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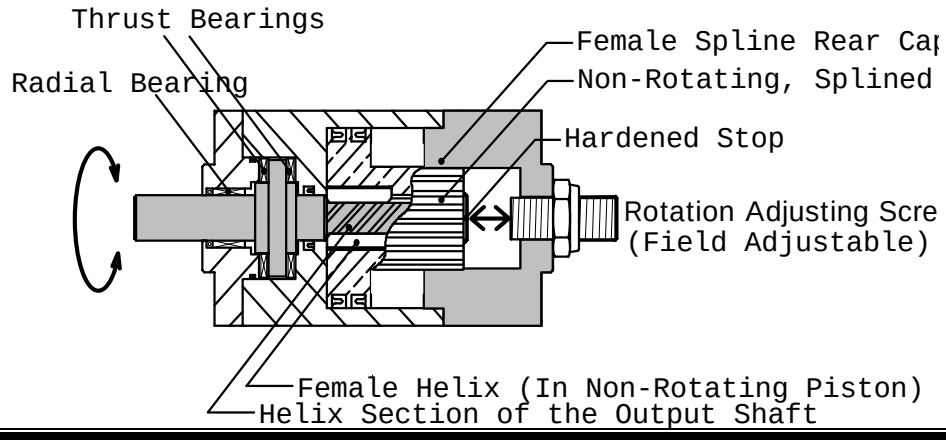
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# RAM - Rotary Actuators

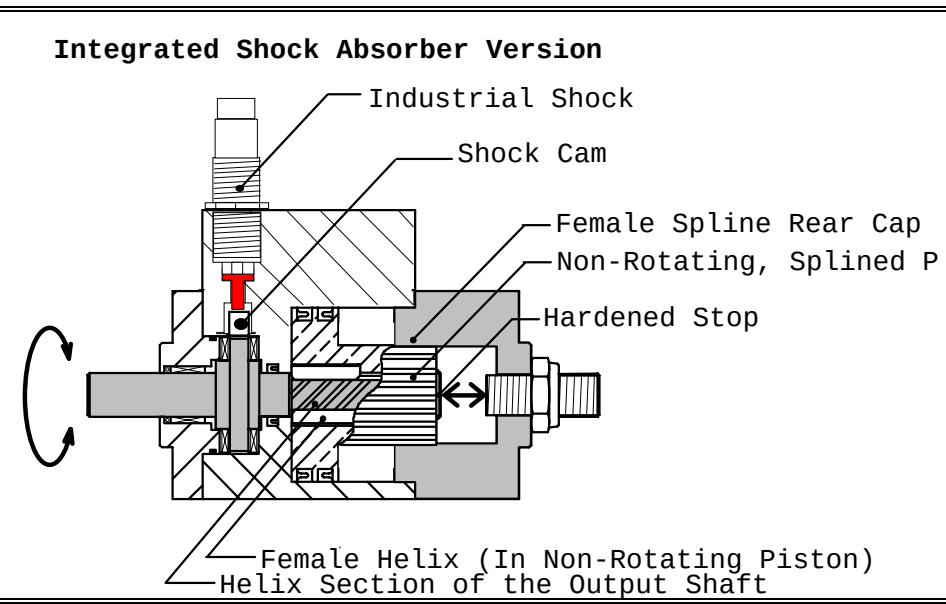
ZAYTRAN rotary actuators provide the most compact rotary action through the use of a high lead multiple start helix. Power transmitted by a non-rotating piston produces rotary motion of the output shaft (US Patent Number 4603616). This advanced design allows a high torque rotating device to be contained in a small envelope. RAM series rotary actuators are designed to provide rotary motion through the use of pneumatic or hydraulic pressure. Equal torque is produced in either direction.

**Standard Version**




The addition of integrated industrial shock absorbers greatly increases the performance of ZAYTRAN rotary actuators. The shocks are actuated by a cam that is part of the output shaft. Therefore, all of the destructive energy that is transmitted to the output shaft is absorbed before it can reach the precision assemblies.

**Integrated Shock Absorber Version**



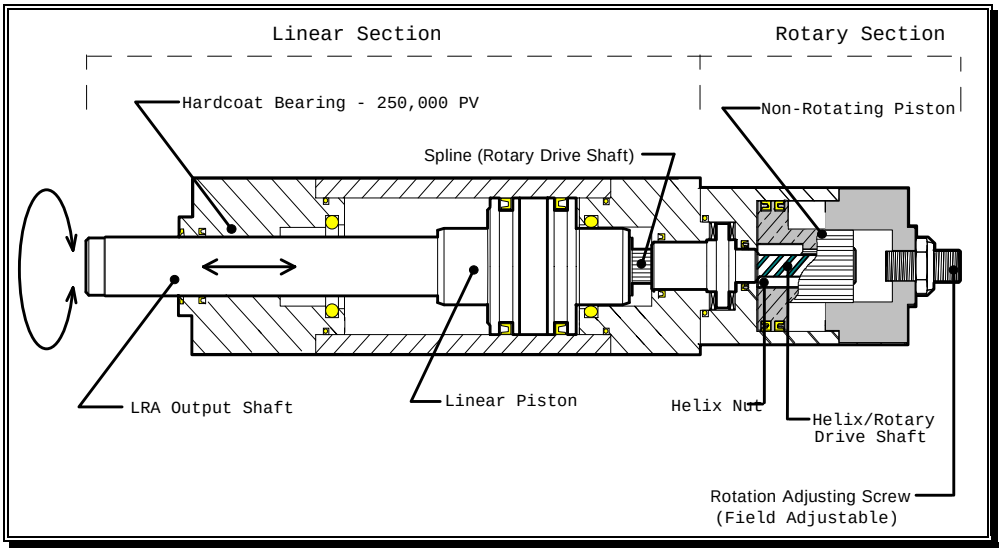


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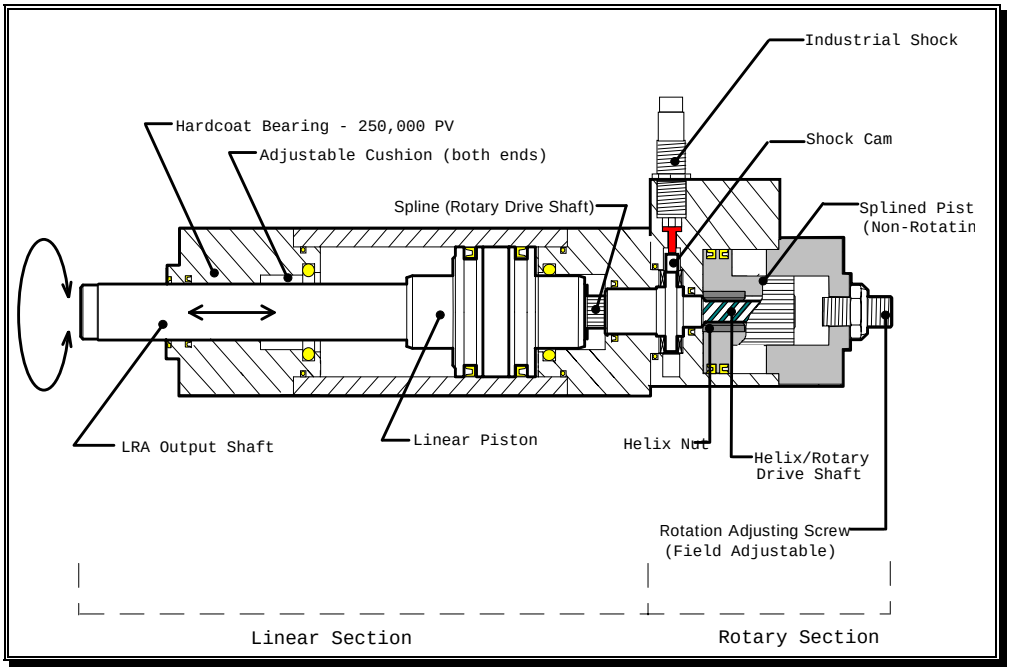
# LRA - Linear/Rotary Actuators

The LRA Series of Linear Rotary Actuators contain an output shaft which provides independent rotary and linear motion in a compact, space saving design. The LRA units have self-contained load bearing capability utilizing internally located radial bearings. Four compact models offer a great deal of flexibility and are easily adapted to a wide range of applications.

Rotating motion is attained by using a piston to drive a multiple start helix. The design concept is the same as that utilized by the ZAYTRAN RAM Series Rotary Actuators. Linear motion is produced when a separate piston is activated, as in a conventional cylinder. The output shaft is connected to the helix and a combination of linear/rotational movement is thereby developed.




The addition of integrated industrial shock absorbers greatly increases the performance of ZAYTRAN Linear/Rotary actuators. The shocks are actuated by a cam that is part of the output shaft. Therefore, all of the destructive energy that is transmitted to the output shaft is absorbed before it can reach the precision assemblies.



# Specifications

| | RAM-10 | RAMS-10 | RAM-35 | RAMS-35 | RAM-75 | RAMS-75 | RAM-250 | RAMS-250 |
|---|---|---|---|---|---|---|---|---|
| Torque (in.-lbs.) @ 100 PSI | 10 | 10 | 35 | 35 | 75 | 75 | 250 | 250 |
| Maximum Pressure (PSI) | 400 | 400 | 400 | 400 | 400 | 400 | 250 | 250 |
| Thrust Bearing Rating (pounds) | 1260 | 1260 | 3370 | 3370 | 3195 | 3195 | 8795 | 8795 |
| Axial Bearing Rating (pounds) | 826 | 826 | 1560 | 1560 | 1560 | 1560 | 5530 | 5530 |
| Displacement per Degree ($in^3$) | .0034 | .0034 | .0100 | .0100 | .0200 | .0200 | .0660 | .0660 |

| | LRA-10 | LRAS-10 | LRA-35 | LRAS-35 | LRA-75 | LRAS-75 | LRA-250 | LRAS-250 |
|---|---|---|---|---|---|---|---|---|
| Linear Extend Force (lbs.) @ 100PSI | 160 | 160 | 215 | 215 | 440 | 440 | 690 | 690 |
| Linear Retract Force (lbs.) @ 100PSI | 130 | 130 | 175 | 175 | 370 | 370 | 580 | 580 |
| Torque (in.-lbs.) @ 100PSI | 10 | 10 | 35 | 35 | 75 | 75 | 250 | 250 |
| Maximum Pressure (PSI) | 400 | 400 | 400 | 400 | 400 | 400 | 250 | 250 |
| Thrust Bearing Rating (pounds) | 1500 | 1500 | 1680 | 1680 | 2290 | 2290 | 5740 | 5740 |
| Axial Bearing Rating (pounds) | 894 | 894 | 1072 | 1072 | 1430 | 1430 | 1790 | 1790 |
| Displacement per Degree ($in^3$) | .0034 | .0034 | .0100 | .0100 | .0200 | .0200 | .0660 | .0660 |
| Displacement/In of Stroke ($in^3$) Extend | 1.76 | 1.76 | 2.40 | 2.40 | 4.91 | 4.91 | 7.67 | 7.67 |
| Displacement/In of Stroke ($in^3$) Retract | 1.46 | 1.46 | 1.96 | 1.96 | 4.12 | 4.12 | 6.44 | 6.44 |

# High Efficiency Seals & Lubricants

**Seal Composition**

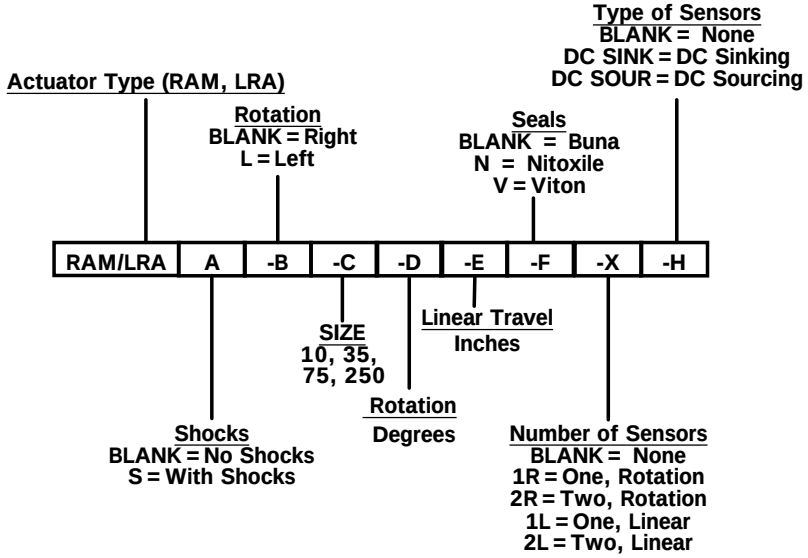
Three types of seals are available:

Standard - Buna-N; -40 to 180ºF
High Temp- Viton; -40 to 300ºF
Non-Lube- Nitroxile; -40 to 180 ºF

**Lubricants**

All actuators are pre-lubricated with "permanent" lubricant that rated H1 by the FDA and is designed to last approximately 10,000,000 cycles in typical applications.

# ORDERING INFORMATION

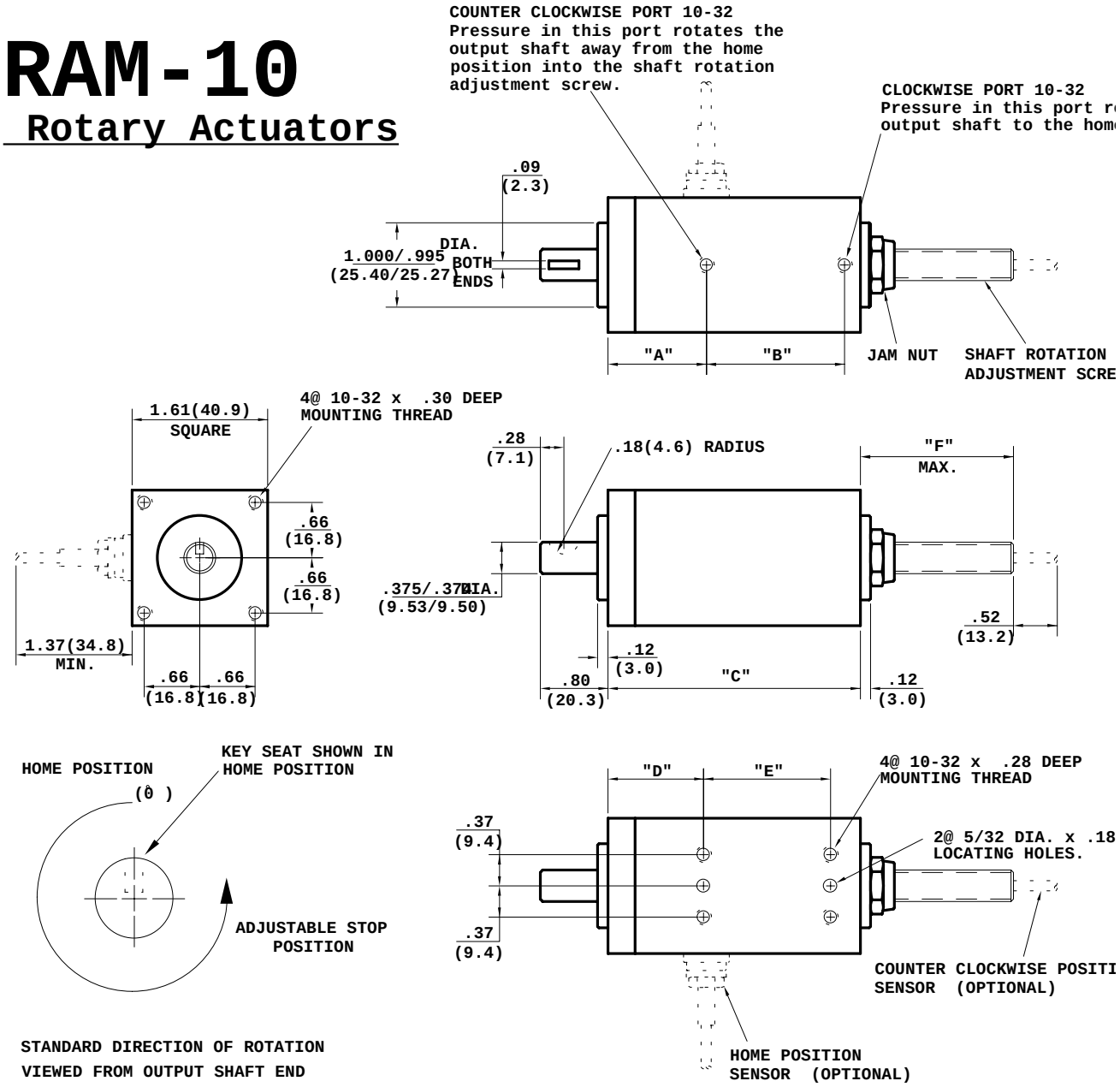



**Example: LRAS-35-180-4-V-2R-2L-DC SINK**

Linear/Rotary Actuator, With Shocks, Right Hand Rotation, 35 in-lb size, 180° of rotation, 4" of linear stroke, Viton Seals, two position Rotary DC proximity sensors-sinking, two position Linear DC proximity sensors-sinking

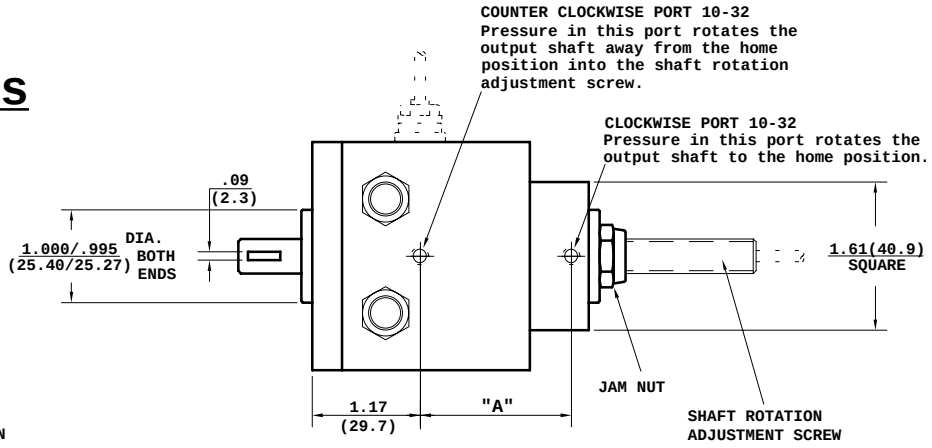
# RAM-10

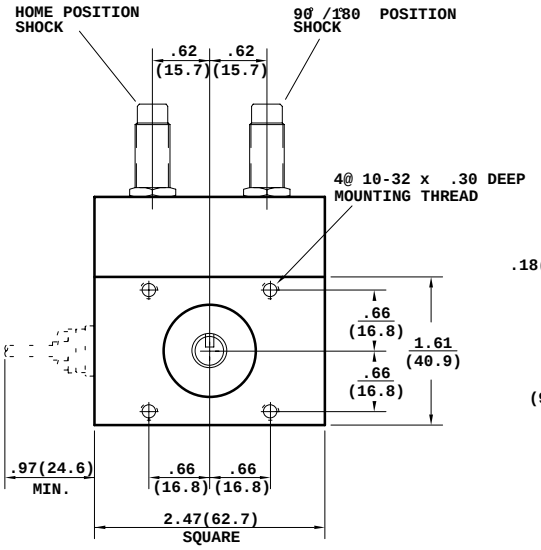
## Rotary Actuators

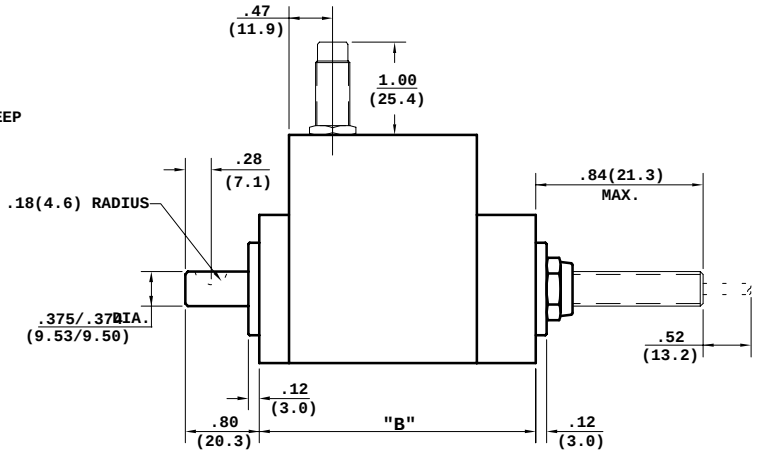


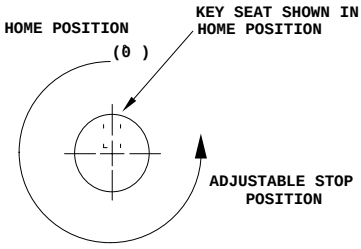

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | "D" in. (mm) | "E" in. (mm) | "F" in. (mm) |
|---|---|---|---|---|---|---|
| 90° | 1.17(29.7) | 1.64(41.7) | 2.99(75.9) | 1.13(28.7) | 1.50(38.1) | .84(21.3) |
| 180° | 1.17(29.7) | 2.14(54.4) | 3.49(88.6) | 1.13(28.7) | 2.00(50.8) | .84(21.3) |
| 360° | 1.17(29.7) | 3.14(79.8) | 4.49(114.0) | 1.13(28.7) | 3.00(76.2) | .84(21.3) |

# RAMS-10
## Rotary Actuators

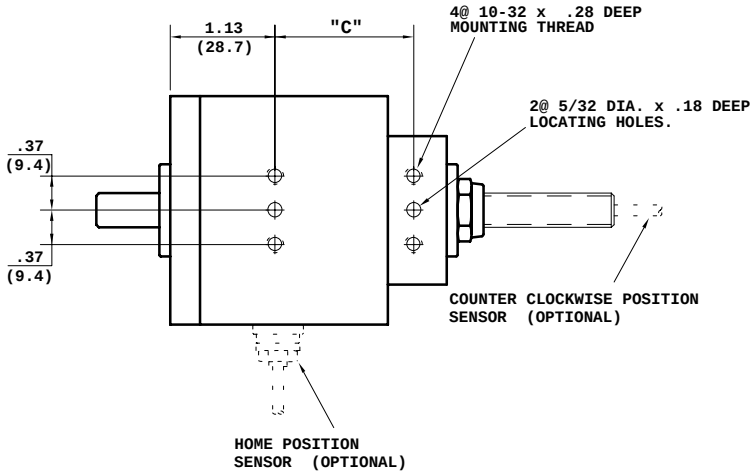


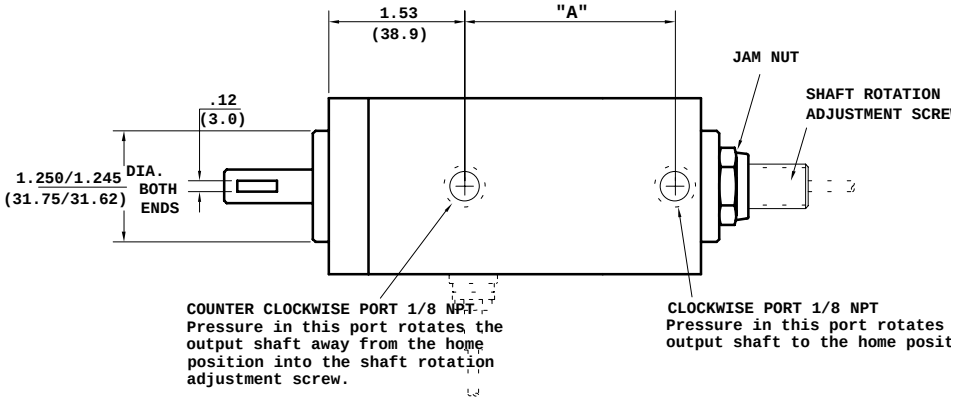

STANDARD DIRECTION OF ROTATION
VIEWED FROM OUTPUT SHAFT END

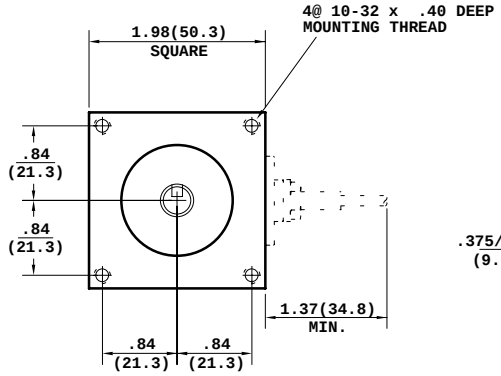


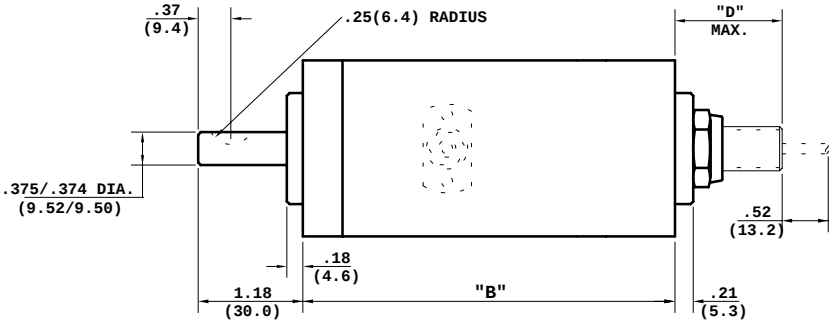

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) |
|---|---|---|---|
| 90° | 1.63(41.4) | 2.99(75.9) | 1.50(38.1) |
| 180° | 2.13(54.1) | 3.49(88.6) | 2.00(50.8) |

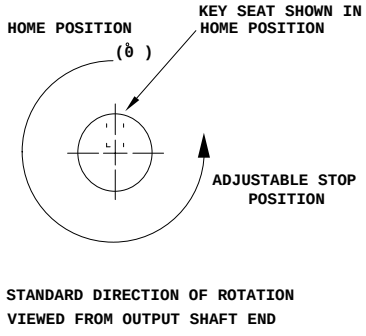
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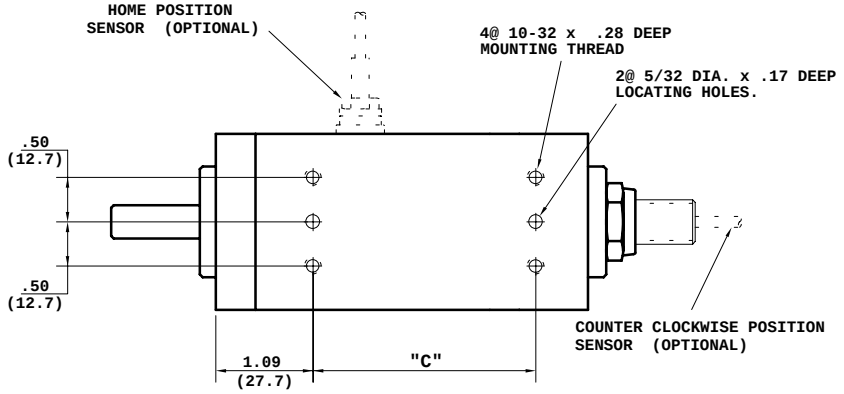
## Rotary Actuators



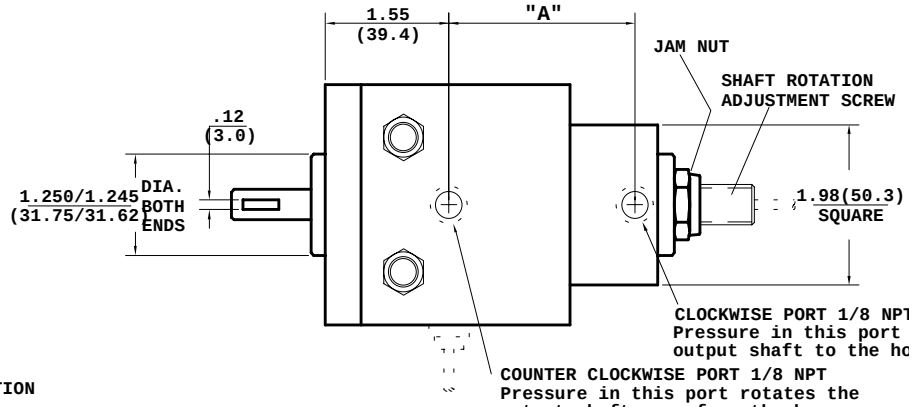



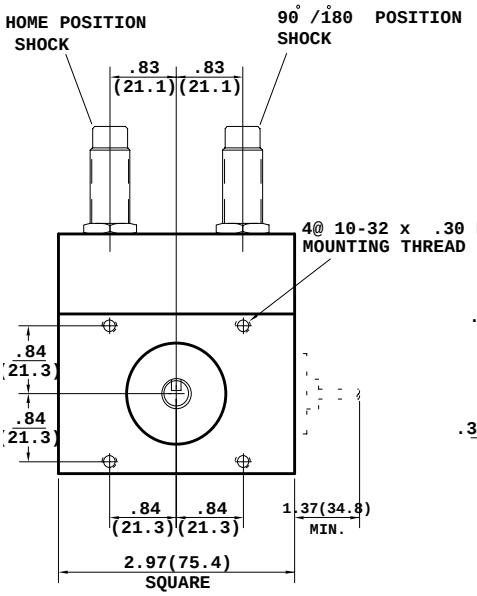



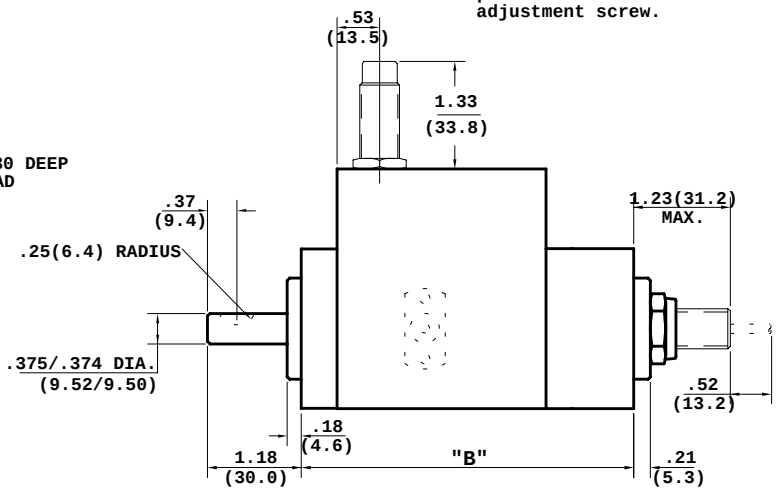

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | Max "D" in. (mm) |
|---|---|---|---|---|
| 90° | 2.37(60.2) | 4.18(106.2) | 2.51(63.8) | 1.23 (31.2) |
| 180° | 3.11(79.0) | 4.93(125.2) | 3.25(82.6) | 1.23 (31.2) |
| 360° | 4.61(117.1) | 6.43(163.3) | 4.75(120.7) | 1.23 (31.2) |

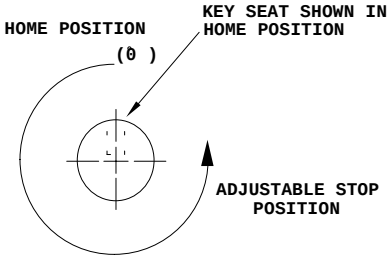
# RAMS-35

## Rotary Actuators

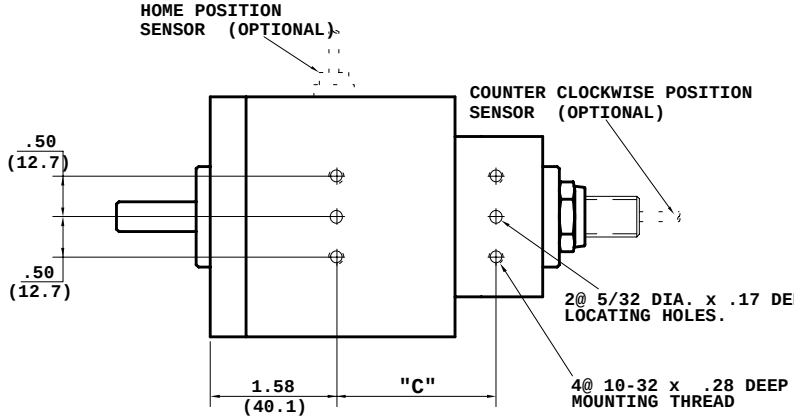


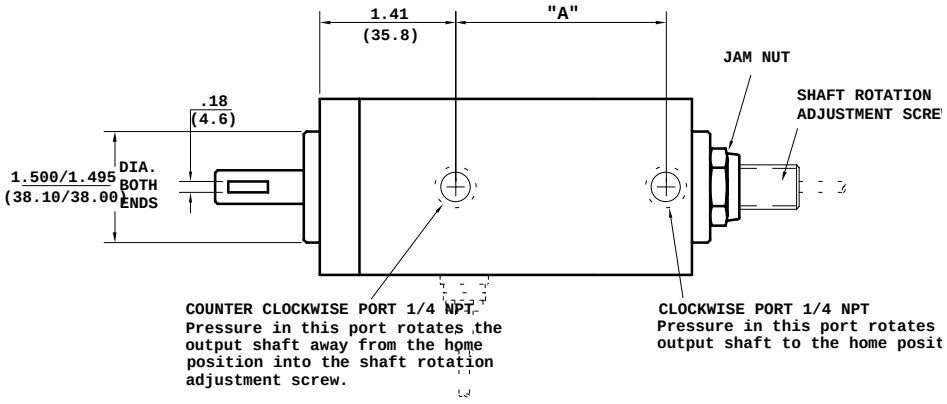

STANDARD DIRECTION OF ROTATION
VIEWED FROM OUTPUT SHAFT END

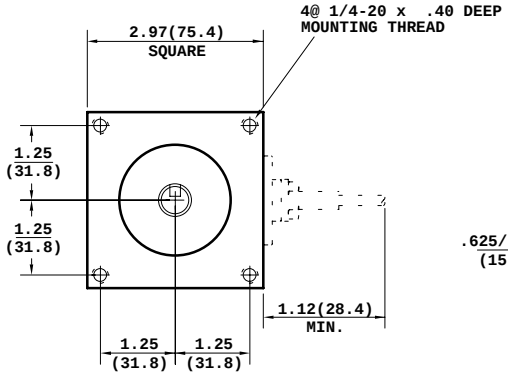


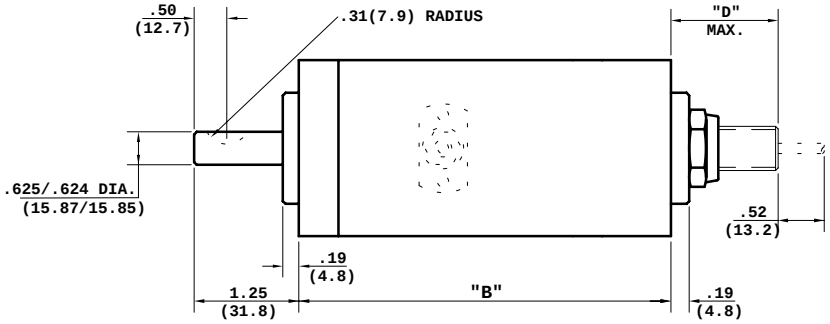

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) |
|---|---|---|---|
| 90° | 2.33(59.2) | 4.17(105.9 | 2.01(51.1) |
| 180° | 3.08(78.2) | 4.92(125.0) | 2.76(70.1) |

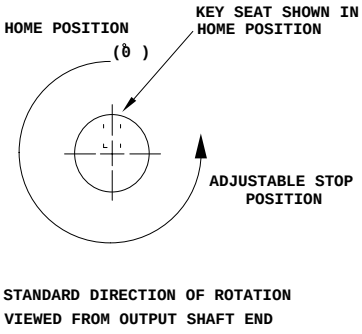
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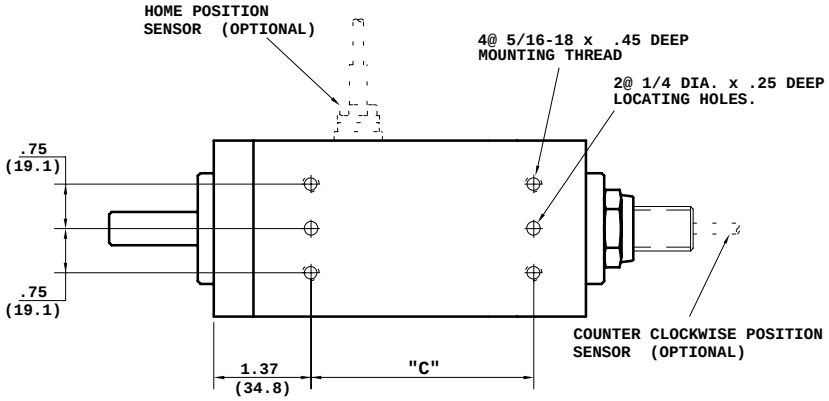
## Rotary Actuators



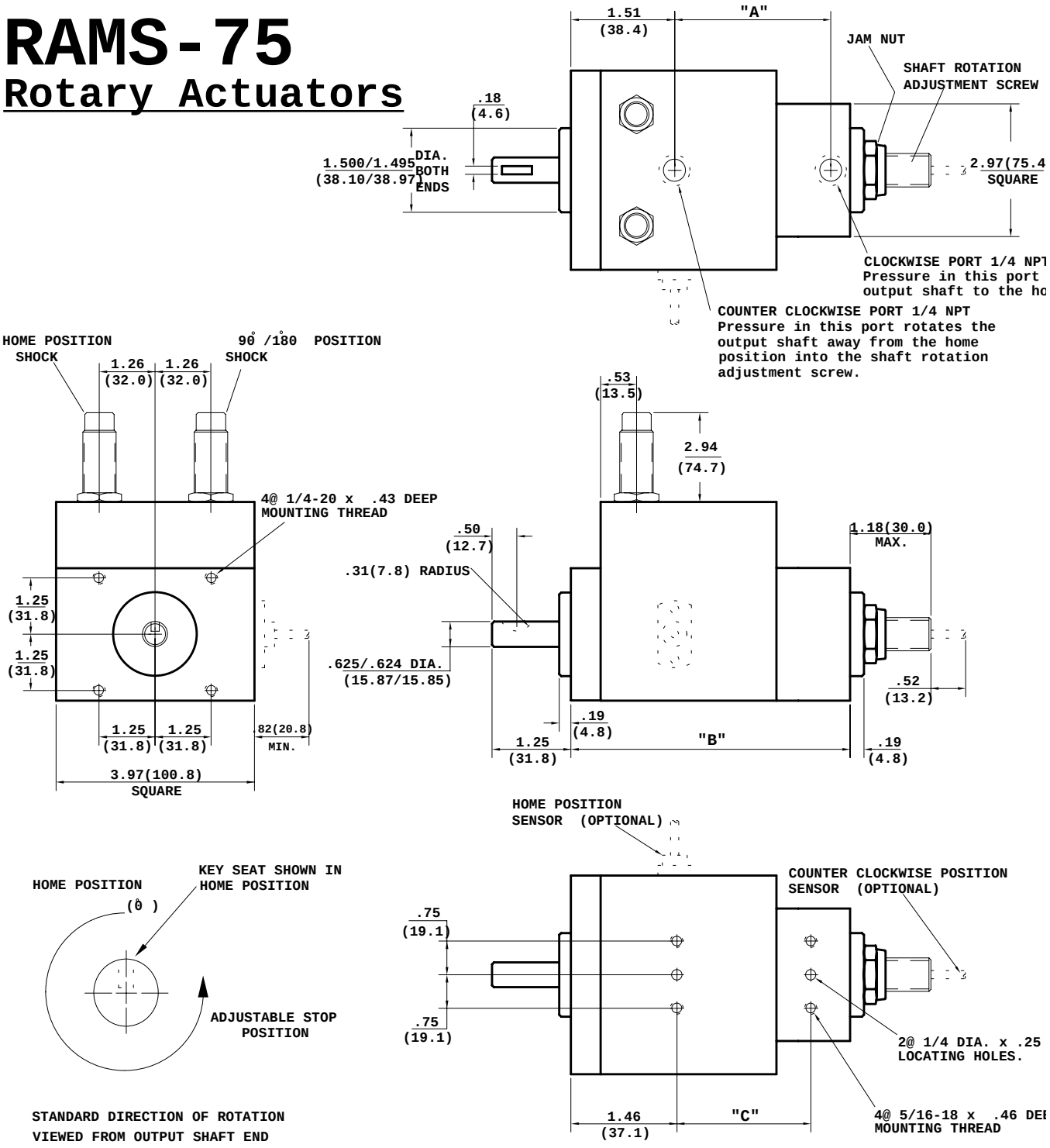




| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | Max "D" in. (mm) |
|---|---|---|---|---|
| 90° | 2.54(64.5) | 4.32(109.7) | 2.25(57.2) | 1.17(29.7) |
| 180° | 3.29(83.6) | 5.07(128.8) | 3.01(76.5) | 1.17(29.7) |
| 360° | 4.79(121.7) | 6.57(166.9) | 4.51(114.6) | 1.17(29.7) |

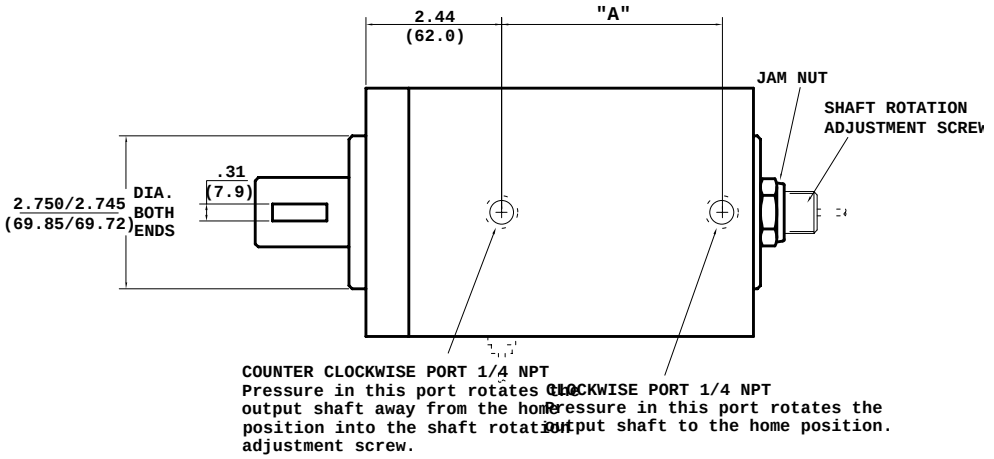
# RAMS-75
## Rotary Actuators

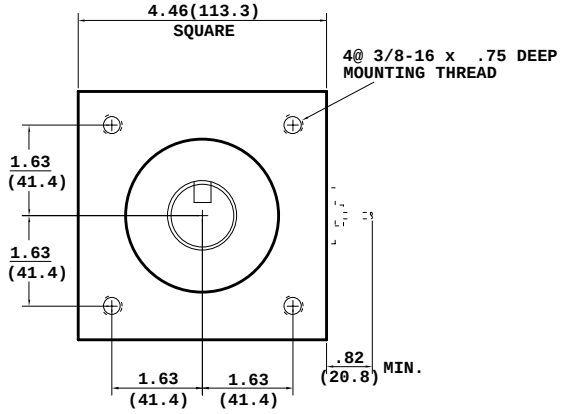


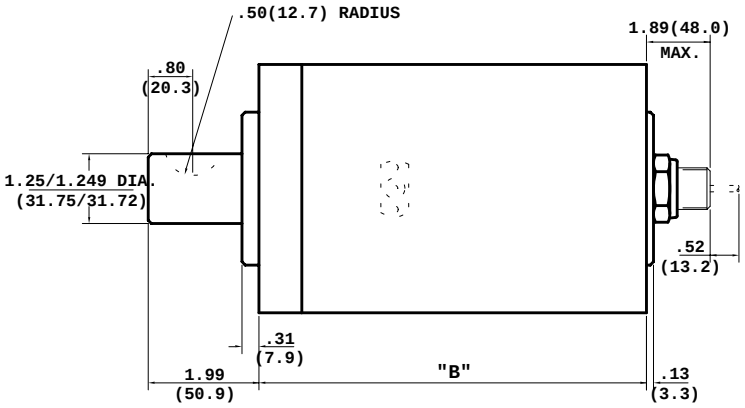

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) |
|---|---|---|---|
| 90° | 2.45(62.2) | 4.34(110.2) | 2.18(55.4) |
| 180° | 3.20(81.3) | 5.09(129.3) | 2.93(74.4) |

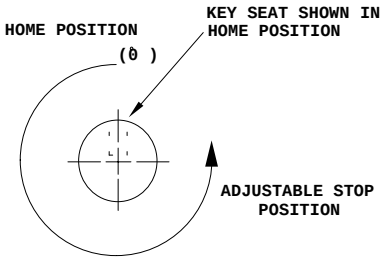
# RAM-250

## Rotary Actuators

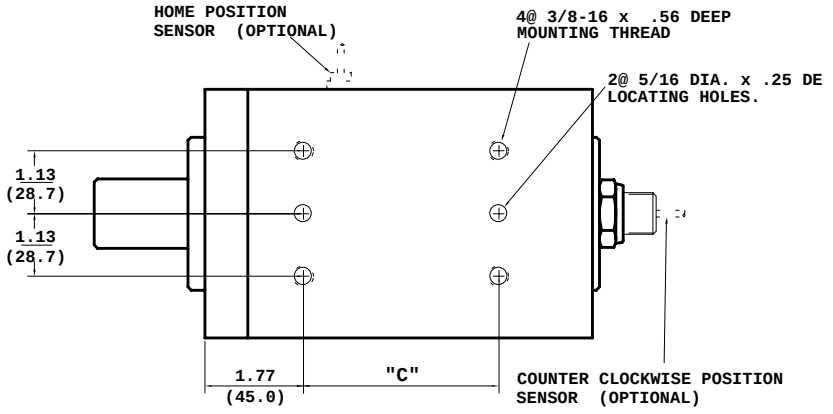


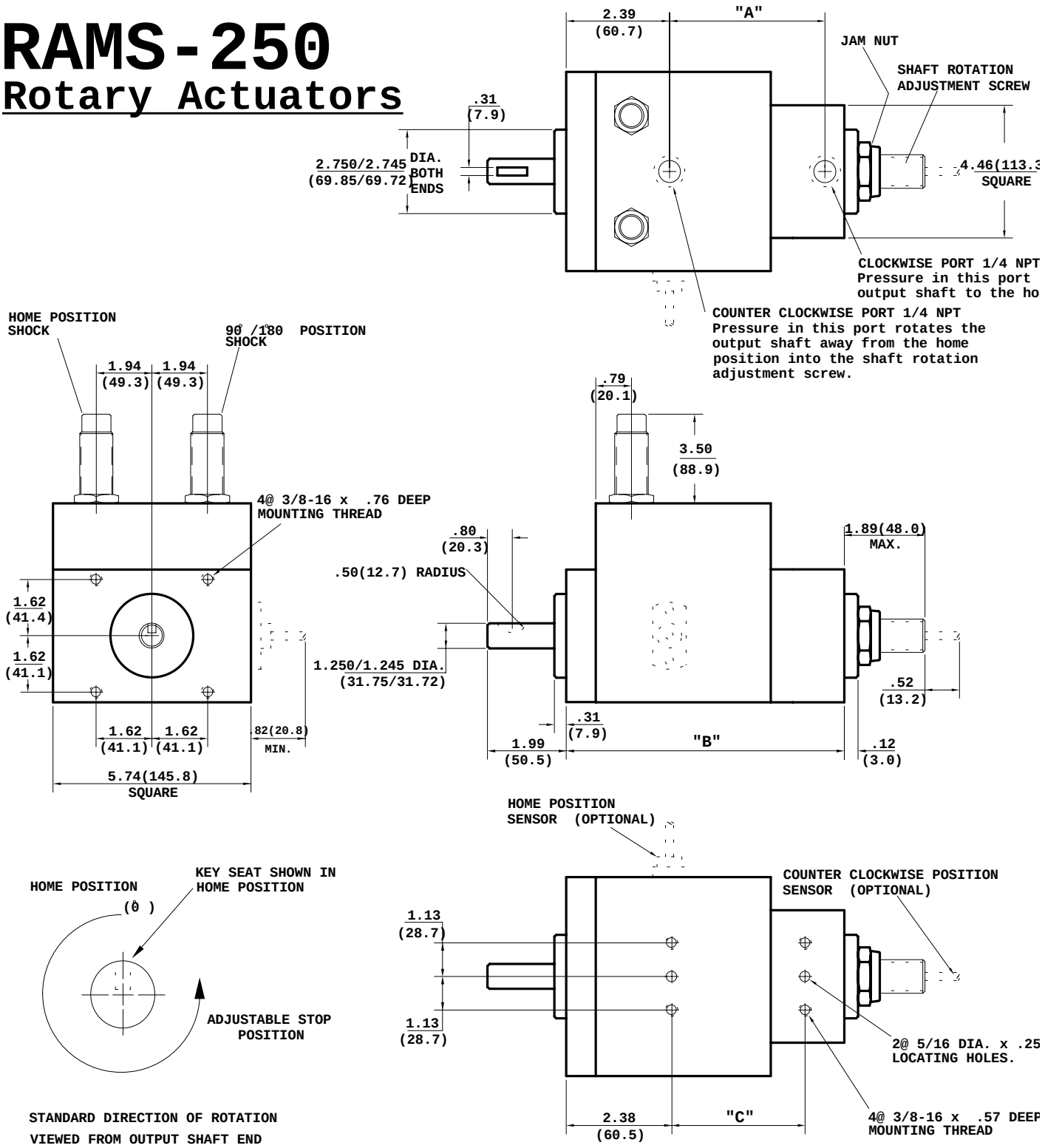




STANDARD DIRECTION OF ROTATION
VIEWED FROM OUTPUT SHAFT END




| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) |
|---|---|---|---|
| 90° | 3.96(100.6) | 6.97(177.0) | 3.51(89.2) |
| 180° | 5.46(138.7) | 8.46(214.9) | 5.01(127.3) |
| 360° | 8.45(214.6) | 11.45(290.8) | 8.00(203.2) |

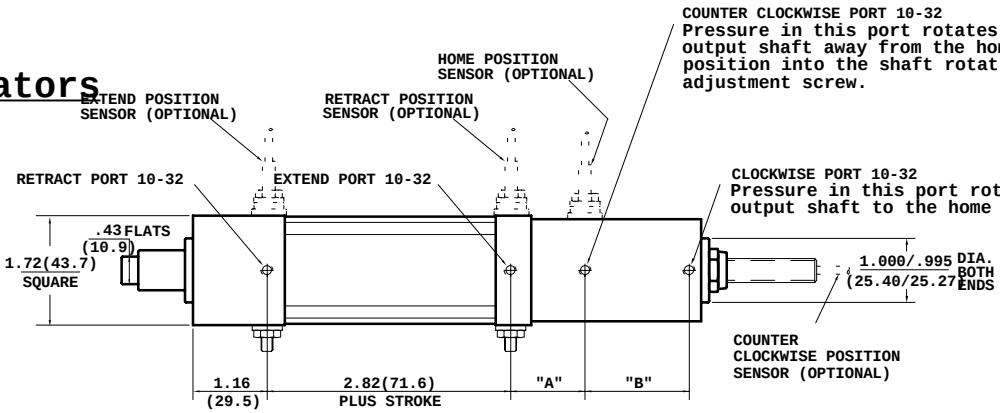
# RAMS-250
## Rotary Actuators

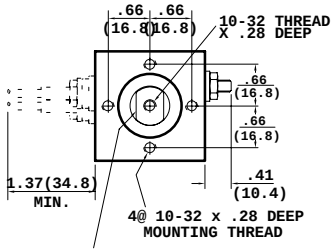



| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) |
|---|---|---|---|
| 90° | 4.06(103.1) | 7.01(178.1) | 2.95(74.9) |
| 180° | 5.56(141.2) | 8.51(216.2) | 4.45(113.0) |

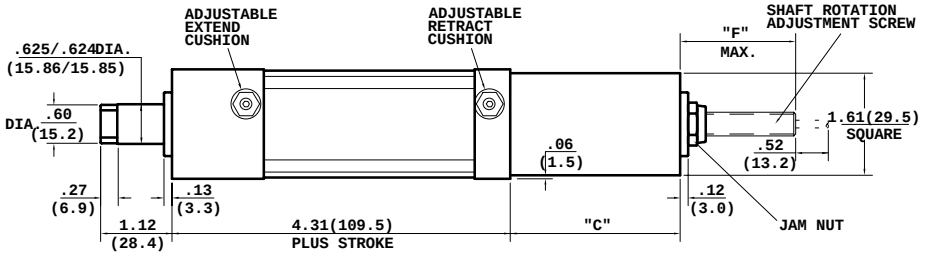
# LRA-10

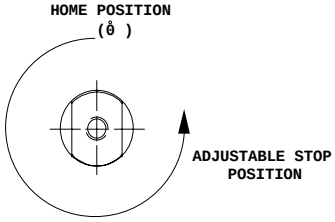
## Linear Rotary Actuators

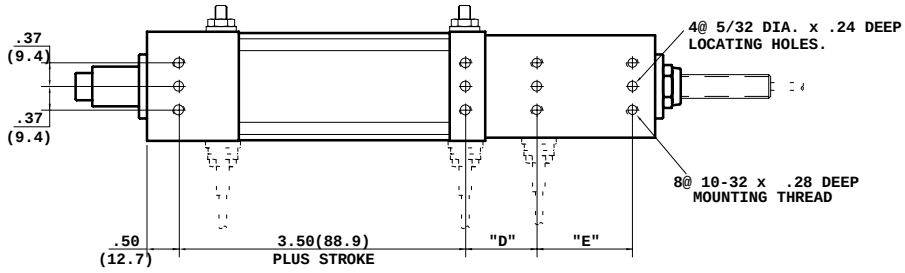



Flat orientation shown in home position.



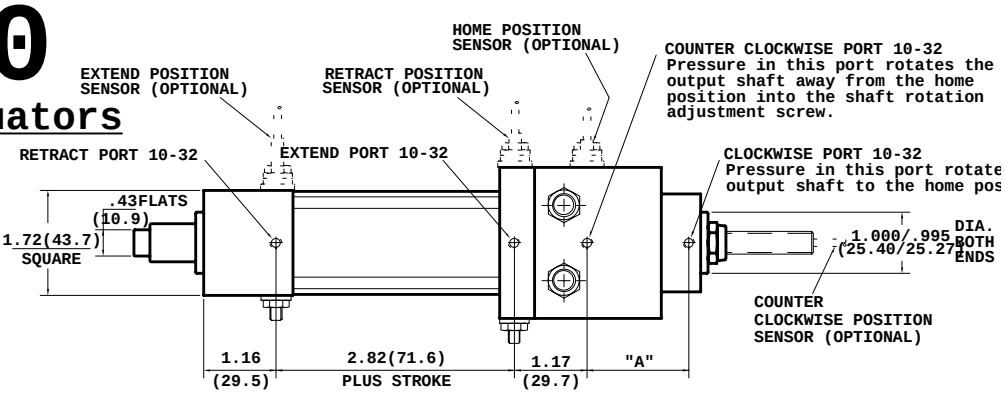

**STANDARD DIRECTION OF ROTATION**
**VIEWED FROM OUTPUT SHAFT END**

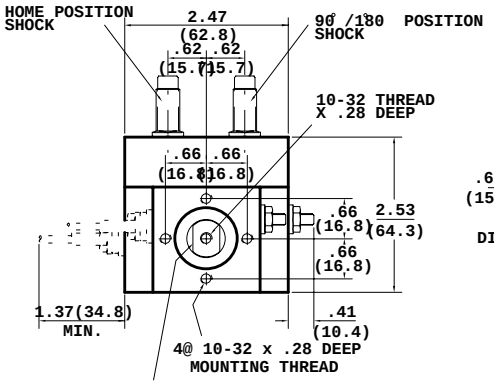
| STANDARD AVAILABLE STROKES |
|---|
| 1in. (25.4 mm) |
| 2in. (50.8mm) |
| 3in. (76.2mm) |
| 4in. (101.6mm) |

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | "D" in. (mm) | "E" in. (mm) | "F" in. (mm) |
|---|---|---|---|---|---|---|
| 90° | 1.17(29.7) | 1.64(41.7) | 2.67(67.8) | 1.12(28.4) | 1.50(38.1) | .84(21.3) |
| 180° | 1.17(29.7) | 2.14(54.4) | 3.17(80.5) | 1.12(28.4) | 2.00(50.8) | .84(21.3) |
| 360° | 1.17(29.7) | 3.14(79.8) | 4.17(105.9) | 1.12(28.4) | 3.00(76.2) | .84(21.3) |

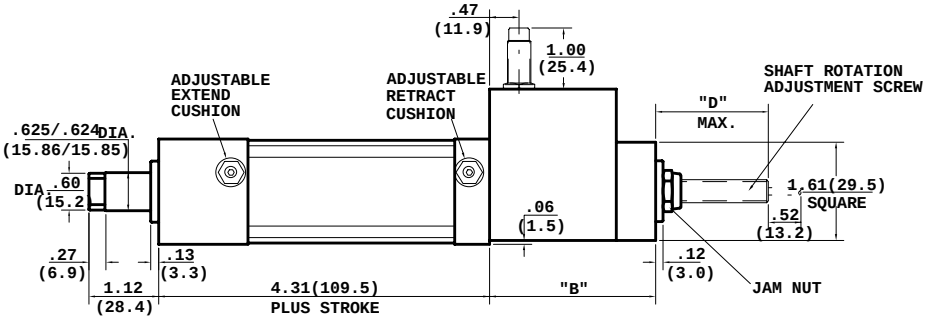
# LRAS-10

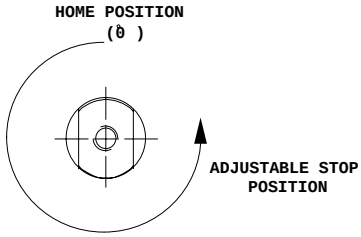
## Linear Rotary Actuators

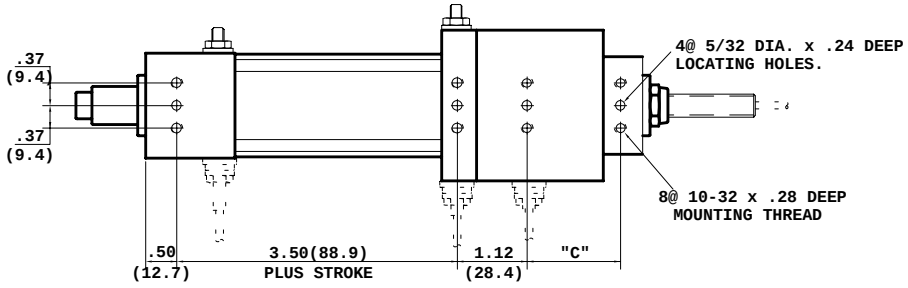



Flat orientation shown in home position.



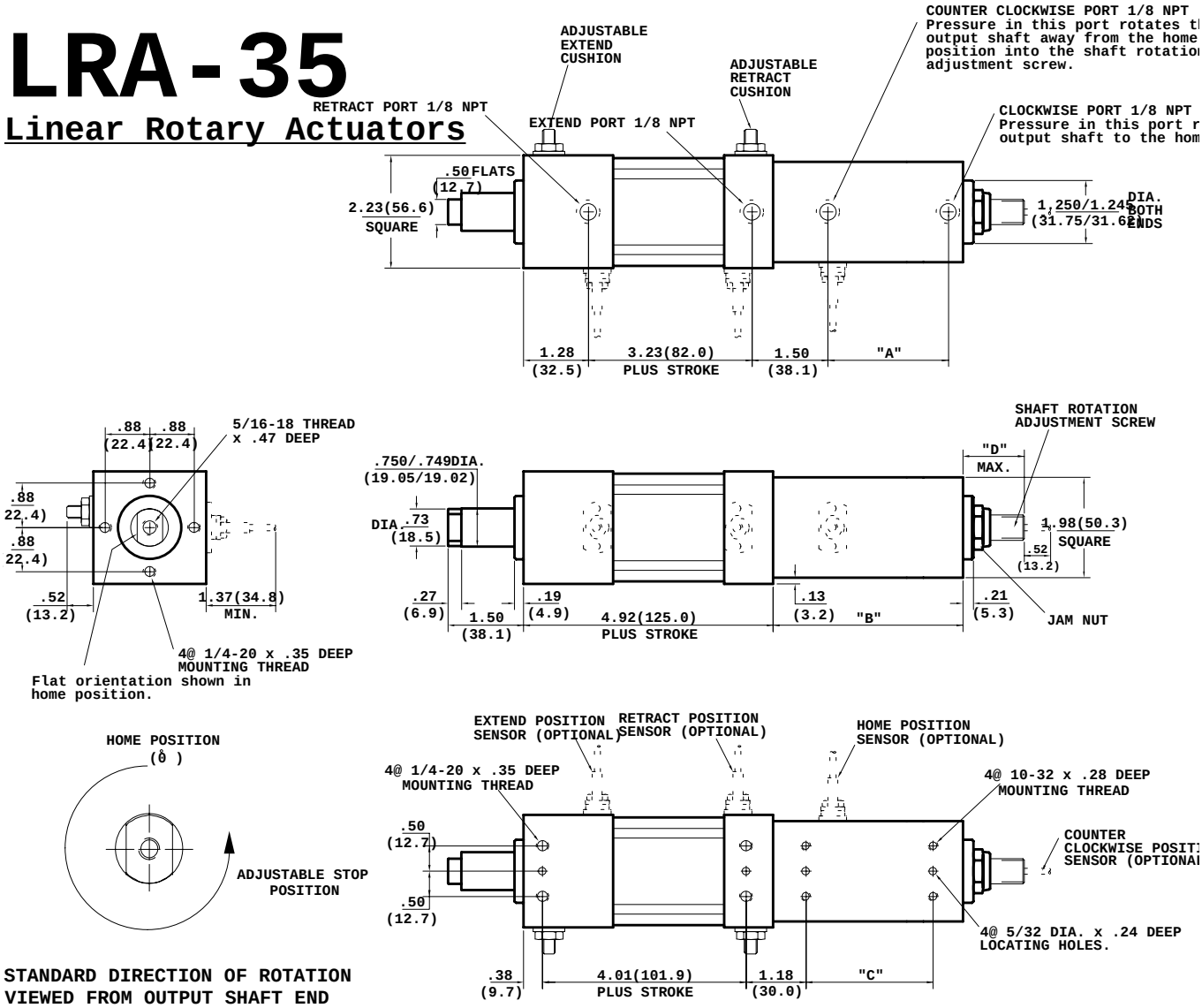

**STANDARD DIRECTION OF ROTATION**
**VIEWED FROM OUTPUT SHAFT END**

| STANDARD AVAILABLE STROKES |
|---|
| 1in. (25.4 mm) |
| 2in. (50.8mm) |
| 3in. (76.2mm) |
| 4in. (101.6mm) |

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | "D" in. (mm) |
|---|---|---|---|---|
| 90° | 1.64(41.7) | 2.67(67.8) | 1.50(38.1) | .84(21.3) |
| 180° | 2.14(54.4) | 3.17(80.5) | 2.00(50.8) | .84(21.3) |

# LRA-35

## Linear Rotary Actuators



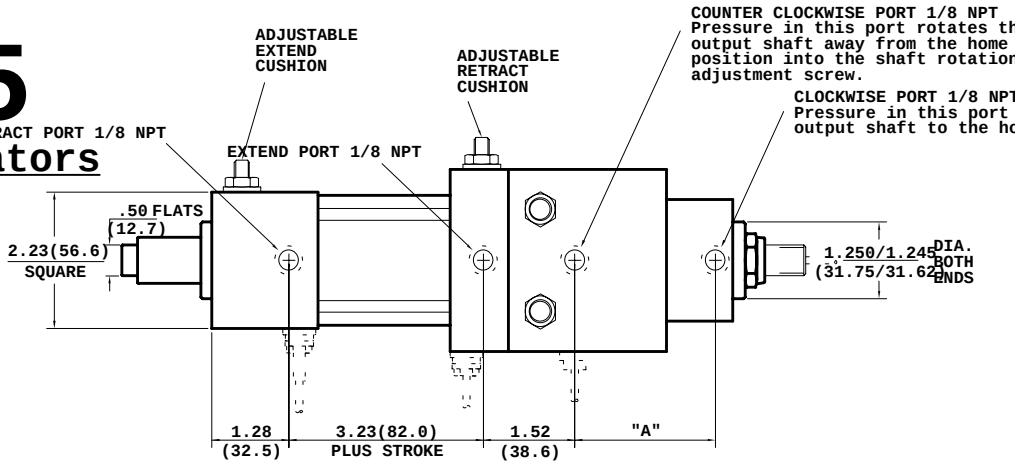

**STANDARD DIRECTION OF ROTATION VIEWED FROM OUTPUT SHAFT END**

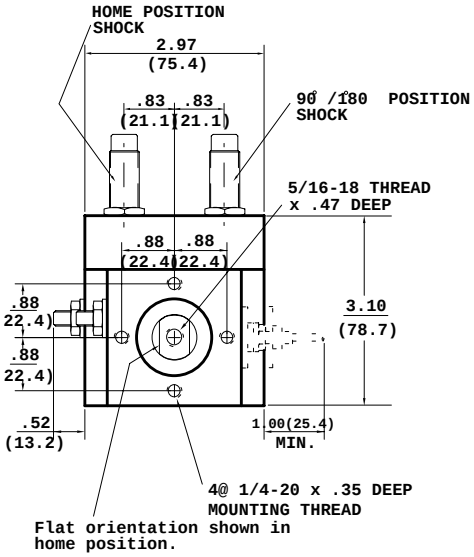
| STANDARD AVAILABLE STROKES |
|---|
| 1in. (25.4 mm) |
| 2in. (50.8mm) |
| 3in. (76.2mm) |
| 4in. (101.6mm) |
| 5in. (127.0mm) |
| 6in. (152.4mm) |

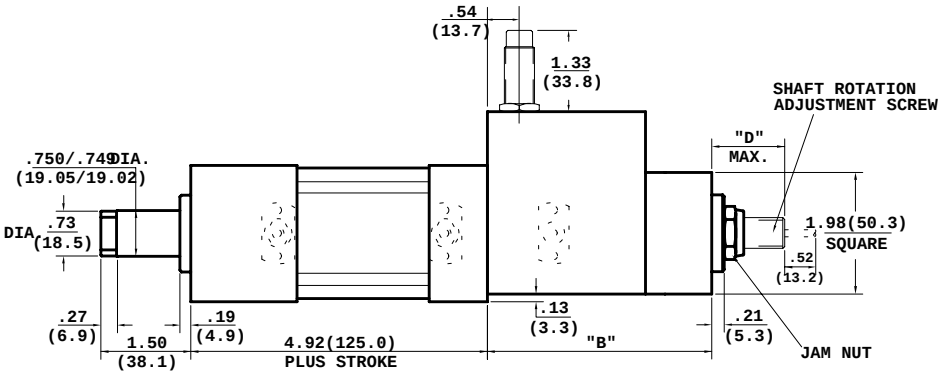
| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | "D" in. (mm) |
|---|---|---|---|---|
| 90° | 2.37(60.2) | 3.74(95.0) | 2.51(63.8) | 1.23(31.2) |
| 180° | 3.11(79.0) | 4.48(113.8) | 3.25(82.6) | 1.23(31.2) |
| 360° | 4.61(117.1) | 5.98(151.9) | 4.75(120.7) | 1.23(31.2) |

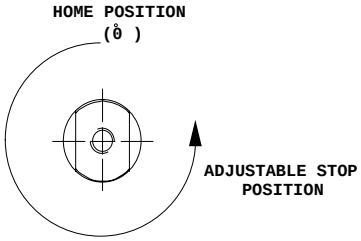
# LRAS-35

## Linear Rotary Actuators

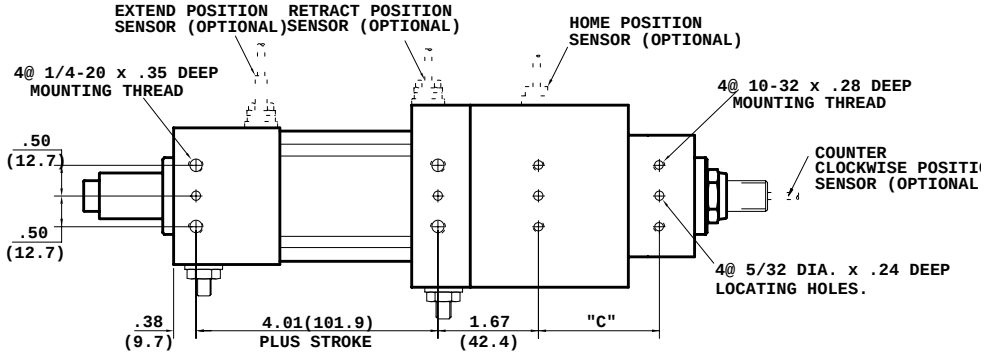



**STANDARD DIRECTION OF ROTATION VIEWED FROM OUTPUT SHAFT END**

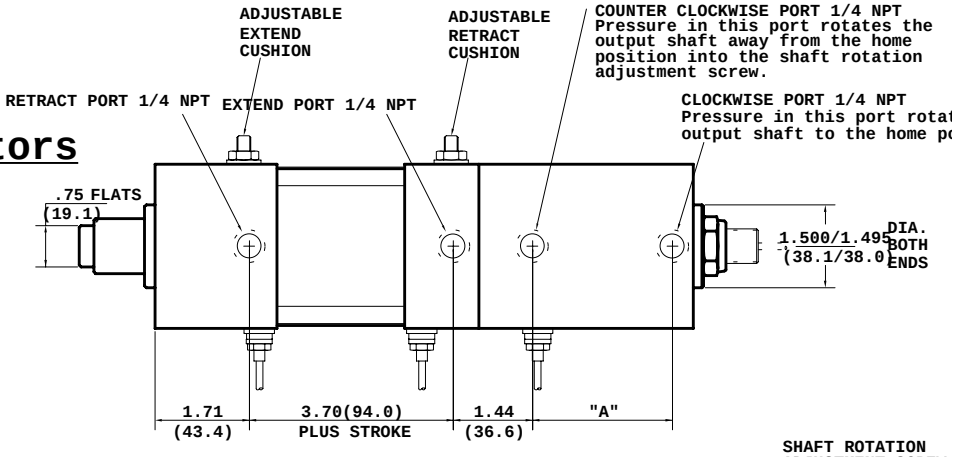


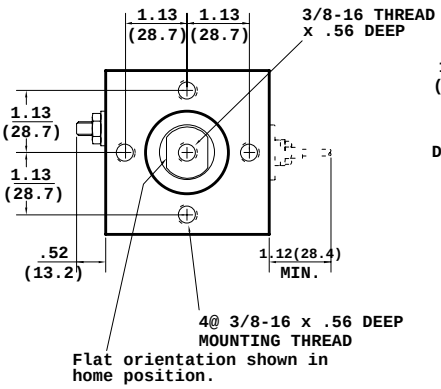

| STANDARD AVAILABLE STROKES |
|---|
| 1in. (25.4 mm) |
| 2in. (50.8mm) |
| 3in. (76.2mm) |
| 4in. (101.6mm) |
| 5in. (127.0mm) |
| 6in. (152.4mm) |

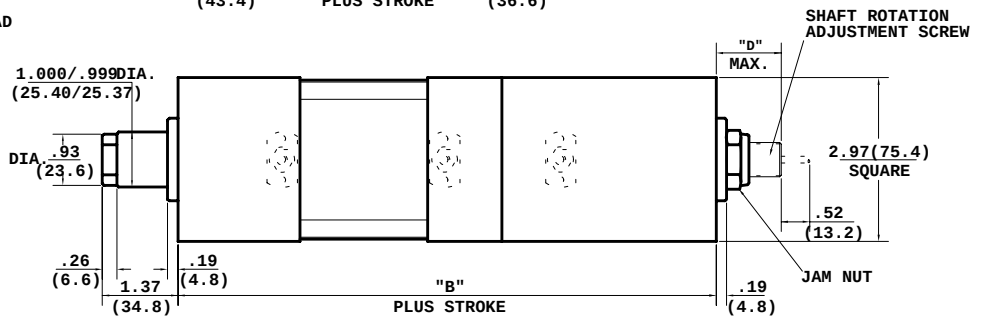
| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | "D" in. (mm) |
|---|---|---|---|---|
| 90° | 2.33(59.2) | 3.73(94.7) | 2.01(51.1) | 1.23(31.2) |
| 180° | 3.08(78.2) | 4.48(113.8) | 2.76(70.1) | 1.23(31.2) |

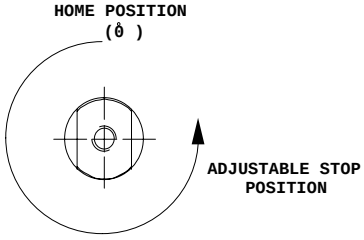
# LRA-75

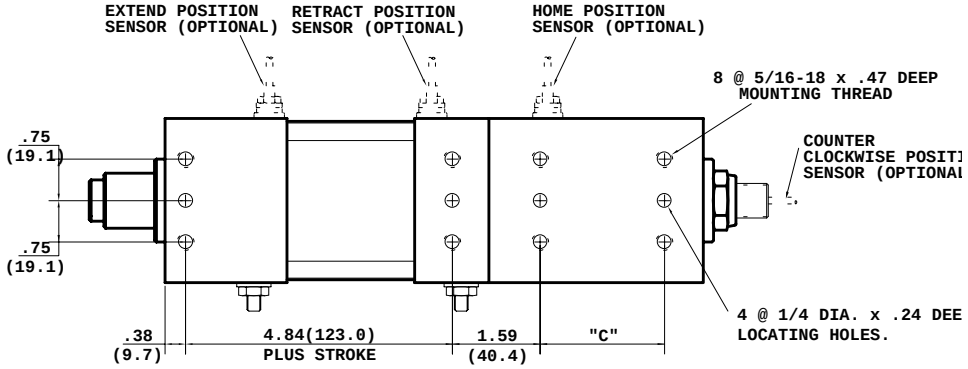
## Linear Rotary Actuators



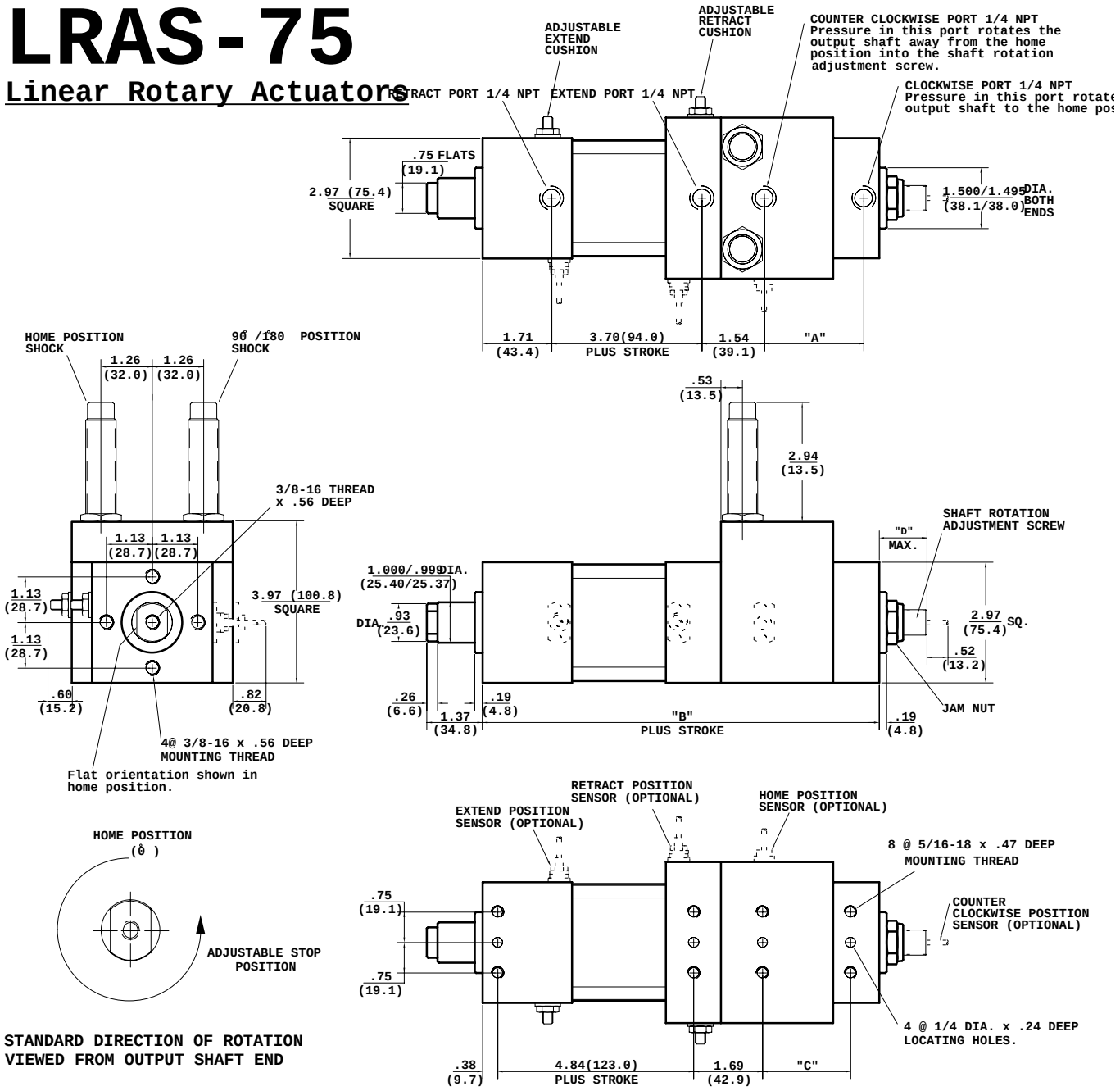

**STANDARD DIRECTION OF ROTATION VIEWED FROM OUTPUT SHAFT END**

| STANDARD AVAILABLE STROKES |
|---|
| 1in. (25.4 mm) |
| 2in. (50.8mm) |
| 3in. (76.2mm) |
| 4in. (101.6mm) |
| 5in. (127.0mm) |
| 6in. (152.4mm) |
| 7in. (177.8mm) |
| 8in. (203.2mm) |

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | "D" in. (mm) |
|---|---|---|---|---|
| 90° | 2.54(64.5) | 9.76(247.9) | 2.25(57.2) | 1.17(29.7) |
| 180° | 3.29(83.6) | 10.51(267.0) | 3.01(76.5) | 1.17(29.7) |
| 360° | 4.79(121.7) | 12.01(305.1) | 4.51(114.6) | 1.17(29.7) |

# LRAS-75

## Linear Rotary Actuators



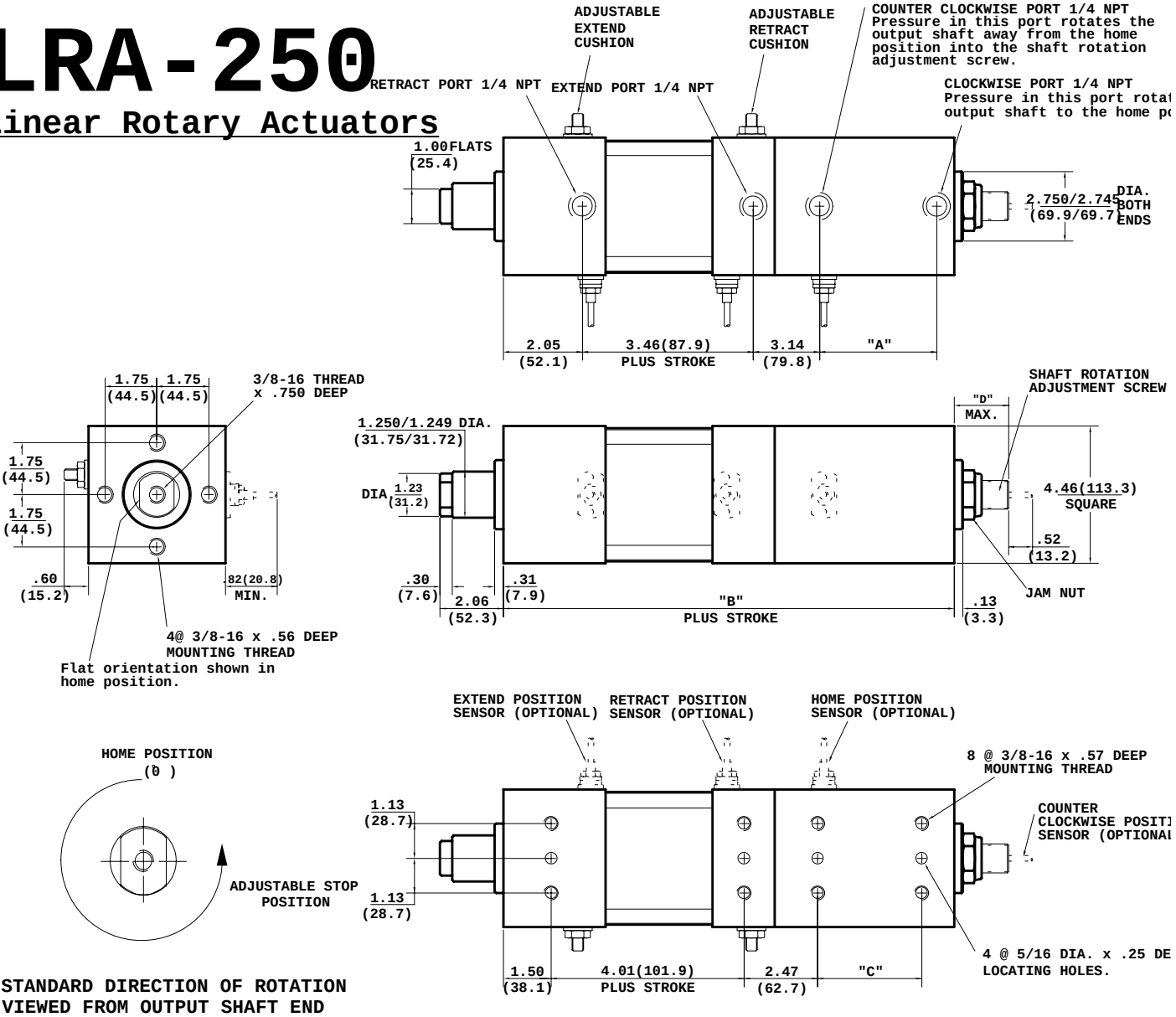

**STANDARD DIRECTION OF ROTATION VIEWED FROM OUTPUT SHAFT END**

| STANDARD AVAILABLE STROKES |
|---|
| 1in. (25.4 mm) |
| 2in. (50.8mm) |
| 3in. (76.2mm) |
| 4in. (101.6mm) |
| 5in. (127 mm) |
| 6in. (152.4mm) |
| 7in. (177.8mm) |
| 8in. (203.2mm) |

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | "D" in. (mm) |
|---|---|---|---|---|
| 90° | 2.45(62.2) | 9.78(248.4) | 2.18(55.4) | 1.17(29.7) |
| 180° | 3.20(81.3) | 10.52(267.2) | 2.92(74.2) | 1.17(29.7) |

# LRA-250

## Linear Rotary Actuators



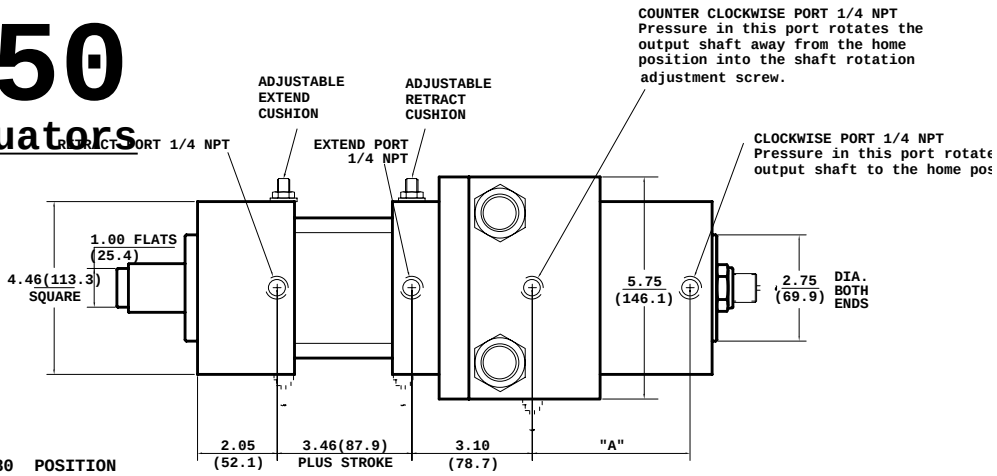

**STANDARD DIRECTION OF ROTATION VIEWED FROM OUTPUT SHAFT END**

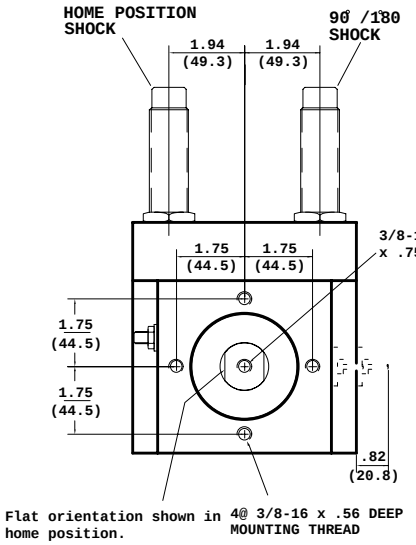
| STANDARD AVAILABLE STROKES |
|---|
| 1in. (25.4 mm) |
| 2in. (50.8mm) |
| 3in. (76.2mm) |
| 4in. (101.6mm) |
| 5in. (127.0mm) |
| 6in. (152.4mm) |
| 7in. (177.8mm) |
| 8in. (203.2mm) |
| 9in. (228.6mm) |
| 10in. (254.0mm) |
| 11in. (279.4mm) |
| 12in. (304.8mm) |

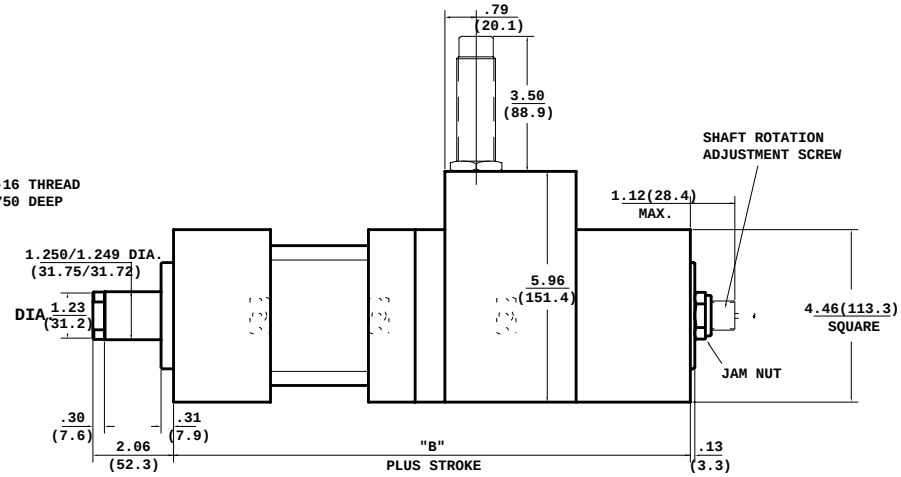
| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) | "D" in. (mm) |
|---|---|---|---|---|
| 90° | 3.96(100.6) | 13.18(334.8) | 3.51(89.2) | |
| 180° | 5.46(138.7) | 14.67(372.6) | 5.01(127.3) | |
| 360° | 8.45(214.6) | 17.67(448.8) | 8.00(203.2) | |

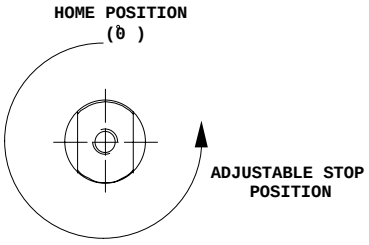
# LRAS-250

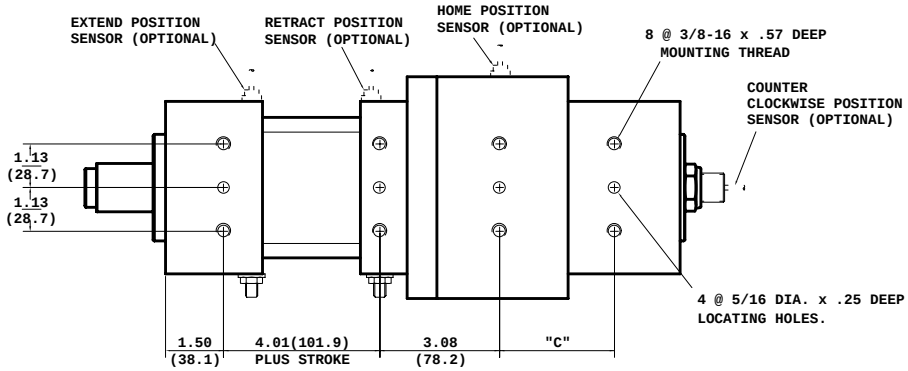
## Linear Rotary Actuators




**STANDARD DIRECTION OF ROTATION VIEWED FROM OUTPUT SHAFT END**

| STANDARD AVAILABLE STROKES |
|---|
| 1in. (25.4 mm) |
| 2in. (50.8mm) |
| 3in. (76.2mm) |
| 4in. (101.6mm) |
| 5in. (127 mm) |
| 6in. (152.4mm) |
| 7in. (177.8mm) |
| 8in. (203.2mm) |
| 9in. (228.6mm) |
| 10in. (254.0mm) |
| 11in. (279.4mm) |
| 12in. (304.8mm) |

| DEGREES of ROTATION | "A" in. (mm) | "B" in. (mm) | "C" in. (mm) |
|---|---|---|---|
| 90° | 4.06(103.1) | 13.23(336.3) | 2.95(74.9) |
| 180° | 5.55(141.0) | 14.72(373.9) | 4.45(115.6) |

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