



ACCORD Controls

ARG Series Heavy Duty Actuator

Double Acting or Spring Return Scotch Yoke Actuator

ARG Series Scotch Yoke

- *IP67M Approved*
- *SIL 3 Capable*



Experience In Motion

Flow Control Division Valve Automation Systems

Flowserve Corporation's Valve Automation Systems provides complete valve and damper automation to the worldwide processing industries. We provide maximum value to the end user through a broad offering of products, services, application engineering and our systematic approach to automation.



Quality, Dependability and Productivity

Recognized as a leader in valve automation systems, ACCORD Controls pneumatic actuators can automate valves with torque values from 25 to 2.2 million in-lbs (2.8 - 248,566Nm).

Actuators are available in a wide range of materials suitable for use in the most demanding applications. Flowserve also offers a comprehensive range of NAMUR Controls and accessories such as lockout modules and gear overrides. To complete the package Flowserve can provide engineering design services for automation mounting brackets and mounting hardware.

AutoSize 4.0



AutoSize 4.0

Automation sizing and selection software
<http://www.flowserve.com>

While reasonable attempts have been made to ensure the accuracy of the output from this program, Flowserve disclaims responsibility for the use of this program including but not limited to the

Sales and service facilities are strategically located in industrial centers throughout the world.

Use AutoSize 4.0 to:

- Ensure accurate actuator sizing
- Simplify and save time sizing actuators
- Create project files and data sheets
- Perform engineering calculations

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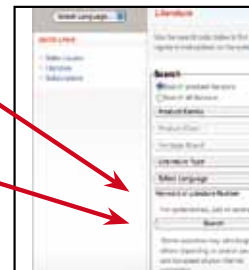
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ARG Series

Heavy-Duty Scotch Yoke Actuator

The Worcester WRG Series provides up to 2.2 million in-lbs of heavy-duty Scotch yoke torque. Enhanced performance is achieved by using a superior yoke support system that significantly reduces transverse loads.



Features

- True Modular Design
- On-Off, Multi-Position and Throttling
- Pneumatic, Gas and Hydraulic Models
- Spring Return “Fail Safe” and Double Acting
- Torque Outputs:
 - DA – 2.2M in-lbs (248K Nm)
 - SR – 1.2M in-lbs (124K Nm)
- Operating Pressures:
 - Pneumatic: 40-150psi
 - Hydraulic: 500-3000psi

IP67M Ingress Protection

O-Rings or dynamic quad seals are utilized to conform to IP67M specifications, ensuring optimal ingress protection.

Modular Construction

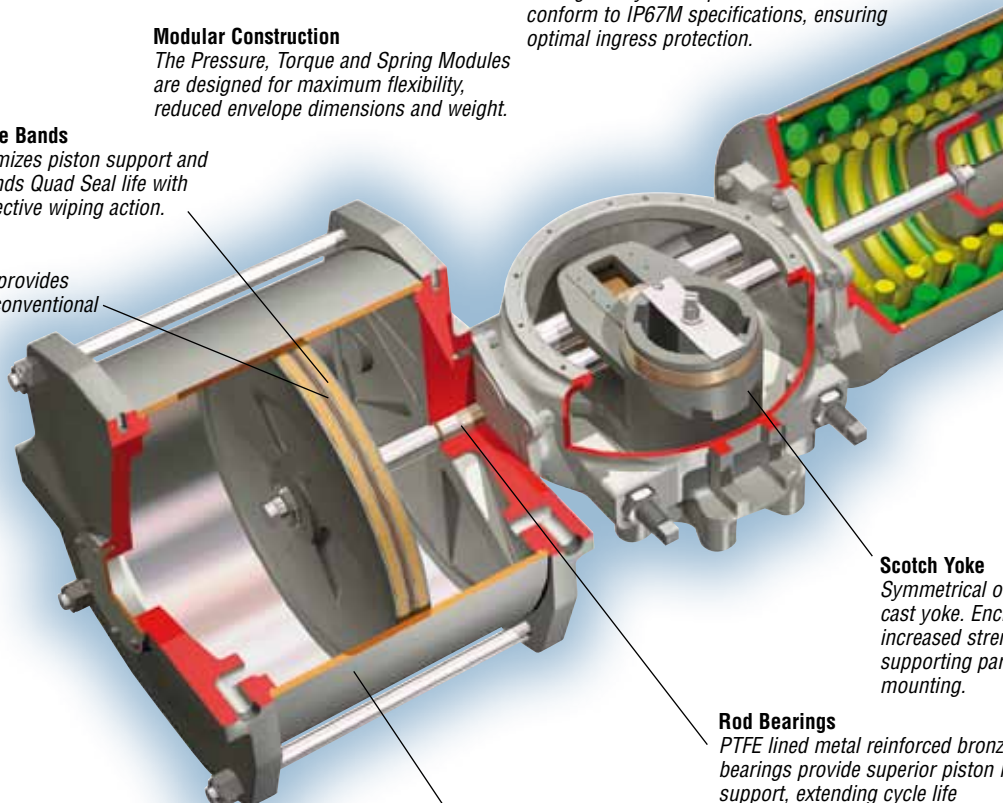
The Pressure, Torque and Spring Modules are designed for maximum flexibility, reduced envelope dimensions and weight.

Guide Bands

Optimizes piston support and extends Quad Seal life with protective wiping action.

Piston Seals

Dynamic Quad Seal design provides enhanced cycle life versus conventional O-Rings.



Scotch Yoke

Symmetrical or canted ductile iron cast yoke. Enclosed yoke slot for increased strength with 2 keyways supporting parallel or perpendicular mounting.

Rod Bearings

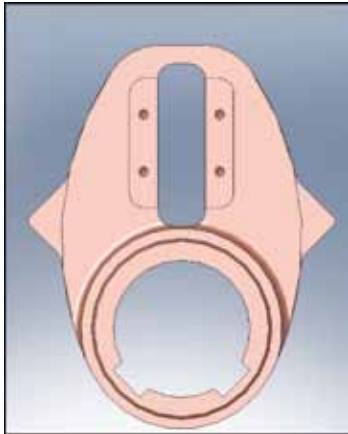
PTFE lined metal reinforced bronze bearings provide superior piston rod support, extending cycle life

Cylinder

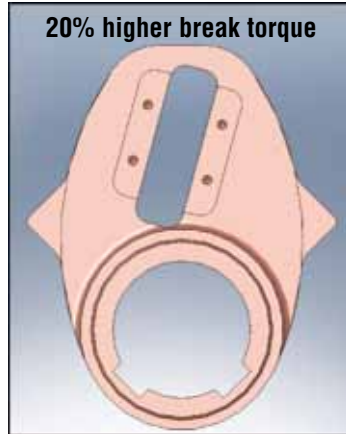
Heavy wall cylinders provide increased “job site” durability. Interior surface is honed and hard chrome plated to provide superior corrosion and wear resistance.

ARG Series

Heavy-Duty Scotch Yoke Actuator



Symmetrical Yoke



Canted Yoke

Features

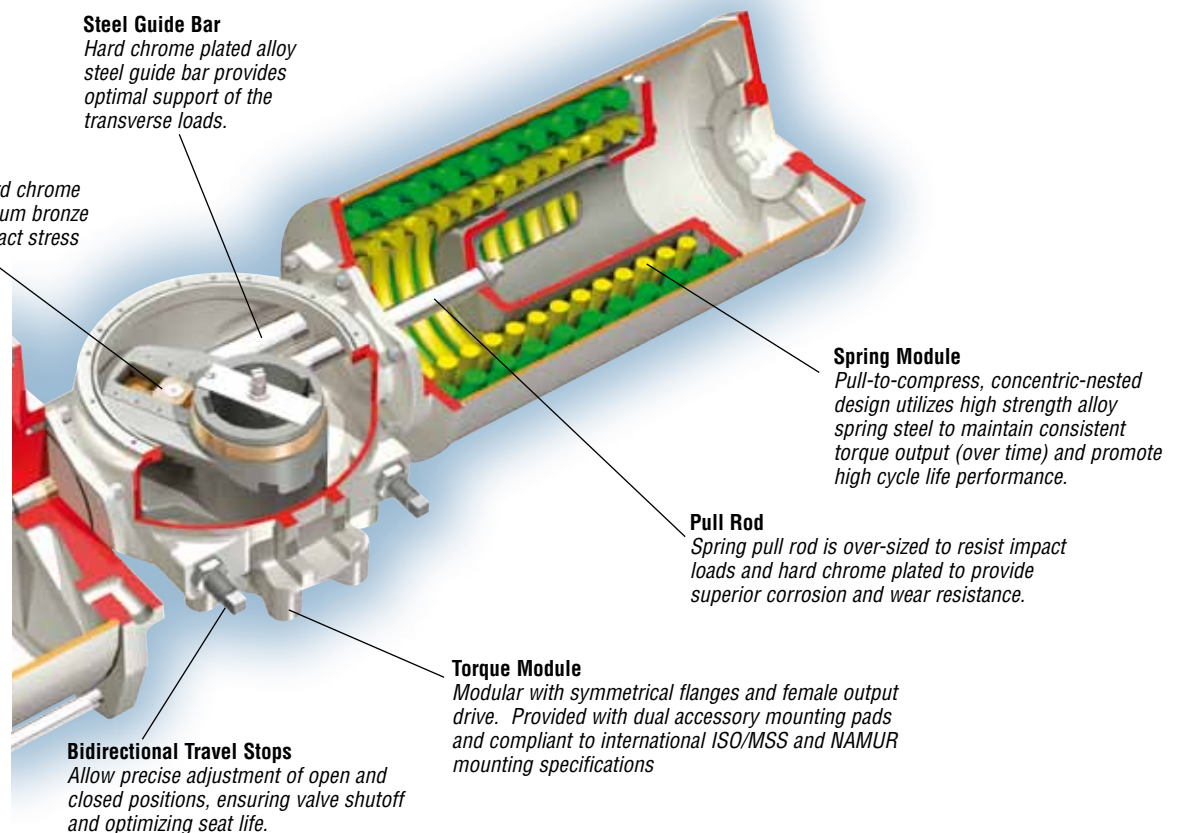
- Hard Chrome Plated Cylinder Walls
- Symmetrical and Canted Yoke
- Guide Bar Yoke Support
- Dual DD Cylinder Option
- Field Reversible Action
- Overrides, Line Break and Special Controls
- ESD Performance

Override Options

Spring Module design facilitates field retrofitting of jackscrew or hydraulic overrides

Interchangeable Yoke System

- Ductile iron casting
- Totally enclosed yoke slot for increased strength and cycle life
- Canted yoke results in approx. 20% higher break torque
- 2 keyway provision for flexibility of parallel or perpendicular mounting



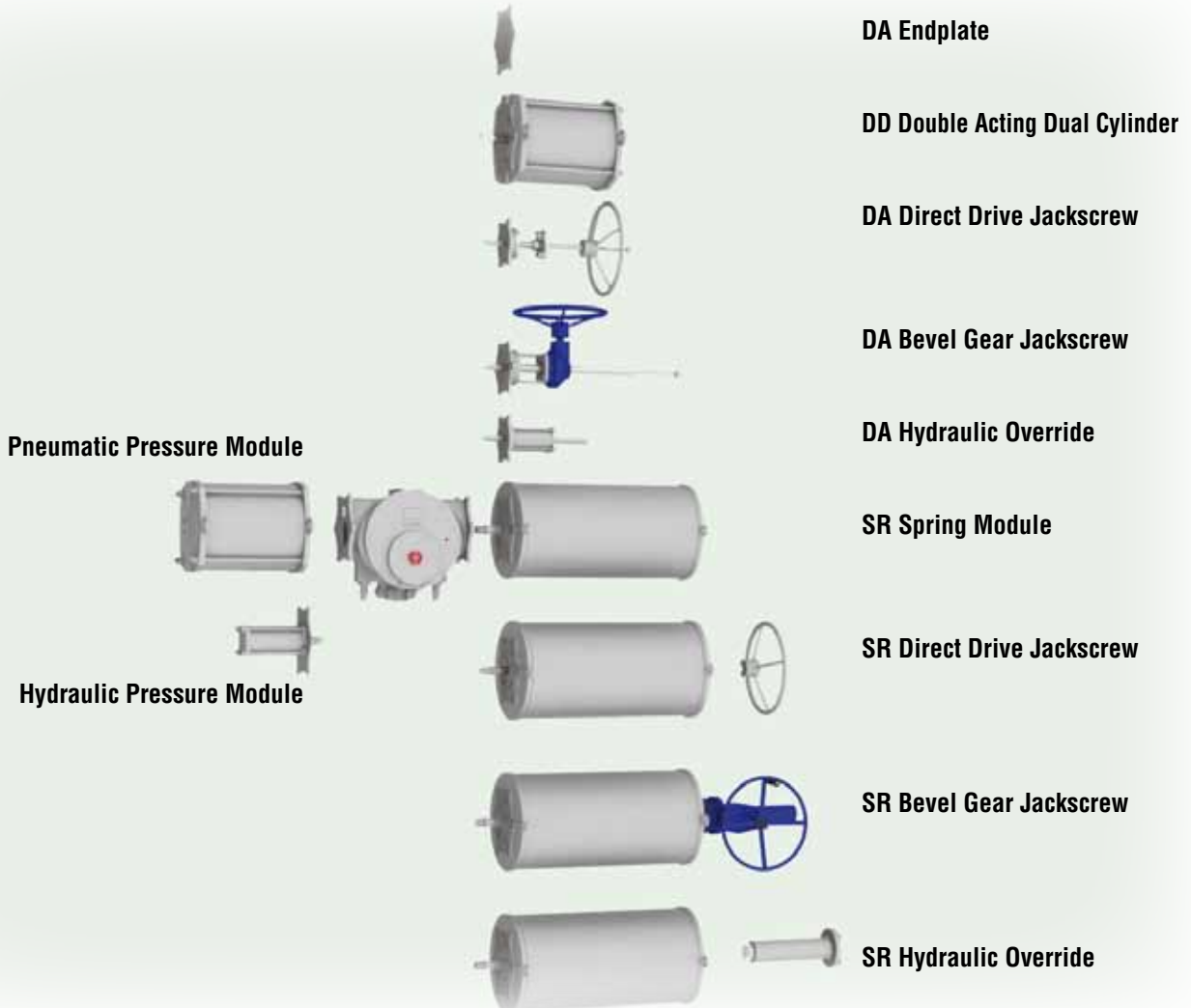
ARG Series

Heavy-Duty Scotch Yoke Actuator

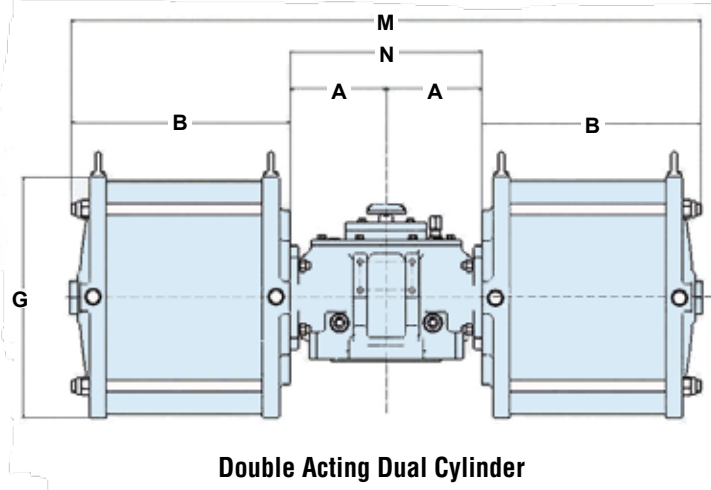
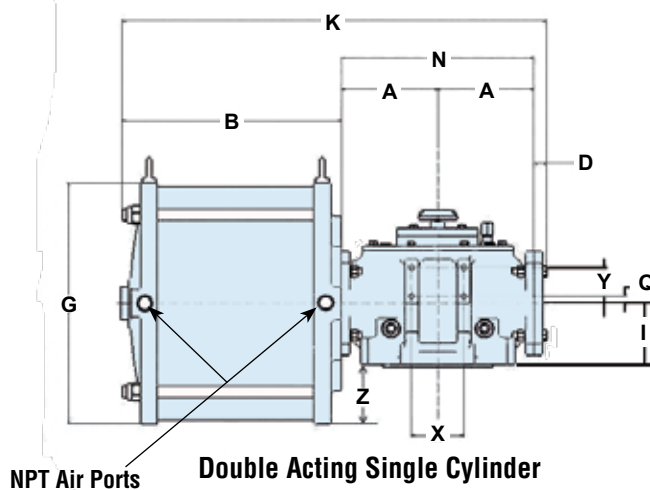
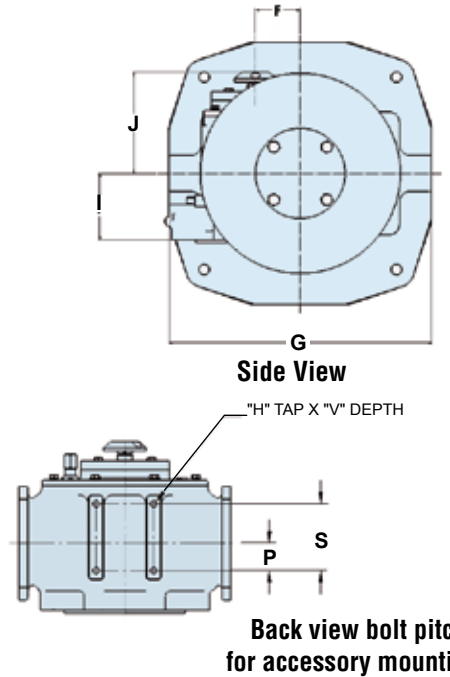
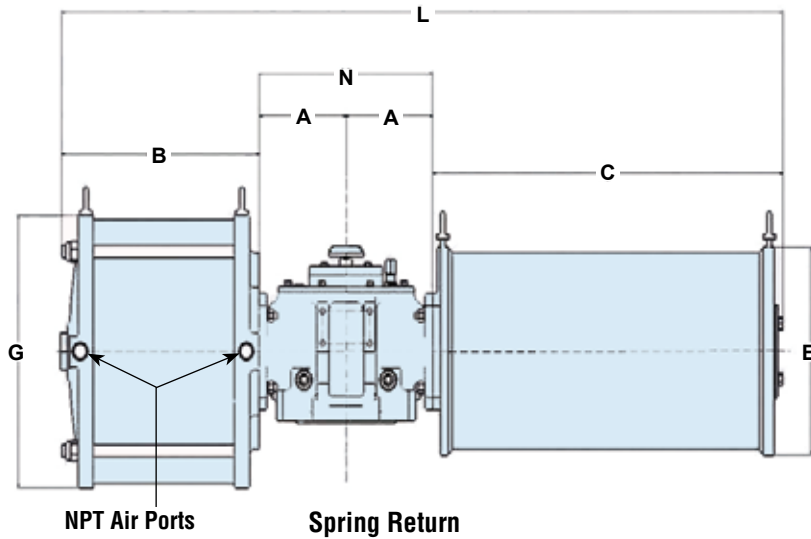
Accessories

Modular Construction

- Double Acting or Spring Return (FCW or FCCW)
- Pneumatic or Hydraulic Pressure Modules
- Torque Module with symmetrical or canted yokes
- Override Options – Direct Drive Jackscrew, Bevel Gear Jackscrew or Hydraulic Override



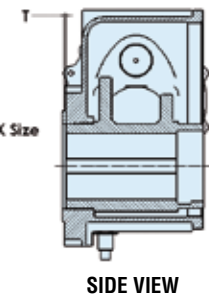
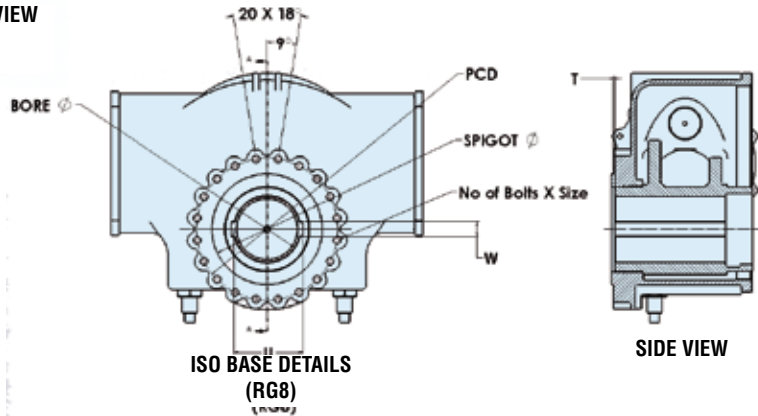
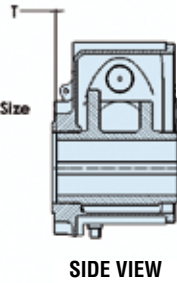
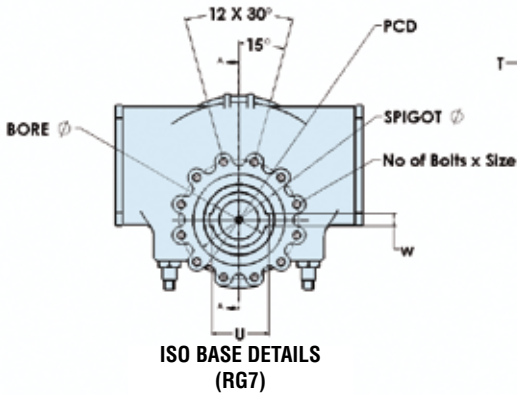
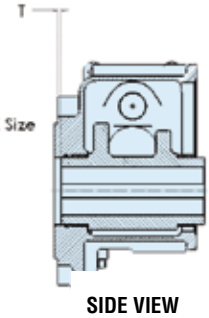
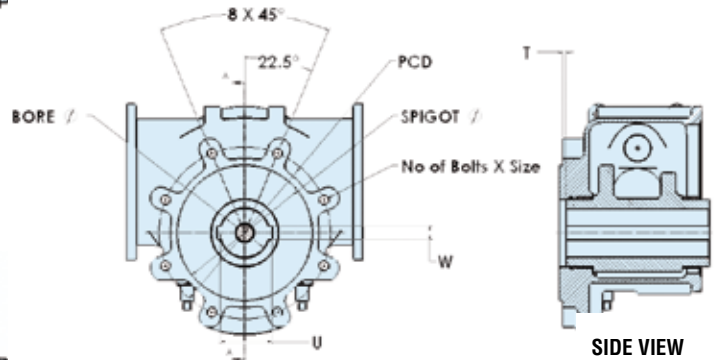
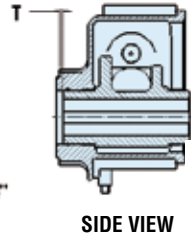
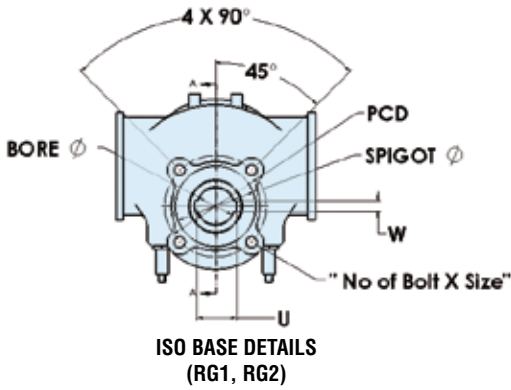
Dimensions



Actuator Dimensions, mm (inch)																	
Series	A	B	C	D	E	F	I	J	K	L	M	N	X	Y	Q	S	P
ARG1	141 (5.55)	310 (12.20)	498 (19.61)	18,5 (0.73)	264 (10.39)	55 (2.17)	99 (3.90)	129 (5.08)	610,5 (24.04)	1090 (42.91)	902 (35.51)	282 (11.10)	68 (2.68)	50 (1.97)	9 (0.35)	60 (2.36)	30 (1.18)
ARG2	162 (6.38)	368 (14.49)	586 (23.07)	20 (0.79)	322 (12.68)	65 (2.56)	116 (4.57)	144 (5.67)	712 (28.03)	1278 (50.31)	1060 (41.73)	324 (12.76)	68 (2.68)	50 (1.97)	8 (0.31)	60 (2.36)	30 (1.18)
ARG3	175 (6.98)	444 (17.48)	706 (27.80)	23 (0.91)	380 (14.96)	75 (2.95)	111 (4.37)	151 (5.94)	817 (32.17)	1500 (59.06)	1238 (48.74)	350 (13.78)	95 (3.74)	50 (1.97)	15 (0.59)	110 (4.33)	45 (1.77)
ARG4	243 (9.57)	565 (22.24)	868 (34.17)	23 (0.91)	467 (18.39)	91 (3.58)	145 (5.71)	175 (6.89)	1074 (42.28)	1919 (75.55)	1616 (63.62)	486 (19.13)	95 (3.74)	70 (2.76)	0 (0.00)	110 (4.33)	55 (2.17)
ARG5	312 (12.28)	716 (28.19)	1008 (39.69)	26 (1.02)	568 (22.36)	145 (5.71)	175,5 (6.91)	189,5 (7.46)	1366 (53.78)	2348 (92.44)	2056 (80.94)	624 (24.57)	95 (3.74)	70 (2.76)	15,5 (0.61)	110 (4.33)	55 (2.17)
ARG6	394 (15.51)	756 (29.76)	1640 (64.57)	28 (1.10)	600 (23.62)	185 (7.28)	208 (8.19)	218 (8.58)	1572 (61.89)	3184 (125.35)	2300 (90.55)	788 (31.02)	95 (3.74)	70 (2.76)	25,5 (1.00)	110 (4.33)	55 (2.17)
ARG7	500 (19.69)	810 (31.89)	2030 (79.92)	50 (1.97)	615 (24.21)	220 (8.66)	265 (10.43)	310 (12.20)	1860 (73.23)	3840 (151.18)	2620 (103.18)	1000 (39.37)	266 (10.47)	150 (5.91)	11,5 (0.45)	260 (10.24)	130 (5.12)
ARG8	665 (26.18)	860 (33.86)	2600 (102.36)	55 (2.17)	680 (26.77)	280 (11.02)	306 (12.05)	360 (14.17)	2245 (88.39)	4790 (188.58)	3050 (120.08)	1330 (52.36)	266 (10.47)	200 (7.87)	21 (0.83)	260 (10.24)	130 (5.12)

Cylinder Size	5"	6"	7"	8"	9"	10"	12"	14"	16"	18"	20"	22"	24"	28"	32"	36"	40"
G	178 (7.01)	178 (7.01)	196 (7.72)	222 (8.74)	248 (9.76)	274 (10.79)	324 (12.76)	375 (14.76)	438 (17.24)	486 (19.13)	532 (20.94)	588 (23.15)	648 (25.51)	865 (34.06)	967 (38.07)	1069 (42.09)	1170 (46.06)
Z	Dimension "Z" upon Request																
Port Size NPT	3/8"	3/8"	3/8"	3/8"	3/8"	1/2"	3/4"	3/4"	3/4"	1"	1"	1"	1"	1 1/2"	1 1/2"	1 1/2"	2"

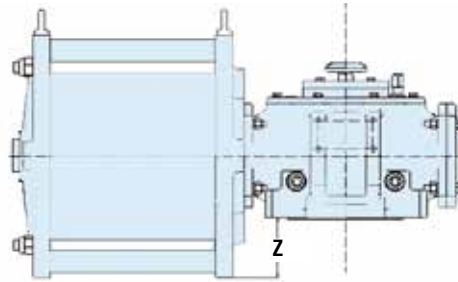
Dimensions



Mounting Base Details & Dimensions, mm (inch)

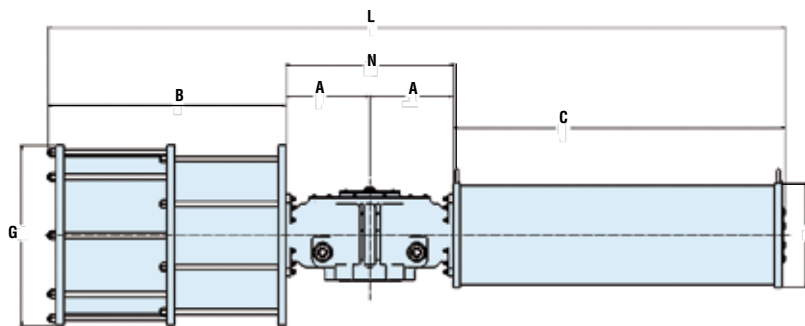
Series	ISO base	SPIGOT Ø	PCD	Bore Ø	Bore Tol	W	W Tol	No of Bolt X Size	T	U	U Tol
ARG1	F14	100 (3.94)	140 (5.51)	48 (1.89)	H9	14 (0.55)	+0.12/+0.05	4 X M16	5 (0.20)	51,8 (2.04)	+0.2/+0.0
ARG2	F16	130 (5.12)	165 (6.50)	60 (2.36)	H9	18 (0.71)	+0.15/+0.07	4 X M20	5 (0.20)	64,4 (2.54)	+0.2/+0.0
ARG3	F25	200 (7.87)	254 (10.0)	72 (2.83)	H9	20 (0.79)	+0.15/+0.07	8 X M16	5 (0.20)	76,9 (3.03)	+0.2/+0.0
ARG4	F30	230 (9.06)	298 (11.73)	98 (3.86)	H9	28 (1.10)	+0.15/+0.07	8 X M20	5 (0.20)	104,4 (4.11)	+0.2/+0.0
ARG5	F35	260 (10.24)	356 (14.02)	160 (6.30)	H9	40 (1.57)	+0.18/+0.08	8 X M30	5 (0.20)	169,4 (6.67)	+0.2/+0.0
ARG6	F40	300 (11.81)	406 (15.98)	180 (7.09)	H9	45 (1.77)	+0.18/+0.08	8 X M36	8 (0.31)	190,4 (5.50)	+0.2/+0.0
ARG7	F48	370 (14.57)	483 (19.02)	220 (8.66)	H9	50 (1.97)	+0.18/+0.08	12 X M36	8 (0.31)	231,4 (9.11)	+0.3/+0.0
ARG8	F60	470 (18.50)	603 (23.74)	280 (11.02)	H9	63 (2.48)	+0.22/+0.10	20 X M36	8 (0.31)	292,4 (11.51)	+0.3/+0.0

Dimensions



Double Acting Single Cylinder

Series	Dimension Z, mm (inch)																
	5"	6"	7"	8"	9"	10"	12"	14"	16"	18"	20"	22"	24"	28"	32"	36"	40"
ARG1	10 (0.39)	10 (0.39)	1 (0.04)	12 (0.47)	25 (0.98)	38 (1.50)	63 (2.48)	-	-	-	-	-	-	-	-	-	-
ARG2	-	-	-	5 (0.20)	8 (0.31)	21 (0.83)	46 (1.81)	71,5 (2.81)	103 (4.06)	-	-	-	-	-	-	-	-
ARG3	-	-	-	-	-	26 (1.02)	51 (2.01)	76,5 (3.01)	108 (4.25)	132 (5.20)	155 (6.10)	-	-	-	-	-	-
ARG4	-	-	-	-	-	-	-	42,5 (1.67)	74 (2.91)	98 (3.86)	121 (4.76)	149 (5.87)	179 (7.05)	-	-	-	-
ARG5	-	-	-	-	-	-	-	-	43,5 (1.71)	67,5 (2.66)	90,5 (3.56)	118,5 (4.67)	148,5 (5.85)	257 (10.12)	-	-	-
ARG6	-	-	-	-	-	-	-	-	-	35 (1.38)	58 (2.28)	86 (3.39)	116 (4.57)	224,5 (8.84)	275,5 (10.85)	326,5 (12.85)	-
ARG7	-	-	-	-	-	-	-	-	-	-	-	-	59 (2.32)	167,5 (6.59)	218,5 (8.6)	269,5 (10.61)	320 (12.60)
ARG8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	177,5 (6.99)	228,5 (9.00)	279 (10.98)



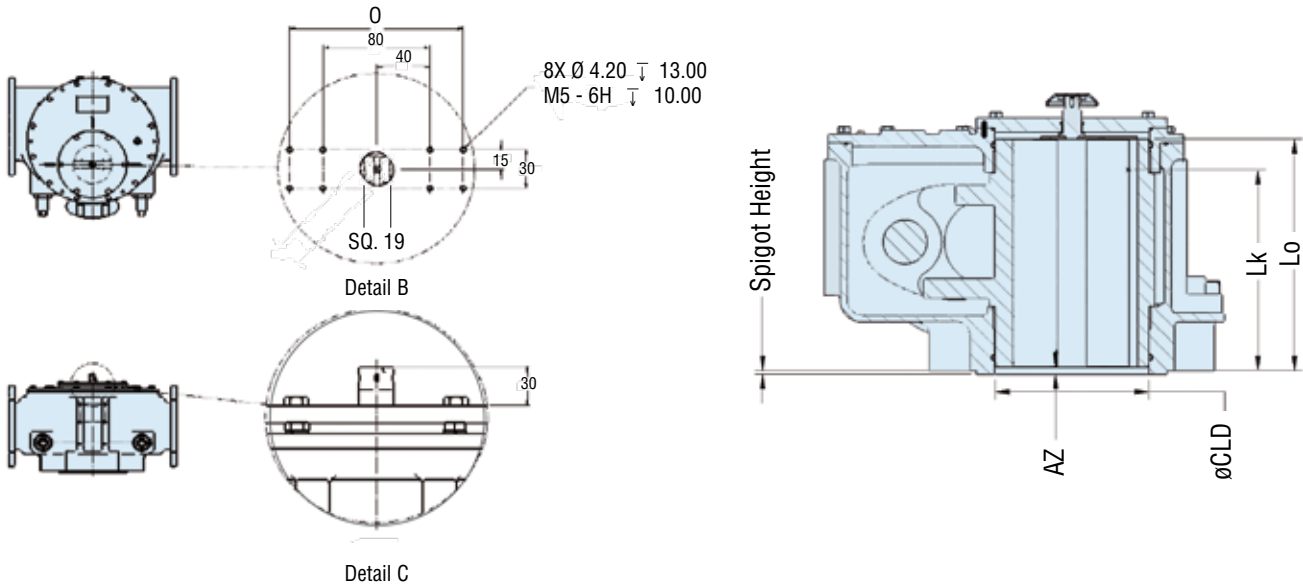
Double Acting Tandem Cylinder

Series	Dimensions for Spring Return Tandem Cylinders, mm (inch)						
	A	B	C	E	G	N	L
ARG8 32-32	665 (26.18)	1715 (67.52)	2600 (102.36)	680 (26.77)	1170 (46.06)	1330 (52.36)	5645 (222.24)
ARG8 36-36	665 (26.18)	1740 (68.50)	2600 (102.36)	680 (26.77)	1170 (46.06)	1330 (52.36)	5670 (223.23)

Module Weights

Module Weights, Lbs (kgs)																									
Model	Torque Module	Pressure Module																Spring Module							
		5	6	7	8	9	10	12	14	16	18	20	22	24	28	32	36	40	1	2	3	4	5	6	7
ARG1	68 (31)	31 (14)	35 (16)	47 (22)	53 (24)	66 (30)	94 (43)	139 (63)	-	-	-	-	-	-	-	-	-	88 (40)	97 (44)	101 (46)	103 (47)	106 (48)	114 (52)	119 (54)	119 (54)
ARG2	99 (45)	-	-	-	56 (25)	69 (32)	99 (45)	143 (65)	209 (95)	320 (145)	-	-	-	-	-	-	-	128 (58)	145 (66)	154 (70)	158 (72)	158 (72)	172 (78)	180 (82)	186 (85)
ARG3	143 (65)	-	-	-	-	-	100 (45)	142 (64)	200 (91)	318 (145)	406 (185)	561 (255)	-	-	-	-	-	226 (103)	260 (118)	267 (121)	269 (122)	276 (125)	330 (150)	321 (146)	-
ARG4	295 (134)	-	-	-	-	-	-	217 (99)	339 (154)	427 (194)	586 (266)	741 (337)	942 (428)	-	-	-	-	402 (183)	442 (201)	462 (210)	477 (217)	510 (232)	545 (248)	565 (257)	581 (254)
ARG5	510 (231)	-	-	-	-	-	-	-	356 (162)	455 (207)	610 (277)	853 (388)	994 (452)	1634 (743)	-	-	-	639 (290)	737 (335)	770 (350)	783 (356)	901 (410)	955 (434)	-	-
ARG6	933 (423)	-	-	-	-	-	-	-	-	493 (224)	616 (280)	861 (391)	1051 (478)	1732 (787)	2321 (1055)	3044 (1384)	-	1283 (583)	1738 (790)	1671 (760)	1730 (787)	2061 (937)	1995 (907)	-	-
ARG7	1881 (853)	-	-	-	-	-	-	-	-	-	-	-	-	-	1824 (829)	2411 (1096)	3156 (1435)	3913 (1779)	2283 (1038)	2946 (1339)	3043 (1383)	3177 (1444)	3630 (1650)	3709 (1686)	-
ARG8	3718 (1686)	-	-	-	-	-	-	-	-	-	-	-	-	-	2165 (984)	2819 (1282)	3372 (1533)	4159 (1891)	4627 (2103)	5800 (2637)	6113 (2779)	6227 (2830)	7111 (3232)	7423 (3374)	-

NAMUR shaft height and bracket mounting details



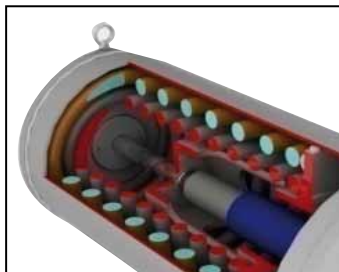
Series	O	H	V	Lk (mm)	Lo (mm)	Spigot height	øCLD	AZ	Key Size	AY	AW X Bolt Size
ARG1	-	M10	14	165	180	4	70	9	14 x 9	95	4 x M6
ARG2	-	M10	14	195	210	5	85	10	18 x 11	110	4 x M6
ARG3	-	M12	14	200	215	5	100	10	20 x 12	125	4 x M6
ARG4	130	M12	14	255	270	5	135	10	28 x 16	160	4 x M6
ARG5	130	M12	20	300	315	5	210	10	40 x 22	240	6 x M10
ARG6	130	M12	20	350	375	8	240	16	45 x 25	270	6 x M10
ARG7	130	M16	20	500	515	8	286	16	50 x 28	326	8 x M10
ARG8	130	M16	20	585	610	8	361	16	63 x 32	400	9 x M12

Manual Override Options

Jackscrew



Hydraulic



Sandwich Gear



Bevel Gear



Model	ISO Mounting	Torque		DA				SR			
		N-m	in-lb	Jackscrew		Sandwich Declutchable Gear	Hydraulic	Jackscrew		Sandwich Declutchable Gear	Hydraulic
				Direct Operation	Bevel Gear			Direct Operator	Bevel Gear		
ARG1	F14	2000	17702	✓	–	✓	–	✓	–	✓	–
ARG2	F16	4000	35404	✓	–	✓	–	✓	–	✓	–
ARG3	F25	8000	70808	✓	✓	✓	✓	✓	✓	✓	✓
ARG4	F30	16000	141616	–	✓	✓	✓	–	✓	✓	✓
ARG5	F35	32000	283232	–	✓	✓	✓	–	✓	✓	✓
ARG6	F40	63000	557613	–	–	–	✓	–	–	–	✓
ARG7	F48	125000	1106375	–	–	–	✓	–	–	–	✓
ARG8	F60	250000	2212750	–	–	–	✓	–	–	–	✓

Product Specification

- Actuator shall be designed in accordance with EN15714-3 to define minimum cycle life performance and designed for on-off and modulating service.
- Actuator output shall meet ISO rated torque compliance to provide safe mounting interface and comply with ISO 5211/MSS SP-101 mounting standards and NAMUR VDI/VDE standards for accessory mounting.
- Actuator shall have a symmetrical torque module to simplify field service and interchangeability of spring and air modules. Manual overrides and mounting is consistent for both spring and torque module to simplify mounting.
- The actuator torque module shall utilize an interchangeable yoke system to allow simple field conversion of symmetrical and canted yokes.
- The spring module shall use a pull-to-compress motion with single or concentric-nested springs that are internally supported and guided and weld secured for safety.
- The spring module shall be designed for minimum length and weight to improve the center of gravity, reduce material stress and assembly support requirements.
- The actuator shall have hard chrome plated cylinder walls to provide superior corrosion and wear resistance.
- The actuator piston sealing should use advanced Quad Seal technology to provide enhanced cycle life compared to conventional O-Rings.
- The internal support guide rods, spring rods and piston rods shall be hard chrome plated for superior corrosion and wear resistance.
- The pneumatic cylinder shall use external retention rods to provide visual confirmation and inspection of rod integrity for increased safety.

Agency & Environmental Approvals

- IP67M (1 meter depth for 30 minutes)
- IEC 61508 SIL 3 Suitable
- ATEX Certified

Standard Paint Specification

The standard external surface treatment consists of a 2 pack primer and 2 pack epoxy coating. This international marine coating is suitable for chemical, coastal and offshore environments providing superior corrosion resistance.

- Primer Coat:** Akzo Nobel Intergard 251, anticorrosive zinc phosphate epoxy primer, 75 microns DFT, color: KGA902-Red.
- Top Coat:** Akzo Nobel Intergard 740 epoxy finish, 2 mills DFT
- Finished Color:** ECK724 – Storm Grey, High Gloss



Actuator Model Designation

How to Order									
Series	Body Size	Cylinder Size	Action	Spring Module	Torque Pattern (Yoke)	Sealing/Temp	Manual Override	Material/ Coatings	Options
ARG	1	05 06 07 08 09 10 12	DA- Double Acting Single Cylinder	0	S- Symmetrical	N- Nitrile, -20° F to 180° F	O- None	GE- Grey Epoxy (std)	00- None
	2	08 09 10 12 14 16	DD- Double Acting Dual Cylinder	1	C- Canted	H- High Temp (Viton), 0° F to 300° F L- Low Temp, (material) -55° F to 180° F	G- Sandwich Declutch Gbox	PO- Primer Only	TC- Ext. Stopper -CW
	3	10 12 14 16 18 20	SR- Spring Return Fail CW	2			J- Jackscrew	WE- White Epoxy	TO- Ext. Stopper -CCW
	4	14 16 18 20 22 24	SO- Spring Return Fail CCW	3			D- Bevel Gear Jackscrew	SP- Specials	TB- Ext. Stopper -Both Dir
	5	16 18 20 22 24 28		4			H- Hydraulic		S xxx- Specials code
	6	18 20 22 24 28 32 36		5					
	7	24 28 32 36 40		6					
	8	28 32 36 40		7					
				8					
Model Code Example:									
ARG	5	22	SR	6	C	N	D	GE	TC

Maximum Cylinder Size

Body Size	Maximum Cylinder Size		
	DA	DD	SR/SO
1	9	8	12
2	12	10	16
3	16	14	20
4	20	16	24
5	22	20	28
6	28	24	36
7	36	32	40
8	40	40	40

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