

# 780-781XS VALVES WITH ACTREG PNEUMATIC ACTREG

## FEATURES

The stainless steel 3-way 780XS+ADA (L-Port) and 781 XS+ADA (T-Port) steel and stainless-steel ball valves provide the mixing, distribution or automatic discharge functions for pipes with non-loaded industrial fluids. It is a reduced-bore valve with an antistatic device. It is EC-SIL and ATEX-approved. The ISO 5211 mounting pad allows the actuator to be directly assembled. The pneumatic motorization is available in double and spring-return with numerous options.

## AVAILABLE MODELS

**780 XS:** L-Port / **781 XS:** T-Port

1.4408 stainless steel body.

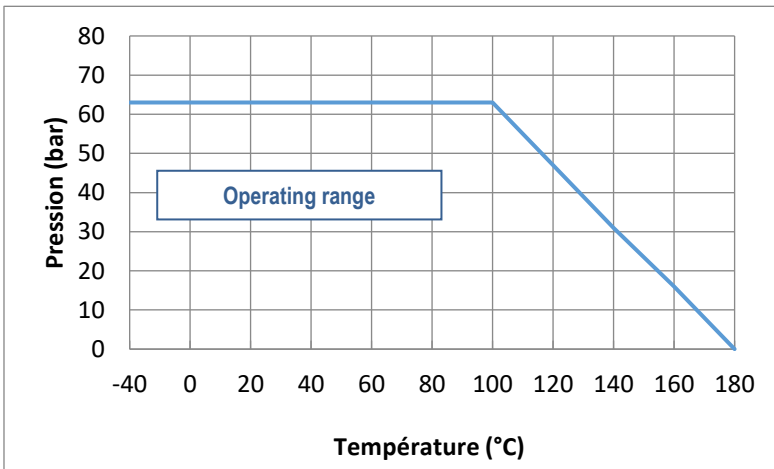
1/4" to 2" diameters.

G thread connections.



## LIMITS OF USE

|                         |                          |
|-------------------------|--------------------------|
| Fluid pressure : PS     | 63 bar (20°C)            |
| Fluid temperature : WT° | - 40°C / +180°C          |
| Ambient temperature     | - 30°C / + 100°C         |
| Motor compressed air    | mini 6 bar / maxi 10 bar |



## DIRECTIVES AND MANUFACTURING STANDARDS

| OBJET                                   | Standard                          | ON        | OBJET                     | Standard     |
|-----------------------------------------|-----------------------------------|-----------|---------------------------|--------------|
| Pressure Equipment Directive 2014/68/EC | <b>1/4" to 1"</b> : not subject   |           | Final test                | EN 12266     |
|                                         | <b>1"1/4 to 2"</b> : category III | TÜV 0035  | Material certificate      | EN 10204     |
| Size                                    | EN 12516-1                        |           | Connection Motorisation   | ISO 5211:    |
| Steel grades                            | EN 1503-1                         |           | Actuator pilot connection | NAMUR        |
| ATEX Directive                          | II 2G/D Tx zones 1,2,21 and 22    | SIRA 0518 | Switch box connection     | VDI/VDE 3845 |
|                                         | EN 13463-1 and 5                  |           | SIL 3 level               | EN 61508     |

Information given as an indication only, and subject to possible modifications



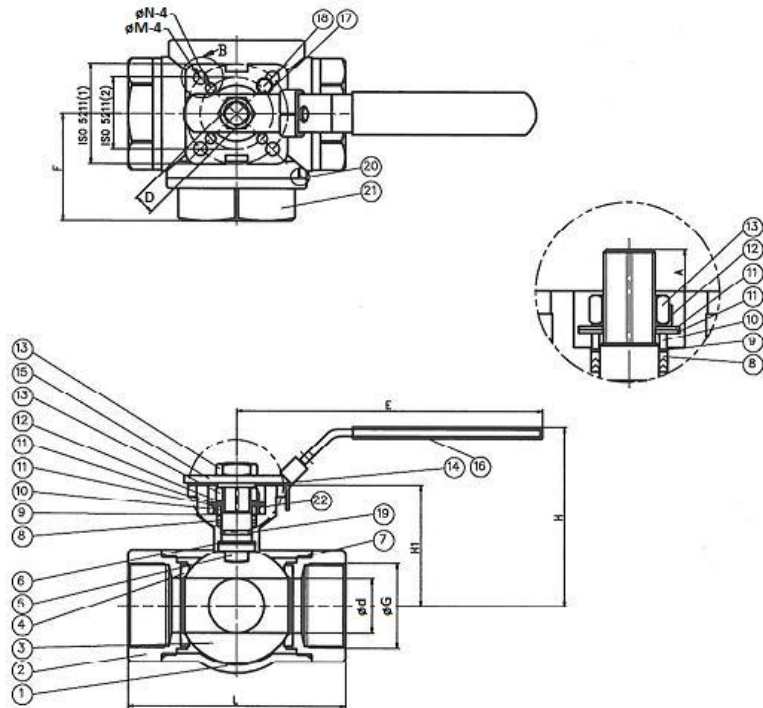
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|-------|--------------|
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| Ref.  | TDS780XS+ADA |
| Rev.  | 02           |
| Date  | 06/2026      |

# 780-781XS VALVES WITH ACTREG PNEUMATIC ACTREG

## CONSTRUCTION

| No. | Name               | Material  | No. | Name        | Material  |
|-----|--------------------|-----------|-----|-------------|-----------|
| 1   | Body               | 1.4408 SS | 12  | Lock washer | 304 SS    |
| 2   | Lateral ends       | 1.4408 SS | 13  | Lever nut   | 304 SS    |
| 3   | Ball               | 1.4408 SS | 14  | Washer      | 304 SS    |
| 4   | Seats              | PTFE      | 15  | Lever       | 304 SS    |
| 5   | Stem               | 316 SS    | 16  | Liner       | PVC       |
| 6   | Stem gasket        | PTFE      | 17  | Stop        | 304 SS    |
| 7   | Body gaskets       | PTFE      | 18  | Nut         | 304 SS    |
| 8   | Cable gland gasket | PTFE      | 19  | O-ring      | FKM       |
| 9   | Washer             | TFM 1600  | 20  | Body gasket | PTFE      |
| 10  | Spacer             | 304 SS    | 21  | Central end | 1.4408 SS |
| 11  | Belleville washer  | 304 SS    | 22  | Spring      | 304 SS    |



## DIMENSIONS (mm)

| DN (G)      | 1/4"    | 3/8"    | 1/2"    | 3/4"    | 1"      | 1 1/4"  | 1 1/2"  | 2"      |
|-------------|---------|---------|---------|---------|---------|---------|---------|---------|
| d           | 11      | 11      | 12,5    | 16      | 20      | 25      | 32      | 38      |
| L           | 75,7    | 75,7    | 75,7    | 86,6    | 103     | 118,2   | 125,8   | 149     |
| H           | 64,9    | 64,9    | 64,9    | 71,6    | 94,3    | 100     | 115,7   | 124,9   |
| F           | 38,3    | 38,3    | 38,3    | 44,7    | 50,8    | 57,7    | 62,6    | 74,3    |
| A           | 8,2     | 8,2     | 8,2     | 9,0     | 11,5    | 11,5    | 15,1    | 15,1    |
| E           | 132     | 132     | 132     | 132     | 180     | 180     | 225     | 225     |
| H1          | 36,8    | 36,8    | 36,8    | 44,1    | 55,1    | 60,7    | 75,2    | 84,4    |
| D           | 9       | 9       | 9       | 9       | 11      | 11      | 14      | 14      |
| ISO         | F03/F04 | F03/F04 | F03/F04 | F03/F04 | F04/F05 | F04/F05 | F05/F07 | F05/F07 |
| Weight (kg) | 0,33    | 0,33    | 0,33    | 0,5     | 0,9     | 1,7     | 2,2     | 3,8     |

Information given as an indication only, and subject to possible modifications

|                                                                                     |                                                                                                                                                                                                                                                                                     |       |              |
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# 780-781XS VALVES WITH ACTREG PNEUMATIC ACTREG

## ACTREG PNEUMATIC MOTORISATION

The ACTREG motorization proposed as standard comprises:

- rack and pinion actuator of anodized aluminium.
- a safety coefficient of 1.3 minimum compared to the nominal torque of the valve.
- air non-lubricated dry motor, minimum 6 bar pressure.
- an upstream / downstream pressure difference  $\Delta P=10$  bar max.

The actuator mounting is direct (except for DN 1/4" to DN 3/4" with SE actuator, mounting with yoke according to EN 15081).

| DN     | Double effect | V (liters) | Time (s)* | Spring-return | V (liters) | Time (s)* |
|--------|---------------|------------|-----------|---------------|------------|-----------|
| 1/4"   | ADA 20        | 0,13       | 0,1       | ASR 40        | 0,27       | 0,2       |
| 3/8"   | ADA 20        | 0,13       | 0,1       | ASR 40        | 0,27       | 0,2       |
| 1/2"   | ADA 20        | 0,13       | 0,1       | ASR 40        | 0,27       | 0,2       |
| 3/4"   | ADA 40        | 0,27       | 0,1       | ASR 80        | 0,64       | 0,3       |
| 1"     | ADA 40        | 0,27       | 0,1       | ASR 80        | 0,64       | 0,3       |
| 1 1/4" | ADA 80        | 0,64       | 0,3       | ASR 130       | 0,77       | 0,5       |
| 1 1/2" | ADA 80        | 0,64       | 0,3       | ASR 200       | 1,20       | 0,6       |
| 2"     | ADA 130       | 0,77       | 0,5       | ASR 300       | 1,96       | 0,9       |

For any other operating conditions, please contact us.

\*indicative time of the no-load actuator for opening or closing.

## INSTALLATION IN AN ATEX ZONE

For 780XS (L-port) - 781XS (T-port) + ACTREG automatic valves to be installed in ATEX 1, 2, 21 or 22 zones, this has to be specified when ordering. Our services will check of the assembly, the installation of an earthing braid, and will issue an assembly certificate. Our authorised technicians carry out these operations in the workshop. Please contact us. The special assembly and maintenance instructions for motorised valves in the ATEX zones must be followed.

## OPTIONS OF MOTORISATION

|                             |                                                                                                      |
|-----------------------------|------------------------------------------------------------------------------------------------------|
| 1                           | actuators dimensioned for a compressed air pressure of 3, 4 or 5 bar                                 |
| 2                           | actuator dimensioned for an upstream / downstream pressure difference $\Delta P$ greater than 10 bar |
| 3                           | manual override with declutchable gear box                                                           |
| 4                           | compressed air filter regulator                                                                      |
| 5                           | All types of piloting solenoid valves                                                                |
| 6                           | all types of switch boxes                                                                            |
| 7                           | all types of positioner                                                                              |
| 8                           | rapid exhaust, flow-rate limiters - exhaust brakes                                                   |
| <b>OPTIONS ON THE VALVE</b> |                                                                                                      |
| 1                           | Full-bore type (787XS)                                                                               |

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## ASSEMBLY AND MAINTAINANCE INSTRUCTIONS

### 1 - Installation

#### 1.1 - Checks

- Check that the material of the valve body is chemically compatible with the fluid.
- Check that the pressure and service conditions are compatible with the (P, T) diagram of the valve. See § "Service limits"
- Check if the ball has an L-shaped or T-shaped hole.
- Check that the fluid is clean and free of particles. The latter could scratch the ball and damage the seats, hence causing the valve to leak. If need be, install an upstream filter.
- Check that there is no risk of thermal expansion of the fluid, which could damage the seats. In the open position, a hole at the top of the ball balances the pressures between the body cavity and the flow of the fluid. As an option, we recommend a relief hole upstream of the valve for equalising the pressures for fluids such as ammonia, LPG, chlorine, etc.
- Check that the valve is not used for flow or pressure control since it is not intended for this use and there is a risk of premature wear of the seats, in particular in the event of high pressure and/or temperature.
- Check that the valve is not used on a gas which might condense at certain times during the process. In such a case, the pressure within the body cavity could become negative, which could lead to a significant deformation of the seats. Please contact us.
- Static electricity: the valve will be supplied with a ball-stem-body internal electrical continuity tester. If the service conditions require the electrical continuity of the installation, check its earthing.
- If the valve is installed in an explosive zone, you must follow the additional "IMEVMATEX" instructions.

#### 1.2 - Storage before installation

- Follow our general "IMESTOCK" instructions for storage.

#### 1.3 - Installation

- Before any installation, isolate the piping upstream and downstream, depressurize the piping and bring the installation to ambient temperature. Carefully clean the piping of any particle (foreign body, dust, rust, etc.) or shavings by water rinsing or air blowing.
- Correctly identify the position of the flow directions with regard to the pipe installation.
- Remove the protective tips from the valve ends.
- Check the cleanliness of the internal surfaces of the valve and if need be, clean them.
- Direction of installation: the flow directions can be identified with respect to the stem marking.
- Check the perfect alignment and the proper support of the pipe installation upstream and downstream of the valve. Alignment defects cause mechanical deformations which can block the valve or lead to leaks at the body gaskets.
- Check that the standards for the valve internal thread and pipe thread are the same.
- Cover the pipe threads using a sealing material (tow, PTFE tape, sealing glue, etc.)
- Screw the tube into the valve end clockwise, as shown in the diagram below.
- Check the sealing of the connection using a suitable test (hydrostatic test or leak detection spray).

### 2 - Service

- If a hot fluid flows across the valve, do not touch the valve surface.
- Always operate the valve slowly and smoothly.
- Opening clockwise, closing anti-clockwise.

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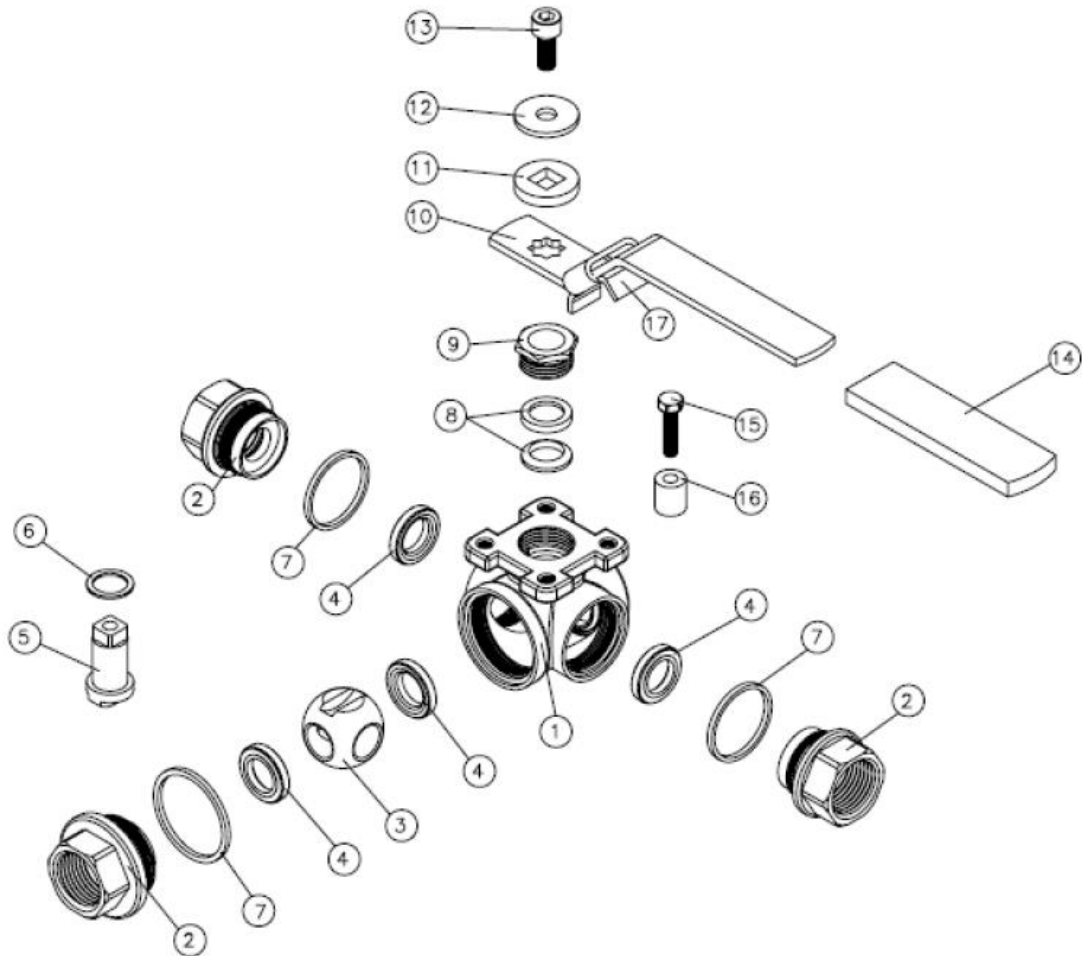
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## 3 - Servicing

### 3.1 - Frequency of servicing

- The servicing frequency depends upon the use of the valve, of the type of fluid, of its velocity, of its frequency of operation, of the cycles of rise and fall in pressure and temperature.
- Before any intervention, isolate the upstream and downstream pipe installation using the valves provided for this purpose. Depressurize the pipe installation and bring it to ambient temperature.
- If the lever has to be removed, do that before disassembling the body.
- To disassemble the central body, unscrew the lateral ends (items 2). Removal
- To remove the ball from the body, turn the stem by a quarter turn.



### 3.2 - Inspecting the state of the valve and possible repair

- Check the state of the ball (Item 3): it has to be clean and unscratched. If the cleaning or polishing is not possible, replace it (see the § on spare parts).
- Check the state of the seats (4.1 and 4.2): they must not be deformed, nor scratched, nor worn, or dirty. Otherwise, replace them with parts from the gasket kit.
- Check the state of the packing gland (6 and 8): no leak should be found at the stem and the rings should not be excessively worn. If need be, replace the gaskets.
- Check the state of the body gaskets (7.1, 7.2, and 7.3). Replace them if necessary.
- Reassemble the different parts of the valve, following the tightening torques shown in the table below.
- Check that the stem manoeuvring is smooth. Perform about ten manoeuvres.

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## 780-781XS VALVES WITH ACTREG PNEUMATIC ACTREG

### SPARE PARTS

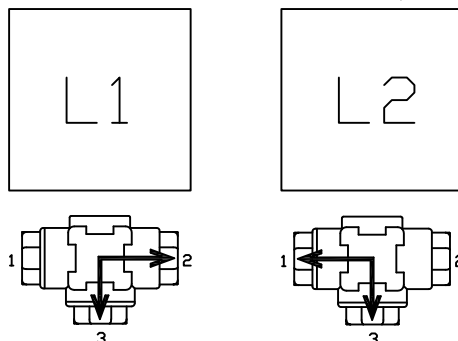
| DN             | Gasket kit | Ball               | Handle             |
|----------------|------------|--------------------|--------------------|
| Reference mark | 4-6-7-8    | 3                  | 14                 |
| 1/4"           | 982882     | Please contact us. | Please contact us. |
| 3/8"           | 982883     | Please contact us. | Please contact us. |
| 1/2"           | 982884     | Please contact us. | Please contact us. |
| 3/4"           | 982885     | Please contact us. | Please contact us. |
| 1"             | 982886     | Please contact us. | Please contact us. |
| 1"1/4          | 982887     | Please contact us. | Please contact us. |
| 1"1/2          | 982888     | Please contact us. | Please contact us. |
| 2"             | 982889     | Please contact us. | Please contact us. |

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|                                                                                     |                                                                                                                                                                                                                                                                              | Date  | 06/2026      |

## 780XS PERÇAGE EN L 780XS L Port

Pour commander indiquer 2 positions successives  
Indicate the 2 successive positions when ordering

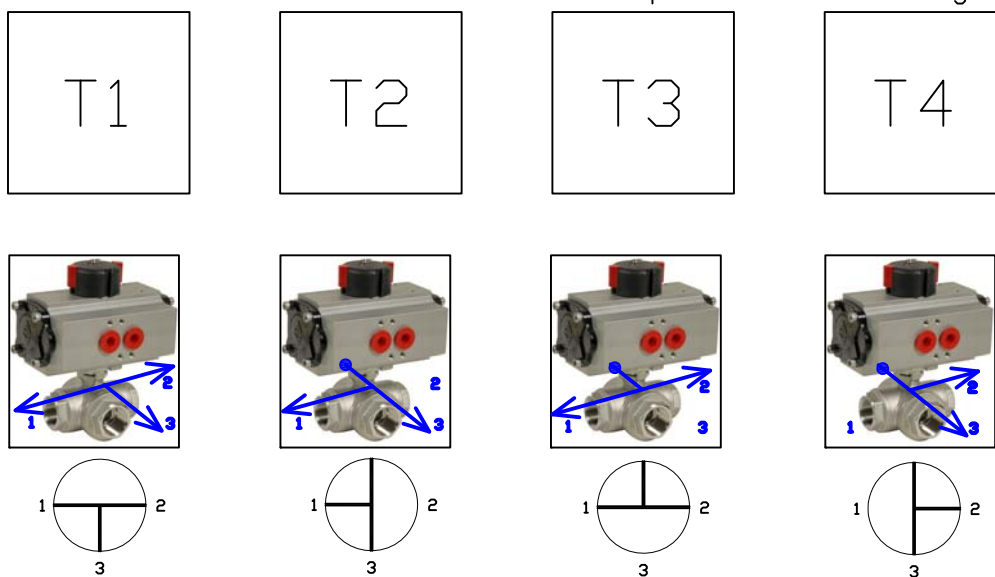


ACTIONNEUR SIMPLE EFFET : Fermeture dans le sens horaire,  
sens inverse: plus value,nous consulter.

SPRING-RETURN : Clockwise closure,  
for counterclockwise closure additional price, please contact us.

## 781XS PERÇAGE EN T 781XS T Port

Pour commander indiquer 2 positions successives  
Indicate the 2 successive positions when ordering



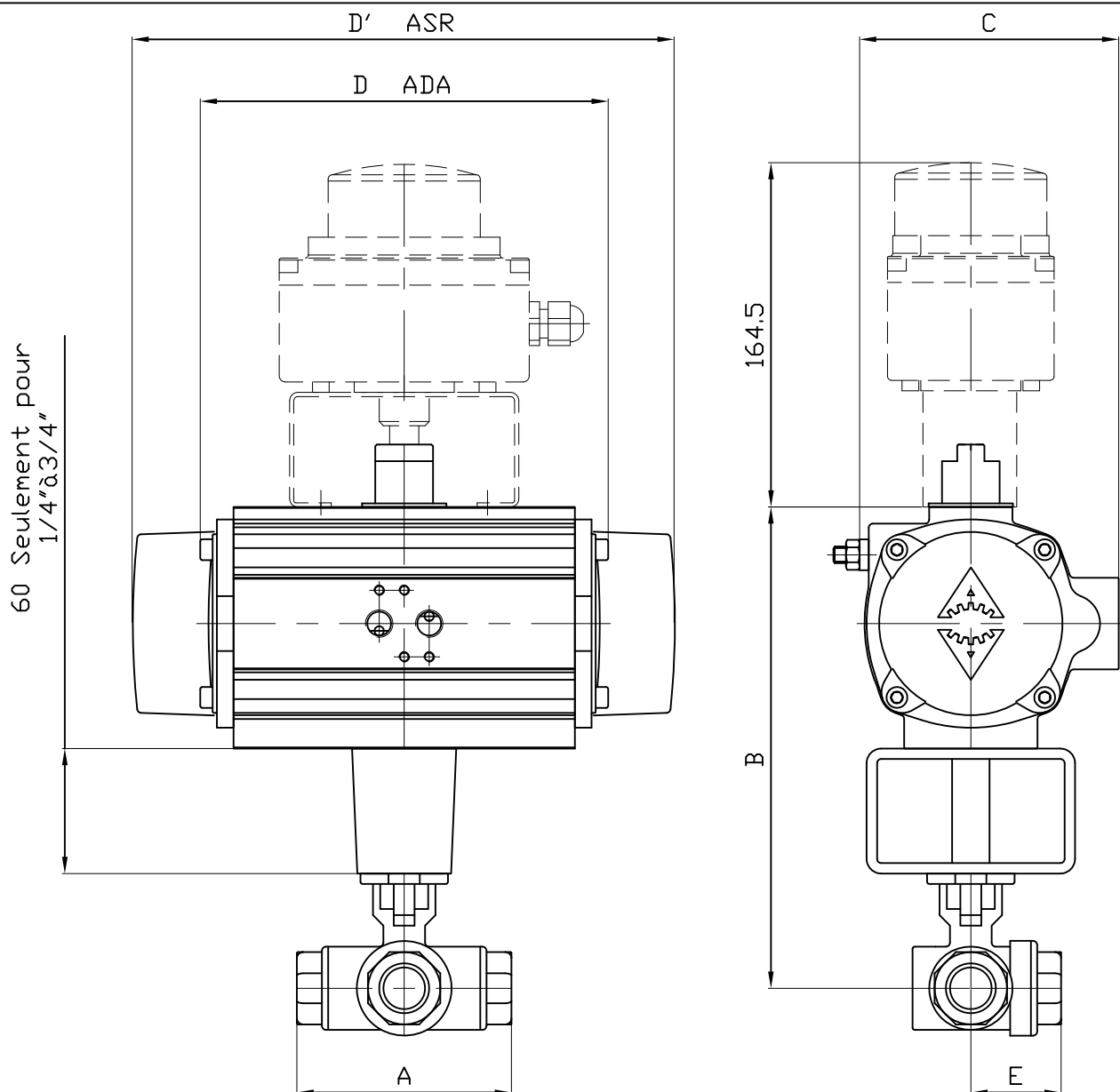
ACTIONNEUR SIMPLE EFFET : Fermeture dans le sens horaire,  
sens inverse: plus value,nous consulter.

SPRING-RETURN : Clockwise closure,  
for counterclockwise closure additional price, please contact us.

Informations données à titre indicatif et sous réserve de modifications éventuelles  
data subject to alteration

|                                                                                                                   |                  |                    |                                |                   |      |      |
|-------------------------------------------------------------------------------------------------------------------|------------------|--------------------|--------------------------------|-------------------|------|------|
| Ech: /                                                                                                            | Date :04/11/2020 | Dessiné par : E.D. | Tolérances générales : +/- 0.2 | Modifications     | Date | REV. |
| ROBINET A TOURNANT SPHERIQUE<br>780-781XS/BALL VALVE 780-781XS POSITIONS POUR<br>COMMANDE/POSITIONS WHEN ORDERING |                  |                    |                                | Matière :         |      |      |
|                                                                                                                   |                  |                    |                                | Poids (Kg) :      |      |      |
|                                |                  |                    |                                | Traitement : SANS |      |      |
|                                                                                                                   |                  |                    |                                | Plan n° Ens 1462  |      |      |

45, Rue du Ruisseau  
38297 SAINT QUENTIN FALLAVIER



| DN     | 1/4"   |        | 3/8"   |        | 1/2"   |        | 3/4"   |        | 1"    |       | 1 1/4" |        | 1 1/2" |        | 2"     |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|--------|--------|--------|--------|--------|--------|
| ACTREG | ADA20  | ASR40  | ADA20  | ASR40  | ADA20  | ASR40  | ADA40  | ASR80  | ADA40 | ASR80 | ADA80  | ASR130 | ADA80  | ASR200 | ADA130 | ASR300 |
| A      | 75.7   |        | 75.7   |        | 75.7   |        | 86.6   |        | 103   |       | 118.2  |        | 125.8  |        | 149    |        |
| B      | *190.9 | *209.9 | *190.9 | *209.9 | *190.9 | *209.9 | *216.6 | *238.6 | 179.3 | 201.3 | 207    | 217    | 222.7  | 250.7  | 241.9  | 276.9  |
| C      | 76     | 91     | 76     | 91     | 76     | 91     | 91     | 111    | 91    | 111   | 111    | 122    | 111    | 135.5  | 122    | 152.5  |
| D      | 145    | -      | 145    | -      | 145    | -      | 158    | -      | 158   | -     | 177    | -      | 177    | -      | 196    | -      |
| D'     | -      | 195    | -      | 195    | -      | 195    | -      | 217    | -     | 217   | -      | 258    | -      | 299    | -      | 348.5  |
| E      | 38.3   |        | 38.3   |        | 38.3   |        | 44.7   |        | 50.8  |       | 57.7   |        | 62.6   |        | 74.3   |        |
| KG     | 2.7    | 3.64   | 2.67   | 3.61   | 2.62   | 3.55   | 3.61   | 5.32   | 3.73  | 5.44  | 5.57   | 7.43   | 6.81   | 11.21  | 9.79   | 16.83  |

\* : Montage avec platine H=60

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data subject to alteration

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|----------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|--------------------------------|-------------------|------|------|
| Ech: /                                                                                                                                       | Date :29/10/2020 | Dessiné par : E.D. | Tolérances générales : +/- 0.2 | Modifications     | Date | REV. |
| ROBINET A TOURNANT SPHERIQUE 780-781XS/BALL VALVE<br>780-781XS +<br>ACTIONNEUR ACTREG / PNEUMATIC ACTUATOR<br>ACTREG + BFC /LIMIT SWITCH BOX |                  |                    |                                | Matière :         |      |      |
|                                                                                                                                              |                  |                    |                                | Poids (Kg) :      |      |      |
|                                                                                                                                              |                  |                    |                                | Traitement : SANS |      |      |
|  45, Rue du Ruisseau<br>38297 SAINT QUENTIN FALLAVIER     |                  |                    |                                | Plan n° Ens 1454  |      |      |



The art of power and perfection



**PNEUMATIC ACTUATORS**

**SECTORIEL**





The art of power and perfection

RACK AND PINION  
**Aluminium housing**

TORQUES UP TO  
**6,500 Nm**

ACTUATORS IN  
**14 different sizes**

We are a manufacturer of rack and pinion aluminium housing actuators with torque figures up to 6,500 Nm and scotch yoke actuators for heavy duty service up to 250,000 Nm. Our products offer reliable and dependable service for ¼ turn valves.

Engineered and built to withstand most of the applications and environmental conditions, the precision in design and quality provides a long and safe operational performance in valve control.

ACTREG has invested in quality assurance, state-of-the-art machining and testing facilities in order to assist customers in safely controlling their processes.

ACTREG engineers are happy to help you with your automation demands.



# The art of power and



SCOTCH YOKE  
**Heavy duty service**

TORQUES UP TO  
**250,000 Nm**

ACTUATORS IN  
**25 different sizes**

## Certificates

ACTREG, S.A. has a quality Management System certified in accordance with the requirements of ISO 9001:2008 for the design, development, manufacturing and distribution of pneumatic actuators and accessories for valves. Certified by BVQI No. ESPMDD005463.

ADA/ASR 10 up to ADA/ASR 300 are classified as category SEP in accordance with the requirements of Pressure Equipment Directive 97/23/EC. ADA/ASR 500 up to ADA/ASR 4000 are classified as Category I, Procedure module A.

All ACTREG pneumatic actuators are classified for use in potentially explosive atmospheres as Group II Category 2, suitable for zones 1, 2, 21 and 22 in accordance with Annex VIII of Directive 94/9/CE (ATEX). Technical file is deposited in LCIE, No. LCIE 05 AR 022.

ACTREG pneumatic actuators have got SIL 3 (Safety integral level 3) certificate. The ACTREG actuators meet manufacturer design process requirements of Safety integral Level (SIL) 3. This is intended to achieve sufficient integrity against systematic errors of design by the manufacturer.



# perfection

# MAIN FEATURES & CHARACTERISTICS

## 1 BODY

The aluminium body is inside and outside coated with hard anodizing, with extremely abrasion resistance, low surface roughness and optimal resistance.

## 2 PINION

Carbon steel shaft electroless nickel plated against external and internal corrosion. Anti-blowout design.

## 3 ADJUSTMENT STROKE

External stroke adjustment for 5 degrees regulation, placed on the opposite side of Namur connection for better manipulation when the solenoid valve is assembled.

## 4 PISTONS

Pistons are coated with special treatment for corrosion resistance. Backlash is avoided by a special tooth machining. The pistons have a 3 way guide for low friction between body and pistons. The pistons are also provided with an integral guide machined between pistons and pinion.

## 5 POSITION INDICATOR

Multi-function indicator suitable for mechanical or inductive switches is a standard feature. Many different combinations without the need to buy external indicators.

## 6 SPRINGS

Pre-stressed springs offers more torque and different options for their positioning. This system allows us to easily fit the necessary torque to close or open the valve, offering a total safety replacement and manipulation.

## 7 END CAPS

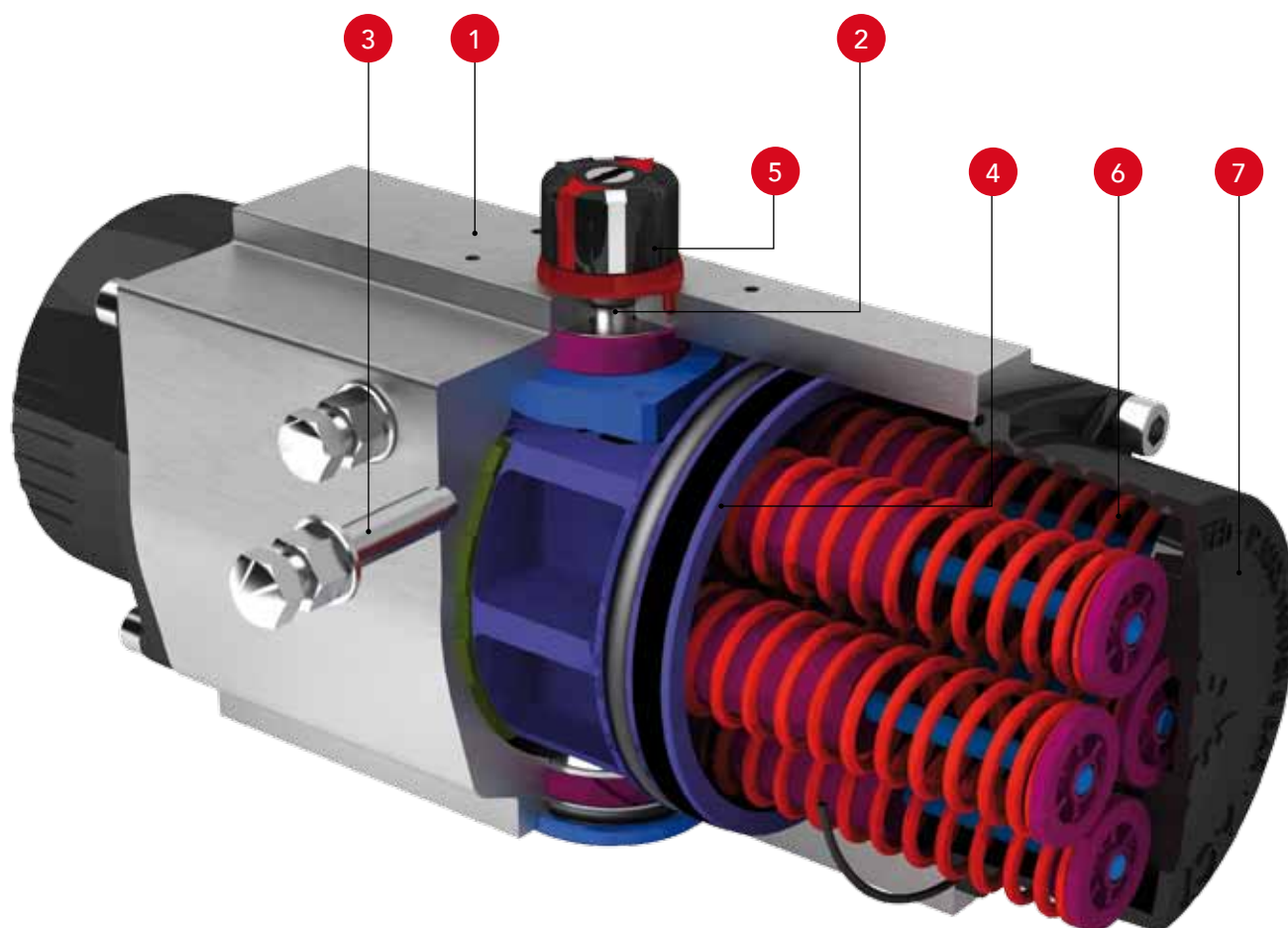
Different end caps for double or single acting for fast and safety identification without the need to read the label. End caps are epoxy coated as standard protecting them against environment corrosion.



Every single actuator is tested and provided with a unique serial number for traceability. This heat number is stamped on the body.



The assembly of switch boxes, proximity switches or positioners, takes place by means of the Namur connection VDI/VDE 3845, which is a standard feature in all our models. The height of the axis to fulfil this Norm is of 30 mm, for all our products, with which it entails that with a single model of Box or positioner, we can cover all our manufacturing range.



## Types of Actuators

### Double Acting & Spring Return



**ADA**  
DOUBLE  
ACTING  
ACTUATOR



**ASR**  
SPRING  
RETURN  
ACTUATOR

Rack and pinion design | Linear torque | Rotation angle  $90^\circ \pm 5^\circ$  | Antifriction sliding bearings | Long life without maintenance | Total safety for springs replacement | Mounting of solenoid valves acc. NAMUR Std. | Mounting of devices acc. NAMUR VDI/VDE 3845 Std. | Coupling according to ISO 5211 and DIN 3337 (Octagonal drive) | Multi-function position indicator suitable for mechanical and inductives direct switches.

#### Working temperature:

-30 °C to 100 °C in Standard Construction.

-15 °C to 150 °C with FKM O-rings (high temperature execution).

-40 °C to 80 °C with Silicone O-rings (low temperature execution).

-55° C to 80° C with Silicone O-rings and 316 pinion (extreme low temperature).

#### Maximum working pressure:

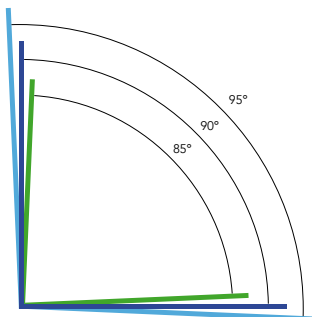
8 bar (116 psig). (Except ADA10 at 10 bar)

## Bi-Directional Travel Stops

ACTREG pneumatic actuators are provided with bi-directional pinion travel stops.

Side located stops allow a full  $\pm 5^\circ$  travel adjustment between  $85^\circ$  and  $95^\circ$ . These travel stops are designed to absorb the maximum rated torque of the actuator and the maximum impact loads associated with recommended travel speed.

Adjustment of the counterclockwise and clockwise rotation limits is accomplished by unscrewing the locking nuts, turning the respective left and right stop studs to reduce or increase the travel angle and screwing the locking nuts.



## Options On Request

- Stainless steel pinion (grade 304 and 316).
- Fast acting actuators.
- Actuators with 100% travel adjustment stroke.
- Actuators fire proof (K-mass, blanket, other executions,...).

## Coatings for special applications

Actreg Pneumatic actuators shall be protected against external corrosion resistant by proper material selection or surface treatment.

Actreg coatings are according to EN 15714-3 and are indicated to:

#### Standard execution

Anticorrosive C3 according EN-ISO 12944-2

| PARTS & PROTECTION | DESCRIPTION        | COATING               |
|--------------------|--------------------|-----------------------|
| BODY               | Hard anodized      | 25 - 30 $\mu\text{m}$ |
| END CAPS           | Epoxy painted      | 80 - 90 $\mu\text{m}$ |
| STEM               | Carbon steel + ENP | 25 - 30 $\mu\text{m}$ |

#### Execution A1

Anticorrosive C5-I according to EN-ISO 12944-2

| PARTS & PROTECTION | DESCRIPTION   | COATING               |
|--------------------|---------------|-----------------------|
| BODY               | Epoxy painted | 80 - 90 $\mu\text{m}$ |
| END CAPS           | Epoxy painted | 80 - 90 $\mu\text{m}$ |
| STEM               | SS 304        |                       |

#### Execution A2

Anticorrosive C5-M according to EN-ISO 12944-2

| PARTS & PROTECTION | DESCRIPTION   | COATING               |
|--------------------|---------------|-----------------------|
| BODY               | Epoxy painted | 80 - 90 $\mu\text{m}$ |
| END CAPS           | Epoxy painted | 80 - 90 $\mu\text{m}$ |
| STEM               | SS 316        |                       |

#### Execution B

Anticorrosive C4 according to EN-ISO 12944-2

| PARTS & PROTECTION | DESCRIPTION        | COATING               |
|--------------------|--------------------|-----------------------|
| BODY               | Epoxy painted      | 80 - 90 $\mu\text{m}$ |
| END CAPS           | Epoxy painted      | 80 - 90 $\mu\text{m}$ |
| STEM               | Carbon steel + ENP | 25 - 30 $\mu\text{m}$ |

#### Execution C

Anticorrosive C5-I according to EN-ISO 12944-2

| PARTS & PROTECTION | DESCRIPTION         | COATING               |
|--------------------|---------------------|-----------------------|
| BODY               | Hard anodized + ENP | 25 - 30 $\mu\text{m}$ |
| END CAPS           | ENP                 | 80 - 90 $\mu\text{m}$ |
| STEM               | Carbon steel + ENP  | 25 - 30 $\mu\text{m}$ |

## Multi-function position indicator



Inductive switch indicating open or closed position



Mechanical switches indicating open and close



Inductive switches indicating open and closed position



Namur connection for direct mounting switch box



Inductive switches indicating open and closed position (45° detecting switches...)

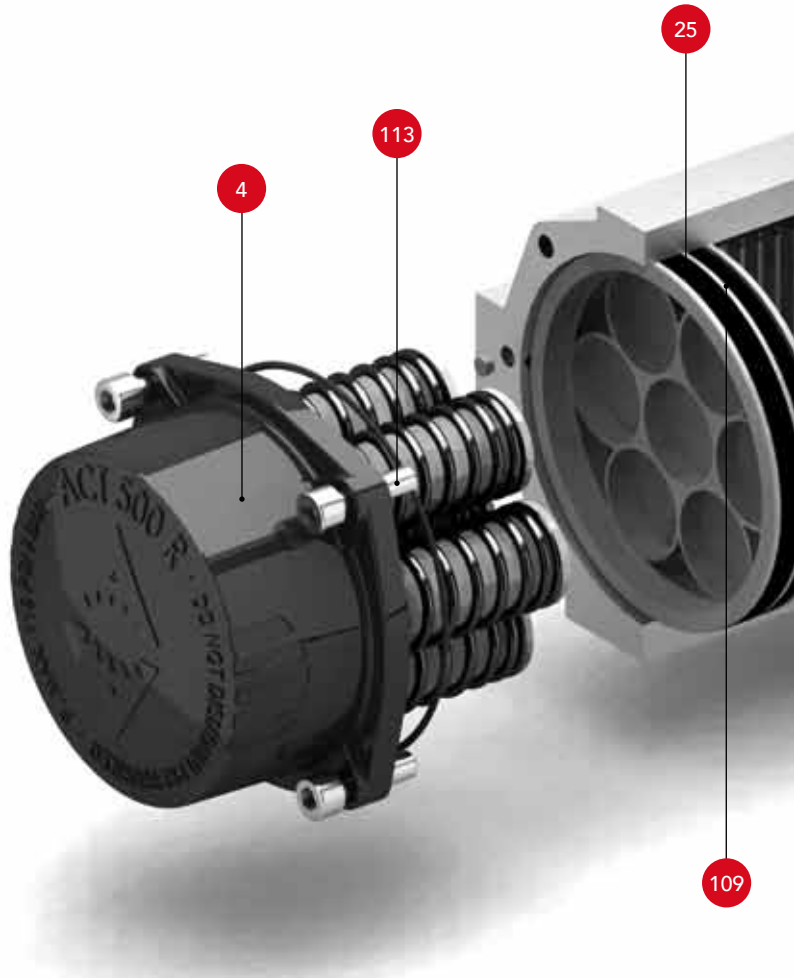


Inductive switches indicating open and closed position (up/down detecting switches...)

# PARTS & MATERIALS

- 1 Body  
Aluminium Hard Anodized
- 2 Piston  
Aluminium
- 3 Pinion  
Nickel Plated Carbon Steel
- 4 End Caps  
Aluminium Epoxy Coated
- 5 Soft Pinion Washer \*  
Polyamide PA 6,6
- 6 Slide Piston \*  
Polyamide PA 6,6 + 30% G.F.
- 7 Lug \*\*  
Nickel Plated Carbon Steel
- 8 Pinion Washer  
Stainless Steel
- 10 Upper Pinion Bearing  
Polyamide PA 6,6 Size 500  
& greater in Reinforced Br.
- 12 Stop  
ASTM A 105
- 14 Spring's Long Support  
Polyamide PA 6,6
- 15 Spring's Short Support  
Polyamide PA 6,6
- 16 Leveling Screw  
Stainless Steel
- 18 Bolt  
Stainless Steel
- 19 Spring  
DIN 2076 · D-5.6
- 20 Position Indicator  
Polypropylene
- 21 Cam  
Polypropylene
- 23 Centering Ring  
Nickel Plated Carbon Steel
- 25 Slide Guide \*  
Polyamide PA 6,6 + 30% G.F.
- 26 Lower Pinion Bearing \*  
Polyamide PA 6,6
- 41 Stop Washer Pinion \*\*  
Stainless Steel
- 109 O-Ring \*  
NBR
- 110 O-Ring \*  
NBR

## SPRING RETURN ACTUATOR (ASR)



- 111 O-Ring \*  
NBR
- 113 Bolt  
Stainless Steel
- 118 O-Ring \*  
NBR
- 119 O-Ring \*  
NBR
- 125 Washer  
Stainless Steel
- 471 Slip Washer \*  
Stainless Steel
- 934 Nut  
Stainless Steel
- 985 Nut  
Stainless Steel

## POSITION INDICATOR

FROM SIZE 20 TO 850



Inserts  
Stainless Steel

FROM SIZE 1200 TO 4000

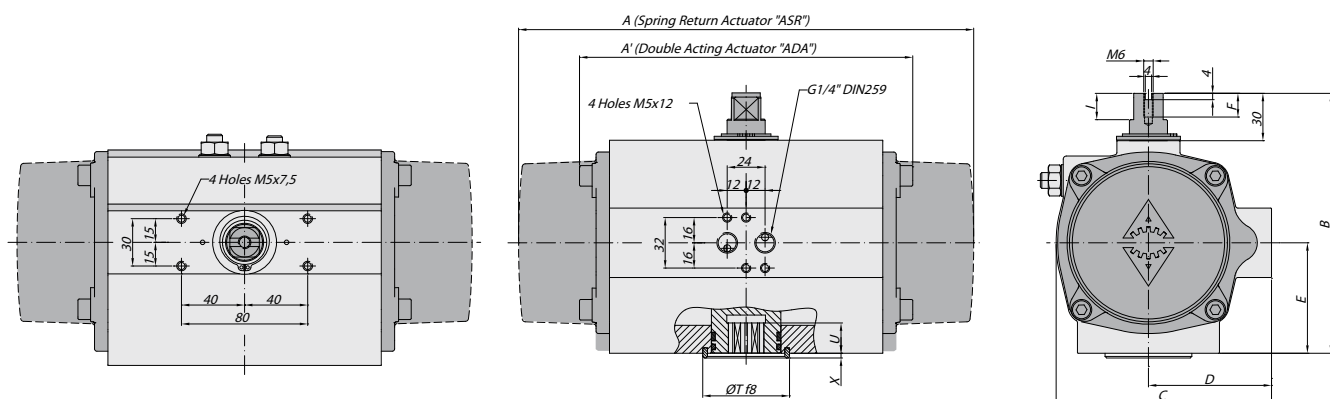


Position indicator & Cams  
Polypropylene

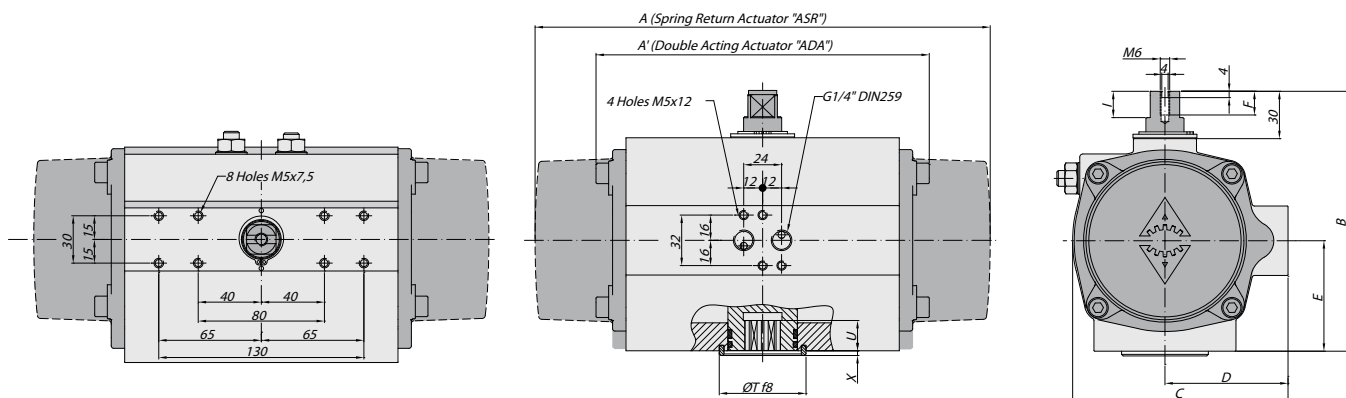


# GENERAL DIMENSIONS

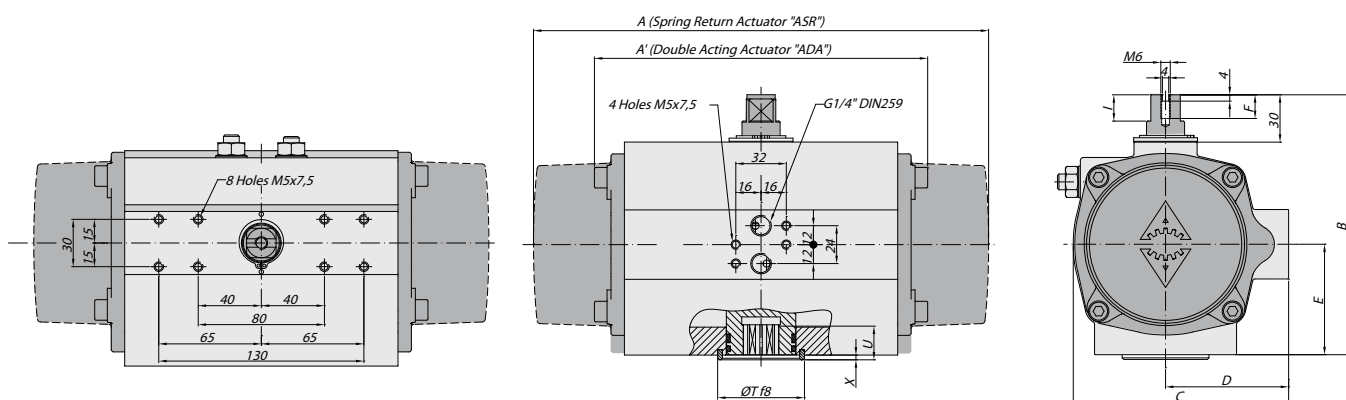
**SIZES** 10 | 20 | 40 | 80 | 130 | 200 | 300 | 500 | 850



**SIZES** 1200 | 1750



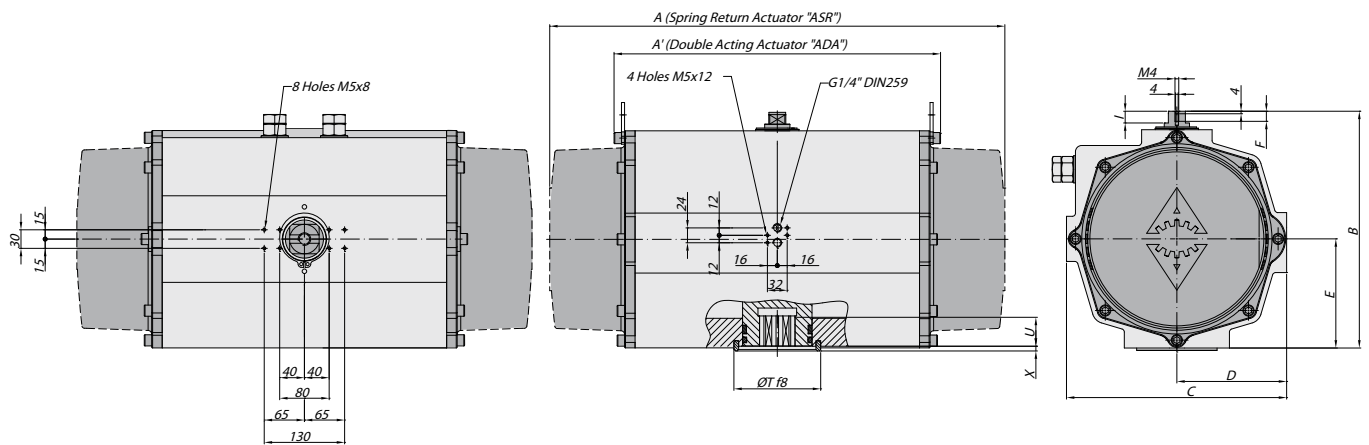
**SIZES** 2100



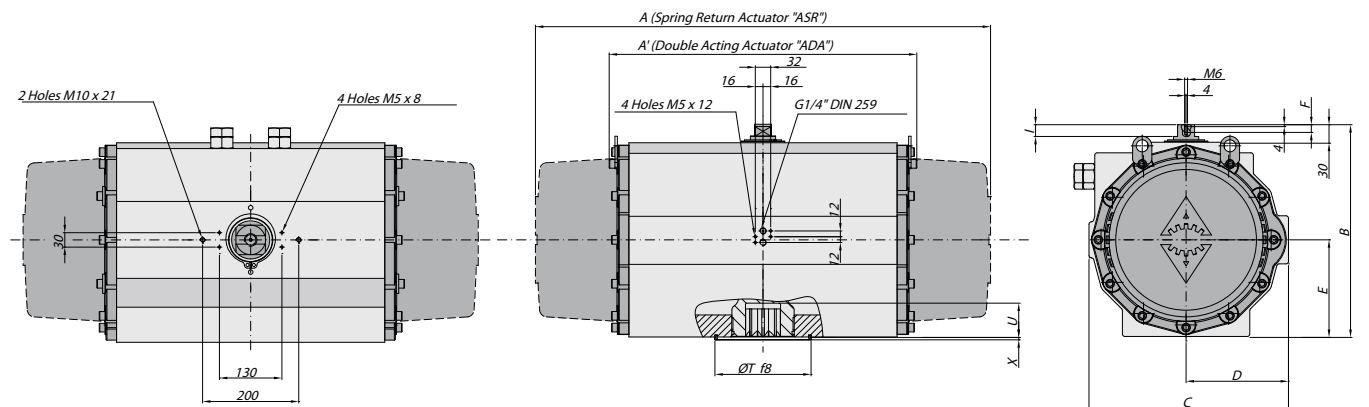
## DOUBLE ACTING & SPRING RETURN ACTUATORS GENERAL DIMENSIONS in mm

| SIZE | A   | A'  | B   | C     | D  | E  | F  | I    | R  | øS   | ISO 5211 | øL | MxV   | ISO 5211 | øL1 | M1xV1  | øT | X | U  |
|------|-----|-----|-----|-------|----|----|----|------|----|------|----------|----|-------|----------|-----|--------|----|---|----|
| 10   | -   | 100 | 76  | 56    | 33 | 23 | 9  | 6    | 9  | 12.5 | F03      | 36 | M5x8  | -        | -   | -      | 11 | 2 | 12 |
| 20   | 163 | 145 | 96  | 76    | 48 | 34 | 9  | 12.5 | 9  | 12.5 | F03      | 36 | M5x8  | F05      | 50  | M6x10  | 25 | 2 | 10 |
| 20   | 163 | 145 | 96  | 76    | 48 | 34 | 9  | 12.5 | 14 | 18.1 | F05      | 50 | M6x10 | -        | -   | -      | 35 | 3 | 12 |
| 20   | 163 | 145 | 96  | 76    | 48 | 34 | 9  | 12.5 | 14 | 18.1 | F04      | 42 | M5x10 | -        | -   | -      | 35 | 3 | 12 |
| 40   | 195 | 158 | 115 | 91    | 56 | 45 | 9  | 12.5 | 14 | 18.1 | F04      | 42 | M5x10 | -        | -   | -      | 35 | 3 | 12 |
| 40   | 195 | 158 | 115 | 91    | 56 | 45 | 9  | 12.5 | 14 | 18.1 | F05      | 50 | M6x10 | -        | -   | -      | 35 | 3 | 12 |
| 80   | 217 | 177 | 137 | 111   | 66 | 55 | 12 | 12.5 | 17 | 22.5 | F05      | 50 | M6x10 | F07      | 70  | M8x16  | 55 | 3 | 19 |
| 130  | 258 | 196 | 147 | 122   | 71 | 60 | 12 | 12.5 | 17 | 22.5 | F05      | 50 | M6x10 | F07      | 70  | M8x16  | 55 | 3 | 22 |
| 200  | 299 | 225 | 165 | 135.5 | 78 | 70 | 12 | 12.5 | 17 | 22.5 | F07      | 70 | M8x16 | F10      | 102 | M10x16 | 55 | 3 | 23 |

## SIZES 2500



## SIZES 4000



## ISO 5211 DETAIL

### SIZES

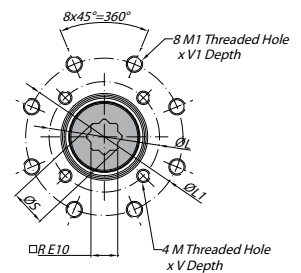
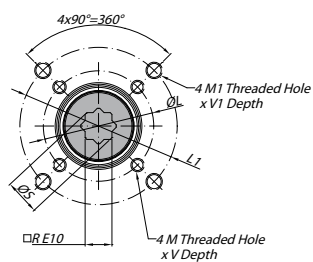
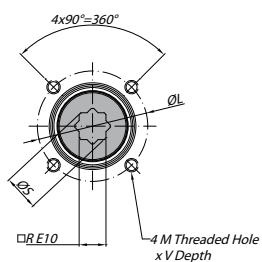
10 | 20 | 40 | 500 | 1750 | 2100 | 2500

### SIZES

20 | 80 | 130 | 200 | 300 | 850 | 1200

### SIZES

4000



## DOUBLE ACTING & SPRING RETURN ACTUATORS GENERAL DIMENSIONS in mm

| SIZE | A     | A'  | B   | C     | D     | E     | F  | I    | R  | øS   | ISO 5211 | øL  | MxV    | ISO 5211 | øL1 | M1xV1  | øT  | X | U  |
|------|-------|-----|-----|-------|-------|-------|----|------|----|------|----------|-----|--------|----------|-----|--------|-----|---|----|
| 300  | 348.5 | 273 | 182 | 152.5 | 86    | 80    | 12 | 12.5 | 22 | 28.5 | F07      | 70  | M8x16  | F10      | 102 | M10x16 | 70  | 3 | 24 |
| 500  | 397   | 304 | 199 | 173   | 96    | 85    | 12 | 12.5 | 22 | 28.5 | F10      | 102 | M10x16 | -        | -   | -      | 70  | 3 | 32 |
| 850  | 473   | 372 | 221 | 191.5 | 106   | 98    | 12 | 12.5 | 27 | 36.5 | F10      | 102 | M10x17 | F12      | 125 | M12x20 | 85  | 3 | 39 |
| 1200 | 560   | 439 | 249 | 212.5 | 116   | 114   | 16 | 18.6 | 36 | 48.5 | F10      | 102 | M10x17 | F14      | 140 | M16x26 | 100 | 4 | 48 |
| 1750 | 601   | 461 | 280 | 242.5 | 131   | 130   | 16 | 18.6 | 36 | 48.5 | F14      | 140 | M16x26 | -        | -   | -      | 100 | 4 | 50 |
| 2100 | 702   | 510 | 313 | 276.5 | 148   | 147   | 16 | 18.6 | 46 | 60.1 | F16      | 165 | M20x29 | -        | -   | -      | 130 | 4 | 50 |
| 2500 | 738   | 518 | 383 | 356   | 177.5 | 176.5 | 16 | 18.6 | 46 | 60.2 | F16      | 165 | M20x29 | -        | -   | -      | 130 | 4 | 58 |
| 4000 | 940   | 630 | 434 | 415   | 213   | 201   | 16 | 18.6 | 55 | 72.5 | F16      | 165 | M20x30 | F25      | 254 | M16x30 | 200 | 4 | 60 |

## DOUBLE ACTING ACTUATOR TORQUE OUTPUT in Nm

| Size | Output torque for double acting in Nm |     |         |     |       |     |         |     |       |     |         |     |       |     |         |     |       |     |       |     | Weight<br>(kg) |        |       |
|------|---------------------------------------|-----|---------|-----|-------|-----|---------|-----|-------|-----|---------|-----|-------|-----|---------|-----|-------|-----|-------|-----|----------------|--------|-------|
|      | 3 bar                                 |     | 3,5 bar |     | 4 bar |     | 4,5 bar |     | 5 bar |     | 5,5 bar |     | 6 bar |     | 6,5 bar |     | 7 bar |     | 8 bar |     |                | 10 bar |       |
|      | 0°                                    | 90° | 0°      | 90° | 0°    | 90° | 0°      | 90° | 0°    | 90° | 0°      | 90° | 0°    | 90° | 0°      | 90° | 0°    | 90° | 0°    | 90° |                | 0°     | 90°   |
| 10   | 6                                     |     | 8       |     | 9     |     | 10      |     | 11    |     | 11.5    |     | 12    |     | 12      |     | 13    |     | 14    |     | 15             |        | 0.64  |
| 20   | 9.7                                   |     | 11.4    |     | 13    |     | 14.6    |     | 16.2  |     | 17.8    |     | 19.5  |     | 21.1    |     | 23    |     | 26    |     | -              |        | 1.4   |
| 40   | 20.3                                  |     | 23.7    |     | 27.1  |     | 30.5    |     | 33.9  |     | 37.3    |     | 41    |     | 44      |     | 47    |     | 54    |     | -              |        | 2.1   |
| 80   | 38.5                                  |     | 44.9    |     | 51.3  |     | 57.7    |     | 64.1  |     | 70.5    |     | 77    |     | 83      |     | 90    |     | 103   |     | -              |        | 3     |
| 130  | 59.1                                  |     | 68.9    |     | 78.7  |     | 88.6    |     | 98.4  |     | 108.3   |     | 118   |     | 128     |     | 138   |     | 157   |     | -              |        | 3.8   |
| 200  | 88                                    |     | 102     |     | 117   |     | 131     |     | 146   |     | 161     |     | 175   |     | 190     |     | 205   |     | 234   |     | -              |        | 5.6   |
| 300  | 145                                   |     | 170     |     | 194   |     | 218     |     | 242   |     | 267     |     | 291   |     | 315     |     | 339   |     | 388   |     | -              |        | 8.5   |
| 500  | 217                                   |     | 253     |     | 289   |     | 325     |     | 361   |     | 397     |     | 433   |     | 469     |     | 505   |     | 577   |     | -              |        | 11.2  |
| 850  | 359                                   |     | 419     |     | 479   |     | 538     |     | 598   |     | 658     |     | 718   |     | 778     |     | 837   |     | 957   |     | -              |        | 16.9  |
| 1200 | 519                                   |     | 606     |     | 692   |     | 779     |     | 865   |     | 952     |     | 1038  |     | 1125    |     | 1211  |     | 1384  |     | -              |        | 25.8  |
| 1750 | 707                                   |     | 824     |     | 942   |     | 1060    |     | 1178  |     | 1295    |     | 1413  |     | 1531    |     | 1649  |     | 1884  |     | -              |        | 32.5  |
| 2100 | 1086                                  |     | 1267    |     | 1448  |     | 1629    |     | 1810  |     | 1991    |     | 2172  |     | 2353    |     | 2534  |     | 2896  |     | -              |        | 49.7  |
| 2500 | 1730                                  |     | 2019    |     | 2307  |     | 2596    |     | 2884  |     | 3172    |     | 3461  |     | 3749    |     | 4038  |     | 4614  |     | -              |        | 69.6  |
| 4000 | 2408                                  |     | 2809    |     | 3210  |     | 3612    |     | 4013  |     | 4414    |     | 4816  |     | 5217    |     | 5618  |     | 6421  |     | -              |        | 129.4 |

## SPRING RETURN ACTUATOR TORQUE OUTPUT in Nm

| Size | Type Pressure | Output torque for spring return in Nm |      |         |      |       |      |         |      |       |      |         |      |       |      |         |      |       |      | Spring Stroke |      | Weight (kg) |        |           |      |
|------|---------------|---------------------------------------|------|---------|------|-------|------|---------|------|-------|------|---------|------|-------|------|---------|------|-------|------|---------------|------|-------------|--------|-----------|------|
|      |               | 3 bar                                 |      | 3,5 bar |      | 4 bar |      | 4,5 bar |      | 5 bar |      | 5,5 bar |      | 6 bar |      | 6,5 bar |      | 7 bar |      | 8 bar         |      |             |        |           |      |
|      |               | 0°                                    | 90°  | 0°      | 90°  | 0°    | 90°  | 0°      | 90°  | 0°    | 90°  | 0°      | 90°  | 0°    | 90°  | 0°      | 90°  | 0°    | 90°  | 0°            | 90°  |             | END 0° | START 90° |      |
| 20   | S04           |                                       |      | 8       | 5    | 9     | 7    | 11      | 8    | 13    | 10   | 14      | 12   | 16    | 13   | 17      | 15   | 19    | 17   | 22            | 20   | 4           | 7      | 1.51      |      |
|      | S06 A         |                                       |      |         |      |       |      |         |      | 11    | 7    | 12      | 9    | 14    | 10   | 15      | 12   | 17    | 13   | 20            | 17   | 7           | 11     | 1.54      |      |
|      | S08           |                                       |      |         |      |       |      |         |      |       |      | 10      | 5    | 12    | 7    | 14      | 9    | 15    | 10   | 18            | 14   | 9           | 15     | 1.56      |      |
| 40   | S04           | 16                                    | 14   | 20      | 17   | 23    | 20   | 26      | 24   | 30    | 27   | 33      | 30   | 37    | 34   | 40      | 37   | 43    | 41   | 50            | 47   | 5           | 8      | 2.17      |      |
|      | S06           | 14                                    | 10   | 18      | 14   | 21    | 17   | 24      | 20   | 28    | 24   | 31      | 27   | 34    | 30   | 38      | 34   | 41    | 37   | 48            | 44   | 7           | 12     | 2.20      |      |
|      | S08           |                                       |      | 15      | 10   | 19    | 14   | 22      | 17   | 26    | 20   | 29      | 24   | 32    | 27   | 36      | 30   | 39    | 34   | 46            | 41   | 10          | 16     | 2.23      |      |
|      | S10           |                                       |      |         |      |       |      | 20      | 14   | 24    | 17   | 27      | 20   | 30    | 24   | 34      | 27   | 37    | 30   | 44            | 37   | 12          | 20     | 2.26      |      |
|      | S12           |                                       |      |         |      |       |      |         |      | 21    | 13   | 25      | 17   | 28    | 20   | 32      | 24   | 35    | 27   | 42            | 34   | 15          | 24     | 2.29      |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      |       |      | 23      | 13   | 26    | 17   | 30      | 20   | 33    | 24   | 40            | 30   | 17          | 28     | 2.32      |      |
| 80   | S04           | 31                                    | 27   | 38      | 34   | 44    | 40   | 50      | 46   | 57    | 53   | 63      | 59   | 70    | 66   | 76      | 72   | 82    | 78   | 95            | 91   | 9           | 13     | 3.28      |      |
|      | S06           | 27                                    | 21   | 34      | 28   | 40    | 34   | 47      | 41   | 53    | 47   | 59      | 53   | 66    | 60   | 72      | 66   | 79    | 73   | 92            | 86   | 13          | 20     | 3.36      |      |
|      | S08           |                                       |      |         |      | 37    | 29   | 43      | 35   | 49    | 41   | 56      | 48   | 62    | 54   | 69      | 61   | 75    | 67   | 88            | 80   | 17          | 27     | 3.43      |      |
|      | S10           |                                       |      |         |      |       |      | 39      | 29   | 46    | 36   | 52      | 42   | 59    | 49   | 65      | 55   | 71    | 61   | 84            | 74   | 22          | 33     | 3.51      |      |
|      | S12           |                                       |      |         |      |       |      |         |      | 42    | 30   | 48      | 36   | 55    | 43   | 61      | 49   | 68    | 56   | 81            | 69   | 26          | 40     | 3.58      |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      |       |      | 45      | 31   | 51    | 37   | 58      | 44   | 64    | 50   | 77            | 63   | 30          | 47     | 3.65      |      |
| 130  | S06           | 43                                    | 36   | 52      | 46   | 62    | 56   | 72      | 65   | 82    | 75   | 92      | 85   | 102   | 95   | 111     | 105  | 121   | 115  | 141           | 134  | 19          | 27     | 4.40      |      |
|      | S08           |                                       |      | 47      | 38   | 57    | 48   | 67      | 58   | 76    | 68   | 86      | 77   | 96    | 87   | 106     | 97   | 116   | 107  | 135           | 127  | 26          | 36     | 4.50      |      |
|      | S10           |                                       |      |         |      | 51    | 40   | 61      | 50   | 71    | 60   | 81      | 70   | 91    | 80   | 100     | 89   | 110   | 99   | 130           | 119  | 32          | 45     | 4.60      |      |
|      | S12           |                                       |      |         |      |       |      | 56      | 42   | 65    | 52   | 75      | 62   | 85    | 72   | 95      | 82   | 105   | 92   | 124           | 111  | 39          | 54     | 4.70      |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      |       |      | 70      | 54   | 80    | 64   | 89      | 74   | 99    | 84   | 119           | 103  | 45          | 64     | 4.80      |      |
| 200  | S06           | 61                                    | 49   | 76      | 63   | 90    | 78   | 105     | 92   | 119   | 107  | 134     | 122  | 149   | 136  | 163     | 151  | 178   | 166  | 207           | 195  | 31          | 46     | 6.50      |      |
|      | S08           |                                       |      | 67      | 50   | 81    | 65   | 96      | 79   | 111   | 94   | 125     | 109  | 140   | 123  | 154     | 138  | 169   | 152  | 198           | 182  | 42          | 61     | 6.70      |      |
|      | S10           |                                       |      |         |      | 72    | 52   | 87      | 66   | 102   | 81   | 116     | 96   | 131   | 110  | 146     | 125  | 160   | 139  | 189           | 169  | 52          | 77     | 6.90      |      |
|      | S12           |                                       |      |         |      |       |      | 78      | 53   | 93    | 68   | 107     | 83   | 122   | 97   | 137     | 112  | 151   | 126  | 180           | 156  | 63          | 92     | 7.00      |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      |       |      | 99      | 70   | 113   | 84   | 128     | 99   | 142   | 113  | 172           | 143  | 73          | 107    | 7.30      |      |
| 300  | S06           | 102                                   | 75   | 126     | 99   | 151   | 123  | 175     | 148  | 199   | 172  | 223     | 196  | 247   | 220  | 272     | 245  | 296   | 269  | 344           | 317  | 51          | 83     | 9.65      |      |
|      | S08           |                                       |      | 112     | 76   | 136   | 100  | 160     | 124  | 185   | 148  | 209     | 173  | 233   | 197  | 257     | 221  | 281   | 245  | 330           | 294  | 68          | 111    | 9.92      |      |
|      | S10           |                                       |      |         |      | 122   | 76   | 146     | 101  | 170   | 125  | 194     | 149  | 219   | 173  | 243     | 198  | 267   | 222  | 315           | 270  | 85          | 138    | 10.20     |      |
|      | S12           |                                       |      |         |      |       |      | 131     | 77   | 156   | 101  | 180     | 126  | 204   | 150  | 228     | 174  | 253   | 198  | 301           | 247  | 102         | 166    | 10.50     |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      |       |      | 165     | 102  | 190   | 126  | 214     | 151  | 238   | 175  | 287           | 223  | 119         | 193    | 10.80     |      |
| 500  | S06           | 152                                   | 119  | 188     | 155  | 224   | 191  | 260     | 227  | 296   | 263  | 333     | 299  | 369   | 335  | 405     | 371  | 441   | 407  | 513           | 480  | 76          | 115    | 13.33     |      |
|      | S08           | 131                                   | 86   | 167     | 122  | 203   | 158  | 239     | 194  | 275   | 231  | 311     | 267  | 347   | 303  | 383     | 339  | 419   | 375  | 492           | 447  | 101         | 153    | 13.84     |      |
|      | S10           |                                       |      |         |      | 181   | 126  | 217     | 162  | 254   | 198  | 290     | 234  | 326   | 270  | 362     | 306  | 398   | 342  | 470           | 414  | 126         | 192    | 14.35     |      |
|      | S12           |                                       |      |         |      |       |      | 196     | 129  | 232   | 165  | 268     | 201  | 304   | 238  | 340     | 274  | 376   | 310  | 449           | 382  | 152         | 230    | 14.85     |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      |       |      | 247     | 169  | 283   | 205  | 319     | 241  | 355   | 277  | 427           | 349  | 177         | 268    | 15.36     |      |
| 850  | S06           | 260                                   | 209  | 320     | 269  | 380   | 328  | 440     | 388  | 500   | 448  | 559     | 508  | 619   | 568  | 679     | 627  | 739   | 687  | 858           | 807  | 116         | 177    | 19.7      |      |
|      | S08           | 227                                   | 159  | 287     | 218  | 347   | 278  | 407     | 338  | 467   | 398  | 526     | 458  | 586   | 518  | 646     | 577  | 706   | 637  | 826           | 757  | 155         | 236    | 20.3      |      |
|      | S10           |                                       |      | 254     | 168  | 314   | 228  | 374     | 288  | 434   | 348  | 494     | 408  | 553   | 467  | 613     | 527  | 673   | 587  | 793           | 707  | 193         | 295    | 20.9      |      |
|      | S12           |                                       |      |         |      |       |      | 341     | 238  | 401   | 298  | 461     | 358  | 521   | 417  | 580     | 477  | 640   | 537  | 760           | 657  | 232         | 353    | 21.6      |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      |       |      | 428     | 307  | 488   | 367  | 547     | 427  | 607   | 487  | 727           | 607  | 271         | 412    | 22.2      |      |
| 1200 | S06           | 373                                   | 289  | 460     | 376  | 546   | 462  | 633     | 549  | 720   | 635  | 806     | 722  | 893   | 808  | 979     | 895  | 1066  | 981  | 1239          | 1154 | 171         | 271    | 30.1      |      |
|      | S08           | 325                                   | 213  | 411     | 299  | 498   | 386  | 584     | 472  | 671   | 559  | 758     | 645  | 844   | 732  | 931     | 818  | 1017  | 905  | 1190          | 1078 | 229         | 361    | 31.1      |      |
|      | S10           | 276                                   | 136  | 363     | 222  | 449   | 309  | 536     | 395  | 622   | 482  | 709     | 569  | 795   | 655  | 882     | 742  | 969   | 828  | 1142          | 1001 | 286         | 451    | 32.2      |      |
|      | S12           |                                       |      |         |      | 401   | 232  | 487     | 319  | 574   | 405  | 660     | 492  | 747   | 578  | 833     | 665  | 920   | 751  | 1093          | 924  | 343         | 541    | 33.2      |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      | 525   | 329  | 612     | 415  | 698   | 502  | 785     | 588  | 871   | 675  | 1044          | 848  | 400         | 631    | 34.3      |      |
| 1750 | S06           | 477                                   | 349  | 595     | 466  | 712   | 584  | 830     | 702  | 948   | 820  | 1066    | 937  | 1183  | 1055 | 1301    | 1173 | 1419  | 1291 | 1654          | 1526 | 270         | 421    | 39.3      |      |
|      | S08           | 400                                   | 229  | 518     | 347  | 636   | 465  | 754     | 582  | 871   | 700  | 989     | 818  | 1107  | 936  | 1225    | 1053 | 1342  | 1171 | 1578          | 1407 | 360         | 562    | 41.0      |      |
|      | S10           |                                       |      | 441     | 228  | 559   | 345  | 677     | 463  | 795   | 581  | 912     | 699  | 1030  | 816  | 1148    | 934  | 1266  | 1052 | 1501          | 1287 | 451         | 702    | 42.7      |      |
|      | S12           |                                       |      |         |      |       |      | 600     | 344  | 718   | 461  | 836     | 579  | 954   | 697  | 1071    | 815  | 1189  | 933  | 1425          | 1168 | 541         | 843    | 44.4      |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      | 642   | 342  | 759     | 460  | 877   | 578  | 995     | 695  | 1113  | 813  | 1348          | 1049 | 631         | 983    | 46.0      |      |
| 2100 | S06           | 702                                   | 509  | 883     | 690  | 1064  | 871  | 1245    | 1052 | 1426  | 1233 | 1607    | 1414 | 1788  | 1595 | 1969    | 1776 | 2150  | 1957 | 2512          | 2319 | 384         | 577    | 60.3      |      |
|      | S08           | 574                                   | 316  | 755     | 497  | 936   | 678  | 1117    | 859  | 1298  | 1040 | 1479    | 1221 | 1660  | 1402 | 1841    | 1583 | 2022  | 1764 | 2384          | 2126 | 512         | 770    | 62.5      |      |
|      | S10           |                                       |      | 627     | 305  | 808   | 486  | 989     | 667  | 1170  | 848  | 1351    | 1029 | 1532  | 1210 | 1713    | 1391 | 1894  | 1572 | 2256          | 1934 | 640         | 962    | 64.2      |      |
|      | S12           |                                       |      |         |      |       |      | 861     | 474  | 1042  | 655  | 1223    | 836  | 1404  | 1017 | 1585    | 1198 | 1766  | 1379 | 2128          | 1741 | 768         | 1154   | 66.3      |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      | 914   | 463  | 1095    | 644  | 1276  | 825  | 1457    | 1006 | 1638  | 1187 | 2000          | 1549 | 896         | 1347   | 68.0      |      |
| 2500 | S06           | 1299                                  | 1045 | 1587    | 1333 | 1876  | 1622 | 2164    | 1910 | 2453  | 2199 | 2741    | 2487 | 3029  | 2755 | 3318    | 3064 | 3606  | 3352 | 4183          | 3929 | 508         | 806    | 85.9      |      |
|      | S08           | 1155                                  | 816  | 1444    | 1105 | 1732  | 1393 | 2020    | 1682 | 2309  | 1970 | 2597    | 2258 | 2886  | 2547 | 3174    | 2835 | 3462  | 3124 | 4039          | 3700 | 677         | 1075   | 89.4      |      |
|      | S10           |                                       |      | 1300    | 876  | 1588  | 1165 | 1877    | 1453 | 2165  | 1742 | 2453    | 2030 | 2742  | 2318 | 3030    | 2607 | 3319  | 2895 | 3895          | 3472 | 846         | 1344   | 92.9      |      |
|      | S12           |                                       |      |         |      | 1444  | 936  | 1733    | 1225 | 2021  | 1513 | 2310    | 1802 | 2598  | 2090 | 2886    | 2378 | 3175  | 2667 | 3752          | 3243 | 1015        | 1613   | 96.4      |      |
|      | S14 A         |                                       |      |         |      |       |      | 1589    | 996  | 1877  | 1285 | 2166    | 1573 | 2454  | 1861 | 2742    | 2150 | 3031  | 2438 | 3608          | 3015 | 1184        | 1882   | 99.9      |      |
| 4000 | S06           | 1763                                  | 1262 | 2165    | 1663 | 2566  | 2065 | 2967    | 2466 | 3369  | 2867 | 3750    | 3269 |       |      |         |      |       |      |               |      | 758         | 1348   | 158.7     |      |
|      | S08           | 1549                                  | 880  | 1950    | 1282 | 2351  | 1683 | 2752    | 2084 | 3154  | 2485 | 3555    | 2887 | 3956  | 3288 | 4358    | 3689 | 4759  | 4091 | 5068          | 4399 | 1011        | 1797   | 164.7     |      |
|      | S10           |                                       |      |         |      | 2136  | 1301 | 2538    | 1702 | 2939  | 2104 | 3340    | 2505 | 3742  | 2906 | 4143    | 3307 | 4544  | 3709 | 4853          | 4017 | 1264        | 2246   | 170.8     |      |
|      | S12           |                                       |      |         |      |       |      |         |      | 2323  | 1320 | 2724    | 1722 |       |      |         |      |       |      |               |      | 1516        | 2696   | 176.9     |      |
|      | S14 A         |                                       |      |         |      |       |      |         |      |       |      |         |      | 2911  | 1741 | 3312    | 2142 | 3713  | 2544 | 4115          | 2945 | 4423        | 3254   | 1769      | 3145 |

## DOUBLE ACTING ACTUATOR TORQUE OUTPUT in ft lb

| Size | Output torque for double acting in ft lb |     |          |     |        |     |          |     |          |     |        |     |        |     |          |     |         |     |         |     | Weight<br>(lb) |         |       |
|------|------------------------------------------|-----|----------|-----|--------|-----|----------|-----|----------|-----|--------|-----|--------|-----|----------|-----|---------|-----|---------|-----|----------------|---------|-------|
|      | 43.5 psi                                 |     | 50.8 psi |     | 58 psi |     | 65.3 psi |     | 72.5 psi |     | 80 psi |     | 87 psi |     | 94.3 psi |     | 102 psi |     | 116 psi |     |                | 145 psi |       |
|      | 0°                                       | 90° | 0°       | 90° | 0°     | 90° | 0°       | 90° | 0°       | 90° | 0°     | 90° | 0°     | 90° | 0°       | 90° | 0°      | 90° | 0°      | 90° |                | 0°      | 90°   |
| 10   | 4.4                                      |     | 6        |     | 6.5    |     | 7.4      |     | 8        |     | 8.5    |     | 9      |     | 9        |     | 9.5     |     | 10.3    |     | 12             |         | 1.4   |
| 20   | 7.2                                      |     | 8.4      |     | 9.6    |     | 10.8     |     | 11.9     |     | 13.1   |     | 14.4   |     | 15.6     |     | 17      |     | 19.2    |     | -              |         | 3.1   |
| 40   | 15.0                                     |     | 17.5     |     | 20.0   |     | 22.5     |     | 25.0     |     | 27.5   |     | 30.2   |     | 32.4     |     | 34.6    |     | 39.8    |     | -              |         | 4.6   |
| 80   | 28.4                                     |     | 33.1     |     | 37.8   |     | 42.5     |     | 47.2     |     | 52.0   |     | 56.7   |     | 61.2     |     | 66      |     | 76      |     | -              |         | 6.6   |
| 130  | 43.6                                     |     | 50.8     |     | 58.0   |     | 65.3     |     | 72.5     |     | 79.8   |     | 87     |     | 94       |     | 102     |     | 116     |     | -              |         | 8.4   |
| 200  | 64.9                                     |     | 75.2     |     | 86.2   |     | 96.5     |     | 108      |     | 119    |     | 129    |     | 140      |     | 151     |     | 172     |     | -              |         | 12.3  |
| 300  | 107                                      |     | 125.3    |     | 143    |     | 161      |     | 178      |     | 197    |     | 214    |     | 232      |     | 250     |     | 286     |     | -              |         | 18.7  |
| 500  | 160                                      |     | 186      |     | 213    |     | 240      |     | 266      |     | 293    |     | 319    |     | 346      |     | 372     |     | 425     |     | -              |         | 24.7  |
| 850  | 265                                      |     | 309      |     | 353    |     | 397      |     | 441      |     | 485    |     | 529    |     | 573      |     | 617     |     | 705     |     | -              |         | 37.3  |
| 1200 | 383                                      |     | 447      |     | 510    |     | 574      |     | 638      |     | 702    |     | 765    |     | 829      |     | 893     |     | 1020    |     | -              |         | 56.9  |
| 1750 | 521                                      |     | 607      |     | 694    |     | 781      |     | 868      |     | 954    |     | 1041   |     | 1128     |     | 1215    |     | 1389    |     | -              |         | 71.6  |
| 2100 | 801                                      |     | 934      |     | 1068   |     | 1201     |     | 1335     |     | 1468   |     | 1602   |     | 1735     |     | 1869    |     | 2136    |     | -              |         | 109.5 |
| 2500 | 1275                                     |     | 1488     |     | 1700   |     | 1913     |     | 2126     |     | 2338   |     | 2551   |     | 2763     |     | 2976    |     | 3401    |     | -              |         | 153.4 |
| 4000 | 1775                                     |     | 2070     |     | 2366   |     | 2662     |     | 2958     |     | 3253   |     | 3549   |     | 3845     |     | 4140    |     | 4732    |     | -              |         | 285.3 |

## SPRING RETURN ACTUATOR TORQUE OUTPUT in lb

| Size | Type Pressure | Output torque for spring acting in ft lb |     |          |      |        |      |          |      |          |      |        |      |        |      |          |      |         |      | Spring Stroke |      | Weight (lb) |        |           |
|------|---------------|------------------------------------------|-----|----------|------|--------|------|----------|------|----------|------|--------|------|--------|------|----------|------|---------|------|---------------|------|-------------|--------|-----------|
|      |               | 43.5 psi                                 |     | 50.8 psi |      | 58 psi |      | 65.3 psi |      | 72.5 psi |      | 80 psi |      | 87 psi |      | 94.3 psi |      | 102 psi |      | 116 psi       |      |             |        |           |
|      |               | 0°                                       | 90° | 0°       | 90°  | 0°     | 90°  | 0°       | 90°  | 0°       | 90°  | 0°     | 90°  | 0°     | 90°  | 0°       | 90°  | 0°      | 90°  | 0°            | 90°  |             | END 0° | START 90° |
| 20   | S04           |                                          |     | 6        | 4    | 7      | 5    | 8        | 6    | 9        | 7    | 10     | 9    | 12     | 10   | 13       | 11   | 14      | 12   | 16            | 15   | 3           | 5      | 3.33      |
|      | S06 A         |                                          |     |          |      |        |      |          |      | 8        | 5    | 9      | 6    | 10     | 8    | 11       | 9    | 13      | 10   | 15            | 12   | 5           | 8      | 3.40      |
|      | S08           |                                          |     |          |      |        |      |          |      |          |      | 8      | 4    | 9      | 5    | 10       | 6    | 11      | 8    | 14            | 10   | 7           | 11     | 3.44      |
| 40   | S04           | 12                                       | 10  | 14       | 12   | 17     | 15   | 19       | 17   | 22       | 20   | 24     | 22   | 27     | 25   | 29       | 27   | 32      | 30   | 37            | 35   | 4           | 6      | 4.78      |
|      | S06           | 10                                       | 7   | 13       | 10   | 15     | 12   | 18       | 15   | 21       | 18   | 23     | 20   | 25     | 22   | 28       | 25   | 30      | 27   | 35            | 32   | 5           | 9      | 4.85      |
|      | S08           |                                          |     | 11       | 7    | 14     | 10   | 16       | 12   | 19       | 15   | 21     | 18   | 24     | 20   | 27       | 22   | 29      | 25   | 34            | 30   | 7           | 12     | 4.92      |
|      | S10           |                                          |     |          |      |        |      | 15       | 10   | 18       | 13   | 20     | 15   | 22     | 18   | 25       | 20   | 27      | 22   | 32            | 27   | 9           | 15     | 4.98      |
|      | S12           |                                          |     |          |      |        |      |          |      | 15       | 10   | 18     | 13   | 21     | 15   | 24       | 18   | 26      | 20   | 31            | 25   | 11          | 18     | 5.05      |
| 80   | S14 A         |                                          |     |          |      |        |      |          |      |          |      | 17     | 10   | 19     | 13   | 22       | 15   | 24      | 18   | 29            | 22   | 13          | 21     | 5.11      |
|      | S04           | 23                                       | 20  | 28       | 25   | 32     | 29   | 37       | 34   | 42       | 39   | 46     | 43   | 52     | 49   | 56       | 53   | 60      | 57   | 70            | 67   | 6           | 10     | 7.23      |
|      | S06           | 20                                       | 16  | 25       | 21   | 30     | 25   | 35       | 30   | 39       | 35   | 43     | 39   | 49     | 44   | 53       | 49   | 58      | 54   | 68            | 63   | 10          | 15     | 7.41      |
|      | S08           |                                          |     |          |      | 27     | 21   | 32       | 26   | 36       | 30   | 41     | 35   | 46     | 40   | 51       | 45   | 55      | 49   | 65            | 59   | 13          | 20     | 7.56      |
|      | S10           |                                          |     |          |      |        |      | 29       | 21   | 34       | 27   | 38     | 31   | 43     | 36   | 48       | 41   | 52      | 45   | 62            | 55   | 16          | 25     | 7.74      |
| 130  | S12           |                                          |     |          |      |        |      |          |      | 31       | 22   | 35     | 27   | 41     | 32   | 45       | 36   | 50      | 41   | 60            | 51   | 19          | 29     | 7.89      |
|      | S14 A         |                                          |     |          |      |        |      |          |      |          |      | 33     | 23   | 38     | 27   | 43       | 32   | 47      | 37   | 57            | 46   | 22          | 34     | 8.05      |
|      | S06           | 31                                       | 26  | 39       | 34   | 46     | 41   | 53       | 48   | 60       | 55   | 68     | 63   | 75     | 70   | 82       | 77   | 89      | 85   | 104           | 99   | 14          | 20     | 9.70      |
|      | S08           |                                          |     | 35       | 28   | 42     | 35   | 49       | 43   | 56       | 50   | 63     | 57   | 71     | 64   | 78       | 71   | 85      | 79   | 99            | 94   | 19          | 27     | 9.92      |
|      | S10           |                                          |     |          |      | 38     | 29   | 45       | 37   | 52       | 44   | 60     | 52   | 67     | 59   | 74       | 66   | 81      | 73   | 96            | 88   | 24          | 33     | 10.14     |
| 200  | S12           |                                          |     |          |      |        |      | 41       | 31   | 48       | 38   | 55     | 46   | 63     | 53   | 70       | 60   | 77      | 68   | 91            | 82   | 29          | 40     | 10.36     |
|      | S14 A         |                                          |     |          |      |        |      |          |      |          |      | 52     | 40   | 59     | 47   | 66       | 55   | 73      | 62   | 88            | 76   | 33          | 47     | 10.58     |
|      | S06           | 45                                       | 36  | 56       | 46   | 66     | 57   | 77       | 68   | 88       | 79   | 99     | 90   | 110    | 100  | 120      | 111  | 131     | 122  | 153           | 144  | 23          | 34     | 14.33     |
|      | S08           |                                          |     | 49       | 37   | 60     | 48   | 71       | 58   | 82       | 69   | 92     | 80   | 103    | 91   | 113      | 102  | 125     | 112  | 146           | 134  | 31          | 45     | 14.77     |
|      | S10           |                                          |     |          |      | 53     | 38   | 64       | 49   | 75       | 60   | 85     | 71   | 97     | 81   | 108      | 92   | 118     | 102  | 139           | 125  | 38          | 56     | 15.21     |
| 300  | S12           |                                          |     |          |      |        |      | 57       | 39   | 69       | 50   | 79     | 61   | 90     | 71   | 101      | 83   | 111     | 93   | 133           | 115  | 46          | 68     | 15.43     |
|      | S14 A         |                                          |     |          |      |        |      |          |      |          |      | 73     | 52   | 83     | 62   | 94       | 73   | 105     | 83   | 127           | 105  | 54          | 79     | 16.09     |
|      | S06           | 75                                       | 55  | 93       | 73   | 111    | 91   | 129      | 109  | 147      | 127  | 164    | 144  | 182    | 162  | 200      | 181  | 218     | 198  | 254           | 234  | 38          | 61     | 21.27     |
|      | S08           |                                          |     | 83       | 56   | 100    | 74   | 118      | 91   | 136      | 109  | 154    | 128  | 172    | 145  | 189      | 163  | 207     | 181  | 243           | 217  | 50          | 81     | 21.87     |
|      | S10           |                                          |     |          |      | 90     | 56   | 108      | 74   | 125      | 92   | 143    | 110  | 161    | 128  | 179      | 146  | 197     | 164  | 232           | 199  | 63          | 102    | 22.49     |
| 500  | S12           |                                          |     |          |      |        |      | 97       | 57   | 115      | 74   | 133    | 93   | 150    | 111  | 168      | 128  | 186     | 146  | 222           | 182  | 75          | 122    | 23.15     |
|      | S14 A         |                                          |     |          |      |        |      |          |      |          |      | 122    | 75   | 140    | 93   | 158      | 111  | 175     | 129  | 212           | 164  | 88          | 143    | 23.81     |
|      | S06           | 112                                      | 88  | 139      | 114  | 165    | 141  | 192      | 167  | 218      | 194  | 245    | 220  | 272    | 247  | 298      | 273  | 325     | 300  | 378           | 354  | 56          | 85     | 29.39     |
|      | S08           | 97                                       | 63  | 123      | 90   | 150    | 116  | 176      | 143  | 203      | 170  | 229    | 197  | 256    | 223  | 282      | 250  | 309     | 276  | 363           | 329  | 74          | 113    | 30.51     |
|      | S10           |                                          |     |          |      | 133    | 93   | 160      | 119  | 187      | 146  | 214    | 172  | 240    | 199  | 267      | 226  | 293     | 252  | 346           | 305  | 93          | 141    | 31.64     |
| 850  | S12           |                                          |     |          |      |        |      | 144      | 95   | 171      | 122  | 198    | 148  | 224    | 175  | 251      | 202  | 277     | 228  | 331           | 282  | 112         | 170    | 32.74     |
|      | S14 A         |                                          |     |          |      |        |      |          |      |          |      | 182    | 125  | 209    | 151  | 235      | 178  | 262     | 204  | 315           | 257  | 130         | 198    | 33.86     |
|      | S06           | 192                                      | 154 | 236      | 198  | 280    | 242  | 324      | 286  | 369      | 330  | 412    | 374  | 456    | 419  | 500      | 462  | 545     | 506  | 632           | 595  | 85          | 130    | 43.43     |
|      | S08           | 167                                      | 117 | 212      | 161  | 256    | 205  | 300      | 249  | 344      | 293  | 388    | 338  | 432    | 382  | 476      | 425  | 520     | 469  | 609           | 558  | 114         | 174    | 44.75     |
|      | S10           |                                          |     | 187      | 124  | 231    | 168  | 276      | 212  | 320      | 256  | 364    | 301  | 408    | 344  | 452      | 388  | 496     | 433  | 584           | 521  | 143         | 217    | 46.08     |
| 1200 | S12           |                                          |     |          |      |        |      | 251      | 175  | 296      | 220  | 340    | 264  | 384    | 307  | 427      | 352  | 472     | 396  | 560           | 484  | 171         | 260    | 47.62     |
|      | S14 A         |                                          |     |          |      |        |      |          |      |          |      | 315    | 226  | 360    | 270  | 403      | 315  | 447     | 359  | 536           | 447  | 200         | 304    | 48.94     |
|      | S06           | 275                                      | 213 | 339      | 277  | 402    | 340  | 467      | 405  | 531      | 468  | 594    | 532  | 658    | 595  | 722      | 660  | 786     | 723  | 913           | 850  | 126         | 199    | 66.36     |
|      | S08           | 240                                      | 157 | 303      | 220  | 367    | 284  | 430      | 348  | 495      | 412  | 559    | 475  | 622    | 539  | 686      | 603  | 750     | 667  | 877           | 794  | 168         | 266    | 68.56     |
|      | S10           | 203                                      | 100 | 268      | 164  | 331    | 228  | 395      | 291  | 458      | 355  | 523    | 419  | 586    | 483  | 650      | 547  | 714     | 610  | 842           | 738  | 210         | 332    | 70.99     |
| 1750 | S12           |                                          |     |          |      | 296    | 171  | 359      | 235  | 423      | 298  | 486    | 363  | 551    | 426  | 614      | 490  | 678     | 553  | 806           | 681  | 253         | 399    | 73.19     |
|      | S14 A         |                                          |     |          |      |        |      |          |      | 387      | 242  | 451    | 306  | 514    | 370  | 579      | 433  | 642     | 497  | 769           | 625  | 295         | 465    | 75.62     |
|      | S06           | 352                                      | 257 | 439      | 343  | 525    | 430  | 612      | 517  | 699      | 604  | 786    | 691  | 872    | 778  | 959      | 865  | 1046    | 951  | 1219          | 1125 | 199         | 310    | 86.64     |
|      | S08           | 295                                      | 169 | 382      | 256  | 469    | 343  | 556      | 429  | 642      | 516  | 729    | 603  | 816    | 690  | 903      | 776  | 989     | 863  | 1163          | 1037 | 265         | 414    | 90.39     |
|      | S10           |                                          |     | 325      | 168  | 412    | 254  | 499      | 341  | 586      | 428  | 672    | 515  | 759    | 601  | 846      | 688  | 933     | 775  | 1106          | 949  | 332         | 517    | 94.14     |
| 2100 | S12           |                                          |     |          |      |        |      | 442      | 254  | 529      | 340  | 616    | 427  | 703    | 514  | 789      | 601  | 876     | 688  | 1050          | 861  | 399         | 621    | 97.88     |
|      | S14 A         |                                          |     |          |      |        |      |          |      | 473      | 252  | 559    | 339  | 646    | 426  | 733      | 512  | 820     | 599  | 993           | 773  | 465         | 724    | 101.41    |
|      | S06           | 518                                      | 375 | 651      | 509  | 785    | 642  | 918      | 776  | 1052     | 909  | 1185   | 1043 | 1319   | 1176 | 1452     | 1310 | 1586    | 1443 | 1853          | 1710 | 283         | 426    | 132.28    |
|      | S08           | 423                                      | 233 | 557      | 367  | 690    | 500  | 824      | 634  | 957      | 767  | 1091   | 901  | 1224   | 1034 | 1358     | 1168 | 1491    | 1301 | 1758          | 1568 | 378         | 568    | 136.69    |
|      | S10           |                                          |     | 462      | 225  | 596    | 358  | 729      | 492  | 863      | 625  | 996    | 759  | 1130   | 892  | 1263     | 1032 | 1397    | 1159 | 1646          | 1426 | 472         | 710    | 141.09    |
| 2500 | S12           |                                          |     |          |      |        |      | 635      | 350  | 768      | 483  | 902    | 617  | 1035   | 750  | 1169     | 884  | 1302    | 1017 | 1569          | 1284 | 566         | 851    | 145.50    |
|      | S14 A         |                                          |     |          |      |        |      |          |      | 674      | 341  | 808    | 475  | 941    | 608  | 1074     | 742  | 1208    | 875  | 1475          | 1142 | 661         | 993    | 149.91    |
|      | S06           | 957                                      | 770 | 1170     | 982  | 1383   | 1195 | 1595     | 1408 | 1808     | 1621 | 2020   | 1833 | 2232   | 2045 | 2445     | 2258 | 2658    | 2470 | 3083          | 2896 | 374         | 594    | 189.38    |
|      | S08           | 851                                      | 601 | 1064     | 814  | 1276   | 1027 | 1489     | 1240 | 1702     | 1452 | 1914   | 1664 | 2127   | 1877 | 2339     | 2089 | 2551    | 2302 | 2977          | 2727 | 499         | 792    | 197.09    |
|      | S10           |                                          |     | 958      | 646  | 1170   | 859  | 1383     | 1071 | 1596     | 1284 | 1808   | 1496 | 2021   | 1708 | 2233     | 1921 | 2446    | 2134 | 2871          | 2559 | 624         | 991    | 204.81    |
| 4000 | S12           |                                          |     |          |      | 1064   | 690  | 1277     | 903  | 1489     | 1115 | 1702   | 1328 | 1915   | 1540 | 2127     | 1753 | 2340    | 1966 | 2765          | 2390 | 748         | 1189   | 212.52    |
|      | S14 A         |                                          |     |          |      |        |      | 1171     | 734  | 1383     | 947  | 1596   | 1159 | 1809   | 1372 | 2021     | 1585 | 2234    | 1797 | 2659          | 2222 | 873         | 1387   | 220.24    |
|      | S06           | 1299                                     | 930 | 1596     | 1226 | 1891   | 1522 | 2187     | 1817 | 2483     | 2113 | 2778   | 2409 |        |      |          |      |         |      |               |      | 559         | 993    | 349.87    |
|      | S08           | 1142                                     | 649 | 1437     | 945  | 1733   | 1240 | 2028     | 1536 | 2324     | 1831 | 2620   | 2128 | 2916   | 2423 | 3212     | 2719 | 3507    | 3015 | 3735          | 3242 | 745         | 1323   | 363.10    |
|      | S10           |                                          |     |          |      | 1574   | 959  | 1871     | 1254 | 2166     | 1551 | 2462   | 1846 | 2758   | 2142 | 3053     | 2437 | 3349    | 2734 | 3577          | 2961 | 932         | 1655   | 376.55    |
| S12  |               |                                          |     |          |      |        |      | 1712     | 973  | 2008     | 1269 | 2303   | 1565 | 2599   | 1860 | 2895     | 2156 | 3190    | 2452 | 3418          | 2680 | 1117        | 1987   | 389.99    |
|      | S14 A         |                                          |     |          |      |        |      |          |      |          |      | 2145   | 1283 | 2441   | 1879 | 2736     | 1875 | 3033    | 2170 | 3260          | 2398 | 1304        | 2318   | 403.22    |