26	7	100	x	-								
K 15. 400. 40	84,6	155,7	781	889	135	267	985	6xM16x25	100	G1/2	75	15	50	36	M30x2	25	41	470	410	17,5	484,5	16	26	7	26	x	-								
K 30. 100. 5	170,0	313,4	1149	1509	170	267	555	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	236	22	-	-	30	x	-								
K 30. 150. 5	170,0	313,4	1149	1509	170	267	555	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	286	22	-	-	30	x	-								
K 30. 200. 5	170,0	313,4	1149	1509	170	267	645	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	336	22	-	-	30	x	-								
K 30. 100. 10	170,0	313,4	1149	1509	170	267	585	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	236	22	-	-	45	x	-								
K 30. 200. 10	170,0	313,4	1149	1509	170	267	645	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	336	22	-	-	50	x	-								
K 30. 300. 10	170,0	313,4	1149	1509	170	267	840	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	436	22	-	-	30	x	-								
K 30. 400. 10	170,0	313,4	1149	1509	170	267	1040	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	536	22	-	-	30	x	-								
K 30. 200. 20	170,0	313,4	1149	1509	170	267	740	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	336	22	-	-	170	x	-								
K 30. 300. 20	170,0	313,4	1149	1509	170	267	840	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	436	22	-	-	82	x	-								
K 30. 400. 20	170,0	313,4	1149	1509	170	267	1040	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	536	22	-	-	40	x	-								
K 30. 200. 40	170,0	313,4	1149	1509	170	267	880	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	336	22	-	-	310	x	-								
K 30. 300. 40	170,0	313,4	1149	1509	170	267	940	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	436	22	-	-	310	x	-								
K 30. 400. 40	170,0	313,4	1149	1509	170	267	1040	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	470	445	20	536	22	-	-	300	x	-								
K 50. 100. 10	283,2	515,0	1259	1887	200	324	635	8xM20x30	150	G3/4	115	25	63	52	M42x2	40	55	540	530	23	243	30	-	-	50	x	-								
K 50. 200. 10	283,2	515,0	1259	1887	200	324	705	8xM20x30	150	G3/4	115	25	63	52	M42x2	40	55	540	530	23	343	30	-	-	70	x	-								
K 50. 300. 10	283,2	515,0	1259	1887	200	324	855	8xM20x30	150	G3/4	115	25	63	52	M42x2	40	55	540	530	23	443	30	-	-	80	x	-								
K 50. 100. 20	283,2	515,0	1259	1887	200																														

TOX®-Powerpackage type K 10 bar and 6 bar

version .51, compact design with total stroke adjustment, 10 – 500 kN (6 bar on request, version .81)

Stroke length and hence LDC position adjustable. For pulling operations a special execution is available.
Patented power bypass with integrated retract hydraulic cushion is available on request and in varying assembly versions.



Order no.	ver- type	total stroke	incl. power stroke	max. force		fast ap- retract- proach ing																*LF**IV									
				at com- pressed air 6 bar	10 bar	force at 10 bar	force	A	A ₂	B	C	D	E	F ₁₇	G	H	K	L	M	N	O		P	R	S	T	Vg6	W	X	Y	
K 1. 51. 50. 5				5,1	9,0	99	123	50	-	241	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	104	11,5	106,5	40	-	-	-	146	-	x
K 1. 51. 100. 10				5,1	9,0	99	123	50	-	341	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	104	11,5	156,5	40	-	-	-	246	-	x
K 1. 51. 150. 10				5,1	9,0	99	123	50	-	441	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	104	11,5	206,5	40	-	-	-	346	-	x
K 1. 51. 200. 10				5,1	9,0	99	123	50	-	541	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	86	104	11,5	256,5	40	-	-	-	446	-	x
K 1. 51. 100. 15				6,5	11,6	99	123	50	70	341	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	106	124	11,5	156,5	40	-	-	-	246	-	x
K 1. 51. 150. 20				6,5	11,6	99	123	50	70	441	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	106	124	11,5	206,5	40	-	-	-	346	-	x
K 1. 51. 200. 20				6,5	11,6	99	123	50	70	541	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	106	124	11,5	256,5	40	-	-	-	446	-	x
K 1. 51. 250. 20				6,5	11,4	99	123	50	70	641	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	116	140	11,5	306,5	40	-	-	-	546	-	x
K 1. 51. 250. 40				6,5	11,4	99	123	50	85	641	6xM 6x11	40	G1/8	30	10	16	24	M12x1,5	12	14	116	140	11,5	306,5	40	-	-	-	546	-	x
K 2. 51. 50. 4				11,3	20,0	208	250	70	-	266	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	106	145	13	116	63	-	-	-	161	-	x
K 2. 51. 100. 8				11,3	20,0	208	250	70	-	366	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	106	145	13	166	63	-	-	-	261	-	x
K 2. 51. 150. 12				11,3	20,0	208	250	70	-	466	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	106	145	13	216	63	-	-	-	361	-	x
K 2. 51. 200. 12				11,3	20,0	208	250	70	-	566	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	106	145	13	266	63	-	-	-	461	-	x
K 2. 51. 100. 12				11,3	19,7	209	249	70	85	366	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	166	63	-	-	-	261	-	x
K 2. 51. 150. 20				11,3	19,7	209	249	70	85	466	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	226	63	-	-	-	361	-	x
K 2. 51. 200. 24				11,3	19,7	209	249	70	85	566	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	116	160	13	286	63	-	-	-	461	-	x
K 2. 51. 300. 20				11,5	20,0	208	249	70	85	766	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	165	185	13	366	63	-	-	-	661	-	x
K 2. 51. 300. 50				11,5	20,0	208	249	70	110	766	6xM 8x12	54	G1/4	40	10	20	26	M16x1,5	15	17	165	185	13	366	63	-	-	-	661	-	x
K 4. 51. 100. 6				24,1	42,1	256	327	85	-	377	6xM 8x15	64	G3/8	50	10	30	28,5 M22x2	20	24	116	175	14	175	63	18	7	70	266	-	x	
K 4. 51. 150. 8				24,1	42,1	256	327	85	-	477	6xM 8x15	64	G3/8	50	10	30	28,5 M22x2	20	24	116	175	14	225	63	18	7	70	366	-	x	
K 4. 51. 200. 12				24,1	42,1	256	327	85	-	577	6xM 8x15	64	G3/8	50	10	30	28,5 M22x2	20	24	116	175	14	275	63	18	7	70	466	-	x	
K 4. 51. 100. 10				24,6	42,7	255	328	85	110	377	6xM 8x15	64	G3/8	50	10	30	28,5 M22x2	20	24	165	200	14	175	63	18	7	-	266	-	x	
K 4. 51. 150. 20				24,6	42,7	255	328	85	110	477	6xM 8x15	64	G3/8	50	10	30	28,5 M22x2	20	24	165	200	14	225	63	18	7	-	366	-	x	

*LF: Series incorporating pneumatic spring. See page 8.

**IV: Integrated valve

See data sheet 10.06 for a comprehensive TOX®-Powerpackage program type EL with pneumatic spring.

TOX®-Powerpackage type K 10 bar and 6 bar

version .51, compact design with total stroke adjustment, 10 – 500 kN (6 bar on request, version .81)

Order no.	ver- type	total stroke	incl. power stroke	fast ap- retract- proach ing force force				<div style="display: flex; align-items: center; justify-content: center;"> </div>																				*LF**IV			
				max. force at compressed air 6 bar	max. force at compressed air 10 bar	max. force at compressed air at 10 bar	max. force at compressed air at 10 bar	A	A ₂	B	C	D	E	F ₁₇	G	H	K	L	M	N	O	P	R	S	T	Vg6	W		X	Y	
K 4. 51. 200. 20		200	20	24,6	42,7	255	328	85	110	577	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	275	63	18	7	-	466	-	x
K 4. 51. 300. 20		300	20	24,6	42,7	255	328	85	110	777	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	375	63	18	7	-	666	-	x
K 4. 51. 400. 20		400	20	24,6	42,7	255	328	85	110	977	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	165	200	14	475	63	18	7	-	866	-	x
K 4. 51. 300. 50		300	50	24,6	42,7	256	327	85	135	777	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	176	225	14	375	63	18	7	-	666	-	x
K 4. 51. 400. 50		400	50	24,6	42,7	256	327	85	135	977	6xM 8x15	64	G3/8	50	10	30	28,5	M22x2	20	24	176	225	14	475	63	18	7	-	866	-	x
K 8. 51. 100. 5		100	5	45,2	78,4	454	553	110	-	392	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	165	225	15	183	90	26	7	-	273	-	x
K 8. 51. 100. 10		100	10	45,2	78,4	455	552	110	-	392	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	176	250	15	183	90	26	7	47	273	-	x
K 8. 51. 150. 5		150	5	45,2	78,4	454	553	110	-	492	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	165	225	15	233	90	26	7	-	373	-	x
K 8. 51. 200. 10		200	10	45,2	78,4	454	553	110	-	592	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	165	225	15	283	90	26	7	-	473	-	x
K 8. 51. 150. 15		150	15	45,2	78,4	455	552	110	135	492	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	176	250	15	233	90	26	7	47	373	-	x
K 8. 51. 200. 20		200	20	45,2	78,4	455	552	110	135	592	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	176	250	15	283	90	26	7	47	473	-	x
K 8. 51. 300. 20		300	20	45,2	78,4	455	552	110	135	792	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	176	250	15	383	90	26	7	-	673	-	x
K 8. 51. 400. 20		400	20	45,2	78,4	455	552	110	135	992	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	176	250	15	483	90	26	7	-	873	-	x
K 8. 51. 300. 50		300	50	45,2	78,4	464	543	110	170	792	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	241	285	15	383	90	26	7	92	673	x	x
K 8. 51. 400. 50		400	50	45,2	78,4	464	543	110	170	992	6xM10x16	88	G3/8	70	10	45	35	M30x2	25	36	241	285	15	483	90	26	7	-	873	x	x
K 15. 51. 150. 5		150	5	89,3	155,0	600	904	135	-	506	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	176	275	17,5	234,5	110	26	7	46	389	-	x
K 15. 51. 200. 5		200	5	89,3	155,0	600	907	135	-	606	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	176	275	17,5	284,5	110	26	7	46	489	-	x
K 15. 51. 100. 10		100	10	88,9	156,6	618	886	135	200	535	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	271	340	17,5	184,5	110	26	7	50	289	x	-
K 15. 51. 200. 10		200	10	88,9	156,6	618	886	135	200	655	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	271	340	17,5	284,5	110	26	7	70	489	x	-
K 15. 51. 300. 10		300	10	88,9	156,6	618	886	135	200	855	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	271	340	17,5	384,5	110	26	7	26	689	x	-
K 15. 51. 400. 10		400	10	88,9	156,6	618	886	135	200	1055	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	271	340	17,5	484,5	110	26	7	26	889	x	-
K 15. 51. 100. 20		100	20	88,9	156,6	618	886	135	200	595	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	271	340	17,5	184,5	110	26	7	110	289	x	-
K 15. 51. 200. 20		200	20	88,9	156,6	618	886	135	200	655	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	271	340	17,5	284,5	110	26	7	110	489	x	-
K 15. 51. 300. 20		300	20	88,9	156,6	618	886	135	200	855	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	271	340	17,5	384,5	110	26	7	105	689	x	-
K 15. 51. 400. 20		400	20	88,9	156,6	618	886	135	200	1055	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	271	340	17,5	484,5	110	26	7	26	889	x	-
K 15. 51. 100. 40		100	40	88,5	163,2	618	886	135	267	655	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	410	410	17,5	184,5	110	26	7	100	289	x	-
K 15. 51. 200. 40		200	40	88,5	163,2	618	886	135	267	655	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	410	410	17,5	284,5	110	26	7	100	489	x	-
K 15. 51. 300. 40		300	40	88,5	163,2	618	886	135	267	855	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	410	410	17,5	384,5	110	26	7	100	689	x	-
K 15. 51. 400. 40		400	40	88,5	163,2	618	886	135	267	1055	6xM16x25	100	G3/8	75	15	50	36	M30x2	25	41	410	410	17,5	484,5	110	26	7	100	889	x	-
K 30. 51. 100. 5		100	5	162,6	299,8	999	1512	170	267	575	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	236	125	-	-	35	307	x	-
K 30. 51. 150. 5		150	5	162,6	299,8	999	1512	170	267	575	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	286	125	-	-	35	407	x	-
K 30. 51. 200. 5		200	5	162,6	299,8	999	1512	170	267	660	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	386	125	-	-	35	507	x	-
K 30. 51. 100. 10		100	10	162,6	299,8	999	1512	170	267	605	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	236	125	-	-	65	307	x	-
K 30. 51. 200. 10		200	10	162,6	299,8	999	1512	170	267	700	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	336	125	-	-	50	507	x	-
K 30. 51. 300. 10		300	10	162,6	299,8	999	1512	170	267	860	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	436	125	-	-	26	707	x	-
K 30. 51. 400. 10		400	10	162,6	299,8	999	1512	170	267	1060	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	536	125	-	-	26	907	x	-
K 30. 51. 200. 20		200	20	162,6	299,8	999	1512	170	267	760	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	336	125	-	-	170	507	x	-
K 30. 51. 300. 20		300	20	162,6	299,8	999	1512	170	267	860	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	436	125	-	-	110	707	x	-
K 30. 51. 400. 20		400	20	162,6	299,8	999	1512	170	267	1060	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	536	125	-	-	40	907	x	-
K 30. 51. 200. 40		200	40	162,6	299,8	999	1512	170	267	900	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	336	125	-	-	310	507	x	-
K 30. 51. 300. 40		300	40	162,6	299,8	999	1512	170	267	960	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	436	125	-	-	330	707	x	-
K 30. 51. 400. 40		400	40	162,6	299,8	999	1512	170	267	1060	6xM20x30	132	G3/4	100	18	56	47	M39x2	35	50	410	445	20	536	125	-	-	300	907	x	-
K 50. 51. 100. 10		100	10	277,1	504,1	977	1889	200	324	660	8xM20x30	150	G1/2	115	25	63	52	M42x2	40	55	500	530	23	243	140	-	-	90	313	x	-
K 50. 51. 200. 10		200	10	277,1	504,1	977	1889	200	324	730	8xM20x30	150	G1/2	115	25	63	52	M42x2	40	55	500	530	23	343	140	-	-	45	513	x	-
K 50. 51. 300. 10		300	10	277,1	504,1	977	1889	200	324	880	8xM20x30	150	G1/2	115	25	63	52	M42x2	40	55	500	530	23	443	140	-	-	50	713	x	-
K 50. 51. 100. 20		100	20																												

TOX®-Powerpackage type T

The "Turbo" Cylinder with cycle speeds up to 550 strokes/min.
Includes integrated power bypass.

- Advantages:**
- Patented power bypass
 - Constant press force
 - Can be mounted in any orientation
 - Internal positive stop

This cylinder is ideal for punching and nibbling machines providing optimum performance. External dampening is recommended.

Function: the full stroke of the cylinder is power stroke. Constant air supply on retract side. Force is generated by the integrated air to oil intensifier. Features complete air to oil separation, integrated oil reservoir, precisely defined end positions, oil level indicator, standard oil refill nipple and high pressure measuring connection.

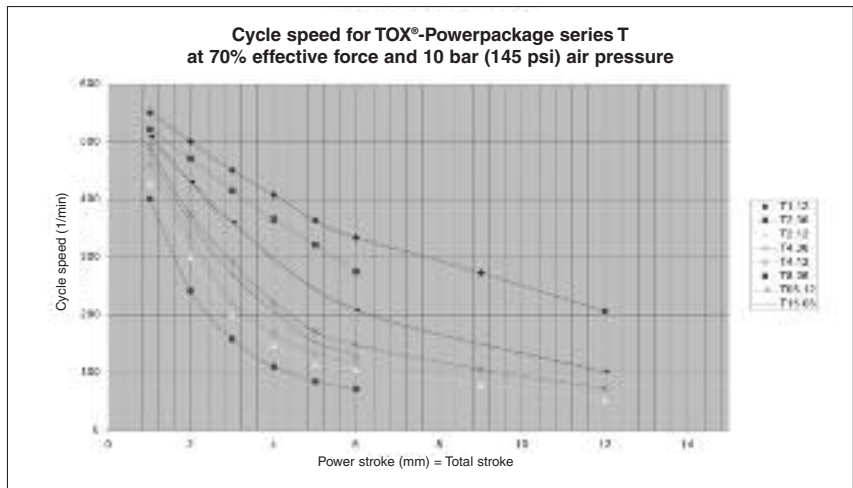
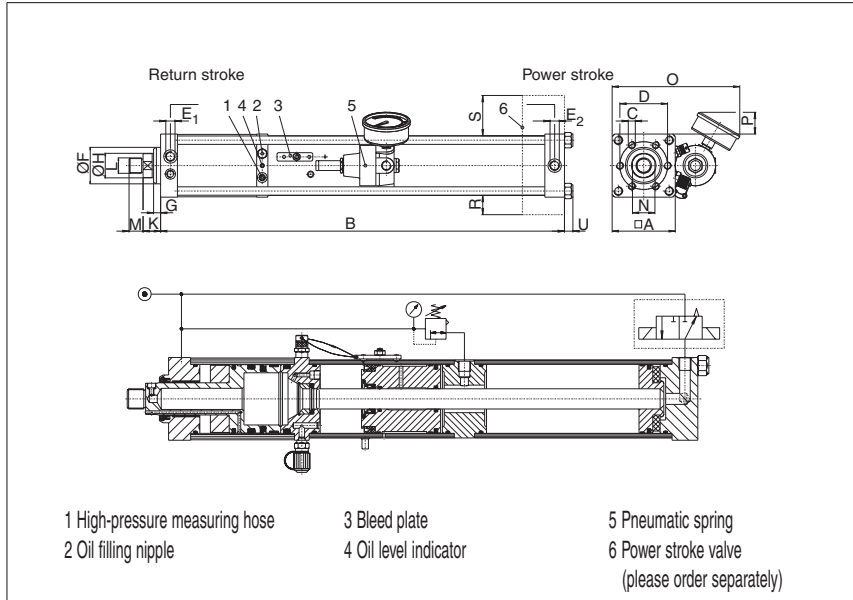
Controls: simple – like any single acting pneumatic cylinder. Return port is connected to a constant air supply. Min. air supply 3 bar.

Mounting: can be mounted in any orientation. Side loads on working rod are not permitted. We recommend use of a flexible coupling from our TOX®-Powerpackage accessories.

Accessories: high frequency pneumatic valve ZVT.

Order no.:

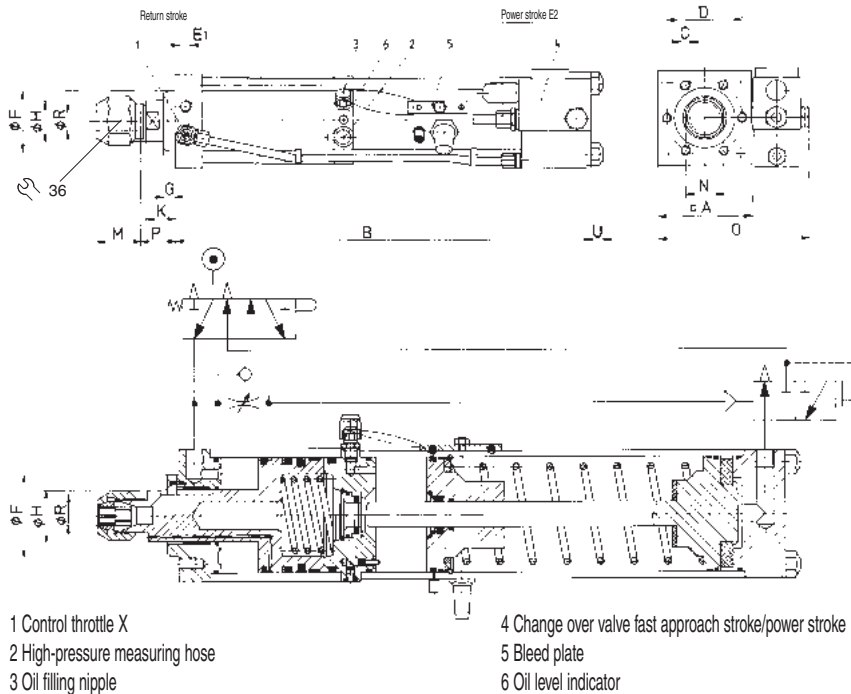
- ZVT - 1/4" (double solenoid 24V)
- ZVT - 1/2" (double solenoid 24V)



Order no.	total stroke	power stroke	max. force at compressed air		retracting force		Stroke positions																		
			6 bar	10 bar	at 6 bar	at 10 bar	A	B	C	D	E ₁	E ₂	F ₁₇	G	H	K	L	M	N	O	P	R	S	U	
type			kN	kN	daN	daN																			
T 1.12	12	12	7	12,5	30	59	65	465	6xM 6x12	54	G1/8	G1/4	45	10	30	25	M16x1,5	15	27	160	40	93	93	8	
T 2.06	6	6	13	23	30	59	65	465	6xM 6x12	54	G1/8	G1/4	45	10	30	25	M16x1,5	15	27	160	40	93	93	8	
T 2.12	12	12	11	20	77	150	80	514	6xM 8x12	65	G1/8	G1/4	52	10	35	25	M22x2	20	32	165	35	80	80	10	
T 4.06	6	6	22	39	77	150	80	514	6xM 8x12	65	G1/8	G1/4	52	10	35	25	M22x2	20	32	165	35	80	80	10	
T 4.12	12	12	23	41	128	245	90	576	6xM10x16	68	G1/4	G1/4	52	10	35	25	M22x2	20	32	185	25	75	75	12	
T 8.06	6	6	45	80	128	245	90	576	6xM10x16	68	G1/4	G1/4	52	10	35	25	M22x2	20	32	185	25	75	75	12	
T 8.12	12	12	35	63	230	445	110	582	6xM10x16	88	G1/4	G1/2	70	10	45	25	M30x2	25	36	220	40	110	110	12	
T 15.06	6	6	68	120	230	445	110	582	6xM10x16	88	G1/4	G1/2	70	10	45	25	M30x2	25	36	220	40	110	110	12	

TOX®-Powerpackage type RP for embossing operation

With anti-rotation device and spring chuck



Function: fast approach via built-in spring. Pneumatic-hydraulic power stroke activated at any point of fast approach. Return stroke entirely pneumatic. Force generated via pressure intensifier, absolute air/oil separation, integrated oil reservoir, oil level indicator and oil filling nipple, measuring and control connection for pressure gauge or pressure switch. This allows sequential functions to be controlled, such as return stroke activation, stamping depth adjustment, etc.

Change-over control from fast approach to power stroke takes place automatically according to the ram pressure principle. Valves included in the TOX®-Powerpackage as a standard supply. The speed of the change-over control can be regulated with control throttle X.

Attention: in the pressureless state the piston rod extends due to the spring-driven fast approach force. Return stroke air pressure: minimum 5 bar.

Order no.	incl. total stroke	incl. power stroke	max. force at compressed air		fast ap- proach force		retracting force		A	B	C	D	E ₁	E ₂	F ₁₇	G	H	K	M	N	O	P	R	U
			6 bar	10 bar	force	at 6 bar	at 10 bar																	
type	stroke	stroke	kN	kN	daN	daN	daN	daN																
RP 8. 32.	3	3	44	79	40	51	86	80	474	6xM 8x12	65	G1/8	G1/4	52	10	35	25	46,5	30	130	20	16	10	
RP 15. 32.	3	3	91	159	50	92	154	90	512	6xM10x16	68	G1/4	G1/4	52	10	35	25	46,5	30	140	20	16	12	

TOX®-Powerpackage with "Safety Rod Catcher"

Type ZSL

Safe locking of cylinder rod in the event of air pressure loss



Function:

The safety rod catcher is held open with air pressure. Loss of air pressure will cause the unit to clamp on the cylinder rod. The energy of the drifting or falling load is used to generate the clamping force. The clamping force increases as the load increases. Internal springs force wedges to clamp the cylinder rod once the air pressure drops. The rod catcher will prevent the cylinder rod from extending unless the static holding force is surpassed. The clamping force is released by applying air pressure and retracting the load.

Unlocking pressure:	min. 2 bar
Release pressure:	4 bar
Max. operating pressure:	10 bar

Controls:

Requires a 3/2 -way valve.

For most applications, use the diagram shown below. During each cycle, the 3/2-way valve is actuated electrically and releases the rod catcher unit. In cases of air pressure loss, power failure, emergency stop, or other failure mode, the rod catcher clamps the cylinder rod and stops the load.

The clamp position can be monitored with proximity sensors. We offer appropriate sensors of 45 and 70 mm length.

Recommendations:

If the plant air pressure fluctuates, such as a pressure drop at the start of cycle, it is recommended to install a check valve in the air supply line to the rod catcher control valve.

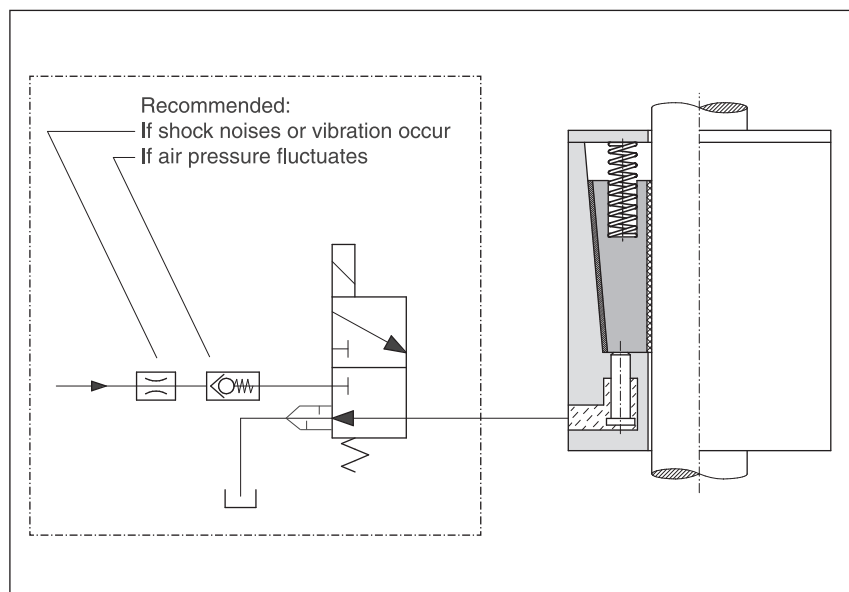
If shock noises or vibration occur during the release operation, a flow control valve can be installed in the air supply line to the rod catcher control valve.

Electrical control

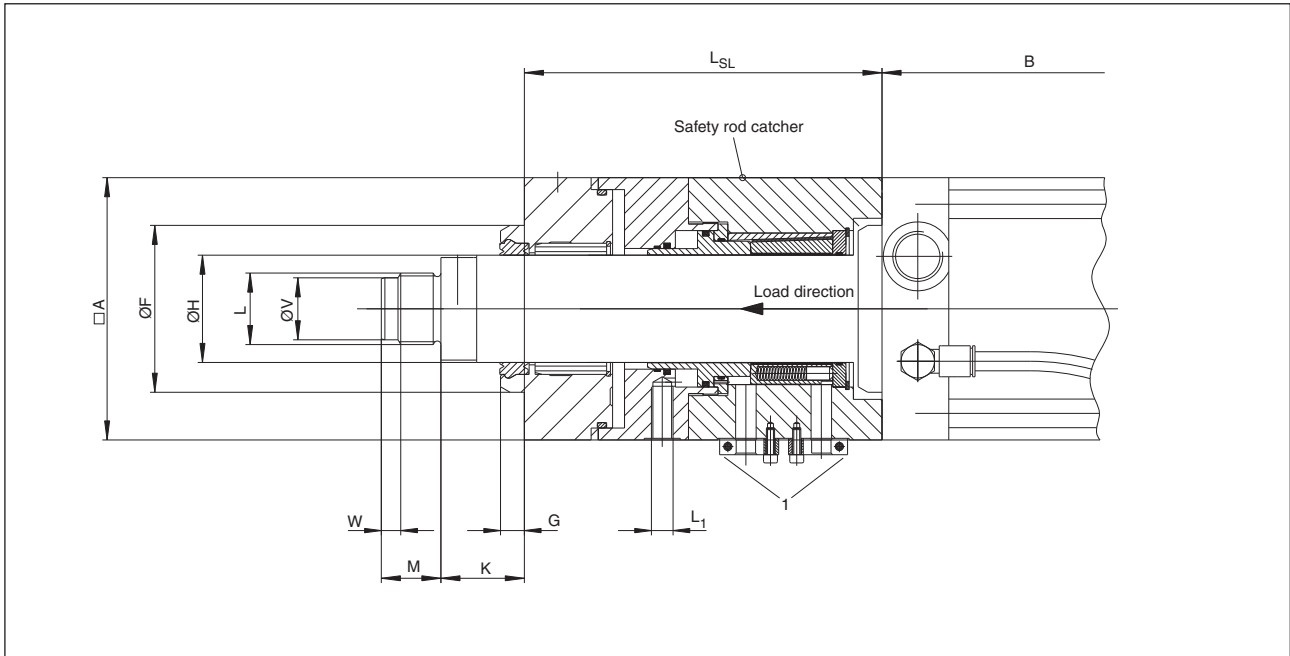
Electrical controls must conform to all applicable local and national regulations for presses. The buyer is responsible for correct installation and maintenance of safety systems.

Advantages:

- Rod catcher integrated on cylinder front flange
- Compact design
- Stroke independent
- Simple controls
- Clamps tighter with increasing load
- Clamps rod for unlimited time
- Approved by the German Occupational Safety Administration



----- Not included



Clamps **1** for Ø 12 mm sensors included with unit. Sensors are not included with unit.
Nominal switching distance of 2 mm (flush mountable).

Type	L _{SL} [mm]	L ₁	Allowable Load* [kN]	For TOX®-Power-package	Required length of sensors [mm]
ZSL 04	200	G1/4	10	S 04, K 04, AT 04	45
ZSL 08	200	G1/4	10	S 08, K 08, AT 08	45
ZSL 15	250	G1/4	15	S 15, K 15, AT 15	45
ZSL 30	256	G1/4	20	S 30, K 30, AT 30	70
ZSL 50	275	G3/8	25	S 50, K 50, AT 50	70
ZSL 100	on request	G3/8	on request	S 100, K 100, AT 100	
ZSL 170	414	G3/8	60	S 170, K 170, AT 170	

* Attention: max. retraction force of the cylinder must be considered.

All TOX®-Powerpackages type S and K, except for S 1, S 2, K 1 and K 2, can be supplied with the "Safety Rod Catcher" option.

Order no.:
S04.100.06D - ZSL

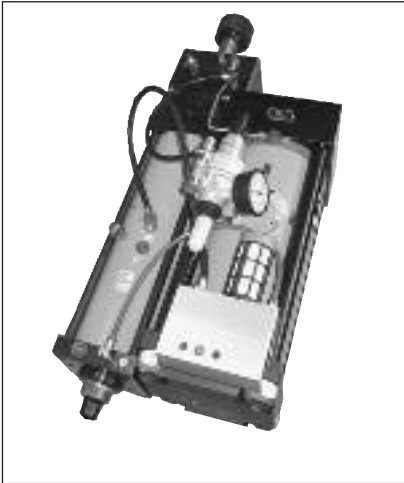
└─ Accessory Safety Rod Catcher
└─ TOX®-Power-package
└─ Order-No.

Accessories (to be ordered separately):

Sensor M12x1x45
Sensor M12x1x70
Cable 5 m long.

TOX®-Powerpackage type EK with Total Stroke Limiter and Adjustable End of Stroke Cushion

Type ZSD, Hydraulic cushion for cutting impact damping



Ideal for damping in punching applications and for smooth operation of machines during approach or power strokes. Available for all TOX®-Powerpackages type EK with total stroke limiter.

Advantages:

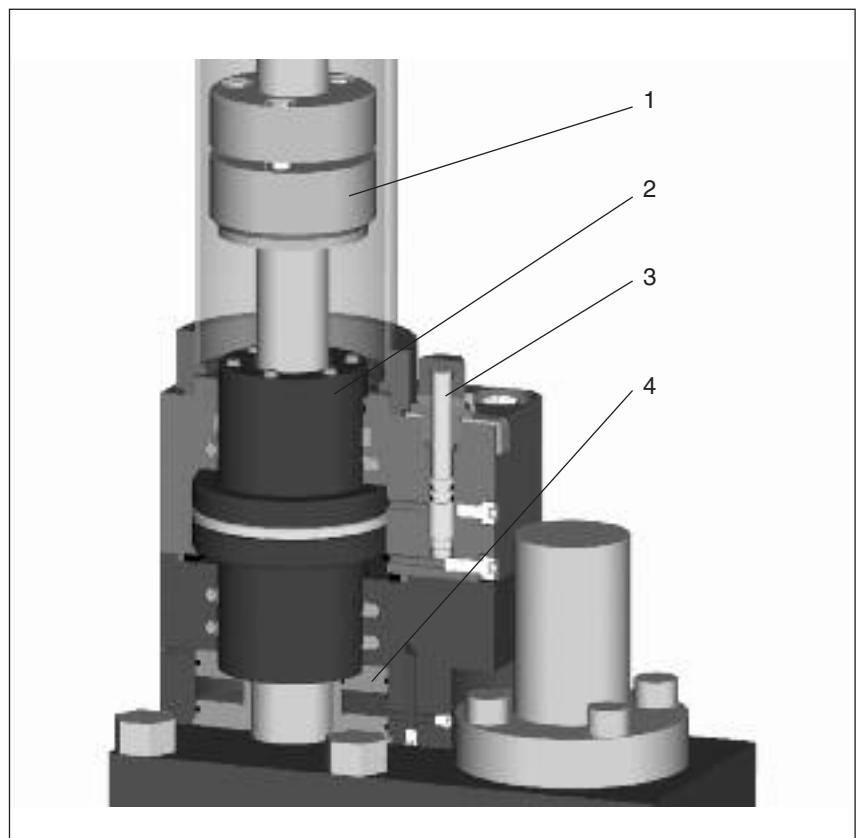
- Hydraulic damping of end of stroke
- Cushioning infinitely adjustable
- Total stroke infinitely adjustable
- Can be mounted in any orientation
- Protects tooling and machine
- Reduces noise levels
- Maintenance-free

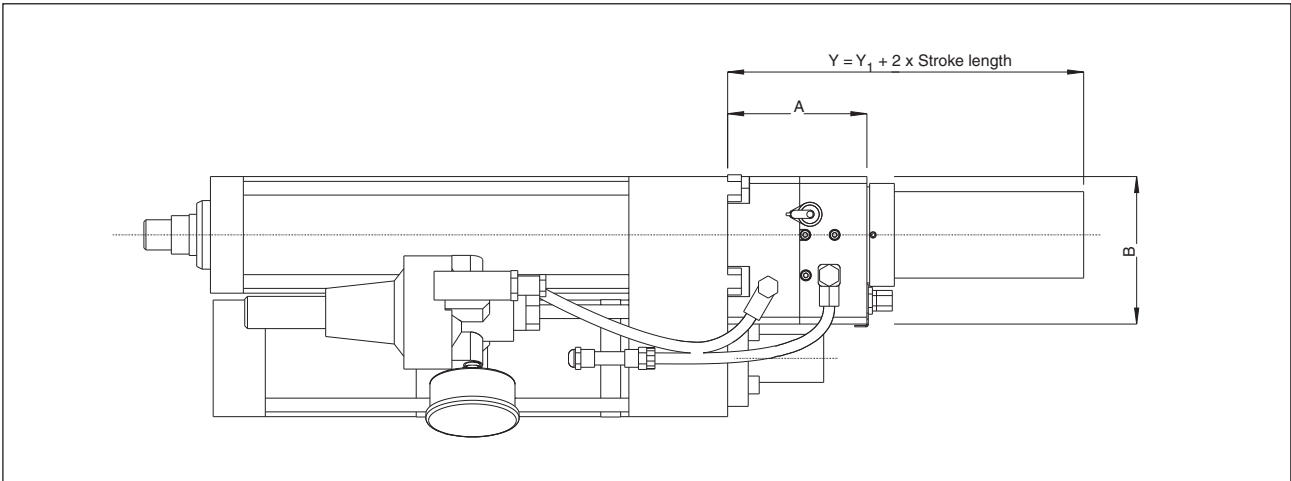
Function:

The adjusting nut (total stroke limiter) **1** contacts the damping piston **2** during approach or power stroke depending on the adjustment position. The damping piston **2** compresses hydraulic oil through the throttling needle **3**. The damping effect can be adjusted with the throttling needle **3**. During the return stroke, the damping piston **2** is pushed back to its original position by the pneumatic piston **4** and through the integrated bypass valves. The maximum damping stroke is approximately 7 mm.

Controls:

Pneumatic controls same as for the TOX®-Powerpackage.





Type	A	B	Y ₁	Y	For TOX®-Powerpackage type EK with total stroke limiter
ZSD 04	101,5	107,5	60	Y = Y ₁ + 2 x stroke length	for EK 04... for stroke 100 mm
ZSD 08	101,5	145	67		for EK 08... for stroke 100 mm
ZSD 15	120,5	181,5	83		for EK 15... for stroke 100 mm
ZSD 30	120,5	251	100		for EK 30... for stroke 100 mm
ZSD 50	122,5	295	105		for EK 50... for stroke 100 mm
ZSD 75/100	130	395	130		for EK 75.../EK100... for stroke 100 mm

Dimensions for all TOX®-Powerpackages type EK with total stroke limiter on request.
For stroke length, see data sheet 10.06 TOX®-Powerpackage with air spring.

Mounting:

Can be mounted in any orientation.
The hydraulic cushion works in any position.

The adjustable hydraulic cushion is completely installed on the cylinder.
No plumbing is required by customer.

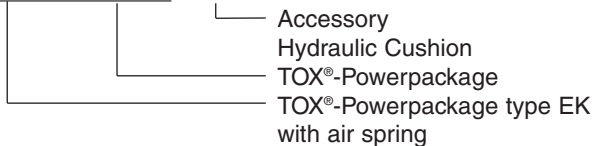
TOX®-Powerpackages with ZSD:

All TOX®-Powerpackages type EK with total stroke limiter starting from EK 04 in version 51 or 81 can be supplied with the ZSD option.

Please refer to data sheet 10.06 for the complete TOX®-Powerpackage program with air spring EK.

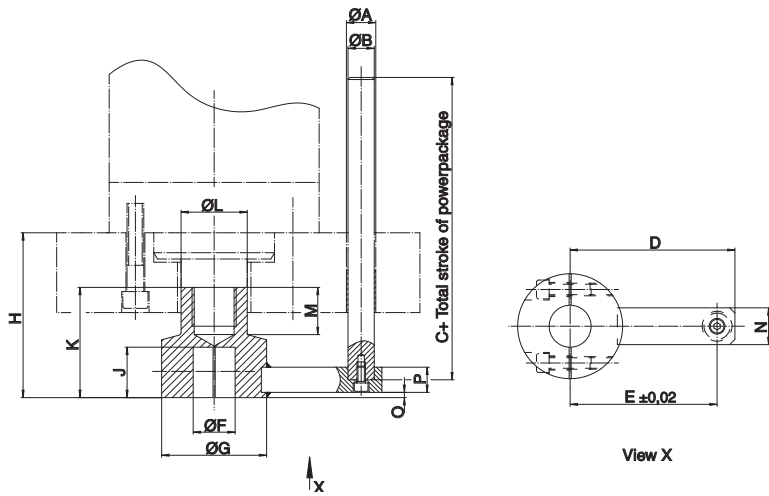
Order no.:

EK04.51.200.20 - ZSD



Subject to changes.

Accessories – Special Models

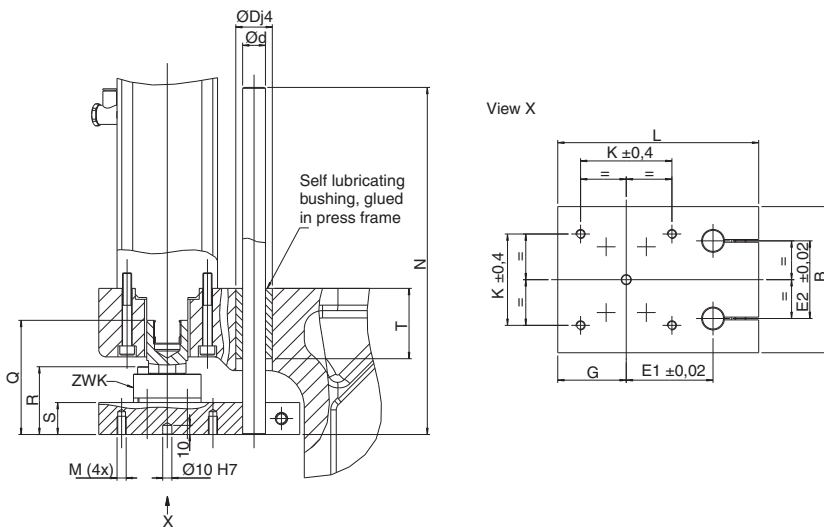


Tool holding fixture with anti-rotation lock V

The guide pin and bushing are included in the delivery package. Please indicate the total travel of the TOX®-Powerpackage when ordering. The center of the guide bushing bore must be set at dimension E from the centerline of the cylinder.

Secure V/working rod with Loctite 222.

Order no.	for TOX®-Powerpackage	A ^{H7}	B	C	D	E	F ^{H7}	G	H	J	K	L	M	N	O	P
V 1	S 1/K 1	14	12	60	94	75	20	38	69	30	45	16	10	16	5	17
V 2	S 2/K 2	14	12	62	109	90	20	38	71	30	45	20	10	16	5	17
V 4	S 4/K 4	18	16	77	132	110	20	48	88,5	30	60	30	25	25	5	20
V 8	S 8/K 8	23	20	105	145	120	40	68	115	50	80	45	22	30	5	24
V 15	S 15/K 15	23	20	106	165	140	40	68	116	50	80	50	23	30	5	24
V 30	S 30/K 30	28	25	125	195	170	40	88	137	50	90	56	30	35	5	24
V 50	S 50/K 50	28	25	145	205	180	40	98	157	50	105	63	45	35	5	24
V 75	S 75/-	28	25	67	255	235	40	98	190	50	136	98	-	35	5	24
V 100	S 100/-	28	25	67	255	235	40	98	190	50	136	98	-	35	5	24



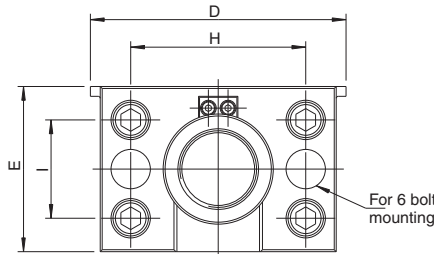
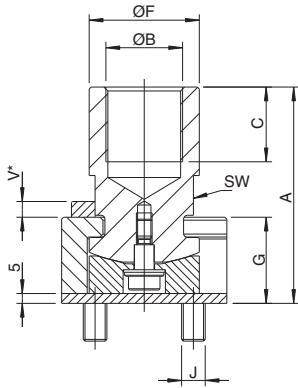
Mini ram guide with coupling ZWK

The center of the guide bushing bore must be set at dimension E1 from the centerline of the cylinder. The bushings, posts and the coupling ZWK are included in the delivery package.

The centering hole allows accurate alignment of the ram plate for finishing work. Secure ZWK with Loctite 222.

Order no.	for frame type	for TOX®-Powerpackage	Corresponding ZWK	max. load capacity	L	B	Q	R	S	G	E1	E2	ØD	Ød	K	M	N	T
ZMS 02.02.250-200	MCC 002	S 2 / K 2	ZWK 002	see schedule coupling ZWK	140	100	100	65,9	30	45	70	45	32	20	60	M8	340	77
ZMS 02.04.250-200	MCC 002	S 4 / K 4	ZWK 004		100	66	66	30	62	90	60	32	20	100	M8	360	77	
ZMS 04.04.250-200	MCC 004	S 4 / K 4	ZWK 004	see schedule coupling ZWK	207	130	110	66	30	62	90	60	32	20	100	M8	360	77
ZMS 04.08.250-200	MCC 004	S 8 / K 8	ZWK 008		110	69,2	69,2	35	75	95	85	40	25	100	M10	380	77	
ZMS 08.08.250-200	MCC 008	S 8 / K 8	ZWK 008	see schedule coupling ZWK	220	160	125	74,2	35	75	95	85	40	25	100	M10	380	77
ZMS 08.15.250-200	MCC 008	S15 / K15	ZWK 015		125	76,5	76,5	40	95	105	120	40	25	150	M10	415	77	
ZMS 15.15.250-200	MCC 015	S15 / K15	ZWK 015	see schedule coupling ZWK	240	200	160	81,5	40	95	105	120	40	25	150	M10	415	77
ZMS 15.30.250-200	MCC 015	S30 / K30	ZWK 030		170	91,8	91,8	40	95	105	120	40	25	150	M10	415	77	

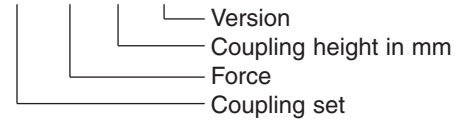
Accessories



Coupling ZWK

is threaded directly on the working rod of the TOX®-Powerpackage and secured with removable Loctite 222. This coupling provides a flexible connection between the TOX®-Powerpackage and die set, thereby preventing any side loads. Includes antirotation device.

ZWK 001.060.000



Order no.	for TOX®-Powerpackage	A	ØB	C	D	E	Ø F	G	H	I	J	V*	SW	max. press force [kN]	max. retract force [kN]
ZWK 001.060.000		60													
ZWK 001.070.000	S 1 / K 1	70	M12x1,5	16	74	44	22	27,9	43,5	22	4xM6x9	8	19	20	2,5
ZWK 001.080.000		80													
ZWK 002.060.000		60													
ZWK 002.070.000	S 2 / K 2	70	M16x1,5	16	74	44	22	27,9	43,5	22	4xM6x9	8	19	20	2,5
ZWK 002.080.000		80													
ZWK 004.060.000		60													
ZWK 004.070.000		70													
ZWK 004.080.000	S 4 / K 4	80	M22x2	21	84	52	30	28	52,5	30	4xM8x12	8	27	48	3,5
ZWK 004.090.000		90													
ZWK 004.100.000		100													
ZWK 008.070.000		70													
ZWK 008.080.000		80													
ZWK 008.090.000	S 8 / K 8	90	M30x2	26	108	74	45	31,2	72	44	4xM10x15	8	41	108	6
ZWK 008.100.000		100													
ZWK 008.110.000		110													
ZWK 008.120.000		120													
ZWK 015.070.000		70													
ZWK 015.090.000		90													
ZWK 015.100.000	S 15 / K 15	100	M30x2	26	108	74	50	33,5	74	44	4xM10x15	8	46	192	9,5
ZWK 015.110.000		110													
ZWK 015.120.000		120													
ZWK 015.140.000		140													
ZWK 015.150.000		150													
ZWK 015.180.000		180													
ZWK 030.110.010		110													
ZWK 030.130.010	S 30 / K 30	130	M39x2	36	130	84	56	43,8	89	50	4xM12x19	20	50	325	16
ZWK 030.160.010		160													
ZWK 030.180.010		180													
ZWK 030.190.010		190													
ZWK 030.210.010		210													
ZWK 030.240.010		240													
ZWK 050.120.010		120													
ZWK 050.140.010	S 50 / K 50	140	M42x2	41	130	84	63	47,2	92,5	56	6xM12x19	20	55	500	20
ZWK 050.160.010		160													
ZWK 050.180.010		180													
ZWK 050.210.010		210													
ZWK 050.230.010		230													
ZWK 050.240.010		240													
ZWK 075.150.010		150													
ZWK 075.170.010		170													
ZWK 075.190.010		190													
ZWK 075.210.010		210													
ZWK 075.230.010	S 75 / K 75	230	M64x2	63	170	124	100	54,5	130,5	90	6xM12x19	25	85	1000	40
ZWK 075.250.010	S 100 / K 100	250													
ZWK 075.270.010		270													
ZWK 075.310.010		310													
ZWK 075.330.010		330													
ZWK 200.180.000		180													
ZWK 200.200.000	S 170 / K 170	200	M80x2	85	240	190	150	80,5	191	140	6xM16x25	25	140	2000	50
ZWK 200.220.000		220													
ZWK 200.240.000		240													
ZWK 200.260.000		260													
ZWK 200.280.000		280													
ZWK 200.300.000		300													
ZWK 200.320.000		320													

*anti-rotation device

Accessories – Press Force Sensor

Type ZPS



Technical data:

Rated output:	1,1 mV/V
Temperature range:	-10°C to 65°C
Zero balance:	± 2%
Excitation voltage:	10 V DC (max. 15V)
Insulation resistance:	1 G Ω
Nominal impedance:	760 Ω
Electric connection:	System Fischer
Combined error:	< ± 0,5%
Overload:	115%
System of protection:	IP54

The press force sensor ZPS can be mounted directly on the working rod of the TOX®-Powerpackage cylinder.

It is possible to measure the force in push and pull direction.

Attention: reduced retracting force!

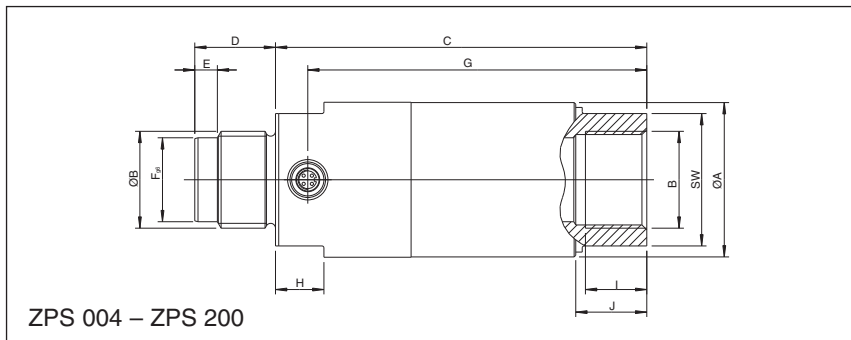
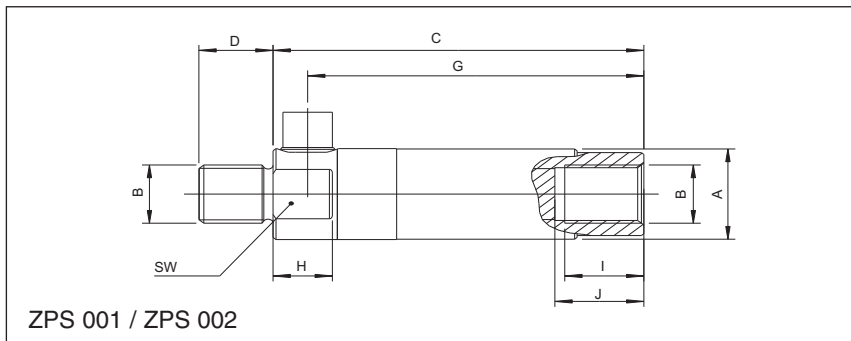
It is sealed against dirt and moisture.

The load cells are available in various sizes to fit each TOX®-Powerpackage.

The sensor should be applied with an antirotation device, to avoid damage of the connection cable (see next page).

Advantages:

- highly precise
- robust
- compact



Order no.	Press force max. kN	for TOX®-Powerpackage	A	B	C	D	E	F ₉₆	G	SW	H	I	J	Retracting force max. kN
ZPS 001	13	S 1 / K 1	20	M12x1,5	60	12	–	–	53	16	8	10	14	9
ZPS 002	21	S 2 / K 2	25	M16x1,5	75	15	–	–	68	21	12	13	16	20
ZPS 004	47	S 4 / K 4	30	M22x2	90	20	7	18	83	26	14	14	16	25
ZPS 008	81	S 8 / K 8	48	M30x2	115	25	7	26	105	41	15	19	22	40
ZPS 015	160	S 15 / K 15												
ZPS 030	325	S 30 / K 30	58	M39x2	130	35	–	–	120	50	20	36	40	110
ZPS 050	500	S 50 / K 50	68	M42x2	150	40	–	–	136	55	20	42	59	110
ZPS 100	1030	S 75 / K 75 S 100 / K 100	100	M64x2	180	60	–	–	155	85	22	63	66	245
ZPS 200	2000	S 200 / K 200	150	M80x2	220	80	–	–	200	140	28	83	88	350

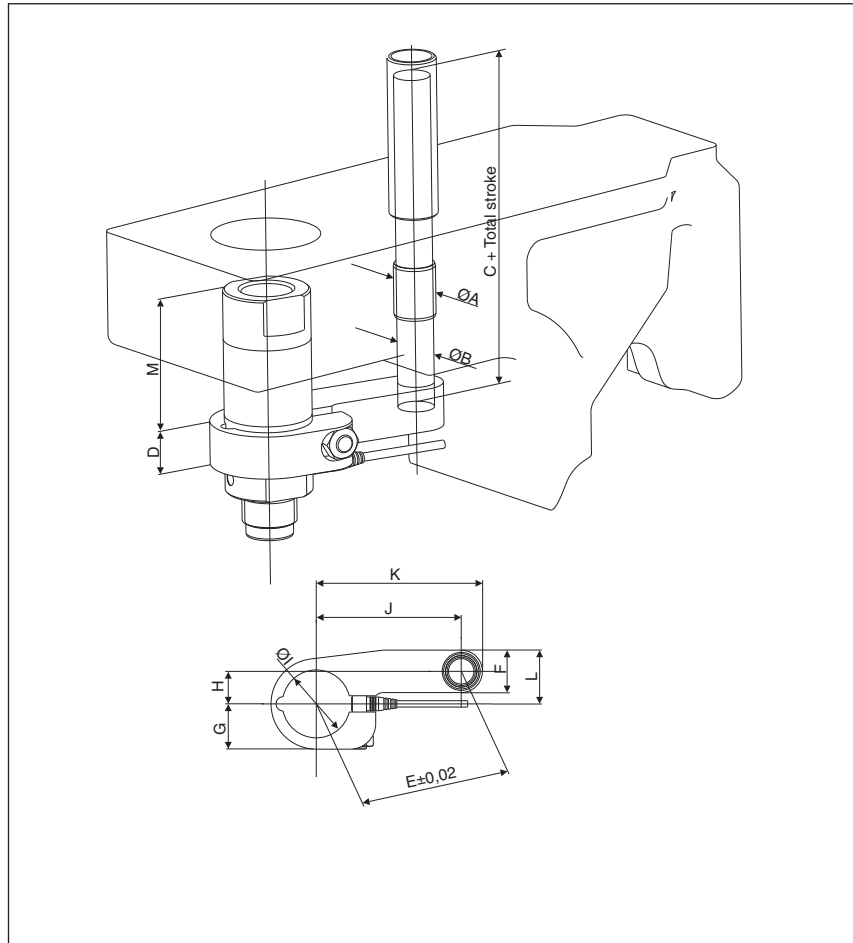
Please order accessories separately

Accessories – Antirotation device

Type ZPSV for press force sensor type ZPS

Antirotation Device

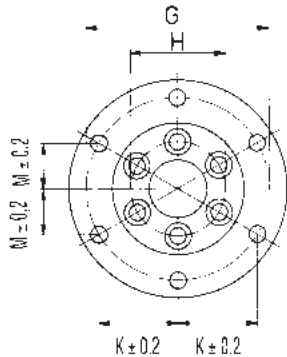
Prevents damage to the sensor cable. The bushing and guide pins are supplied with this option. The center of the guide bushing bore must be set at dimension E from the centerline of the sensor. When ordering, please advise the total stroke of the TOX®-Powerpackage cylinder.



Order no.	for sensor type	A _{H7}	B	C	D	E	F	G	H	I	J	K	L	M
ZPSV 001	ZPS 001	14	12	70	17	52	18	19	17	20	49,14	58,14	26	37
ZPSV 002	ZPS 002	14	12	85	17	52	18	21	17	25	49,14	58,14	26	49
ZPSV 004	ZPS 004	18	16	100	19	80	24	23	20	30	77,46	89,46	32	59
ZPSV 008	ZPS 008	23	20	90	24	105	30	32	23	48	102,45	117,45	38	75
ZPSV 015	ZPS 008/ZPS 015	23	20	90	24	110	30	32	23	48	107,57	122,57	38	75
ZPSV 030	ZPS 030	28	25	150	24	170	38	37	27	58	167,84	186,84	46	85
ZPSV 050	ZPS 050	28	25	150	24	180	38	42	27	68	177,96	238,96	46	105
ZPSV 100	ZPS 100	on request												
ZPSV 200	ZPS 200													

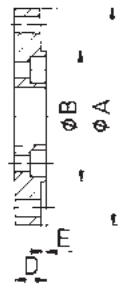
Please observe the corresponding mounting instructions described in our Operating Manual "TOX®-Powerpackage Accessory".

Mounting options



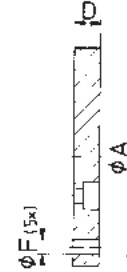
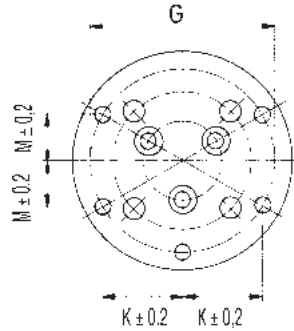
Front mounting plate **ZFV** retrofit-
table, for TOX®-Powerpackages
type S/AT.

ϕC
 ϕF (6x)

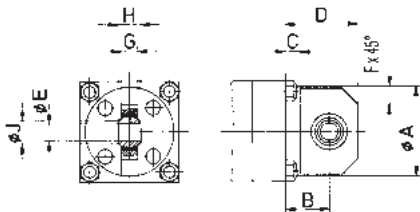


Rear mounting plate **ZFH** non retrofittable

Order no. **ZFH 1 – 15** for TOX®-Powerpackages with larger intensifier section
 $A_2 > A$ Dimensions on request.



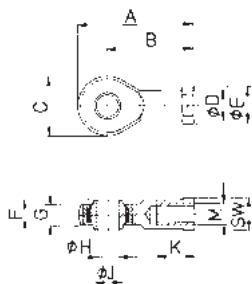
Order no.	Order no.	for TOX®-Powerpackage	A	B ₁₇	C ^{H8}	D	E	F	G	H	K	M
ZFV 1	ZFH 1	S/K/AT 1	90	55	30	18	3	6,6	75	40	32,5	18,75
ZFV 2	ZFH 2	S/K/AT 2	125	75	40	18	3	9	105	54	45,5	26,25
ZFV 4	ZFH 4	S/K/AT 4	145	85	50	21	3	9	125	64	54,1	31,25
ZFV 8	ZFH 8	S/K/AT 8	180	110	70	24	4	11	155	88	67,1	38,75
ZFV 15	ZFH 15	S/K/AT15	225	135	75	29	4	18	195	100	84,4	48,75



Rear spherical bearing mount **ZGH**,
non retrofittable

For TOX®-Powerpackages with larger intensifier sections $A_2 > A$
Dimensions on request.

Order no.	for TOX®-Powerpackage	A	B	C	D	E ^{H7}	F	G	H	J
ZGH 1	S/K 1	42	22	10	34	8	8	9	12	10,4
ZGH 2	S/K 2	62	30	10	50	12	12	12	16	15,4
ZGH 4	S/K 4	72	40	12	64	16	16	15	21	19,3
ZGH 8	S/K 8	90	45	12	70	22	20	20	28	25,8
ZGH 15	S/K 15	100	50	15	84	30	20	25	37	34,8



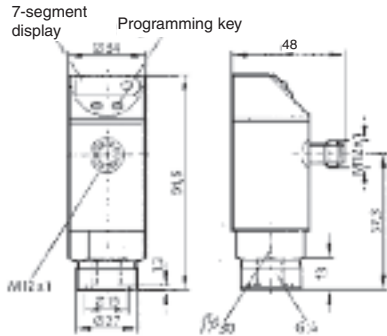
Front spherical rod eye mount **ZGK**,
retrofitable

Order no.	for TOX®-Powerpackage	A	B	C	D	E	F	G	H ^{H7}	J	K	M	SW
ZGK 1	S/K 1	66	50	32	17,5	22	16	12	12	15,4	22	M12x1,5	19
ZGK 2	S/K 2	85	64	42	22	27	21	15	16	19,3	28	M16x1,5	22
ZGK 4	S/K 4	111	84	54	30	37	28	20	22	25,8	37	M22x2	32
ZGK 8	S/K 8	145	110	70	40	50	37	25	30	34,8	51	M30x2	41
ZGK 15	S/K 15	145	110	70	40	50	37	25	30	34,8	51	M30x2	41

Attention: The rod eye mount must be screwed securely against the shoulder on the working rod of the cylinder.
Length compensation over the threads is not permissible.

Accessories

Electronic Pressure Switch ZDO



For switch ZDO-01-400A, the second setpoint can be additionally set at 4 – 20 mA or 0 – 10 V.

Additional programming menu

- LED unit display (bar, psi, Pa)
- Switching logic (PNP, NPN)
- Peak hold
- LED-display can be flipped 180°
- LED display can be turned off

In addition, a malfunction signal is displayed if:

- system pressure > 10 % of max. nominal pressure
- short circuit in switch output 1 or switch output 2

The pressure switch is specially adjusted to the pressure characteristic of the TOX®-Powerpackage.

Specifications:

Pressure range	Increment	Order no.
0,5 – 10 bar	0,01 bar	ZDO 01.010
0 – 400 bar	1 bar	ZDO 01.400
0 – 400 bar	1 bar	ZDO 01.400A
0 – 600 bar	1 bar	ZDO 01.600

- Repetive accuracy: ± 0,1% FS*
- Switch point accuracy: ± 1,5% FS*
- Display:
 - LED-7-segments

* FS = Full Scale

Switch function per switch point
Output:
hysteresis/ normally open
hysteresis/ normally closed

- window function/ normally open
- window function/ normally closed

In addition, for ZDO-01-400A:

Output 2: Analog
4 – 20 mA/0 – 10 V

Working voltage: 18 – 30 V DC
System of protection: IP 67

Example for ordering

- ZDO-01-400A - with SP2 as analog output
 - max. pressure 400 bar
 - version 01
 - electronic pressure switch

External attachment to the TOX®-Powerpackage with mounting plate, including protective caps for the display and the programming keys as well as the HP measuring terminal.

Accessories to be ordered separately:

- two-piece fastening strap with two screws M5, hole distance 44 mm
- ZMP - 001.002

└─ Mounting plate for attachment to the service side of TOX®-Powerpackage

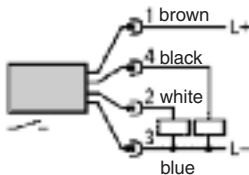
- HP measuring hose ZHM 630;
- ZHM 630-90

└─ connection 90°
length 630 mm

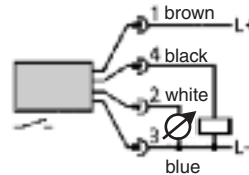
connection 1 x 90°, compl. assembled, filled and bled, secured against leaking of oil (optional 400, 1000, 1500, 2000 mm)

- cable socket with 5 m cable

Connection scheme:



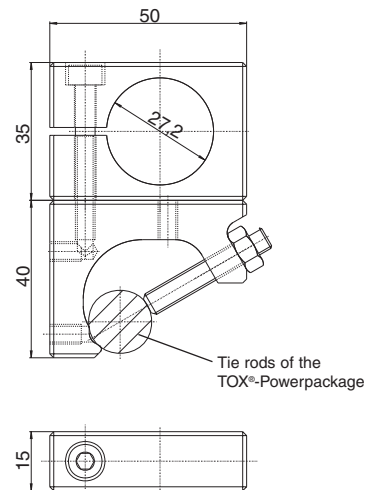
- ZDO-01-400A with analog output



The electronic pressure switch ZDO registers the oil pressure in the high pressure part of the TOX®-Powerpackage as system pressure and displays it by a 4 digit LED display. The pressure sensor registers the system pressure and shows the actual system pressure on a LED display. According to the set switch function (separate selection for each output), 2 output signals are generated: hysteresis, window function, each as make contact or break contact. The hysteresis provides a stable switching condition of the output when the system pressure fluctuates around the nominal value. The window function enables the monitoring of a defined acceptance region. It is also possible to set a delay time (0–50 sec.), a response time for the switch outputs and dampings.

Mounting bracket for ZDO ZMP-001.002

Attaches switch to tie rod of the TOX®-Powerpackage.

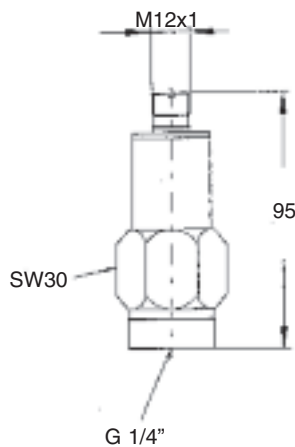


Accessories

Analog pressure indicator ZDA



Transducer ZDS



The oil pressure in the high pressure chamber of the TOX®-Powerpackage is registered by the pressure sensor as system pressure and displayed by 5 digits on the pressure indicator with integrated power supply. Thus the measured value „pressure“ is converted in a ceramic pressure pickup cell into a capacitive signal by the deflection of a diaphragm. The measured value „pressure“ is displayed in “bar”. It is possible to change the press

force into kN on site. A freely programmable microprocessor controls the evaluation of the signal. The function keys on the front part of the processor measuring device serve for programming. The function „instantaneous value storage“ is available for receiving variable measuring signals. Further tests are possible with the peak value memory. A freely selectable analog output (4...20 mA, 0...10 V) is available for connection with a PLC. As option, a serial interface for the transmission of the measured data to a PC is offered as well.

Specifications:

Pressure sensor ZDS:

Pressure range: 0 – 400 bar
 Connection: M 12 plug
 Analog output: 4 – 20 mA
 Deviation from characteristic: 1% FS*
 Repetitive accuracy: 0,1% FS*
 Supply: 12 – 30 DC/
 by processor measuring device

Pressure indicator ZDA:

5 digit display 2-color
 peak value memory
 Analog input
 two programmable set points
 analog output for PLC
 Reading rate: 10/sec.
 Supply: 90 ... 264 V AC
 50/60 Hz
 Structural dimension (WxHxD): 96 x 48 x 187 mm
 Panel cutout: 92^{+0.5} x 45^{+0.5} mm

* FS = Full Scale

Order no.: ZDA

Pressure indicator and accessories:
 - Pressure indicator ZDA
 - Pressure sensor ZDS, attachment by mounting plate to service side of TOX®-Powerpackage
 - Mounting plate ZMP, adapted to TOX®-Powerpackage
 - HP measuring hose ZHM 630, connection 1 x 90°, compl. assembled, filled and bled, secured against leaking of oil
 - electric connection cable between pressure sensor and pressure indicator (5000 mm)

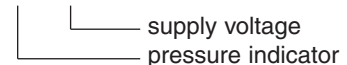
Option:

- serial interface

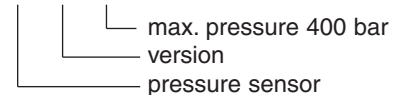
Please do not forget to state type of TOX®-Powerpackage

Example for ordering:

- ZDA-230AC

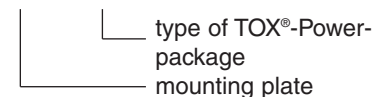


- ZDS-01-400

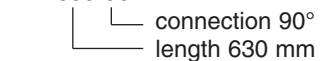


Accessories:

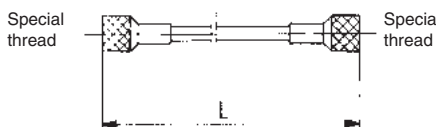
- ZMP-S2.50.12



- ZHM 630-90



- connection cable (5000 mm)
 - serial interface



High-pressure measuring hose ZHM

Pressure range up to 400 bar
 Available lengths: 400, 630, 1000, 1500, 2000, 2500, 3000, 3500 mm.
 Also available with 90° end connectors up to 2000 mm.

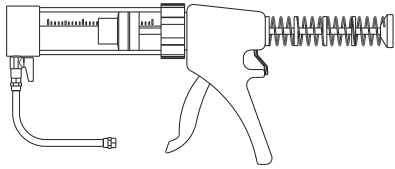
Attention: Due to the compressibility of the oil, the following loss of power stroke occurs when the device is fitted to the TOX®-Powerpackage (given a

hose length of 400 mm):

S 1 / K 1 = 0,8 mm,
 S 2 / K 2 = 0,5 mm,
 S 4 / K 4 = 0,25 mm,
 S 8 / K 8 = 0,13 mm – negligible in larger TOX®-Powerpackages

Order no.	Length
ZHM	See text
Order example: ZHM 630	

Accessories/Special Models



Oil pump

It guarantees the optimum maintenance concept and extended maintenance intervals. For easy, air-free **refilling** and **reduction** of the oil volume of the TOX®-Powerpackage. Clear body and refill hose allow easy monitoring of the oil level in the pump. Little operator effort required.

Pumping medium: hydraulic oil DIN 51524 HL or HPL with 32 cSt viscosity at 40° C.

- Pump capacity: 9 ml/stroke
- Container filling volume 0,3l
- Max. permissible back pressure 10 bar
- Hose length 800 mm

Order no.
ZP 20.000

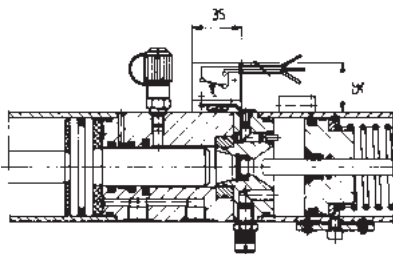


Tool set to replace seals of TOX®-Powerpackage cylinders

Special tools facilitate the removal and installation of seals.

The carrying case also contains instructions and tips on the use of the tools.

Order no.
ZWS 01



Oil level monitor ZU

When the minimum oil level is reached, the indicator pin integrated in the TOX®-Powerpackage actuates a switch (can be pneumatic or electric). Mounted via steel strip.

Manual reset.

Can be retrofitted to all TOX®-Powerpackages.

Type **ZU 01** = floating contact set with step function (open/close)
Contact load rating 0 – 30 V DC
Constant current 5 A
Cable length 2 m.

Type **ZU 02** = 3/2-way valve with locking zero setting (make contact) Connecting thread M5

Type **ZU 03** = as for **ZU 02**, but with quick connector

Order no.
ZU 01 electric
ZU 02 pneumatic (connecting thread M5)
ZU 03 pneumatic (quick connector)

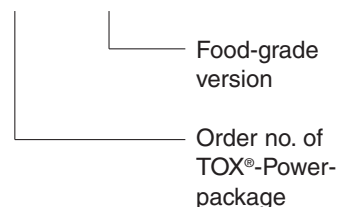


TOX®-Powerpackage for use in the food industry ZLM

All TOX®-Powerpackages are available on request with food grade oil and grease lubrication. Both lubricants are certified according to USDA-H11 and are used wherever there is a chance of occasional, technically unavoidable contact between foodstuffs and lubricant.

These TOX®-Powerpackages are used in industrial food manufacturing, processing, filling and packaging machines, as well as in the pharmaceutical and cosmetics industry.

Order no.
S 1.32.6 - ZLM



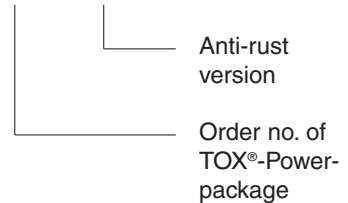
Special Models



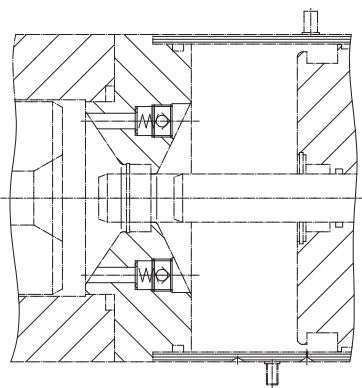
Anti-rust execution ZRO

All TOX®-Powerpackages can be supplied with rust protection on request. All individual parts are either chromium-plated, galvanised or primed and painted, whereby stainless steel is not generally used. These devices are particularly suitable for use in the food and packaging industries.

Order no.
S 1.32.6 - **ZRO**



On request, we can provide our drives in a rust resistant execution. Please contact us!



TOX®-Powerpackage with power bypass ZLB

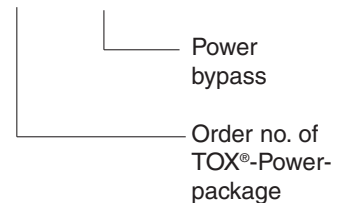
In the event of control errors, or in the case of special applications (particularly punching operations), the strong acceleration of the working piston after punching through the material may cause an underpressure in the high-pressure oil chamber of the TOX®-Powerpackage and so lead to malfunctions. Such an underpressure can be prevented with the patented, integrated power bypass system ZLB available for the TOX®-Powerpackage.

The speeds required for these operations should be kept relatively low, however. Please contact us for more detailed advice if you intend to use your equipment for the above purposes.

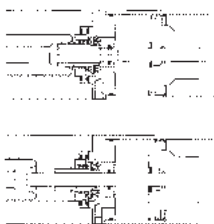
A further development of the ZLB, the bypass ZHD with hydraulic damping is a standard feature on all TOX®-Powerpackage cylinders S 4 – S 170, K 75 – K 170 and line-Q (see below).

It is also possible to use the **bypass** system for the realization of long power strokes. Thus the characteristics of operation will be: approach stroke - power stroke - approach stroke - power stroke or approach stroke - power stroke - power stroke etc. which will e.g. be necessary for the mounting of bushes.

Order no.
S 1.32.6 - **ZLB**



Buffering gap Bypass valve



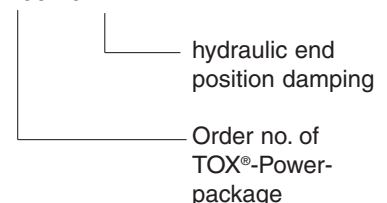
Power bypass ZHD with hydraulic end position cushioning in the return stroke

A patented further development of the power bypass ZLB, the integrated hydraulic end position damping (non adjustable) provides optimum cushioning of the working rod at the end of the return stroke. This feature is especially useful in applications with heavy tooling weight and high cycle speeds. This results in longer tool life and reduced noise level of the TOX®-Powerpackage, even on severe working conditions.

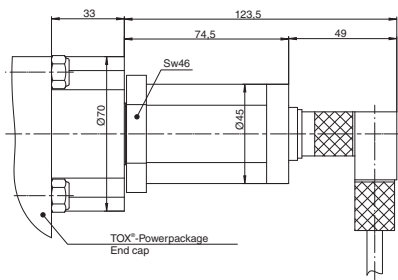
TOX®-Powerpackage cylinders S 4 – S 170, K 75 – K 170, AT 170 and line-Q come standard equipped with bypass and end position damping.

TOX®-Powerpackage series AT 2 – AT 100 and K 2 – K 50 are available with ZHD on request.

Order no.
K 4.100.10 - **ZHD**



Special Models



Connector S 32 for shielded cable (max. 20 m = 65 ft) Ø 6 to 8 mm. Right angle connector included with unit.



Analogue absolute position transducer ZKW

The path transducer indicates the absolute actual position of the TOX®-Powerpackage piston, even in the event of a power interruption. The measuring system works contactless. Therefore it is free of wear, insensitive to dirt and interferences. Final values are adjustable. CANopen and PROFIBUS-DP interfaces are available on request.

Technical data:

Repeat accuracy: $\leq \pm 10 \mu\text{m}$
 Current Supply:
 Distribution voltage 24 V DC $\pm 20\%$ (stabilized)

With optional USB interface:

2 outputs over USB interface.
 Output 1 for total stroke;
 output 2 freely configurable (e.g. for the last 5 mm of the stroke).

Optional interface:

Simple configuration through USB interface and PC software:
 +online display of actual position of sensor
 +graphics support for adjusting functions and signature curve
 +simple parameterising
 +freely configurable signature curve
 +2 outputs independently selected and adjusted

Remaining ripple: $\leq 0,5 V_{SS}$
 Current consumption: $\leq 150 \text{ mA}$

Electric strength
 GND against housing 500 V.

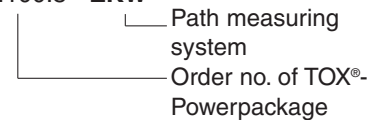
Exits:

Output voltage 0 ... 10 and 10 ... 0 V
 Load $\leq 5 \text{ mA}$
 System of protection: IP 67 (in connected condition)

Can be supplied with all type K, AT, HZ TOX®-Powerpackages with the exception of AT 1, K 1, HZ 2-5.

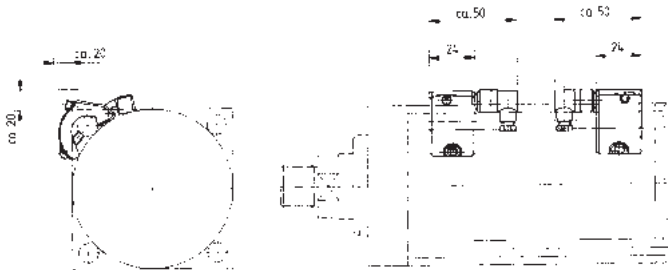
Order no.

K 2.100.8 - ZKW



System requirements for interface:

- standard PC
- operating system Windows 2000/XP/Vista or better
- min. screen resolution 1024 x 768 pixel
- 10 MB free hard drive space
- Java Runtime Environment Version 1.4.2 or newer
- 1 USB port



Feed and return stroke monitor ZHU

Attached to the working piston is a permanent magnet which is detected by the sensors through the special tube.

Available for all TOX®-Powerpackages of type S/K/AT 01–30 and HZ 05–48.

Accessories, please order separately:

- Proximity switch, magnet-sensitive, with LED, ZHS 001.000
- Holding angle ZMP for proximity switch ZHS (S/K 1)

- Holding angle ZMP for proximity switch ZHS (S/K 2–15)
- Holder for ZHS (S/K 30), ZMP 001.003
- Cable box M8x1 with 5 m cable, straight, without LED

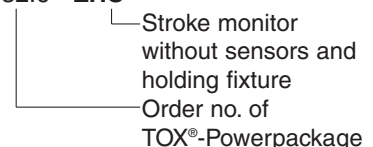
Attention: The total stroke of the TOX®-Powerpackage is shortened by the ZHU installation: for types S/K/AT 01–30 by 10 mm and HZ 05–48 with total stroke up to 200 mm by 20 mm. TOX®-Powerpackages line-Q (Q-S, Q-K, RZS) feature an integrated ZHU without stroke reduction.

Technical data:

Operating voltage: UB 10 30 V DC
 Residual ripple: $\leq 15 \%$
 Max. admissible current: 1a 200 mA
 Turn-on time: $\leq 0,5 \text{ ms}$
 Turn-off time: 20 – 50 ms
 Hysteresis: 0,5...1 mm
 Plug connection: With LED, M8 according to DIN 43 650 IP 65

Order no.

S 1.32.6 - ZHU

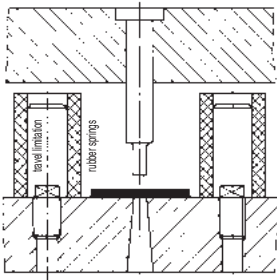


- Quantity of brackets ZMP
- Quantity of proximity sensors ZHS
- Quantity of cables

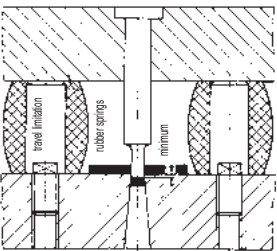
Mounting Instructions and Control Types

Rule for mounting: After the power stroke has travelled, the stroke of the working piston must be limited. In forming operations such as riveting, stamping, stretching etc., this limitation is ensured by the principle of the application. For other applications, the stroke must be limited in the tool. If stroke limitation is not possible in the tool, mounting of a fixed stop is required (please state when ordering). Alternatively, the TOX®-Powerpackage with stroke adjustment can be used (type .50 / .80 or .51 / .81). For TOX®-Powerpackages with total stroke limiter, a hydraulic damping of the lower dead centre (cutting impact damping) type ZSD is available (see page 20).

Tool in starting position UDC
UDC = upper dead centre



Tool after punching LDC
LDC = lower dead centre
The tension of the rubber spring must be adapted to the punching process.



Punching applications: When punching, the working piston may continue moving after the punching process. To avoid damages, this must be prevented by a travel limitation in the tool. Alternatively, the TOX®-Powerpackage must be mounted in a way that the sum of the fast approach and the required power stroke is identical to the total stroke (fixed stop necessary). Example S 8.32.6: Required power stroke 4 mm + fast approach 28 mm = total stroke 32 mm, which is then limited in the TOX®-Powerpackage.

Generally it must be ensured that the power stroke of the TOX®-Powerpackage used for punching operations is only used to a maximum of 80%. Example S 8.32.6: Power stroke 6 mm, used power stroke 80 % = 4.8 mm.

For punching operations only TOX®-Powerpackages with integrated bypass ZLB, ZHD should be used.

Fastening: To mount the TOX®-Powerpackage only screws of the property class 12.9 must be used. The maintenance connections of the Powerpackage (oil refill nipple, vent borehole, high pressure measuring terminal, control throttle 'X', and oil level indicator) should be easily accessible at all times.

Press force: Specified at 10 bar resp. 6 bar compressed air each. The press force changes in linear relation to the compressed air.

Example: S 8 at 10 bar 77 kN press force, at 5 bar 36 kN. Force values $\pm 5\%$. Minimum pressure 2 bar. By adding a pressure control valve, the TOX®-Powerpackage can be easily adjusted to the work to be performed. This means a considerable saving on energy costs.

Control: Via a 4/2 or 5/2 way valve, as for normal double-action pneumatic cylinders.

Speed: The speed can be regulated as required by installing one-way throttles in the fast approach stroke and return stroke lines. Furthermore, the speed of the power stroke can be adjusted by mounting a throttle in the power stroke line of the unit e.g. for pressing in bushes, projecting, drawing, etc.

Attention: The return stroke speed of the working rod must be greater than or equal to the approach stroke speed. If using a TOX®-Powerpackage type S, EL, line-Q type S with hydraulic return stroke damping ZHD and very short approach stroke, please contact TOX® PRESSOTECHNIK.

The cross section of the valve must at least correspond with the linkage dimension of the TOX®-Powerpackage (linkage dimension "E"). The cross sections of the compressed air piping should be as large as possible. Otherwise the stroke speed of the cylinder will be reduced, i.e. the cylinder will not run free from stick-slip.

Measuring and control connection:

Available as screw connection at the unit. Via the screw connection, the oil pressure can be measured. This oil pressure is proportional to the press force. The measured value can either be displayed on a pressure gauge or transmitted to a pressure switch in order to generate a switching pulse.

Temperature range:

The TOX®-Powerpackage may be operated between $T_{min} = 10^{\circ}C$ and $T_{max} = 60^{\circ}C$.

Operation: The unit can be operated either with slightly oiled or dry compressed air. Severe operation conditions (humidity, oil, abrasive process liquids, ..) can strongly influence the seals of the TOX®-Powerpackage. Please contact the TOX® service department.

Service: The unit can be easily dismantled should it be necessary to change the seals.

Change-over from fast approach stroke to power stroke takes place automatically according to the ram pressure principle. The TOX®-Powerpackage is equipped with valves by default. The change-over speed can be adjusted using throttle X (figure 1).

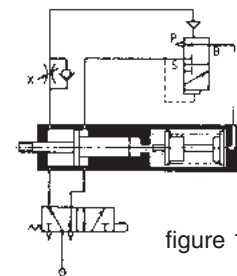


figure 1

Special change-over controls:

The standard ram pressure change-over control can be replaced by a **distance-dependent** control. This should be used if: 1. the TOX®-Powerpackage is used with the piston rod pointing upwards and the tooling is heavy, 2. the fast approach stroke is interrupted due to fixture spring pressure, prior to the necessary power stroke (figure 2).

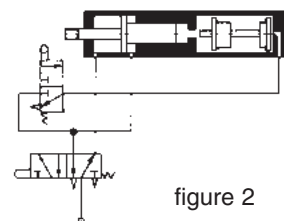


figure 2

We present the system comparison

Press forces from 2 to 2000 kN

Total strokes up to 400 mm, power strokes up to 80 mm

1) Function of the TOX®-Powerpackage

It is operated like a pneumatic cylinder and has the press force of a hydraulic cylinder. All that is needed is a standard 4/2 or 5/2 way pneumatic valve such as used with a normal double acting pneumatic cylinder. The included sequence valve controls automatically the changeover from fast approach to power stroke whenever the working rod meets an opposing force during the fast approach.

2) Warranty

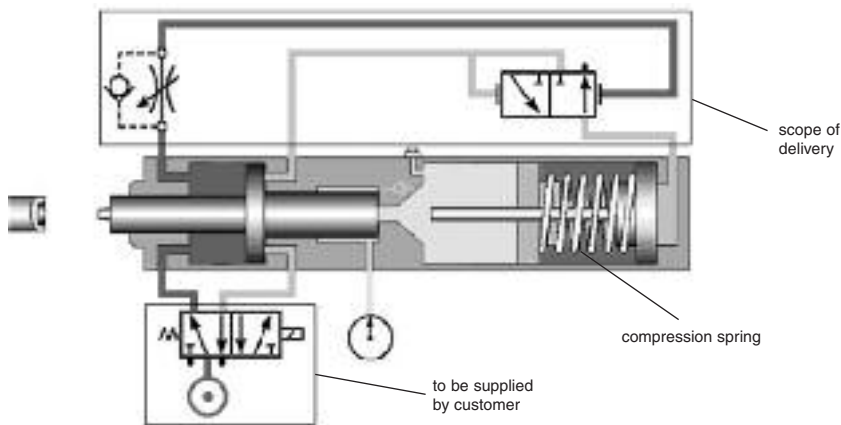
The standard TOX®-Powerpackage type S and type K are guaranteed for 10 million cycles, or one year, regardless of the number of working shifts or hours.

3) Energy consumption

The TOX®-Powerpackage provides up to 90% energy savings compared to pneumatic or hydraulic systems. Energy is used only when needed, namely for the power stroke, barely any for the fast approach and return stroke.

4) Service maintenance

TOX® companies and agents throughout the world are at your service. If needed e.g., in case of a service, a replacement cylinder can be provided of a nominal charge, during the service period.



5) Investment

The TOX®-Powerpackage is up to 20% less expensive than hydraulic, pneumatic or toggle systems for comparable technical requirements.

6) Capacity

The TOX®-Powerpackage behaves like a pneumatic cylinder in its operation and cycle speeds. Despite its compact dimensions, it delivers the hard work and high forces associated with hydraulic systems, however, without the need for an expensive hydraulic unit. The TOX®-Powerpackage provides a clean, quiet and reliable operation.

7) Environment

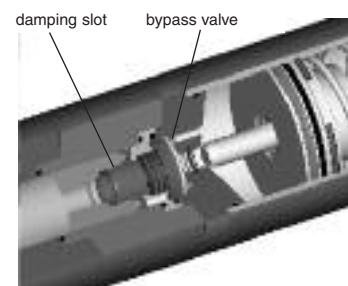
The TOX®-Powerpackage provides an extremely low noise level due to the hydraulic end position damping in the return stroke. In addition, a low exhaust noise and reduced air consumption. No oil disposal or oil contamination from leakage, no generation of noise such as produced by a constantly running hydraulic pump.

8) Technology of the TOX®-Powerpackage

The **patented power bypass** protects the oil system from negative pressure, which can be generated in applications, such as punching, shearing, etc. or high cycle speeds. The power bypass is the basic requirement for trouble-free operation of pneumo-hydraulic systems in such applications.

Patented, hydraulic end position damping in the DC for a quiet and material-protecting operation.

If short fast approach strokes are required, please contact TOX® PRESSOTECHNIK. This is a standard feature for all TOX®-Powerpackages type S 4 – S 170, K 75 – K 170 and line-Q.



Technology of the TOX®-Powerpackage

Stroke monitor **type ZHU** and analogue absolute position transducer **type ZKW** to determine the precise position of the working rod.

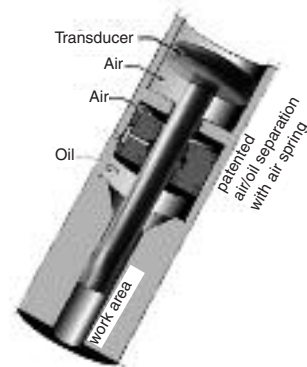
Special types and accessories

We will find a solution for all your requirements and problems.

The **ingenious** double function of the **mechanical spring** results in energy savings. No air is used for the return stroke of the intensifier piston, and the automatic preload of the oil reservoir allows for mounting the cylinder in any position. It is a matter of course that these elements are also included in the 10 million stroke guarantee. Because of the spring, no additional air connection on the unit is required.

Sealing system: The use of longlife-seals and a continuous development are guaranteed with the TOX®-Powerpackage, the evidence in the 10 million strokes guarantee.

Patented absolute air/oil separation is a prerequisite for a troublefree operation over a long period of time. A ring groove connected to the atmosphere avoids the "carry-over" of air into the oil.



The **double-bearing** arrangement of the working rod ensures an extraordinary good guidance.



General Info

Air consumption

The air consumption for approach and retract are calculated using the given maximum air pressure. The air consumption during the power stroke is calculated according to the required press force. This depends, e.g. at which point the required oil pressure has been reached. If the intensifier chamber is filled completely, then the

air consumption can be higher as specified.

In general, the specified air consumption includes the volume required per cycle for all stages.

The values correspond to the specific drive. One must also consider the volume of the hoses and valves when selecting a compressor, especially for long hoses with large cross sections.

When using pressure regulators (e.g. for an air spring), a small consumption of air is unavoidable. However, this volume is usually in the range of a few liters per hour.

Similarly, there might be air losses in the hoses and fittings. In order to avoid air losses, the air supply to the drive can be turned off at night.

Cycle time specifications

The values for cycle time correspond to the required press force. The effective press force is the ratio of the available press force at the specified air pressure to the required press force. The smaller the effective press force, the faster the cycle time. In order to achieve the given cycle times, the following requirements must be considered:

• Adequate air supply

The required air pressure results from the desired effective press force.

• Adequate hose cross section

The hose cross section should be at least the same size as the connections found in the data sheet. This applies also to the valves and air servicing units installed ahead of the drive. Reduced hose cross sections will considerably reduce the cycle times.

• Short hose length

The length of the hoses should be kept to a minimum, in order to reduce the air consumption as well as the cycle time.

• Adequate compressor performance

The compressor performance should always be sized with sufficient safety.

An effective press force over 90% should be avoided.

In addition to the specified cycle times, one must also take into consideration the reaction times of the valves and controls.

The specified cycle time specifications correspond in general to the specific drive under normal conditions. If necessary, the cycle time can be further reduced using our optional accessory type ZHO.

TOX®-Powerpackage

Air pressure/oil pressure/press force
TOX®-Powerpackage type S, K

Oil pressure - press force table for 10 bar

Air pressure (bar)	S 1/K 1		S 2/K 2		S 4/K 4		S 8/K 8		S 15/K 15		S 30/K 30		S 50/K 50		S 75		S 100	
	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN
2	35	1,3	50	2,9	55	6,2	55	12	55	23	46	38	48	61	38	101	40	106
3	65	2,4	85	4,9	95	10,6	95	20	95	39	90	74	87	110	81	212	84	220
4	95	3,4	130	7,3	130	14,5	135	29	130	53	130	106	128	161	118	308	125	326
5	125	4,5	162	9,1	170	18,8	170	36	170	69	170	139	168	212	146	382	167	435
6	155	5,6	205	11,5	205	22,7	210	44	210	85	210	171	209	263	186	486	208	542
7	185	6,6	245	13,7	245	27,1	245	52	245	100	250	204	250	315	218	569	258	671
8	210	7,6	285	15,9	285	31,5	285	60	285	116	290	236	291	366	254	663	296	770
9	240	8,6	325	18,1	325	35,8	325	69	325	132	330	269	330	415	286	746	345	897
10	275	9,8	365	20,3	360	39,7	365	77	365	148	365	297	369	464	320	835	385	1000

Specifications only apply to TOX®-Powerpackages of measure A = A₂, all other types on request.

Tolerance ± 5%

Oil pressure - press force table for 6 bar

Air pressure (bar)	S 1/K 1		S 2/K 2		S 4/K 4		S 8/K 8		S 15		S 30		S 50		S 75		S 100	
	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN	P _{oil} bar	F kN
2	90	3,0	90	4,9	75	8,2	100	20,7	95	38,0	77	62	56	71	72	187	98	253
3	145	4,9	145	7,8	135	14,7	165	34,0	155	62,0	141	114	130	163	134	347	172	444
4	200	6,7	200	10,8	190	20,6	235	48,3	215	85,0	201	162	195	244	190	492	246	634
5	260	8,7	260	13,9	240	26,0	300	61,6	275	109,0	264	212	255	318	251	649	325	837
6	320	10,7	320	17,1	290	31,4	360	73,9	335	133,0	328	264	325	406	312	806	400	1030

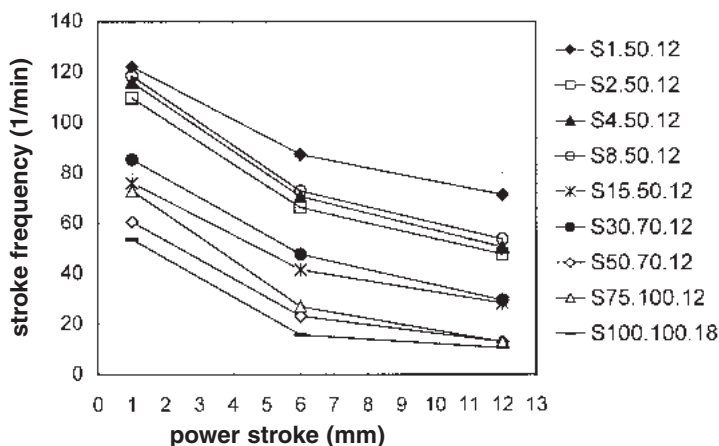
Specifications only apply to TOX®-Powerpackages of measure A = A₂, all other types on request.

Tolerance ± 5%

Stroke frequency of types S and K, series 10 bar

At 70 % effective force, fast approach stroke 38 mm and 10 % use of the fast approach stroke force

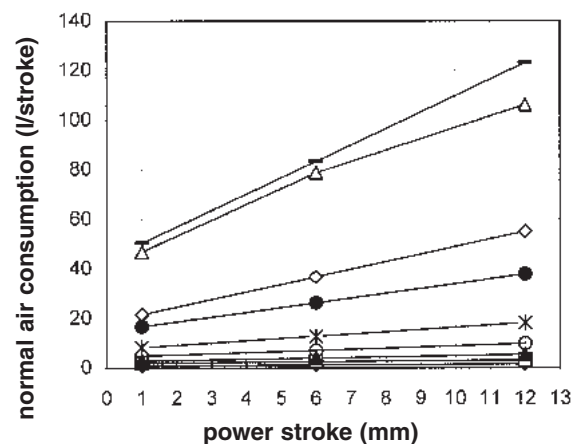
Operation at 6 bar air pressure.
Max. stroke frequency requires ZLB or ZHD.



Air consumption type S and K, series 10 bar

At 70 % effective force, fast approach stroke 38 mm and 10 % of the fast approach stroke force

Operation at 6 bar air pressure



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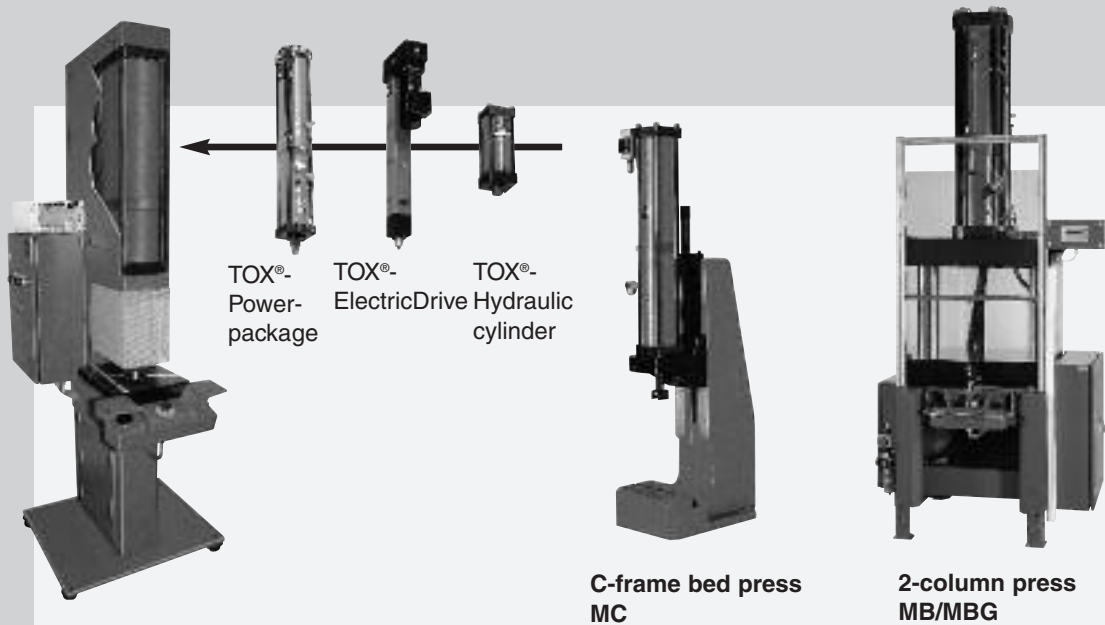


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TOX®-Electric Power Module EPMS
 5, 10, 25, 55, 100, 200 kN
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