

MORIN B AND C SERIES ACTUATORS

B series - Ductile iron w/ stainless steel cylinders, C series - Ductile iron w/ carbon steel cylinders
 Spring return and double acting actuators
 Quarter-turn output torques to 158200 Nm



B SERIES



C SERIES

FEATURES AND BENEFITS

- Ductile iron housing, piston and end caps provide long life and durable, cost-effective operation.
- High strength alloy steel or 17-4PH stainless output shaft transmits torque without fatigue.
- Sintered bronze or PTFE composite output shaft bushings eliminate side loading of valve stem to maximize stem packing performance.
- Strong, corrosion-resistant chrome-plated steel piston rod for enduring high cycle applications.
- Sintered bronze piston rod bushings provide low-friction support and precise alignment to increase efficiency, reduce maintenance and extend actuator life.
- Heat-treated stainless steel thrust pin and rollers transfer piston force to yoke to reduce friction for longer life and more efficient torque transmission.
- PTFE guide bands ensure low-friction piston guidance, protecting cylinder walls from scoring and extending seal performance with a continuous cylinder wiping action.
- Bi-directional travel stops provide accurate valve rotation adjustment.
- NAMUR drive slot maintains a compact assembly for accessory-driven components with no couplings necessary.
- Tectyl-coated springs need no special tools to be disarmed safely and easily, reducing down time.

ALGA/ALGAS models available over the 1150 size

GENERAL APPLICATIONS

For remote control of any quarter-turn application: ball, butterfly, rotary plug or damper style valves, etc. for use in chemical process, food and beverage, iron and steel, pharmaceutical, power, oil and gas, pulp and paper and textile industries.

TECHNICAL DATA

Supply pressure:	3 to 11 barg (see torque chart)
Supply medium:	Air or any gas compatible with materials of construction
Temperature rating	
Standard range:	-29°C to 99°C
Optional range:	-54°C to 149°C
Angular rotation:	90 degrees (adjustable between 82 and 98 degrees)
Mounting pattern:	ISO 5211
Protection:	IP66
Certification:	SIL3 capable



MORIN B AND C SERIES ACTUATORS

DESIGNED WITH A RUGGED HEART

Scotch yoke design

The heart of any scotch yoke actuator is the yoke. B and C series actuators use either 17-4PH or ductile iron for this critical area as standard.

The yoke is the mechanism used to convert linear force to torque. The yoke is critical to actuator performance, it must be rugged yet precisely machined to give long life at high efficiency - all our yoke designs meet this test.

Principles of construction

Using high quality materials of construction and modern rugged design concepts, provides the standard for high quality, low cost valve actuation.

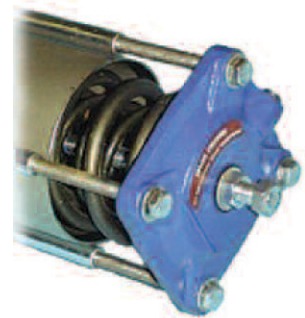
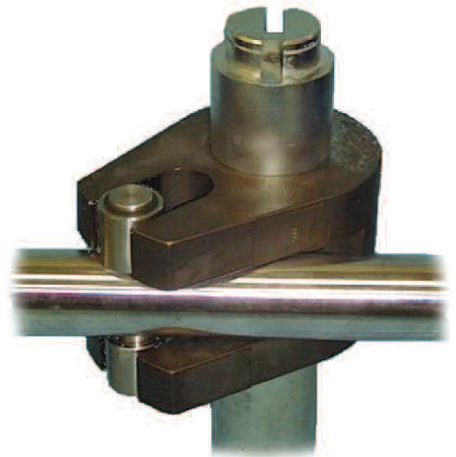
The actuator housings are all machined from ductile iron castings. This produces a rugged, low cost product through reduced machining time and by eliminating wasteful excess material. Any components that rotate or slide during operation, such as the high strength output shaft, chrome-plated piston rod, stainless steel thrust pin or the ductile iron piston, are all supported by replaceable friction reducing bearings.

Bi-directional travel stops

Adjustable stops on each end cap provide the flexibility of accurate valve rotation positioning at the end of the 'open' and 'close' stroke. Both stops are located on the cylinder centerline, the optimal position to maximize travel adjustment and eliminate any detrimental side loading on the travel stops. Adjustable from 82° to 98°.

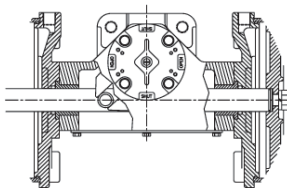
Spring designed for safety

All spring return models incorporate a 'man safe' spring design that allows the actuator to be safely assembled and disassembled in the field without the need for special tools. The integral tie rods are bored and tapped to provide a means of loading and unloading the spring in a safe and convenient manner.

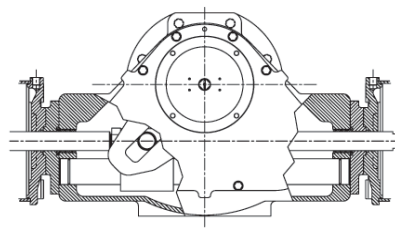


Experts in actuator design

We understand that the most efficient design for one torque range is not the most efficient for another. Our actuators use the standard scotch yoke design for lower torque ranges and a guide bar design for the higher torque ranges. This gives a rugged design with economic cost.



STANDARD DESIGN, SCOTCH YOKE

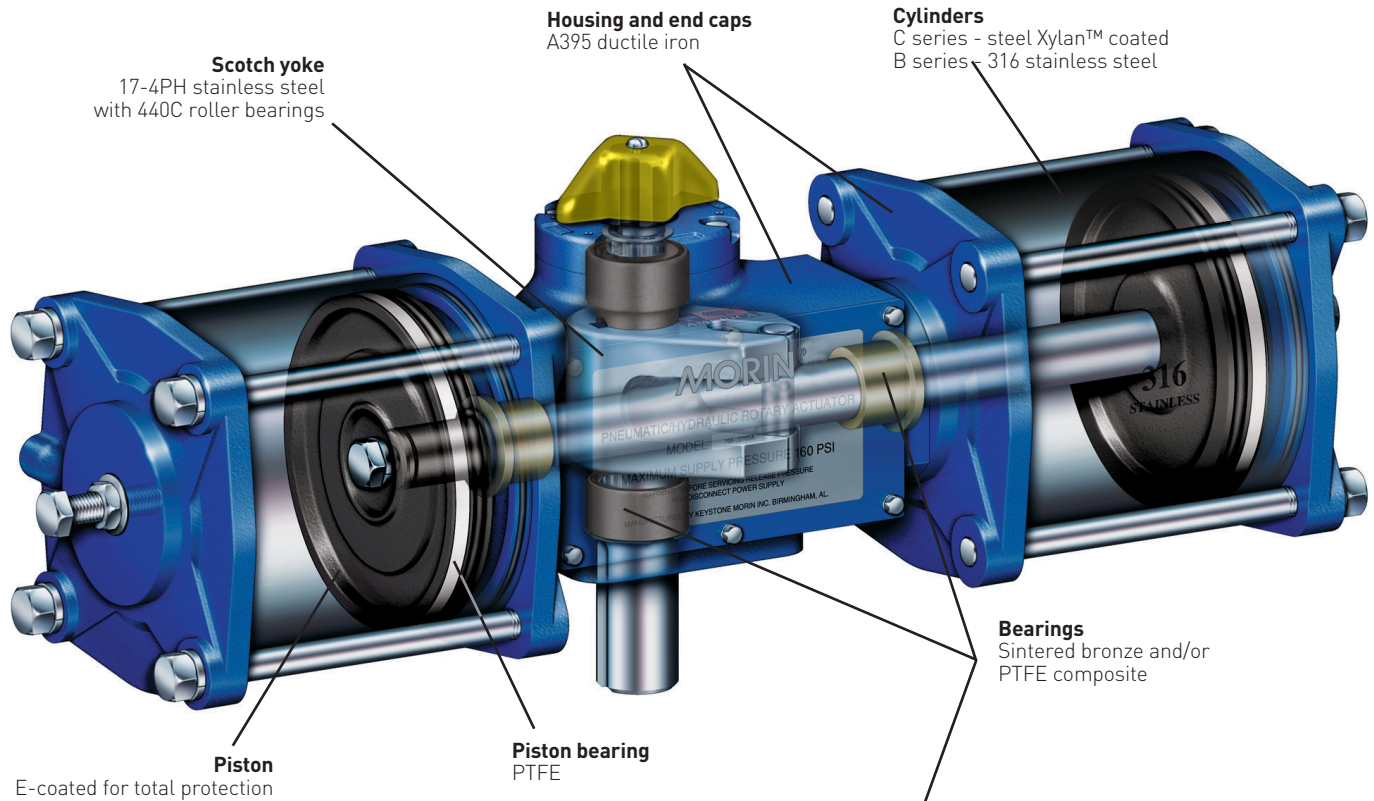


GUIDE BAR DESIGN, SCOTCH YOKE

MORIN B AND C SERIES ACTUATORS

Superior materials of construction offer long life, and mean less downtime

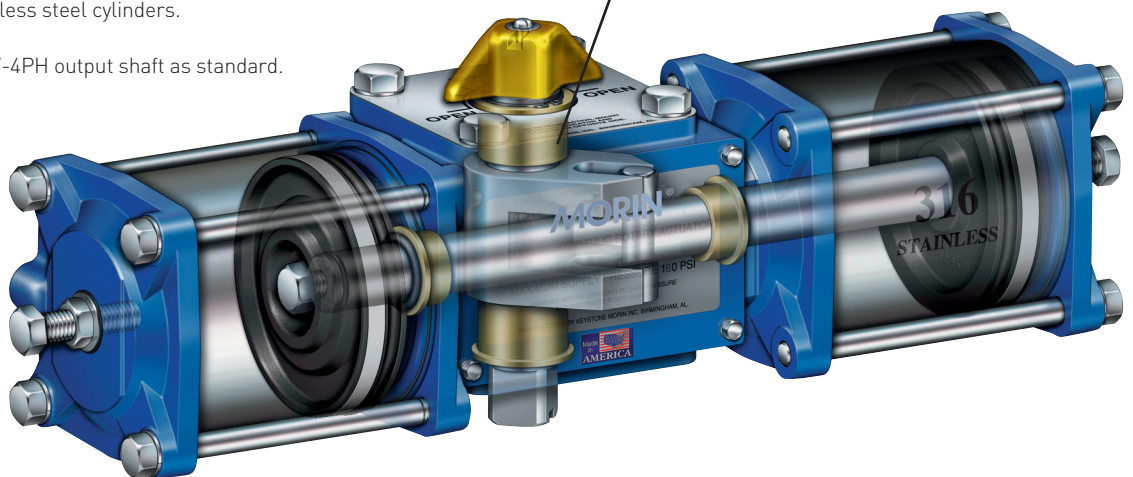
B OR C SERIES, MODELS 135 TO 1150



B SERIES MODELS 006 TO 100

B series actuators use construction identical to the C series, but with 316 stainless steel cylinders.

Models 006 to 100 use 17-4PH output shaft as standard.



NOTE

See B/C/S series IOM for a complete bill of materials.

MORIN B AND C SERIES ACTUATORS

SYMMETRICAL AND CANTED YOKES

It's about fitting the torque curve of the actuator to the valve . . .

It's about lower cost, lighter weight, smaller actuators . . .

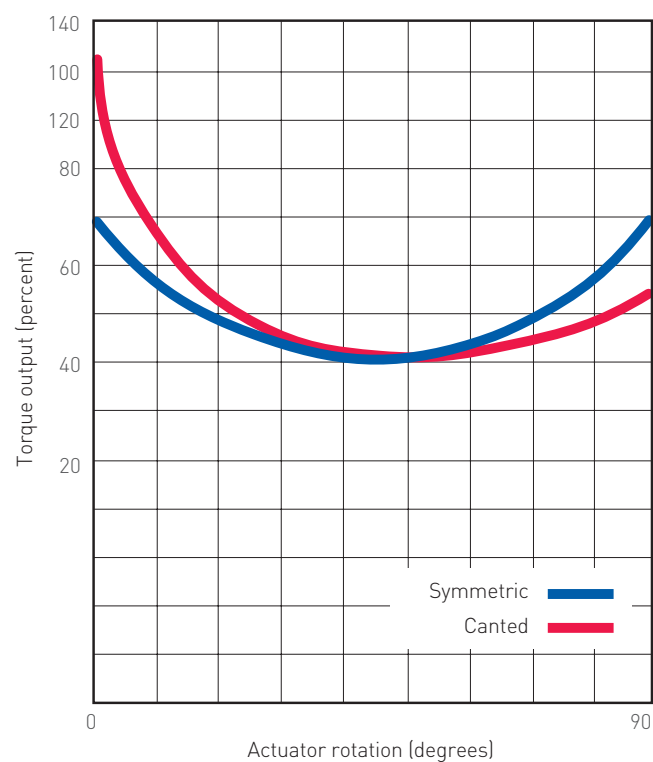
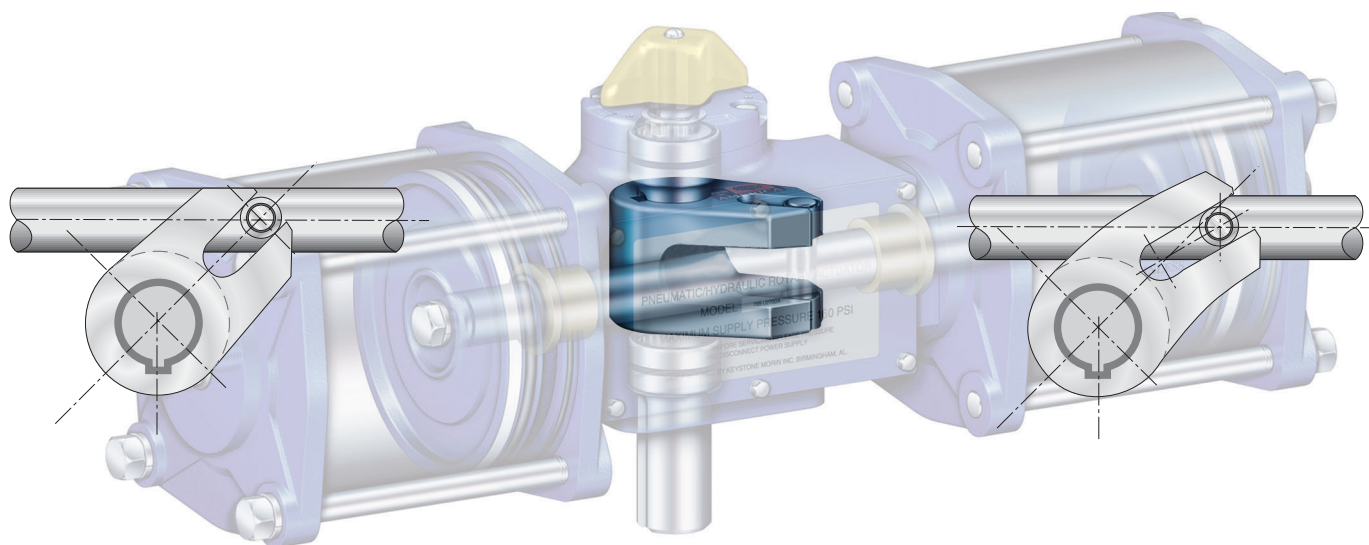
It's about CHOICE . . .

Symmetric

Symmetrical yoke design offers the standard torque curve seen most often in relation to scotch yoke actuators. It offers the increased torque advantage at both ends of the 90° stroke as shown on the blue curve below. This torque curve covers most quarter-turn applications.

Canted

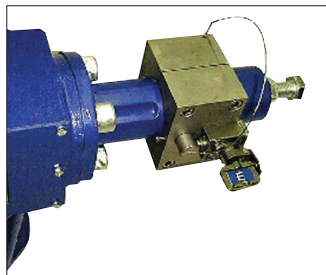
Canted yoke design moves the torque curve to where it's needed most, gaining as much as 35% more break and reseat torque for the same size actuator. The canted yoke curve is shown in red below. Canted yoke actuators allow selection of smaller, lighter, and less expensive actuator packages.



MORIN B AND C SERIES ACTUATORS

OPTIONS

To provide the actuation package best suited for your application, we offer a full range of manual accessories.



Partial stroke test device (PSTD)
Provides a method of testing ESD packages without shutdown.



Lockout
Integral lockout allows safe shutdowns for maintenance and isolation of systems.



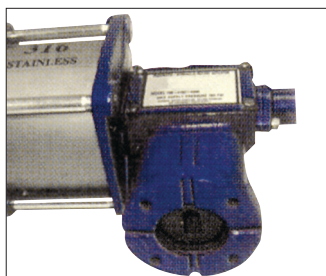
Jackscrew override (JSO)
Manual operation when power is lost. Simple and effective.



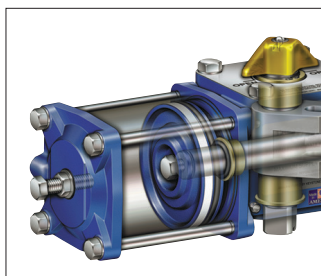
Hydraulic override (MHP)
Manual operation when power is lost. Includes speed controls.



AWWA
Tested per American Waterworks Association C540. Available for pneumatic or water service operation.



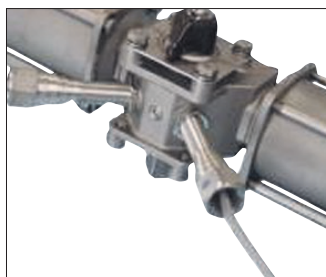
Direct mounting cast adapters
Many valve top works covered, including some ISO mounting. Assures economic but correct mounting alignment.



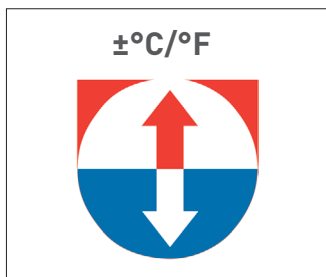
Full stroke adjuster
Provides mechanical control of maximum and/or minimum valve stroke.



Epoxy painting (EX)
Offshore rated, three-part coating system for high level of environmental protection.



Proximity switch preparation
Allows installation of cartridge style proximity switches. Leaves top works open for mounting of other devices.



High or low temperature ratings
Standard rating of -29°C to 99°C [-20°F to 210°F] covers most applications. Optional ratings down to -54°C [-65°F] and up to 149°C [300°F].



Optional certification for CE
Manufactured in accordance with the Pressure Equipment Directive 97/23/EC and ATEX 94/9/EC.

MORIN B AND C SERIES ACTUATORS

MECHANICAL DATA

Actuator model	Closing torque at 5.5 barg		Number of pistons	Cylinder bore (mm)	Stroke (mm)	Volume ^[1] (liters) 90° stroke	Cycle time ^[2] (seconds)	Weight (kg)
	Symmetrical	Canted					90° stroke	
Double acting								
006	68	-	1	69.9	50.8	0.20	1	5.0
015	170	-	1	111.1	50.8	0.49	1	6.5
023	260	338	1	111.1	76.2	0.74	1	13.5
036	447	582	1	138.1	76.2	1.15	2	15.0
050	565	735	1	158.8	76.2	1.51	2	17.5
059	667	867	2	111.1/138.1	76.2	1.84	2	16.5
072	895	*1018	2	138.1	76.2	2.25	3	18.5
100	1130	**1102	2	158.8	76.2	2.98	3	22.0
135	1602	2082	1	209.6	127.0	4.38	5	75.0
210	2610	3393	1	260.4	127.0	6.77	5	84.0
270	3204	4165	2	209.6	127.0	8.62	6	95.5
345	4093	*4656	2	209.6/260.4	127.0	11.00	7	106.0
370	4181	5816	1	311.2	152.4	11.59	8	177.0
420	4746	**4627	2	260.4	127.0	13.37	9	116.5
575	7212	9376	1	393.7	152.4	18.55	10	235.5
740	8780	11414	2	311.2	152.4	22.86	10	240.5
945	11426	**11140	2	311.2/393.7	152.4	29.82	11	296.0
1150	13645	***11086	2	393.7	152.4	36.79	12	351.5
1485	•	•	•	•	•	•	•	•
1935	•	•	•	•	•	•	•	•
2385	•	•	•	•	•	•	•	•
3071	•	•	•	•	•	•	•	•
3731	•	•	•	•	•	•	•	•
4534	•	•	•	•	•	•	•	•
5336	•	•	•	•	•	•	•	•
7114	•	•	•	•	•	•	•	•

• Use ALGA model

Spring return

006	25	-	1	69.9	50.8	0.20	0.5	6.0
015	59	-	1	111.1	50.8	0.49	1	9.0
023	90	127	1	111.1	76.2	0.74	1	17.0
036	142	199	1	138.1	76.2	1.15	1.5	21.0
046	181	235	2	111.1	76.2	1.44	2	21.5
058	*181	*253	2	138.1/111.1	76.2	1.84	2.3	24.5
059	214	299	2	111.1/138.1	76.2	1.84	2.4	24.5
072	283	396	2	138.1	76.2	2.25	2.5	27.0
100	396	554	2	158.8	76.2	2.98	3	39.0
135	641	897	1	209.6	127.0	4.38	4.5	95.5
210	914	1279	1	260.4	127.0	6.77	5	106.5
270	1175	1644	2	209.6	127.0	8.62	6	113.5
344	1428	1999	2	260.4/209.6	127.0	11.00	7	143.0
345	****1555	****2177	2	209.6/260.4	127.0	11.00	7	143.0
370	1683	2356	1	311.2	152.4	11.59	8	245.0
420	1744	2442	2	260.4	127.0	13.37	8.5	172.0
575	2388	3108	1	393.7	152.4	18.55	9.5	353.5
740	3366	4712	2	311.2	152.4	25.56	10	299.5
944	*3132	*4384	2	393.7/311.2	152.4	29.82	11	395.0
945	3650	5110	2	311.2/393.7	152.4	29.82	11	395.0
1150	4776	6686	2	393.7	152.4	36.79	12	491.0
1485	✧	✧	✧	✧	✧	✧	✧	✧
1934	✧	✧	✧	✧	✧	✧	✧	✧
1935	✧	✧	✧	✧	✧	✧	✧	✧
2385	✧	✧	✧	✧	✧	✧	✧	✧
3071	✧	✧	✧	✧	✧	✧	✧	✧
3072	✧	✧	✧	✧	✧	✧	✧	✧
3731	✧	✧	✧	✧	✧	✧	✧	✧
4534	✧	✧	✧	✧	✧	✧	✧	✧
5336	✧	✧	✧	✧	✧	✧	✧	✧
6044	✧	✧	✧	✧	✧	✧	✧	✧
7114	✧	✧	✧	✧	✧	✧	✧	✧

✧ Use ALGAS model

NOTES

1. Air consumption:

Liter shown in chart represent actual free air volume in cylinder between piston and end cap when furthest apart. Air consumption will vary depending on supply pressure. To determine standard cubic meter per second use the following formula:

$$SCMS = \left(\frac{\text{Vol. ltr.}}{1000} \right) \left(\frac{\text{Supply air barg} + 1}{1 \text{ barg}} \right) \left(\frac{\text{Strokes/min}}{60} \right)$$

Example: calculate SCMS for model 023 double acting using 5.5 barg air supply and 5 strokes/minute.

$$SCMS = \left(\frac{0.737}{1000} \right) \left(\frac{5.5 + 1}{1} \right) \left(\frac{5}{60} \right) = 0.000401$$

2. Cycle times shown represent average time to stroke 90 degrees using standard pilot valves and should be used as a guide only. Cycle times can be increased or decreased dramatically by using speed controls, oversized pilot valves or quick exhaust valves.

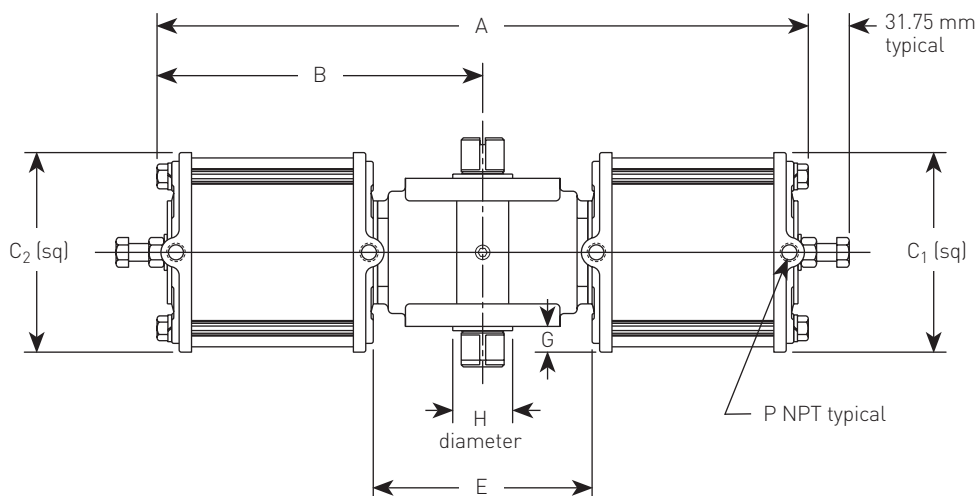
* at 4.8 barg;
** at 4.1 barg;

*** at 3.4 barg;
**** at 6.2 barg

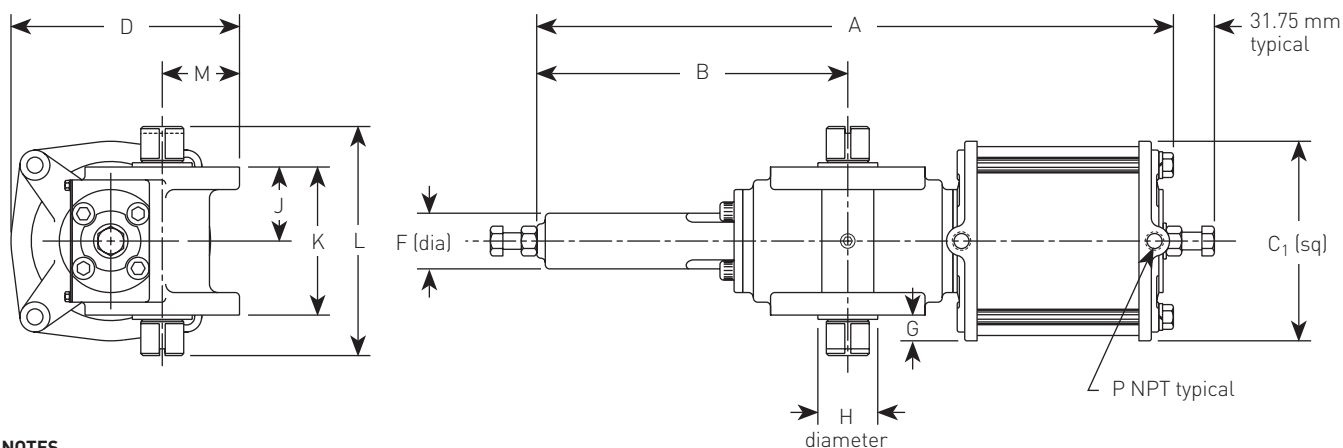
MORIN B AND C SERIES ACTUATORS

DIMENSIONS

MODELS 046, 058, 059, 072 AND 100



MODELS 006, 015, 023, 036 AND 050



NOTES

1. Shown without pointer for clarity.
2. For mounting dimensions, refer to page 10.

DIMENSIONS (mm) DOUBLE ACTING

Model	A	B	C ₁	C ₂	D	E	F	G	H	J	K	L	M	P
006DA	326.9	134.1	80.8	-	98.3	-	27.7	4.6	38.1	38.1	76.2	120.7	33.3	1/8
015DA	312.7	134.1	122.2	-	122.2	-	27.7	25.4	38.1	38.1	76.2	120.7	33.3	1/4
023DA	470.9	225.6	122.2	-	156.5	-	44.5	6.4	44.5	54.9	109.5	169.9	57.2	1/4
036DA	472.4	225.6	147.6	-	169.2	-	44.5	19.1	44.5	54.9	109.5	169.9	57.2	1/4
050DA	471.2	225.6	180.8	-	185.7	-	44.5	35.1	44.5	54.9	109.5	169.9	57.2	1/4
059DA	492.8	245.4	122.2	147.6	169.2	161.0	-	19.1	44.5	54.9	109.5	169.9	57.2	1/4
072DA	491.5	245.9	147.6	147.6	169.2	162.1	-	19.1	44.5	54.9	109.5	169.9	57.2	1/4
100DA	482.1	245.9	180.8	180.8	185.7	162.1	-	35.1	44.5	54.9	109.5	169.9	57.2	1/4

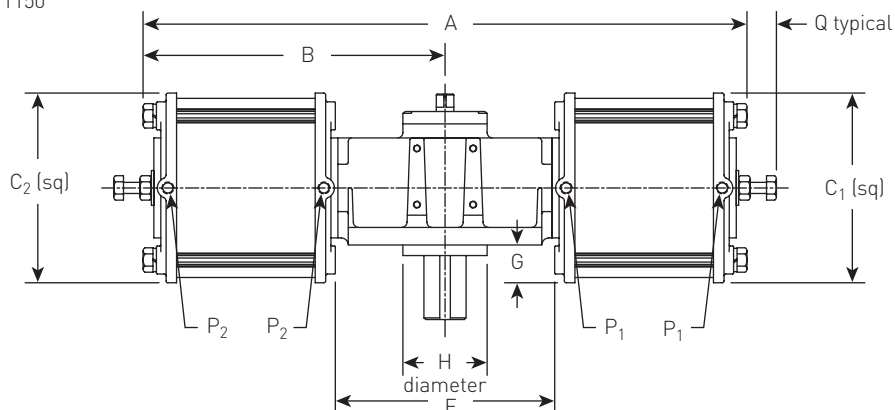
DIMENSIONS (mm) SPRING RETURN

Model	A	B	C ₁	C ₂	D	E	F	G	H	J	K	L	M	P
006SR	326.9	134.1	80.8	-	98.3	-	27.7	4.6	38.1	38.1	76.2	120.7	33.3	1/8
015SR	368.3	134.1	122.2	-	122.2	-	27.7	25.4	38.1	38.1	76.2	120.7	33.3	1/4
023SR	557.5	225.6	122.2	-	156.6	-	44.5	6.4	44.5	54.9	109.5	169.9	57.2	1/4
036SR	600.7	225.6	147.6	-	169.2	-	44.5	19.1	44.5	54.9	109.5	169.9	57.2	1/4
046SR	577.3	245.4	122.2	122.2	156.5	141.7	-	6.4	44.5	54.9	109.5	169.9	57.2	1/4
058SR	578.9	247.1	147.6	122.2	169.2	141.7	-	19.1	44.5	54.9	109.5	169.9	57.2	1/4
059SR	620.8	245.4	122.2	147.6	169.2	138.2	-	19.1	44.5	54.9	109.5	169.9	57.2	1/4
072SR	621.0	245.9	147.6	147.6	169.2	138.2	-	19.1	44.5	54.9	109.5	169.9	57.2	1/4
100SR	622.6	247.1	180.8	180.8	185.7	138.2	-	35.1	44.5	54.9	109.5	169.9	57.2	1/4

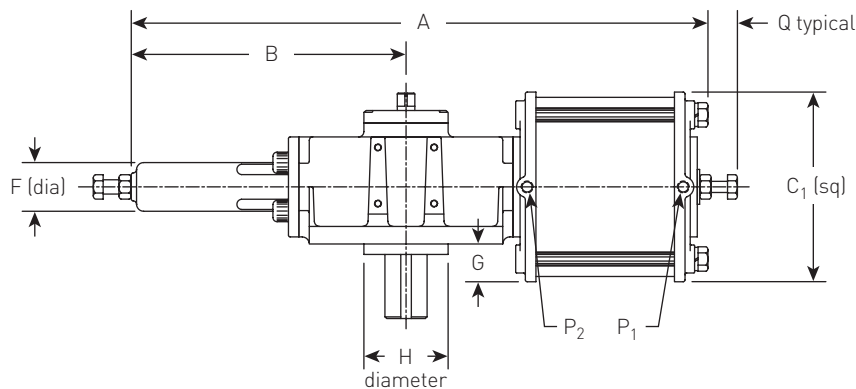
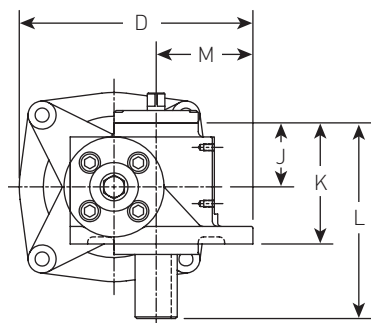
MORIN B AND C SERIES ACTUATORS

DIMENSIONS

MODELS 270, 344, 345, 420, 740, 944, 945 AND 1150



MODELS 135, 210, 370 AND 575



NOTES

1. Shown without pointer for clarity.
2. For mounting dimensions, refer to pages 10-11.

DIMENSIONS (mm) DOUBLE ACTING

Model	A	B	C ₁	C ₂	D	E	F	G	H	J	K	L	M	P ₁	P ₂	Q
135DA	831.6	403.4	241.3	-	265.2	-	69.9	25.4	-	111.3	206.5	300.2	81.0	3/8	3/8	44.5
210DA	844.8	403.4	292.1	-	290.6	-	69.9	50.8	-	111.3	206.5	300.2	81.0	1/2	1/2	53.8
270DA	857.8	429.0	241.3	241.3	265.2	297.7	-	25.4	-	111.3	206.5	300.2	81.0	3/8	3/8	44.5
345DA	870.2	429.0	241.3	292.1	290.6	291.3	-	50.8	-	111.3	206.5	300.2	81.0	3/8	1/2	53.8
370DA	1057.7	496.8	342.9	-	425.5	-	88.9	68.3	149.9	138.2	241.3	376.2	174.8	1/2	1/2	44.5
420DA	882.7	441.5	292.1	292.1	290.6	285.0	-	50.8	-	111.3	206.5	300.2	81.0	1/2	1/2	53.8
575DA	1073.4	496.8	431.8	-	469.9	-	88.9	112.8	149.9	138.2	241.3	376.2	174.8	3/4	3/4	63.5
740DA	1121.4	560.6	342.9	342.9	425.5	396.7	-	68.3	149.9	138.2	241.3	376.2	174.8	1/2	1/2	44.5
945DA	1137.2	560.6	342.9	431.8	469.9	387.4	-	112.8	149.9	138.2	241.3	376.2	174.8	1/2	3/4	63.5
1150DA	1152.9	576.3	431.8	431.8	469.9	378.0	-	112.8	149.9	138.2	241.3	376.2	174.8	3/4	3/4	63.5

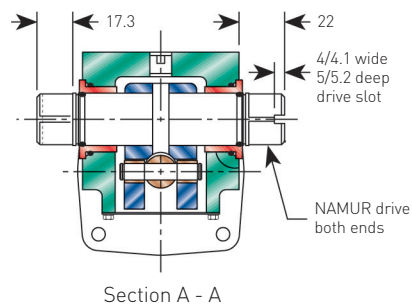
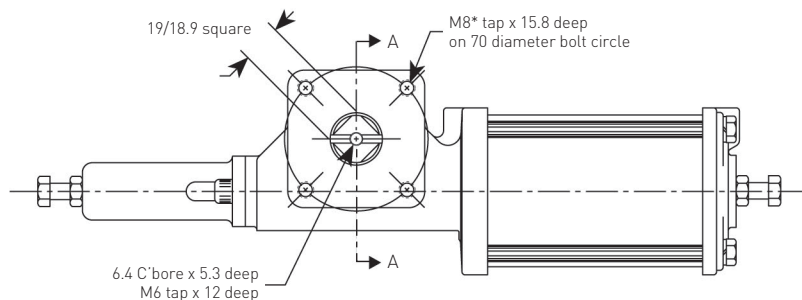
DIMENSIONS (mm) SPRING RETURN

Model	A	B	C ₁	C ₂	D	E	F	G	H	J	K	L	M	P ₁	P ₂	Q
135SR	1002.3	403.4	241.3	-	265.2	-	69.9	25.4	-	111.3	206.5	300.2	81.0	3/8	3/8	44.5
210SR	1083.8	403.4	292.1	-	290.6	-	69.9	50.8	-	111.3	206.5	300.2	81.0	1/2	1/2	53.8
270SR	1030.5	431.5	241.3	241.3	265.2	278.1	-	25.4	-	111.3	206.5	300.2	81.0	3/8	3/8	44.5
344SR	1040.1	441.5	292.1	241.3	290.6	271.8	-	50.8	-	111.3	206.5	300.2	81.0	1/2	3/8	53.8
345SR	1112.3	431.5	241.3	292.1	290.6	269.5	-	50.8	-	111.3	206.5	300.2	81.0	3/8	1/2	53.8
370SR	1307.6	496.8	342.9	-	425.5	-	88.9	68.3	149.9	138.2	241.3	376.2	174.8	1/2	1/2	44.5
420SR	1121.9	441.5	292.1	292.1	290.6	263.1	-	50.8	-	111.3	206.5	300.2	81.0	1/2	1/2	53.8
575SR	1374.6	496.8	431.8	-	469.9	-	88.9	112.8	149.9	138.2	241.3	376.2	174.8	3/4	3/4	63.5
740SR	1371.3	560.6	342.9	342.9	425.5	374.7	-	68.3	149.9	138.2	241.3	376.2	174.8	1/2	1/2	44.5
944SR	1386.6	575.8	431.8	342.9	469.9	365.0	-	112.8	149.9	138.2	241.3	376.2	174.8	3/4	1/2	63.5
945SR	1438.4	560.6	342.9	431.8	469.9	359.7	-	112.8	149.9	138.2	241.3	376.2	174.8	1/2	3/4	63.5
1150SR	1453.4	576.3	431.8	431.8	469.9	350.3	-	112.8	149.9	138.2	241.3	376.2	174.8	3/4	3/4	63.5

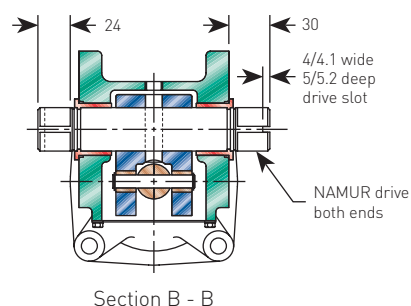
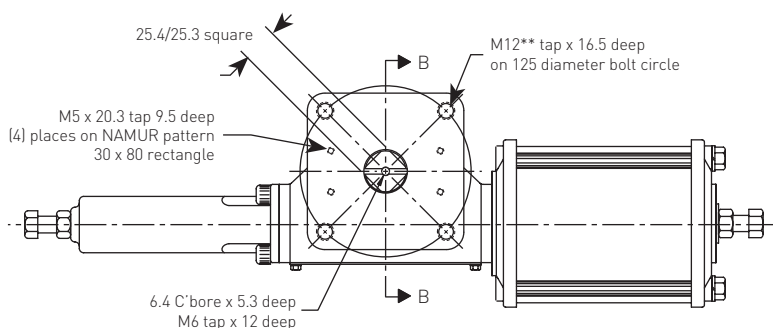
MORIN B AND C SERIES ACTUATORS

MOUNTING DETAILS

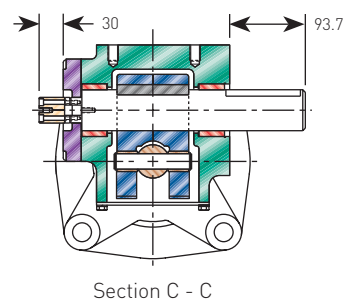
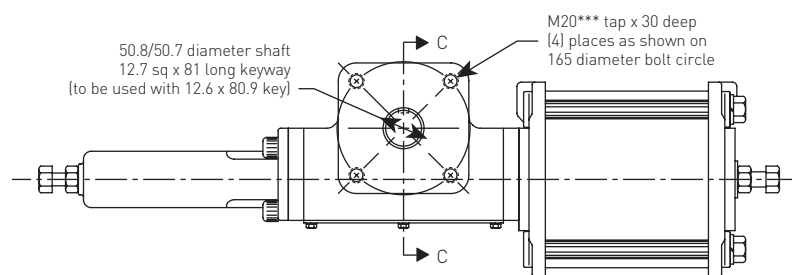
MODELS 006 AND 015 - TOP AND BOTTOM OF HOUSING (SYMMETRICAL) ISO 5211-F07



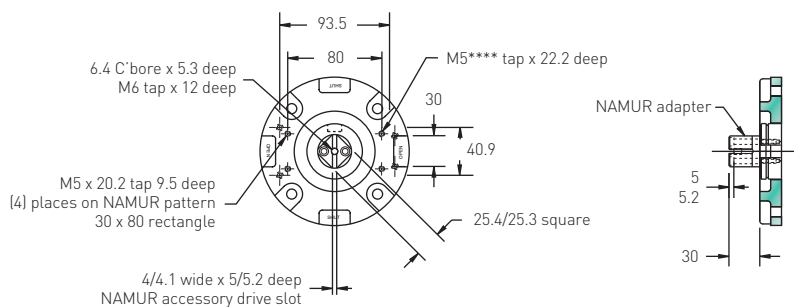
MODELS 023 THROUGH 100 - TOP AND BOTTOM OF HOUSING (SYMMETRICAL) ISO 5211-F12



MODELS 135, 210, 270, 344, 345 AND 420 - BOTTOM OF HOUSING ISO 5211-F16



MODELS 135, 210, 270, 344, 345 AND 420 - TOP OF HOUSING - MOUNTING DETAILS



IMPERIAL THREAD OPTION

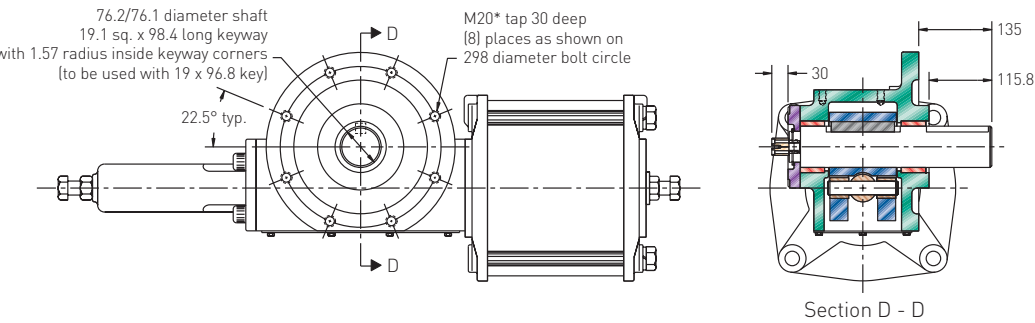
Standard tap	Model number
* 5/16 - 18 UNC	006 and 015
** 1/2 - 13 UNC	023 to 100
*** 3/4 - 10 UNC	135 to 1150
**** 10 - 32 UNC	135 to 1150

Replace 'M' with 'U' in order number designation (refer to page 12).

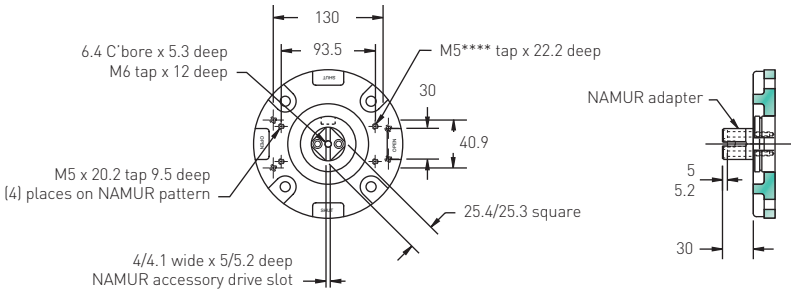
MORIN B AND C SERIES ACTUATORS

MOUNTING DETAILS

MODELS 370, 575, 740, 944, 945 AND 1150 - BOTTOM OF HOUSING ISO 5211-F30



MODELS 370, 575, 740, 944, 945 AND 1150 - TOP OF HOUSING - MOUNTING DETAILS



IMPERIAL THREAD OPTION

Standard tap	Model number
* 3/4 - 10 UNC	370 and 575 to 1150
**** 10 - 32 UNC	135 to 1150

Replace 'M' with 'U' in order number designation
[refer to page 12].

MORIN B AND C SERIES ACTUATORS

ORDERING INFORMATION

SELECTION GUIDE

Actuator model									
B-									
C-									
	Actuator size Model code based on approximate torque of symmetrical double acting at 5.5 barg								
270	006	059	370						
	012	072	420						
	015	100	575						
	023	135	740						
	036	210	944						
	046	270	945						
	050	344	1150						
	058	345							
	Interface bolting								
	U -	UNC mounting threads							
	M -	Metric mounting threads							
	Yoke design								
		[blank] - Symmetrical yoke							
	C -	Canted yoke							
	Function								
		D - Double acting							
		S - Spring return							
	Spring code								
	00	00 - No spring - Double acting							
		04 - 40 pound spring							
		05 - 50 pound spring							
		06 - 60 pound spring							
		Etc. see Morin Torque Book for available springs							
	Spring return failure rotation								
	0 -	No spring (double acting OR actuator rotates clockwise on loss of air)							
	1 -	Actuator rotates counterclockwise on loss of air							
	Option								
		[blank] - No options [standard configuration]							
		See complete modules code listing							
		Note: Some codes can be used in combination. Indicate by "stacking" separated by "-".							
		Consult factory for possible combinations combinations.							
B-	270	U	C	-	D	00	0	-	JSO = Model number S-270UC-D000-JSO

HOW TO ORDER

1. Double acting (symmetrical yoke) example	2. Spring return (symmetrical yoke) example	3. Double acting (canted yoke) example
Air supply: 5.5 barg Break/end torque: 2610 Nm	Air supply: 5.5 barg End torque: 914Nm	Air supply: 5.5 barg Break (CCW) torque: 3524 Nm End (CW) torque: 3393 Nm
B-210U-D000	B-210U-S080	B-210UC-D000
B Series	B Series	B Series
210 Model number	210 Model number	210 Model number
U UNC mounting threads	U UNC mounting threads	U UNC mounting threads
D Double acting	S Spring return	C Canted yoke
000 No spring	080 Spring set	D Double acting
		000 No spring

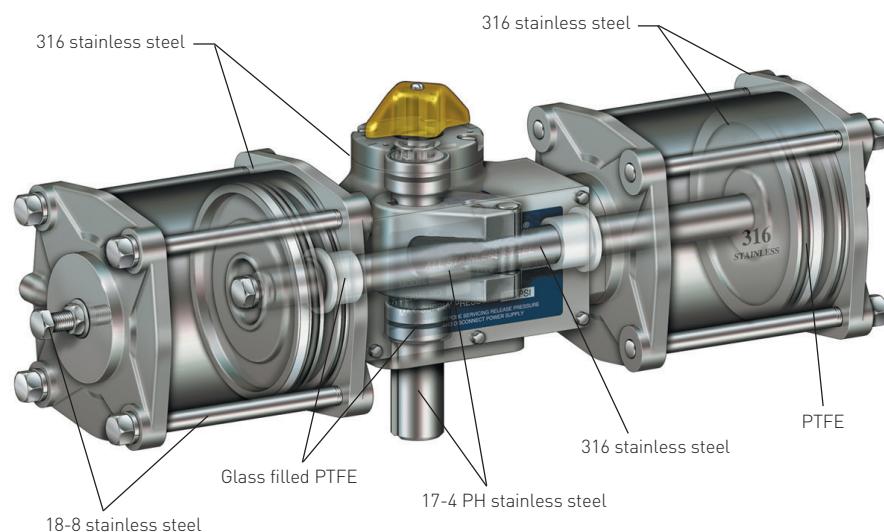
4. For all spring return models

Use required torque to determine spring set code (see torque chart)
 All spring sets ending with '0' fail clockwise (40, 50, 60, etc.)
 All spring sets ending with '1' fail counterclockwise (41, 51, 61, etc.)
 All symmetrical yoke models between 006 and 100 may be mounted to fail clockwise or counterclockwise by 'flipping' along the longitudinal axis

MORIN B AND C SERIES ACTUATORS

ALSO AVAILABLE

THE S SERIES ACTUATOR (ALL STAINLESS)



Setting an unrivaled standard in actuation at a price unexpectedly low for stainless steel.

- Up to 11 barg max operating pressure (see torque chart).
- Double acting break torques to 27120 Nm.
- Spring end torques to 11766 Nm.

For additional information, refer to S series data sheet.

THE HP SERIES ACTUATOR



High pressure actuation with carbon steel cylinders for superior corrosion resistance.

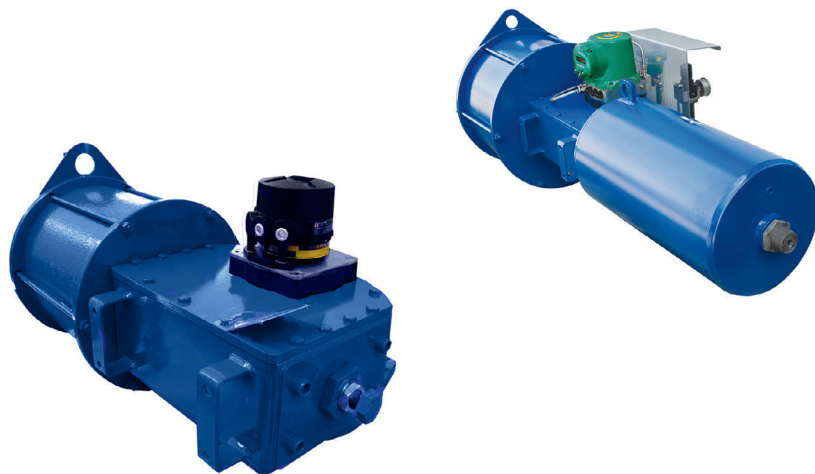
- Up to 155 bar max operating pressure (see torque chart).
- Double acting torques to 90400 Nm.
- Spring end torques to 45200 Nm.

For additional information, refer to HP series data sheet.

MORIN ALGA/ALGAS PNEUMATIC ACTUATORS

SCOTCH YOKE DESIGN

Double acting and spring return pneumatic quarter turn actuators for on-off and modulating control of valves in heavy duty service. Available for output torques to 750,000 Nm.



GENERAL APPLICATION

ALGA and ALGAS pneumatic actuators are designed for on-off or modulating control of quarter turn ball, butterfly, plug or damper style valves.

TECHNICAL DATA

Design pressure:	12 bar g
Supply medium:	Air, nitrogen or sweet gas (Sour gas version available)
Output torque	
ALGA:	Double acting torque up to 750,000 Nm
ALGAS/ALGAS-QA:	Spring starting torque up to 335,000 Nm
	Spring end torque up to 235,000 Nm
Ambient temperature	
Standard range:	-20°C to +100°C (-20°F to +210°F)
Extended temperature:	-60°C to +135°C (-70°F to +275°F)

FEATURES

- Totally enclosed, weatherproof housing in fabricated carbon steel for maximum strength.
- Guide bar resists transverse loads and supports the piston rod.
- Hard chromium plated alloy steel material guarantees corrosion protection and minimal friction.
- PTFE-impregnated bronze or sintered bronze bushings provide minimal friction and extended service life.
- Scotch yoke design with canted or symmetric torque arm allows close working to distinctive valve torque profiles.
- External travel stops for precise angular stroke adjustment between 82° and 98°.
- Electroless nickel plated and polished cylinder provides maximum corrosion resistance and reduces friction.
- Floating type piston seals provide low hysteresis and high sensitivity, preventing sticking problems.
- ALGAS spring return pack incorporates up to four springs, fully encapsulated in a factory welded cartridge ensuring personnel safety and simplifying assembly.
- ALGAS spring action can be changed easily in the field from to close to open or vice versa.
- Special coatings for offshore or corrosive environments.

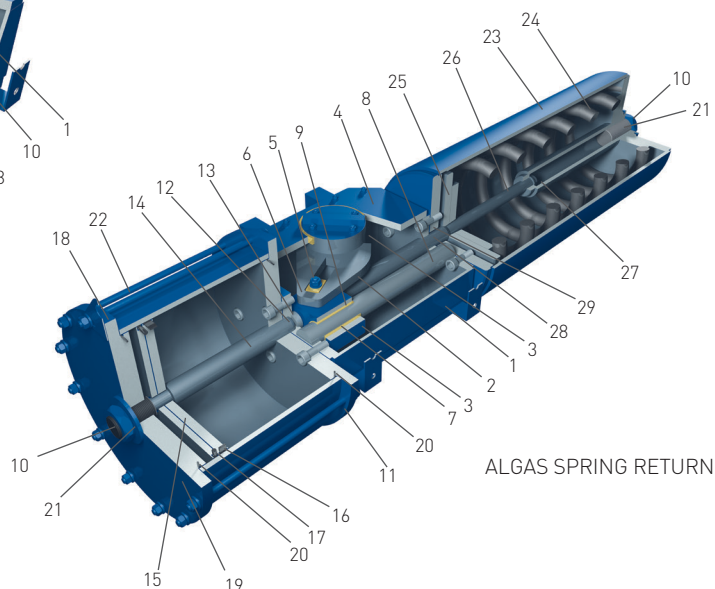
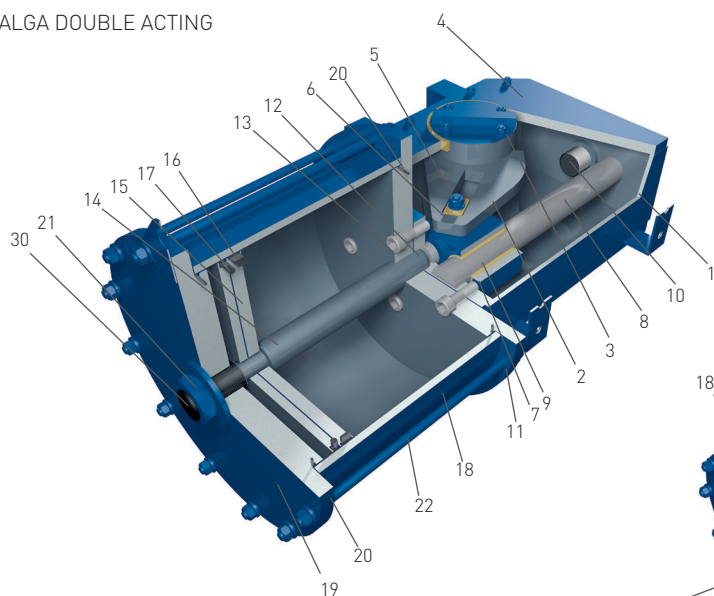
APPROVALS

Safety Integrity Level:
(IEC 61508-1÷7:2010): SIL 3
Area Classification:
(ATEX): II 2G 135° T4
Enclosure standards:
(IEC 60529): IP66, IP66M, IP67M
(ANSI/NEMA 250): NEMA 4, 4X, 6
Pressure Equipment Directive:
2014/68/EU
Machinery Directive:
2006/42/EC

MORIN ALGA / ALGAS PNEUMATIC ACTUATORS

SCOTCH YOKE DESIGN

ALGA DOUBLE ACTING



ALGAS SPRING RETURN

MATERIALS

Part	Material
1 Housing	Carbon steel
2 Yoke	Carbon steel
3 Yoke bushing	Bronze
4 Cover	Carbon steel
5 Guide block pin	Alloy steel
6 Sliding block	Bronze
7 Guide block	Carbon steel
8 Guide bar	Alloy steel (hard chrome plated)
9 Guide block bushing	Steel + bronze + PTFE
10 Travel stop screw	Carbon steel
11 Cylinder head flange	Carbon steel
12 Piston rod bushing	Steel + bronze + PTFE
13 Piston rod seal	NBR rubber
14 Piston rod	Alloy steel (hard chrome plated)
15 Piston	Carbon steel
16 Piston guide sliding ring	PTFE + graphite
17 Piston seal O-ring	NBR rubber
18 Cylinder tube	Carbon steel (ENP)
19 Cylinder end flange	Carbon steel
20 Cylinder seal O-ring	NBR rubber
21 Sealing washer	PVC
22 Tie rod	Alloy steel
23 Spring container	Carbon steel
24 Spring	Carbon steel
25 Spring thrust flange	Carbon steel
26 Guide rod	Alloy steel (hard chrome plated)
27 Guide rod bushing	Steel + bronze + PTFE
28 Container rod	Alloy steel (hard chrome plated)
29 Container rod bushing	Steel + bronze + PTFE
30 Travel stop screw	Carbon steel

Mounting brackets and tie rods available in stainless steel as an option.

Fluoroelastomer and fluorosilicone seals available as an option.

MORIN ALGA DOUBLE ACTING PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, MODELS 1.5C-280 TO 6C-585

		Operating supply pressure (bar g)												MOP* (bar g)
		3.5		4		4.5		5		5.5		6		
Model	Position	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	
1.5C-280	0°	4556	4950	5228	5680	5900	6411	6572	7142	7244	7872	7916	8603	10.3
	45°	1781	1744	2043	2002	2306	2259	2569	2517	2831	2774	3094	3032	
	90°	2568	2416	2947	2773	3325	3130	3704	3487	4083	3843	4462	4200	
1.5C-335	0°	6541	7153	7503	8205	8465	9258	9427	10310	10389	11363	11351	12415	7.2
	45°	2557	2521	2933	2892	3309	3263	3685	3634	4061	4005	4437	4376	
	90°	3687	3492	4229	4006	4771	4520	5313	5034	5856	5547	6398	6061	
1.5C-385	0°	8691	9538	9961	10933	11232	12328	12502	13723	-	-	-	-	5.4
	45°	3397	3362	3893	3853	4390	4345	4887	4837	-	-	-	-	
	90°	4898	4657	5614	5338	6330	6019	7047	6700	-	-	-	-	
3C-335	0°	10827	11840	12420	13582	14012	15324	15604	17066	17197	18807	18789	20549	8.7
	45°	4232	4173	4854	4787	5477	5401	6099	6015	6722	6629	7344	7243	
	90°	6102	5780	7000	6631	7897	7481	8795	8332	9692	9182	10590	10033	
3C-385	0°	14385	15788	16488	18097	18591	20405	20694	22714	22797	25023	24900	27332	6.5
	45°	5623	5564	6445	6378	7267	7192	8089	8006	8911	8820	9733	9633	
	90°	8108	7708	9293	8835	10478	9963	11664	11090	12849	12217	14035	13344	
3C-435	0°	18418	20263	21102	23218	23787	26172	26472	29127	-	-	-	-	5.1
	45°	7199	7142	8248	8183	9298	9225	10347	10266	-	-	-	-	
	90°	10381	9893	11894	11336	13407	12778	14920	14221	-	-	-	-	
3C-485	0°	22962	25306	26299	28985	-	-	-	-	-	-	-	-	4.1
	45°	8975	8919	10280	10216	-	-	-	-	-	-	-	-	
	90°	12942	12355	14823	14151	-	-	-	-	-	-	-	-	
6C-485	0°	26844	29586	30746	33886	34648	38187	38550	42488	42452	46789	46354	51090	7
	45°	10493	10428	12018	11944	13543	13459	15069	14975	16594	16491	18119	18007	
	90°	15130	14445	17330	16545	19529	18644	21728	20744	23927	22844	26127	24944	
6C-535	0°	32760	36150	37508	41390	42255	46630	47003	51869	51751	57109	-	-	5.7
	45°	12805	12742	14661	14588	16517	16435	18373	18282	20229	20129	-	-	
	90°	18464	17650	21140	20208	23817	22766	26493	25325	29169	27883	-	-	
6C-585	0°	39169	43264	44846	49534	50523	55805	-	-	-	-	-	-	4.8
	45°	15311	15249	17530	17459	19749	19669	-	-	-	-	-	-	
	90°	22077	21123	25277	24184	28476	27246	-	-	-	-	-	-	

* MOP = Maximum Operating Pressure (bar g)

MORIN ALGA DOUBLE ACTING PNEUMATIC ACTUATOR
 OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, MODELS 1.5C-280 TO 6C-585

		Operating supply pressure (bar g)												MOP* (bar g)
		7		8		9		10		11		12		
Model	Position	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	
1.5C-280	0°	9261	10064	10605	11526	11949	12987	13293	14448	-	-	-	-	10.3
	45°	3620	3547	4145	4062	4670	4577	5196	5092	-	-	-	-	
	90°	5219	4914	5977	5627	6735	6340	7492	7054	-	-	-	-	
1.5C-335	0°	13275	14520	-	-	-	-	-	-	-	-	-	-	7.2
	45°	5189	5117	-	-	-	-	-	-	-	-	-	-	
	90°	7482	7089	-	-	-	-	-	-	-	-	-	-	
1.5C-385	0°	-	-	-	-	-	-	-	-	-	-	-	-	5.4
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	
3C-335	0°	21973	24033	25158	27517	-	-	-	-	-	-	-	-	8.7
	45°	8589	8471	9834	9699	-	-	-	-	-	-	-	-	
	90°	12385	11734	14180	13435	-	-	-	-	-	-	-	-	
3C-385	0°	-	-	-	-	-	-	-	-	-	-	-	-	6.5
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	
3C-435	0°	-	-	-	-	-	-	-	-	-	-	-	-	5.1
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	
3C-485	0°	-	-	-	-	-	-	-	-	-	-	-	-	4.1
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	
6C-485	0°	54158	59691	-	-	-	-	-	-	-	-	-	-	7
	45°	21169	21039	-	-	-	-	-	-	-	-	-	-	
	90°	30525	29144	-	-	-	-	-	-	-	-	-	-	
6C-535	0°	-	-	-	-	-	-	-	-	-	-	-	-	5.7
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	
6C-585	0°	-	-	-	-	-	-	-	-	-	-	-	-	4.8
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	

* MOP = Maximum Operating Pressure (bar g)

MORIN ALGA DOUBLE ACTING PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, MODELS 14C-635 TO 18C2-685

		Operating supply pressure (bar g)												MOP* (bar g)
		3.5		4		4.5		5		5.5		6		
Model	Position	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	
14C-635	0°	50441	55473	57752	63513	65062	71554	72373	79594	79683	87635	86994	95676	7.5
	45°	19717	19552	22574	22386	25432	25220	28290	28054	31147	30888	34005	33722	
	90°	28430	27084	32551	31010	36671	34935	40792	38861	44912	42787	49033	46713	
14C-735	0°	67580	74492	77374	85290	87168	96087	96962	106884	106757	117681	-	-	5.6
	45°	26416	26256	30244	30062	34073	33867	37901	37673	41730	41478	-	-	
	90°	38090	36370	43611	41642	49131	46913	54651	52185	60172	57456	-	-	
18C-635	0°	58008	63794	66415	73040	74822	82287	83229	91534	91636	100780	100043	110027	9.7
	45°	22674	22485	25961	25744	29247	29003	32533	32262	35819	35522	39105	38781	
	90°	32695	31146	37434	35661	42172	40176	46911	44690	51649	49205	56388	53720	
18C-685	0°	67503	74331	77286	85105	87069	95879	96852	106652	106635	117426	116418	128200	8.4
	45°	26386	26199	30210	29996	34034	33794	37858	37591	41682	41389	45506	45186	
	90°	38047	36291	43561	41551	49075	46812	54589	52072	60103	57332	65617	62592	
18C-735	0°	77717	85666	88980	98083	100243	110500	111507	122916	122770	135333	134033	147750	7.2
	45°	30378	30194	34781	34571	39184	38947	43587	43324	47989	47700	52392	52077	
	90°	43804	41826	50152	47888	56501	53950	62849	60013	69198	66075	75546	72137	
18C2-635	0°	115491	128171	132230	146747	148968	165324	-	-	-	-	-	-	4.8
	45°	45144	45176	51687	51723	58230	58271	-	-	-	-	-	-	
	90°	65095	62578	74529	71648	83964	80718	-	-	-	-	-	-	
18C2-685	0°	134480	149245	153971	170876	-	-	-	-	-	-	-	-	4.2
	45°	52567	52604	60186	60228	-	-	-	-	-	-	-	-	
	90°	75798	72867	86784	83429	-	-	-	-	-	-	-	-	

* MOP = Maximum Operating Pressure (bar g)

		Operating supply pressure (bar g)										MOP* (bar g)		
		7		8		9		10		11			12	
Model	Position	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	
14C-635	0°	101614	111757	-	-	-	-	-	-	-	-	-	-	7.5
	45°	39720	39390	-	-	-	-	-	-	-	-	-	-	
	90°	57273	54564	-	-	-	-	-	-	-	-	-	-	
14C-735	0°	-	-	-	-	-	-	-	-	-	-	-	-	5.6
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	
18C-635	0°	116857	128521	133671	147014	150485	165507	-	-	-	-	-	-	9.7
	45°	45678	45299	52250	51817	58823	58336	-	-	-	-	-	-	
	90°	65865	62749	75342	71778	84819	80807	-	-	-	-	-	-	
18C-685	0°	135984	149748	155550	171296	-	-	-	-	-	-	-	-	8.4
	45°	53155	52781	60803	60376	-	-	-	-	-	-	-	-	
	90°	76645	73113	87674	83633	-	-	-	-	-	-	-	-	
18C-735	0°	156560	172583	-	-	-	-	-	-	-	-	-	-	7.2
	45°	61198	60830	-	-	-	-	-	-	-	-	-	-	
	90°	88243	84262	-	-	-	-	-	-	-	-	-	-	
18C2-635	0°	-	-	-	-	-	-	-	-	-	-	-	-	4.8
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	
18C2-685	0°	-	-	-	-	-	-	-	-	-	-	-	-	4.2
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	

* MOP = Maximum Operating Pressure (bar g)

MORIN ALGA DOUBLE ACTING PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, MODELS 1.5S-280 TO 6S-585

		Operating supply pressure (bar g)														MOP* (bar g)
		3		3.5		4		4.5		5		5.5		6		
Model	Pos.	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	
1.5S-280	0°	2645	2901	3102	3404	3560	3906	4017	4409	4475	4911	4933	5413	5390	5916	12.0
	45°	1547	1510	1815	1772	2082	2034	2350	2295	2618	2557	2885	2818	3153	3080	
	90°	2551	2271	2993	2664	3434	3058	3876	3451	4317	3844	4759	4238	5200	4631	
1.5S-335	0°	3799	4195	4454	4919	5109	5642	5764	6366	6419	7090	7074	7814	7729	8537	10.4
	45°	2222	2184	2605	2561	2989	2938	3372	3314	3755	3691	4138	4068	4521	4445	
	90°	3665	3284	4297	3850	4929	4417	5561	4984	6193	5550	6825	6117	7457	6683	
1.5S-385	0°	5052	5600	5917	6559	6783	7518	7648	8477	8513	9437	9378	10396	10243	11355	7.9
	45°	2955	2915	3461	3415	3968	3914	4474	4414	4980	4913	5486	5412	5992	5912	
	90°	4874	4384	5709	5135	6544	5885	7378	6636	8213	7387	9048	8138	9883	8889	
3S-335	0°	6206	6853	7276	8035	8346	9218	9416	10400	10486	11582	11556	12764	12627	13947	12.0
	45°	3680	3619	4314	4244	4949	4868	5584	5492	6218	6117	6853	6741	7487	7366	
	90°	6160	5520	7223	6472	8285	7424	9347	8376	10409	9329	11471	10281	12534	11233	
3S-385	0°	8253	9148	9667	10715	11080	12282	12494	13849	13907	15416	15320	16983	16734	18550	9.6
	45°	4894	4831	5732	5659	6570	6486	7408	7314	8247	8142	9085	8969	9923	9797	
	90°	8193	7368	9596	8630	10999	9892	12402	11154	13805	12417	15208	13679	16611	14941	
3S-435	0°	10573	11747	12377	13753	14181	15758	15986	17763	17790	19768	19594	21773	21398	23778	7.5
	45°	6269	6204	7339	7263	8409	8322	9479	9381	10549	10440	11619	11499	12689	12558	
	90°	10495	9462	12286	11077	14077	12692	15868	14307	17659	15922	19450	17537	21241	19152	
3S-485	0°	13188	14678	15431	17175	17674	19672	19917	22169	22160	24666	24402	27162	26645	29659	6.0
	45°	7820	7752	9150	9071	10480	10389	11810	11708	13140	13027	14470	14345	15800	15664	
	90°	13091	11822	15317	13833	17544	15844	19770	17855	21997	19866	24223	21877	26449	23888	
6S-485	0°	15390	17130	18008	20044	20625	22958	23243	25871	25860	28785	28478	31699	31095	34613	10.3
	45°	9143	9064	10698	10606	12253	12148	13808	13690	15363	15232	16918	16774	18473	18316	
	90°	15336	13850	17944	16206	20553	18562	23161	20918	25769	23274	28377	25630	30986	27985	
6S-535	0°	18791	20941	21976	24491	25161	28041	28346	31591	31531	35141	34716	38691	37901	42240	8.5
	45°	11163	11081	13055	12960	14948	14838	16840	16717	18732	18595	20624	20474	22516	22352	
	90°	18725	16932	21899	19802	25072	22672	28246	25542	31420	28413	34594	31283	37767	34153	
6S-585	0°	22468	25062	26276	29310	30084	33559	33892	37807	37700	42055	41509	46303	45317	50552	7.1
	45°	13347	13262	15610	15510	17872	17758	20135	20006	22397	22254	24659	24502	26922	26750	
	90°	22388	20264	26183	23698	29978	27133	33773	30568	37567	34003	41362	37438	45157	40873	

* MOP = Maximum Operating Pressure (bar g)

MORIN ALGA DOUBLE ACTING PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, MODELS 1.5S-280 TO 6S-585

		Operating supply pressure (bar g)												MOP* (bar g)
		7		8		9		10		11		12		
Model	Position	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	
1.5S-280	0°	6305	6921	7221	7926	8136	8930	9051	9935	9966	10940	10882	11945	12.0
	45°	3689	3603	4224	4126	4759	4649	5295	5173	5830	5696	6366	6219	
	90°	6083	5418	6966	6204	7850	6991	8733	7778	9616	8564	10499	9351	
1.5S-335	0°	9039	9985	10349	11432	11659	12880	12970	14327	-	-	-	-	10.4
	45°	5288	5198	6054	5952	6821	6706	7587	7459	-	-	-	-	
	90°	8721	7816	9985	8949	11249	10083	12513	11216	-	-	-	-	
1.5S-385	0°	11974	13274	-	-	-	-	-	-	-	-	-	-	7.9
	45°	7004	6911	-	-	-	-	-	-	-	-	-	-	
	90°	11552	10391	-	-	-	-	-	-	-	-	-	-	
3S-335	0°	14767	16311	16907	18676	19047	21040	21187	23405	23327	25769	25468	28134	12.0
	45°	8756	8614	10025	9863	11295	11112	12564	12361	13833	13610	15102	14859	
	90°	14658	13138	16783	15042	18907	16947	21031	18851	23156	20755	25280	22660	
3S-385	0°	19560	21684	22387	24818	25214	27952	-	-	-	-	-	-	9.6
	45°	11599	11452	13275	13107	14951	14762	-	-	-	-	-	-	
	90°	19417	17465	22222	19989	25028	22513	-	-	-	-	-	-	
3S-435	0°	25007	27789	-	-	-	-	-	-	-	-	-	-	7.5
	45°	14829	14676	-	-	-	-	-	-	-	-	-	-	
	90°	24823	22382	-	-	-	-	-	-	-	-	-	-	
3S-485	0°	-	-	-	-	-	-	-	-	-	-	-	-	6.0
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	
6S-485	0°	36331	40440	41566	46268	46801	52095	52036	57923	-	-	-	-	10.3
	45°	21583	21399	24693	24483	27803	27567	30913	30650	-	-	-	-	
	90°	36202	32697	41419	37409	46635	42121	51852	46832	-	-	-	-	
6S-535	0°	44271	49340	50641	56440	-	-	-	-	-	-	-	-	8.5
	45°	26301	26109	30085	29866	-	-	-	-	-	-	-	-	
	90°	44115	39893	50462	45633	-	-	-	-	-	-	-	-	
6S-585	0°	52933	59048	-	-	-	-	-	-	-	-	-	-	7.1
	45°	31446	31246	-	-	-	-	-	-	-	-	-	-	
	90°	52746	47743	-	-	-	-	-	-	-	-	-	-	

* MOP = Maximum Operating Pressure (bar g)

MORIN ALGA DOUBLE ACTING PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, MODELS 14S-635 TO 18S2-685

		Operating supply pressure (bar g)														MOP* (bar g)
		3		3.5		4		4.5		5		5.5		6		
Model	Pos.	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	
14S-635	0°	29368	32617	34346	38146	39324	43676	44301	49205	49279	54734	54257	60263	59234	65793	10.9
	45°	17180	16982	20092	19861	23004	22740	25916	25619	28828	28497	31740	31376	34652	34255	
	90°	28334	25534	33137	29862	37939	34191	42742	38519	47544	42848	52347	47176	57149	51505	
14S-735	0°	39346	43801	46015	51226	52684	58650	59353	66075	66022	73500	72691	80925	79360	88350	8.1
	45°	23018	22805	26919	26671	30820	30536	34722	34402	38623	38268	42524	42134	46426	46000	
	90°	37961	34289	44396	40101	50830	45914	57264	51726	63698	57539	70132	63351	76567	69163	
18S-635	0°	33764	37499	39487	43856	45209	50213	50932	56570	56655	62926	62378	69283	68100	75640	12.0
	45°	19758	19530	23107	22841	26455	26152	29804	29462	33153	32773	36502	36084	39851	39395	
	90°	32595	29374	38120	34353	43645	39333	49170	44312	54694	49292	60219	54271	65744	59251	
18S-685	0°	39290	43693	45950	51100	52609	58507	59269	65913	65928	73320	72588	80727	79247	88133	12.0
	45°	22992	22756	26889	26614	30786	30471	34683	34329	38580	38186	42477	42044	46374	45901	
	90°	37931	34226	44360	40028	50789	45830	57218	51631	63647	57433	70076	63235	76505	69037	
18S-735	0°	45236	50357	52903	58893	60570	67429	68237	75965	75904	84501	83571	93037	91238	101573	10.5
	45°	26471	26227	30957	30672	35444	35118	39931	39564	44417	44010	48904	48455	53391	52901	
	90°	43670	39446	51072	46132	58474	52819	65876	59505	73278	66192	80679	72878	88081	79565	
18S2-635	0°	67222	75342	78616	88113	90010	100884	101405	113655	112799	126426	124194	139197	135588	151968	7.0
	45°	39336	39240	46004	45891	52672	52542	59340	59194	66008	65845	72675	72496	79343	79148	
	90°	64895	59017	75896	69021	86896	79025	97896	89029	108896	99032	119896	109036	130896	119040	
18S2-685	0°	78275	87731	91543	102601	104810	117472	118078	132343	131346	147213	144614	162084	157882	176954	6.1
	45°	45804	45692	53569	53437	61333	61182	69097	68926	76861	76671	84625	84416	92389	92161	
	90°	75566	68721	88375	80370	101184	92019	113992	103667	126801	115316	139610	126964	152419	138613	

* MOP = Maximum Operating Pressure (bar g)

		Operating supply pressure (bar g)												MOP* (bar g)
		7		8		9		10		11		12		
Model	Position	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	OP	CL	
14S-635	0°	69190	76851	79145	87910	89101	98968	99056	110027	-	-	-	-	10.9
	45°	40476	40013	46300	45770	52124	51528	57948	57286	-	-	-	-	
	90°	66754	60162	76359	68819	85964	77476	95569	86133	-	-	-	-	
14S-735	0°	92698	103199	106036	118049	-	-	-	-	-	-	-	-	8.1
	45°	54229	53731	62031	61463	-	-	-	-	-	-	-	-	
	90°	89435	80788	102303	92413	-	-	-	-	-	-	-	-	
18S-635	0°	79546	88354	90991	101067	102437	113781	113883	126495	125328	139208	136774	151922	12.0
	45°	46548	46016	53246	52638	59944	59259	66641	65881	73339	72502	80037	79124	
	90°	76793	69210	87843	79168	98892	89127	109942	99086	120991	109045	132041	119004	
18S-685	0°	92566	102947	105885	117760	119204	132574	132523	147387	145842	162200	159161	177014	12.0
	45°	54168	53617	61962	61332	69755	69047	77549	76762	85343	84477	93137	92192	
	90°	89363	80641	102221	92244	115079	103848	127937	115452	140795	127055	153653	138659	
18S-735	0°	106573	118645	121907	135718	137241	152790	152576	169862	-	-	-	-	10.5
	45°	62364	61793	71337	70684	80310	79576	89284	88467	-	-	-	-	
	90°	102885	92938	117689	106311	132492	119684	147296	133057	-	-	-	-	
18S2-635	0°	158377	177510	-	-	-	-	-	-	-	-	-	-	7.0
	45°	92679	92450	-	-	-	-	-	-	-	-	-	-	
	90°	152897	139048	-	-	-	-	-	-	-	-	-	-	
18S2-685	0°	-	-	-	-	-	-	-	-	-	-	-	-	6.1
	45°	-	-	-	-	-	-	-	-	-	-	-	-	
	90°	-	-	-	-	-	-	-	-	-	-	-	-	

* MOP = Maximum Operating Pressure (bar g)

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO CLOSE. MODELS 1.5C-1100-385-CL TO 1.5C-1200-585-CL

					Operating supply pressure (bar g)											
					3			3.5			4			4.5		
Model	MOP (bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5C-1100-385-CL	8.0	5705	3194	5167	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1100-435-CL	6.3	5692	3184	5141	-	-	-	-	-	-	7.378	848	848	9.000	1.762	1.762
1.5C-1100-485-CL	5.1	5684	3178	5124	6.485	344	344	8.501	1.481	1.481	10.517	2.496	2.617	12.534	3.329	3.754
1.5C-1100-535-CL	4.2	5682	3177	5121	9.104	1.821	1.821	11.558	2.930	3.204	14.012	3.926	4.587	-	-	-
1.5C-1100-585-CL	3.0	5656	3157	5067	11.937	3.086	3.417	14.870	4.270	5.071	-	-	-	-	-	-
1.5C-1200-385-CL	8.8	6617	3887	7096	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1200-435-CL	6.9	6604	3877	7069	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1200-485-CL	5.5	6596	3871	7053	-	-	-	6.580	429	429	8.597	1.566	1.566	10.613	2.554	2.702
1.5C-1200-535-CL	4.5	6594	3870	7049	7.184	769	769	9.637	2.131	2.152	12.091	3.166	3.535	14.544	4.155	4.918
1.5C-1200-585-CL	3.0	6568	3850	6996	10.016	2.299	2.365	12.950	3.514	4.019	-	-	-	-	-	-

					Operating supply pressure (bar g)											
					5			5.5			6			7		
Model	MOP (bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5C-1100-385-CL	8.0	5705	3194	5167	7131	709	709	8402	1425	1425	9672	2126	2141	12214	3199	3573
1.5C-1100-435-CL	6.3	5692	3184	5141	10622	2540	2676	12244	3212	3590	13866	3867	4505	-	-	-
1.5C-1100-485-CL	5.1	5684	3178	5124	14550	4142	4890	-	-	-	-	-	-	-	-	-
1.5C-1100-535-CL	4.2	5682	3177	5121	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1100-585-CL	3.0	5656	3157	5067	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1200-385-CL	8.8	6617	3887	7096	-	-	-	-	-	-	7752	1089	1089	10293	2418	2522
1.5C-1200-435-CL	6.9	6604	3877	7069	8701	1624	1624	10323	2432	2539	11945	3106	3453	-	-	-
1.5C-1200-485-CL	5.5	6596	3871	7053	12630	3385	3839	14646	4195	4975	-	-	-	-	-	-
1.5C-1200-535-CL	4.5	6594	3870	7049	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1200-585-CL	3.0	6568	3850	6996	-	-	-	-	-	-	-	-	-	-	-	-

MOP (bar g)					Operating supply pressure (bar g)								
					9			10			12		
Model		BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5C-1100-385-CL	8.0	5705	3194	5167	-	-	-	-	-	-	-	-	-
1.5C-1100-435-CL	6.3	5692	3184	5141	-	-	-	-	-	-	-	-	-
1.5C-1100-485-CL	5.1	5684	3178	5124	-	-	-	-	-	-	-	-	-
1.5C-1100-535-CL	4.2	5682	3177	5121	-	-	-	-	-	-	-	-	-
1.5C-1100-585-CL	3.0	5656	3157	5067	-	-	-	-	-	-	-	-	-
1.5C-1200-385-CL	8.8	6617	3887	7096	-	-	-	-	-	-	-	-	-
1.5C-1200-435-CL	6.9	6604	3877	7069	-	-	-	-	-	-	-	-	-
1.5C-1200-485-CL	5.5	6596	3871	7053	-	-	-	-	-	-	-	-	-
1.5C-1200-535-CL	4.5	6594	3870	7049	-	-	-	-	-	-	-	-	-
1.5C-1200-585-CL	3.0	6568	3850	6996	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO CLOSE. MODELS 3C-2000-385-CL TO 14C-8300-935-CL

Model	MOP (bar g)	Operating supply pressure (bar g)														
		BTC	RTC	ETC	3			3.5			4			4.5		
					BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
3C-2000-385-CL	9.9	9735	5856	11307	-	-	-	-	-	-	-	-	-	-	-	-
3C-2000-435-CL	7.8	9713	5840	11264	-	-	-	-	-	-	-	-	-	12153	2466	2466
3C-2000-485-CL	6.2	9700	5830	11236	-	-	-	11328	2001	2001	14665	3615	3882	18003	4977	5763
3C-2000-535-CL	5.1	9697	5828	11230	12326	2564	2564	16387	4324	4853	20449	5956	7142	24510	7568	9431
3C-2000-585-CL	4.3	9654	5796	11142	17014	4578	5206	21870	6522	7943	26726	8443	10680	-	-	-
6C-2500-485-CL	9.9	13894	8477	16899	-	-	-	-	-	-	-	-	-	17299	3838	3880
6C-2500-535-CL	8.1	13891	8474	16892	-	-	-	15411	2816	2816	20159	5058	5492	24907	6986	8168
6C-2500-585-CL	6.8	13840	8437	16789	16144	3229	3229	21821	5740	6428	27497	8022	9628	33174	10273	12828
6C-2500-635-CL	5.8	13785	8396	16677	22114	5859	6594	28802	8541	10364	35491	11188	14134	42180	13823	17904
6C-2500-735-CL	4.3	13662	8305	16425	35522	11200	14151	44483	14727	19202	53444	18245	24253	-	-	-
6C-3800-535-CL	9.0	18816	11838	25340	-	-	-	-	-	-	-	-	-	16493	2592	2592
6C-3800-585-CL	7.6	18766	11801	25237	-	-	-	13407	853	853	19084	4053	4053	24761	6490	7252
6C-3800-635-CL	6.4	18711	11761	25125	13700	1018	1018	20389	4663	4788	27078	7429	8558	33766	10101	12328
6C-3800-735-CL	4.8	18588	11671	24872	27108	7442	8575	36070	11014	13626	45031	14550	18677	53992	18073	23728
14C-5100-635-CL	10.3	22483	14170	30454	-	-	-	19303	2959	2959	26614	6581	7079	33924	9554	11200
14C-5100-735-CL	7.7	22348	14071	30178	26647	6595	7098	36442	10561	12619	46236	14444	18139	56030	18304	23660
14C-5100-785-CL	6.8	22274	14017	30025	34777	9895	11680	45949	14330	17977	57121	18733	24274	68293	23121	30571
14C-5100-835-CL	6.0	22194	13959	29862	43441	13340	16564	56082	18324	23689	68722	23289	30813	81363	28245	37938
14C-5100-885-CL	5.3	22110	13897	29689	52640	16969	21749	66840	22551	29752	81040	28118	37756	95240	33680	45759
14C-5100-935-CL	4.8	22020	13832	29506	62374	20796	27235	78224	27014	36169	94073	33224	45102	109923	39429	54036
14C-5400-635-CL	10.8	29197	17959	36493	-	-	-	-	-	-	-	-	-	-	-	-
14C-5400-735-CL	8.6	29062	17861	36217	-	-	-	30427	5312	5312	40221	10021	10832	50016	14004	16353
14C-5400-785-CL	7.0	28988	17806	36064	28762	4374	4374	39934	9902	10671	51107	14442	16968	62279	18889	23265
14C-5400-835-CL	6.2	28908	17748	35901	37427	8847	9257	50067	14024	16382	62708	19059	23507	75348	24052	30631
14C-5400-885-CL	5.5	28824	17686	35728	46626	12639	14442	60826	18313	22446	75025	23924	30449	89225	29512	38453
14C-5400-935-CL	5.0	28734	17620	35545	56360	16538	19928	72209	22815	28862	88059	29053	37795	103909	35277	46729
14C-8300-735-CL	8.4	37471	23145	47494	-	-	-	-	-	-	-	-	-	38785	7003	7003
14C-8300-785-CL	7.5	37396	23091	47341	-	-	-	28704	1321	1321	39876	7618	7618	51048	12812	13915
14C-8300-835-CL	6.7	37317	23032	47178	-	-	-	38836	7032	7032	51477	12990	14157	64118	18116	21282
14C-8300-885-CL	5.9	37232	22971	47005	35395	5093	5093	49595	12209	13096	63795	17986	21100	77994	23639	29103
14C-8300-935-CL	5.3	37143	22905	46822	45129	10310	10579	60979	16855	19512	76828	23177	28446	92678	29442	37379

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO CLOSE. MODELS 3C-2000-385-CL TO 14C-8300-935-CL

Model	MOP (bar g)	Operating supply pressure (bar g)														
		BTC	RTC	ETC	5			5.5			6			7		
					BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
3C-2000-385-CL	9.9	9735	5856	11307	-	-	-	11163	1908	1908	13266	3020	3094	17473	4763	5464
3C-2000-435-CL	7.8	9713	5840	11264	14838	3687	3980	17523	4784	5493	20208	5860	7006	25577	7989	10033
3C-2000-485-CL	6.2	9700	5830	11236	21340	6311	7644	24678	7634	9526	28015	8951	11407	-	-	-
3C-2000-535-CL	5.1	9697	5828	11230	28571	9170	11720	-	-	-	-	-	-	-	-	-
3C-2000-585-CL	4.3	9654	5796	11142	-	-	-	-	-	-	-	-	-	-	-	-
6C-2500-485-CL	9.9	13894	8477	16899	21201	5487	6079	25103	7065	8279	29005	8622	10478	36809	11708	14876
6C-2500-535-CL	8.1	13891	8474	16892	29655	8879	10844	34403	10758	13520	39150	12630	16196	48646	16363	21548
6C-2500-585-CL	6.8	13840	8437	16789	38851	12512	16027	44528	14745	19227	50205	16975	22427	-	-	-
6C-2500-635-CL	5.8	13785	8396	16677	48868	16450	21674	55557	19074	25444	-	-	-	-	-	-
6C-2500-735-CL	4.3	13662	8305	16425	-	-	-	-	-	-	-	-	-	-	-	-
6C-3800-535-CL	9.0	18816	11838	25340	21241	5030	5269	25989	6989	7945	30737	8896	10621	40233	12659	15973
6C-3800-585-CL	7.6	18766	11801	25237	30438	8776	10452	36114	11032	13652	41791	13274	16851	53145	17740	23250
6C-3800-635-CL	6.4	18711	11761	25125	40455	12747	16098	47144	15382	19868	53832	18010	23638	-	-	-
6C-3800-735-CL	4.8	18588	11671	24872	-	-	-	-	-	-	-	-	-	-	-	-
14C-5100-635-CL	10.3	22483	14170	30454	41235	12465	15320	48545	15356	19441	55856	18235	23561	70476	23977	31802
14C-5100-735-CL	7.7	22348	14071	30178	65824	22152	29180	75619	25993	34700	85413	29833	40221	105001	37502	51261
14C-5100-785-CL	6.8	22274	14017	30025	79465	27501	36868	90637	31879	43165	101809	36252	49462	-	-	-
14C-5100-835-CL	6.0	22194	13959	29862	94004	33197	45063	106644	38145	52188	119285	43094	59312	-	-	-
14C-5100-885-CL	5.3	22110	13897	29689	109439	39239	53763	-	-	-	-	-	-	-	-	-
14C-5100-935-CL	4.8	22020	13832	29506	-	-	-	-	-	-	-	-	-	-	-	-
14C-5400-635-CL	10.8	29197	17959	36493	35220	7889	8013	42531	10973	12134	49841	13933	16254	64462	19754	24495
14C-5400-735-CL	8.6	29062	17861	36217	59810	17910	21873	69604	21786	27393	79398	25647	32914	98987	33346	43955
14C-5400-785-CL	7.0	28988	17806	36064	73451	23304	29562	84623	27703	35859	95795	32093	42156	118139	40857	54750
14C-5400-835-CL	6.2	28908	17748	35901	87989	29026	37756	100630	33992	44881	113270	38948	52005	-	-	-
14C-5400-885-CL	5.5	28824	17686	35728	103425	35088	46456	117625	40655	54460	-	-	-	-	-	-
14C-5400-935-CL	5.0	28734	17620	35545	119758	41492	55662	-	-	-	-	-	-	-	-	-
14C-8300-735-CL	8.4	37471	23145	47494	48579	11784	12524	58373	15804	18044	68167	19734	23564	87756	27500	34605
14C-8300-785-CL	7.5	37396	23091	47341	62220	17353	20212	73392	21814	26509	84564	26239	32806	106908	35045	45400
14C-8300-835-CL	6.7	37317	23032	47178	76758	23149	28407	89399	28149	35531	102040	33129	42656	-	-	-
14C-8300-885-CL	5.9	37232	22971	47005	92194	29252	37107	106394	34843	45110	-	-	-	-	-	-
14C-8300-935-CL	5.3	37143	22905	46822	108527	35681	46313	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO CLOSE. MODELS 3C-2000-385-CL TO 14C-8300-985-CL

Model	MOP (bar g)	BTC	RTC	ETC	Operating supply pressure (bar g)								
					9			10			12		
					BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
3C-2000-385-CL	9.9	9735	5856	11307	25885	8111	10206	-	-	-	-	-	-
3C-2000-435-CL	7.8	9713	5840	11264	-	-	-	-	-	-	-	-	-
3C-2000-485-CL	6.2	9700	5830	11236	-	-	-	-	-	-	-	-	-
3C-2000-535-CL	5.1	9697	5828	11230	-	-	-	-	-	-	-	-	-
3C-2000-585-CL	4.3	9654	5796	11142	-	-	-	-	-	-	-	-	-
6C-2500-485-CL	9.9	13894	8477	16899	52416	17842	23673	-	-	-	-	-	-
6C-2500-535-CL	8.1	13891	8474	16892	-	-	-	-	-	-	-	-	-
6C-2500-585-CL	6.8	13840	8437	16789	-	-	-	-	-	-	-	-	-
6C-2500-635-CL	5.8	13785	8396	16677	-	-	-	-	-	-	-	-	-
6C-2500-735-CL	4.3	13662	8305	16425	-	-	-	-	-	-	-	-	-
6C-3800-535-CL	9.0	18816	11838	25340	59224	20127	26677	-	-	-	-	-	-
6C-3800-585-CL	7.6	18766	11801	25237	-	-	-	-	-	-	-	-	-
6C-3800-635-CL	6.4	18711	11761	25125	-	-	-	-	-	-	-	-	-
6C-3800-735-CL	4.8	18588	11671	24872	-	-	-	-	-	-	-	-	-
14C-5100-635-CL	10.3	22483	14170	30454	99718	35434	48284	114339	41157	56525	-	-	-
14C-5100-735-CL	7.7	22348	14071	30178	-	-	-	-	-	-	-	-	-
14C-5100-785-CL	6.8	22274	14017	30025	-	-	-	-	-	-	-	-	-
14C-5100-835-CL	6.0	22194	13959	29862	-	-	-	-	-	-	-	-	-
14C-5100-885-CL	5.3	22110	13897	29689	-	-	-	-	-	-	-	-	-
14C-5100-935-CL	4.8	22020	13832	29506	-	-	-	-	-	-	-	-	-
14C-5400-635-CL	10.8	29197	17959	36493	93704	31271	40977	108325	37009	49218	-	-	-
14C-5400-735-CL	8.6	29062	17861	36217	-	-	-	-	-	-	-	-	-
14C-5400-785-CL	7.0	28988	17806	36064	-	-	-	-	-	-	-	-	-
14C-5400-835-CL	6.2	28908	17748	35901	-	-	-	-	-	-	-	-	-
14C-5400-885-CL	5.5	28824	17686	35728	-	-	-	-	-	-	-	-	-
14C-5400-935-CL	5.0	28734	17620	35545	-	-	-	-	-	-	-	-	-
14C-8300-735-CL	8.4	37471	23145	47494	-	-	-	-	-	-	-	-	-
14C-8300-785-CL	7.5	37396	23091	47341	-	-	-	-	-	-	-	-	-
14C-8300-835-CL	6.7	37317	23032	47178	-	-	-	-	-	-	-	-	-
14C-8300-885-CL	5.9	37232	22971	47005	-	-	-	-	-	-	-	-	-
14C-8300-935-CL	5.3	37143	22905	46822	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO CLOSE. MODELS 18C-9600-835-CL TO 18C-11000-1300-CL

MOP (bar g)BTCRTCETC					Operating supply pressure (bar g)											
					3			3.5			4			4.5		
Model	(bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
18C-9600-835-CL	8.0	60605	35385	63670	-	-	-	-	-	-	-	-	-	-	-	-
18C-9600-935-CL	6.7	60405	35236	63260	-	-	-	60748	3533	3533	78975	13806	13806	97202	23001	24080
18C-9600-1000-CL	5.9	60263	35130	62969	57993	1980	1980	78842	13732	13732	99691	24055	25483	120541	32621	37234
18C-9600-1100-CL	4.9	60026	34953	62483	83825	16540	16540	109053	27943	30759	134281	38146	44979	159508	48188	59198
18C-9600-1200-CL	4.1	59766	34760	61951	112118	29198	32487	142141	41287	49409	172164	53199	66331	-	-	-
18C-9600-1300-CL	3.5	59484	34549	61373	142870	41577	49820	178106	55546	69680	-	-	-	-	-	-
18C-9800-835-CL	9.0	76919	44620	79020	-	-	-	-	-	-	-	-	-	-	-	-
18C-9800-935-CL	7.1	76719	44471	78611	-	-	-	-	-	-	-	-	-	-	-	-
18C-9800-1000-CL	6.2	76577	44366	78320	-	-	-	-	-	-	-	-	-	105253	19444	19444
18C-9800-1100-CL	5.2	76339	44189	77834	-	-	-	93765	12969	12969	118992	26730	27189	144220	37352	41408
18C-9800-1200-CL	4.3	76079	43995	77302	96829	14697	14697	126853	30133	31619	156876	42497	48541	-	-	-
18C-9800-1300-CL	3.0	75797	43784	76723	127582	30443	32030	162818	44896	51890	-	-	-	-	-	-
18C-10500-935-CL	7.3	86028	49417	85409	-	-	-	-	-	-	-	-	-	-	-	-
18C-10500-1000-CL	6.4	85886	49311	85118	-	-	-	-	-	-	-	-	-	-	-	-
18C-10500-1100-CL	5.3	85648	49133	84632	-	-	-	86993	2922	2922	112221	17142	17142	137449	30847	31361
18C-10500-1200-CL	4.4	85388	48939	84100	90058	4650	4650	120081	21572	21572	150105	36292	38494	-	-	-
18C-10500-1300-CL	3.0	85106	48727	83522	120811	21983	21983	156047	38776	41843	-	-	-	-	-	-
18C-11000-935-CL	7.9	96334	57101	106518	-	-	-	-	-	-	-	-	-	-	-	-
18C-11000-1000-CL	6.9	96192	56996	106227	-	-	-	-	-	-	-	-	-	-	-	-
18C-11000-1100-CL	5.7	95954	56820	105741	-	-	-	-	-	-	-	-	-	116427	19512	19512
18C-11000-1200-CL	4.8	95694	56627	105209	-	-	-	99059	9723	9723	129082	26645	26645	159105	40044	43567
18C-11000-1300-CL	4.1	95412	56417	104630	99789	10134	10134	135024	29758	29994	170260	44622	49854	-	-	-

MOP (bar g)BTCRTCETC					Operating supply pressure (bar g)											
					5			5.5			6			7		
Model	(bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
18C-9600-835-CL	8.0	60605	35385	63670	-	-	-	93431	21378	21955	107968	27497	30148	137042	39250	46535
18C-9600-935-CL	6.7	60405	35236	63260	115429	30548	34353	133656	37896	44627	151883	45164	54900	-	-	-
18C-9600-1000-CL	5.9	60263	35130	62969	141390	40988	48986	162240	49271	60737	-	-	-	-	-	-
18C-9600-1100-CL	4.9	60026	34953	62483	-	-	-	-	-	-	-	-	-	-	-	-
18C-9600-1200-CL	4.1	59766	34760	61951	-	-	-	-	-	-	-	-	-	-	-	-
18C-9600-1300-CL	3.5	59484	34549	61373	-	-	-	-	-	-	-	-	-	-	-	-
18C-9800-835-CL	9.0	76919	44620	79020	-	-	-	-	-	-	92680	12358	12358	121753	27943	28745
18C-9800-935-CL	7.1	76719	44471	78611	100141	16563	16563	118368	26452	26837	136595	34214	37110	173049	49004	57657
18C-9800-1000-CL	6.2	76577	44366	78320	126102	29813	31196	146951	38469	42947	167801	46898	54699	-	-	-
18C-9800-1100-CL	5.2	76339	44189	77834	169448	47559	55627	-	-	-	-	-	-	-	-	-
18C-9800-1200-CL	4.3	76079	43995	77302	-	-	-	-	-	-	-	-	-	-	-	-
18C-9800-1300-CL	3.0	75797	43784	76723	-	-	-	-	-	-	-	-	-	-	-	-
18C-10500-935-CL	7.3	86028	49417	85409	-	-	-	111597	16790	16790	129824	27063	27063	166278	42994	47610
18C-10500-1000-CL	6.4	85886	49311	85118	119331	21149	21149	140180	32049	32900	161030	40837	44652	-	-	-
18C-10500-1100-CL	5.3	85648	49133	84632	162677	41515	45580	-	-	-	-	-	-	-	-	-
18C-10500-1200-CL	4.4	85388	48939	84100	-	-	-	-	-	-	-	-	-	-	-	-
18C-10500-1300-CL	3.0	85106	48727	83522	-	-	-	-	-	-	-	-	-	-	-	-
18C-11000-935-CL	7.9	96334	57101	106518	-	-	-	-	-	-	108802	15214	15214	145256	34239	35761
18C-11000-1000-CL	6.9	96192	56996	106227	-	-	-	119158	21051	21051	140007	31973	32803	-	-	-
18C-11000-1100-CL	5.7	95954	56820	105741	141654	32690	33731	166882	43241	47951	-	-	-	-	-	-
18C-11000-1200-CL	4.8	95694	56627	105209	-	-	-	-	-	-	-	-	-	-	-	-
18C-11000-1300-CL	4.1	95412	56417	104630	-	-	-	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO CLOSE. MODELS 18C-9600-835-CL TO 18C-11000-1300-CL

Model	MOP (bar g)	BTC	RTC	ETC	Operating supply pressure (bar g)								
					9			10			12		
					BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
18C-9600-835-CL	8.0	60605	35385	63670	-	-	-	-	-	-	-	-	-
18C-9600-935-CL	6.7	60405	35236	63260	-	-	-	-	-	-	-	-	-
18C-9600-1000-CL	5.9	60263	35130	62969	-	-	-	-	-	-	-	-	-
18C-9600-1100-CL	4.9	60026	34953	62483	-	-	-	-	-	-	-	-	-
18C-9600-1200-CL	4.1	59766	34760	61951	-	-	-	-	-	-	-	-	-
18C-9600-1300-CL	3.5	59484	34549	61373	-	-	-	-	-	-	-	-	-
18C-9800-835-CL	9.0	76919	44620	79020	179900	51742	61519	-	-	-	-	-	-
18C-9800-935-CL	7.1	76719	44471	78611	-	-	-	-	-	-	-	-	-
18C-9800-1000-CL	6.2	76577	44366	78320	-	-	-	-	-	-	-	-	-
18C-9800-1100-CL	5.2	76339	44189	77834	-	-	-	-	-	-	-	-	-
18C-9800-1200-CL	4.3	76079	43995	77302	-	-	-	-	-	-	-	-	-
18C-9800-1300-CL	3.0	75797	43784	76723	-	-	-	-	-	-	-	-	-
18C-10500-935-CL	7.3	86028	49417	85409	-	-	-	-	-	-	-	-	-
18C-10500-1000-CL	6.4	85886	49311	85118	-	-	-	-	-	-	-	-	-
18C-10500-1100-CL	5.3	85648	49133	84632	-	-	-	-	-	-	-	-	-
18C-10500-1200-CL	4.4	85388	48939	84100	-	-	-	-	-	-	-	-	-
18C-10500-1300-CL	3.0	85106	48727	83522	-	-	-	-	-	-	-	-	-
18C-11000-935-CL	7.9	96334	57101	106518	-	-	-	-	-	-	-	-	-
18C-11000-1000-CL	6.9	96192	56996	106227	-	-	-	-	-	-	-	-	-
18C-11000-1100-CL	5.7	95954	56820	105741	-	-	-	-	-	-	-	-	-
18C-11000-1200-CL	4.8	95694	56627	105209	-	-	-	-	-	-	-	-	-
18C-11000-1300-CL	4.1	95412	56417	104630	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO OPEN. MODELS 1.5C-1100-385-OP TO 1.5C-1200-585-OP

					Operating supply pressure (bar g)											
					3			3.5			4			4.5		
Model	MOP (bar g)	BTO	RTO	ETO	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
1.5C-1100-385-OP	9.8	10071	2304	2366	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1100-435-OP	7.7	10047	2293	2352	-	-	-	-	-	-	3937	1546	1546	4816	2517	3346
1.5C-1100-485-OP	6.2	10032	2287	2344	3453	555	555	4546	2307	2793	5638	3144	5031	6731	3962	7268
1.5C-1100-535-OP	5.1	10029	2285	2342	4873	2561	3462	6202	3567	6185	7532	4556	8908	8861	5531	11631
1.5C-1100-585-OP	4.2	9981	2264	2315	6407	3720	6606	7997	4899	9861	9587	6061	13117	-	-	-
1.5C-1200-385-OP	10.6	11759	3030	3348	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1200-435-OP	8.3	11735	3020	3334	-	-	-	-	-	-	-	-	-	3775	1276	1276
1.5C-1200-485-OP	6.6	11720	3014	3326	-	-	-	3505	722	722	4598	2359	2960	5690	3193	5198
1.5C-1200-535-OP	5.4	11717	3013	3324	3832	1392	1392	5162	2793	4115	6491	3793	6838	7820	4779	9561
1.5C-1200-585-OP	4.6	11669	2993	3297	5367	2949	4535	6956	4139	7791	8546	5310	11046	10135	6469	14302

					Operating supply pressure (bar g)											
					5			5.5			6			7		
Model	MOP (bar g)	BTO	RTO	ETO	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
1.5C-1100-385-OP	9.8	10071	2304	2366	3803	1272	1272	4492	2265	2683	5180	2797	4093	6557	3832	6913
1.5C-1100-435-OP	7.7	10047	2293	2352	5695	3186	5146	6574	3845	6947	7453	4497	8747	9211	5786	12347
1.5C-1100-485-OP	6.2	10032	2287	2344	7824	4771	9506	8916	5571	11744	10009	6368	13982	-	-	-
1.5C-1100-535-OP	5.1	10029	2285	2342	10191	6500	14354	-	-	-	-	-	-	-	-	-
1.5C-1100-585-OP	4.2	9981	2264	2315	-	-	-	-	-	-	-	-	-	-	-	-
1.5C-1200-385-OP	10.6	11759	3030	3348	-	-	-	3451	612	612	4140	1996	2022	5517	3062	4842
1.5C-1200-435-OP	8.3	11735	3020	3334	4654	2403	3076	5533	3075	4876	6412	3734	6676	8170	5035	10277
1.5C-1200-485-OP	6.6	11720	3014	3326	6783	4010	7436	7876	4819	9673	8968	5618	11911	-	-	-
1.5C-1200-535-OP	5.4	11717	3013	3324	9150	5751	12284	-	-	-	-	-	-	-	-	-
1.5C-1200-585-OP	4.6	11669	2993	3297	-	-	-	-	-	-	-	-	-	-	-	-

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)								
					9			10			12		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	BTC
1.5C-1100-385-OP	9.8	10071	2304	2366	9311	5860	12553	-	-	-	-	-	-
1.5C-1100-435-OP	7.7	10047	2293	2352	-	-	-	-	-	-	-	-	-
1.5C-1100-485-OP	6.2	10032	2287	2344	-	-	-	-	-	-	-	-	-
1.5C-1100-535-OP	5.1	10029	2285	2342	-	-	-	-	-	-	-	-	-
1.5C-1100-585-OP	4.2	9981	2264	2315	-	-	-	-	-	-	-	-	-
1.5C-1200-385-OP	10.6	11759	3030	3348	8271	5109	10483	9648	6114	13303	-	-	-
1.5C-1200-435-OP	8.3	11735	3020	3334	-	-	-	-	-	-	-	-	-
1.5C-1200-485-OP	6.6	11720	3014	3326	-	-	-	-	-	-	-	-	-
1.5C-1200-535-OP	5.4	11717	3013	3324	-	-	-	-	-	-	-	-	-
1.5C-1200-585-OP	4.6	11669	2993	3297	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO OPEN. MODELS 3C-2000-385-OP TO 1.5C-1100-385-OP

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)											
					3			3.5			4			4.5		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
3C-2000-385-OP	11.1	17300	4694	5367	-	-	-	-	-	-	-	-	-	-	-	-
3C-2000-435-OP	8.7	17261	4678	5345	-	-	-	-	-	-	5085	1785	1785	6540	3459	4765
3C-2000-485-OP	7.2	17236	4668	5331	-	-	-	6093	3112	3849	7901	4490	7553	9710	5837	11256
3C-2000-535-OP	5.7	17231	4666	5328	6634	3531	4957	8834	5187	9464	11035	6814	13971	13235	8420	18478
3C-2000-585-OP	4.8	17151	4634	5283	9174	5440	10159	11805	7376	15548	14436	9293	20937	17067	11203	26326
6C-2500-485-OP	10.5	24670	6891	8034	-	-	-	-	-	-	7248	3287	3287	9362	5093	7617
6C-2500-535-OP	8.6	24663	6888	8031	-	-	-	8339	4308	5521	10911	6261	10791	13484	8174	16060
6C-2500-585-OP	7.8	24570	6851	7978	8736	4615	6335	11812	6933	12635	14888	9205	18935	17964	11449	25235
6C-2500-635-OP	6.1	24469	6810	7921	11971	7051	12960	15595	9722	20383	19219	12362	27806	22843	14994	35229
6C-2500-735-OP	4.6	24242	6719	7793	19236	12375	27840	24091	15900	37785	28947	19417	47730	33803	22931	57675
6C-3800-535-OP	9.7	33620	10043	12246	-	-	-	-	-	-	-	-	-	8921	4448	5073
6C-3800-585-OP	8.1	33527	10006	12193	-	-	-	7249	1648	1648	10325	5537	7948	13401	7851	14248
6C-3800-635-OP	6.9	33426	9966	12136	7408	1973	1973	11032	6075	9396	14656	8784	16819	18280	11446	24242
6C-3800-735-OP	5.1	33199	9876	12008	14673	8796	16853	19528	12357	26799	24384	15888	36744	29240	19410	46689
14C-5100-635-OP	10.5	40170	12043	14720	-	-	-	10451	5184	5810	14412	8215	13923	18373	11161	22036
14C-5100-735-OP	7.4	39921	11945	14580	14430	8228	13960	19737	12164	24830	25044	16035	35699	30351	19890	46569
14C-5100-785-OP	6.9	39784	11890	14502	18835	11502	22982	24889	15922	35381	30942	20319	47780	36996	24706	60178
14C-5100-835-OP	6.1	39637	11832	14420	23530	14933	32598	30379	19910	46626	37228	24874	60655	44078	29834	74683
14C-5100-885-OP	5.4	39481	11770	14332	28514	18557	42807	36209	24136	58566	43903	29707	74324	51597	35270	90083
14C-5100-935-OP	4.8	39316	11704	14239	33789	22384	53609	42377	28602	71199	50965	34813	88789	59553	41022	106379
14C-5400-635-OP	11.4	51974	14788	17456	-	-	-	-	-	-	-	-	-	15070	7309	7557
14C-5400-735-OP	8.5	51725	14689	17316	-	-	-	16434	8389	10351	21741	12428	21221	27048	16377	32090
14C-5400-785-OP	7.2	51587	14634	17239	15532	7678	8504	21585	12312	20902	27639	16813	33301	33692	21243	45700
14C-5400-835-OP	6.6	51441	14575	17156	20226	11290	18119	27076	16397	32148	33925	21413	46176	40774	26398	60204
14C-5400-885-OP	5.9	51285	14513	17068	25211	15015	28328	32905	20669	44087	40599	26270	59846	48293	31854	75605
14C-5400-935-OP	5.2	51120	14447	16975	30485	18903	39131	39073	25160	56721	47661	31395	74310	56249	37617	91900
14C-8300-735-OP	9.3	66586	19102	22673	-	-	-	-	-	-	15744	2993	2993	21051	10860	13862
14C-8300-785-OP	8.2	66448	19047	22595	-	-	-	15588	2674	2674	21642	11318	15073	27695	15905	27472
14C-8300-835-OP	7.7	66301	18988	22513	-	-	-	21079	10882	13920	27928	16079	27948	34777	21167	41977
14C-8300-885-OP	6.4	66145	18926	22425	19214	9414	10100	26908	15315	25859	34602	21038	41618	42296	26669	57377
14C-8300-935-OP	5.8	65980	18860	22332	24488	13493	20903	33076	19908	38493	41664	26208	56082	50252	32460	73672

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO OPEN. MODELS 3C-2000-385-OP TO 1.5C-1100-385-OP

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)											
					5			5.5			6			7		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
3C-2000-385-OP	11.1	17300	4694	5367	4864	1332	1332	6004	3043	3666	7143	3919	6000	9422	5624	10668
3C-2000-435-OP	8.7	17261	4678	5345	7995	4560	7744	9450	5645	10724	10904	6718	13704	13814	8840	19663
3C-2000-485-OP	7.2	17236	4668	5331	11518	7167	14960	13327	8486	18664	15135	9801	22368	18752	12425	29776
3C-2000-535-OP	5.7	17231	4666	5328	15436	10020	22985	17636	11616	27492	-	-	-	-	-	-
3C-2000-585-OP	4.8	17151	4634	5283	-	-	-	-	-	-	-	-	-	-	-	-
6C-2500-485-OP	10.5	24670	6891	8034	11476	6683	11948	13591	8252	16278	15705	9802	20608	19933	12882	29269
6C-2500-535-OP	8.6	24663	6888	8031	16057	10059	21329	18629	11933	26598	21202	13803	31867	26347	17534	42405
6C-2500-585-OP	7.8	24570	6851	7978	21040	13686	31535	24116	15917	37835	27192	18146	44135	33343	22600	56735
6C-2500-635-OP	6.1	24469	6810	7921	26468	17622	42652	30092	20246	50075	33716	22869	57498	-	-	-
6C-2500-735-OP	4.6	24242	6719	7793	-	-	-	-	-	-	-	-	-	-	-	-
6C-3800-535-OP	9.7	33620	10043	12246	11494	6423	10342	14066	8347	15611	16639	10247	20880	21784	13999	31419
6C-3800-585-OP	8.1	33527	10006	12193	16477	10128	20548	19553	12375	26848	22629	14613	33148	28780	19077	45748
6C-3800-635-OP	6.9	33426	9966	12136	21905	14086	31665	25529	16718	39088	29153	19347	46511	-	-	-
6C-3800-735-OP	5.1	33199	9876	12008	34095	22926	56634	-	-	-	-	-	-	-	-	-
14C-5100-635-OP	10.5	40170	12043	14720	22334	14061	30149	26296	16945	38262	30257	19821	46375	38179	25563	62601
14C-5100-735-OP	7.4	39921	11945	14580	35658	23737	57438	40965	27580	68308	46272	31420	79177	56886	39094	100917
14C-5100-785-OP	6.9	39784	11890	14502	43049	29089	72577	49103	33467	84976	55157	37844	97374	-	-	-
14C-5100-835-OP	6.1	39637	11832	14420	50927	34786	88712	57776	39738	102740	64626	44690	116768	-	-	-
14C-5100-885-OP	5.4	39481	11770	14332	59291	40833	105842	-	-	-	-	-	-	-	-	-
14C-5100-935-OP	4.8	39316	11704	14239	-	-	-	-	-	-	-	-	-	-	-	-
14C-5400-635-OP	11.4	51974	14788	17456	19031	10386	15670	22992	13364	23783	26953	16307	31897	34875	22106	48123
14C-5400-735-OP	8.5	51725	14689	17316	32355	20267	42960	37662	24133	53829	42969	27990	64699	53582	35686	86438
14C-5400-785-OP	7.2	51587	14634	17239	39746	25650	58098	45799	30044	70497	51853	34434	82896	63960	43201	107693
14C-5400-835-OP	6.6	51441	14575	17156	47623	31368	74233	54473	36331	88261	61322	41291	102290	-	-	-
14C-5400-885-OP	5.9	51285	14513	17068	55987	37428	91363	63681	42999	107122	-	-	-	-	-	-
14C-5400-935-OP	5.2	51120	14447	16975	64837	43836	109490	-	-	-	-	-	-	-	-	-
14C-8300-735-OP	9.3	66586	19102	22673	26358	14903	24732	31664	18862	35601	36971	22780	46471	47585	30520	68210
14C-8300-785-OP	8.2	66448	19047	22595	33749	20407	39870	39802	24849	52269	45856	29262	64668	57963	38057	89465
14C-8300-835-OP	7.7	66301	18988	22513	41626	26180	56005	48476	31168	70033	55325	36143	84062	69023	46073	112119
14C-8300-885-OP	6.4	66145	18926	22425	49990	32269	73136	57684	37855	88894	65378	43434	104653	-	-	-
14C-8300-935-OP	5.8	65980	18860	22332	58840	38694	91262	67428	44918	108852	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO OPEN. MODELS 3C-2000-385-OP TO 14C-8300-985-OP

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)								
					9			10			12		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	BTC
3C-2000-385-OP	11.1	17300	4694	5367	13981	8962	20004	16260	10618	24672	-	-	-
3C-2000-435-OP	8.7	17261	4678	5345	-	-	-	-	-	-	-	-	-
3C-2000-485-OP	7.2	17236	4668	5331	-	-	-	-	-	-	-	-	-
3C-2000-535-OP	5.7	17231	4666	5328	-	-	-	-	-	-	-	-	-
3C-2000-585-OP	4.8	17151	4634	5283	-	-	-	-	-	-	-	-	-
6C-2500-485-OP	10.5	24670	6891	8034	28390	19014	46590	32619	22075	55250	-	-	-
6C-2500-535-OP	8.6	24663	6888	8031	-	-	-	-	-	-	-	-	-
6C-2500-585-OP	7.8	24570	6851	7978	-	-	-	-	-	-	-	-	-
6C-2500-635-OP	6.1	24469	6810	7921	-	-	-	-	-	-	-	-	-
6C-2500-735-OP	4.6	24242	6719	7793	-	-	-	-	-	-	-	-	-
6C-3800-535-OP	9.7	33620	10043	12246	32075	21462	52495	-	-	-	-	-	-
6C-3800-585-OP	8.1	33527	10006	12193	-	-	-	-	-	-	-	-	-
6C-3800-635-OP	6.9	33426	9966	12136	-	-	-	-	-	-	-	-	-
6C-3800-735-OP	5.1	33199	9876	12008	-	-	-	-	-	-	-	-	-
14C-5100-635-OP	10.5	40170	12043	14720	54023	37025	95053	61946	42752	111280	-	-	-
14C-5100-735-OP	7.4	39921	11945	14580	-	-	-	-	-	-	-	-	-
14C-5100-785-OP	6.9	39784	11890	14502	-	-	-	-	-	-	-	-	-
14C-5100-835-OP	6.1	39637	11832	14420	-	-	-	-	-	-	-	-	-
14C-5100-885-OP	5.4	39481	11770	14332	-	-	-	-	-	-	-	-	-
14C-5100-935-OP	4.8	39316	11704	14239	-	-	-	-	-	-	-	-	-
14C-5400-635-OP	11.4	51974	14788	17456	50720	33614	80575	58642	39350	96801	-	-	-
14C-5400-735-OP	8.5	51725	14689	17316	-	-	-	-	-	-	-	-	-
14C-5400-785-OP	7.2	51587	14634	17239	-	-	-	-	-	-	-	-	-
14C-5400-835-OP	6.6	51441	14575	17156	-	-	-	-	-	-	-	-	-
14C-5400-885-OP	5.9	51285	14513	17068	-	-	-	-	-	-	-	-	-
14C-5400-935-OP	5.2	51120	14447	16975	-	-	-	-	-	-	-	-	-
14C-8300-735-OP	9.3	66586	19102	22673	68813	45921	111688	-	-	-	-	-	-
14C-8300-785-OP	8.2	66448	19047	22595	-	-	-	-	-	-	-	-	-
14C-8300-835-OP	7.7	66301	18988	22513	-	-	-	-	-	-	-	-	-
14C-8300-885-OP	6.4	66145	18926	22425	-	-	-	-	-	-	-	-	-
14C-8300-935-OP	5.8	65980	18860	22332	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO OPEN. MODELS 18C-9600-835-OP TO 18C-11000-1300-OP

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)											
					3			3.5			4			4.5		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
18C-9600-835-OP	9.7	105772	26591	28911	-	-	-	-	-	-	-	-	-	35406	12057	12057
18C-9600-935-OP	7.5	105403	26438	28703	-	-	-	33450	8050	8050	43326	22305	28278	53202	29841	48507
18C-9600-1000-OP	6.7	105141	26329	28555	31957	4992	4992	43254	22249	28131	54551	30857	51269	65848	39283	74408
18C-9600-1100-OP	5.6	104703	26148	28308	45954	24337	33661	59623	34653	61659	73293	44794	89656	86963	54787	117654
18C-9600-1200-OP	4.7	104224	25949	28038	61284	35890	65060	77552	47916	98379	93820	59784	131699	110088	71611	165018
18C-9600-1300-OP	4.0	103703	25733	27744	77947	48205	99189	97040	62126	138293	116132	75996	177397	-	-	-
18C-9800-835-OP	10.7	134273	33251	35801	-	-	-	-	-	-	-	-	-	-	-	-
18C-9800-935-OP	8.6	133904	33097	35593	-	-	-	-	-	-	-	-	-	44952	13548	13548
18C-9800-1000-OP	7.1	133642	32987	35446	-	-	-	-	-	-	46301	16310	16310	57598	30000	39449
18C-9800-1100-OP	6.2	133204	32805	35199	-	-	-	51373	25108	26700	65043	35695	54697	78713	45957	82695
18C-9800-1200-OP	5.2	132724	32604	34929	53034	26431	30101	69302	38912	63420	85570	51056	96740	101838	63049	130059
18C-9800-1300-OP	4.4	132203	32386	34635	69697	39210	64230	88790	53443	103334	107882	67462	142438	-	-	-
18C-10500-935-OP	9.2	156518	38971	42109	-	-	-	-	-	-	-	-	-	-	-	-
18C-10500-1000-OP	8.1	156255	38862	41961	-	-	-	-	-	-	-	-	-	50045	11711	11711
18C-10500-1100-OP	6.7	155817	38681	41714	-	-	-	-	-	-	57490	26959	26959	71160	38193	54957
18C-10500-1200-OP	5.6	155338	38482	41444	45481	2363	2363	61749	30901	35683	78017	43399	69002	94285	55577	102322
18C-10500-1300-OP	4.8	154817	38265	41150	62144	31213	36493	81237	45826	75597	100329	60064	114701	119421	74124	153805
18C-11000-935-OP	9.9	175538	46768	52829	-	-	-	-	-	-	-	-	-	-	-	-
18C-11000-1000-OP	8.6	175275	46662	52681	-	-	-	-	-	-	-	-	-	-	-	-
18C-11000-1100-OP	7.3	174838	46484	52435	-	-	-	-	-	-	46099	3629	3629	59769	29327	31627
18C-11000-1200-OP	6.0	174358	46289	52164	-	-	-	50358	12352	12352	66626	34710	45672	82894	47069	78991
18C-11000-1300-OP	5.1	173837	46077	51870	50754	13162	13162	69846	37188	52266	88938	51593	91370	108030	65766	130474

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)											
					5			5.5			6			7		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
18C-9600-835-OP	9.7	105772	26591	28911	43282	22271	28189	51159	28301	44322	59036	34215	60455	74789	45892	92720
18C-9600-935-OP	7.5	105403	26438	28703	63078	37227	68735	72955	44544	88963	82831	51772	109191	102583	66159	149648
18C-9600-1000-OP	6.7	105141	26329	28555	77145	47618	97546	88442	55867	120685	99740	64090	143823	-	-	-
18C-9600-1100-OP	5.6	104703	26148	28308	100632	64739	145651	114302	74668	173649	-	-	-	-	-	-
18C-9600-1200-OP	4.7	104224	25949	28038	-	-	-	-	-	-	-	-	-	-	-	-
18C-9600-1300-OP	4.0	103703	25733	27744	-	-	-	-	-	-	-	-	-	-	-	-
18C-9800-835-OP	10.7	134273	33251	35801	-	-	-	42909	9363	9363	50786	24636	25496	66539	36829	57761
18C-9800-935-OP	8.6	133904	33097	35593	54828	27845	33776	64705	35438	54004	74581	42873	74233	94334	57545	114689
18C-9800-1000-OP	7.1	133642	32987	35446	68895	38605	62587	80193	47060	85726	91490	55445	108864	114084	71988	155141
18C-9800-1100-OP	6.2	133204	32805	35199	92382	56104	110692	106052	66127	138690	119721	76097	166688	-	-	-
18C-9800-1200-OP	5.2	132724	32604	34929	118106	74922	163379	-	-	-	-	-	-	-	-	-
18C-9800-1300-OP	4.4	132203	32386	34635	-	-	-	-	-	-	-	-	-	-	-	-
18C-10500-935-OP	9.2	156518	38971	42109	47275	6038	6038	57152	26267	26267	67028	35020	46495	86780	49982	86951
18C-10500-1000-OP	8.1	156255	38862	41961	61342	30579	34850	72639	39324	57988	83937	47851	81127	106531	64660	127404
18C-10500-1100-OP	6.7	155817	38681	41714	84829	48519	82955	98499	58707	110952	112168	68813	138950	-	-	-
18C-10500-1200-OP	5.6	155338	38482	41444	110553	67629	135641	126821	79523	168960	-	-	-	-	-	-
18C-10500-1300-OP	4.8	154817	38265	41150	-	-	-	-	-	-	-	-	-	-	-	-
18C-11000-935-OP	9.9	175538	46768	52829	-	-	-	45761	2936	2936	55637	23164	23164	75390	41412	63621
18C-11000-1000-OP	8.6	175275	46662	52681	49951	11519	11519	61249	30504	34658	72546	39253	57796	95140	56215	104073
18C-11000-1100-OP	7.3	174838	46484	52435	73438	39930	59624	87108	50227	87622	100777	60396	115619	128117	80469	171615
18C-11000-1200-OP	6.0	174358	46289	52164	99162	59198	112311	115430	71201	145630	131698	83082	178950	-	-	-
18C-11000-1300-OP	5.1	173837	46077	51870	127122	79743	169578	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - CANTED YOKE DESIGN, SPRING TO OPEN. MODELS 18C-9600-835-OP TO 18C-11000-1300-OP

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)								
					9			10			12		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	BTC
18C-9600-835-OP	9.7	105772	26591	28911	106296	68859	157251	-	-	-	-	-	-
18C-9600-935-OP	7.5	105403	26438	28703	-	-	-	-	-	-	-	-	-
18C-9600-1000-OP	6.7	105141	26329	28555	-	-	-	-	-	-	-	-	-
18C-9600-1100-OP	5.6	104703	26148	28308	-	-	-	-	-	-	-	-	-
18C-9600-1200-OP	4.7	104224	25949	28038	-	-	-	-	-	-	-	-	-
18C-9600-1300-OP	4.0	103703	25733	27744	-	-	-	-	-	-	-	-	-
18C-9800-835-OP	10.7	134273	33251	35801	98046	60272	122292	113799	71780	154558	-	-	-
18C-9800-935-OP	8.6	133904	33097	35593	-	-	-	-	-	-	-	-	-
18C-9800-1000-OP	7.1	133642	32987	35446	-	-	-	-	-	-	-	-	-
18C-9800-1100-OP	6.2	133204	32805	35199	-	-	-	-	-	-	-	-	-
18C-9800-1200-OP	5.2	132724	32604	34929	-	-	-	-	-	-	-	-	-
18C-9800-1300-OP	4.4	132203	32386	34635	-	-	-	-	-	-	-	-	-
18C-10500-935-OP	9.2	156518	38971	42109	126286	79133	167864	-	-	-	-	-	-
18C-10500-1000-OP	8.1	156255	38862	41961	-	-	-	-	-	-	-	-	-
18C-10500-1100-OP	6.7	155817	38681	41714	-	-	-	-	-	-	-	-	-
18C-10500-1200-OP	5.6	155338	38482	41444	-	-	-	-	-	-	-	-	-
18C-10500-1300-OP	4.8	154817	38265	41150	-	-	-	-	-	-	-	-	-
18C-11000-935-OP	9.9	175538	46768	52829	114895	70809	144534	-	-	-	-	-	-
18C-11000-1000-OP	8.6	175275	46662	52681	-	-	-	-	-	-	-	-	-
18C-11000-1100-OP	7.3	174838	46484	52435	-	-	-	-	-	-	-	-	-
18C-11000-1200-OP	6.0	174358	46289	52164	-	-	-	-	-	-	-	-	-
18C-11000-1300-OP	5.1	173837	46077	51870	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO CLOSE. MODELS 1.5S-1100-385-CL TO 1.5S-1200-585-CL

MOP (bar g) BTC RTC ETC					Operating supply pressure (bar g)											
					3			3.5			4			4.5		
Model	(bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5S-1100-385-CL	10.9	6209	3024	3643	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1100-435-CL	8.5	6195	3014	3625	-	-	-	-	-	-	4935	1070	1070	6039	2109	2135
1.5S-1100-485-CL	6.8	6186	3008	3614	4326	483	483	5699	1808	1808	7072	2775	3132	8445	3616	4457
1.5S-1100-535-CL	5.6	6184	3006	3611	6110	2157	2204	7781	3212	3816	9452	4222	5428	11122	5219	7040
1.5S-1100-585-CL	4.5	6155	2986	3574	8039	3369	4065	10036	4572	5992	12034	5759	7919	14031	6940	9846
1.5S-1200-385-CL	11.6	7216	3730	4969	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1200-435-CL	9.1	7202	3720	4951	-	-	-	-	-	-	-	-	-	4731	908	908
1.5S-1200-485-CL	7.3	7193	3714	4940	-	-	-	4392	580	580	5765	1905	1905	7138	2830	3230
1.5S-1200-535-CL	6.0	7191	3713	4937	-	-	-	6473	2412	2588	8144	3447	4200	9814	4453	5812
1.5S-1200-585-CL	5.0	7162	3693	4901	6731	2576	2837	8728	3801	4764	10726	4996	6692	12724	6181	8619

MOP (bar g) BTC RTC ETC					Operating supply pressure (bar g)											
					5			5.5			6			7		
Model	(bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5S-1100-385-CL	10.9	6209	3024	3643	4767	908	908	5632	1742	1742	6497	2411	2577	8227	3484	4247
1.5S-1100-435-CL	8.5	6195	3014	3625	7144	2819	3201	8248	3497	4266	9353	4163	5332	11562	5480	7463
1.5S-1100-485-CL	6.8	6186	3008	3614	9818	4442	5782	11191	5260	7106	12564	6074	8431	-	-	-
1.5S-1100-535-CL	5.6	6184	3006	3611	12793	6209	8651	14464	7196	10263	-	-	-	-	-	-
1.5S-1100-585-CL	4.5	6155	2986	3574	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1200-385-CL	11.6	7216	3730	4969	-	-	-	4324	515	515	5189	1350	1350	6920	2694	3019
1.5S-1200-435-CL	9.1	7202	3720	4951	5836	1973	1973	6940	2707	3039	8045	3387	4105	10254	4715	6236
1.5S-1200-485-CL	7.3	7193	3714	4940	8511	3670	4554	9884	4494	5879	11257	5311	7204	14003	6936	9853
1.5S-1200-535-CL	6.0	7191	3713	4937	11485	5447	7424	13156	6436	9036	14826	7422	10648	-	-	-
1.5S-1200-585-CL	5.0	7162	3693	4901	14721	7360	10546	-	-	-	-	-	-	-	-	-

MOP (bar g) BTC RTC ETC					Operating supply pressure (bar g)								
					9			10			12		
Model	(bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
1.5S-1100-385-CL	10.9	6209	3024	3643	11688	5555	7585	13418	6579	9255	-	-	-
1.5S-1100-435-CL	8.5	6195	3014	3625	-	-	-	-	-	-	-	-	-
1.5S-1100-485-CL	6.8	6186	3008	3614	-	-	-	-	-	-	-	-	-
1.5S-1100-535-CL	5.6	6184	3006	3611	-	-	-	-	-	-	-	-	-
1.5S-1100-585-CL	4.5	6155	2986	3574	-	-	-	-	-	-	-	-	-
1.5S-1200-385-CL	11.6	7216	3730	4969	10380	4790	6358	12111	5818	8027	-	-	-
1.5S-1200-435-CL	9.1	7202	3720	4951	14672	7331	10498	-	-	-	-	-	-
1.5S-1200-485-CL	7.3	7193	3714	4940	-	-	-	-	-	-	-	-	-
1.5S-1200-535-CL	6.0	7191	3713	4937	-	-	-	-	-	-	-	-	-
1.5S-1200-585-CL	5.0	7162	3693	4901	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO CLOSE. MODELS 3S-2000-385-CL TO 14S-8300-935-CL

Model	MOP (bar g)	Operating supply pressure (bar g)														
		BTC	RTC	ETC	3			3.5			4			4.5		
					BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
3S-2000-385-CL	12.0	10845	5668	7860	-	-	-	-	-	-	-	-	-	-	-	-
3S-2000-435-CL	10.6	10821	5652	7831	-	-	-	-	-	-	6179	1171	1171	7984	2891	2962
3S-2000-485-CL	8.5	10806	5642	7812	-	-	-	7429	2411	2411	9672	3978	4637	11915	5360	6864
3S-2000-535-CL	7.0	10802	5640	7808	8100	2970	3077	10829	4696	5786	13558	6356	8495	16288	7999	11205
3S-2000-585-CL	5.8	10754	5608	7748	11250	4954	6204	14514	6933	9444	17777	8891	12683	21040	10841	15922
6S-2500-485-CL	12.0	15533	8240	11721	-	-	-	-	-	-	8720	2029	2029	11337	4320	4637
6S-2500-535-CL	11.3	15529	8238	11716	-	-	-	10070	3374	3374	13255	5538	6548	16440	7496	9722
6S-2500-585-CL	9.4	15473	8200	11646	10562	3803	3864	14370	6229	7659	18178	8551	11454	21986	10846	15248
6S-2500-635-CL	8.0	15411	8159	11570	14567	6350	7855	19054	9080	12326	23541	11779	16797	28028	14466	21268
6S-2500-735-CL	6.0	15273	8067	11399	23561	11792	16818	29573	15389	22808	35584	18976	28798	41596	22559	34788
6S-3800-535-CL	12.0	21051	11605	17481	-	-	-	-	-	-	-	-	-	10755	3111	3111
6S-3800-585-CL	10.2	20994	11568	17411	-	-	-	8684	1048	1048	12493	4634	4843	16301	7046	8637
6S-3800-635-CL	8.6	20933	11527	17335	8881	1244	1244	13368	5206	5715	17855	8000	10186	22342	10721	14657
6S-3800-735-CL	6.5	20795	11436	17164	17876	8012	10207	23887	11652	16197	29898	15259	22187	35910	18852	28177
14S-5100-635-CL	12.0	24596	13852	21159	-	-	-	12930	3643	3643	17907	7250	8445	22885	10264	13248
14S-5100-735-CL	10.6	24447	13752	20969	17930	7264	8467	24599	11289	14901	31268	15246	21336	37937	19179	27770
14S-5100-785-CL	9.3	24365	13697	20864	23466	10612	13808	31073	15131	21147	38680	19616	28486	46287	24089	35826
14S-5100-835-CL	8.2	24277	13638	20752	29365	14120	19500	37972	19199	27804	46579	24260	36108	55186	29312	44412
14S-5100-885-CL	7.3	24184	13575	20633	35629	17820	25543	45298	23507	34871	54966	29183	44200	64635	34853	53528
14S-5100-935-CL	6.6	24086	13509	20507	42257	21721	31937	53049	28059	42350	63841	34388	52762	74633	40711	63174
14S-5400-635-CL	12.0	31902	17436	25418	-	-	-	-	-	-	-	-	-	18684	4827	4827
14S-5400-735-CL	10.9	31754	17336	25229	-	-	-	20398	6481	6481	27067	11022	12915	33736	15061	19349
14S-5400-785-CL	9.6	31671	17281	25124	19265	5387	5387	26872	10902	12727	34479	15507	20066	42086	20036	27406
14S-5400-835-CL	8.5	31584	17222	25012	25164	9844	11079	33771	15082	19383	42379	20209	27688	50986	25297	35992
14S-5400-885-CL	7.5	31491	17159	24893	31428	13674	17123	41097	19449	26451	50766	25167	35779	60434	30863	45108
14S-5400-935-CL	6.7	31392	17093	24767	38056	17642	23517	48848	24035	33929	59640	30396	44342	70432	36738	54754
14S-8300-735-CL	11.5	40951	22498	33067	-	-	-	-	-	-	-	-	-	26007	8526	8526
14S-8300-785-CL	10.1	40869	22443	32962	-	-	-	-	-	-	26750	9223	9242	34357	14070	16582
14S-8300-835-CL	8.9	40781	22384	32850	-	-	-	26042	8559	8559	34649	14249	16864	43256	19452	25168
14S-8300-885-CL	7.9	40688	22321	32731	23699	6299	6299	33367	13462	15627	43036	19320	24955	52705	25078	34284
14S-8300-935-CL	7.1	40590	22254	32605	30327	11565	12693	41119	18170	23105	51911	24607	33518	62703	30990	43930

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO CLOSE. MODELS 3S-2000-385-CL TO 14S-8300-935-CL

Model	MOP (bar g)	Operating supply pressure (bar g)														
		BTC	RTC	ETC	5			5.5			6			7		
					BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
3S-2000-385-CL	12.0	10845	5668	7860	5905	898	898	7318	2301	2301	8732	3383	3704	11558	5142	6510
3S-2000-435-CL	10.6	10821	5652	7831	9788	4051	4753	11592	5163	6544	13397	6259	8335	17005	8429	11917
3S-2000-485-CL	8.5	10806	5642	7812	14158	6718	9090	16401	8066	11317	18643	9410	13543	23129	12087	17996
3S-2000-535-CL	7.0	10802	5640	7808	19017	9633	13914	21746	11262	16623	24475	12889	19332	29934	16138	24750
3S-2000-585-CL	5.8	10754	5608	7748	24303	12787	19161	27566	14729	22400	-	-	-	-	-	-
6S-2500-485-CL	12.0	15533	8240	11721	13955	5972	7245	16572	7576	9853	19190	9162	12462	24425	12309	17678
6S-2500-535-CL	11.3	15529	8238	11716	19625	9425	12896	22810	11342	16070	25995	13251	19243	32365	17057	25591
6S-2500-585-CL	9.4	15473	8200	11646	25795	13130	19043	29603	15407	22838	33411	17680	26633	41027	22220	34222
6S-2500-635-CL	8.0	15411	8159	11570	32515	17146	25739	37001	19822	30211	41488	22495	34682	50462	27838	43624
6S-2500-735-CL	6.0	15273	8067	11399	47607	26138	40779	53618	29716	46769	59630	33291	52759	-	-	-
6S-3800-535-CL	12.0	21051	11605	17481	13940	5571	6285	17125	7553	9458	20310	9493	12632	26680	13330	18980
6S-3800-585-CL	10.2	20994	11568	17411	20109	9371	12432	23917	11670	16227	27725	13957	20022	35342	18513	27611
6S-3800-635-CL	8.6	20933	11527	17335	26829	13420	19128	31316	16106	23600	35803	18788	28071	44777	24139	37013
6S-3800-735-CL	6.5	20795	11436	17164	41921	22437	34168	47933	26019	40158	53944	29598	46148	-	-	-
14S-5100-635-CL	12.0	24596	13852	21159	27863	13230	18050	32840	16174	22853	37818	19109	27655	47774	24962	37260
14S-5100-735-CL	10.6	24447	13752	20969	44606	23101	34204	51275	27018	40638	57944	30929	47072	71282	38748	59941
14S-5100-785-CL	9.3	24365	13697	20864	53894	28554	43165	61501	33016	50505	69109	37476	57844	84323	46386	72523
14S-5100-835-CL	8.2	24277	13638	20752	63793	34360	52716	72401	39404	61020	81008	44445	69324	98222	54527	85933
14S-5100-885-CL	7.3	24184	13575	20633	74304	40518	62856	83973	46181	72185	93641	51844	81513	112979	63165	100170
14S-5100-935-CL	6.6	24086	13509	20507	85425	47032	73586	96217	53353	83999	107010	59672	94411	-	-	-
14S-5400-635-CL	12.0	31902	17436	25418	23662	8896	9630	28640	11984	14432	33617	14990	19235	43573	20916	28840
14S-5400-735-CL	10.9	31754	17336	25229	40405	19038	25784	47074	22988	32218	53743	26923	38652	67081	34770	51521
14S-5400-785-CL	9.6	31671	17281	25124	49693	24534	34745	57301	29018	42084	64908	33493	49424	80122	42427	64103
14S-5400-835-CL	8.5	31584	17222	25012	59593	30368	44296	68200	35427	52600	76807	40483	60904	94021	50578	77512
14S-5400-885-CL	7.5	31491	17159	24893	70103	36545	54436	79772	42221	63765	89441	47892	73093	108778	59226	91750
14S-5400-935-CL	6.7	31392	17093	24767	81225	43073	65166	92017	49402	75578	102809	55730	85991	-	-	-
14S-8300-735-CL	11.5	40951	22498	33067	32676	13034	14960	39345	17101	21394	46014	21099	27828	59352	29011	40697
14S-8300-785-CL	10.1	40869	22443	32962	41964	18677	23921	49571	23217	31260	57178	27727	38600	72393	36700	53279
14S-8300-835-CL	8.9	40781	22384	32850	51863	24579	33472	60470	29672	41776	69077	34748	50080	86292	44872	66688
14S-8300-885-CL	7.9	40688	22321	32731	62374	30795	43612	72042	36494	52941	81711	42181	62269	101049	53536	80926
14S-8300-935-CL	7.1	40590	22254	32605	73495	37349	54342	84287	43695	64754	95079	50035	75167	116664	62693	95991

NOTES

- MOP: Maximum Operating Pressure
- BTC: Break to Close
- RTC: Run to Close
- ETC: End to Close
- BTO: Break to Open
- RTO: Run to Open
- ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO CLOSE. MODELS 3S-2000-385-CL TO 14S-8300-985-CL

Model	MOP (bar g)	BTC	RTC	ETC	Operating supply pressure (bar g)								
					9			10			12		
					BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
3S-2000-385-CL	12.0	10845	5668	7860	17212	8553	12122	20039	10244	14928	25692	13613	20540
3S-2000-435-CL	10.6	10821	5652	7831	24222	12738	19081	27831	14886	22663	-	-	-
3S-2000-485-CL	8.5	10806	5642	7812	-	-	-	-	-	-	-	-	-
3S-2000-535-CL	7.0	10802	5640	7808	-	-	-	-	-	-	-	-	-
3S-2000-585-CL	5.8	10754	5608	7748	-	-	-	-	-	-	-	-	-
6S-2500-485-CL	12.0	15533	8240	11721	34895	18565	28111	40130	21686	33328	50600	27920	43761
6S-2500-535-CL	11.3	15529	8238	11716	45105	24649	38286	51476	28442	44634	-	-	-
6S-2500-585-CL	9.4	15473	8200	11646	56260	31287	49401	-	-	-	-	-	-
6S-2500-635-CL	8.0	15411	8159	11570	-	-	-	-	-	-	-	-	-
6S-2500-735-CL	6.0	15273	8067	11399	-	-	-	-	-	-	-	-	-
6S-3800-535-CL	12.0	21051	11605	17481	39420	20945	31675	45790	24743	38022	58530	32329	50718
6S-3800-585-CL	10.2	20994	11568	17411	50574	27591	42790	58191	32126	50379	-	-	-
6S-3800-635-CL	8.6	20933	11527	17335	-	-	-	-	-	-	-	-	-
6S-3800-735-CL	6.5	20795	11436	17164	-	-	-	-	-	-	-	-	-
14S-5100-635-CL	12.0	24596	13852	21159	67685	36642	56470	77640	42472	66075	97551	54134	85285
14S-5100-735-CL	10.6	24447	13752	20969	97958	54372	85678	111296	62180	98546	-	-	-
14S-5100-785-CL	9.3	24365	13697	20864	114752	64202	101880	-	-	-	-	-	-
14S-5100-835-CL	8.2	24277	13638	20752	-	-	-	-	-	-	-	-	-
14S-5100-885-CL	7.3	24184	13575	20633	-	-	-	-	-	-	-	-	-
14S-5100-935-CL	6.6	24086	13509	20507	-	-	-	-	-	-	-	-	-
14S-5400-635-CL	12.0	31902	17436	25418	63484	32656	48050	73439	38505	57655	93350	50184	76865
14S-5400-735-CL	10.9	31754	17336	25229	93757	50423	77257	107095	58240	90126	-	-	-
14S-5400-785-CL	9.6	31671	17281	25124	110551	60264	93460	-	-	-	-	-	-
14S-5400-835-CL	8.5	31584	17222	25012	-	-	-	-	-	-	-	-	-
14S-5400-885-CL	7.5	31491	17159	24893	-	-	-	-	-	-	-	-	-
14S-5400-935-CL	6.7	31392	17093	24767	-	-	-	-	-	-	-	-	-
14S-8300-735-CL	11.5	40951	22498	33067	86028	44717	66433	99365	52549	79302	-	-	-
14S-8300-785-CL	10.1	40869	22443	32962	102821	54576	82636	118036	63498	97315	-	-	-
14S-8300-835-CL	8.9	40781	22384	32850	-	-	-	-	-	-	-	-	-
14S-8300-885-CL	7.9	40688	22321	32731	-	-	-	-	-	-	-	-	-
14S-8300-935-CL	7.1	40590	22254	32605	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO CLOSE. MODELS 18S-9600-835-CL TO 18S-11000-1300-CL

MOP (bar g) BTC RTC ETC					Operating supply pressure (bar g)											
					3			3.5			4			4.5		
Model	(bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
18S-9600-835-CL	11.4	66304	34048	44881	-	-	-	-	-	-	-	-	-	42714	6986	6986
18S-9600-935-CL	9.1	66083	33897	44600	-	-	-	40257	4614	4614	52664	16592	16592	65072	25424	28570
18S-9600-1000-CL	7.9	65927	33789	44400	38381	2803	2803	52574	16505	16505	66766	26480	30206	80959	35148	43908
18S-9600-1100-CL	6.6	65665	33610	44065	55966	19546	19779	73139	30402	36358	90312	40769	52937	107484	50998	69515
18S-9600-1200-CL	5.5	65378	33413	43700	75225	31675	38372	95662	43964	58102	116099	56101	77832	136536	68177	97562
18S-9600-1300-CL	4.5	65067	33199	43302	96159	44260	58582	120144	58497	81737	144129	72649	104892	168115	86765	128048
18S-9800-835-CL	11.9	83920	42715	55491	-	-	-	-	-	-	-	-	-	-	-	-
18S-9800-935-CL	9.5	83699	42564	55210	-	-	-	-	-	-	-	-	-	54608	8237	8237
18S-9800-1000-CL	8.3	83543	42456	55010	-	-	-	-	-	-	56303	9873	9873	70495	23575	23575
18S-9800-1100-CL	6.9	83281	42276	54676	-	-	-	62675	16025	16025	79848	30077	32604	97021	40725	49183
18S-9800-1200-CL	5.8	82994	42079	54310	64762	18039	18039	85199	33448	37769	105636	45945	57499	126073	58192	77229
18S-9800-1300-CL	4.5	82683	41866	53912	85695	33757	38249	109681	48383	61404	133666	62709	84560	157651	76926	107715
18S-10500-935-CL	9.6	92694	46404	58625	-	-	-	-	-	-	-	-	-	-	-	-
18S-10500-1000-CL	8.4	92538	46296	58425	-	-	-	-	-	-	-	-	-	67127	13374	13374
18S-10500-1100-CL	7.0	92276	46115	58091	-	-	-	59307	5824	5824	76480	22403	22403	93653	35620	38982
18S-10500-1200-CL	5.9	91989	45917	57725	61394	7838	7838	81831	27568	27568	102268	41008	47298	122705	53464	67028
18S-10500-1300-CL	5.0	91678	45702	57327	82327	28048	28048	106313	43500	51203	130298	58031	74359	154283	72348	97514
18S-11000-935-CL	10.2	104062	54199	73136	-	-	-	-	-	-	-	-	-	-	-	-
18S-11000-1000-CL	8.9	103905	54092	72936	-	-	-	-	-	-	-	-	-	-	-	-
18S-11000-1100-CL	7.4	103643	53913	72602	-	-	-	-	-	-	62170	8588	8588	79343	25167	25167
18S-11000-1200-CL	6.2	103357	53717	72236	-	-	-	67521	13753	13753	87958	31960	33483	108395	44779	53213
18S-11000-1300-CL	5.3	103045	53504	71839	68017	14233	14233	92003	34571	37388	115988	49402	60544	139973	63823	83699

MOP (bar g) BTC RTC ETC					Operating supply pressure (bar g)											
					5			5.5			6			7		
Model	(bar g)	BTC	RTC	ETC	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
18S-9600-835-CL	11.4	66304	34048	44881	52610	16539	16539	62505	23808	26092	72400	29952	35645	92191	41891	54751
18S-9600-935-CL	9.1	66083	33897	44600	77479	33043	40548	89886	40514	52526	102294	47912	64504	127109	62610	88461
18S-9600-1000-CL	7.9	65927	33789	44400	95151	43659	57609	109344	52099	71310	123536	60500	85012	151921	77238	112414
18S-9600-1100-CL	6.6	65665	33610	44065	124657	61162	86094	141830	71294	102673	159003	81409	119251	-	-	-
18S-9600-1200-CL	5.5	65378	33413	43700	156974	80213	117292	177411	92228	137022	-	-	-	-	-	-
18S-9600-1300-CL	4.5	65067	33199	43302	-	-	-	-	-	-	-	-	-	-	-	-
18S-9800-835-CL	11.9	83920	42715	55491	-	-	-	52042	5759	5759	61937	15312	15312	81728	31269	34418
18S-9800-935-CL	9.5	83699	42564	55210	67016	20215	20215	79423	29805	32194	91831	37551	44172	116645	52561	68128
18S-9800-1000-CL	8.3	83543	42456	55010	84688	33129	37276	98880	41857	50977	113073	50418	64679	141458	67337	92082
18S-9800-1100-CL	6.9	83281	42276	54676	114194	51091	65761	131367	61342	82340	148540	71533	98919	-	-	-
18S-9800-1200-CL	5.8	82994	42079	54310	146510	70330	96959	166947	82416	116689	-	-	-	-	-	-
18S-9800-1300-CL	4.5	82683	41866	53912	-	-	-	-	-	-	-	-	-	-	-	-
18S-10500-935-CL	9.6	92694	46404	58625	63648	10015	10015	76055	21993	21993	88463	32289	33971	113277	47758	57927
18S-10500-1000-CL	8.4	92538	46296	58425	81320	27075	27075	95512	36795	40777	109705	45578	54478	138090	62698	81881
18S-10500-1100-CL	7.0	92276	46115	58091	110826	46262	55560	127999	56652	72139	145172	66926	88718	179518	87312	121875
18S-10500-1200-CL	5.9	91989	45917	57725	143142	65715	86758	163579	77870	106488	-	-	-	-	-	-
18S-10500-1300-CL	5.0	91678	45702	57327	178269	86572	120669	-	-	-	-	-	-	-	-	-
18S-11000-935-CL	10.2	104062	54199	73136	-	-	-	61745	8178	8178	74152	20156	20156	98967	38959	44112
18S-11000-1000-CL	8.9	103905	54092	72936	67010	13260	13260	81202	26962	26962	95395	36721	40663	123780	54112	68066
18S-11000-1100-CL	7.4	103643	53913	72602	96516	37426	41745	113689	48008	58324	130862	58369	74903	165207	78834	108060
18S-11000-1200-CL	6.2	103357	53717	72236	128832	57152	72943	149269	69367	92673	169707	81500	112403	-	-	-
18S-11000-1300-CL	5.3	103045	53504	71839	163959	78095	106854	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO CLOSE. MODELS 18S-9600-835-CL TO 18S-11000-1300-CL

Model	MOP (bar g)	BTC	RTC	ETC	Operating supply pressure (bar g)								
					9			10			12		
					BTO	RTO	ETO	BTO	RTO	ETO	BTO	RTO	ETO
18S-9600-835-CL	11.4	66304	34048	44881	131772	65364	92963	151563	77027	112069	-	-	-
18S-9600-935-CL	9.1	66083	33897	44600	176738	91833	136373	-	-	-	-	-	-
18S-9600-1000-CL	7.9	65927	33789	44400	-	-	-	-	-	-	-	-	-
18S-9600-1100-CL	6.6	65665	33610	44065	-	-	-	-	-	-	-	-	-
18S-9600-1200-CL	5.5	65378	33413	43700	-	-	-	-	-	-	-	-	-
18S-9600-1300-CL	4.5	65067	33199	43302	-	-	-	-	-	-	-	-	-
18S-9800-835-CL	11.9	83920	42715	55491	121309	55348	72630	141100	67125	91736	-	-	-
18S-9800-935-CL	9.5	83699	42564	55210	166275	82019	116040	-	-	-	-	-	-
18S-9800-1000-CL	8.3	83543	42456	55010	-	-	-	-	-	-	-	-	-
18S-9800-1100-CL	6.9	83281	42276	54676	-	-	-	-	-	-	-	-	-
18S-9800-1200-CL	5.8	82994	42079	54310	-	-	-	-	-	-	-	-	-
18S-9800-1300-CL	4.5	82683	41866	53912	-	-	-	-	-	-	-	-	-
18S-10500-935-CL	9.6	92694	46404	58625	162907	77472	105839	-	-	-	-	-	-
18S-10500-1000-CL	8.4	92538	46296	58425	-	-	-	-	-	-	-	-	-
18S-10500-1100-CL	7.0	92276	46115	58091	-	-	-	-	-	-	-	-	-
18S-10500-1200-CL	5.9	91989	45917	57725	-	-	-	-	-	-	-	-	-
18S-10500-1300-CL	5.0	91678	45702	57327	-	-	-	-	-	-	-	-	-
18S-11000-935-CL	10.2	104062	54199	73136	148597	68967	92024	173412	83695	115981	-	-	-
18S-11000-1000-CL	8.9	103905	54092	72936	-	-	-	-	-	-	-	-	-
18S-11000-1100-CL	7.4	103643	53913	72602	-	-	-	-	-	-	-	-	-
18S-11000-1200-CL	6.2	103357	53717	72236	-	-	-	-	-	-	-	-	-
18S-11000-1300-CL	5.3	103045	53504	71839	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO OPEN. MODELS 1.5S-1100-385-OP TO 1.5S-1200-585-OP

MOP (bar g) BTO RTO ETO					Operating supply pressure (bar g)											
					3			3.5			4			4.5		
Model	(bar g)	BTO	RTO	ETO	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
1.5S-1100-385-OP	12.0	6777	2589	2847	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1100-435-OP	9.5	6761	2579	2831	-	-	-	-	-	-	4267	1163	1163	5236	2329	2400
1.5S-1100-485-OP	7.6	6750	2572	2822	3733	481	481	4938	2020	2020	6143	2977	3559	7347	3809	5098
1.5S-1100-535-OP	6.3	6748	2571	2819	5298	2375	2480	6764	3409	4353	8230	4409	6225	9696	5397	8098
1.5S-1100-585-OP	5.2	6716	2550	2788	6991	3564	4642	8743	4756	6881	10496	5934	9119	12249	7107	11358
1.5S-1200-385-OP	12.0	7926	3315	3990	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1200-435-OP	10.1	7910	3305	3975	-	-	-	-	-	-	-	-	-	4090	977	977
1.5S-1200-485-OP	8.1	7900	3299	3965	-	-	-	3792	596	596	4997	2135	2135	6201	3031	3674
1.5S-1200-535-OP	6.7	7898	3297	3963	4152	1056	1056	5618	2620	2929	7084	3640	4801	8550	4636	6674
1.5S-1200-585-OP	5.5	7865	3278	3931	5845	2780	3218	7597	3990	5457	9350	5175	7696	11103	6351	9934

MOP (bar g) BTO RTO ETO					Operating supply pressure (bar g)											
					5			5.5			6			7		
Model	(bar g)	BTO	RTO	ETO	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
1.5S-1100-385-OP	12.0	6777	2589	2847	4120	974	974	4879	1944	1944	5638	2621	2914	7156	3678	4853
1.5S-1100-435-OP	9.5	6761	2579	2831	6205	3021	3638	7174	3690	4876	8143	4350	6114	10081	5656	8590
1.5S-1100-485-OP	7.6	6750	2572	2822	8552	4627	6636	9757	5438	8175	10961	6246	9714	13371	7856	12792
1.5S-1100-535-OP	6.3	6748	2571	2819	11162	6380	9970	12628	7360	11843	14094	8338	13715	-	-	-
1.5S-1100-585-OP	5.2	6716	2550	2788	14001	8276	13597	-	-	-	-	-	-	-	-	-
1.5S-1200-385-OP	12.0	7926	3315	3990	-	-	-	3733	520	520	4492	1490	1490	6010	2897	3429
1.5S-1200-435-OP	10.1	7910	3305	3975	5059	2211	2215	6028	2910	3452	6997	3581	4690	8935	4896	7166
1.5S-1200-485-OP	8.1	7900	3299	3965	7406	3860	5213	8611	4677	6751	9815	5488	8290	12225	7101	11368
1.5S-1200-535-OP	6.7	7898	3297	3963	10016	5622	8546	11482	6604	10419	12948	7583	12291	-	-	-
1.5S-1200-585-OP	5.5	7865	3278	3931	12855	7522	12173	14608	8691	14412	-	-	-	-	-	-

MOP (bar g) BTO RTO ETO					Operating supply pressure (bar g)											
					9			10			12					
Model	(bar g)	BTO	RTO	ETO	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
1.5S-1100-385-OP	12.0	6777	2589	2847	10192	5731	8732	11711	6747	10671	14747	8774	14550	-	-	-
1.5S-1100-435-OP	9.5	6761	2579	2831	13958	8247	13542	-	-	-	-	-	-	-	-	-
1.5S-1100-485-OP	7.6	6750	2572	2822	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1100-535-OP	6.3	6748	2571	2819	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1100-585-OP	5.2	6716	2550	2788	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1200-385-OP	12.0	7926	3315	3990	9046	4971	7308	10565	5991	9247	13601	8019	13126	-	-	-
1.5S-1200-435-OP	10.1	7910	3305	3975	12812	7493	12118	14750	8786	14594	-	-	-	-	-	-
1.5S-1200-485-OP	8.1	7900	3299	3965	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1200-535-OP	6.7	7898	3297	3963	-	-	-	-	-	-	-	-	-	-	-	-
1.5S-1200-585-OP	5.5	7865	3278	3931	-	-	-	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO OPEN. MODELS 3S-2000-385-OP TO 14S-8300-935-OP

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)											
					3			3.5			4			4.5		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
3S-2000-385-OP	12.0	11460	5082	6413	-	-	-	-	-	-	-	-	-	-	-	-
3S-2000-435-OP	11.0	11434	5066	6386	-	-	-	-	-	-	5655	1417	1417	7284	3231	3439
3S-2000-485-OP	8.9	11417	5056	6370	4758	304	304	6783	2818	2818	8808	4293	5331	10832	5660	7845
3S-2000-535-OP	7.3	11413	5054	6366	7389	3306	3570	9853	5002	6629	12316	6649	9688	14780	8281	12746
3S-2000-585-OP	6.1	11360	5021	6313	10233	5258	7101	13179	7221	10758	16124	9168	14416	19070	11107	18073
6S-2500-485-OP	12.0	16307	7415	9589	-	-	-	-	-	-	8100	2527	2527	10472	4816	5461
6S-2500-535-OP	11.3	16303	7412	9585	6438	471	471	9324	3994	4041	12210	6011	7610	15097	7949	11180
6S-2500-585-OP	9.4	16240	7374	9523	9769	4318	4592	13220	6693	8860	16671	8996	13128	20122	11276	17396
6S-2500-635-OP	8.0	16172	7333	9455	13399	6813	9080	17465	9522	14109	21531	12205	19138	25597	14876	24167
6S-2500-735-OP	6.0	16020	7240	9303	21550	12217	19161	26997	15794	25899	32445	19366	32637	37892	22937	39374
6S-3800-535-OP	12.0	22273	10680	14589	-	-	-	-	-	-	7090	214	214	9976	3784	3784
6S-3800-585-OP	10.3	22211	10642	14527	-	-	-	8100	1463	1463	11551	5212	5731	15002	7579	10000
6S-3800-635-OP	8.7	22143	10601	14459	8278	1684	1684	12344	5768	6713	16410	8524	11742	20476	11225	16771
6S-3800-735-OP	6.5	21991	10510	14307	16429	8537	11765	21877	12151	18502	27324	15736	25240	32772	19309	31978
14S-5100-635-OP	12.0	27158	12811	17370	-	-	-	11347	4235	4235	15715	7832	9814	20082	10813	15393
14S-5100-735-OP	10.3	26989	12711	17207	15735	7846	9840	21586	11828	17314	27438	15755	24789	33289	19661	32264
14S-5100-785-OP	9.0	26895	12655	17117	20592	11158	16044	27266	15640	24570	33941	20096	33096	40615	24549	41622
14S-5100-835-OP	8.0	26795	12596	17020	25768	14638	22656	33320	19682	32303	40872	24720	41950	48424	29758	51597
14S-5100-885-OP	7.1	26689	12533	16918	31264	18310	29676	39747	23970	40513	48231	29629	51350	56714	35286	62187
14S-5100-935-OP	6.4	26577	12466	16809	37079	22190	37105	46548	28507	49201	56017	34821	61297	65486	41130	73393
14S-5400-635-OP	12.0	35100	15878	20665	-	-	-	-	-	-				16352	5555	5555
14S-5400-735-OP	11.0	34931	15777	20502	-	-	-	17856	7476	7476	23708	11858	14951	29559	15853	22425
14S-5400-785-OP	9.6	34837	15721	20412	16862	6206	6206	23536	11740	14732	30211	16294	23258	36885	20787	31784
14S-5400-835-OP	8.5	34737	15661	20315	22038	10698	12818	29590	15874	22465	37142	20959	32112	44694	26011	41758
14S-5400-885-OP	7.6	34631	15598	20213	27534	14479	19838	36017	20204	30675	44501	25882	41512	52984	31541	52349
14S-5400-935-OP	6.8	34519	15530	20104	33349	18411	27267	42818	24758	39363	52287	31077	51459	61756	37394	63554
14S-8300-735-OP	11.8	44975	20479	26826	-	-	-	-	-	-	17029	2508	2508	22880	9983	9983
14S-8300-785-OP	10.4	44881	20423	26736	-	-	-	16857	2289	2289	23532	10477	10815	30207	15195	19342
14S-8300-835-OP	9.2	44781	20363	26639	-	-	-	22911	10013	10022	30463	15372	19669	38015	20517	29316
14S-8300-885-OP	8.1	44675	20300	26537	20855	7396	7396	29338	14595	18233	37822	20386	29069	46305	26097	39906
14S-8300-935-OP	7.3	44563	20233	26428	26670	12733	14824	36139	19248	26920	45609	25629	39016	55078	31968	51112

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO OPEN. MODELS 3S-2000-385-OP TO 14S-8300-935-OP

Model	MOP (bar g)	Operating supply pressure (bar g)														
		BTO	RTO	ETO	5			5.5			6			7		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
3S-2000-385-OP	12.0	11460	5082	6413	5407	1110	1110	6683	2694	2694	7959	3708	4278	10511	5444	7446
3S-2000-435-OP	11.0	11434	5066	6386	8913	4365	5462	10541	5465	7484	12170	6552	9506	15428	8709	13551
3S-2000-485-OP	8.9	11417	5056	6370	12857	7008	10359	14882	8348	12873	16907	9683	15387	20956	12346	20415
3S-2000-535-OP	7.3	11413	5054	6366	17244	9905	15805	19708	11526	18864	22171	13144	21923	27099	16382	28041
3S-2000-585-OP	6.1	11360	5021	6313	22016	13042	21730	24962	14978	25388	27908	16913	29045	-	-	-
6S-2500-485-OP	12.0	16307	7415	9589	12844	6440	8394	15216	8029	11328	17588	9603	14262	22332	12731	20129
6S-2500-535-OP	11.3	16303	7412	9585	17983	9864	14750	20869	11769	18320	23755	13667	21890	29528	17453	29029
6S-2500-585-OP	9.4	16240	7374	9523	23573	13547	21664	27024	15812	25933	30475	18074	30201	37377	22600	38737
6S-2500-635-OP	8.0	16172	7333	9455	29663	17542	29196	33729	20208	34225	37795	22874	39254	45928	28205	49312
6S-2500-735-OP	6.0	16020	7240	9303	43340	26509	46112	48788	30080	52850	54235	33652	59587	-	-	-
6S-3800-535-OP	12.0	22273	10680	14589	12862	6126	7353	15748	8081	10923	18635	10005	14493	24407	13819	21632
6S-3800-585-OP	10.3	22211	10642	14527	18453	9884	14268	21904	12169	18536	25355	14442	22804	32257	18972	31341
6S-3800-635-OP	8.7	22143	10601	14459	24542	13908	21800	28609	16580	26829	32675	19246	31858	40807	24577	41916
6S-3800-735-OP	6.5	21991	10510	14307	38219	22881	38715	43667	26453	45453	49115	30024	52191	-	-	-
14S-5100-635-OP	12.0	27158	12811	17370	24450	13754	20972	28817	16678	26551	33185	19592	32130	41920	25419	43288
14S-5100-735-OP	10.3	26989	12711	17207	39140	23565	39738	44992	27469	47213	50843	31372	54687	62546	39171	69636
14S-5100-785-OP	9.0	26895	12655	17117	47290	29002	50148	53965	33454	58675	60639	37900	67201	73988	46793	84253
14S-5100-835-OP	8.0	26795	12596	17020	55976	34794	61244	63528	39825	70890	71080	44856	80537	86183	54910	99831
14S-5100-885-OP	7.1	26689	12533	16918	65198	40937	73024	73681	46589	83860	82164	52235	94697	99131	63527	116371
14S-5100-935-OP	6.4	26577	12466	16809	74956	47438	85488	84425	53740	97584	93894	60041	109680	-	-	-
14S-5400-635-OP	12.0	35100	15878	20665	20720	9770	11134	25087	12808	16713	29455	15783	22292	38190	21662	33450
14S-5400-735-OP	11.0	34931	15777	20502	35410	19797	29900	41262	23717	37374	47113	27625	44849	58816	35432	59798
14S-5400-785-OP	9.6	34837	15721	20412	43560	25254	40310	50235	29707	48836	56909	34160	57362	70258	43065	74415
14S-5400-835-OP	8.5	34737	15661	20315	52246	31049	51405	59798	36087	61052	67350	41125	70699	82453	51198	89993
14S-5400-885-OP	7.6	34631	15598	20213	61468	37201	63185	69951	42860	74022	78434	48520	84859	95401	59824	106532
14S-5400-935-OP	6.8	34519	15530	20104	71226	43711	75650	80695	50027	87746	90164	56335	99842	-	-	-
14S-8300-735-OP	11.8	44975	20479	26826	28732	14174	17457	34583	18190	24932	40434	22150	32407	52137	30001	47356
14S-8300-785-OP	10.4	44881	20423	26736	36881	19750	27868	43556	24251	36394	50230	28726	44920	63580	37639	61972
14S-8300-835-OP	9.2	44781	20363	26639	45567	25601	38963	53119	30658	48610	60671	35699	58257	75775	45775	77550
14S-8300-885-OP	8.1	44675	20300	26537	54789	31775	50743	63272	37434	61580	71756	43094	72416	88723	54413	94090
14S-8300-935-OP	7.3	44563	20233	26428	64547	38285	63208	74016	44602	75304	83485	50919	87400	102423	63550	111591

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO OPEN. MODELS 3S-2000-385-OP TO 14S-8300-985-OP

Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)								
					9			10			12		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	BTC
3S-2000-385-OP	12.0	11460	5082	6413	15614	8832	13782	18166	10513	16951	23270	13866	23287
3S-2000-435-OP	11.0	11434	5066	6386	21943	12994	21640	25201	15134	25684	-	-	-
3S-2000-485-OP	8.9	11417	5056	6370	-	-	-	-	-	-	-	-	-
3S-2000-535-OP	7.3	11413	5054	6366	-	-	-	-	-	-	-	-	-
3S-2000-585-OP	6.1	11360	5021	6313	-	-	-	-	-	-	-	-	-
6S-2500-485-OP	12.0	16307	7415	9589	31820	18956	31864	36564	22066	37731	46052	28287	49466
6S-2500-535-OP	11.3	16303	7412	9585	41073	25023	43308	46846	28807	50448	-	-	-
6S-2500-585-OP	9.4	16240	7374	9523	51181	31650	55810	-	-	-	-	-	-
6S-2500-635-OP	8.0	16172	7333	9455	-	-	-	-	-	-	-	-	-
6S-2500-735-OP	6.0	16020	7240	9303	-	-	-	-	-	-	-	-	-
6S-3800-535-OP	12.0	22273	10680	14589	35953	21395	35912	41725	25179	43051	53270	32749	57330
6S-3800-585-OP	10.3	22211	10642	14527	46061	28022	48413	52963	32547	56950	-	-	-
6S-3800-635-OP	8.7	22143	10601	14459	-	-	-	-	-	-	-	-	-
6S-3800-735-OP	6.5	21991	10510	14307	-	-	-	-	-	-	-	-	-
14S-5100-635-OP	12.0	27158	12811	17370	59390	37068	65605	68125	42887	76763	85595	54518	99079
14S-5100-735-OP	10.3	26989	12711	17207	85952	54756	99535	97654	62544	114484	-	-	-
14S-5100-785-OP	9.0	26895	12655	17117	100687	64562	118358	-	-	-	-	-	-
14S-5100-835-OP	8.0	26795	12596	17020	-	-	-	-	-	-	-	-	-
14S-5100-885-OP	7.1	26689	12533	16918	-	-	-	-	-	-	-	-	-
14S-5100-935-OP	6.4	26577	12466	16809	-	-	-	-	-	-	-	-	-
14S-5400-635-OP	12.0	35100	15878	20665	55660	33326	55766	64395	39154	66925	81865	50806	89241
14S-5400-735-OP	11.0	34931	15777	20502	82222	51044	89697	93925	58840	104646	-	-	-
14S-5400-785-OP	9.6	34837	15721	20412	96957	60860	108519	-	-	-	-	-	-
14S-5400-835-OP	8.5	34737	15661	20315	-	-	-	-	-	-	-	-	-
14S-5400-885-OP	7.6	34631	15598	20213	-	-	-	-	-	-	-	-	-
14S-5400-935-OP	6.8	34519	15530	20104	-	-	-	-	-	-	-	-	-
14S-8300-735-OP	11.8	44975	20479	26826	75543	45620	77254	87246	53427	92203	-	-	-
14S-8300-785-OP	10.4	44881	20423	26736	90278	55450	96077	103627	64352	113129	-	-	-
14S-8300-835-OP	9.2	44781	20363	26639	105982	65922	116138	-	-	-	-	-	-
14S-8300-885-OP	8.1	44675	20300	26537	-	-	-	-	-	-	-	-	-
14S-8300-935-OP	7.3	44563	20233	26428	-	-	-	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO OPEN. MODELS 18S-9600-835-OP TO 18S-11000-1300-OP

MOP (bar g) BTO RTO ETO					Operating supply pressure (bar g)											
					3			3.5			4			4.5		
Model	(bar g)	BTO	RTO	ETO	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
18S-9600-835-OP	12.0	71007	29097	34300	-	-	-	-	-	-	-	-	-	38605	9520	9520
18S-9600-935-OP	9.7	70755	28943	34057	-	-	-	36447	6766	6766	47340	20669	20672	58233	28479	34578
18S-9600-1000-OP	8.6	70577	28833	33885	34800	4664	4664	47261	20571	20571	59721	29514	36478	72181	38054	52385
18S-9600-1100-OP	7.0	70279	28650	33597	50239	22812	24372	65316	33370	43620	80393	43616	62867	95470	53755	82115
18S-9600-1200-OP	5.5	69952	28449	33282	67147	34624	45958	85090	46782	68864	103033	58821	91770	120976	70806	114676
18S-9600-1300-OP	5.0	69598	28232	32940	85526	47075	69421	106584	61196	96304	127642	75252	123187	148700	89295	150069
18S-9800-835-OP	12.0	90360	36648	42752	-	-	-	-	-	-	-	-	-	-	-	-
18S-9800-935-OP	10.5	90109	36493	42509	-	-	-	-	-	-	-	-	-	-	-	-
18S-9800-1000-OP	9.2	89930	36383	42337	-	-	-	-	-	-	50246	12503	12503	62707	27761	28410
18S-9800-1100-OP	7.6	89632	36198	42049	-	-	-	55841	19646	19646	70918	33683	38893	85995	44140	58141
18S-9800-1200-OP	6.4	89306	35996	41734	57673	21984	21984	75616	36977	44890	93559	49296	67796	111501	61425	90702
18S-9800-1300-OP	5.4	88951	35777	41392	76052	37280	45447	97110	51709	72330	118168	65908	99212	139226	80013	126095
18S-10500-935-OP	10.9	105334	42899	50258	-	-	-	-	-	-	-	-	-	-	-	-
18S-10500-1000-OP	9.5	105156	42790	50086	-	-	-	-	-	-	-	-	-	54253	9550	9550
18S-10500-1100-OP	7.8	104858	42607	49798	-	-	-	-	-	-	62464	20032	20032	77541	35772	39280
18S-10500-1200-OP	6.6	104531	42406	49483	49219	3123	3123	67161	26029	26029	85104	41130	48935	103047	53506	71841
18S-10500-1300-OP	5.5	104176	42188	49141	67598	26586	26586	88656	43607	53469	109714	58043	80352	130771	72267	107234
18S-11000-935-OP	1.4	118281	50792	62758	-	-	-	-	-	-	-	-	-	-	-	-
18S-11000-1000-OP	10.0	118103	50684	62585	-	-	-	-	-	-	-	-	-	-	-	-
18S-11000-1100-OP	8.3	117805	50504	62298	-	-	-	-	-	-	-	3993	3993	64977	23241	23241
18S-11000-1200-OP	6.9	117478	50306	61983	-	-	-	54598	9990	9990	72541	32126	32896	90484	44876	55803
18S-11000-1300-OP	5.5	117124	50091	61640	55034	10547	10547	76092	34727	37430	97150	49470	64313	118208	63796	91196

MOP (bar g) BTO RTO ETO					Operating supply pressure (bar g)											
					5			5.5			6			7		
Model	(bar g)	BTO	RTO	ETO	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	ETC
18S-9600-835-OP	12.0	71007	29097	34300	47292	20611	20611	55980	26903	31701	64668	32925	42792	82043	44730	64974
18S-9600-935-OP	9.7	70755	28943	34057	69126	35975	48485	80020	43364	62391	90913	50698	76297	112699	65285	104110
18S-9600-1000-OP	8.6	70577	28833	33885	84642	46480	68292	97102	54850	84198	109562	63188	100105	134483	79814	131919
18S-9600-1100-OP	7.0	70279	28650	33597	110547	63846	101362	125624	73906	120610	140701	83960	139857	170855	104070	178352
18S-9600-1200-OP	5.5	69952	28449	33282	138919	82772	137582	156862	94738	160488	-	-	-	-	-	-
18S-9600-1300-OP	5.0	69598	28232	32940	169758	103339	176952	-	-	-	-	-	-	-	-	-
18S-9800-835-OP	12.0	90360	36648	42752	-	-	-	46505	7727	7727	55193	18818	18818	72568	34846	41000
18S-9800-935-OP	10.5	90109	36493	42509	59652	24510	24510	70545	33419	38417	81438	41010	52323	103224	55845	80136
18S-9800-1000-OP	9.2	89930	36383	42337	75167	36665	44317	87627	45254	60224	100088	53724	76131	125008	70497	107945
18S-9800-1100-OP	7.6	89632	36198	42049	101072	54389	77388	116149	64553	96635	131226	74664	115883	161380	94802	154378
18S-9800-1200-OP	6.4	89306	35996	41734	129444	73472	113608	147387	85470	136514	165330	97436	159420	-	-	-
18S-9800-1300-OP	5.4	88951	35777	41392	160284	94071	152978	-	-	-	-	-	-	-	-	-
18S-10500-935-OP	10.9	105334	42899	50258	51198	5650	5650	62091	19556	19556	72984	32454	33462	94770	47836	61275
18S-10500-1000-OP	9.5	105156	42790	50086	66713	25457	25457	79173	36941	41364	91634	45671	57271	116554	62678	89085
18S-10500-1100-OP	7.8	104858	42607	49798	92618	46351	58527	107695	56671	77775	122772	66880	97022	152926	87130	135517
18S-10500-1200-OP	6.6	104531	42406	49483	120990	65678	94747	138933	77750	117654	156876	89771	140560	-	-	-
18S-10500-1300-OP	5.5	104176	42188	49141	151829	86396	134117	172887	100473	161000	-	-	-	-	-	-
18S-11000-935-OP	11.4	118281	50792	62758	-	-	-	49527	3517	3517	60420	17423	17423	82207	39093	45236
18S-11000-1000-OP	10.0	118103	50684	62585	54149	9418	9418	66610	25325	25325	79070	36868	41232	103991	54150	73046
18S-11000-1100-OP	8.3	117805	50504	62298	80054	37568	42488	95131	48084	61736	110208	58379	80983	140362	78709	119478
18S-11000-1200-OP	6.9	117478	50306	61983	108426	57168	78709	126369	69303	101615	144312	81359	124521	-	-	-
18S-11000-1300-OP	5.5	117124	50091	61640	139266	77973	118078	160324	92077	144961	-	-	-	-	-	-

NOTES

MOP: Maximum Operating Pressure

BTC: Break to Close

RTC: Run to Close

ETC: End to Close

BTO: Break to Open

RTO: Run to Open

ETO: End to Open

MORIN

ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OUTPUT TORQUES (Nm) - SYMMETRIC YOKE DESIGN, SPRING TO OPEN. MODELS 18S-9600-835-OP TO 18S-11000-1300-OP

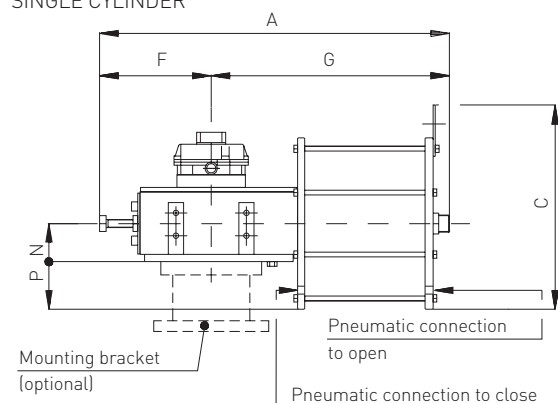
Model	MOP (bar g)	BTO	RTO	ETO	Operating supply pressure (bar g)								
					9			10			12		
					BTC	RTC	ETC	BTC	RTC	ETC	BTC	RTC	BTC
18S-9600-835-OP	12.0	71007	29097	34300	116793	68017	109337	134169	79604	131518	168919	102779	175881
18S-9600-935-OP	9.7	70755	28943	34057	156272	94344	159735	-	-	-	-	-	-
18S-9600-1000-OP	8.6	70577	28833	33885	-	-	-	-	-	-	-	-	-
18S-9600-1100-OP	7.0	70279	28650	33597	-	-	-	-	-	-	-	-	-
18S-9600-1200-OP	5.5	69952	28449	33282	-	-	-	-	-	-	-	-	-
18S-9600-1300-OP	5.0	69598	28232	32940	-	-	-	-	-	-	-	-	-
18S-9800-835-OP	12.0	90360	36648	42752	107319	58608	85363	124694	70286	107544	159445	93512	151907
18S-9800-935-OP	10.5	90109	36493	42509	146797	85076	135761	168583	99606	163573	-	-	-
18S-9800-1000-OP	9.2	89930	36383	42337	174850	103785	171573	-	-	-	-	-	-
18S-9800-1100-OP	7.6	89632	36198	42049	-	-	-	-	-	-	-	-	-
18S-9800-1200-OP	6.4	89306	35996	41734	-	-	-	-	-	-	-	-	-
18S-9800-1300-OP	5.4	88951	35777	41392	-	-	-	-	-	-	-	-	-
18S-10500-935-OP	10.9	105334	42899	50258	138343	77354	116900	160129	91947	144713	-	-	-
18S-10500-1000-OP	9.5	105156	42790	50086	166396	96137	152713	-	-	-	-	-	-
18S-10500-1100-OP	7.8	104858	42607	49798	-	-	-	-	-	-	-	-	-
18S-10500-1200-OP	6.6	104531	42406	49483	-	-	-	-	-	-	-	-	-
18S-10500-1300-OP	5.5	104176	42188	49141	-	-	-	-	-	-	-	-	-
18S-11000-935-OP	1.4	118281	50792	62758	125779	68905	100861	147565	83542	128674	-	-	-
18S-11000-1000-OP	10.0	118103	50684	62585	153832	87736	136674	178753	104385	168488	-	-	-
18S-11000-1100-OP	8.3	117805	50504	62298	-	-	-	-	-	-	-	-	-
18S-11000-1200-OP	6.9	117478	50306	61983	-	-	-	-	-	-	-	-	-
18S-11000-1300-OP	5.5	117124	50091	61640	-	-	-	-	-	-	-	-	-

NOTES
MOP: Maximum Operating Pressure
BTC: Break to Close
RTC: Run to Close
ETC: End to Close
BTO: Break to Open
RTO: Run to Open
ETO: End to Open

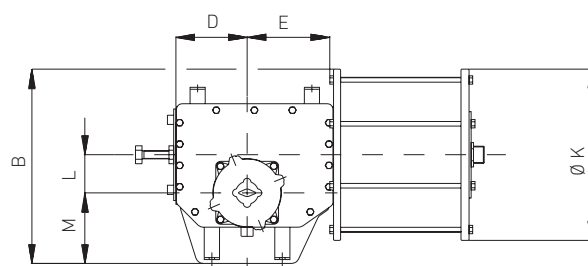
MORIN ALGA DOUBLE ACTING PNEUMATIC ACTUATOR

OVERALL DIMENSIONS - SINGLE CYLINDER / TWO CYLINDERS

SINGLE CYLINDER



Top view

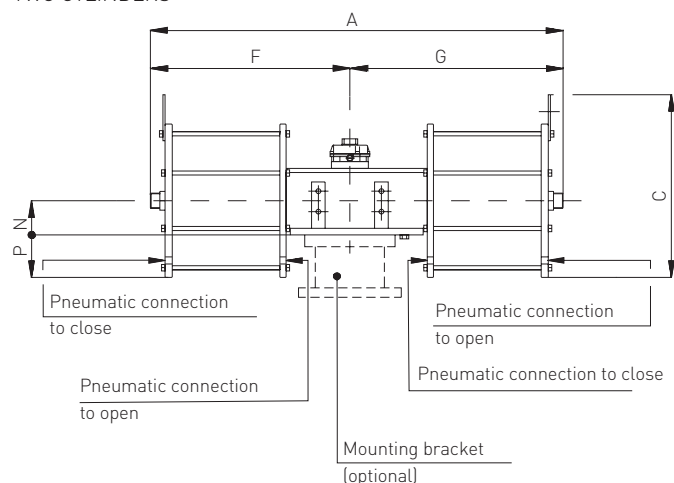


DIMENSIONS (mm)

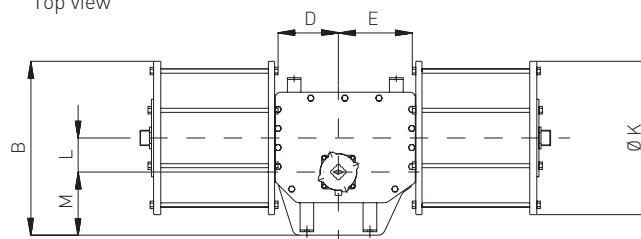
Model	A	B	C	D	E	F	G	ØK	L	M	N	P	Pneumatic connection*		Weight (kg)	Air consumption (liters)
													Close	Open		
1.5-280	992	469	361	187	227	310	682	345	100	185	100	73	1/2	3/4	166	16
1.5-335	989	485	477	187	227	310	680	400	100	185	100	100	1/2	1	194	23
1.5-385	992	510	536	187	227	310	683	450	100	185	100	125	1/2	1	227	31
3-335	1313	586	477	285	330	391	921	400	160	215	106	95	1/2	1	265	36
3-385	1316	600	536	285	330	391	924	450	160	215	106	120	1/2	1	308	47
3-435	1316	625	579	285	330	391	925	500	160	215	106	142	3/4	1	370	60
3-485	1321	655	639	285	330	391	930	560	160	215	106	175	3/4	1	388	74
6-485	1497	740	639	327	379	430	1067	560	185	260	140	140	3/4	1	512	85
6-535	1508	755	705	327	379	430	1078	670	185	260	140	170	3/4	1	660	104
6-585	1505	780	758	327	379	430	1075	670	185	260	140	195	3/4	1	704	124
14-635	1676	855	809	376	435	497	1179	720	200	295	193	167	1	1	1250	159
14-735	1810	902	914	376	435	497	1313	815	200	295	193	217	1	1	1475	213
18-635	1927	940	813	425	493	546	1381	730	230	340	193	172	1	1	799	184
18-685	1952	955	889	425	493	546	1406	770	230	340	193	192	1	1	1550	208
18-735	1955	980	914	425	493	546	1409	820	230	340	193	217	1	1	1650	239

* Pneumatic connection NPT (in)

TWO CYLINDERS



Top view



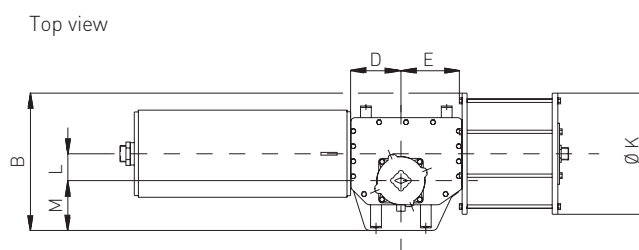
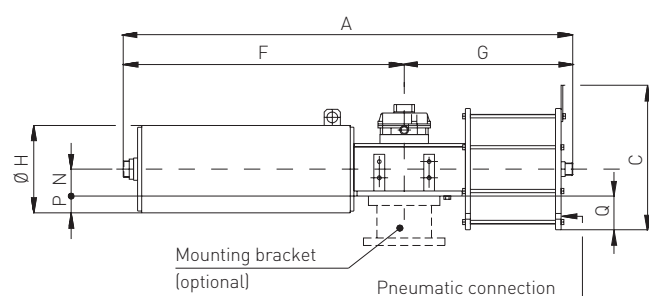
DIMENSIONS (mm)

Model	A	B	C	D	E	F	G	ØK	L	M	N	P	Pneumatic connection*		Weight (kg)	Air consumption (liters)
													Close	Open		
18#2-635	2694	940	813	425	493	1313	1381	730	230	340	193	172	1	1	1283	357
18#2-685	2744	955	889	425	493	1338	1406	770	230	340	193	192	1	1	2040	416

* Pneumatic connection NPT (in)

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OVERALL DIMENSIONS - SPRING TO CLOSE, MODELS 1.5-1100-385-CL TO 14-8300-935-CL

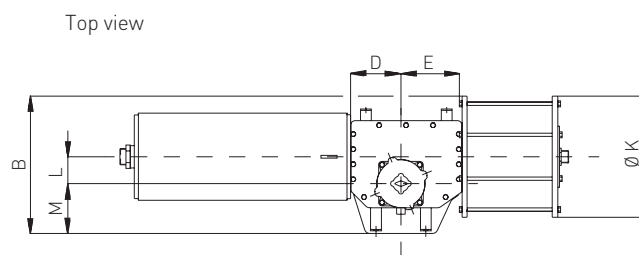
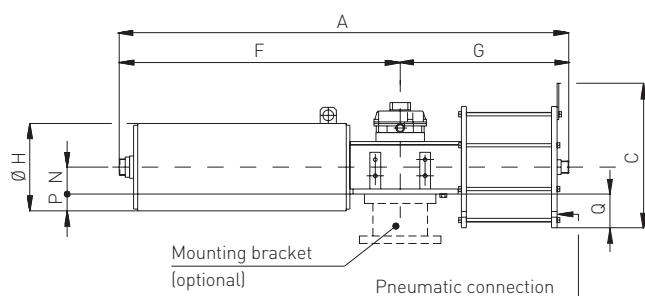


DIMENSIONS (mm)

Model	A	B	C	D	E	F	G	H	K	L	M	N	P	Q	NPT (in)	Weight (kg)	Air consumption (liters)
1.5-1100-385-CL	1691	510	536	187	227	1048	643	400	450	100	185	100	100	125	1	476	31
1.5-1100-435-CL	1691	535	579	187	227	1048	643	400	500	100	185	100	100	150	1	511	39
1.5-1100-485-CL	1697	565	639	187	227	1048	649	400	560	100	185	100	100	180	1	547	48
1.5-1100-535-CL	1706	620	710	187	227	1048	658	400	620	100	185	100	100	210	1	564	59
1.5-1100-585-CL	1701	670	758	187	227	1048	653	400	670	100	185	100	100	235	1	581	70
1.5-1200-385-CL	1760	510	536	187	227	1117	643	322	450	100	185	100	61	125	1	478	31
1.5-1200-435-CL	1760	535	579	187	227	1117	643	322	500	100	185	100	61	150	1	503	39
1.5-1200-485-CL	1766	565	639	187	227	1117	649	322	560	100	185	100	61	180	1	539	48
1.5-1200-535-CL	1775	620	710	187	227	1117	658	322	620	100	185	100	61	210	1	556	59
1.5-1200-585-CL	1770	670	758	187	227	1117	653	322	670	100	185	100	61	235	1	573	70
3-2000-385-CL	2354	600	536	285	330	1474	880	415	450	160	215	106	102	120	1	774	47
3-2000-435-CL	2354	625	582	285	330	1474	880	415	500	160	215	106	102	145	1	809	60
3-2000-485-CL	2359	655	674	285	330	1474	885	415	560	160	215	106	102	175	1	843	74
3-2000-535-CL	2372	685	710	285	330	1474	898	415	620	160	215	106	102	205	1	929	90
3-2000-585-CL	2397	710	758	285	330	1474	923	415	670	160	215	106	102	230	1	1015	108
6-2500-485-CL	2974	740	640	327	379	1958	1016	383	560	185	260	140	52	140	1	1068	85
6-2500-535-CL	2984	754	705	327	379	1958	1024	383	620	185	260	140	52	170	1	1265	104
6-2500-585-CL	2987	780	758	327	379	1958	1029	383	670	185	260	140	52	195	1	1245	124
6-2500-635-CL	3029	805	809	327	379	1958	1071	383	720	185	260	140	52	220	1	1323	146
6-2500-735-CL	3048	853	912	327	379	1958	1090	383	815	185	260	140	52	267	1	1498	196
6-3800-535-CL	3214	755	705	327	379	2186	1028	530	620	185	260	140	125	170	1	1600	104
6-3800-585-CL	3211	780	758	327	379	2186	1025	530	670	185	260	140	125	195	1	1640	124
6-3800-635-CL	3259	805	809	327	379	2188	1071	530	720	185	260	140	125	220	1	1720	146
6-3800-735-CL	3278	853	912	327	379	2188	1090	530	815	185	260	140	125	268	1	1934	196
14-5100-635-CL	3271	890	809	376	435	2151	1120	530	720	200	330	192	72	168	1	1810	159
14-5100-735-CL	3290	938	912	376	435	2151	1138	530	815	200	330	192	72	214	1	2026	213
14-5100-785-CL	3290	973	993	376	435	2151	1138	530	885	200	330	192	72	251	1	2026	243
14-5100-835-CL	3330	992	1036	376	435	2151	1179	530	925	200	330	192	72	270	1	2355	274
14-5100-885-CL	3371	1030	1123	376	435	2151	1220	530	1000	200	330	192	72	307	1	2455	308
14-5100-935-CL	3369	1056	1179	376	435	2151	1218	530	1051	200	330	192	72	334	1	2555	343
14-5400-635-CL	3219	890	809	376	435	2101	1120	530	720	200	330	192	72	167	1	1915	159
14-5400-735-CL	3237	903	912	376	435	2099	1138	530	815	200	295	192	72	215	1	2050	213
14-5400-785-CL	3237	973	993	376	435	2099	1138	530	885	200	330	192	72	251	1	2260	243
14-5400-835-CL	3237	958	1036	376	435	2099	1138	530	925	200	295	192	72	270	1	2250	274
14-5400-885-CL	3172	1030	1123	376	435	2099	1073	530	1000	200	330	192	72	307	1	2455	308
14-5400-935-CL	3314	1051	1179	376	435	2099	1215	530	1051	200	326	192	72	335	1	2600	343
14-8300-735-CL	3300	903	912	376	435	2162	1138	530	815	200	295	192	72	215	1	2100	213
14-8300-785-CL	3300	973	993	376	435	2162	1138	530	885	200	330	192	72	251	1	2540	243
14-8300-835-CL	3300	958	1036	376	435	2162	1138	530	925	200	330	192	72	270	1	2300	274
14-8300-885-CL	3235	1030	1123	376	435	2162	1073	530	1000	200	330	192	72	307	1	2330	308
14-8300-935-CL	3377	1051	1179	376	435	2162	1215	530	1051	200	295	192	72	335	1	2650	343

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OVERALL DIMENSIONS - SPRING TO CLOSE, MODELS 18-9600-835-CL TO 18-11000-1300-CL

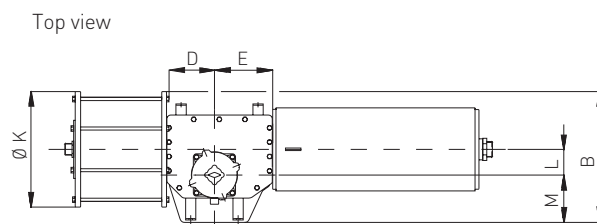
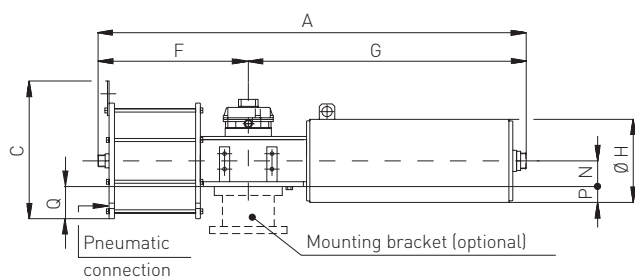


DIMENSIONS (mm)

Model	A	B	C	D	E	F	G	H	K	L	M	N	P	Q	NPT (in)	Weight (kg)	Air consumption (liters)
18-9600-835-CL	4030	1033	1036	427	495	2765	1373	559	925	230	340	196	176	267	2 x 1	3350	318
18-9600-935-CL	4107	1098	1179	427	495	2765	1410	559	1055	230	340	196	176	332	2 x 1	3750	398
18-9600-1000-CL	4110	1145	1264	425	493	2763	1414	559	1120	230	355	193	176	367	2 x 1	3994	456
18-9600-1100-CL	4107	1216	1364	427	495	2765	1414	559	1220	230	340	196	176	414	2 x 1	4350	552
18-9600-1200-CL	4087	1320	1465	425	493	2763	1373	559	1320	230	340	193	176	467	2 x 1	4400	660
18-9600-1300-CL	4152	1420	1575	425	493	2763	1443	559	1420	230	340	193	176	517	2 x 1	5660	770
18-9800-835-CL	4020	1033	1036	427	495	2755	1375	559	925	230	340	196	176	267	2 x 1	3700	318
18-9800-935-CL	4097	1098	1179	427	495	2755	1410	559	1055	230	340	196	176	332	2 x 1	4100	398
18-9800-1000-CL	4100	1145	1264	427	495	2753	1414	559	1120	230	355	193	176	367	2 x 1	4190	456
18-9800-1100-CL	4097	1216	1364	427	495	2755	1414	559	1220	230	340	196	176	414	2 x 1	4700	552
18-9800-1200-CL	4077	1320	1465	427	495	2753	1394	559	1320	230	340	196	176	467	2 x 1	5080	660
18-9800-1300-CL	4142	1420	1575	427	495	2753	1447	559	1420	230	340	193	176	517	2 x 1	5820	770
18-10500-935-CL	4183	1098	1179	427	495	2841	1408	670	1055	230	340	196	232	332	2 x 1	4785	398
18-10500-1000-CL	4184	1145	1264	427	495	2837	1415	670	1120	230	355	193	232	367	2 x 1	5026	456
18-10500-1100-CL	4183	1216	1364	427	495	2841	1410	670	1220	230	340	196	232	414	2 x 1	4750	552
18-10500-1200-CL	4161	1245	1465	427	495	2837	1373	670	1320	230	355	193	232	467	2 x 1	5376	660
18-10500-1300-CL	4226	1420	1575	427	495	2837	1457	670	1420	230	340	196	232	514	2 x 1	5376	770
18-11000-935-CL	4065	1098	1179	427	495	2723	1410	670	1055	230	340	196	232	332	2 x 1	4100	398
18-11000-1000-CL	4068	1145	1264	427	495	2721	1415	670	1120	230	355	193	232	367	2 x 1	4700	456
18-11000-1100-CL	4065	1216	1364	427	495	2723	1410	670	1220	230	340	196	232	414	2 x 1	4700	552
18-11000-1200-CL	4049	1320	1465	427	495	2723	1394	670	1320	230	340	196	232	464	2 x 1	4100	660
18-11000-1300-CL	4110	1295	1575	427	495	2721	1456	670	1420	230	355	193	232	517	2 x 1	6470	770

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OVERALL DIMENSIONS - SPRING TO OPEN, MODELS 1.5-1100-385-OP TO 14-8300-935-OP

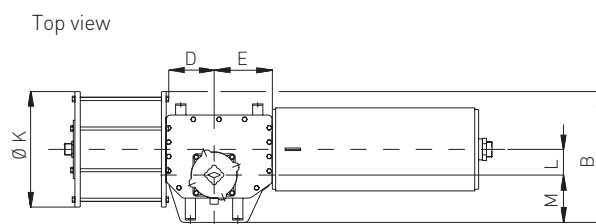
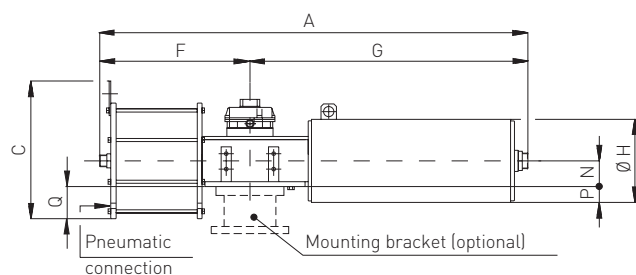


DIMENSIONS (mm)

Model	A	B	C	D	E	F	G	H	K	L	M	N	P	Q	NPT (in)	Weight (kg)	Air consumption (liters)
1.5-1100-385-OP	1691	510	536	187	227	643	1048	400	450	100	185	100	100	125	1	476	31
1.5-1100-435-OP	1691	535	579	187	227	643	1048	400	500	100	185	100	100	150	1	511	39
1.5-1100-485-OP	1697	565	639	187	227	649	1048	400	560	100	185	100	100	180	1	547	48
1.5-1100-535-OP	1706	620	710	187	227	658	1048	400	620	100	185	100	100	210	1	564	59
1.5-1100-585-OP	1701	670	758	187	227	653	1048	400	670	100	185	100	100	235	1	581	70
1.5-1200-385-OP	1760	510	536	187	227	643	1117	322	450	100	185	100	61	125	1	478	31
1.5-1200-435-OP	1760	535	579	187	227	643	1117	322	500	100	185	100	61	150	1	503	39
1.5-1200-485-OP	1766	565	639	187	227	649	1117	322	560	100	185	100	61	180	1	539	48
1.5-1200-535-OP	1775	620	710	187	227	658	1117	322	620	100	185	100	61	210	1	556	59
1.5-1200-585-OP	1770	670	758	187	227	653	1117	322	670	100	185	100	61	235	1	573	70
3-2000-385-OP	2354	600	536	285	330	880	1474	415	450	160	215	106	102	120	1	774	47
3-2000-435-OP	2354	625	582	285	330	880	1474	415	500	160	215	106	102	145	1	809	60
3-2000-485-OP	2359	655	674	285	330	885	1474	415	560	160	215	106	102	175	1	843	74
3-2000-535-OP	2372	685	710	285	330	898	1474	415	620	160	215	106	102	205	1	929	90
3-2000-585-OP	2397	710	758	285	330	923	1474	415	670	160	215	106	102	230	1	1015	108
6-2500-485-OP	2974	740	640	327	379	1016	1958	383	560	185	260	140	52	140	1	1068	85
6-2500-535-OP	2984	754	705	327	379	1024	1958	383	620	185	260	140	52	170	1	1265	104
6-2500-585-OP	2987	780	758	327	379	1029	1958	383	670	185	260	140	52	195	1	1245	124
6-2500-635-OP	3029	805	809	327	379	1071	1958	383	720	185	260	140	52	220	1	1323	146
6-2500-735-OP	3048	853	912	327	379	1090	1958	383	815	185	260	140	52	267	2 x 1	1498	196
6-3800-535-OP	3214	755	705	327	379	1028	2186	530	620	185	260	140	125	170	1	1600	104
6-3800-585-OP	3211	780	758	327	379	1025	2186	530	670	185	260	140	125	195	1	1640	124
6-3800-635-OP	3259	805	809	327	379	1071	2188	530	720	185	260	140	125	220	1	1720	146
6-3800-735-OP	3278	853	912	327	379	1090	2188	530	815	185	260	140	125	268	2 x 1	1934	196
14-5100-635-OP	3271	890	809	376	435	1120	2151	530	720	200	330	192	72	168	1	1810	159
14-5100-735-OP	3290	938	912	376	435	1138	2151	530	815	200	330	192	72	214	2 x 1	2026	213
14-5100-785-OP	3290	973	993	376	435	1138	2151	530	885	200	330	192	72	251	2 x 1	2026	243
14-5100-835-OP	3330	992	1036	376	435	1179	2151	530	925	200	330	192	72	270	2 x 1	2355	274
14-5100-885-OP	3371	1030	1123	376	435	1220	2151	530	1000	200	330	192	72	307	2 x 1	2455	308
14-5100-935-OP	3369	1056	1179	376	435	1218	2151	530	1051	200	330	192	72	334	2 x 1	2555	343
14-5400-635-OP	3219	890	809	376	435	1120	2101	530	720	200	330	192	72	167	1	1915	159
14-5400-735-OP	3237	903	912	376	435	1138	2099	530	815	200	295	192	72	215	2 x 1	2050	213
14-5400-785-OP	3237	973	993	376	435	1138	2099	530	885	200	330	192	72	251	2 x 1	2260	243
14-5400-835-OP	3237	958	1036	376	435	1138	2099	530	925	200	295	192	72	270	2 x 1	2250	274
14-5400-885-OP	3172	1030	1123	376	435	1073	2099	530	1000	200	330	192	72	307	2 x 1	2455	308
14-5400-935-OP	3314	1051	1179	376	435	1215	2099	530	1051	200	326	192	72	335	2 x 1	2600	343
14-8300-735-OP	3300	903	912	376	435	1138	2162	530	815	200	295	192	72	215	2 x 1	2100	213
14-8300-785-OP	3300	973	993	376	435	1138	2162	530	885	200	330	192	72	251	2 x 1	2540	243
14-8300-835-OP	3300	958	1036	376	435	1138	2162	530	925	200	330	192	72	270	2 x 1	2300	274
14-8300-885-OP	3235	1030	1123	376	435	1073	2162	530	1000	200	330	192	72	307	2 x 1	2330	308
14-8300-935-OP	3377	1051	1179	376	435	1215	2162	530	1051	200	295	192	72	335	2 x 1	2650	343

MORIN ALGAS SPRING RETURN PNEUMATIC ACTUATOR

OVERALL DIMENSIONS - SPRING TO OPEN, MODELS 18-9600-835-OP TO 18-11000-1300-OP



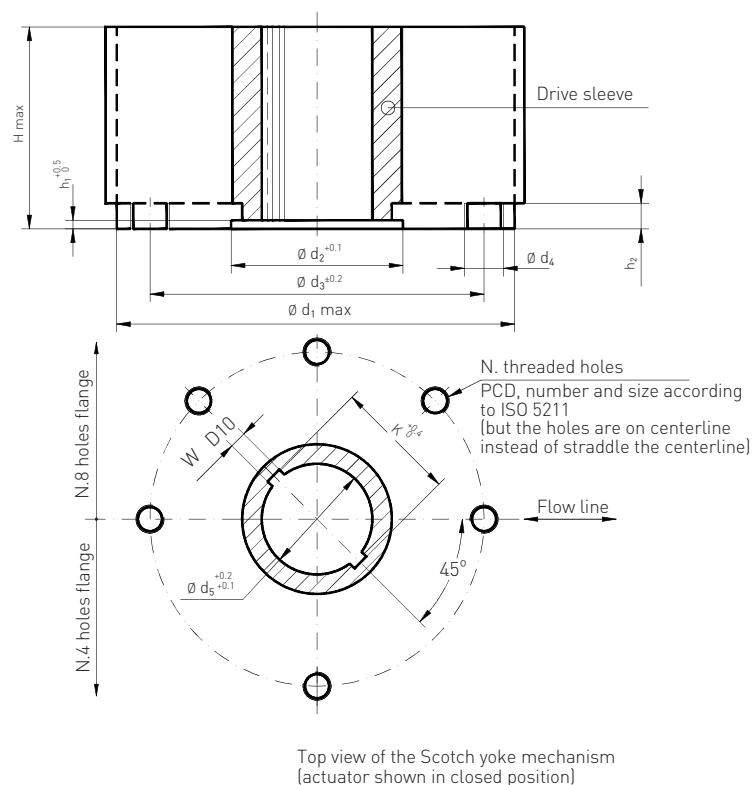
DIMENSIONS (mm)

Model	A	B	C	D	E	F	G	H	K	L	M	N	P	Q	NPT (in)	Weight (kg)	Air consumption (liters)
18-9600-835-OP	4030	1033	1036	427	495	1373	2765	559	925	230	340	196	176	267	2 x 1	3350	318
18-9600-935-OP	4107	1098	1179	427	495	1410	2765	559	1055	230	340	196	176	332	2 x 1	3750	398
18-9600-1000-OP	4110	1145	1264	425	493	1414	2763	559	1120	230	355	193	176	367	2 x 1	3994	456
18-9600-1100-OP	4107	1216	1364	427	495	1414	2765	559	1220	230	340	196	176	414	2 x 1	4350	552
18-9600-1200-OP	4087	1320	1465	425	493	1373	2763	559	1320	230	340	193	176	467	2 x 1	4400	660
18-9600-1300-OP	4152	1420	1575	425	493	1443	2763	559	1420	230	340	193	176	517	2 x 1	5660	770
18-9800-835-OP	4020	1033	1036	427	495	1375	2755	559	925	230	340	196	176	267	2 x 1	3700	318
18-9800-935-OP	4097	1098	1179	427	495	1410	2755	559	1055	230	340	196	176	332	2 x 1	4100	398
18-9800-1000-OP	4100	1145	1264	427	495	1414	2753	559	1120	230	355	193	176	367	2 x 1	4190	456
18-9800-1100-OP	4097	1216	1364	427	495	1414	2755	559	1220	230	340	196	176	414	2 x 1	4700	552
18-9800-1200-OP	4077	1320	1465	427	495	1394	2753	559	1320	230	340	196	176	467	2 x 1	5080	660
18-9800-1300-OP	4142	1420	1575	427	495	1447	2753	559	1420	230	340	193	176	517	2 x 1	5820	770
18-10500-935-OP	4183	1098	1179	427	495	1408	2841	670	1055	230	340	196	232	332	2 x 1	4785	398
18-10500-1000-OP	4184	1145	1264	427	495	1415	2837	670	1120	230	355	193	232	367	2 x 1	5026	456
18-10500-1100-OP	4183	1216	1364	427	495	1410	2841	670	1220	230	340	196	232	414	2 x 1	4750	552
18-10500-1200-OP	4161	1245	1465	427	495	1373	2837	670	1320	230	355	193	232	467	2 x 1	5376	660
18-10500-1300-OP	4226	1420	1575	427	495	1457	2837	670	1420	230	340	196	232	514	2 x 1	5376	770
18-11000-935-OP	4065	1098	1179	427	495	1410	2723	670	1055	230	340	196	232	332	2 x 1	4100	398
18-11000-1000-OP	4068	1145	1264	427	495	1415	2721	670	1120	230	355	193	232	367	2 x 1	4700	456
18-11000-1100-OP	4065	1216	1364	427	495	1410	2723	670	1220	230	340	196	232	414	2 x 1	4700	552
18-11000-1200-OP	4049	1320	1465	427	495	1394	2723	670	1320	230	340	196	232	464	2 x 1	4100	660
18-11000-1300-OP	4110	1295	1575	427	495	1456	2721	670	1420	230	355	193	232	517	2 x 1	6470	770

MORIN ALGA / ALGAS PNEUMATIC ACTUATOR

MOUNTING DIMENSIONS - COUPLINGS MODELS 0.1 TO 6

ACTUATOR MODELS 1.5 TO 6.0



COUPLING DIMENSIONS (mm) MODELS 0.3 TO 0.6 (mm)

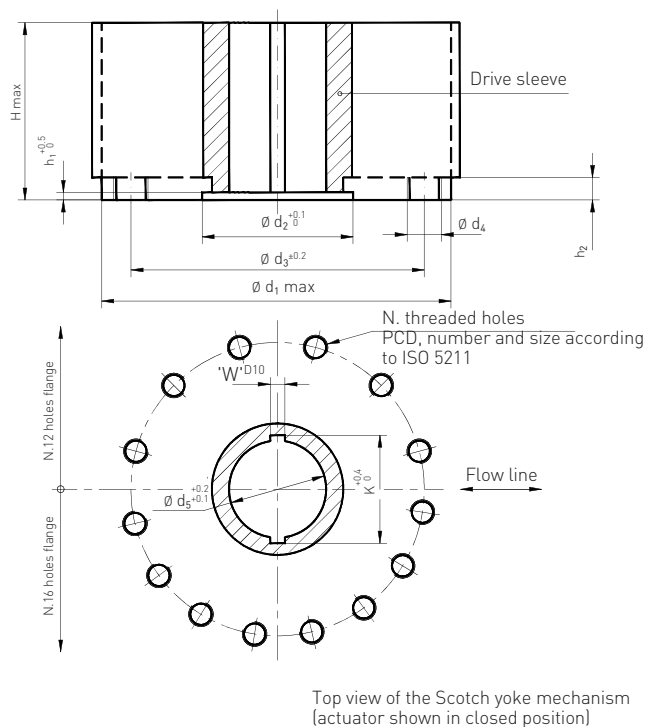
Actuator model	Ø d ₁	Ø d ₂	Ø d ₃	Ø d ₄	N	h ₁	h ₂	H max	Ø d ₅	W	K
1.5	360	144	298	M20	8	6	19	190	112	18	119.0
3	430	195	356	M30	8	9	23	200	157	25	167.8
6	520	250	406	M36	8	14	29	260	200	28	212.8

Ø d₁ is maximum adapter flange diameter.

MORIN ALGA / ALGAS PNEUMATIC ACTUATOR

MOUNTING DIMENSIONS - COUPLINGS MODELS 14 TO 18

ACTUATOR MODELS 14 TO 18



COUPLING DIMENSIONS (mm) MODELS 14 TO 18

Actuator model	$\varnothing d_1$	$\varnothing d_2$	$\varnothing d_3$	$\varnothing d_4$	N	h_1	h_2	H max	$\varnothing d_5$	W	K
14	580	250	483	M36	12	10	29	340	175	45	195.8
18	680	290	603	M36	16	12	32	350	200	45	220.8

$\varnothing d_1$ is maximum adapter flange diameter.

MORIN ALGA / ALGAS PNEUMATIC ACTUATOR

MOUNTING DIMENSIONS - STEM ACCEPTANCE

MOUNTING DIMENSIONS - STEM ACCEPTANCE

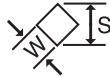
Square key



Rectangular key



Square stem



STEM ACCEPTANCE DIMENSIONS FOR INSERT BUSHES (mm)

Housing size	Max. stem diameter with square key (key dimension)	Max. stem diameter with rectangular key	Square stem		Maximum stem protrusion**
			W	S*	
1.5	85(18)	90	73	103	180
3	120(32)	130	104	147	190
6	150(36)	170	133	188	250
14	175(38)	197	-	-	360
18	200(45)	220	-	-	360

NOTES

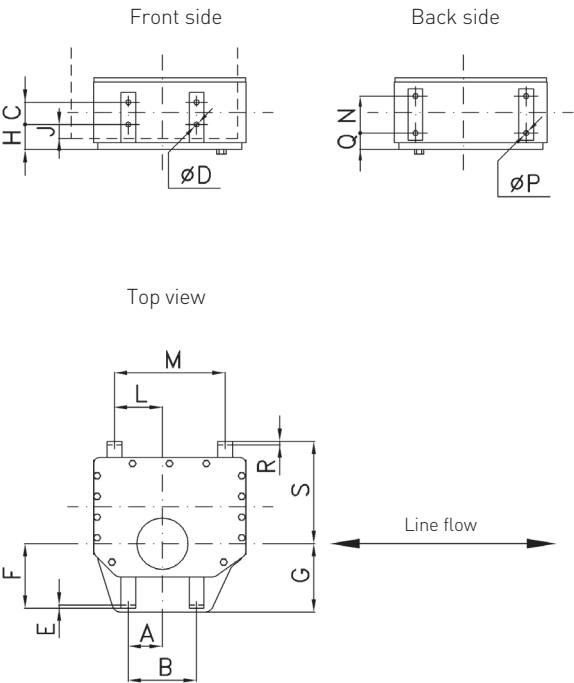
- 1. The listed maximum acceptance values are applicable for stems with keyway parallel or perpendicular to the flow line and for square stems with diagonal parallel with the flow line.
- 2. Key according to UNI6604 or DIN 6885 sh.1 or BS4325 part 1 or ISO 773 or equivalent.
- 3. * S max: maximum external diameter in case of rounded edge.
- 4. ** Without adapter flange.

MORIN ALGA / ALGAS PNEUMATIC ACTUATOR

ACCESSORIES MOUNTING DIMENSIONS

ACCESSORIES MOUNTING DIMENSIONS

Actuator models 1.5 to 18



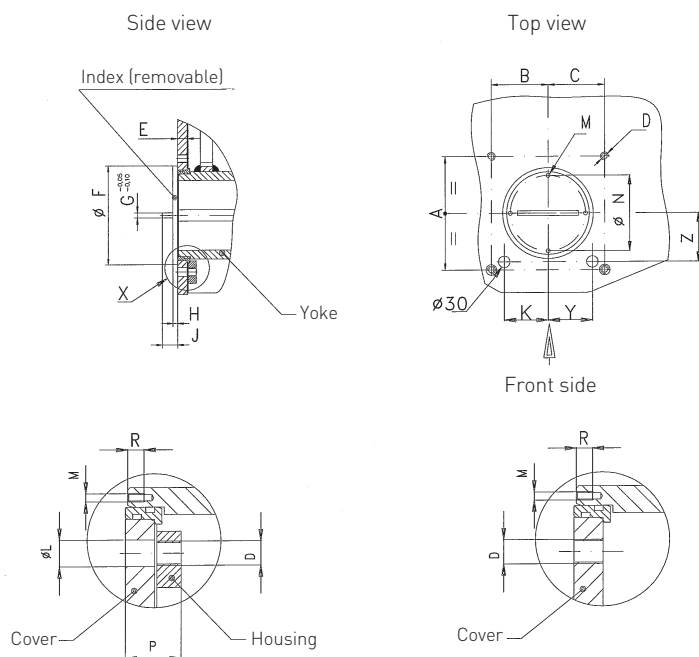
ACCESSORIES MOUNTING DIMENSIONS (mm)

Actuator model	A	B	C	$\varnothing D$	E	F	G	H	J	L	M	N	$\varnothing P$	Q	R	S
1.5	92.5	185	60	14	5	175	185	62	35	130	300	100	14	45	5	284
3	117.5	235	85	23	8	203	215	57	25	230	500	100	14	54	5	371
6	137.0	455	115	23	8	248	260	59	22	224	500	100	14	87	8	480
14	315.0	630	200	27	10	227	330	97	55	220	500	170	27	99	8	543
18	315.0	630	200	27	10	235	340	72	32	306	680	215	27	80	10	600

MORIN ALGA / ALGAS PNEUMATIC ACTUATOR

MOUNTING DIMENSIONS - ACCESSORIES ON ACTUATOR TOP

ACCESSORIES MOUNTING HOLES ON ACTUATOR TOP (COVER AND YOKE)



X : for model

6 - 18

X : for model

3 - 14

The index is represented for actuator in end position (fully open or closed)

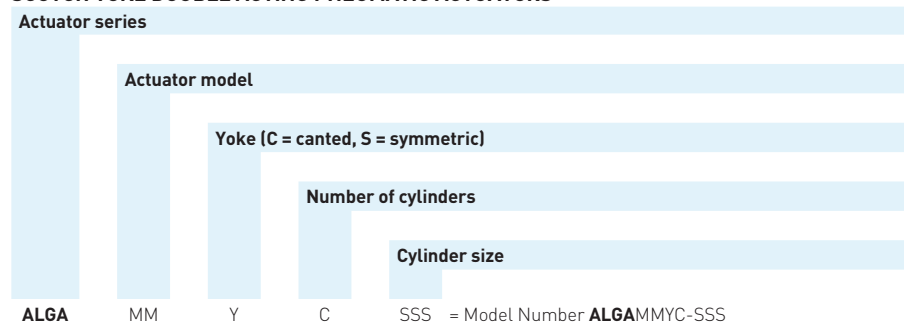
ACCESSORIES MOUNTING HOLES DIMENSIONS (mm)

Actuator model	A	B	C	D	E	Ø F	G	H	J	Ø L	M	Ø N	P	R	K	Y	Z
1.5	140	70	70	4 x M10	12	162.5	6	7	18	11.0	4 x M5	122	22	7	-	-	-
3	160	127	136	4 x M16	12	220	6	8	20	-	4 x M6	171	-	10	107	115	76
6	160	127	136	4 x M16	12	270	6	8	20	16.5	4 x M6	216	30	10	-	-	-
14	160	127	136	4 x M16	15	270	6	6.5	19.5	-	4 x M6	216	-	10	-	-	-
18	314	109	109	4 x M16	18	310	6	8.6	14	16.5	4 x M6	240	35	10	-	-	-

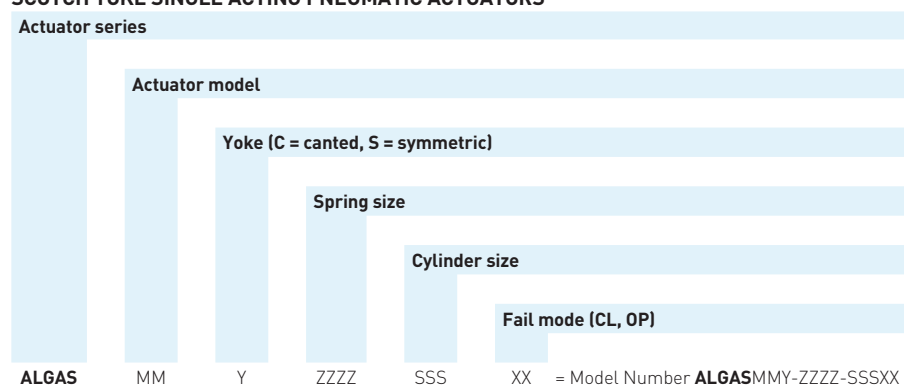
MORIN ALGA / ALGAS PNEUMATIC ACTUATOR

SELECTION GUIDE

SCOTCH YOKE DOUBLE ACTING PNEUMATIC ACTUATORS



SCOTCH YOKE SINGLE ACTING PNEUMATIC ACTUATORS



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