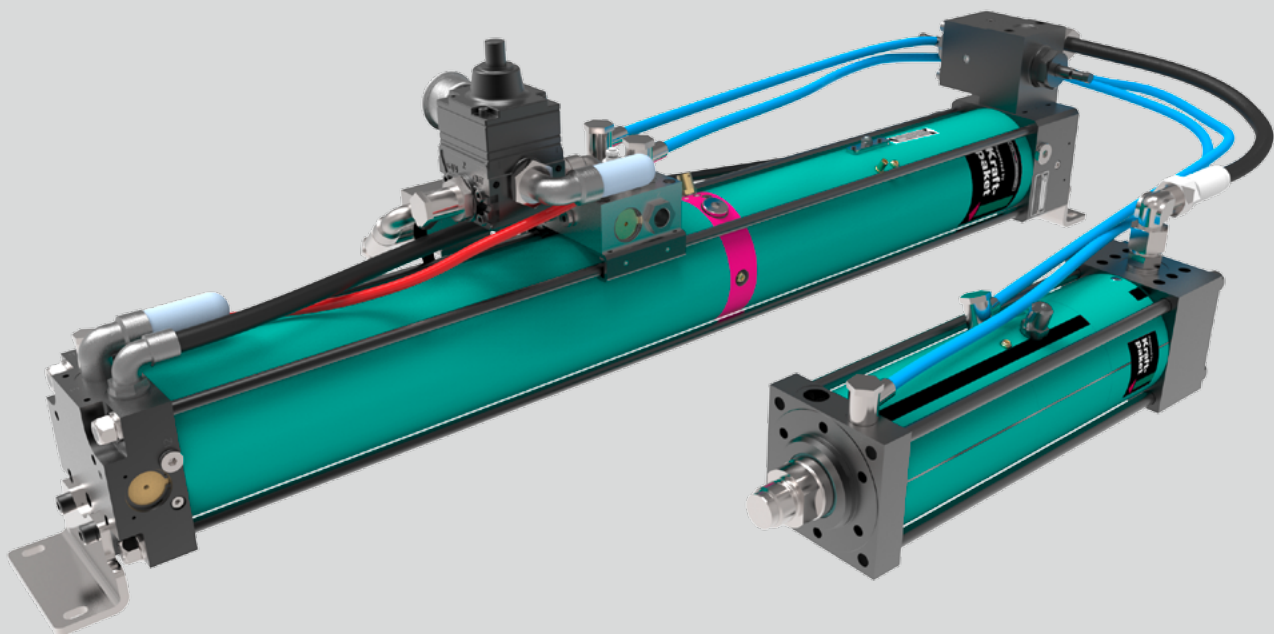


TOX®-Powerpackage X-KT-System

The pneumohydraulic split system



Data
sheet
10.05

2018/02

TOX® PRESSOTECHNIK GmbH & Co. KG
Riedstrasse 4
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Find your local contact at:
www.tox-pressotechnik.com

TOX®-Powerpackage X-KT-System

Customized to individual needs

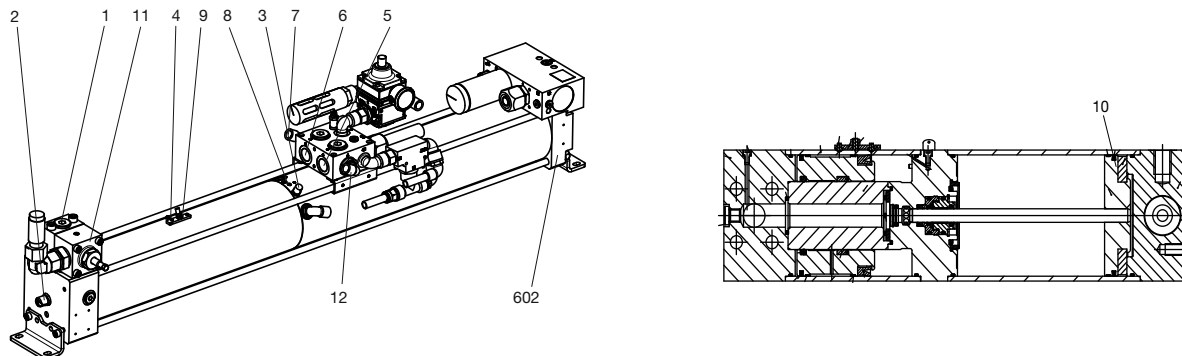
The TOX®-Powerpackage X-KT-System consists of the pressure intensifier X-ES and one or more drive cylinders. Depending on the required press force, dimensions and cycle-time each system is configured individually to customers needs. Drive cylinders can be selected from either the TOX®-Hydraulic Cylinder HZL or the pneumohydraulic TOX®-Working Cylinder X-AT.

Advantages of the X-KT-System:

- + Press forces 2 – 1700 kN
- + Long power strokes
- + Compact measurements
- + Easy controls
- + Use up to 6 drive cylinders per intensifier
- + Low noise
- + Connection via TOX®-Hydrosplit Coupling
- + Easy colour-guided pneumatic plug-in-system



TOX®-Pressure Intensifier X-ES with fast approach stroke function



The TOX®-Pressure Intensifier X-ES is connected to the drive cylinders via hydraulic hoses and TOX®-Hydrosplit Couplings. The changeover from fast approach stroke to power stroke is performed automatically according to the dynamic pressure principle. The speed of the changeover can be regulated via a control throttle. The unit is controlled by a 4/2 or 5/2-way valve.

As standard, the pressure intensifiers are designed for air pressure of 6 bar. Other air pressures or combinations on request.

The TOX®-Pressure Intensifier X-ES features:

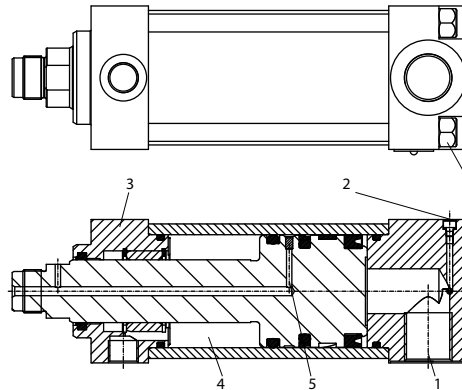
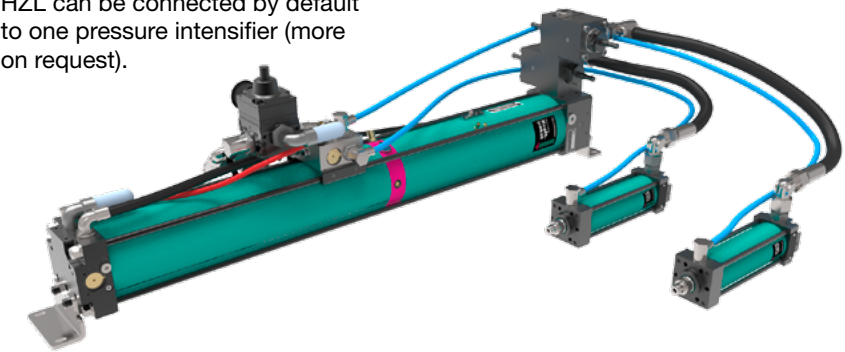
- + Absolute air-oil separation
- + Integrated bypass for reliable operation of the system
- + Ring reservoir for significantly reduced overall length
- + Can be mounted in any orientation
- + Air spring included
- + Simple pneumatic controls like for any double acting pneumatic cylinder
- + Closed oil system
- + All X-KT-Systems with fast approach support

- 1 High pressure connection
- 2 High pressure measuring and control connection
- 3 Oil filling nipple
- 4 Bleed plate
- 5 Air connection fast approach stroke
- 6 Air connection return stroke
- 7 Return stroke air hose
- 8 Oil level indicator
- 9 Patented anti-overfill device
- 10 Intensifier piston
- 11 Hydrosplit coupling
- 12 Fast approach stroke hose (only for X-AT)
- 602 Power stroke valve
- 632 Valve block ZVX

TOX®-Hydraulic Cylinder HZL

The TOX®-Hydraulic Cylinder HZL features an absolute air-oil separation. Fast approach stroke and return stroke are conducted by the pressure intensifier X-ES. That allows the return stroke to be operated with air pressure only (min. 3 bar).

Up to 6 TOX®-Hydraulic Cylinders HZL can be connected by default to one pressure intensifier (more on request).



- 1 High pressure connection
- 2 Bleed screw
- 3 Special guiding system
- 4 Return stroke chamber
- 5 Absolute air-oil separation
- 6 Flexible tie rod

Advantages of the TOX®-Hydraulic Cylinder HZL

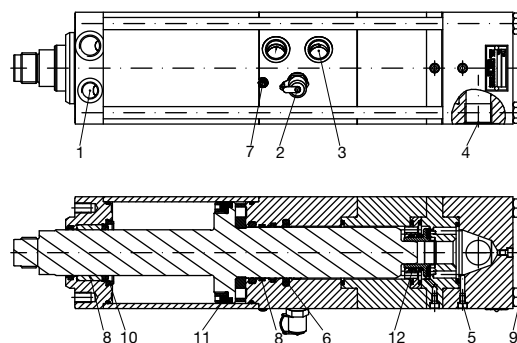
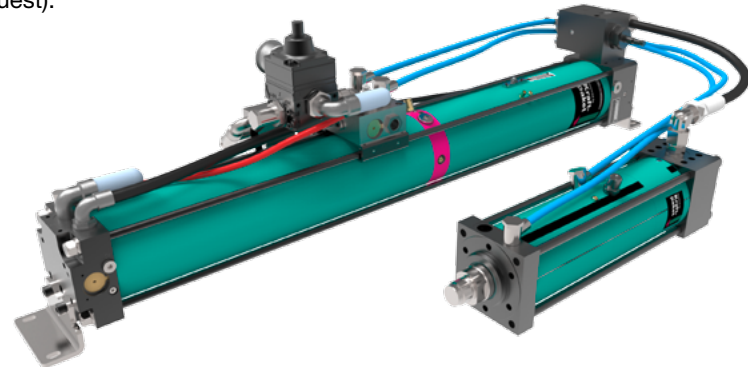
- + Compact design
- + Single-bearing working piston
- + Absolute air-oil separation
- + Fixed stop in approach stroke (elastomer cushioning optional)
- + Options: stroke monitoring ZHU and travel transducer ZKW
- + Budget solution
- + Also available with total stroke adjustment (version 151)

See pages 5 + 6

TOX®-Working Cylinder X-AT

The pneumatic TOX®-Working Cylinder X-AT with double-bearing working piston and absolute air-oil separation provides fast approach stroke and return stroke by applying pressure to the working cylinder. This results in high stroke forces, fast approach and return stroke forces. The power stroke is carried out by the TOX®-Pressure Intensifier X-ES.

Up to 6 TOX®-Working Cylinders X-AT can be connected to one pressure intensifier (more on request).



- 1 Return stroke connection (closed)
- 2 Oil high pressure measuring connection
- 3 Fast approach stroke connection (closed)
- 4 Oil high pressure port from X-ES
- 5 Bleed screw
- 6 Special seals
- 7 Absolute air-oil separation
- 8 Double-bearing working piston
- 9 Flexible tie rod
- 10 Elastomer cushioning
- 11 Magnet ring for stroke monitoring
- 12 Bypass with hydraulic end position cushioning

Advantages of the TOX®-Working Cylinder X-AT

- + High fast approach and return stroke forces
- + Short cycle-times
- + Fixed stop with elastomer cushioning
- + Prepared for stroke monitoring ZHU and external linear position sensor ZHW up to X-AT-030
- + Hydraulic cushioning for return stroke
- + Bypass ZLB and hydraulic end position cushioning ZHD

See page 7

Design of a TOX[®]-X-KT-System

Example calculation of a combination of TOX[®]-Pressure Intensifier X-ES and TOX[®]-Hydraulic Cylinder HZL:

To figure out what combination of TOX[®]-Pressure Intensifier X-ES and TOX[®]-Working Cylinders HZL is appropriate for you, we give you the following sample calculation. The values you have to provide are shown in red. That means: you define the required press force, total stroke and power stroke of the cylinder. Furthermore you have to determine the number of cylinders installed to one intensifier and the hose lengths. Following this sample calculation also combinations of TOX-Hydraulic Cylinders HZL with total stroke adjustment or TOX[®]-Pressure Intensifiers X-ES with TOX[®]-Working Cylinders can be specified.

Example: You need **60** kN press force, **100** mm total stroke, **14** mm power stroke and you want **2** HZL connected to one intensifier X-ES. You need one hydrosplit coupling ZHK for each working cylinder (factor for calculation: ZHK 020 = 1.5) and one hose with **800** mm length. (**■** defined data **■** data from table on page 5 **■** calculated figures)

- a** The required press force e.g. **60** kN leads to the selection of a cylinder with max. **76** kN press force. The calculation results in **197** bar required oil pressure. Attention: max. 250 bar possible!

Calculation for system selection

$$\text{Max. oil pressure bar} \quad 250 \div \text{Max. press force kN} \quad 76 \times \text{Required press force for application kN} \quad 60 = \text{Required oil pressure for application bar} \quad 197$$

- b** The volume required in your case can be determined by multiplying the required power stroke (e.g. **14** mm) by the type specific volume factor V (e.g. **3.1**). The factors $F_1 + F_2$ are added to the previous result (whereby F_2 depends on the hose length e.g. **800** mm). Then add a factor of 1.5 for each ZHK 020 hydrosplit coupling, equals 56.6. Finally, this multiplied by the number of cylinders e.g. **2**, results in **113.2** cm³ oil volume. This leads to the selection of an intensifier X-ES with 123 cm³, the X-ES 125.000.0123.48.

Required total delivery volume for power stroke

Required delivery volume per 1 mm power stroke	Required power stroke for the application	Factor 1 depending on total stroke	Factor 2 per 100 mm hose length	Required delivery volume for power stroke	Amount cylinders	Required total delivery volume for power stroke for the application
V 3.1	x 14 mm	+ F_1 6.9	+ F_2 (0.6 x 8)	+ 1.5 = 56.6 cm ³	x 2	= 113.2 cm ³
<small>(ZHK 020)</small>						

- c** The stroke required for your application leads to the selection of a cylinder with a total stroke of **100** mm and defines the type of cylinder. Multiply the delivery volume factor V by the number of cylinders (e.g. **2**) equals in the total delivery volume of **620** cm³. Check whether this is possible with the selected intensifier. This intensifier delivers e.g. **1300** cm³. Therefore it's enough.

Required total delivery volume for fast approach stroke

Required delivery volume per 1 mm total stroke	Total stroke of cylinder	Required delivery volume for fast approach stroke	Amount cylinders	Required total delivery volume for fast approach stroke for the application
V 3.1	x 100 mm	= 310 cm ³	x 2	= 620 cm ³

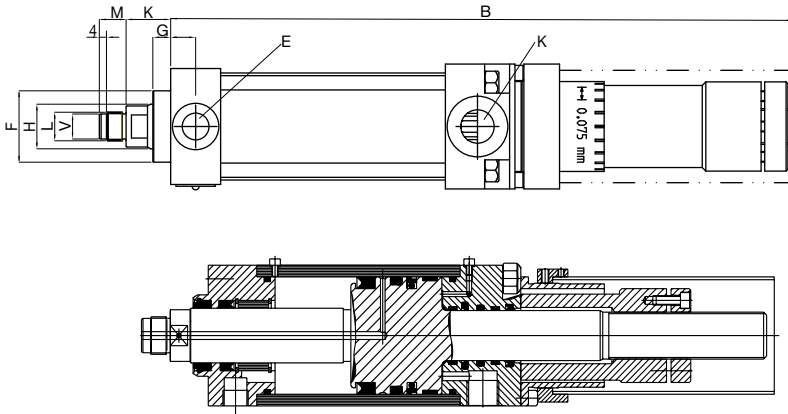
- d** The oil pressure calculated **a** e.g. 197 bar is divided by the oil pressure produced by the intensifier at 1 bar air pressure (e.g. **40**). The result is the required air pressure (e.g. 4.9 bar). In order to obtain high stroke frequencies, the air pressure should always be about 20 % higher (e.g. 5.9 bar). Caution: the maximum pressure / press force of the cylinder must not be exceeded.

$$\text{Calculated oil pressure} \quad 197 \text{ bar} \div \text{Required air pressure for application} \quad 40 = 4.9 \text{ bar}$$

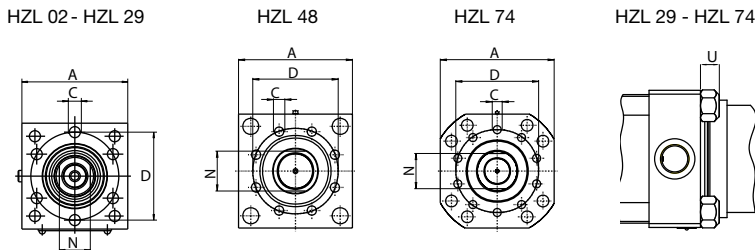
Note: When using different cylinders and different hose lengths, the calculation of the volume must be done individually for each cylinder. Then add the combined results.

TOX®-Hydraulic Cylinder HZL

with total stroke adjustment max. 250 bar oil pressure



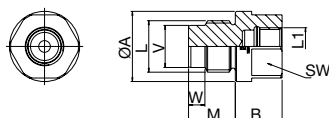
Corresponding TOX®-Pressure Intensifier X-ES see page 5.



Order no.	Type	Version	Total stroke	Max. press force at 250bar oil pressure c	Fast approach force at 6 bar air pressure	Return force at 6 bar air pressure	V	F ₁	F ₂	per 100mm hose length																Weight kg
										A	B	C	D	E	F ₁₇	G	H	K	L	M	N	W	V ₉₆	R	U	
	HZL 02.151..50		18	7	12	0.8	0.9	0.2	55	328	6xM6x12	42	G1/8"	32	9.5	16	27	M12x1.5	12	14	4	10	10	-	G1/4"	4
	HZL 02.151.100		18	7	12	0.8	1.6	0.2	55	478	6xM6x12	42	G1/8"	32	9.5	16	27	M12x1.5	12	14	4	10	10	-	G1/4"	4
	HZL 02.151.150		18	7	12	0.8	2.3	0.2	55	628	6xM6x12	42	G1/8"	32	9.5	16	27	M12x1.5	12	14	4	10	10	-	G1/4"	5
	HZL 02.151.200		18	7	12	0.8	3.1	0.2	55	778	6xM6x12	42	G1/8"	32	9.5	16	27	M12x1.5	12	14	4	10	10	-	G1/4"	6
	HZL 05.151..50		38	26	29	1.6	2.0	0.5	65	349	6xM8x12	54	G3/8"	40	10.0	25	25	M16x1.5	15	19	4	14	14	-	G1/2"	6
	HZL 05.151.100		38	26	29	1.6	4.0	0.5	65	506.5	6xM8x12	54	G3/8"	40	10.0	25	25	M16x1.5	15	19	4	14	14	-	G1/2"	8
	HZL 05.151.150		38	26	29	1.6	5.5	0.5	65	656.5	6xM8x12	54	G3/8"	40	10.0	25	25	M16x1.5	15	19	4	14	14	-	G1/2"	9
	HZL 05.151.200		38	26	29	1.6	7.0	0.5	65	806.5	6xM8x12	54	G3/8"	40	10.0	25	25	M16x1.5	15	19	4	14	14	-	G1/2"	11
	HZL 07.151..50		61	48	41	2.5	3.2	0.5	80	373.5	6xM8x16	65	G3/8"	52	10.0	35	25	M24x1.5	19	30	6	22	18	-	G1/2"	10
	HZL 07.151.150		61	48	41	2.5	8.9	0.5	80	667	6xM8x16	65	G3/8"	52	10.0	35	25	M24x1.5	19	30	6	22	18	-	G1/2"	14
	HZL 07.151.200		61	48	41	2.5	11.3	0.5	80	817	6xM8x16	65	G3/8"	52	10.0	35	25	M24x1.5	19	30	6	22	18	-	G1/2"	16
	HZL 11.151..50		88	85	85	3.6	4.5	0.5	90	373	6xM10x16	68	G3/8"	52	10.0	35	25	M24x1.5	19	30	6	22	18	-	G1/2"	13
	HZL 11.151.100		88	85	85	3.6	9.2	0.5	90	523	6xM10x16	68	G3/8"	52	10.0	35	25	M24x1.5	19	30	6	22	18	-	G1/2"	16
	HZL 11.151.150		88	85	85	3.6	12.6	0.5	90	675	6xM10x16	68	G3/8"	52	10.0	35	25	M24x1.5	19	30	6	22	18	-	G1/2"	18
	HZL 11.151.200		88	85	85	3.6	16.0	0.5	90	823	6xM10x16	68	G3/8"	52	10.0	35	25	M24x1.5	19	30	6	22	18	-	G1/2"	21
	HZL 19.151..50		153	148	142	6.3	8.0	0.7	125	418	6xM16x25	100	G1/2"	75	10.0	50	28	M30x2	25	41	7	26	24	-	G1"	28
	HZL 19.151.100		153	148	142	6.3	16.3	0.7	125	568	6xM16x25	100	G1/2"	75	10.0	50	28	M30x2	25	41	7	26	24	-	G1"	32
	HZL 19.151.150		153	148	142	6.3	22.3	0.7	125	718	6xM16x25	100	G1/2"	75	10.0	50	28	M30x2	25	41	7	26	24	-	G1"	38
	HZL 19.151.200		153	148	142	6.3	28.4	0.7	125	868	6xM16x25	100	G1/2"	75	10.0	50	28	M30x2	25	41	7	26	24	-	G1"	43
	HZL 29.151..50		252	277	254	10.3	12.7	0.7	160	498	6xM20x30	115	G3/4"	80	15.0	55	47	M39x2	35	50	-	-	27	22	G1"	56
	HZL 29.151.100		252	277	254	10.3	25.8	0.7	160	648	6xM20x30	115	G3/4"	80	15.0	55	47	M39x2	35	50	-	-	27	22	G1"	63
	HZL 29.151.150		252	277	254	10.3	35.2	0.7	160	798	6xM20x30	115	G3/4"	80	15.0	55	47	M39x2	35	50	-	-	27	22	G1"	71
	HZL 29.151.200		252	277	254	10.3	44.7	0.7	160	948	6xM20x30	115	G3/4"	80	15.0	55	47	M39x2	35	50	-	-	27	22	G1"	79
	HZL 48.151..50		411	500	423	16.8	20.7	0.7	200	505	8xM20x30	150	G3/4"	125	25.0	80	60	M64x2	60	70	-	-	27	30	G1"	92
	HZL 48.151.100		411	500	423	16.8	42.2	0.7	200	655	8xM20x30	150	G3/4"	125	25.0	80	60	M64x2	60	70	-	-	27	30	G1"	104
	HZL 48.151.150		411	500	423	16.8	57.7	0.7	200	805	8xM20x30	150	G3/4"	125	25.0	80	60	M64x2	60	70	-	-	27	30	G1"	116
	HZL 48.101.200		411	500	423	16.8	73.2	0.7	200	955	8xM20x30	150	G3/4"	125	25.0	80	60	M64x2	60	70	-	-	27	30	G1"	128
	HZL 74.101..50		577	747	733	23.6	31.5	0.7	275	612	10xM24x40	200	G3/4"	150	25.0	100	65	M64x2	60	85	-	-	38	30	G1"	186
	HZL 74.101.100		577	747	733	23.6	64.1	0.7	275	762	10xM24x40	200	G3/4"	150	25.0	100	65	M64x2	60	85	-	-	38	30	G1"	207
	HZL 74.101.150		577	747	733	23.6	88.4	0.7	275	912	10xM24x40	200	G3/4"	150	25.0	100	65	M64x2	60	85	-	-	38	30	G1"	228
	HZL 74.101.200		577	747	733	23.6	112.6	0.7	275	1062	10xM24x40	200	G3/4"	150	25.0	100	65	M64x2	60	85	-	-	38	30	G1"	249

Dimensions in mm

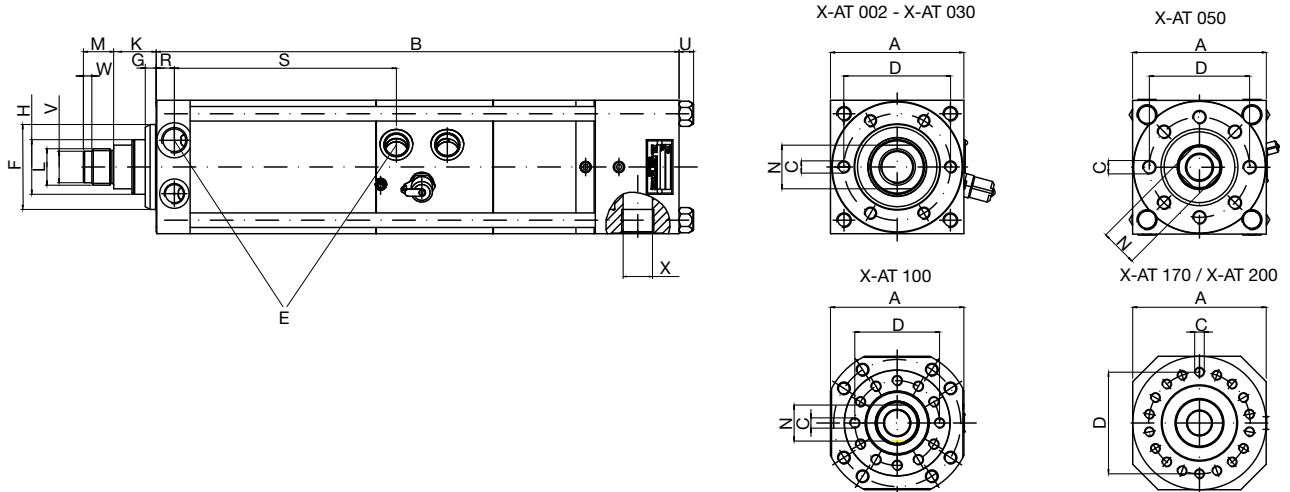
Adapter for working piston (with internal thread to fit the piston rod end)



Type	fits to	ØA	B	L1	L	M	W	V ₉₆	SW
HZZ 012.016.020.000	HZL 02	22	20	M12 x 1.5	M16 x 1.5	15	4	14	19
HZZ 016.022.020.000	HZL 05	30	20	M16 x 1.5	M22 x 2	20	7	18	27
HZZ 024.030.030.000	HZL 07 / HZL 11	45	30	M24 x 1.5	M30 x 2	25	7	26	41
HZZ 030.039.040.000	HZL 19	56	40	M30 x 2	M39 x 2	35	-	-	50

Dimensions in mm

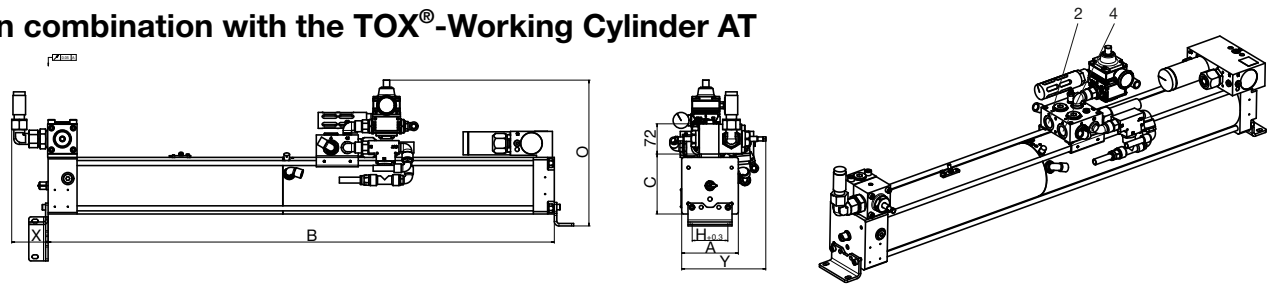
TOX®-Working Cylinder X-AT max. 400 bar oil pressure



Order no.	Type	Total stroke	Max. press force at 400 bar oil pressure ^d	Fast approach force at 6 bar air pressure	Return stroke force at 6 bar air pressure	V	F ₁	F ₂	per 100 mm hose length	Dimensions in mm																		Weight kg
										A	B	C	D	E _{EH} ⁺ E _{RH} ⁺	F ₁₇	G	H	K	L	M	N	R	S	V ₆₆	W	U	X hydr.	
X-AT 002.000.100	21	170	146	0.49	2.6	0.7	70	377	6xM8x12	54	G1/4"	40	9	20	26.0	M16x1.5	15	17	13	166.0	-	-	8	G1/2"	9			
X-AT 002.000.200	21	170	146	0.49	2.6	0.7	70	577	6xM8x12	54	G1/4"	40	9	20	26.0	M16x1.5	15	17	13	266.0	-	-	8	G1/2"	13			
X-AT 002.000.300	21	170	146	0.49	3.9	0.7	70	777	6xM8x12	54	G1/4"	40	9	20	26.0	M16x1.5	15	17	13	366.0	-	-	8	G1/2"	17			
X-AT 004.000.100	52	243	187	1.26	3.9	0.7	85	402	6xM8x15	64	G3/8"	50	10	30	28.5	M22x2	20	24	14	175.0	18	7	10	G1/2"	15			
X-AT 004.000.200	52	243	187	1.26	7.0	0.7	85	602	6xM8x15	64	G3/8"	50	10	30	28.5	M22x2	20	24	14	275.0	18	7	10	G1/2"	21			
X-AT 004.000.400	52	243	187	1.26	13.2	0.7	85	1002	6xM8x15	64	G3/8"	50	10	30	28.5	M22x2	20	24	14	475.0	18	7	10	G1/2"	32			
X-AT 008.000.100	81	432	318	1.96	6.5	0.9	110	431	6xM10x16	88	G1/2"	70	9	45	35.0	M30x2	25	36	15	183.0	26	7	12	G3/4"	28			
X-AT 008.000.200	81	432	318	1.96	11.2	0.9	110	631	6xM10x16	88	G1/2"	70	9	45	35.0	M30x2	25	36	15	283.0	26	7	12	G3/4"	37			
X-AT 008.000.400	81	432	318	1.96	20.6	0.9	110	1031	6xM10x16	88	G1/2"	70	9	45	35.0	M30x2	25	36	15	483.0	26	7	12	G3/4"	57			
X-AT 015.000.100	158	678	518	3.85	12.9	1.1	135	450	6xM16x25	100	G1/2"	75	15	50	36.0	M30x2	25	41	17.5	184.5	26	7	16	G1"	43			
X-AT 015.000.200	158	678	518	3.85	21.9	1.1	135	650	6xM16x25	100	G1/2"	75	15	50	36.0	M30x2	25	41	17.5	284.5	26	7	16	G1"	58			
X-AT 015.000.400	158	678	518	3.85	40.0	1.1	135	1050	6xM16x25	100	G1/2"	75	15	50	36.0	M30x2	25	41	17.5	484.5	26	7	16	G1"	87			
X-AT 030.000.100	320	1117	874	7.85	26.5	1.7	170	500	6xM20x30	132	G3/4"	100	17	56	47.0	M39x2	35	50	20	236.0	-	-	22	G1 1/4"	77			
X-AT 030.000.200	320	1117	874	7.85	44.7	1.7	170	700	6xM20x30	132	G3/4"	100	17	56	47.0	M39x2	35	50	20	336.0	-	-	22	G1 1/4"	100			
X-AT 030.000.400	320	1117	874	7.85	81.0	1.7	170	1100	6xM20x30	132	G3/4"	100	17	56	47.0	M39x2	35	50	20	536.0	-	-	22	G1 1/4"	145			
X-AT 050.000.100	498	1423	1083	12.27	34.8	1.7	200	519	8xM20x30	150	G3/4"	115	25	63	52.0	M42x2	40	55	23	243.0	-	-	30	G1 1/4"	113			
X-AT 050.000.200	498	1423	1083	12.27	62.8	1.7	200	719	8xM20x30	150	G3/4"	115	25	63	52.0	M42x2	40	55	23	343.0	-	-	30	G1 1/4"	144			
X-AT 050.000.400	498	1423	1083	12.27	119.1	1.7	200	1119	8xM20x30	150	G3/4"	115	25	63	52.0	M42x2	40	55	23	543.0	-	-	30	G1 1/4"	206			
X-AT 100.000.100	1030	2752	1972	25.45	71.4	3.1	310	559	12xM24x40	200	G1"	150	25	100	60.0	M64x2	60	85	40	248.0	-	-	30	SAE 2"	262			
X-AT 100.000.200	1030	2752	1972	25.45	129.2	3.1	310	759	12xM24x40	200	G1"	150	25	100	60.0	M64x2	60	85	40	348.0	-	-	30	SAE 2"	326			
X-AT 100.000.300	1030	2752	1972	25.45	187.0	3.1	310	959	12xM24x40	200	G1"	150	25	100	60.0	M64x2	60	85	40	448.0	-	-	30	SAE 2"	390			
X-AT 170.000.100	1670	1570	2530	41.55	116.1	3.1	420	644	18xM30x55	320	G1"	240	35	150	70.0	M80x2	80	4xØ16	99	253.0	-	-	30	SAE 2"	556			
X-AT 170.000.200	1670	1570	2530	41.55	210.0	3.1	420	844	18xM30x55	320	G1"	240	35	150	70.0	M80x2	80	4xØ16	99	253.0	-	-	30	SAE 2"	643			
X-AT 170.000.400	1670	1570	2530	41.55	397.9	3.1	420	1244	18xM30x55	320	G1"	240	35	150	70.0	M80x2	80	4xØ16	99	253.0	-	-	30	SAE 2"	817			
X-AT 200 on request																												

Notice: The specified press force includes the fast approach force. For mounting specifications see data sheet 10.18 TOX®-Powerpackage, pressure tolerances ± 5 %. Dimensions in mm
 * Pneumatic supply at the intensifier X-ES (connection sizes see X-ES).
 Due to the flange connection SAE 2", the X-AT 100 and X-AT 170 types can only be used with intensifiers of the sizes X-ES 250 and X-ES 300.

TOX®-Pressure Intensifier X-ES in combination with the TOX®-Working Cylinder AT



Order no.	ZHK										Pneumatic connection [4]	Hydraulic connection high pressure [2]	Delivery volume for fast appr. stroke cm ³	Delivery volume for power stroke cm ³	Oil pressure at 1 bar air pressure bar	Oil pressure at 6 bar air pressure bar	Maximum number of hydrosplit coupling direct	Amount of hydrosplit couplings with adapter 603	Weight kg ****		
	A	B	C	D	E	G	H	O	V	X _{max}										Y	
X-ES 100.000.0043.69	110	999	143	9	6	28	85	258	46	100	-	188	G1/2"	G1/2"	600	43	57**	347***	3xZHK020	4 - 6	43
X-ES 125.000.0070.80	135	1207	168	9	6	28	85	302	46	100	-	201	G3/4"	G3/4"	1300	70	66**	398***	3xZHK020	4 - 6	70
X-ES 180.000.0199.81	190	1569	305	14	20	45	100	409	88	100	-	228	G1"	G1"	4300	199	67**	405***	-	1 - 6	158
X-ES 250.000.0424.80	267	1731	382	14	20	45	100	486	88	100	205	267	G1"	G1"	10000	424	66**	398***	1xZHK042	1 - 6	317
X-ES 300.000.0878.73	324	2207	439	14	20	45	100	543	88	100	205	295	G1"	G1"	20000	878	61**	367***	1xZHK042	1 - 6	559

Note: Unless specified otherwise the max. permissible oil pressure is 400 bar for all intensifiers of the type X-ES. It must not be exceeded.
 ** Attention: Pressure and force values to be considered as calculation basis for preselection. The real values can differ.
 *** Pressure tolerance ± 5%
 **** Weight data for X-ES including pneumatic control and hydrosplit coupling ZHK 020.

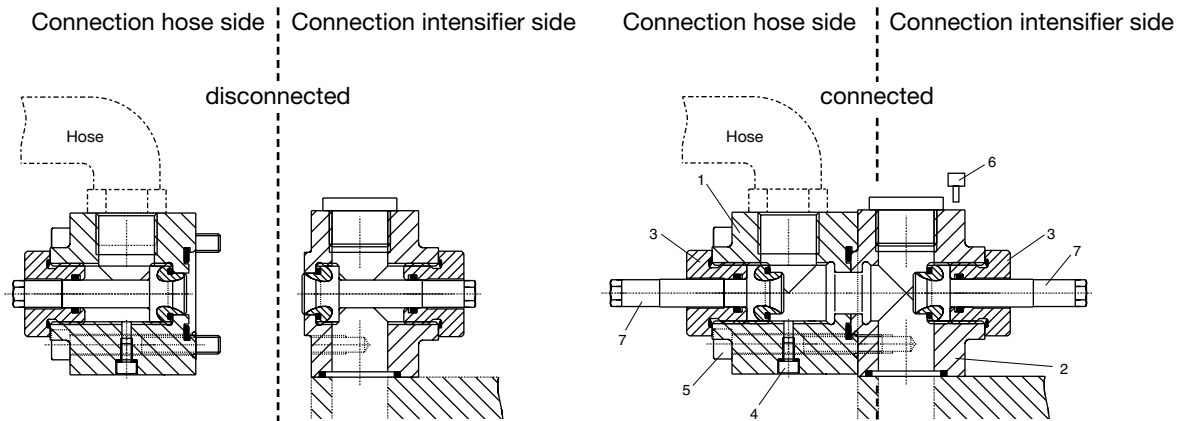
Pneumatic connection sizes	
Connection	Nominal sizes/Inside-Ø hose
G1/4"	7 - 8 mm
G3/8"	8 - 9 mm
G1/2"	10 - 11 mm
G3/4"	19 - 20 mm
G1"	25 mm
G1 1/2"	38 mm

TOX®-Hydrosplit Coupling type ZHK

Easy separation of pressure intensifier and drive cylinder

In order to ship the components already filled with oil and for easy installation, the TOX®-Hydrosplit Coupling has been developed. This allows to connect all components without any introduction of air to the system and without leakage. The coupling is available as manual or electric switchable.

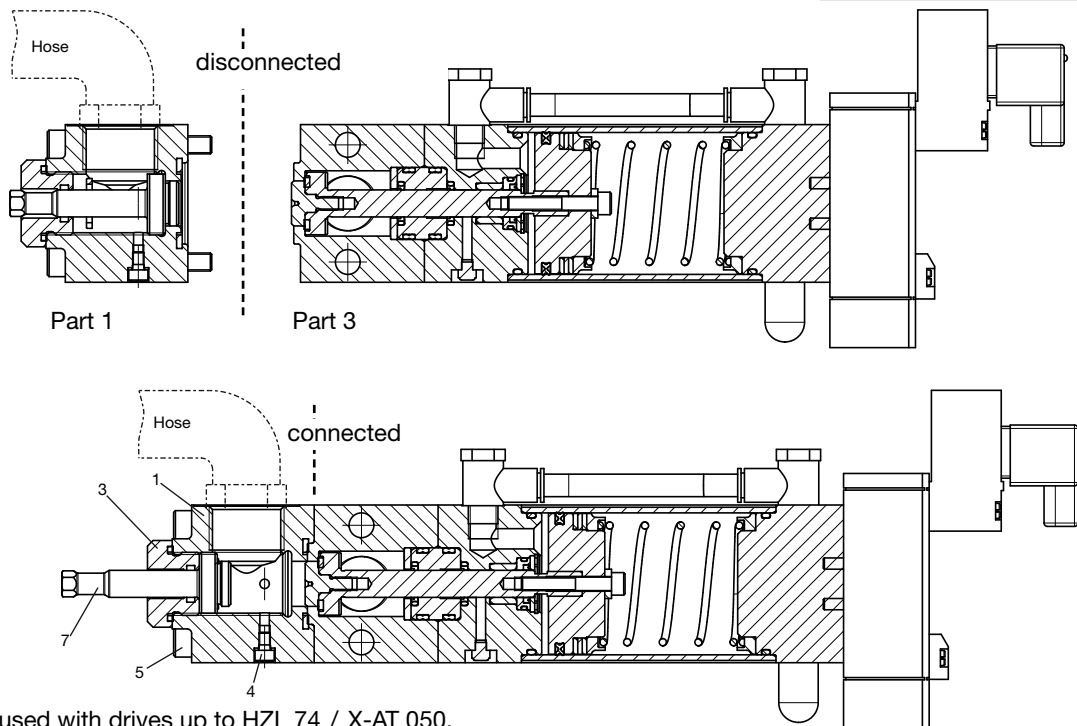
TOX®-Hydrosplit Coupling type ZHK 020.000 manually switchable



Part 1 Part 2

Can be used with drives up to HZL 74 / X-AT 050.
For bigger cylinders request the ZHK 042 (with SAE 2" connection.)

TOX®-Hydrosplit Coupling type ZHK 020.001 with solenoid operated valve



Can be used with drives up to HZL 74 / X-AT 050.

Features:

- Valve is operated with a drive cylinder. No pressure drop
- Cylinders can be activated independently. Return stroke position can be controlled
- One valve size can be used on all cylinders
- Improved cycle time
- Prepared for position feedback

Technical data:

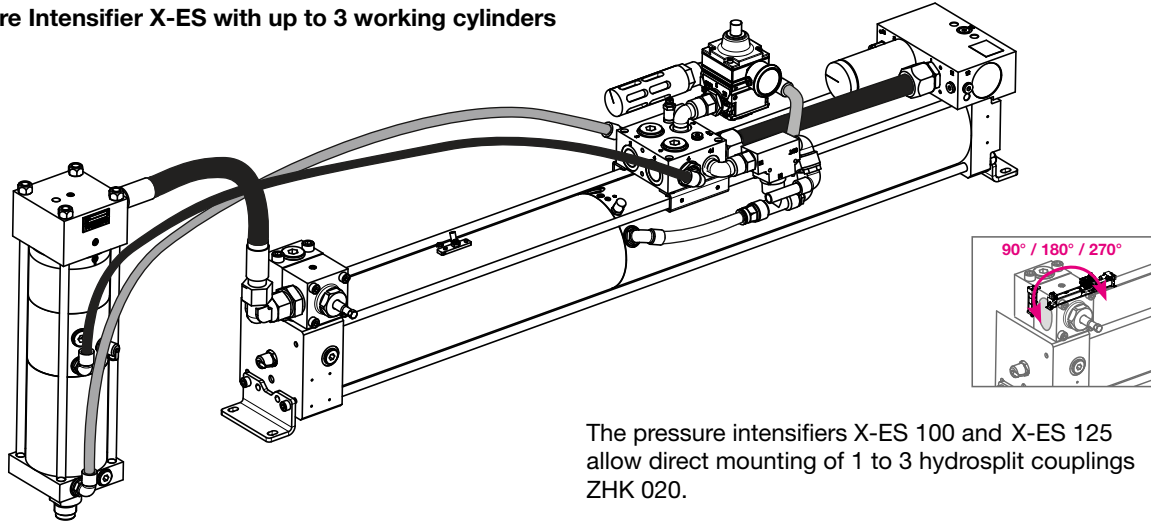
Operating voltage	24 V/DC
Power consumption	4.4 W

Includes solenoid DIN 43650 (ISO 4400) design A, with LED

TOX[®]-Hydrosplit Coupling type ZHK

Combinable with up to 6 drive cylinders

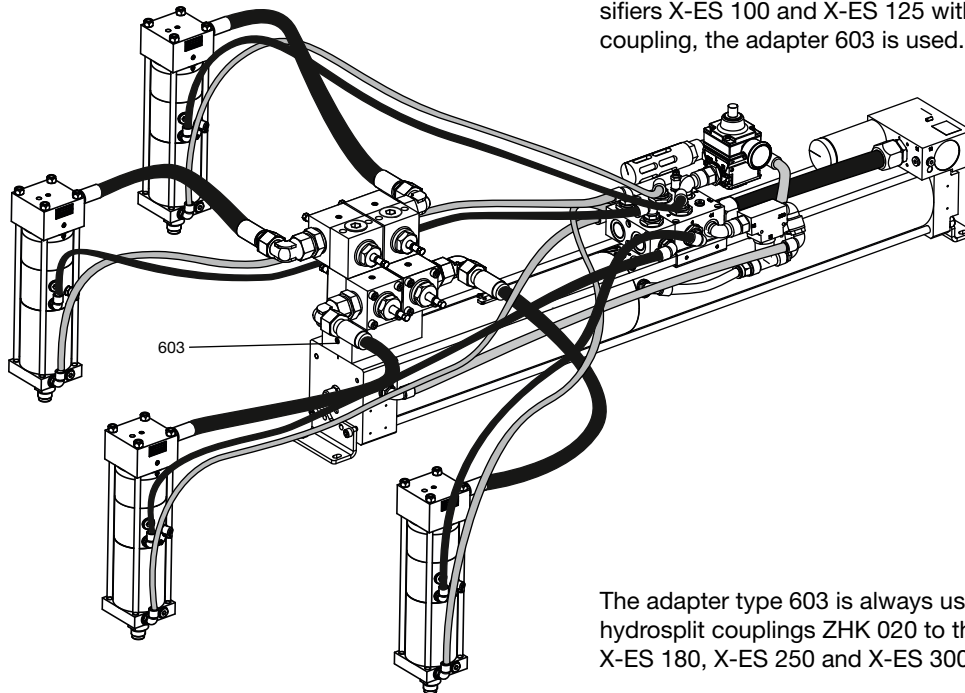
Pressure Intensifier X-ES with up to 3 working cylinders



The pressure intensifiers X-ES 100 and X-ES 125 allow direct mounting of 1 to 3 hydrosplit couplings ZHK 020.

Pressure Intensifier X-ES with 4 and more working cylinders

When mounting 4 to 6 working cylinders to the intensifiers X-ES 100 and X-ES 125 with the hydrosplit coupling, the adapter 603 is used.

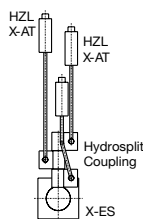
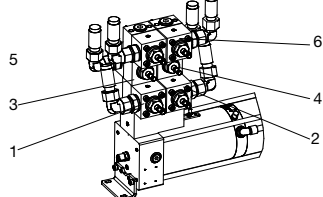


The adapter type 603 is always used when mounting hydrosplit couplings ZHK 020 to the intensifiers X-ES 180, X-ES 250 and X-ES 300.

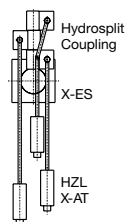
Mounting variants

Mounting variants of TOX[®]-Hydrosplit Coupling with 1 – 6 hoses. Swivel fitting allows each hose to be independently oriented.

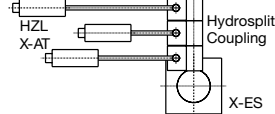
Standard mounting sequence of the TOX[®]-Hydrosplit Coupling ZHK 020



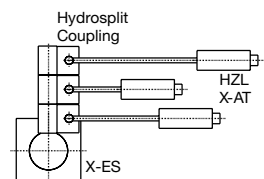
Variant 1



Variant 2



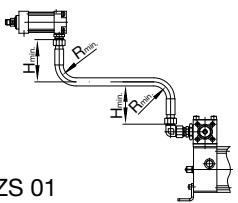
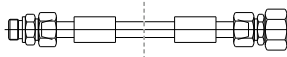
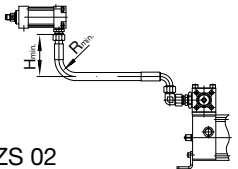
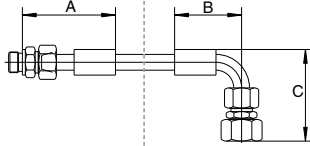
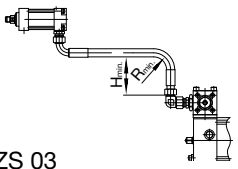
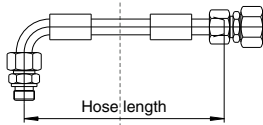
Variant 3



Variant 4

Hydraulic hoses

The connection between the drive cylinders and pneumohydraulic intensifier

Connection variants			
Variant no.	Cylinder HZL / X-AT side	Intensifier X-ES side	Connection
 <p>ZS 01</p>			2 x straight connection
 <p>ZS 02</p>			1 x 90° elbow on X-ES 1 x straight connection on HZL/X-AT
 <p>ZS 03</p>			1 x straight connection on X-ES 1 x 90° elbow on HZL/X-AT

Allocation of the hydraulic hoses to the drive cylinders

Drive	Standard hose lengths	Nominal size	Hoses Ø D	Hose dimensions					Hose weight incl. oil* [kg/m]
				A	B	C	H _{min}	R _{min}	
AT 001	500/1000/1500/2000/2500/3000	10	21	88	75	84	220	150	0.6
X-AT 002/X-AT 004	500/1000/1500/2000/2500/3000	12	24	94	85	92	275	200	0.8
X-AT 008	500/1000/1500/2000/2500/3000	16	28.5	101	90	74	320	240	1.3
X-AT 015	500/1000/1500/2000/2500/3000	19	32	118	125	137	375	280	1.8
X-AT 030/X-AT 050	500/1000/1500/2000/2500/3000	25	39	145	160	100	420	270	2.6
X-AT 100/X-AT 170	1000/1500/2000/2500/3000	50	71	200	200	176	1120	920	6.8
HZL 02	500/1000/1500/2000/2500/3000	10	21	88	75	84	220	150	0.6
HZL 05	500/1000/1500/2000/2500/3000	12	24	94	85	92	275	200	0.8
HZL 07/HZL 11	500/1000/1500/2000/2500/3000	16	28.5	101	90	74	320	240	1.3
HZL 19/HZL 29	500/1000/1500/2000/2500/3000	19	32	118	125	137	375	280	1.8
HZL 48/HZL 74	500/1000/1500/2000/2500/3000	25	39	145	160	100	420	270	2.6

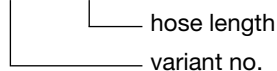
R_{min}: smallest allowable bending radius

*without screw-type fittings

Dimensions in mm

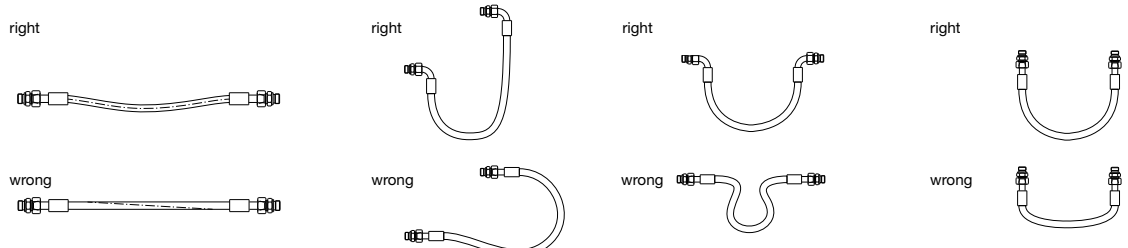
Ordering example:

ZS 01 - 1000



Other connection variants on request.

Examples of the correct installation of hydraulic hoses



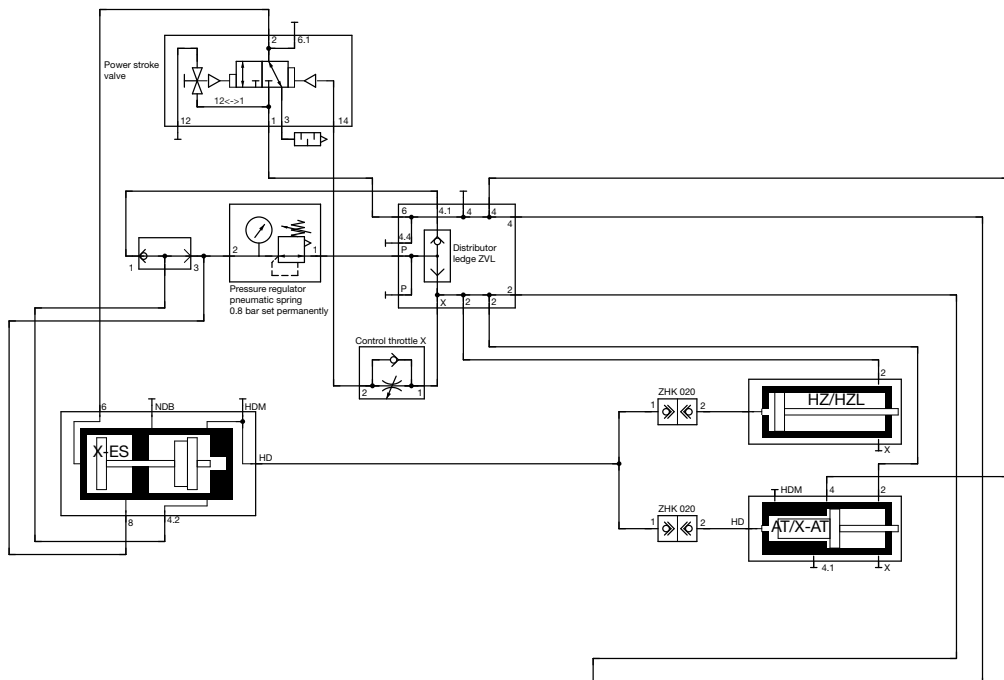
Hoses must be installed so that it can be bled properly!

Additional information

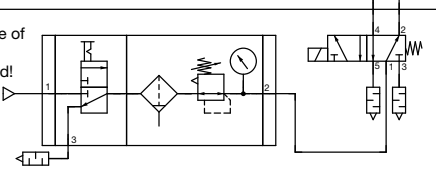
Pneumatic control diagram

Pneumatic control diagram (example):

TOX®-Powerpackage X-KT-System for up to 6 drive cylinders (X-AT or HZL) with pneumatic control, power stroke valve and hydrosplit coupling ZHK 020.



Not included in the scope of delivery!
Maintenance unit required!
Configuration range:
min. 2 bar, max. 10 bar



Control system for X-KT systems for 1-2 X-AT/HZL with power stroke valve, with fast approach stroke support and control throttle X

Description:
Storage piston during fast approach pressurized with fast approach pressure.
Storage piston during return stroke pressurized with reduced air spring pressure.
Power stroke piston permanently pressurized with reduced air spring pressure.

Additional information

Ordering information

The following ordering example (TOX[®]-Pressure Intensifier with 2 TOX[®]-Hydraulic Cylinders HZL) shows, how to order a TOX[®]-Powerpackage X-KT system (either with working part X-AT or with hydraulic cylinder HZL):

Ordering data:	Example:	Quantity:
Order no. of the intensifier X-ES	X-ES 125.000.0123.48	1
Order no. of either the TOX [®] -Working Cylinder X-AT or the TOX [®] -Hydraulic Cylinder HZL	HZL 07.101.100	2
Length and variant no. of the hydraulic hose ZS	ZS 01.1000	2
Type of TOX [®] -Hydrosplit Coupling and mounting variant	ZHK 020.000, Mounting variant 1	2

You will receive:

- 2 x HZL incl. hoses and hydrosplit coupling
- 1 x X-ES incl. hydrosplit coupling (manually switchable)

The TOX[®]-Powerpackage X-KT-System will be delivered in detached condition but completely filled with oil.

All components are ready for connection including colour-guided pneumatic plug-in-system.

