

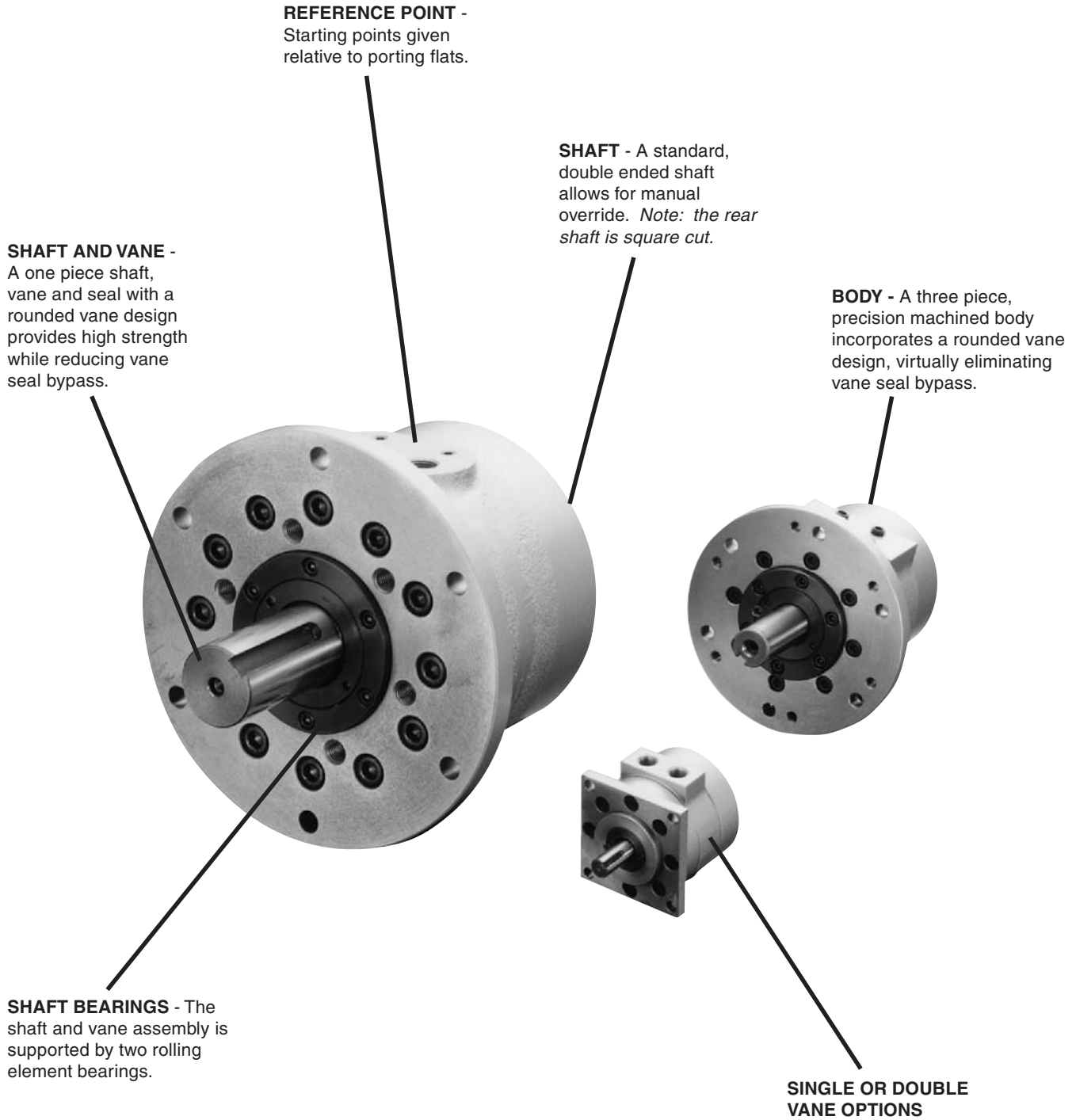
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HRN-C Series

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HRN Series

The HRN Series incorporates a rounded vane design, which provides lower vane seal bypass. The shaft and vane are machined from high strength alloy steel as one piece. The vane seal is molded in a pre-machined groove in order to provide a one piece shaft, vane, and seal assembly for long life and reliability. The standard rear output shaft provides for an easily accessible manual override in the event that hydraulic pressure is lost.

Available options include rotations of 90 degrees and 270 degrees depending on whether the unit is arranged as a double vane or single vane configuration. Reference points (or keyway timing) are provided relative to the port positioning. Large, convenient, front flange with precision pilot diameter allows for concise mounting and easy integration with the customer's application.

Specifications

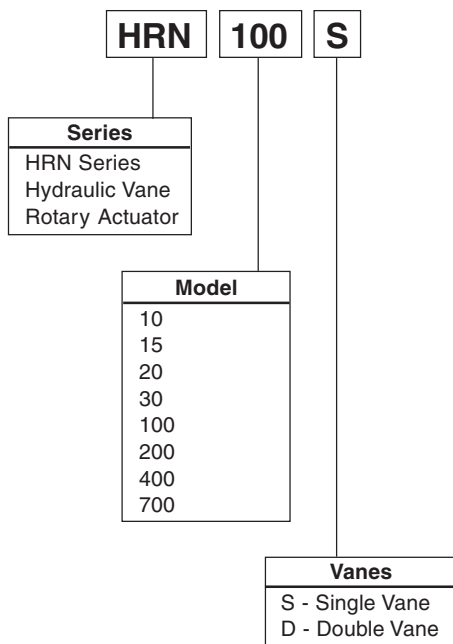
- Rated Operating Pressure: 7 MPa (1000 psi)
- Minimum Operating Pressure: 1 MPa (145 psi)
- Output Torque @ 7 MPa: 10 to 1960 N•m (89 to 17346 in-lb)
- Standard Rotations: 90° to 270°
- Operating Temperature Range: 0°C to 60°C (32°F to 140°F)
- Filtration Requirement: ISO Class 17/14 Cleanliness Level
- Mounting Orientation: Unrestricted
- Standard Keyway Timing: See Figures for Start Position

Quick Reference Data

| Model Number | | Theoretical Output Torque | | | | Maximum Breakaway Pressure | Unit Weight | | | | | | |
|--------------|---------|---------------------------|----------|--------------------|----------|----------------------------|-------------|-----------|--------------------|-------|---------------------|---------|---------|
| | | 1.75 MPa (250 psi) | | 3.50 MPa (500 psi) | | | | | 5.00 MPa (750 psi) | | 7.00 MPa (1000 psi) | | |
| | | N•m | (in-lb) | N•m | (in-lb) | N•m | (in-lb) | N•m | (in-lb) | MPa | (psi) | kg | (lb) |
| Single Vane | HRN10S | 2 | (17.7) | 4 | (35.0) | 8 | (70.8) | 10 | (89.0) | 1.00 | (145) | 1.00 | (2.21) |
| | HRN15S | 3 | (26.6) | 8 | (70.8) | 12 | (106.0) | 20 | (177.0) | 1.00 | (145) | 2.00 | (4.41) |
| | HRN20S | 9 | (79.7) | 13 | (115.0) | 19 | (168.0) | 30 | (266.0) | 1.00 | (145) | 3.00 | (6.62) |
| | HRN30S | 12 | (106.2) | 21 | (186.0) | 45 | (398.0) | 60 | (531.0) | 1.00 | (145) | 4.30 | (9.48) |
| | HRN100S | 20 | (177.0) | 55 | (487.0) | 96 | (850.0) | 123 | (1089.0) | 1.00 | (145) | 10.20 | (22.49) |
| | HRN200S | 40 | (354.0) | 133 | (1177.0) | 210 | (1859.0) | 314 | (2779.0) | 1.00 | (145) | 20.00 | (44.10) |
| | HRN400S | 100 | (885.0) | 200 | (1770.0) | 420 | (3717.0) | 539 | (4770.0) | 1.00 | (145) | 32.00 | (70.56) |
| HRN700S | 170 | (1504.5) | 211 | (1867.0) | 397 | (3513.0) | 980 | (8673.0) | 1.00 | (145) | 41.00 | (90.41) | |
| Double Vane | HRN10D | 3 | (26.6) | 8 | (70.8) | 12 | (106.2) | 20 | (177.0) | 1.00 | (145) | 1.00 | (2.21) |
| | HRN15D | 6 | (53.1) | 18 | (142.0) | 27 | (239.0) | 40 | (354.0) | 1.00 | (145) | 2.00 | (4.41) |
| | HRN20D | 12 | (106.2) | 21 | (186.0) | 45 | (398.0) | 60 | (531.0) | 1.00 | (145) | 3.00 | (6.62) |
| | HRN30D | 21 | (185.9) | 49 | (434.0) | 78 | (690.0) | 117 | (1035.0) | 1.00 | (145) | 4.50 | (9.92) |
| | HRN100D | 30 | (265.5) | 105 | (929.0) | 160 | (1416.0) | 245 | (2168.0) | 1.00 | (145) | 10.40 | (22.93) |
| | HRN200D | 71 | (628.4) | 250 | (2213.0) | 405 | (3584.0) | 627 | (5549.0) | 1.00 | (145) | 20.50 | (45.20) |
| | HRN400D | 220 | (1947.0) | 440 | (3894.0) | 760 | (6726.0) | 1078 | (9540.0) | 1.00 | (145) | 33.00 | (72.77) |
| HRN700D | 320 | (2832.0) | 730 | (6461.0) | 1132 | (10018.0) | 1960 | (17346.0) | 1.00 | (145) | 43.00 | (94.82) | |

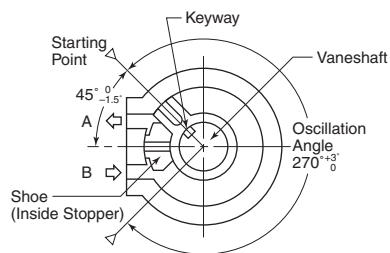
Model Code and Ordering Information

Example: HRN100S



Oscillation Starting Point

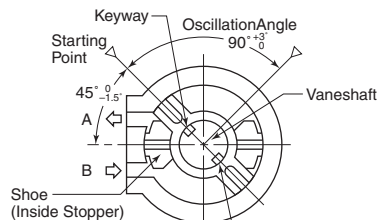
**HRN10S, HRN15S, HRN20S,
 HRN30S, HRN100S, HRN200S,
 HRN400S, HRN700S**



Note:

1. Figures show stroke end position with B port pressurized.
2. It is a view from shaft-with-key side.

**HRN10D, HRN15D, HRN20D,
 HRN30D, HRN100D, HRN200D,
 HRN400D, HRN700D**



Two Keyways are provided for HRN-30D, 100D and 200D types only

| Model No. | Unit Size | HRN10S | HRN15S | HRN20S | HRN30S | HRN100S | HRN200S | HRN400S | HRN700S |
|----------------------------------|----------------------|-------------|--------|--------|--------|---------|---------|---------|---------|
| Vane | | Single Vane | | | | | | | |
| Rotation | Degree | 270 | | | | | | | |
| Rotational Tolerance | Degree | +3 -0 | | | | | | | |
| Reference Point | Degree | 45 | | | | | | | |
| Port Size | | Rc 1/8 | | | Rc 1/4 | Rc 3/8 | | Rc 1/2 | |
| Minimum Operating Pressure Range | MPa | 1.0 | | | | | | | |
| | psi | 145.0 | | | | | | | |
| Maximum Operating Pressure Range | MPa | 7.0 | | | | | | | |
| | psi | 1015.0 | | | | | | | |
| Fluid Temperature Range | °C | 0 to 60 | | | | | | | |
| | °F | 32 to 140 | | | | | | | |
| Displacement | cm ³ | 10.0 | 17.0 | 24.0 | 51.0 | 111.0 | 221.0 | 435.0 | 780.0 |
| Internal Bypass Leakage at 40°C | cm ³ /min | 10.0 | 15.0 | 20.0 | 30.0 | 50.0 | 100.0 | 100.0 | 100.0 |

| Model No. | Unit Size | HRN10D | HRN15D | HRN20D | HRN30D | HRN100D | HRN200D | HRN400D | HRN700D |
|----------------------------------|----------------------|-------------|--------|--------|--------|---------|---------|---------|---------|
| Vane | | Double Vane | | | | | | | |
| Rotation | Degree | 90 | | | | | | | |
| Rotational Tolerance | Degree | +3 -0 | | | | | | | |
| Reference Point | Degree | 45 | | | | | | | |
| Port Size | | Rc 1/8 | | | Rc 1/4 | Rc 3/8 | | Rc 1/2 | |
| Minimum Operating Pressure Range | MPa | 1.0 | | | | | | | |
| | psi | 145.0 | | | | | | | |
| Maximum Operating Pressure Range | MPa | 7.0 | | | | | | | |
| | psi | 1015.0 | | | | | | | |
| Fluid Temperature Range | °C | 0 to 60 | | | | | | | |
| | °F | 32 to 140 | | | | | | | |
| Displacement | cm ³ | 6.5 | 11.0 | 16.0 | 34.0 | 74.0 | 147.0 | 290.0 | 520.0 |
| Internal Bypass Leakage at 40°C | cm ³ /min | 20.0 | 30.0 | 40.0 | 60.0 | 100.0 | 200.0 | 200.0 | 200.0 |

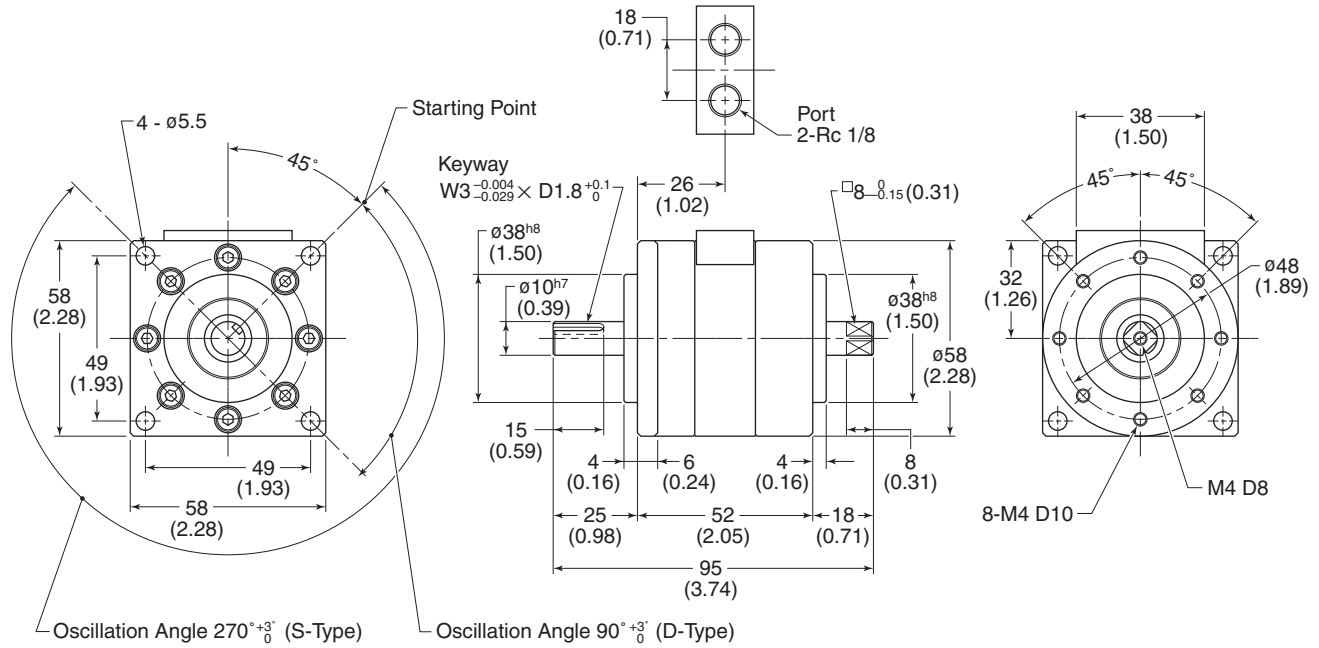
Kinetic Energy Ratings and Bearing Load Capacities

| Model Number | Bearing Load Capacities | | | | Maximum Inertia Energy Rating | |
|--------------|-------------------------|------|-------------|------|-------------------------------|-------|
| | Thrust Load | | Radial Load | | J | in-lb |
| | N | lb | N | lb | | |
| HRN10 | 4.9 | 1.1 | 9.8 | 2.2 | 0.013 | 0.12 |
| HRN15 | 9.8 | 2.2 | 19.6 | 4.4 | 0.025 | 0.22 |
| HRN20 | 24.5 | 5.5 | 49 | 11.0 | 0.046 | 0.41 |
| HRN30 | 39.2 | 8.8 | 78.4 | 17.6 | 0.088 | 0.78 |
| HRN100 | 68.6 | 15.4 | 147.0 | 33.0 | 0.255 | 2.26 |
| HRN200 | 137.2 | 30.8 | 294.0 | 66.1 | 0.510 | 4.51 |
| HRN400 | 166.6 | 37.5 | 343.0 | 77.1 | 0.755 | 6.68 |
| HRN700 | 166.6 | 37.5 | 343.0 | 77.1 | 0.911 | 8.06 |

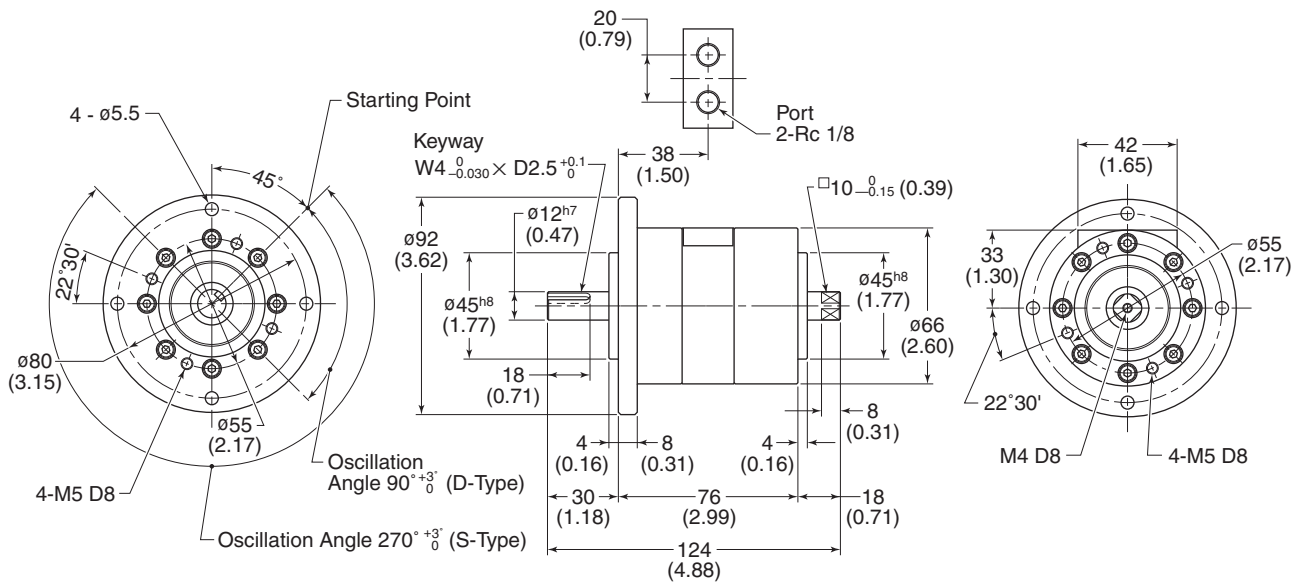
Note: The allowable inertia energy is applicable when the load is installed on the keyed input shaft.

Caution: Operation of actuator at conditions of excessive inertia energy may damage the actuator. See Engineering Guidelines section for selection criteria.

HRN10S/D

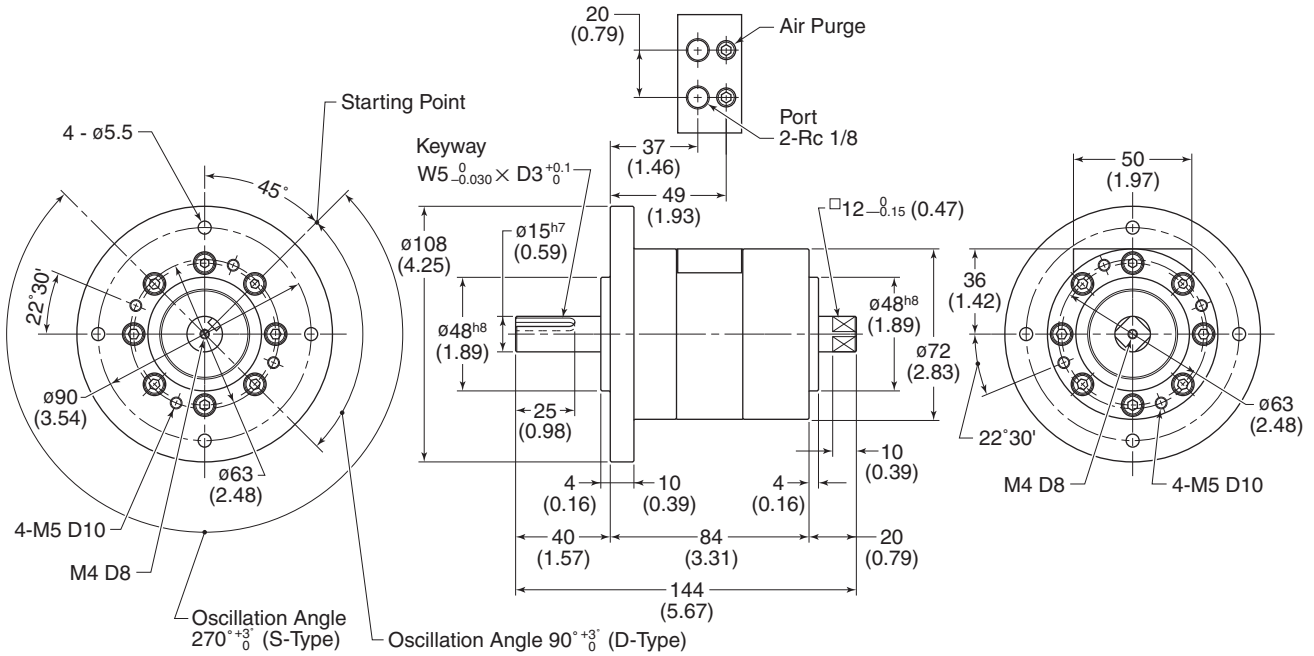


HRN15S/D

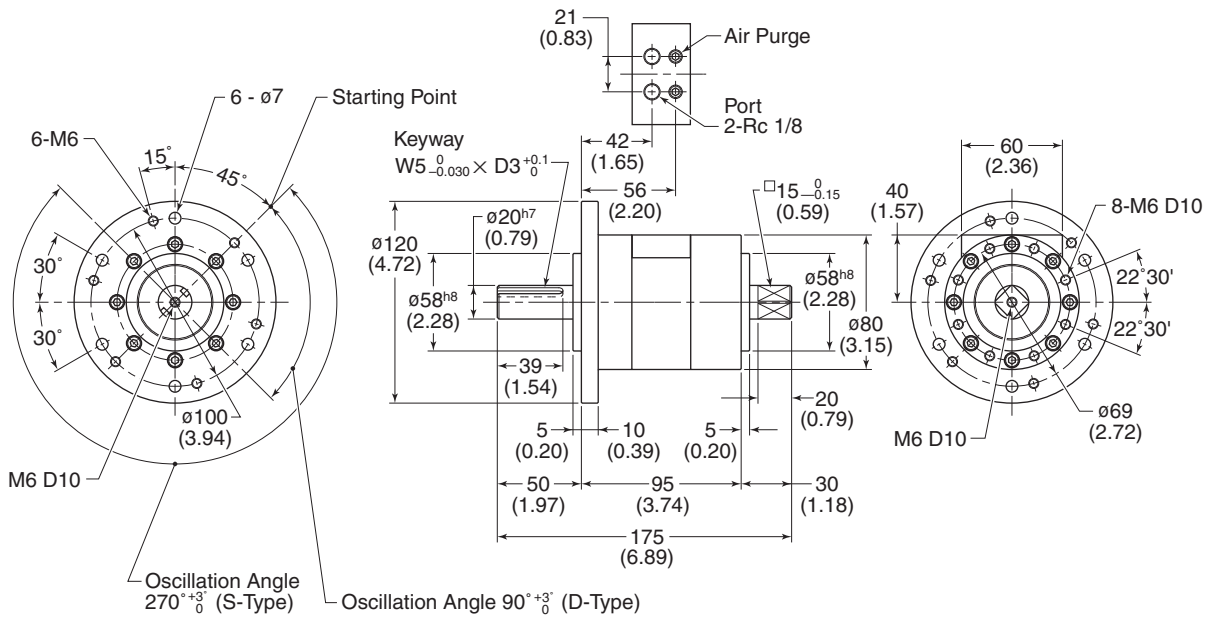


Dimensions are in mm (Inches)

HRN20S/D



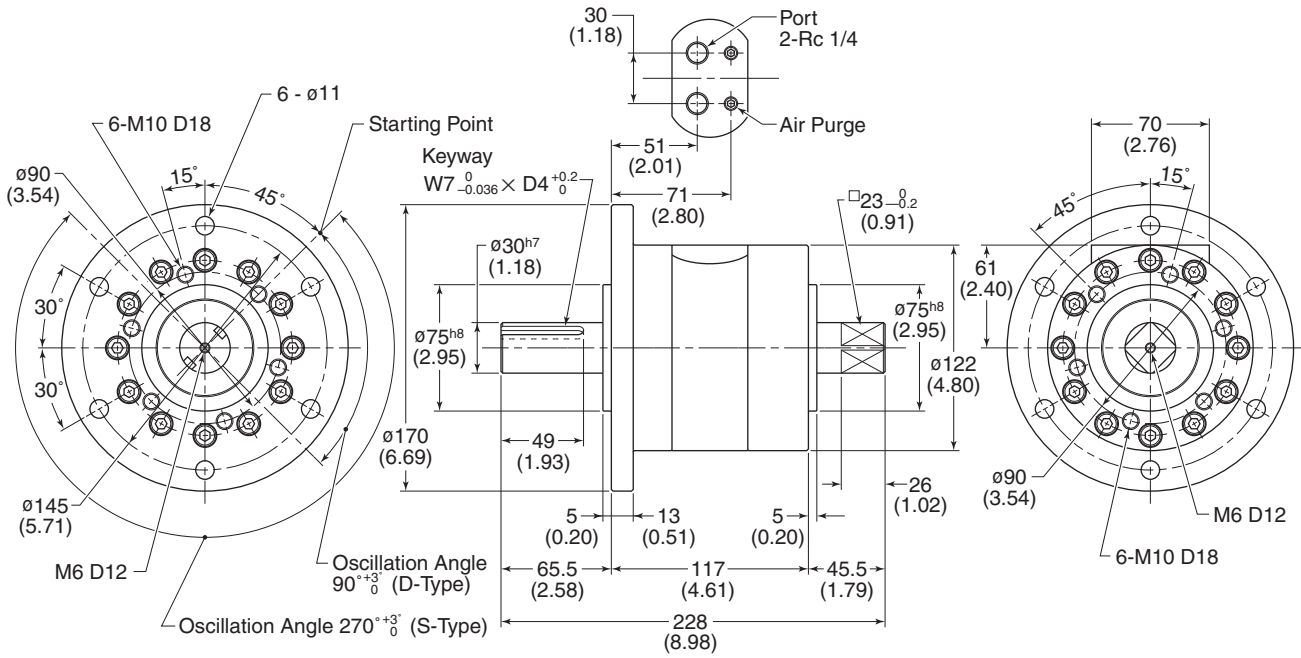
HRN30S/D



Note: For Double Vane, 2 Keyways are Provided

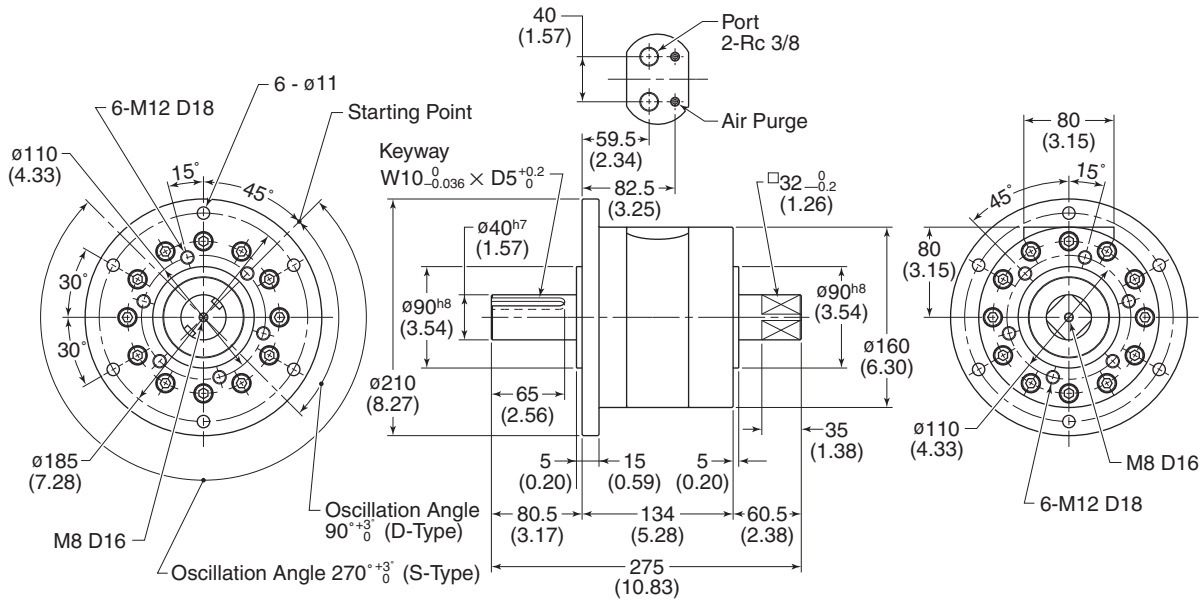
Dimensions are in mm (Inches)

HRN100S/D



Note: For Double Vane, 2 Keyways are Provided

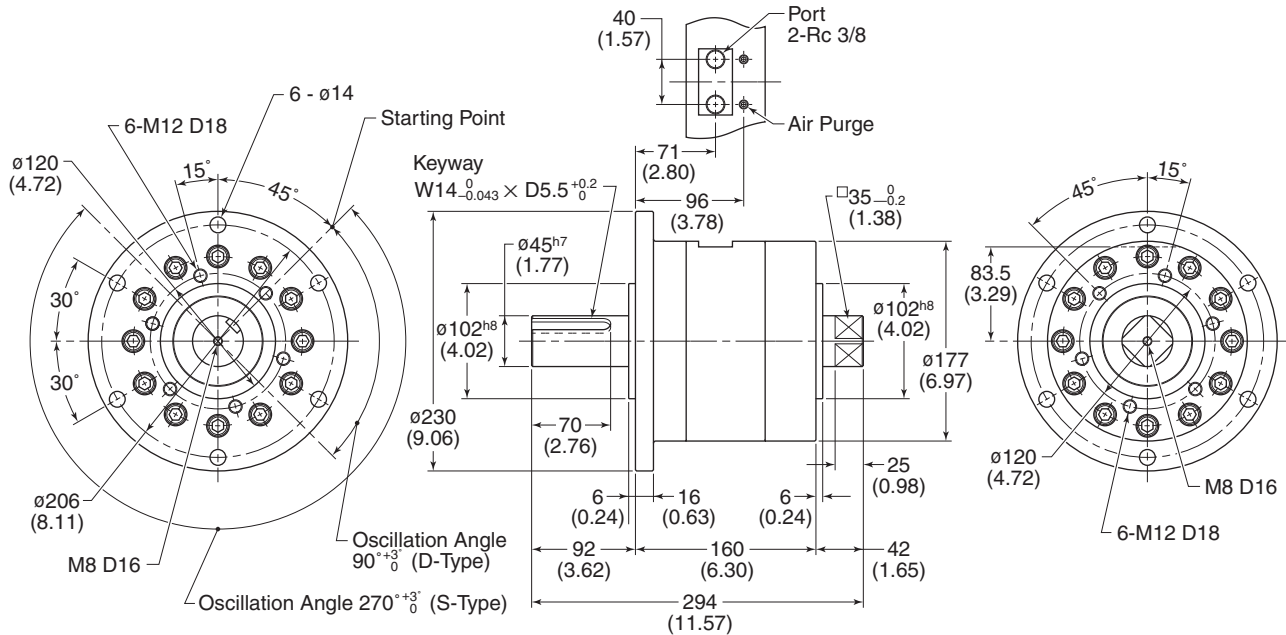
HRN200S/D



Note: For Double Vane, 2 Keyways are Provided

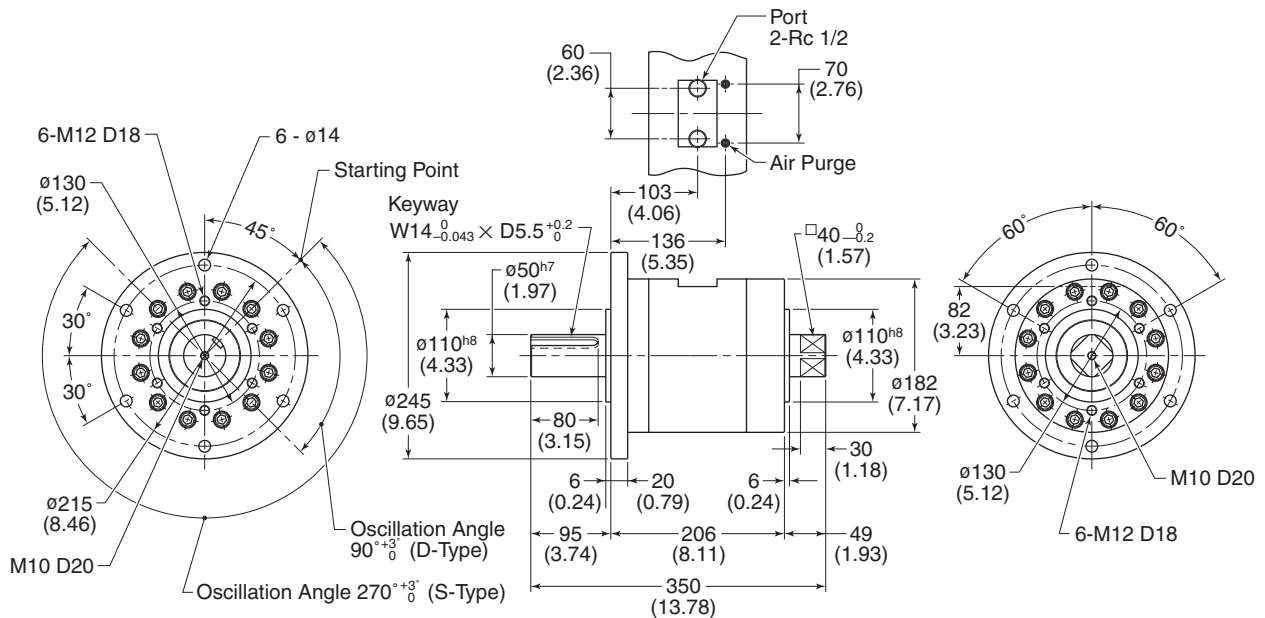
Dimensions are in mm (Inches)

HRN400S/D

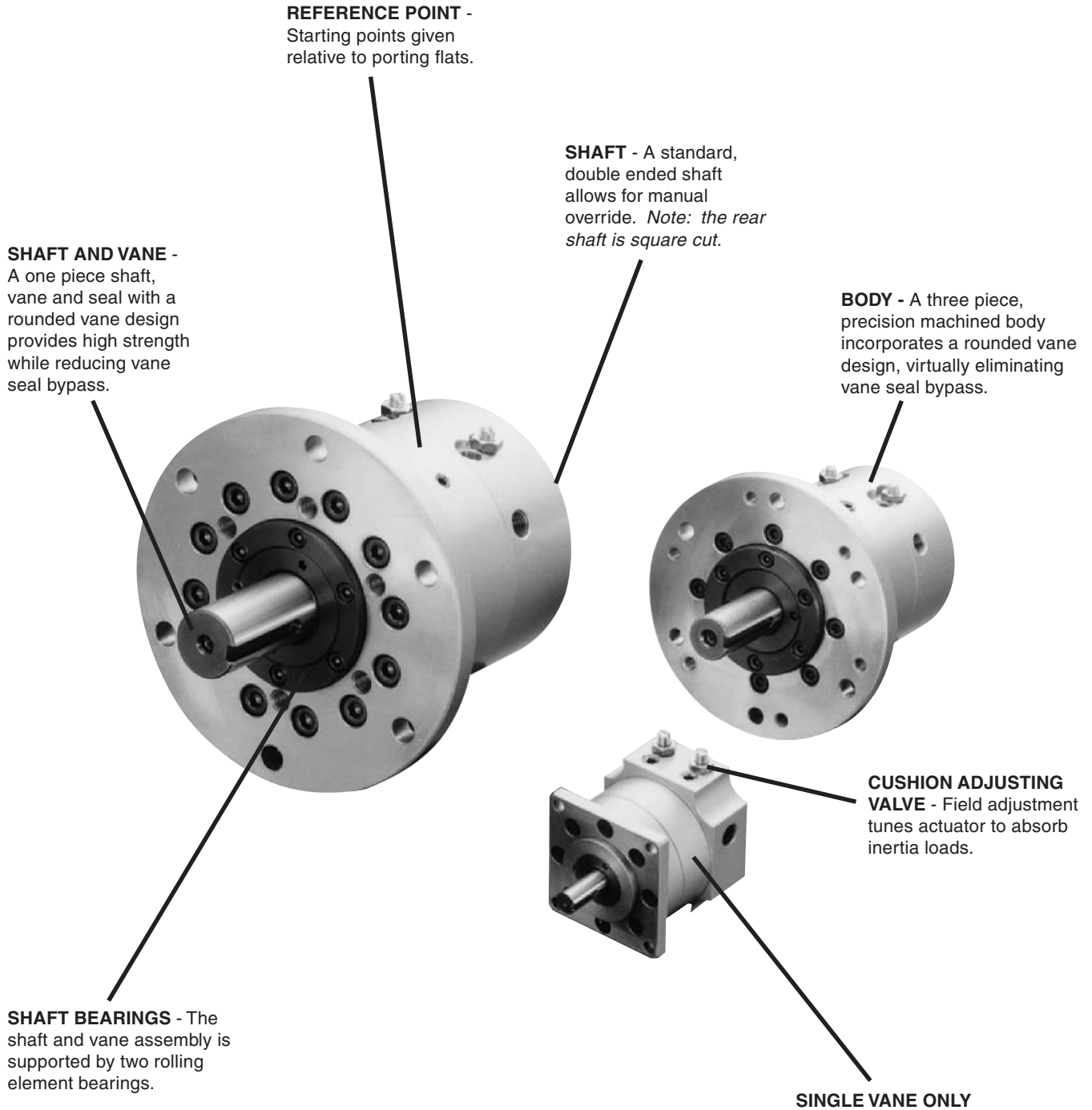


Vane Actuators
HRN
Tork-Mor

HRN700S/D



Dimensions are in mm (Inches)



HRN-C Series

The HRN-C Series provides an additional range of vane actuator technology. Unique cushion options are available for applications where control of high inertia loads is critical. The actuator incorporates load deceleration cushions which act over the last 20 to 25 degrees of rotation. These are field adjustable and can be selected to meet varying rotational speeds and loading.

The HRN-C Series also incorporates a rounded vane design, which provides lower vane seal bypass. The shaft and vane are machined from high strength alloy steel as one piece. The vane seal is molded in a pre-machined groove in order to provide a one piece shaft, vane, and seal assembly for long life and reliability. The standard rear output shaft provides for an easily accessible manual override in the event that hydraulic pressure is lost.

Available options include rotations of 90 degrees and 180 degrees with the unit configured as a single vane arrangement. Reference points (or keyway timing) are provided relative to the port positioning. Large, convenient, front flange with precision pilot diameter allows for concise mounting and easy integration with the customer's application.

Specifications

- Rated Operating Pressure: 7 MPa (1000 psi)
- Minimum Operating Pressure: 1 MPa (145 psi)
- Output Torque @ 7 MPa: 10 to 1960 N•m (89 to 17346 in-lb)
- Standard Rotations: 90° to 270°
- Operating Temperature Range: 0°C to 60°C (32°F to 140°F)
- Filtration Requirement: ISO Class 17/14 Cleanliness Level
- Mounting Orientation: Unrestricted
- Standard Keyway Timing: See Figures for Start Position

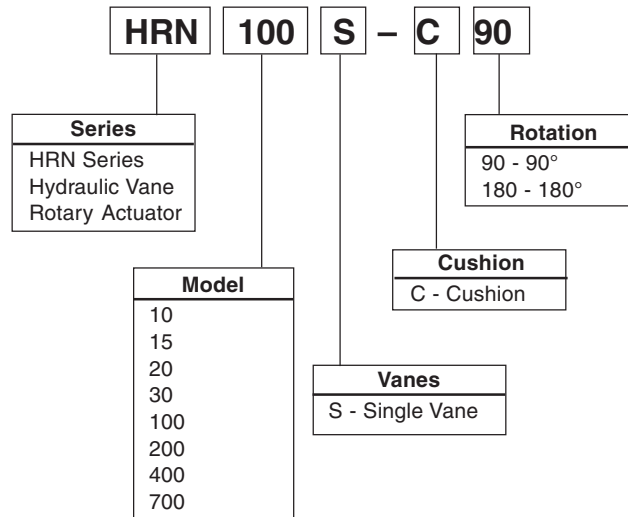
Vane Actuators
HRN-C
Tork-Mor

Quick Reference Data

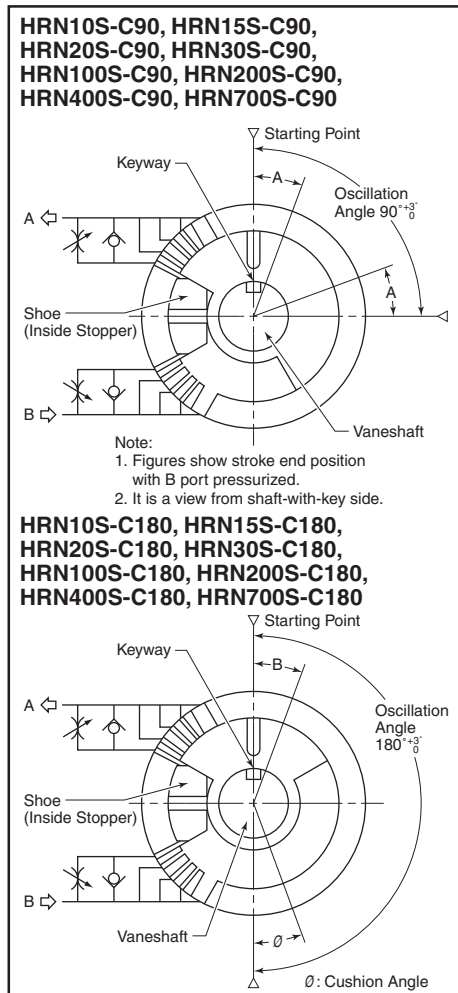
| Model Number | | Theoretical Output Torque | | | | Maximum Breakaway Pressure | Unit Weight | |
|--------------|-----------|---------------------------|--------------------|--------------------|---------------------|----------------------------|---------------|--|
| | | 1.75 MPa (250 psi) | 3.50 MPa (500 psi) | 5.00 MPa (750 psi) | 7.00 MPa (1000 psi) | | | |
| | | N•m (in-lb) | N•m (in-lb) | N•m (in-lb) | N•m (in-lb) | MPa (psi) | kg (lb) | |
| Single Vane | HRN10S-C | 2 (17.7) | 5 (44.3) | 7 (62.0) | 10 (88.5) | 1.00 (145) | 1.20 (2.65) | |
| | HRN15S-C | 3 (26.6) | 8 (70.8) | 13 (115.1) | 20 (177.0) | 1.00 (145) | 2.40 (5.29) | |
| | HRN20S-C | 8 (70.8) | 13 (115.1) | 23 (203.6) | 29 (256.7) | 1.00 (145) | 3.30 (7.28) | |
| | HRN30S-C | 10 (88.5) | 26 (230.1) | 38 (336.3) | 58 (513.3) | 1.00 (145) | 4.70 (10.36) | |
| | HRN100S-C | 23 (203.6) | 56 (495.6) | 92 (814.2) | 123 (1088.6) | 1.00 (145) | 13.50 (29.77) | |
| | HRN200S-C | 45 (398.3) | 124 (1097.4) | 212 (1876.2) | 314 (2778.9) | 1.00 (145) | 25.70 (56.67) | |
| | HRN400S-C | 170 (1504.5) | 250 (2212.5) | 398 (3522.3) | 539 (4770.2) | 1.00 (145) | 34.00 (74.97) | |
| | HRN700S-C | 201 (1778.9) | 410 (3628.5) | 579 (5124.2) | 1078 (9540.3) | 1.00 (145) | 44.00 (97.02) | |

Model Code and Ordering Information

Example: HRN100S-C90



Oscillation Starting Point



| Model No. | Unit Size | HRN10S-C | | HRN15S-C | | HRN20S-C | | HRN30S-C | |
|-------------------------------------|----------------------|-----------------|--------|----------|--------|----------|--------|----------|--------|
| Vane | | Single Vane | | | | | | | |
| Rotation | Degree | 90 | 180 | 90 | 180 | 90 | 180 | 90 | 180 |
| Rotational Tolerance | Degree | +3 -0 | | | | | | | |
| Reference Point | Degree | 90 | | | | | | | |
| Port Size | | Rc 1/8 | | | | | | | |
| Operating Pressure Range | MPa | 1.0 to 7.0 | | | | | | | |
| | psi | 145.0 to 1015.0 | | | | | | | |
| Temperature Range | °C | 0 to 60 | | | | | | | |
| | °F | 32 to 140 | | | | | | | |
| Displacement | cm ³ | 6.5 | 3.3 | 11.0 | 5.5 | 16.0 | 8.0 | 34.0 | 17.0 |
| | in ³ | 0.40 | 0.20 | 0.67 | 0.30 | 0.98 | 0.49 | 2.07 | 1.04 |
| Internal Bypass Leakage at 40°C | cm ³ /min | 10 | | 15 | | 20 | | 30 | |
| Maximum Moment of Inertia | in-lb | 8.5 | | 17.0 | | 25.5 | | 50.9 | |
| Maximum Inrush Angular Velocity | Radian/s | 10.4720 | | | | | | | |
| | Degree/s | 600 | | | | | | | |
| Cushion Angle | Radian | 0.3491 | | | 0.4363 | | | | |
| | Degree | 20 | | | 25 | | | | |
| Oscillating Angle Before Cushioning | Radian | 1.2217 | 2.7925 | 1.1345 | 2.7053 | 1.1345 | 2.7053 | 1.1345 | 2.7053 |
| | Degree | 70 | 160 | 65 | 155 | 65 | 155 | 65 | 155 |

| Model No. | Unit Size | HRN100S-C | | HRN200S-C | | HRN400S-C | | HRN700S-C | |
|-------------------------------------|----------------------|-----------------|--------|-----------|--------|-----------|--------|-----------|--------|
| Vane | | Single Vane | | | | | | | |
| Rotation | Degree | 90 | 180 | 90 | 180 | 90 | 180 | 90 | 180 |
| Rotational Tolerance | Degree | +3 -0 | | | | | | | |
| Reference Point | Degree | 90 | | | | | | | |
| Port Size | | Rc 1/4 | | Rc 3/8 | | | Rc 1/2 | | |
| Operating Pressure Range | MPa | 1.0 to 7.0 | | | | | | | |
| | psi | 145.0 to 1015.0 | | | | | | | |
| Temperature Range | °C | 0 to 60 | | | | | | | |
| | °F | 32 to 140 | | | | | | | |
| Displacement | cm ³ | 74.0 | 37.0 | 147.0 | 73.5 | 290.0 | 145.0 | 520.0 | 260.0 |
| | in ³ | 4.52 | 2.26 | 8.97 | 4.49 | 17.70 | 8.85 | 31.70 | 15.90 |
| Internal Bypass Leakage at 40°C | cm ³ /min | 50 | | 100 | | 100 | | 100 | |
| Maximum Moment of Inertia | in-lb | 127.3 | | 339.5 | | 594.3 | | 1188.0 | |
| Maximum Inrush Angular Velocity | Radian/s | 8.7266 | | 6.9813 | | 5.2360 | | 4.3633 | |
| | Degree/s | 500 | | 400 | | 300 | | 250 | |
| Cushion Angle | Radian | 0.4363 | | | | | | | |
| | Degree | 25 | | | | | | | |
| Oscillating Angle Before Cushioning | Radian | 1.1345 | 2.7053 | 1.1345 | 2.7053 | 1.1345 | 2.7053 | 1.1345 | 2.7053 |
| | Degree | 65 | 155 | 65 | 155 | 65 | 155 | 65 | 155 |

Vane Actuators
HRN-C
 Torq-Mor

Kinetic Energy Ratings and Bearing Load Capacities

| Model Number | Bearing Load Capacities | | | | Maximum Inertia Energy Rating | |
|--------------|-------------------------|------|-------------|------|-------------------------------|-------|
| | Thrust Load | | Radial Load | | J | in-lb |
| | N | lb | N | lb | | |
| HRN10S-C | 4.9 | 1.1 | 9.8 | 2.0 | 0.013 | 0.12 |
| HRN15S-C | 9.8 | 2.2 | 19.6 | 4.0 | 0.025 | 0.22 |
| HRN20S-C | 24.5 | 5.5 | 49.0 | 11.0 | 0.046 | 0.41 |
| HRN30S-C | 39.2 | 8.8 | 78.4 | 18.0 | 0.088 | 0.78 |
| HRN100S-C | 68.6 | 15.4 | 147.0 | 33.0 | 0.260 | 2.26 |
| HRN200S-C | 137.2 | 30.8 | 294.0 | 66.0 | 0.510 | 4.51 |
| HRN400S-C | 166.6 | 37.5 | 343.0 | 77.0 | 0.760 | 6.68 |
| HRN700S-C | 166.6 | 37.5 | 343.0 | 77.0 | 0.910 | 8.06 |

Note: The allowable inertia energy is applicable when the load is installed on the keyed input shaft.

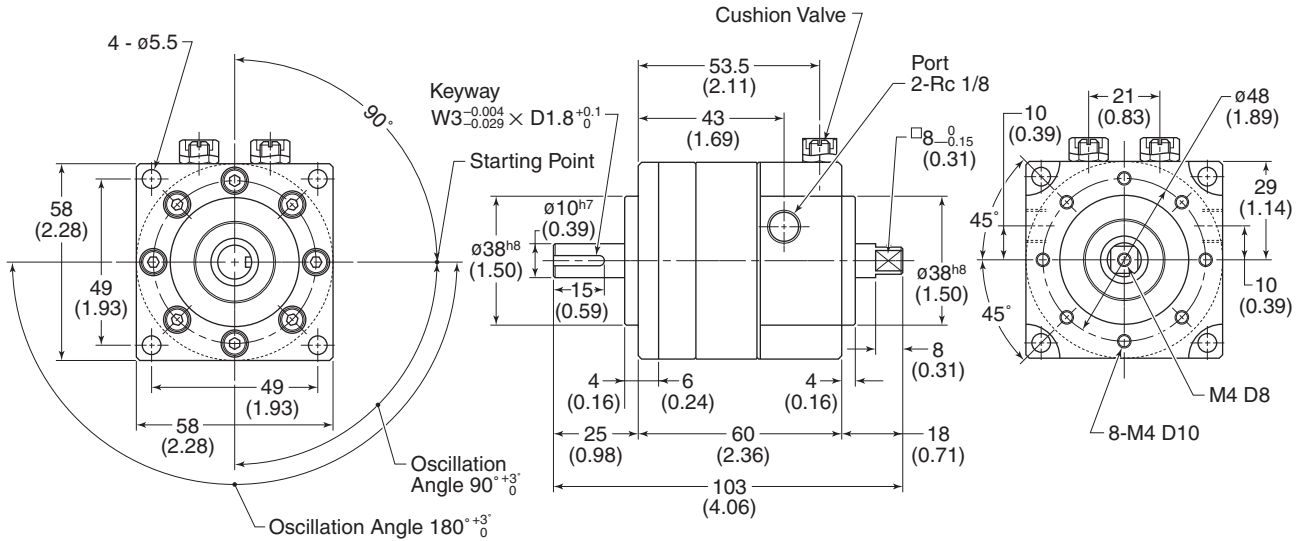
Maximum Absorbed Energy

| Model Number | Maximum Absorbed Energy J (in-lb) | | | | | |
|--------------|-----------------------------------|------------------|------------------|------------------|-----------------|----------------|
| | Operating Pressure MPa (psi) | | | | | |
| | 1.96 (284) | 2.94 (426) | 3.92 (569) | 4.90 (710) | 5.88 (853) | 6.86 (995) |
| HRN10S-C | 2.06 (18.23) | 1.76 (15.58) | 1.47 (13.01) | 1.18 (10.44) | 0.88 (7.79) | 0.59 (5.22) |
| HRN15S-C | 4.80 (42.48) | 4.12 (36.46) | 3.43 (30.36) | 2.74 (24.25) | 2.06 (18.23) | 1.37 (12.12) |
| HRN20S-C | 7.55 (66.82) | 6.47 (57.26) | 5.39 (47.70) | 4.31 (38.14) | 3.23 (28.59) | 2.16 (19.12) |
| HRN30S-C | 15.09 (133.55) | 12.94 (114.52) | 10.78 (95.40) | 8.62 (76.29) | 6.47 (57.26) | 4.31 (38.14) |
| HRN100S-C | 30.87 (273.20) | 26.46 (234.17) | 22.05 (195.14) | 17.64 (156.11) | 13.23 (117.09) | 8.62 (76.29) |
| HRN200S-C | 78.89 (698.18) | 67.62 (598.44) | 56.35 (498.70) | 45.08 (398.96) | 33.81 (299.22) | 22.54 (199.48) |
| HRN400S-C | 137.20 (1214.22) | 117.60 (1040.76) | 98.00 (867.30) | 78.40 (693.84) | 58.80 (520.38) | 39.20 (346.92) |
| HRN700S-C | 250.39 (2215.95) | 214.62 (1899.39) | 178.85 (1582.82) | 143.08 (1266.26) | 107.31 (949.69) | 71.54 (633.13) |

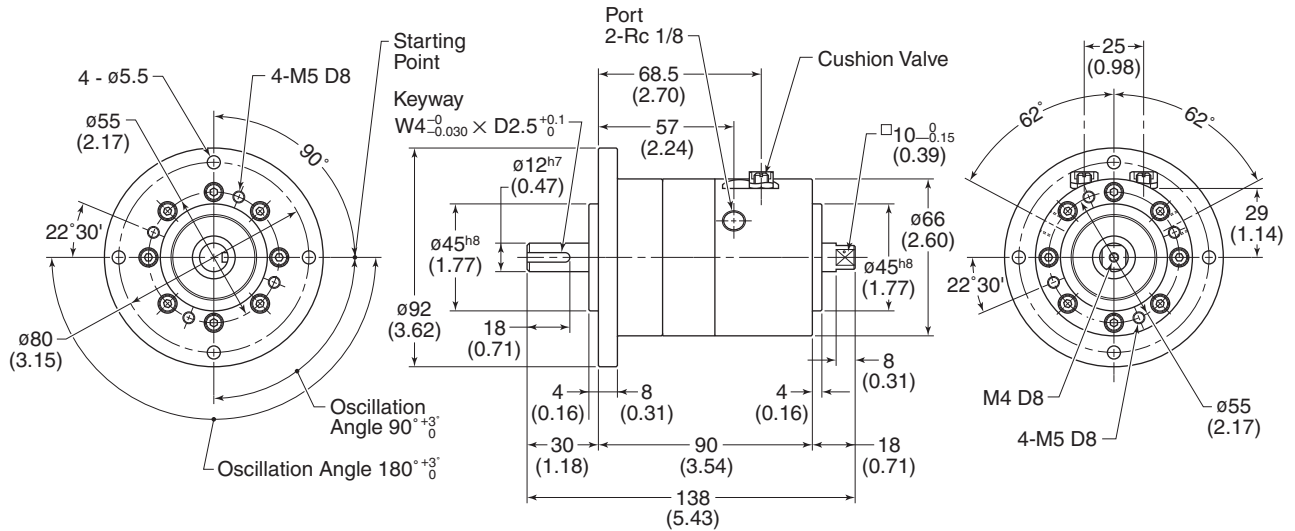
1800_HRN.pmd, M&A



HRN10S-C

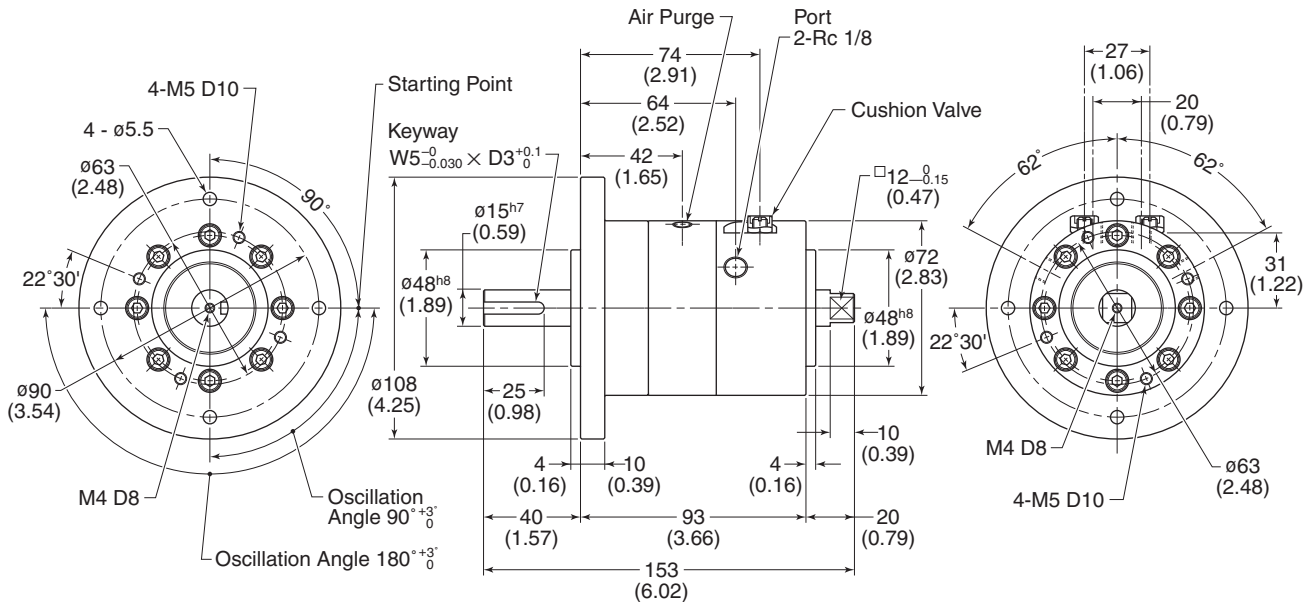


HRN15S-C

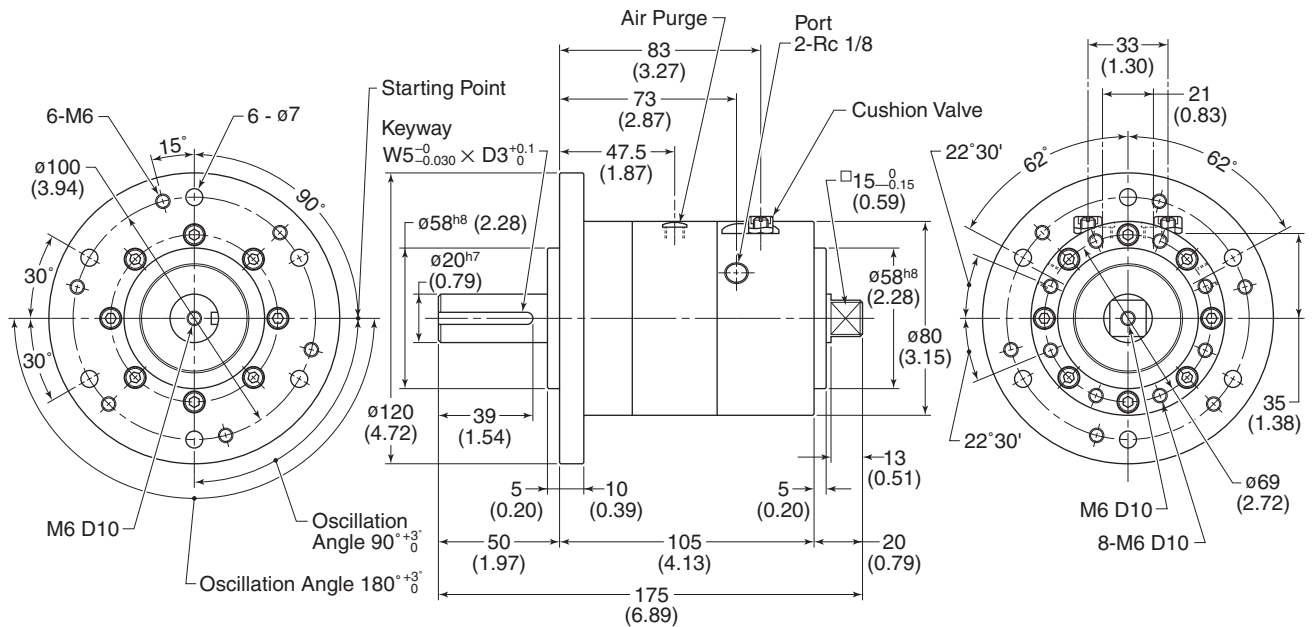


Dimensions are in mm (Inches)

HRN20S-C

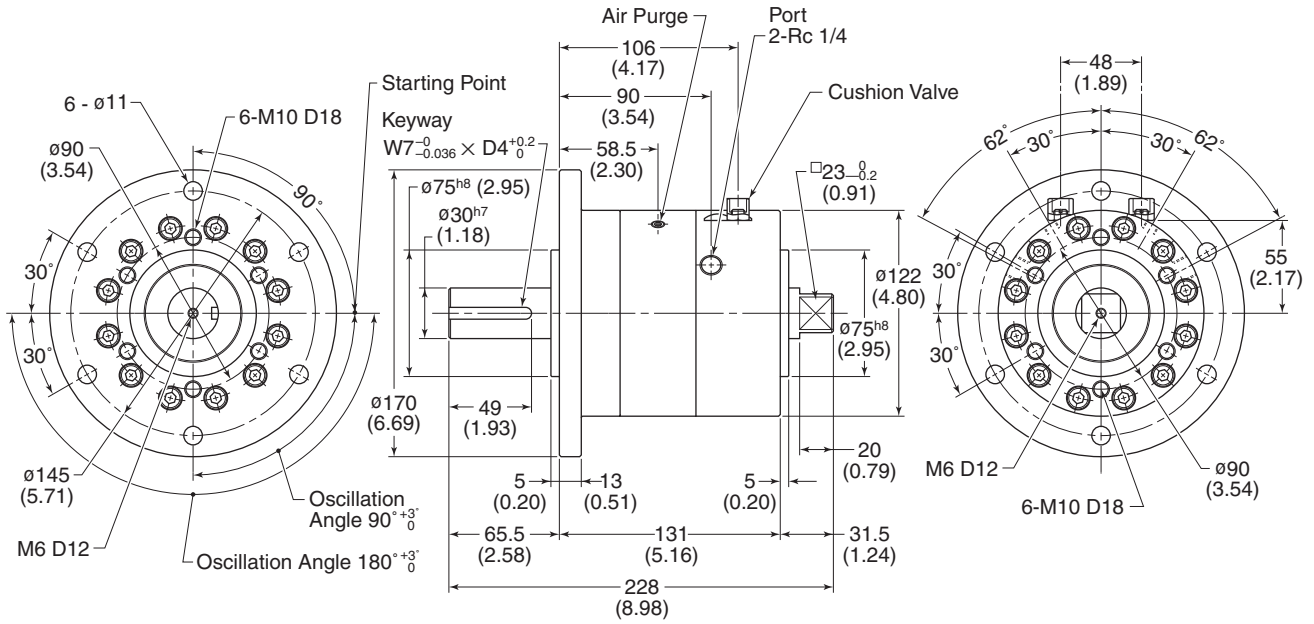


HRN30S-C

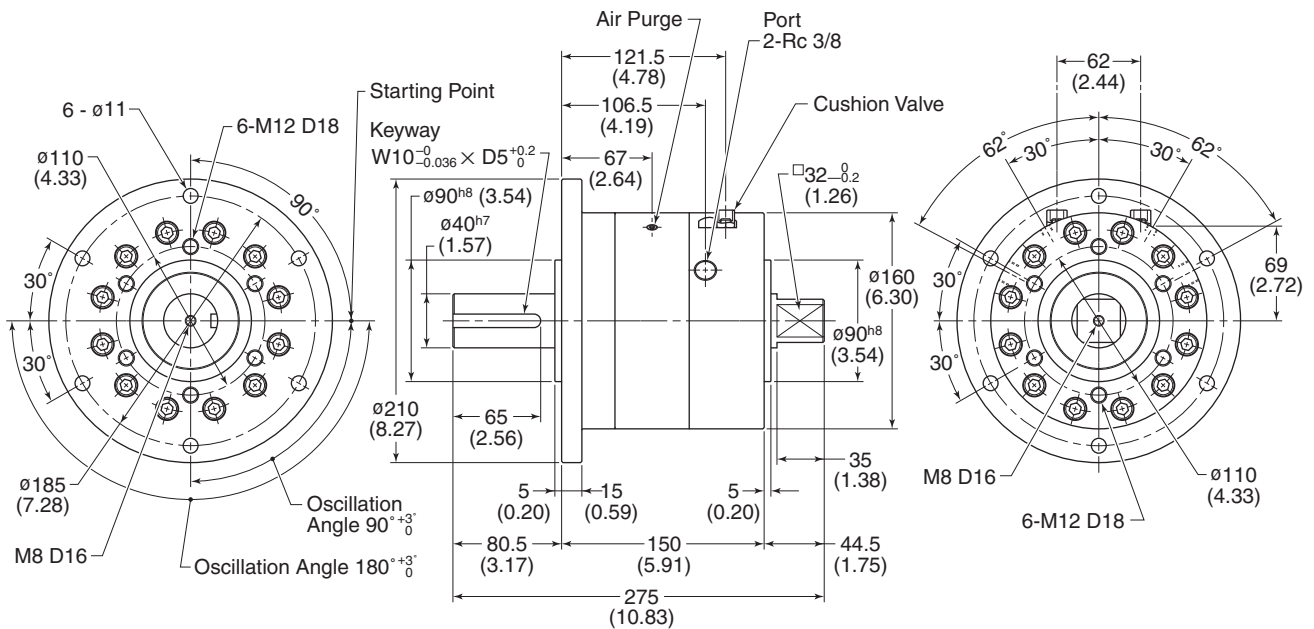


Dimensions are in mm (Inches)

HRN100S-C

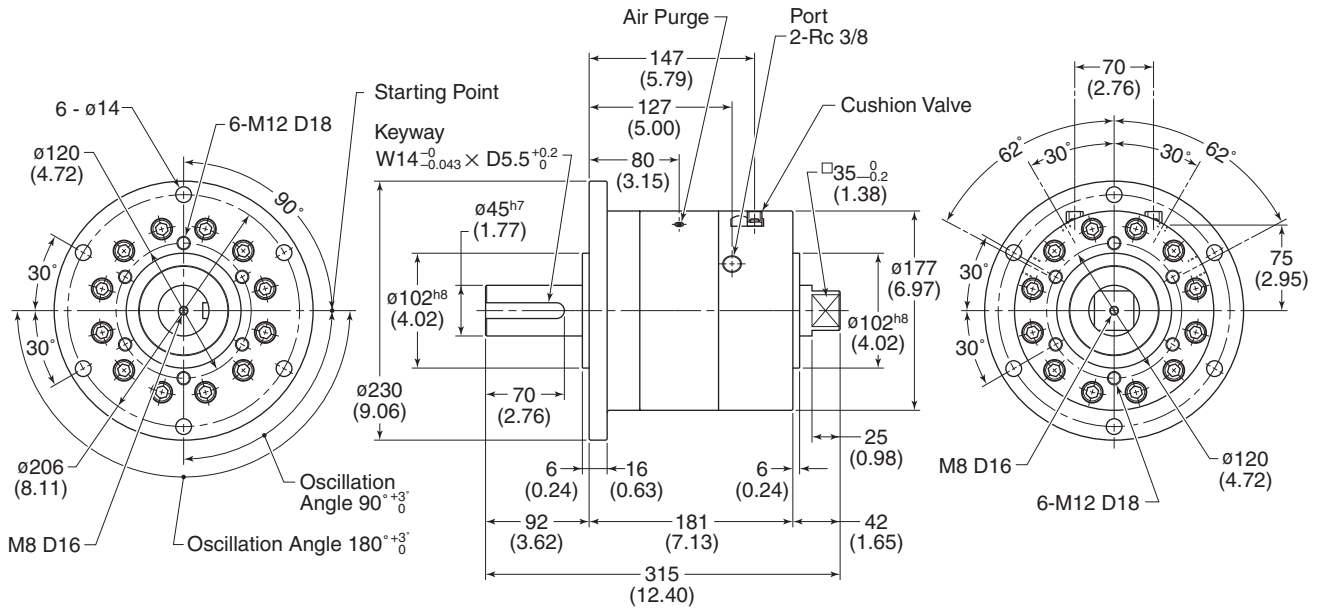


HRN200S-C

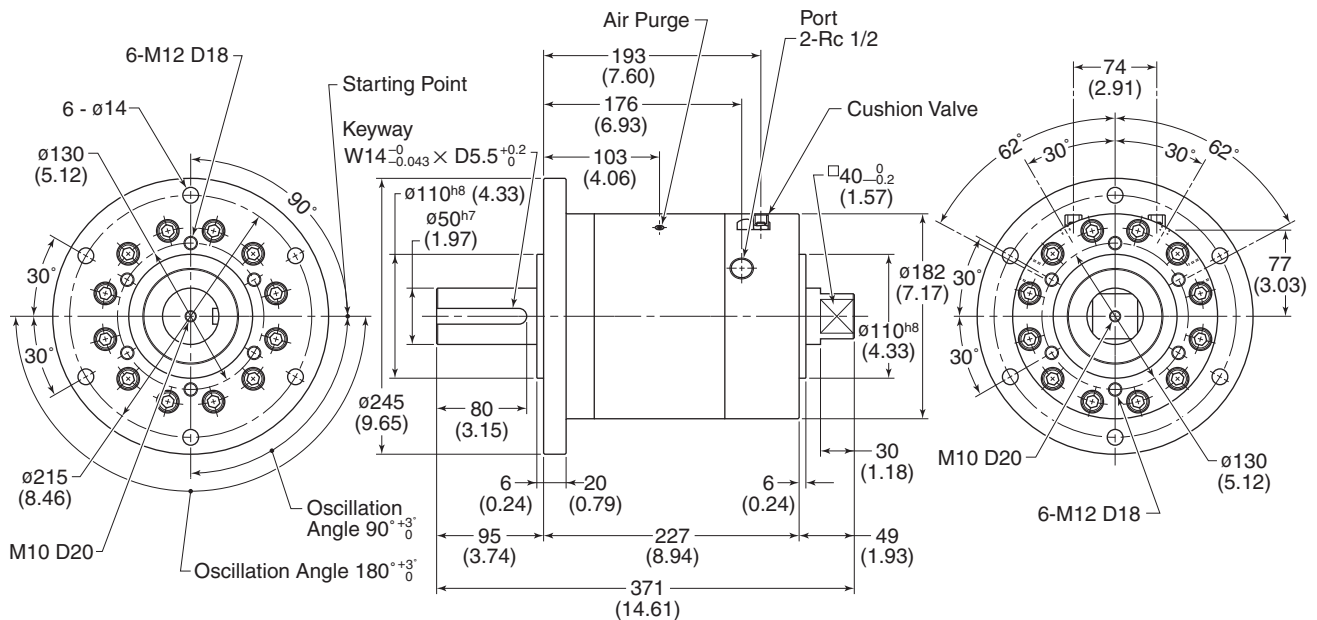


Dimensions are in mm (Inches)

HRN400S-C



HRN700S-C

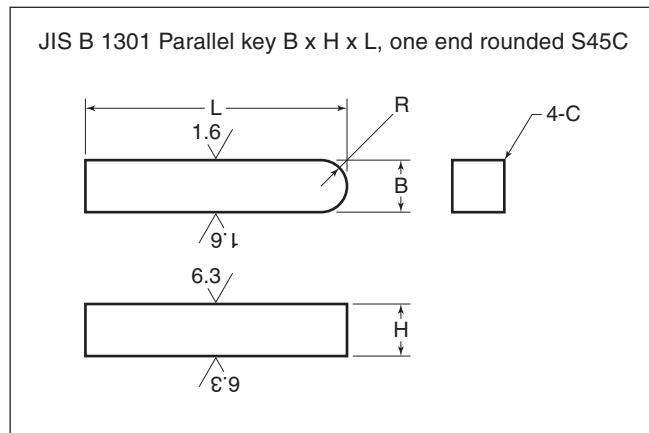


Dimensions are in mm (Inches)

Keys for HRN Series Actuators

HRN Series Actuators with keyways are accompanied by the following keys, respectively.

| Model No. | Key Size | Quantity | |
|-----------|-------------|----------------------------------|--------------|
| | | Standard | With Cushion |
| HRN10 | 3 x 3 x 15 | 1 | 1 |
| HRN15 | 4 x 4 x 18 | 1 | 1 |
| HRN20 | 5 x 5 x 25 | 1 | 1 |
| HRN30 | 5 x 5 x 39 | Single Bane: 1 Double Bane: 2 | 1 |
| HRN100 | 7 x 7 x 49 | Single Bane: 1 Double Bane: 2 | 1 |
| HRN200 | 10 x 8 x 65 | Single Bane: 1 Double Bane: 2 | 1 |
| HRN400 | 14 x 9 x 70 | 1 | 1 |
| HRN700 | 14 x 9 x 80 | 1 | 1 |



Dimensions are in mm

| Key Size | B | H | L | C | R |
|-------------|-----------------------------------|----------------------------------|-----------------------------------|-------------|-----|
| 3 x 3 x 15 | 3 ⁰ _{-0.05} | 3 ⁰ _{-0.25} | 15 ⁰ _{-0.18} | 0.16 – 0.25 | 1.5 |
| 4 x 4 x 18 | 4 ⁰ _{-0.03} | 4 ⁰ _{-0.03} | 18 ⁰ _{-0.18} | 0.16 – 0.25 | 2 |
| 5 x 5 x 25 | 5 ⁰ _{-0.03} | 5 ⁰ _{-0.03} | 25 ⁰ _{-0.21} | 0.25 – 0.40 | 2.5 |
| 5 x 5 x 39 | 5 ⁰ _{-0.03} | 5 ⁰ _{-0.03} | 39 ⁰ _{-0.25} | 0.25 – 0.40 | 2.5 |
| 7 x 7 x 49 | 7 ⁰ _{-0.036} | 7 ⁰ _{-0.036} | 49 ⁰ _{-0.025} | 0.25 – 0.40 | 3.5 |
| 10 x 8 x 65 | 10 ⁰ _{-0.036} | 8 ⁰ _{-0.09} | 65 ⁰ _{-0.3} | 0.4 – 0.6 | 5 |
| 14 x 9 x 70 | 14 ⁰ _{-0.043} | 9 ⁰ _{-0.09} | 70 ⁰ _{-0.3} | 0.4 – 0.6 | 7 |
| 14 x 9 x 80 | 14 ⁰ _{-0.043} | 9 ⁰ _{-0.09} | 80 ⁰ _{-0.3} | 0.4 – 0.6 | 7 |