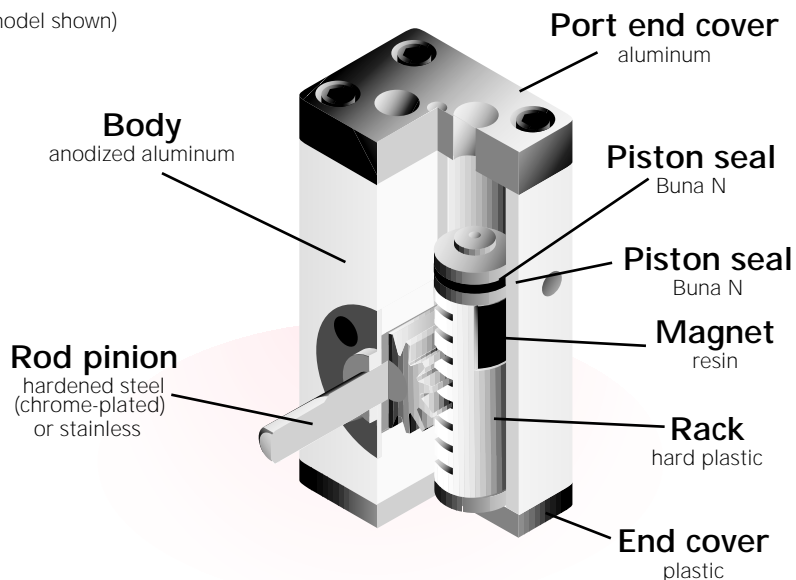


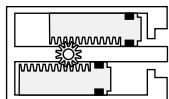
Rotary Cutaway, specifications and weight chart

Cutaway view (HRAPS standard model shown)



See terms and definitions page for more information.

Rotary specifications



Media	Air			
Temperature °C (°F)	0° to 50° (32° to 122°)			
Lubrication	None required. If used, must be compatible with seal materials.			
Model	HRAPS1	HRAPS5	HRAPS10	HRAPS20
Allowable energy kgf/cm (lbf/in)	0.01 (0.009)	0.03 (.026)	0.08 (0.069)	0.15 (0.130)
Pressure range "P" kgf/cm ² (psi)	1.5 - 7 (20 - 100)		0.6 - 7 (9 - 100)	
Angle tolerance	+ 10° - 0°			

Rotary weight chart

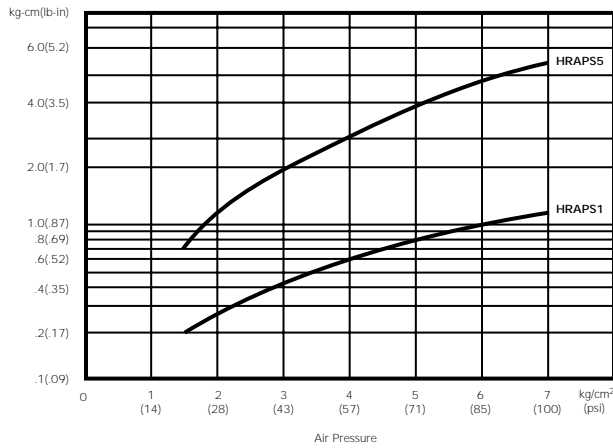
Model	Base		Added wt.	
	gm	oz	gm	oz
HRAPS1 90, 100	83	2.93	2	0.071
HRAPS1 180, 190	101	3.56	2	0.071
HRAPS1 360	148	5.22	2	0.071
HRAPS5 90, 100	212	7.48	4	0.141
HRAPS5 180, 190	260	9.17	4	0.141
HRAPS5 360	375	13.2	4	0.141
HRAPS10 90, 100	300	10.6	10	0.353
HRAPS10 180, 190	380	13.4	10	0.353
HRAPS10 360	538	19	10	0.353
HRAPS20 90, 100	500	17.6	16	0.564
HRAPS20 180, 190	614	21.7	16	0.564
HRAPS20 360	870	30.7	16	0.564

Rotary Bore and stroke chart

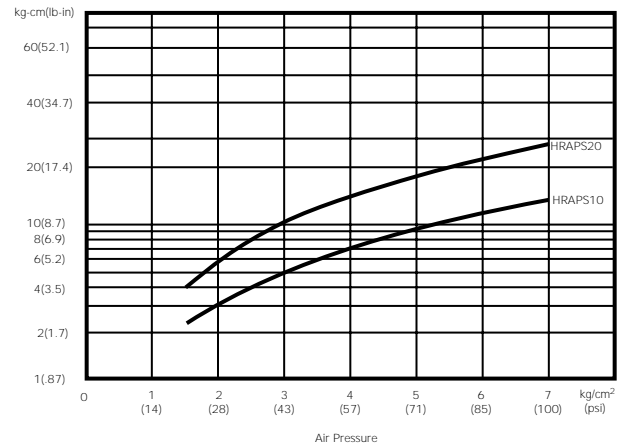
	HRAPS1	HRPAS5	HRAPS10	HRAPS20
90°	10 x 7.2 mm	16 x 9.5 mm	20 x 12.6 mm	25 x 15.7 mm
100°	10 x 8.0 mm	16 x 10.6 mm	20 x 14.0 mm	25 x 17.5 mm
180°	10 x 14.4 mm	16 x 19.0 mm	20 x 25.2 mm	25 x 31.4 mm
190°	10 x 15.2 mm	16 x 20.1 mm	20 x 26.5 mm	25 x 33.2 mm
360°	10 x 28.8 mm	16 x 38.0 mm	20 x 50.4 mm	25 x 62.8 mm

Rotary Torque charts

HRAPS1, HRAPS5



HRAPS10, HRAPS20

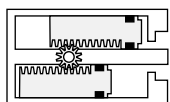


Actual torque kgf/cm (lbf/in)

MODEL	Air pressure kgf/cm2 (psi)					
	2 (28)	3 (43)	4 (57)	5 (71)	6 (85)	7 (100)
HRAPS1	.26 (.23)	.43 (.37)	.53 (.61)	.80 (.69)	.98 (.85)	1.1 (1.0)
HRAPS5	1.1 (1.0)	2.0 (1.7)	2.9 (2.5)	3.8 (3.3)	4.6 (4.0)	5.5 (4.8)
HRAPS10	3.0 (2.6)	4.5 (3.9)	6.7 (5.8)	9.0 (7.8)	11.3 (9.8)	13.6 (11.8)
HRAPS20	6.0 (5.2)	10.0 (8.7)	14.5 (12.6)	19.0 (16.6)	23.4 (20.3)	28.0 (24.3)

Notes

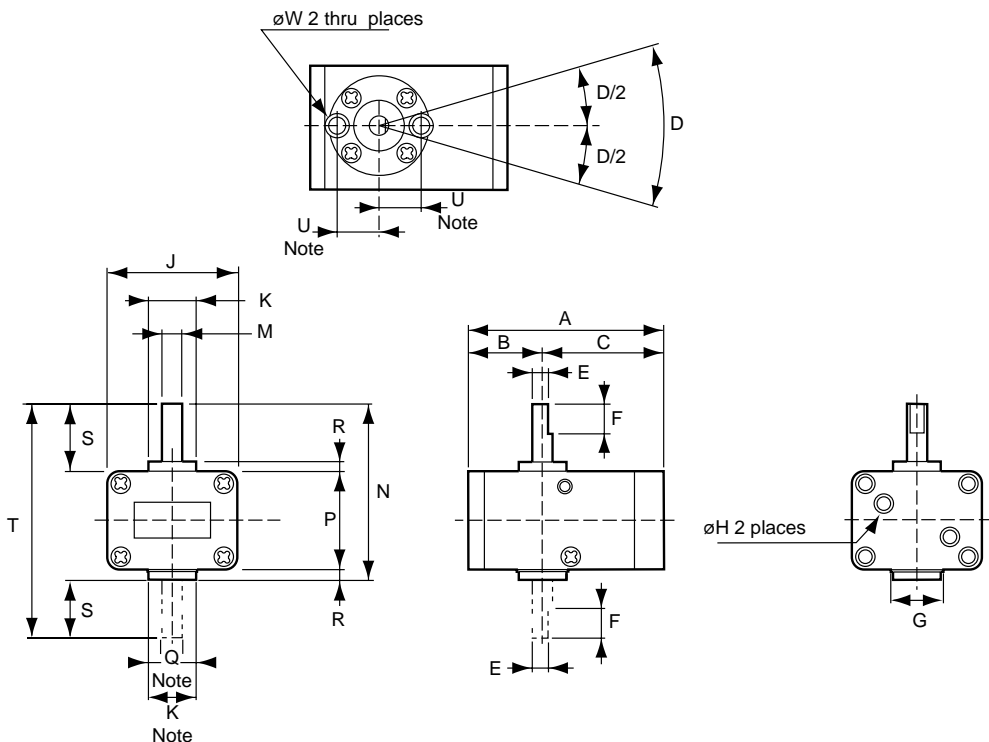
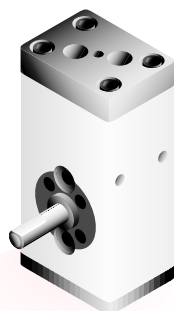
Rotary Rotary actuator (HRAPS1 and HRAPS5)



The actuator is available in swing angles from 90° to a full 360°. HRAPS1 and HRAPS5 models are shown below.

Sensor switches (see Sensor section page 11)

- ZC153
- CS5T
- CS11T



Model 1 mm (in)	Degree rotation	A	B	C	D	E	F	G	H	J	K	M
HRAPS1	90°, 100°	48 (1.890)	17 (.669)	31 (1.220)	90°, 100°	3.6 (1.412)	8 (.315)	11 (.433)	10-32 UNF	30 (1.181)	10 (.394)	4 (.157)
HRAPS1	180°, 190°	60 (2.362)	23 (.906)	37 (1.457)	180°, 190°	3.6 (1.412)	8 (.315)	11 (.433)	10-32 UNF	30 (1.181)	10 (.394)	4 (.157)
HRAPS1	360°	88 (3.465)	37 (1.457)	51 (2.008)	360°	3.6 (1.412)	8 (.315)	11 (.433)	10-32 UNF	30 (1.181)	10 (.394)	4 (.157)
		N	P	Q	R	S	T	U	W			
		size x c'bore x depth										
HRAPS1	90°, 100°	41.5 (1.634)	23 (.906)	2 (.079)	2.5 (.098)	16 (.630)	55 (2.165)	10 (.394)	3.4 (.134) x 6.5 (.256) x 3.3 (.130)			
HRAPS1	180°, 190°	41.5 (1.634)	23 (.906)	2 (.079)	2.5 (.098)	16 (.630)	55 (2.165)	10 (.394)	3.4 (.134) x 6.5 (.256) x 3.3 (.130)			
HRAPS1	360°	41.5 (1.634)	23 (.906)	2 (.079)	2.5 (.098)	16 (.630)	55 (2.165)	10 (.394)	3.4 (.134) x 6.5 (.256) x 3.3 (.130)			

Model 5 mm (in)	Degree rotation	A	B	C	D	E	F	G	H	J	K	M
HRAPS5	90°, 100°	62 (2.441)	22.5 (.886)	39.5 (1.555)	90°, 100°	5.5 (.217)	10 (.394)	16 (.630)	1/8 NPT	45 (1.772)	14 (.551)	6 (.236)
HRAPS5	180°, 190°	78 (3.070)	27.5 (1.082)	50.5 (1.988)	180°, 190°	5.5 (.217)	10 (.394)	16 (.630)	1/8 NPT	45 (1.772)	14 (.551)	6 (.236)
HRAPS5	360°	116 (4.66)	47 (1.850)	69 (2.716)	360°	5.5 (.217)	10 (.394)	16 (.630)	1/8 NPT	45 (1.772)	14 (.551)	6 (.236)
		N	P	Q	R	S	T	U	W			
		size x c'bore x depth										
HRAPS5	90°, 100°	54.5 (2.146)	32 (1.260)	2 (.079)	2.5 (.098)	20 (.787)	72 (2.834)	14 (.551)	5.5 (.216) x 9.5 (.374) x 5.4 (2.13)			
HRAPS5	180°, 190°	54.5 (2.146)	32 (1.260)	2 (.079)	2.5 (.098)	20 (.787)	72 (2.834)	14 (.551)	5.5 (.216) x 9.5 (.374) x 5.4 (2.13)			
HRAPS5	360°	54.5 (2.146)	32 (1.260)	2 (.079)	2.5 (.098)	20 (.787)	72 (2.834)	14 (.551)	5.5 (.216) x 9.5 (.374) x 5.4 (2.13)			

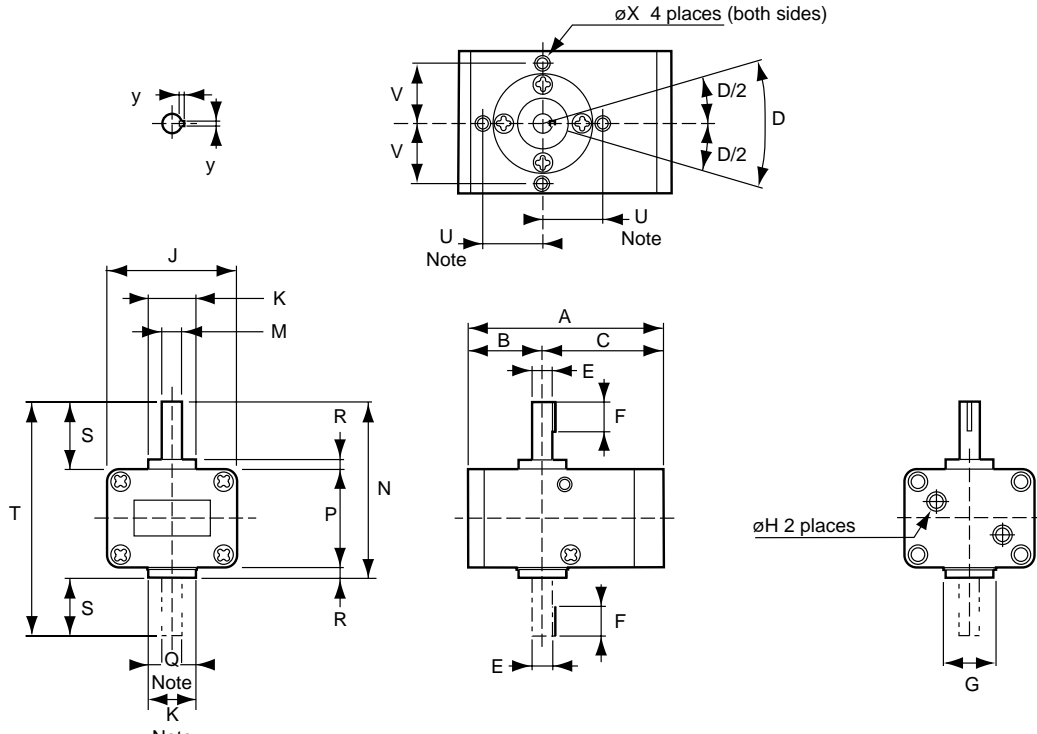
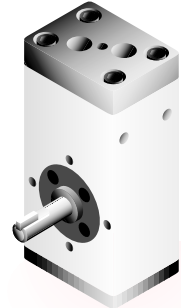
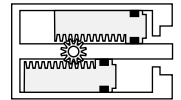
Tolerances		
Note K	Note Q	Note U
+0 + (0)	+0 + (0)	+0 + (0)
-.004 -.0001)	-.0007 -.00003)	-.0007 -.00003)

Rotary Rotary actuator (HRAPS10 and HRAPS20)

The actuator is available in swing angles from 90° to a full 360°. HRAPS10 and HRAPS20 models are shown below

Sensor switches (see Sensor section page 11)

ZC153
CS5T
CS11T



Model 10 mm (in)	Degree rotation	A	B	C	D	E	F	G	H	J	K
HRAPS10	90°, 100°	73 (2.874)	26.5 (1.043)	46.5 (1.831)	90°, 100°	9.2 (.362)	16 (.630)	14 (.551)	1/8 NPT	49 (1.929)	16 (.630)
HRAPS10	180°, 190°	95 (3.740)	35.9 (1.413)	59.1 (2.327)	180°, 190°	9.2 (.362)	16 (.630)	14 (.551)	1/8 NPT	49 (1.929)	16 (.630)
HRAPS10	360°	143 (5.630)	59 (2.323)	84 (3.307)	360°	9.2 (.362)	16 (.630)	14 (.551)	1/8 NPT	49 (1.929)	16 (.630)

		M	N	P	Q	R	S	T	U	V	X	Y
HRAPS10	90°, 100°	8 (.315)	63.5 (2.500)	36 (1.417)	2 (.079)	2.5 (.098)	25 (.984)	86 (3.386)	20 (.787)	20 (.787)	8-32 x 7 (.276)	3 (.118)
HRAPS10	180°, 190°	8 (.315)	63.5 (2.500)	36 (1.417)	2 (.079)	2.5 (.098)	25 (.984)	86 (3.386)	20 (.787)	20 (.787)	8-32 x 7 (.276)	3 (.118)
HRAPS10	360°	8 (.315)	63.5 (2.500)	36 (1.417)	2 (.079)	2.5 (.098)	25 (.984)	86 (3.386)	20 (.787)	20 (.787)	8-32 x 7 (.276)	3 (.118)

Model 20 mm (in)	Degree rotation	A	B	C	D	E	F	G	H	J	K
HRAPS20	90°, 100°	87 (3.425)	33.1 (1.303)	53.9 (2.122)	90°, 100°	11.2 (.440)	20 (.787)	20 (.787)	1/8 NPT	59 (2.323)	20 (.787)
HRAPS20	180°, 190°	113 (4.448)	45 (1.772)	68 (2.677)	180°, 190°	11.2 (.440)	20 (.787)	20 (.787)	1/8 NPT	59 (2.323)	20 (.787)
HRAPS20	360°	172 (6.772)	73 (2.874)	99 (3.898)	360°	11.2 (.440)	20 (.787)	20 (.787)	1/8 NPT	59 (2.323)	20 (.787)

		M	N	P	Q	R	S	T	U	V	X	Y
HRAPS20	90°, 100°	10 (.394)	74.5 (2.933)	42 (1.654)	2 (.079)	2.5 (.098)	30 (1.181)	102 (4.016)	24 (.944)	24 (.944)	10-32 UNF x 8 (.315)	3 (.118)
HRAPS20	180°, 190°	10 (.394)	74.5 (2.933)	42 (1.654)	2 (.079)	2.5 (.098)	30 (1.181)	102 (4.016)	24 (.944)	24 (.944)	10-32 UNF x 8 (.315)	3 (.118)
HRAPS20	360°	10 (.394)	74.5 (2.933)	42 (1.654)	2 (.079)	2.5 (.098)	30 (1.181)	102 (4.016)	24 (.944)	24 (.944)	10-32 UNF x 8 (.315)	3 (.118)

Tolerances		
Note K	Note Q	Note U
+0 + (0)	+0 + (0)	+0 + (0)
-.004 - (.0001)	-.0007 - (.00003)	-.0007 - (.00003)

Rotary How to Order

Actuator

Model	Nominal torque	Swing angle	Rod types	Rod material
HRAPS				
HRAPS Rotary actuator	1 1 kgf • cm (.87 in • lb) 5 5 kgf • cm (4.3 in • lb) 10 10 kgf • cm (8.7 in • lb) 20 20 kgf • cm (17.4 in • lb)	90° 100° 180° 190° 360°	Blank Single rod D Double rod	Blank Hardened steel (chrome-plated) S Stainless steel

Example: HRAPS5-190-DS

Sensor

See Sensor section at back of catalog for order information.