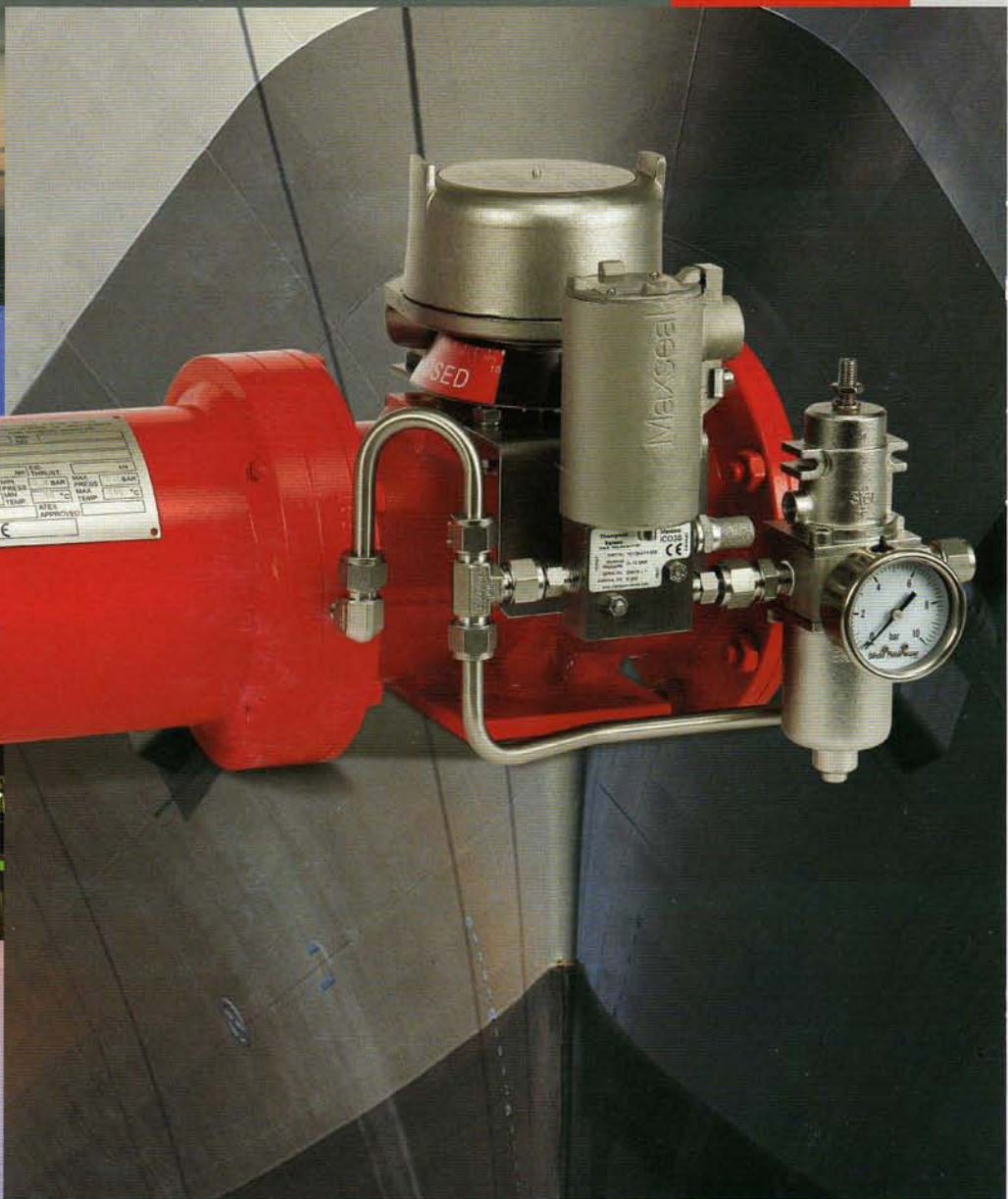
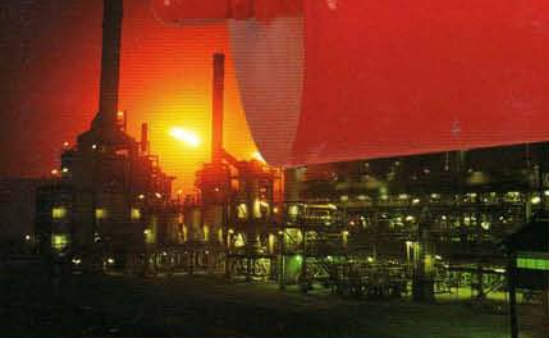


Hydraulic and Pneumatic
Actuator Systems



Camtorc



automation solutions

IN SOME OF THE WORLDS MOST CRITICAL AND DEMANDING APPLICATIONS

MATIC

High Integrity Actuation & Controls

The Camtorc S Type range of actuators provides highly reliable, hydraulic or pneumatic actuation for rotary valves and dampers. The patented design utilises a profiled cam that ensures a constant torque is generated throughout the entire stroke of the actuator.

In addition, the lack of internal gearing means that backlash is eliminated, making the S Type an excellent choice for modulating control applications.

The S Type range is available for hydraulic and pneumatic applications in either double acting or spring return configurations with a full range of control accessories. Actuator bodies, spring cylinders and internal components are of steel construction, with drive shafts of 316 stainless steel.

Hydraulic and Pneumatic Actuator Systems

Actuator Design Criteria

- **Rotation:**
Models S25 to S35: 0° - 90°.
(Optional: 0° - 95° with adjustable end stops available on request).
Model S45 & Above: 0° - 95° with adjustable end stops.
- **Working pressure range:**
Hydraulic actuators - 3 barg (minimum) to 300 barg (maximum).
(Optional: Higher pressure versions up to 700 barg available on request).
Pneumatic actuators - 2.7 barg (minimum) to 10.5 barg (maximum).
(Maximum over-pressure: 15.0 barg).
- **Operating temperature range:**
-30°C to +100°C with standard seals.
(Optional: Higher / lower temperature versions available on request).
- **Weatherproof to IP66.**
- **NAMUR output for limit switch indication.**
- **Operating media:**
Hydraulic actuators - Mineral oil or equal operating fluid.
Pneumatic actuators - Air (dry or lubricated) or non-corrosive gas.

Materials of Construction

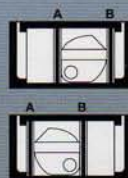
| Description | Material |
|--|---|
| Body | Steel DIN 2448/1629/3-ST35 and BS 10025: S275 |
| End Cap & Intermediate Cap | Steel BS 10025: S275 |
| Pistons, Spacers & Cam | Steel BS 970: 220M07 |
| Drive Shaft | Stainless steel BS 970: 316S16 |
| Hydraulic Cylinder (Hydraulic Actuator Only) | Steel DIN 2448/1629/3-ST35 and BS 10025: S275 |
| Spring Cylinder (Spring Return Only) | Steel DIN 2448/1629/3-ST35 and BS 10025: S275 |
| Spring Piston (Spring Return Only) | Steel BS 10025: S275/BS970: 070M20 |
| Spring Nest (Spring Return Only) | Steel BS 1408-B3 |
| Screws | Steel BS 4168 |
| Seals | Nitrile |

Paint System

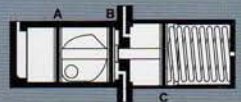
Standard actuators are finished in 2-pack epoxy paint system to offshore standard



Double Acting Actuator

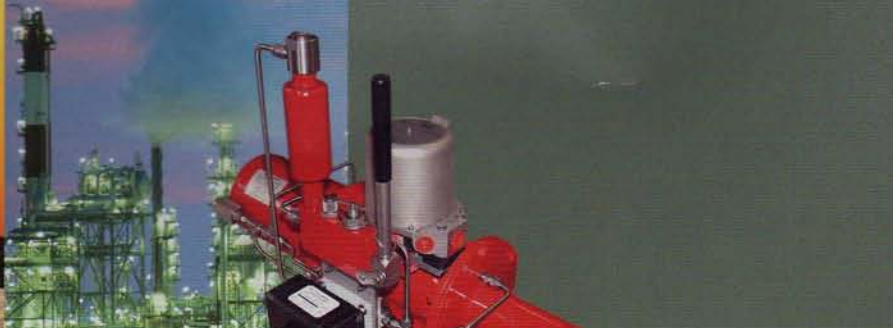


Spring Return Actuator



MATIC

High Integrity Actuation & Controls



Features

Patented Design

Unique cam design that offers simple, backlash free operation with constant torque throughout stroke (double acting version).

High Integrity Construction

Actuators only utilise steel and stainless steel materials for all actuator components and are fully tested on assembly to provide superior operational life.

No Side Forces

Giving an extended life of seals and components.

Whole Life Cost

Exceptionally low wear providing low maintenance (for example, the complex assemblies required to dissipate the high side loads generated by other actuator types are totally eliminated) and initial competitive pricing, S type actuator provides the optimum Whole Life Cost solution for the customer.

Paint Finish

Standard paint finish for steel actuators is offshore epoxy. Other paint specifications available on request.

Hydraulic Operating Parameters

Standard operating pressure range is 3 barg to 300 barg. Standard temperature range is -30°C to 100°C. Increased ranges available on request.

Pneumatic Operating Parameters

Standard operating pressure range is 2.7 barg to 10.5 barg (maximum over-pressure 15 barg). Standard temperature range is -30°C to 100°C. Increased ranges available on request.

Wide Torque Range

Torque range extends from 6Nm to 23,400Nm with standard actuators. Special actuators up to 60,000Nm available on request.

Adjustable Stroke Lengths

End stops can be fitted to provide full adjustability throughout the range of the actuator.

Full Torque Output

The output of the spring return unit is the same as that of the double acting actuator. At the beginning of the spring stroke there is a 15% increase in torque output, a useful safety premium.

Compact Dimensions

The high torque output allows the use of a smaller size spring return actuator than is the case with conventional units.

Long Spring Life

The springs are stress relieved after forming to ensure a long life.

Simple Mounting

Mounting to valves or dampers is simple through ISO mounting flange on underside of the actuator.

Wide Range of Accessory Options

A complete range of control accessories including position monitors, solenoids, positioners, filter regulators, etc. are available. Factory design and assembly of control systems ensures full requirements are satisfied.

Basic Actuator

Principle of Operation Double Acting Actuator

The two pistons (A and B) are connected by spacer bars, with the cam between them. The cam is profiled so that it always makes contact with the centre of the piston face throughout the stroke.

As pressure is applied to either piston A or B, the piston movement causes the cam and shaft assembly to rotate in either a clockwise or counter-clockwise direction. The end of the stroke occurs when the flat face of the cam comes up against the piston.

Spring Return Actuator

The spring return actuator use the same parts as a double acting actuator but is fitted with a spring module at one end consisting of a cylinder and a third piston (C) preloaded with a spring nest.

In operation, the supply pressure is applied to pistons A and C compressing the spring and rotating the cam as in the double acting actuator. When the supply pressure is removed, the ports connected pistons A and C are vented and the spring force returns the assembly to its original position.

Hydraulic Actuator

The Camtorc hydraulic actuator uses standard actuator bodies and internals but with a hydraulic module in the actuator end cap; two hydraulic modules are required for a double acting actuator and one for a spring return actuator. The module consists of a small diameter cylinder fitted with a piston/push rod, in operation, hydraulic pressure moves the piston, and this movement is transmitted to the actuator mechanism.

Hydraulic and Pneumatic Actuator Systems



Camtorc

Torque Output (Typical) - Newton Metres (Nm)

Hydraulic Actuators (Supply : Mineral Oil or Equal)

Note: Torque figures stated are based on a Hydraulic Supply Pressure of 200 barg (2900 psig).

| Model | Double Acting | | | | Spring Return | | | | | |
|-------|---------------|--------|-----------------|-------|---------------|--------|-----------------|-------|---------------|-------|
| | Function | Module | Pressure Torque | | Function | Module | Pressure Torque | | Spring Torque | |
| | | | Start | End | | | Start | End | Start | End |
| S25 | DA | M16 | 65 | 65 | SR80 | M18 | 54 | 42 | 40 | 28 |
| S30 | DA | M18 | 118 | 118 | SR80 | M22 | 125 | 71 | 108 | 72 |
| S35 | DA | M20 | 166 | 166 | SR80 | M24 | 149 | 119 | 120 | 90 |
| S45 | DA | M25 | 346 | 346 | SR80 | M30 | 299 | 212 | 285 | 199 |
| S55 | DA | M30 | 523 | 523 | SR80 | M36 | 440 | 353 | 400 | 312 |
| S65 | DA | M38 | 998 | 998 | SR80 | M42 | 700 | 619 | 600 | 519 |
| S75 | DA | M40 | 1460 | 1460 | SR80 | M50 | 1368 | 960 | 1320 | 913 |
| S85 | DA | M48 | 2484 | 2484 | SR80 | M58 | 2241 | 1660 | 1968 | 1386 |
| S100 | DA | M58 | 4185 | 4185 | SR80 | M70 | 4009 | 3197 | 3252 | 2440 |
| S110 | DA | M65 | 5957 | 5957 | SR80 | M78 | 5261 | 3740 | 4838 | 3318 |
| S120 | DA | M70 | 7586 | 7586 | SR80 | M85 | 6709 | 4886 | 6299 | 4477 |
| S140 | DA | M80 | 9731 | 9731 | SR80 | M90 | 7013 | 5517 | 6799 | 5303 |
| S160 | DA | M95 | 18089 | 18089 | SR80 | M115 | 16799 | 11720 | 14787 | 9708 |
| S180 | DA | M105 | 21336 | 21336 | SR80 | M120 | 16961 | 13530 | 15332 | 11901 |
| S220 | DA | M105 | 30480 | 30480 | SR80 | M135 | 28399 | 22902 | 27482 | 21986 |

Pneumatic Actuators (Supply : Air or Non-Corrosive Gas)

Note: Torque figures stated are based on a Pneumatic Supply Pressure of 5.5 barg (80 psig).

| Model | Double Acting | | | | Spring Return | | | | | |
|-------|---------------|-----------------|-------|----------|-----------------|-------|---------------|-------|--|--|
| | Function | Pressure Torque | | Function | Pressure Torque | | Spring Torque | | | |
| | | Start | End | | Start | End | Start | End | | |
| S25 | DA | 29 | 29 | SR80 | 29 | 29 | 40 | 28 | | |
| S30 | DA | 65 | 65 | SR80 | 65 | 65 | 108 | 72 | | |
| S35 | DA | 92 | 92 | SR80 | 92 | 92 | 120 | 90 | | |
| S45 | DA | 199 | 199 | SR80 | 199 | 199 | 285 | 199 | | |
| S55 | DA | 312 | 312 | SR80 | 312 | 312 | 400 | 312 | | |
| S65 | DA | 521 | 521 | SR80 | 521 | 521 | 600 | 519 | | |
| S75 | DA | 913 | 913 | SR80 | 913 | 913 | 1320 | 913 | | |
| S85 | DA | 1408 | 1408 | SR80 | 1408 | 1408 | 1968 | 1386 | | |
| S100 | DA | 2461 | 2461 | SR80 | 2461 | 2461 | 3252 | 2440 | | |
| S110 | DA | 3376 | 3376 | SR80 | 3376 | 3376 | 4838 | 3318 | | |
| S120 | DA | 4477 | 4477 | SR80 | 4477 | 4477 | 6299 | 4477 | | |
| S140 | DA | 5612 | 5612 | SR80 | 5612 | 5612 | 6799 | 5303 | | |
| S160 | DA | 9930 | 9930 | SR80 | 9930 | 9930 | 14787 | 9708 | | |
| S180 | DA | 12483 | 12483 | SR80 | 12483 | 12483 | 15332 | 11901 | | |
| S220 | DA | 24831 | 24831 | SR80 | 24831 | 24831 | 27482 | 21986 | | |

Note: The torques quoted above apply only for the supply pressures stated.

For different supply pressures please refer to separate torques bulletin or contact the technical sales department.



High Integrity Actuation & Controls

Matic Actuators

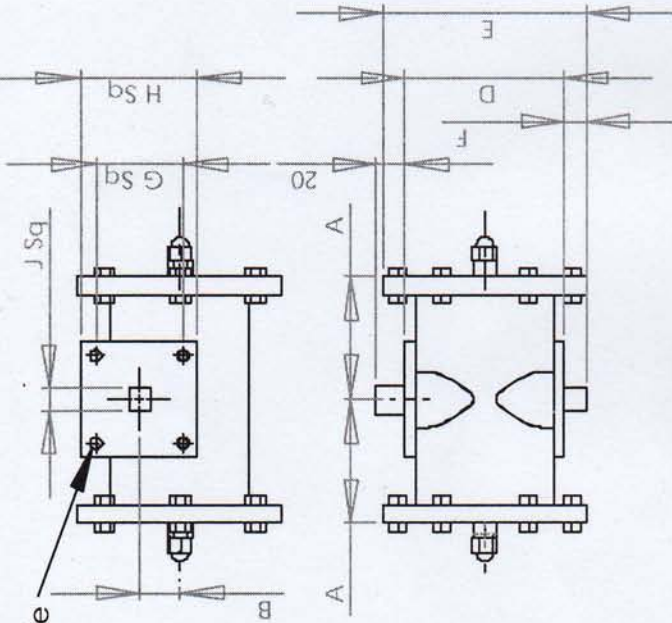
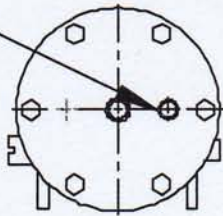
Unit 5a Valley Industries Hadlow Road Tonbridge Kent TN11 0AH UK

Tel +44 (0)1732-850360 Fax +44 (0)1732-852133 Email sales@matic-actuators.com

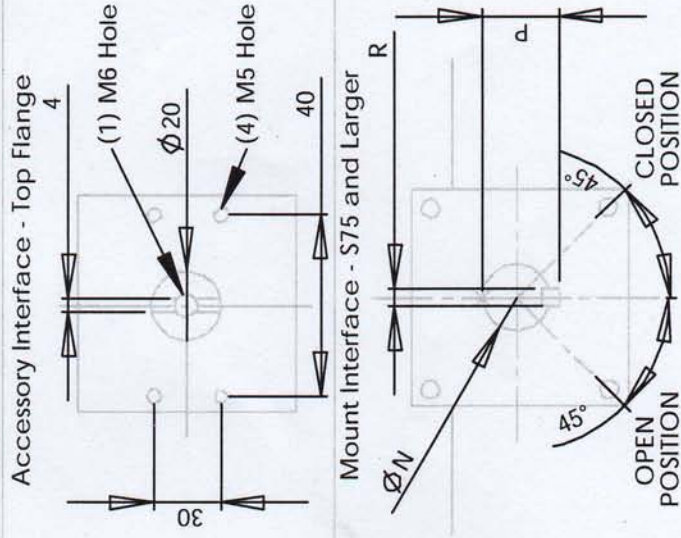
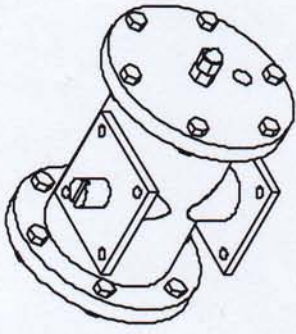
www.matic-actuators.com

(4) 'L' Hole

Port 'C'



| MODEL | A | B | C | D | E | F | G | H | J | L | N | P | R |
|--------|-----|------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| S25DA | 66 | 17.5 | 1/8" | 86 | 115 | 12.5 | 45 | 60 | 12 | M5 | N/A | N/A | N/A |
| S30DA | 84 | 24.5 | 1/4" | 102 | 140 | 13.5 | 50 | 70 | 13.5 | M8 | N/A | N/A | N/A |
| S35DA | 88 | 28 | 1/4" | 110 | 140 | 15 | 60 | 80 | 15 | M8 | N/A | N/A | N/A |
| S45DA | 114 | 35 | 1/4" | 140 | 190 | 18 | 75 | 100 | 18 | M10 | N/A | N/A | N/A |
| S55DA | 135 | 42 | 1/4" | 170 | 215 | 22 | 100 | 125 | 22 | M12 | N/A | N/A | N/A |
| S65DA | 157 | 50 | 3/8" | 200 | 260 | 25 | 105 | 130 | 25 | M12 | N/A | N/A | N/A |
| S75DA | 182 | 60 | 3/8" | 230 | 300 | 53 | 120 | 150 | N/A | M12 | 35 | 38 | 10 |
| S85DA | 208 | 70.5 | 3/8" | 255 | 320 | 60 | 130 | 170 | N/A | M12 | 40 | 43 | 12 |
| S100DA | 256 | 84 | 1/2" | 315 | 395 | 83 | 135 | 175 | N/A | M16 | 55 | 59 | 16 |
| S110DA | 280 | 95 | 1/2" | 340 | 440 | 83 | 140 | 180 | N/A | M16 | 55 | 59 | 16 |
| S120DA | 306 | 105 | 1/2" | 395 | 475 | 95 | 160 | 210 | N/A | M24 | 65 | 69.5 | 20 |



| REV | DRAWN | DATE | CHK'D | ECO |
|-----|-------|--------|-------|--------|
| A | | 7.6.07 | | 07-553 |

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN MILLIMETERS
 SURFACE FINISH:
 TOLERANCES:
 LINEAR:
 ANGULAR:

TITLE:
**Camtorc Actuator
 - Double Acting - Dimensions**

DWG NO. **J100262**

SCALE: 1:10

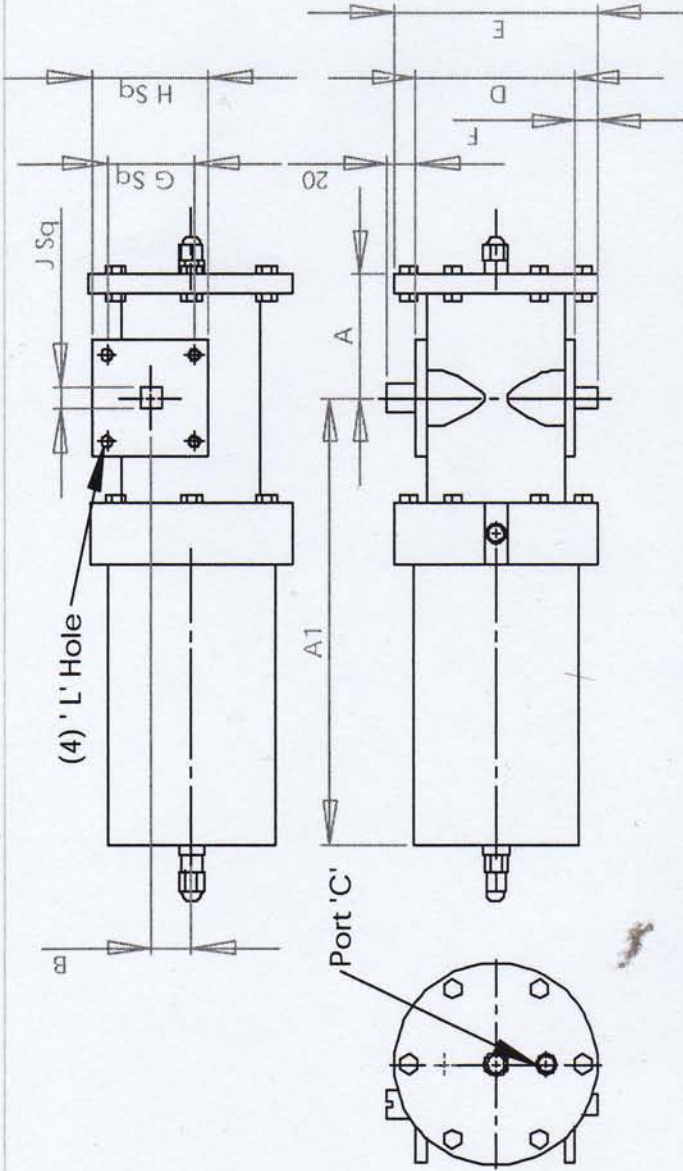
SHEET 1 OF 1

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MATIC Actuators
 Unit 5A, Valley Industries, Hadlow Road
 Tonbridge, Kent, TN11 0AH, United Kingdom
 Tel: +44(0)1732-850360 Fax: +44(0)1732-852133
 Website: www.matic-actuators.com

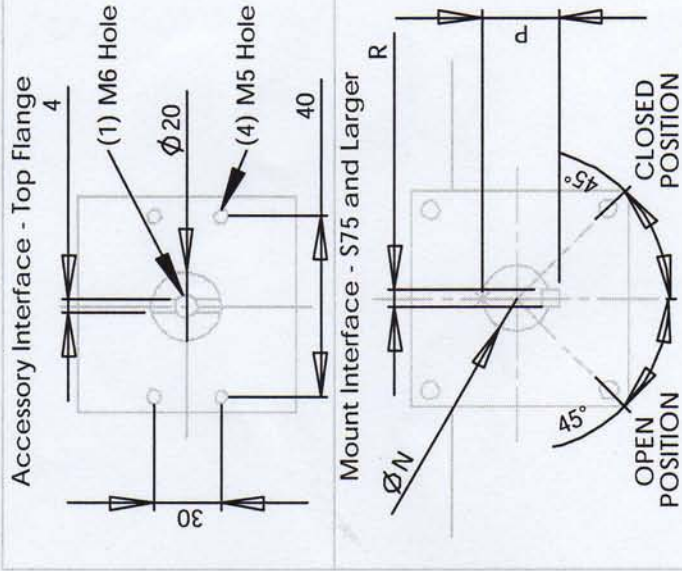
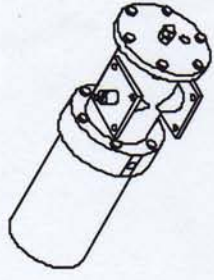
DEBUR AND BREAK SHARP EDGES
 MATERIAL:
 WEIGHT(g):

A4



| MODEL* | A | A1 | B | C | D | E | F | G | H | J | L | N | P | R |
|------------|-----|-----|------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| S25SR-xxx | 66 | 227 | 17.5 | 1/8" | 86 | 115 | 12.5 | 45 | 60 | 12 | M5 | N/A | N/A | N/A |
| S30SR-xxx | 84 | 285 | 24.5 | 1/4" | 102 | 140 | 13.5 | 50 | 70 | 13.5 | M8 | N/A | N/A | N/A |
| S35SR-xxx | 88 | 307 | 28 | 1/4" | 110 | 140 | 15 | 60 | 80 | 15 | M8 | N/A | N/A | N/A |
| S45SR-xxx | 114 | 387 | 35 | 1/4" | 140 | 190 | 18 | 75 | 100 | 18 | M10 | N/A | N/A | N/A |
| S55SR-xxx | 135 | 497 | 42 | 1/4" | 170 | 215 | 22 | 100 | 125 | 22 | M12 | N/A | N/A | N/A |
| S65SR-xxx | 157 | 533 | 50 | 3/8" | 200 | 260 | 25 | 105 | 130 | 25 | M12 | N/A | N/A | N/A |
| S75SR-xxx | 182 | 608 | 60 | 3/8" | 230 | 300 | 53 | 120 | 150 | N/A | M12 | 35 | 38 | 10 |
| S85SR-xxx | 208 | 700 | 70.5 | 3/8" | 255 | 320 | 60 | 130 | 170 | N/A | M12 | 40 | 43 | 12 |
| S100SR-xxx | 256 | 824 | 84 | 1/2" | 315 | 395 | 83 | 135 | 175 | N/A | M16 | 55 | 59 | 16 |
| S110SR-xxx | 280 | 910 | 95 | 1/2" | 340 | 440 | 83 | 140 | 180 | N/A | M16 | 55 | 59 | 16 |
| S120SR-xxx | 306 | 959 | 105 | 1/2" | 395 | 475 | 95 | 160 | 210 | N/A | M24 | 65 | 69.5 | 20 |

* - Spring Rating size depends on Sizing Criteria



TITLE:

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
SURFACE FINISH:
TOLERANCES:
LINEAR:
ANGULAR:

ECO
07-553

CHK'D

DATE
7.6.07

DRAWN

REV
A

Camtorc Actuator - Spring Return - Dimensions

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SHEET 1 OF 1

A4

