BULLETIN B - 310

HABONIM COMPACT

Quarter Turn Actuator

The Actuator that Delivers Maximum Torque for Minimum Air Consumption

The Standards Institution of Israel
SI
ISO 9001
Quality Assured Firm

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Introduction

The COMPACT pneumatic quarter turn actuator has been developed to be simple, reliable, and efficient using a patented rack and pinion design. Four separate racks, each with its own piston, develop torque around the centrally located pinion.

Greater Torque per Size

This four rack design permits air pressure to be applied simultaneously to four pistons, significantly reducing piston diameter and the actuator's overall size while producing higher torque, compared to single and double rack designs.

Less Wear

Symmetrically spaced at 90 degree angles around the central pinion, the COMPACT's four racks also achieve a more uniform load distribution than do single and double rack actuators, greatly reducing gear wear at the points of contact between rack and pinion.

Energy Saving

A look at the operation of the COMPACT actuator reveals several other important advantages of its symmetric four rack design, including a trouble-free high cycle life, minimum air consumption, energy efficient, fast responding, and of course, a compact shape.

Efficient

Patented 4-Pistons give maximum torque for minimum air consumption.

Long life

The unique balanced piston design and shorter stroke prevents uneven wear of gear and pistons.

Corrosion resistant

a) Anodized coating of body, covers and stop provides protection internally and externally.
b) A two layer external polyurethane paint coating provides protection against aggressive environments.

Stop

The stop design allows rotational adjustment in both directions of actuator travel.

Safe guard

Built-in for secure and easy operation, assembly and dismantling of the actuator.

Advantages of the Actuator Design

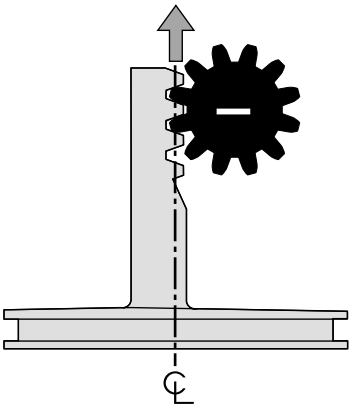
COMPACT's superiority over single and double rack designs is achieved through distribution of the total torque equally among its four racks so that each rack generates less torque. At a given air pressure, COMPACT can produce the same torque output using smaller diameter pistons and a narrower pinion. Four small cylinders, each located on one side of a cube, permit a compact, space saving shape.

A narrower pinion results in a shorter piston travel which makes the COMPACT fast acting.

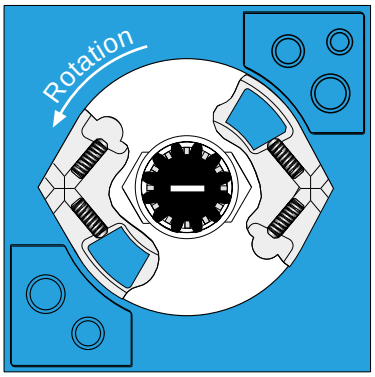
COMPACT's cube shape and short piston travel minimize dead space. Dead space is space not swept by piston travel that must be pressurized before piston motion begins. This is pressurized air that does no work but nonetheless requires energy to maintain pressure.

COMPACT's minimun dead space geometry means minimum air consumption, which in turn means maximum energy efficiency, since little pressurized air goes to waste.

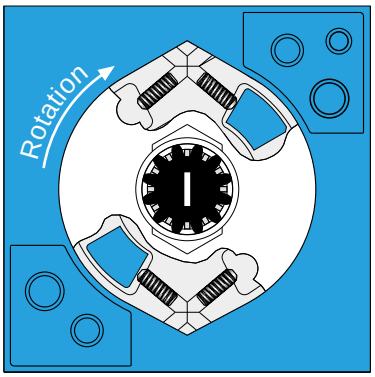
The COMPACT design also results in a long trouble-free operating life. It's four-rack, cube-shaped configuration positions the pistons so that each piston develops thrust along its own axis, rather than the off-axis thrust that results from the geometries of most other actuator configurations. Piston side loading, caused by off-axis thrust, does not occur, resulting in less stress on the seals.



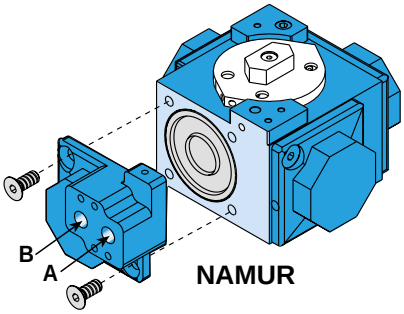
The four equally spaced racks driving the pinion encounter a symmetrical, uniformly distributed load dispersed about the entire circumference of the pinion. The pinion rotation is limited by two diametrically opposed stops on the actuator body and four adjustable set screws in the stop. Each opposing pair of screws exerts simultaneous and equal forces on opposite sides of the pinion when the rotation limit is reached, so that no off-center forces are generated by the stops. The set screws can be adjusted to limit or extend the actuator travel.



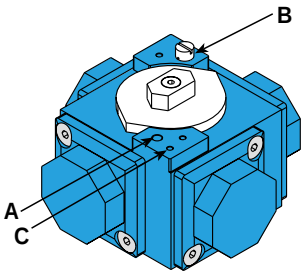
The four equally spaced racks and the paired stops produce only symmetrical, balanced forces. Throughout the entire angle of rotation from stop to stop there are no off-center forces to produce eccentric bearing wear or leaks. The major moving parts of COMPACT are thus subject to low mechanical wear.
The stop shows the position of the actuator.



The COMPACT actuator transforms the linear motion of it's pneumatic pistons into rotary motion via 4 gear racks that drive the central pinion. Supply air, to drive the pistons, flows into one of the two chambers located on the NAMUR cover: Port **A** is connected to the center chamber and port **B** is connected to the four outside chambers.
Size H15 does not have a NAMUR option. H60 and H75 have Namur blocks on the side.

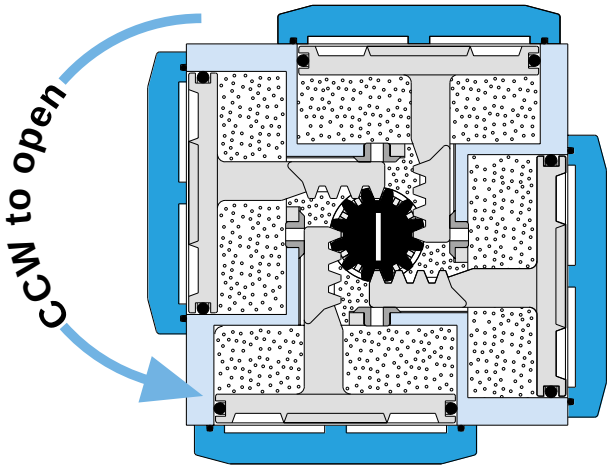


NAMUR

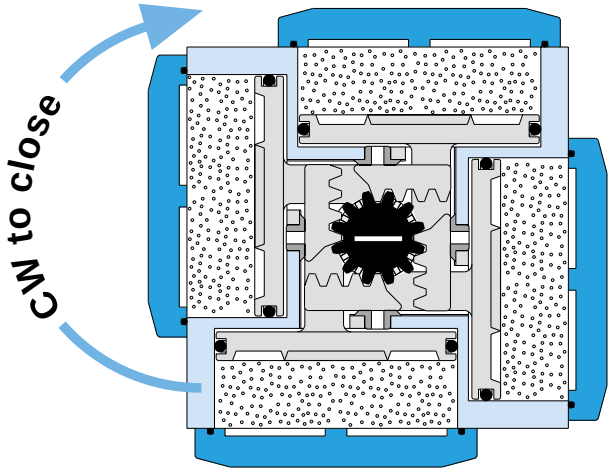


STANDARD

Double Acting

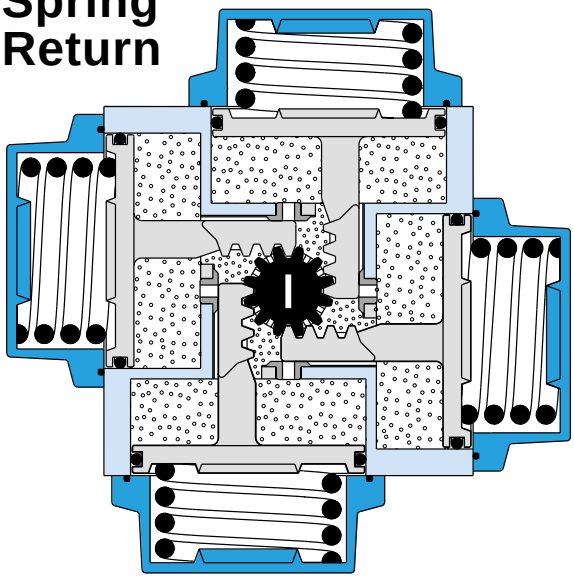


Pressure entering **Port A to open**:
Center chamber pressurized. Pistons move outward. Pinion rotates counter clockwise.

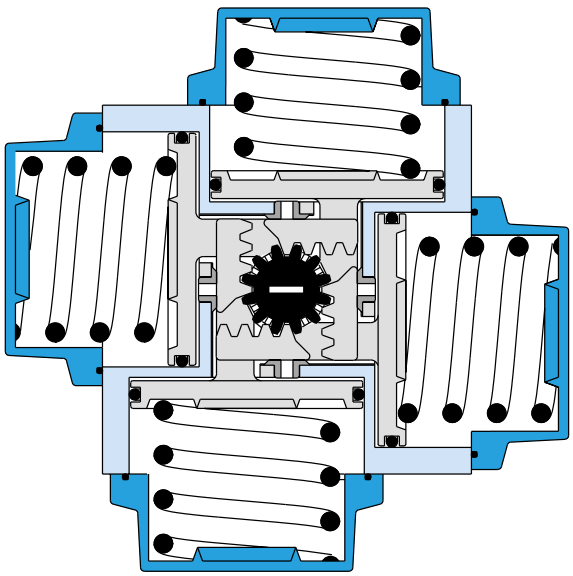


Pressure entering **Port B to close**:
Outside chamber pressurized. Pistons move inward. Pinion rotates clockwise.

Spring Return

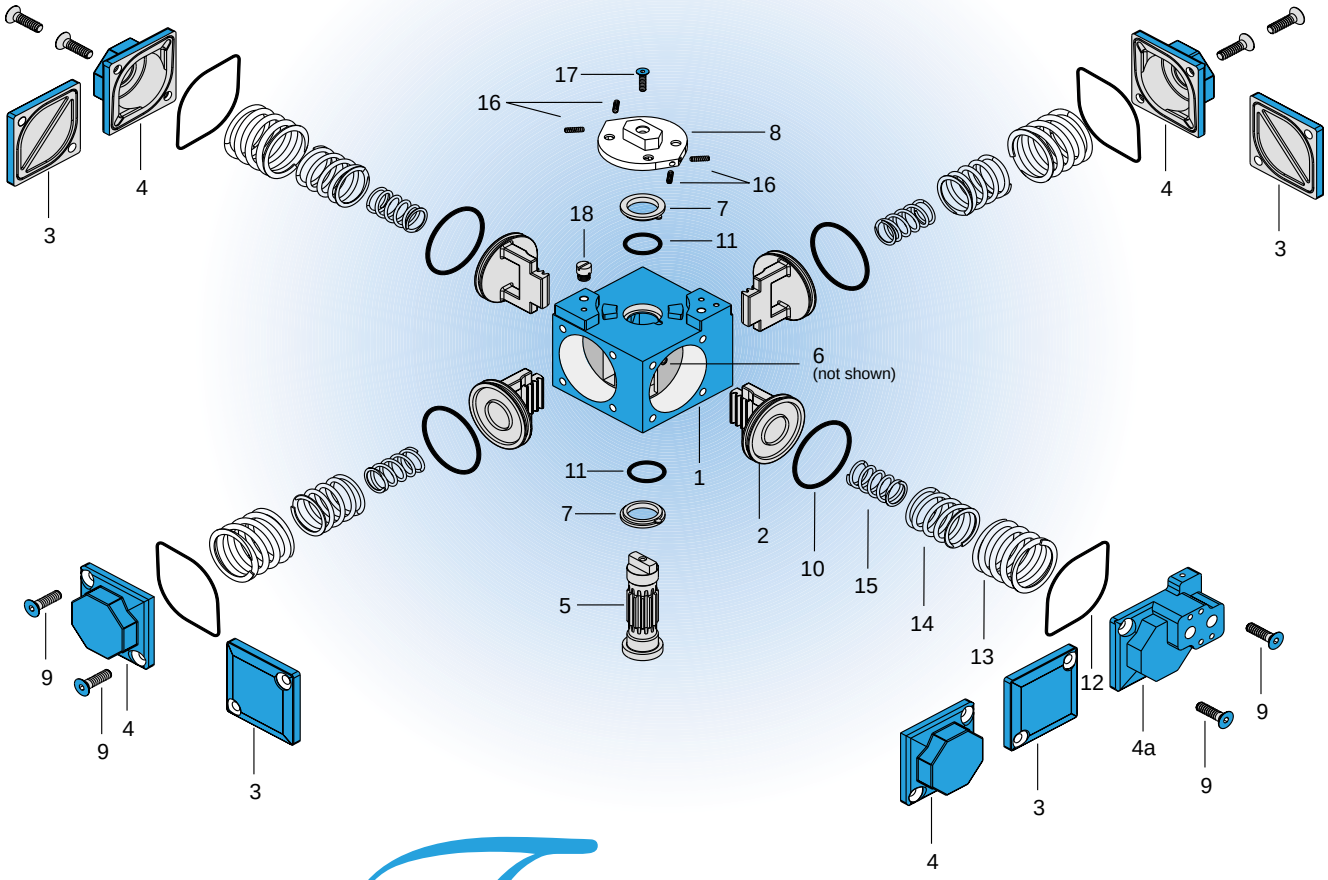


Pressure entering **Port A to open**:
Center chamber pressurized. Pistons move outward. Springs are compressed. Pinion rotates counter clockwise.



Pressure exiting **Port A to close**:
Air released from center chamber. Springs drive pistons inward. Pinion rotates clockwise.

Parts List



Technical Data

Actuator Size	Unit	15	20	25	30	35	45	60	75
Weight Double Acting	Lb Kg	1.50 0.70	2.00 0.91	4.30 1.97	6.80 3.10	13.0 5.90	22.0 10.0	43.0 19.5	84.0 38.0
Weight Spring Return	Lb Kg	1.80 0.82	3.00 1.33	5.70 2.60	9.20 4.20	17.40 7.90	27.5 12.5	66.0 30.0	123.0 56.0
Air Consumption Per Stroke at 80 psi	In^3 Lit.	2.80 0.05	6.20 0.10	13.00 0.21	25.0 0.41	41.0 0.62	81.0 1.33	195.0 3.20	351.0 5.76
Stroke time with S.V. with 2.4 orifice at 80 psi	Sec.	0.5	0.5	0.70	0.8	1.0	1.50	2.5	4.0

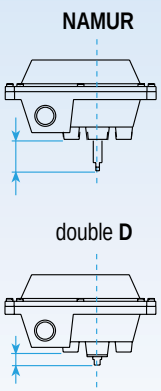
Pressure Range:
20-120 PSI (1.5 - 8 bar) for DA actuators
30-120 PSI (2- 8 bar) for SR actuators

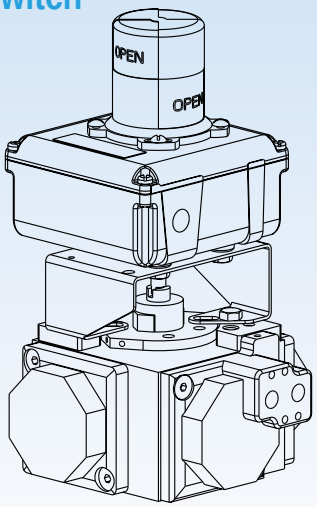
Optional Electroless Nickel Coating of body, covers and stop.

Operating Temperature:
Buna N: -20°C to 80°C (-4°F to 176°F)
Viton: -20°C to 120°C (-4°F to 250°F)
EPDM: -40°C to 80°C (-40°F to 176°F)

Description	Qty	Material
1. Body	1	AL 356-T6
2. Piston	4	AL 356/380
3. D.A. Cover	4	AL 356/380
4. S.R. Cover	4	AL 356/380
4a. NAMUR Cover	1	AL 356/380
5. Pinion	1	Steel E.N.Coated
6. Pad	4	Delrin, NRG, UHMWPE
7. Thrust Washer	2	Delrin, NRG, UHMWPE
8. Stop	1	AL 356/380
(color)		White (Standard)
		Red (High Temperature)
9. Cover Screw	8-16	ST. ST.
10. Piston O-ring	4	Buna N, Viton, EPDM
11. Pinion O-ring	2	Buna N, Viton, EPDM
12. Cover O-ring	4	Buna N, Viton, EPDM
13. Outer Spring	4	Spring steel
14. Middle Spring	4	Spring steel
15. Inner Spring	4	Spring steel
16. Stroke Adjustment Screw	4	ST. ST.
17. Stop Screw	1	ST. ST.
18. Exhaust plug (Silencer)	1	Delrin (Brass)

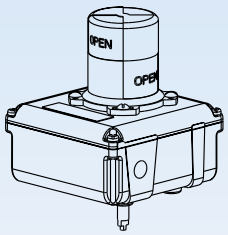
NAMUR Limit Switch

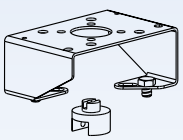


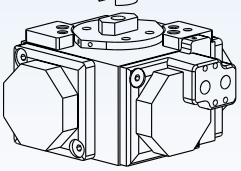


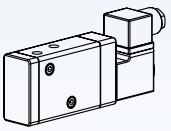
The Habonim COMPACT “R” NAMUR actuators can be fitted with many types of limit switches ranging from those for general use to those for use in hazardous situations. The height of the mounting kits is in accordance with the limit switch output shaft: “NAMUR” or “double D”.

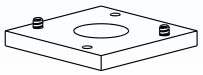
The Complete Habonim Package





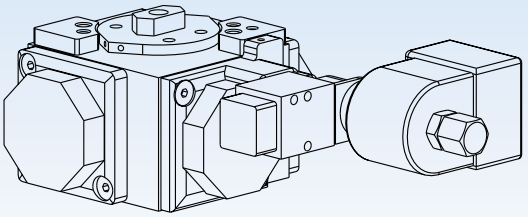






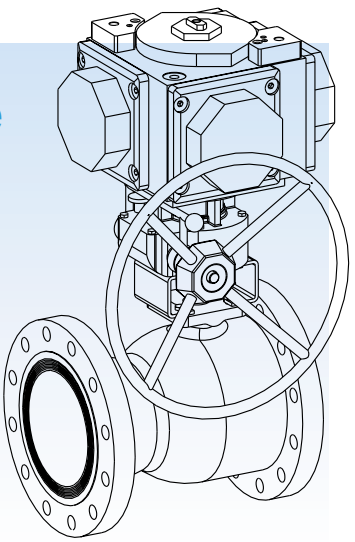
The COMPACT “R” NAMUR actuator is fitted with solenoid and limit switch according to NAMUR standards. All Habonim actuators are available with an ISO bottom plate that permits easy connection to valves.

NAMUR Solenoid Valve



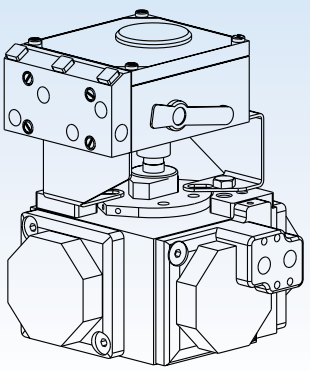
The Habonim COMPACT “R” NAMUR actuators allows direct connection to NAMUR type solenoids, in spring return or double acting configuration on all actuator sizes.

Declutchable Manual Override



Declutchable gears fit between the actuator and valve, allowing operation of valve during air power failure.

Positioner



For control application the COMPACT “R” NAMUR actuator can be mounted with any positioner. The actuator features accurate, quick responding positioning with minimum hysteresis.

Spring Return - Output Torque

The output torque of a spring return actuator is effected by the spring compression force. As the springs are compressed during the outward, air-driven piston stroke (counter clockwise rotation), the torque output is linearly reduced over the range of motions as the compressing springs oppose the piston movement. During the spring return (clockwise rotation), the springs drive the pistons inward with linearly decreasing force as they expand and the torque output decreases linearly over the range of motion. This is shown in the torque vs. position plot as the actuator output shaft is air-driven, counter clockwise, from 0 to 90 degrees and then spring returned, clockwise, from 90 to 0 degrees. Sizing a spring return actuator requires that the torque output at the start and end of both the spring and air drive strokes is greater than the valve torque at that position.

Spring Configuration

The COMPACT actuator has many spring configurations for different air supply pressures:

H15 (2 springs per piston)

1A - Inner spring

1B - Outer spring

1B2 - 2 opposing pistons with *outer* springs
2 opposing pistons with *inner* and *outer* springs

2 - Two springs

H20 to H75 (3 springs per piston)

2A - *Inner* and *middle* springs

2B - *Inner* and *outer* springs

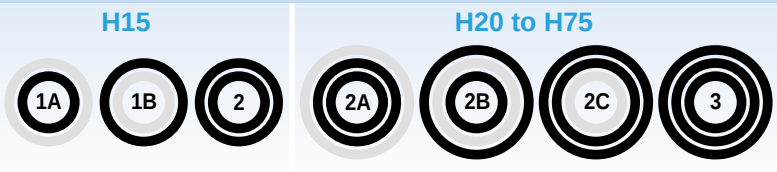
2A2B - 2 opposing pistons with *inner* and *middle* springs
2 opposing pistons with *inner* and *outer* springs

2C - *Middle* and *outer* springs

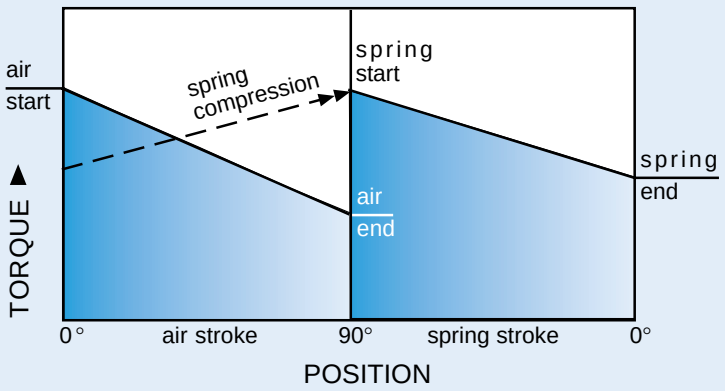
3 - Three springs

Other spring combinations are available using the same number of springs in each opposing piston.

Spring Configuration



Torque Vs. Position



Double Acting

From the torque table select the actuator size whose torque output at a given air pressure exceeds the valve torque.

Example:

Given: *valve torque = 650 in. lbs.*
air pressure = 60 psi

Answer: *from the table, the smallest actuator whose output torque exceeds 650 in. lbs. is model 30 (806 in. lb.)*

Spring to Close valve

Select the actuator whose torque output at "Spring End" and "Air start" at a given air pressure exceeds the valve torque.

Example:

Given: *valve torque = 1200 in. lbs.*
air pressure = 80 psi

(1) locate: "Spring End" = 1258 in. lbs.
(2) locate: "Air Start" at 80 psi = 2295 in. lbs.

Answer: *model 45-2C*

Spring to Open valve

Select the actuator whose torque output at "Spring Start" and "Air End" at a given air pressure exceeds the valve torque.

Example:

Given: *valve torque = 90 NM*
air pressure = 5 bar

(1) locate: "Spring Start" = 97 NM
(2) locate: "Air End" at 5 bar = 94 NM

Answer: *model 35-2A2B*

Double Acting

Actuator Size (model)	Operating Pressure (BAR)						
	2	3	4	5	6	7	8
15	6.5	9.8	13.0	16.3	19.5	22.8	26.1
20	13.0	19.5	26.0	32.5	39.0	45.5	52.0
25	26.1	39.2	52.3	65.4	78.4	91.5	104.6
30	44	66	88	110	132	154	176
35	77	115	154	192	230	269	307
45	148	222	297	371	445	519	593
60	351	527	703	879	1,055	1,230	1,406
75	650	974	1,299	1,624	1,948	2,273	2,596

Spring Configurations

H15 ONLY	1A	- Inner spring
	1B	- Outer spring
	1B2	- In opposing pistons: outer springs Inner and outer springs
	2	- Two springs
	2A	- Inner and middle springs
	2A2B	- In opposing pistons: Inner and middle springs Inner and outer springs
	2C	- Middle and outer springs
	3	- Three springs

Spring Return

Actuator Size (model)	No. of Springs	Operating Pressure (BAR)												Spring Torque	
		3		4		5		6		7		8		Maximum	
		Air Start	Air End	Air Start	Air End	Air Start	Air End	Air Start	Air End	Air Start	Air End	Air Start	Air End	Spring Start	Spring End
15	1A	6.3	3.3	9.6	6.5	12.9	9.7							5.5	2.7
	1B			6.9	1.2	10.2	4.4	13.7	7.7					10.8	5.4
	1B2					9.6	2.8	12.8	6.0	16.0	9.2	19.3	12.5	13.5	6.7
	2							10.9	2.2	14.2	5.3	17.5	8.4	16.3	8.1
20	2A	10.2	4.4	16.9	10.9	23.4	17.4							13.0	7.7
	2A2B			15.4	8.1	21.9	14.6	29.0	22.1					15.8	9.2
	2C					17.4	7.3	24.5	13.8	30.8	20.0	37.2	26.2	23.1	13.7
	3							21.6	9.6	27.9	15.8	34.3	21.9	27.3	16.6
25	2A	21.7	7.8	35.1	20.8	48.2	33.9							27.3	14.4
	2A2B			33.0	16.6	46.1	29.7	60.2	42.7					31.6	16.5
	2C					39.1	15.9	53.2	28.9	66.1	41.4	78.9	53.8	45.3	23.5
	3							47.8	18.7	60.6	31.2	73.5	43.6	55.5	28.9
30	2A	37	15	59	37	81	59							44	24
	2A2B			55	29	77	51	101	73					51	27.7
	2C					66	30	90	52	112	73	133	94	73	39
	3							82	37	104	58	125	79	88	47
35	2A	63	17	103	56	140	94							86	43
	2A2B			98	45	136	83	177	121					97	48
	2C					113	37	154	75	192	112	229	148	143	71
	3							140	46	178	83	215	119	172	85
45	2A	119	28	196	103	270	176							171	85
	2A2B			185	81	259	155	350	229					193	96
	2C					213	63	294	136	366	207	439	277	285	142
	3							266	80	338	147	411	220	342	170
60	2A	294	85	475	261	651	436							387	191
	2A2B			451	211	627	386	818	562					437	215
	2C					524	178	715	354	886	520	1,058	687	645	318
	3							651	225	822	391	994	558	774	382
75	2A	484	116	788	472	1,148	786							661	345
	2A2B			744	388	1,104	702	1,423	1,012					745	389
	2C					918	346	1,234	656	1,538	947	1,840	1,240	1,101	575
	3							1,122	436	1,423	727	1,725	1,020	1,321	690

Torque Chart - Imperial (in-Lb)

Double Acting

Actuator Size (model)	Operating Pressure (PSI)					
	20	40	60	80	100	120
15	39	79	119	160	199	239
20	79	158	238	318	398	478
25	160	320	480	640	800	960
30	267	537	806	1,074	1,343	1,611
35	471	941	1,412	1,882	2,353	2,824
45	907	1,813	2,719	3,626	4,532	5,438
60	2,149	4,298	6,446	8,595	10,744	12,893
75	3,765	7,530	11,295	15,060	18,825	22,590

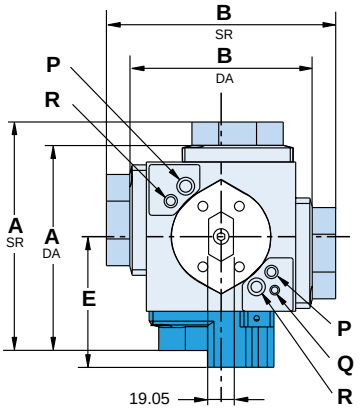
Spring Configurations

H15 ONLY	1A	- Inner spring
	1B	- Outer spring
	1B2	- In opposing pistons: outer springs Inner and outer springs
	2	- Two springs
	2A	- Inner and middle springs
	2A2B	- In opposing pistons: Inner and middle springs Inner and outer springs
	2C	- Middle and outer springs
	3	- Three springs

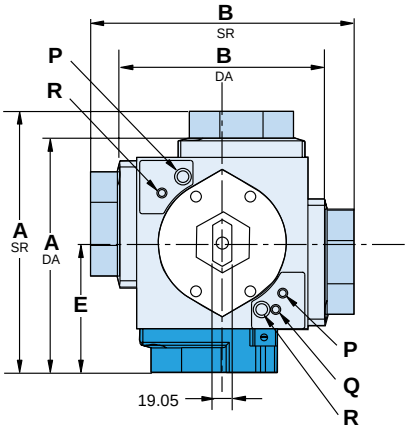
Spring Return

Actuator Size (model)	No. of Springs	Operating Pressure (PSI)										Spring Torque	
		40		60		80		100		120		Maximum	
		Air Start	Air End	Air Start	Air End	Air Start	Air End	Air Start	Air End	Air Start	Air End	Spring Start	Spring End
15	1A	53	26	92	64							49	24
	1B			69	18	109	56	147	93			96	48
	1B2					100	41	139	80	179	120	119	60
	2					85	8	123	45	162	83	144	72
20	2A	78	27	158	104							115	68
	2A2B			145	79	231	162					140	81
	2C					191	97	269	173	358	249	205	121
	3					165	60	243	136	331	212	242	147
25	2A	169	46	331	200							242	128
	2A2B			310	162	481	328					280	146
	2C					419	207	576	359	733	511	401	208
	3					371	116	528	268	685	420	492	256
30	2A	284	92	556	351							391	210
	2A2B			521	286	808	564					456	245
	2C					703	369	966	625	1,229	879	651	350
	3					634	239	897	495	1,160	749	781	419
35	2A	487	86	962	538							761	379
	2A2B			916	441	1,419	929					859	425
	2C					1,212	520	1,674	967	2,135	1,415	1,268	632
	3					1,068	266	1,548	713	2,009	1,161	1,522	758
45	2A	913	115	1,828	985							1,516	755
	2A2B			1,733	794	2,702	1,737					1,708	850
	2C					2,295	919	3,183	1,779	4,071	2,640	2,526	1,258
	3					2,043	414	2,931	1,274	3,819	2,135	3,031	1,510
60	2A	2,261	437	4,431	2,499							3,431	1,693
	2A2B			4,222	2,062	6,521	4,297					3,868	1,902
	2C					5,602	2,447	7,708	4,489	9,814	6,530	5,718	2,821
	3					5,040	1,303	7,146	3,345	9,252	5,386	6,862	3,383
75	2A	3,869	927	7,332	4,538							5,853	3,059
	2A2B			6,948	3,798	11,316	7,714					6,593	3,443
	2C					9,661	4,552	13,351	8,129	17,040	11,706	9,755	5,098
	3					8,642	2,600	12,332	6,177	16,021	9,754	11,707	6,117

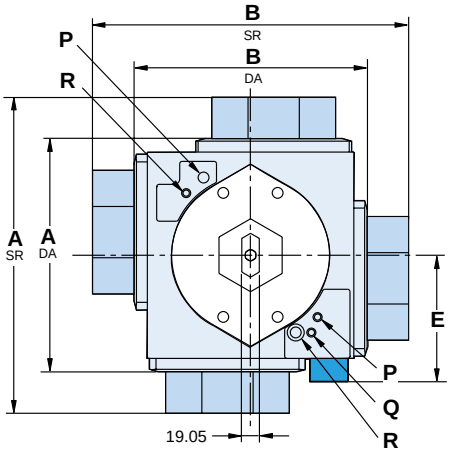
H15 to H30

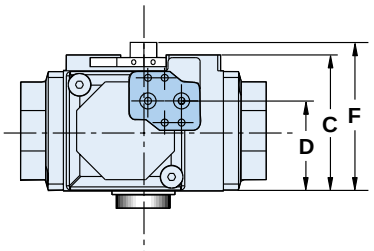


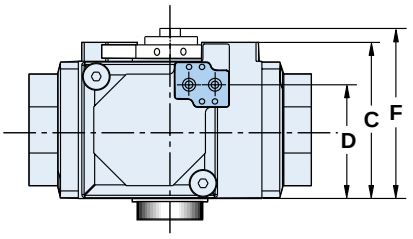
H35 to H45

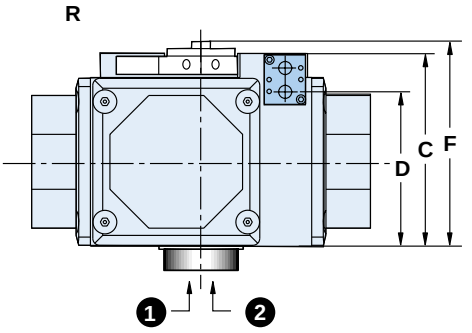


H60 to H75



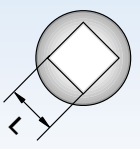






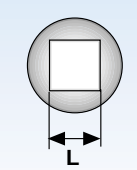
Metric (mm)

Actuator	A (SR)	A (DA)	B (SR)	B (DA)	C	D	E	F	L	P	Q	R	Metric 45 Gear Output
15	105.7	80.4	105.7	80.4	59.9	-	-	67.8	9.1 9.0	1/8-BSP	M6	M8	
20	121.5	107.4	121.5	93.3	66.6	36.9	72.5	77.7	11.1 11.0	1/8-BSP	M6	M8	
25	153.8	137.3	153.8	120.8	84.4	53.3	87.8	96.3	14.1 14.0	1/8-BSP	M6	M8	
30	175.8	158.7	175.8	141.6	96.0	64.3	99.8	106.2	17.1 17.0	1/8-BSP	M6	M8	
35	214.8	193.6	214.8	172.4	122.1	85.5	106.6	135.0	22.1 22.0	1/4-BSP	M8	M8	
45	261.7	231.5	261.7	201.2	144.8	105.4	129.8	157.5	27.1 27.0	1/4-BSP	M8	M8	
60	343.5	303.9	343.5	264.3	195.5	156.9	138.5	207.4	36.1 36.0	1/4-BSP	M8	M8	
75	422.0	371.8	422.0	321.5	243.0	204.1	163.6	262.5	36.1 36.0	1/4-BSP	M8	M8	



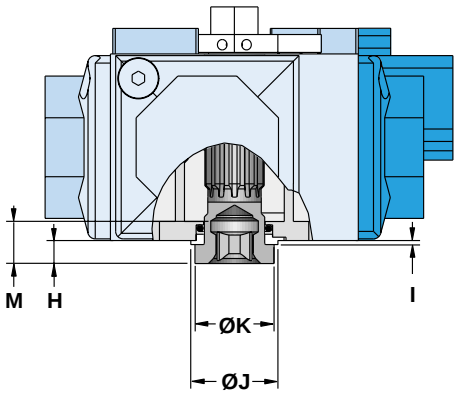
Imperial (in)

Actuator	A (SR)	A (DA)	B (SR)	B (DA)	C	D	E	F	L	P	Q	R	Imperial 90 Gear Output
15	4.161	3.165	4.161	3.165	2.358	-	-	2.669	9.1 9.0	1/8-NPT	1/4--20 UNC	5/16-18 UNC	
20	4.783	4.228	4.783	3.673	2.622	1.453	2.854	3.059	11.1 11.0	1/8-NPT	1/4--20 UNC	5/16-18 UNC	
25	6.055	5.406	6.055	4.756	3.323	2.098	3.457	3.791	14.1 14.0	1/8-NPT	1/4--20 UNC	5/16-18 UNC	
30	6.921	6.248	6.921	5.575	3.780	2.531	3.929	4.181	17.1 17.0	1/8-NPT	1/4--20 UNC	5/16-18 UNC	
35	8.457	7.622	8.457	6.787	4.807	3.366	4.197	5.315	22.1 22.0	1/4-NPT	5/16-18 UNC	5/16-18 UNC	
45	10.303	9.114	10.303	7.921	5.701	4.150	5.110	6.201	27.1 27.0	1/4-NPT	5/16-18 UNC	5/16-18 UNC	
60	13.524	11.965	13.524	10.406	7.697	6.177	5.453	8.165	36.1 36.0	1/4-NPT	5/16-18 UNC	5/16-18 UNC	
75	16.614	14.638	16.614	12.657	9.567	8.035	6.441	10.335	36.1 36.0	1/4-NPT	5/16-18 UNC	5/16-18 UNC	

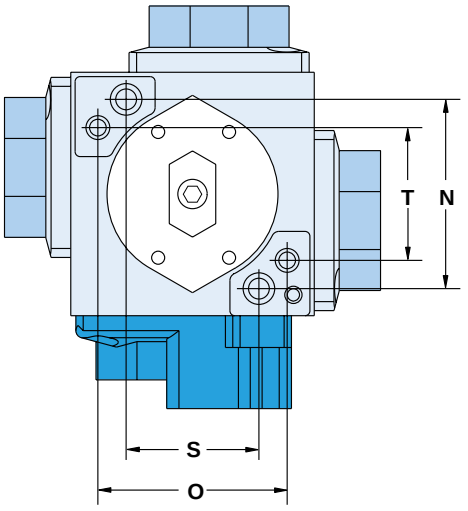


Due to ongoing development we reserve the right to alter any of the figures in this catalogue without prior notice.

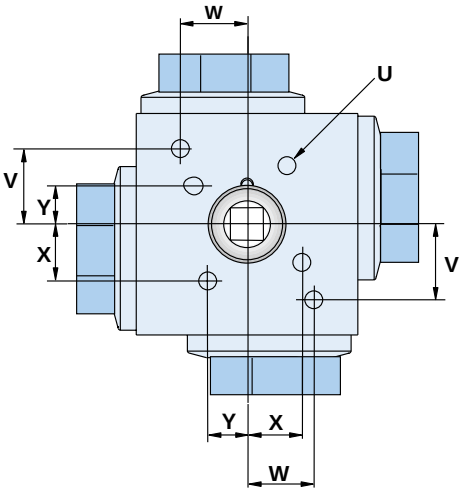
SIDE VIEW



TOP VIEW



BOTTOM VIEW



Metric (mm)

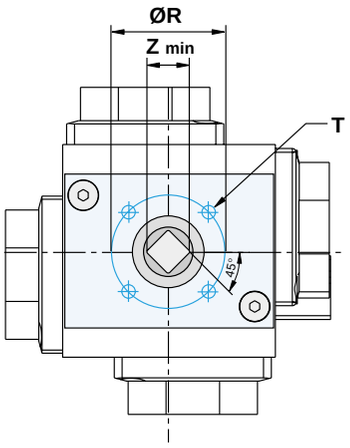
Actuator	H	I	J	K	M	N	O	S	T	U	V	W	X	Y	Z
15	7.6	1.9	25.0	22.5	10.0	49.5	49.5	26.5	26.7	M5	26.0	17.2	17.1	12.1	12.1
20	7.6	1.9	30.0	25.5	12.0	60.4	60.4	37.5	37.5	M5	30.8	20.3	20.3	13.8	14.1
25	9.7	2.5	35.0	32.0	16.0	77.2	77.2	52.5	54.4	M8	38.5	25.4	25.4	16.8	18.1
30	12.5	2.8	45.0	39.0	19.0	77.2	77.2	54.3	54.4	M8	45.7	29.2	29.2	20.3	22.2
35	15.4	2.8	55.0	50.8	24.0	106.6	107.4	65.6	74.2	M10	56.5	36.7	36.8	26.0	28.2
45	19.0	2.8	70.0	60.3	29.0	132.2	120.2	78.4	99.8	M12	68.5	44.5	44.5	30.5	36.2
60	25.1	3.2	85.0	76.2	38.0	167.6	140.0	98.2	135.2	M16	90.8	57.6	57.8	40.0	48.2
75	25.3	3.9	100.0	88.0	38.0	198.2	170.6	128.8	165.7	M16	109.2	69.4	69.4	48.3	48.2

Imperial (in)

Actuator	H	I	J	K	M	N	O	S	T	U	V	W	X	Y	Z
15	0.299	0.075	0.984	0.886	0.394	1.950	1.950	1.043	1.051	10-24 UNC	1.024	0.677	0.673	0.476	0.476
20	0.299	0.075	1.181	1.004	0.472	2.380	2.380	1.476	1.476	10-24 UNC	1.213	0.799	0.799	0.543	0.555
25	0.382	0.098	1.378	1.260	0.630	3.040	3.040	2.067	2.142	5/16-18 UNC	1.516	1.000	1.000	0.661	0.713
30	0.492	0.110	1.772	1.535	0.748	3.040	3.040	2.138	2.142	5/16-18 UNC	1.799	1.150	1.150	0.799	0.874
35	0.606	0.110	2.165	2.000	0.945	4.200	4.225	2.583	2.921	3/8-16 UNC	2.224	1.445	1.449	1.024	1.110
45	0.748	0.110	2.756	2.374	1.142	5.200	4.732	3.087	3.929	1/2-13 UNC	2.697	1.752	1.752	1.201	1.425
60	0.988	0.126	3.346	3.000	1.496	6.600	5.513	3.866	5.323	5/8-11 UNC	3.575	2.268	2.276	1.575	1.898
75	0.996	0.154	3.937	3.465	1.496	7.803	6.716	5.071	6.524	5/8-11 UNC	4.299	2.732	2.732	1.902	1.898

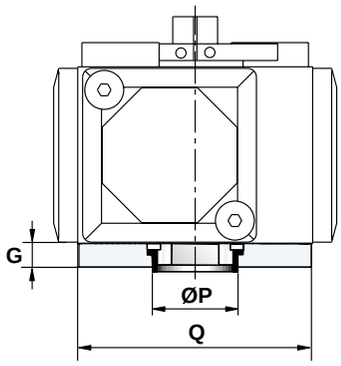
NAMUR & ISO Interface

BOTTOM VIEW



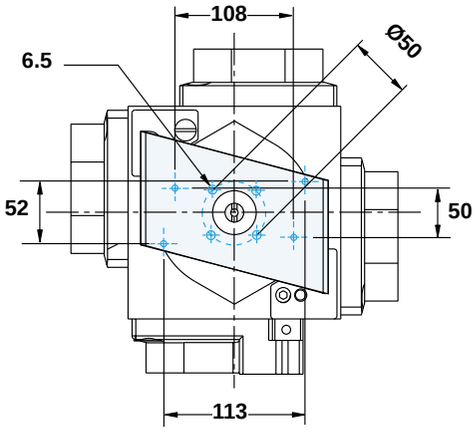
ISO plate attached to actuator :
* 90° square conforms to **ISO 5211**
* 45° square conforms to **DIN 3337**

SIDE VIEW



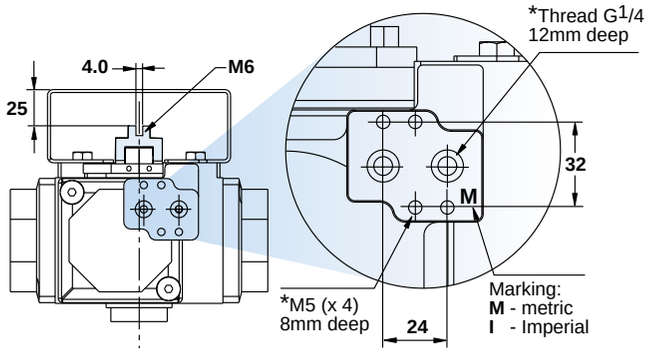
The **ISO plate** is available with the centering ring or without.The plate is attached to the bottom of the actuator with 2 screws.

TOP VIEW



Positioners and signal transmitters are attached by means of a bracket. The connecting shaft has two flats with M6 thread.

Actuator	ØR	ISO	T	Z min	G	ØP	Q
15	36	F03	M5	12.1	8.0	25	66
20	42	F04	M5	14.1	8.0	30	76
25	50	F05	M6	18.1	10.0	35	98
30	70	F07	M8	22.2	13.0	55	113
35	102	F10	M10	28.2	16.0	70	139
45	125	F12	M12	36.2	20.0	85	169
60	140	F14	M16	48.2	25.0	100	222
75	140	F14	M16	48.2	25.0	100	259



Attachment of solenoid valves is made with two M5 fixing screws.

* Actuators with NAMUR Imperial threads have 1/4" NPT air ports and 10-24 UNC x 5/16" connection threads.

How To Order

When ordering the Namur R series actuator, please give all the information as specified below.
Top attachments include a Namur bracket and adapter for connecting limit switches or positioners.

Size	Action	Springs	R	Threads	Gear	Options
H20 to **H75**	**SR** - Spring Return **DA** - Double Acting	**1A** - 40 psi (H15) **1B2** - 80 psi (H15) **2** - 100 psi (H15) **2A** - 40 psi **2A2B** - 60 psi **2C** - 80 psi **3** - 100 psi	NAMUR	**IMP** - Imperial **MET** - Metric (Metric is default)	**45** - (DIN 3337) **90** - (ISO 5211)	**P** - ISO plate **V** - Viton O-rings **E** - EPDM O-rings **N** - Electroless Nickel Coating

(H15 is not available with NAMUR cover)

Examples

H35 SR 2A2BR MET/45 N Size H35, spring return, 60 psi, Namur, metric thread, 45 square output, electroless nickel coating.

H60 DAR IMP/90 PE Size H60, double acting, Namur, imperial thread, 90 square output, ISO plate, EPDM O-rings.

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