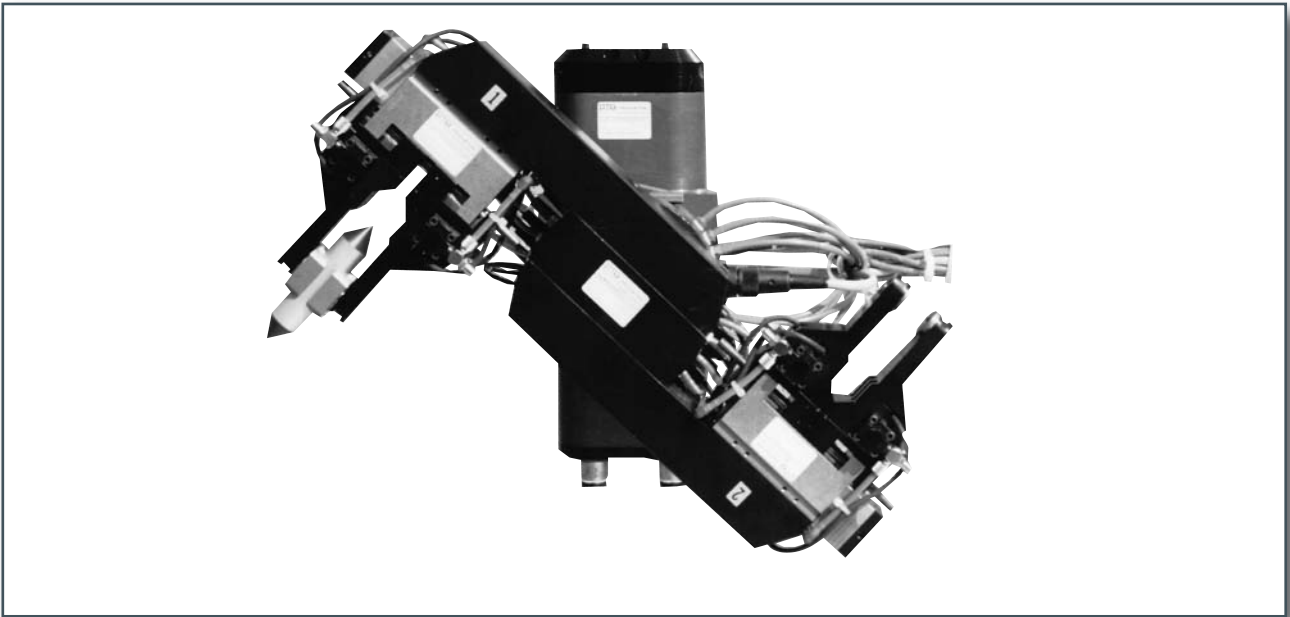


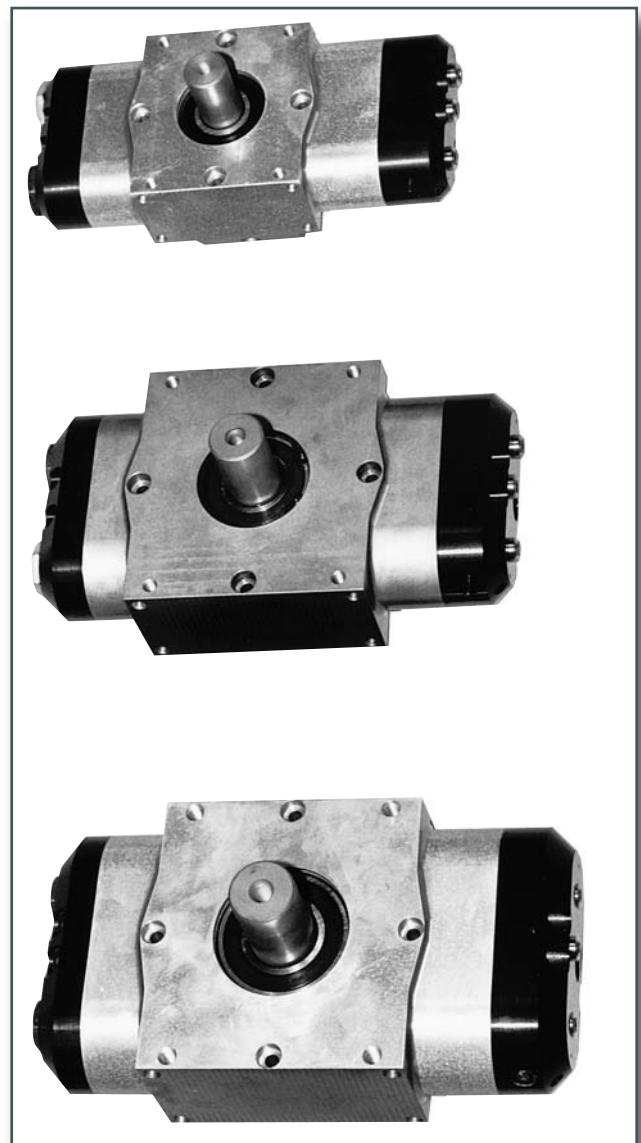
Hydraulic-Pneumatic Rotary Actuators

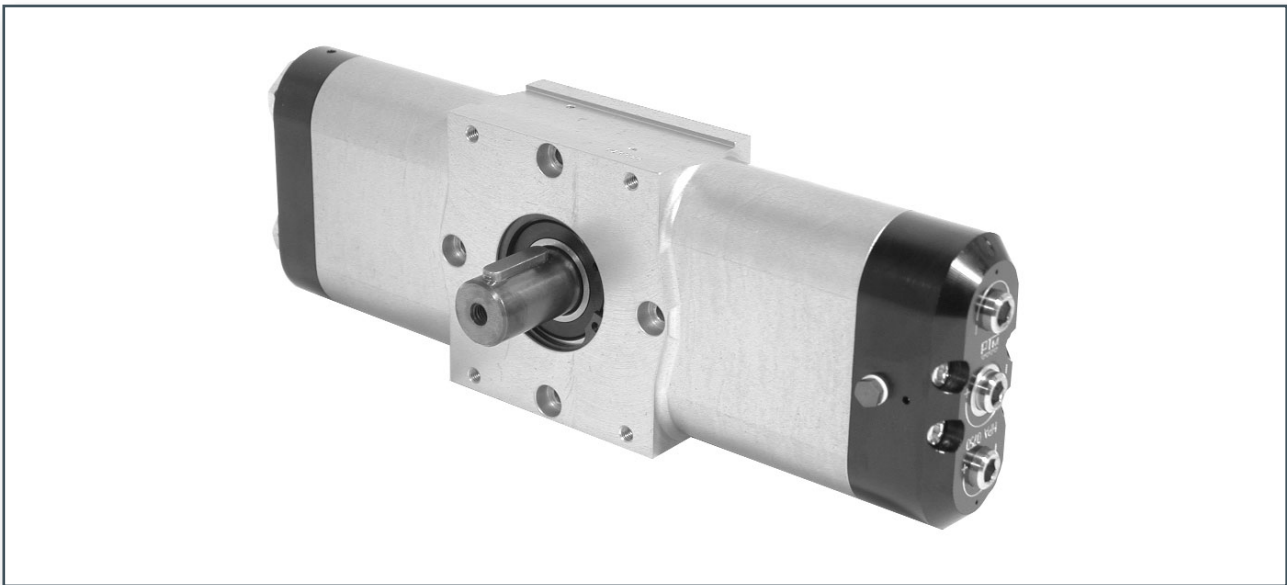
HPA 0750, HPA 1500, HPA 3000



The accelerated mass represents a major problem in pneumatics. The actuator may self-destruct because of the kinetic energy. Some clients had this unpleasant experience already. Throttle valves can be used to control the rotating speed. For damping of the accelerated mass before reaching the end positions it is possible to install hydraulic shock absorbers. This will improve the situation, but the result is not totally satisfactory.

We developed the Hydraulic-Pneumatic Rotary Actuator -HPA to solve this problem. We split the task into two steps: The cheap, clean and compressible medium air will continue to do the work for the actuation. But to control the moving mass the non compressible medium oil is used in a closed hydraulic system. This allows to adjust the rotation speed exactly. A restart after an E-stop is possible without any problems. There are two independent and adjustable rotation speeds possible. This guarantees a precise and constant adjustment of the end position damping.

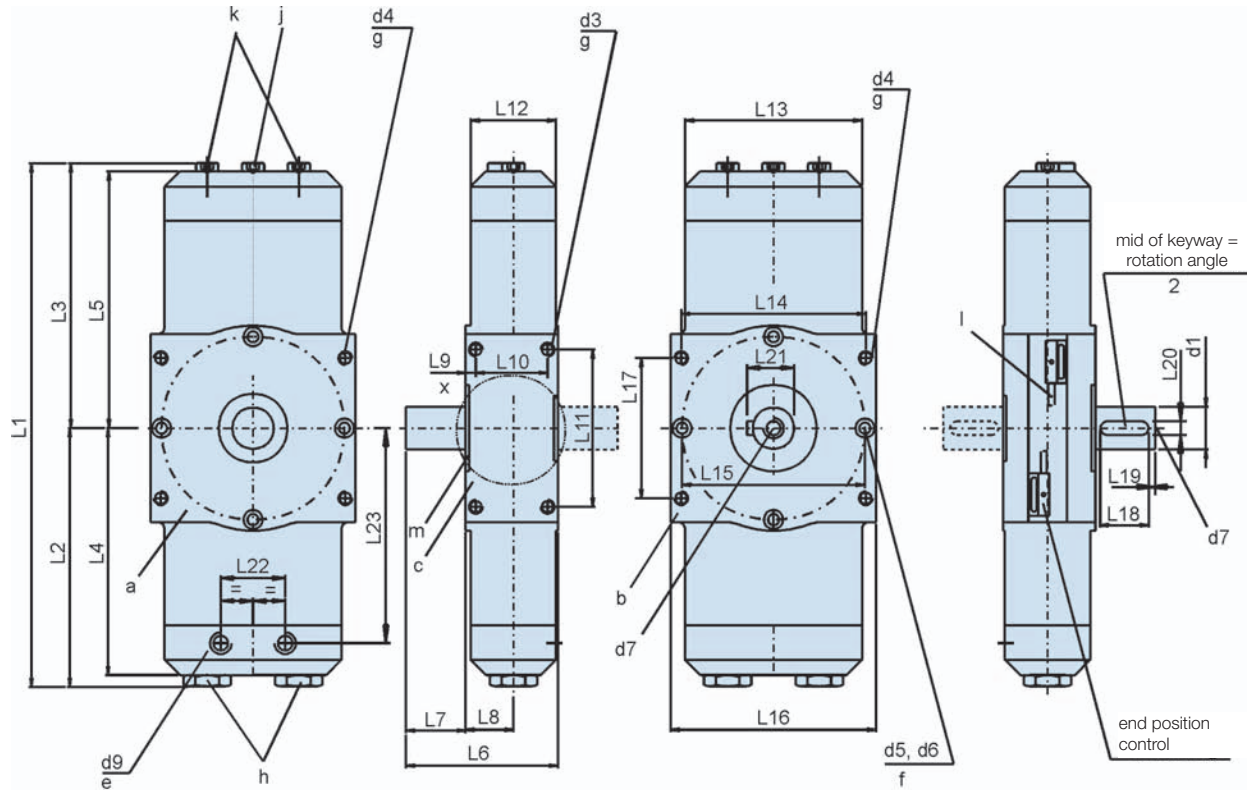




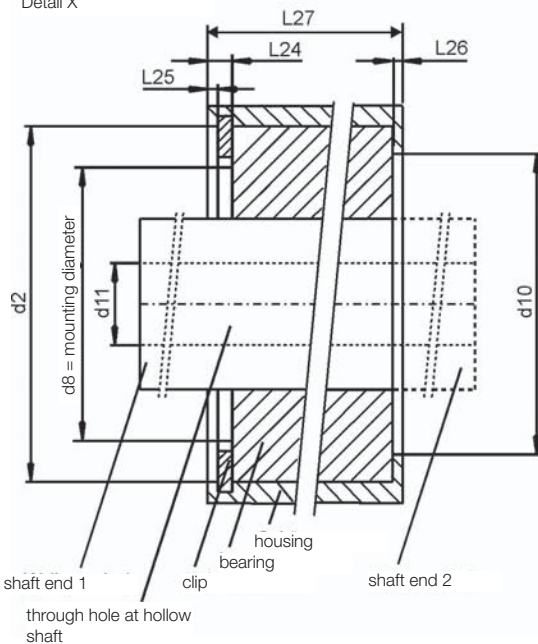
Material:	<ul style="list-style-type: none"> - aluminum hard or black anodized - steel parts of stainless material or corrosion resistant - shorttime gas nitration
Operating or mounting position:	<ul style="list-style-type: none"> - any position desired
Operating media:	<ul style="list-style-type: none"> - filtered oiled air or filtered oil-free air
Operating pressure:	<ul style="list-style-type: none"> - maximum 8 bar = 118 psi (specs are based on 6 bar = 88 psi)
Rotation speed:	<ul style="list-style-type: none"> - exactly adjustable stroke speeds are possible through a closed loop hydraulic system - no extra pipes for leakage of hydraulics necessary
Rotation time:	<ul style="list-style-type: none"> - from 0,5 sec. to several minutes at a rotation angle of 180° for example
Rotation angle:	<ul style="list-style-type: none"> - rotation angle of maximum 365°, 185° and 95° - adjustable until -15° through adjustment screws
End position damping:	<ul style="list-style-type: none"> - progressive damping characteristics - the damping distance and damping characteristics are adjustable
End position control with LED:	<ul style="list-style-type: none"> - please see our sheet "end position control" on page 44
Shaft-Hub connection:	<ul style="list-style-type: none"> - keyway/key - hub flange
Operating temperature:	<ul style="list-style-type: none"> - -10° C to +80° C (14°F to 176°F)
Maintenance:	<ul style="list-style-type: none"> - all PTM actuators are maintenance-free
Installation information:	<ul style="list-style-type: none"> - because of the hydraulic controlled movements the use of the throttle valves is not necessary

Hydraulic-Pneumatic Rotary Actuators

HPA 0750, HPA 1500, HPA 3000



Dimensions:
Detail X



Attention: Dimensions and ordering code for HPA-hub flange you will find on page 12 of the catalog.

ADDITION : Hub flange ZAF

- a, b, c** mounting surface
- e** air connections, 2x
- f** mounting alternatives, 4x bores for mounting DIN 74 with through holes on side **a, b**
- g** mounting alternatives, 4x threaded holes on side **a, b, c**
- h** adjustment screws to limit the rotation angle until -15°
- j** adjustment screw for rotation speed
- k** adjustment screws for end position damping
- l** connection cable for end position control
- m** centre bore

Attention: Dimensions of shaft end 2 are identical with shaft end of the basic model.

model	HPA 0750			HPA 1500			HPA 3000		
	750 Ncm at 6 bar			1500 Ncm at 6 bar			3000 Ncm at 6 bar		
torque									
rotation angle	095°	185°	365°	095°	185°	365°	095°	185°	365°
L1	210,8	270,4	389,8	233,2	305,6	450,4	257,8	339,4	502,8
L2	102,8	132,6	192,3	114,1	150,3	222,7	125,8	166,6	248,3
L3	108,0	137,8	197,5	119,1	155,3	227,7	132,0	172,8	254,5
L4	95,9	125,7	185,4	107,2	143,4	215,8	118,9	159,7	241,4
L5	103,5	133,3	193,0	114,6	150,8	223,2	127,5	168,3	250,0
L6	73,0	73,0	73,0	89,0	89,0	89,0	106,0	106,0	106,0
L7	30,0	30,0	30,0	35,0	35,0	35,0	40,0	40,0	40,0
L8	22,5	22,5	22,5	28,0	28,0	28,0	34,0	34,0	34,0
L9	5,0	5,0	5,0	6,0	6,0	6,0	6,0	6,0	6,0
L10	33,0	33,0	33,0	42,0	42,0	42,0	54,0	54,0	54,0
L11	70,0	70,0	70,0	98,0	98,0	98,0	108,0	108,0	108,0
L12	39,0	39,0	39,0	50,0	50,0	50,0	62,0	62,0	62,0
L13	84,6	84,6	84,6	103,6	103,6	103,6	123,8	123,8	123,8
L14	78,0	78,0	78,0	107,0	107,0	107,0	118,0	118,0	118,0
ø L15	76,0	76,0	76,0	107,0	107,0	107,0	118,0	118,0	118,0
L16	88,0	88,0	88,0	120,0	120,0	120,0	130,0	130,0	130,0
L17	60,0	60,0	60,0	86,0	86,0	86,0	92,0	92,0	92,0
L18	25,0	25,0	25,0	28,0	28,0	28,0	36,0	36,0	36,0
L19	3,0	3,0	3,0	4,0	4,0	4,0	4,0	4,0	4,0
L20	6,0 N9	6,0 N9	6,0 N9	8,0 N9	8,0 N9	8,0 N9	8,0 N9	8,0 N9	8,0 N9
L21	22,5	22,5	22,5	28,0	28,0	28,0	33,0	33,0	33,0
L22	33,0	33,0	33,0	41,0	41,0	41,0	46,0	46,0	46,0
L23	81,4	111,2	170,9	91,0	127,0	199,0	104,0	144,8	226,5
L24	3,0	3,0	3,0	3,6	3,6	3,6	4,1	4,1	4,1
L25	1,2	1,2	1,2	1,5	1,5	1,5	2,0	2,0	2,0
L26	1,0	1,0	1,0	1,5	1,5	1,5	2,0	2,0	2,0
L27	43,0	43,0	43,0	54,0	54,0	54,0	66,0	66,0	66,0
ø d1	20,0 h6	20,0 h6	20,0 h6	25,0 h6	25,0 h6	25,0 h6	30,0 h6	30,0 h6	30,0 h6
ø d2	42,0 J7	42,0 J7	42,0 J7	52,0 J7	52,0 J7	52,0 J7	62,0 J7	62,0 J7	62,0 J7
d3	4xM5/8	4xM5/8	4xM5/8	4xM6/14	4xM6/14	4xM6/14	4xM8/15	4xM8/15	4xM8/15
d4	4xM5/8	4xM5/8	4xM5/8	4xM6/10	4xM6/10	4xM6/10	4xM8/15	4xM8/15	4xM8/15
ø d5	4x5,4	4x5,4	4x5,4	4x6,4	4x6,4	4x6,4	4x6,4	4x6,4	4x6,4
ø d6	10x5,5	10x5,5	10x5,5	11x6,5	11x6,5	11x6,5	11x6,5	11x6,5	11x6,5
d7	M6x12	M6x12	M6x12	M8x16	M8x16	M8x16	M10x18	M10x18	M10x18
ø d8 max.	30,0	30,0	30,0	40,0	40,0	40,0	50,0	50,0	50,0
d9	R1/8x8	R1/8x8	R1/8x8	R1/8x8	R1/8x8	R1/8x8	R1/4x10	R1/4x10	R1/4x10
ø d10	36,0	36,0	36,0	44,0	44,0	44,0	52,0	52,0	52,0
ø d11 max.	11,0	11,0	11,0	15,0	15,0	15,0	18,0	18,0	18,0
F _A axial N	1250	1250	1250	1750	1750	1750	5000	5000	5000
C _o radial N	5000	5000	5000	7000	7000	7000	10000	10000	10000
weight in kg	ca. 2,5	ca. 2,6	ca. 2,9	ca. 3,4	ca. 3,9	ca. 4,4	ca. 5,8	ca. 6,4	ca. 6,9
compressed air/stroke in cm ³	12,7	24,7	48,7	26,4	51,4	101,5	45,8	89,1	175,8

All dimensions in mm

Ordering Code

HPA 0750 - XXX - X - X
 HPA 1500 - XXX - X - X
 HPA 3000 - XXX - X - X

Ordering Example

you order:
HPA 1500 - 185 - 1 - 1

0 = basic model
 1 = with end position control (sheet "end position control")

1 = 1 shaft end, basic model
 2 = 1 shaft end / hollow shaft
 3 = 2 shaft ends
 4 = 2 shaft ends / hollow shaft

torque at 6 bar in Ncm rotation angle

we deliver:
 Hydraulic-Pneumatic Rotary Actuator, model HPA 1500, with rotation angle 185°, with end position control and 1 shaft end