

MODEL HX

Fail Safe Hydraulic Actuator



Hydraulic Actuation



INTRO

Omni Model HX hydraulic actuators are designed to operate surface safety or shutdown valves on oil & gas wellhead, transmission, storage, manifold or other applications where fail-safe capability is required.

Model HX actuators can be used for land or off shore installations and are engineered to provide reliable service in a variety of operating conditions.

Omni can provide Model HX actuators already mounted on valves and ready to deploy, or as actuated bonnet assemblies ready to mount on valves from other manufacturers. Omni also offers a full range of accessories including standard & fusible manual overrides, position indicators, and standard & fusible lock open devices.

FEATURES

Flexibility

Model HX actuators can be adapted to operate valves from any manufacturer (interface information is required) and can be delivered with alternate materials of construction if required by field conditions.

Over-Pressure Protection

Model HX actuators come equipped with pressure relief devices to protect personnel and guard against damage to the actuator in case of an over pressure condition. The pressure relief device is easily inspected and is field-replaceable.

Non-Pressurized Actuator Housing

Model HX actuators have outer housings that are structural and protective only – they are not under hydraulic pressure. This helps protect personnel and equipment in the event of damage to the outer housing.

Backseat & Packing Integrity

Model HX actuators incorporate bonnet assemblies that have an integrated metal-to-metal backseat. A bonnet fitting can also be used to relieve any pressure that might be trapped between the backseat and stem packing after the backseat operation. A tattle-tale weep port is located above the packing to provide visual confirmation of stem seal integrity during operation. All Model HX ports can be used to pipe fugitive emissions to a containment vessel, if required.

Corrosion Protection

Model HX actuator housings are internally and externally coated to prevent corrosion due to environmental conditions. All internal components are either stainless steel or are coated to prevent corrosion due to any contamination that might be present in the control pressure source.

Maintenance

Model HX actuators are designed for ease of maintenance. All non-metallic seals and other parts are easily replaceable. Omni stocks redress kits for all sizes of Model HX Actuators.

Orientation, Rotation & Ease of Piping

The orientation of the control pressure port can be rotated to any angle for ease of piping while the actuator is not pressurized.

AVAILABLE SIZES

| Model | Size | STROKE |
|--------|----------|--------------------|
| HX 20 | 2 1/2" " | Up to 2 9/16" bore |
| HX 30 | 3 1/2" " | Up to 4 1/16" bore |
| HX 40 | 4 1/2" " | Up to 4 1/16" bore |
| HX 60 | 6 1/2" " | Up to 7 1/16" bore |
| HX 90 | 9" | Up to 7 1/16" bore |
| HX 110 | 11" | Up to 7 1/16" bore |

ACTUATOR OPERATION

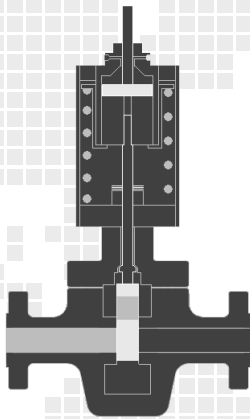
Fail "closed" operation is depicted.

Fail "open" operation is available upon request.

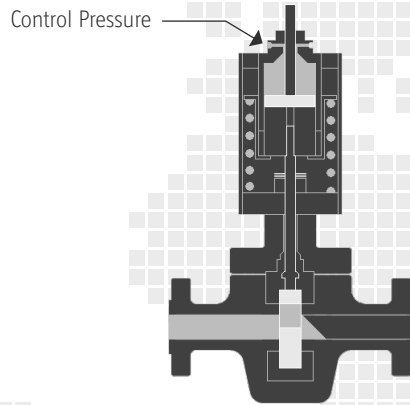


Hydraulic Actuation

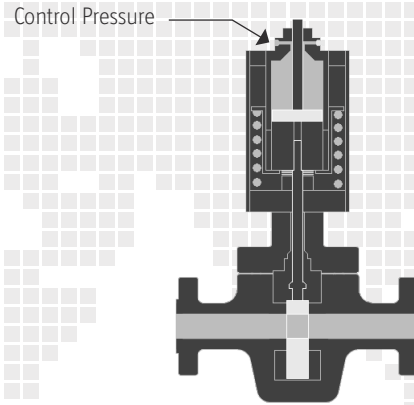
Open / close operation of a modified manually operated valve which utilizes a direct acting slab gate (DASG) is depicted. Utilize control pressure to the lower port to open the valve and control pressure to the upper port to close the valve.



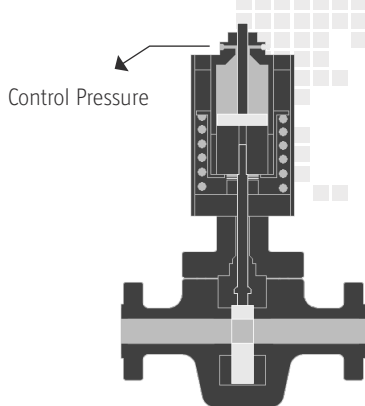
When no control pressure is applied to actuator, valve is in closed position (gate all the way up)



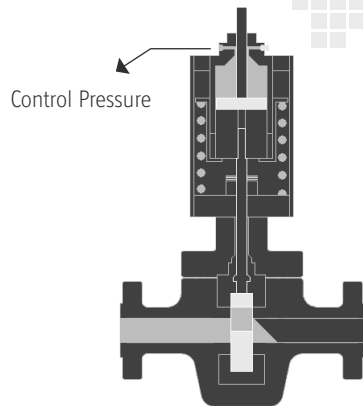
Upon application of adequate control pressure to the actuator port, valve begins to open (gate moves down)



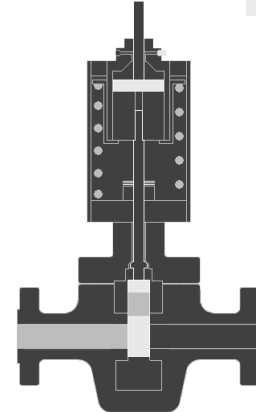
With continued application of adequate control pressure, valve moves to the fully open position (gate all the way down)



Valve remains in fully open positions as long as adequate control pressure is present (gate all the way down)



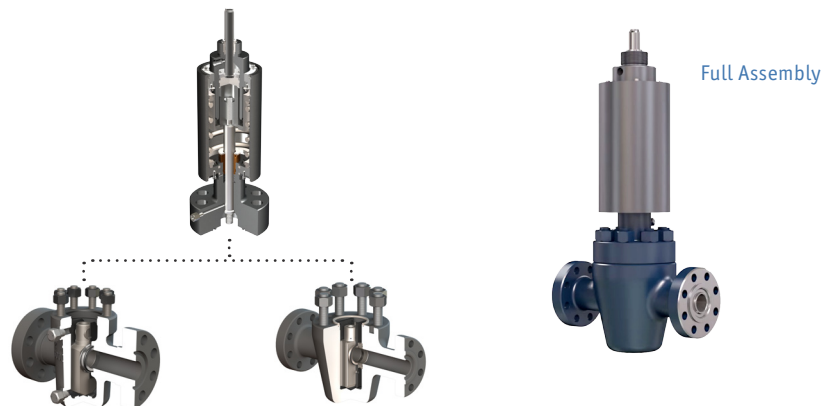
Upon loss of control pressure, valve begins to close (gate moves up)



Valve fully closes and remains closed until application of control pressure to the upper actuator port (gate all the way up)

OMNI GATE VALVES PREPARED FOR ACTUATOR:

Omni offers a complete line of cast and forged body reverse acting slab gate valves prepared for actuator. All Omni valves prepared for actuator are designed to be used as surface safety valves for oil and natural gas wellhead, manifold or other critical service applications with operating pressures from 2,000 to 15,000 psi.



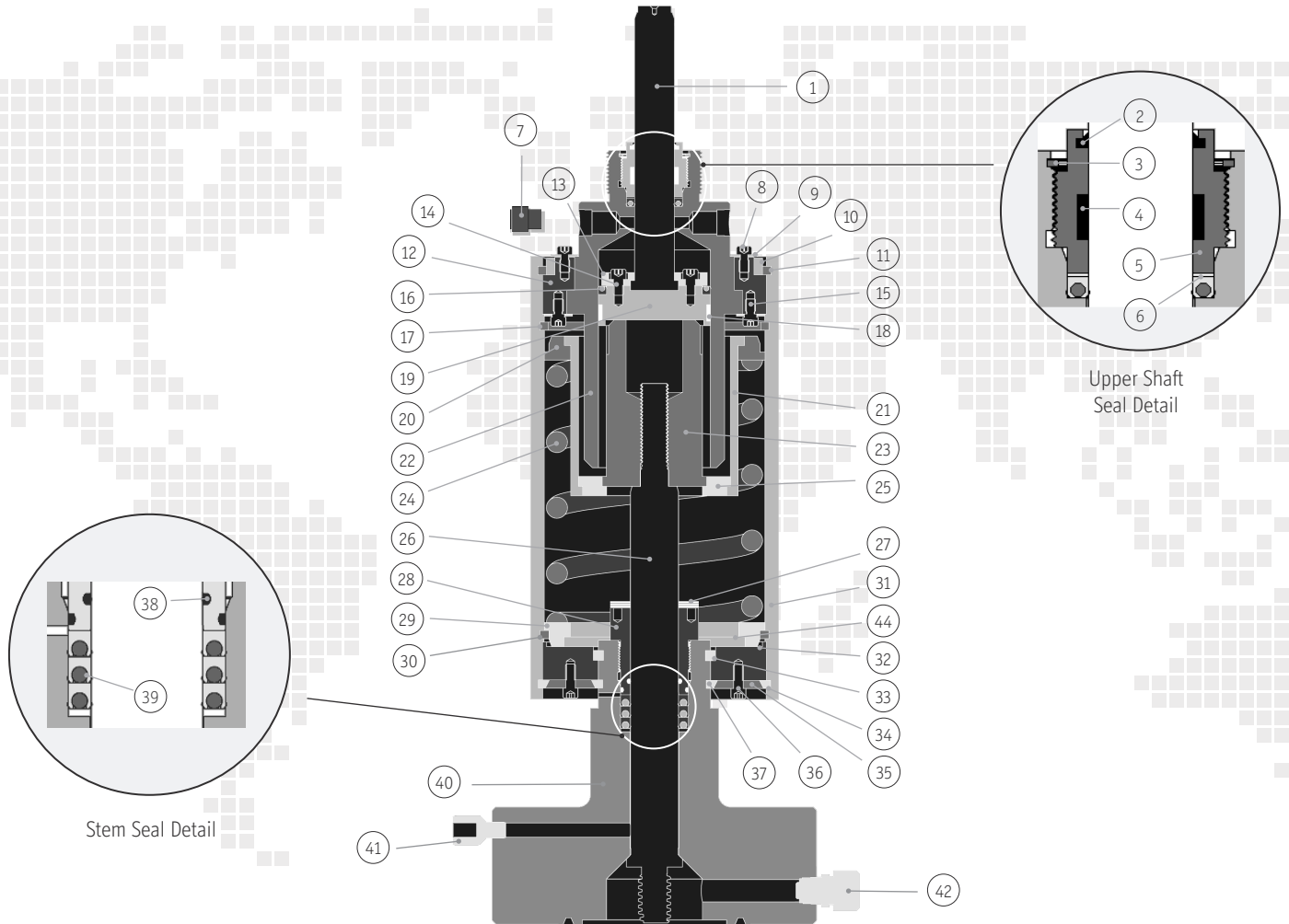
INTERNAL CONFIGURATION

Actuator depicted with typical 10,000 / 15,000 psi bonnet

See Note 2 below



Hydraulic Actuation



| Component | Description | Qty |
|-----------|---|---------|
| 1 | Upper Shaft | 1 |
| 2 | Rod Wiper | 1 (ARK) |
| 3 | Shaft Seal Retainer Ring | 1 (ARK) |
| 4 | Wear Band | 1 (ARK) |
| 5 | Upper Shaft Seal Retainer | 1 |
| 6 | Upper Shaft Seal | 1 (ARK) |
| 7 | Burst Disc | 1 (ARK) |
| 8 | Housing Bolts | 4 |
| 9 | Housing Washers | 4 |
| 10 | Housing Retainer Ring | 1 |
| 11 | Housing Snap Ring | 1 |
| 12 | Cylinder Adapter Ring | 1 |
| 13 | Upper Shaft Retainer Plate | 1 |
| 14 | Socket Head Cap Screw - Retainer (See Note 3) | Varies |
| 15 | Socket Head Cap Screw - Adapter (See Note 3) | Varies |
| 16 | Piston Seal | 1 (ARK) |
| 17 | Spring Retainer Snap Ring - Upper | 1 |
| 18 | Piston Wear Band | 1 (ARK) |
| 19 | Piston | 1 |
| 20 | Spring Retainer Plate - Upper | 1 |
| 21 | Spring Retainer Tube | 1 |

(ARK = Actuator Redress Kit Item)

| Component | Description | Qty |
|-----------|--|--------------|
| 22 | Cylinder | 1 |
| 23 | Spring Adjustment Nut (See Note 1) | 1 |
| 24 | Spring | 1 |
| 25 | Spring Retainer Plate - Inner | 1 |
| 26 | Operating Stem | 1 |
| 27 | Drift Shims | 3 |
| 28 | Packing Retainer | 1 |
| 29 | Spring Retainer Plate - Lower | 1 |
| 30 | Spring Retainer Snap Ring - Lower | 1 |
| 31 | Housing | 1 |
| 32 | Bonnet Ring | 1 |
| 33 | Bonnet Retaining Ring - Upper | 2 (AAK) |
| 34 | Spring Tube Retaining Ring - Lower | 4 (AAK) |
| 35 | Bonnet Clamp Ring | 3 (AAK) |
| 36 | Socket Head Cap Screw (See Note 3) | Varies (AAK) |
| 37 | Bonnet Retaining Ring - Lower | 2 (AAK) |
| 38 | Packing Retainer O-Ring | 2 (BRK) |
| 39 | Stem Seal | 3 (BRK) |
| 40 | Valve Bonnet (See Note 2) | 1 |
| 41 | Bonnet Vent Fitting (See Note 2) | 1 |
| 42 | Valve Lubrication Fitting (See Note 2) | 1 |

(AAK = Actuator Attachment Kit Item) (BRK = Bonnet Redress Kit Item)

Note 1: Actuators for some valve sizes have a counter-bore on the upper portion of the nut - example shows counter-bore. Some sizes have all-thread.

Note 2: The specific configuration of bonnet and operating stem is dependent on valve design. Omni Model HWX actuators can be adapted to operate valves from any from any valve manufacturer. Location and configuration of bonnet fittings is also dependent on valve manufacturer's design. Example depicts standard Omni 10,000 psi bonnet design.

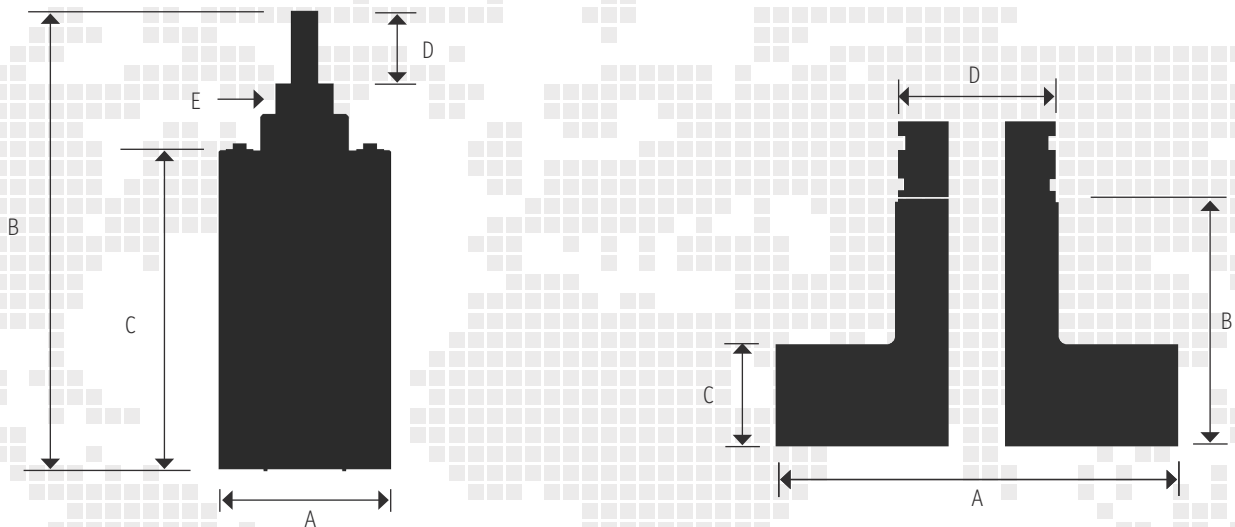
Note 3: Varies depending on valve size. Consult factory for exact quantity.

DIMENSIONAL DATA

Specifications



Hydraulic Actuation



ACTUATOR CLOSING DATA

| Actuator Model | Stroke ID | Size | Max Valve Stroke | Estimated Closing Time at Maximum Stroke In Seconds |
|----------------|-----------|------|------------------|---|
| HWX-20 | -4 | 4.5" | 4 1/16" | 7 to 10 |
| HWX-30 | -4 | 4.5" | 4 1/16" | 7 to 10 |
| HWX-40 | -4 | 4.5" | 4 1/16" | 7 to 10 |
| HWX-60 | -7 | 6.5" | 7 1/16" | 10 to 13 |
| HWX-90 | -7 | 9" | 7 1/16" | 12 to 15 |
| HWX-110 | -7 | 11" | 7 1/16" | 15 to 18 |

NOTE: Actual closing times will depend on the configuration of system used to pipe fluid to and from the actuator as well as whether or not a quick exhaust valve is used.

NOTE: Values for models HWX-40, HWX-60, HWX-90 & HWX-110 are estimates and subject to change without notice.

ACTUATOR DATA

| Actuator Model | Stroke Identifier | Size | Max Valve Stroke | A | | B | | C | | D | | E | | Swept Volume | | Weight | |
|----------------|-------------------|------|------------------|-------|-----|-------|------|-------|-----|------|-----|-----------------|-----------------|-----------------|-------|--------|--|
| | | | | in | mm | in | mm | in | mm | in | mm | Thread | in ³ | cm ³ | lb | kg | |
| HX-20 | -2 | 2.5" | 29/16" | 5.3 | 135 | 17 | 432 | 9.5 | 241 | 3 | 76 | 2.5" - 8 UNC 2A | 12 | 196 | 44 | 20 | |
| HX-30 | -4 | 3.5" | 41/16" | 7.88 | 200 | 21.34 | 542 | 13.85 | 352 | 3.84 | 98 | 3.0" - 8 UNC 2A | 40 | 655 | 131 | 59 | |
| HX-40 | -4 | 4.5" | 41/16" | 9.98 | 253 | 29.52 | 749 | 20.25 | 514 | 5.82 | 148 | 3.0" - 8 UNC 2A | 70 | 1,147 | 288 | 131 | |
| HX-60 | -7 | 6.5" | 71/16" | 12.6 | 320 | 41.86 | 1063 | 29.18 | 741 | 8.82 | 224 | 3.0" - 8 UNC 2A | 258 | 4,227 | 536 | 243 | |
| HX-90 | -7 | 9" | 71/16" | 15.95 | 405 | 42.16 | 1071 | 29.61 | 752 | 8.73 | 222 | 3.0" - 8 UNC 2A | 590 | 9,668 | 785 | 356 | |
| HX-110 | -7 | 11" | 71/16" | 18.2 | 462 | 41.2 | 1046 | 27.25 | 692 | 8.1 | 206 | 3.0" - 8 UNC 2A | 944 | 15,469 | 1,210 | 549 | |

BONNET DATA

| Valve Size | Working Pressure | A | | B | | C | | D | | Weight | | Valve Size | Working Pressure | A | | B | | C | | D | | Weight | |
|------------|------------------|-------|-----|------|-----|------|----|------|-----|--------|----|---|------------------|-------|-----|------|-----|------|-----|------|-----|--------|-----|
| | | in | mm | in | mm | in | mm | in | mm | lb | kg | | | in | mm | in | mm | in | mm | in | mm | lb | kg |
| 2 1/16" | 2,000 | 6.38 | 161 | 4.45 | 114 | 1.2 | 30 | 3 | 76 | 17 | 7 | 1 13/16" | 10,000 | 8.94 | 227 | 5.48 | 139 | 2.3 | 58 | 3.5 | 89 | 41 | 19 |
| 2 9/16" | 2,000 | 7.28 | 184 | 4.96 | 125 | 1.4 | 36 | 3.5 | 89 | 30 | 14 | 2 1/16" | 10,000 | 9 | 229 | 5.49 | 139 | 3 | 76 | 3.5 | 89 | 50 | 23 |
| 3 1/8" | 2,000 | 8.5 | 215 | 5.13 | 130 | 2 | 51 | 3.5 | 89 | 36 | 16 | 2 9/16" | 10,000 | 9.38 | 238 | 6.23 | 158 | 3.2 | 81 | 3.5 | 89 | 59 | 27 |
| 4 1/16" | 2,000 | 11 | 279 | 5.44 | 138 | 2.14 | 54 | 4.25 | 108 | 70 | 32 | 3 1/16" | 10,000 | 10.12 | 257 | 7.2 | 183 | 3.72 | 94 | 3.5 | 89 | 75 | 34 |
| 5 1/8" | 2,000 | 13.07 | 331 | 6.54 | 166 | 2.68 | 68 | 5.2 | 132 | 99 | 44 | 4 1/16" | 10,000 | 12.69 | 322 | 7.5 | 191 | 4.19 | 106 | 4.25 | 108 | 137 | 62 |
| 7 1/16" | 2,000 | 15.53 | 394 | 7.2 | 183 | 3 | 76 | 7.2 | 183 | 204 | 92 | 5 1/16" | 10,000 | 15 | 381 | 8 | 203 | 5.5 | 139 | 9 | 228 | 190 | 86 |
| 3 1/8" | 3,000 | 9.03 | 229 | 4.23 | 107 | 1.58 | 40 | 3 | 76 | 41 | 19 | 7 1/16" | 10,000 | 18 | 457 | 10 | 254 | 5.75 | 146 | 10.1 | 257 | 235 | 106 |
| 4 1/16" | 3,000 | 11.9 | 302 | 5.31 | 135 | 2.14 | 54 | 4.25 | 108 | 75 | 34 | 1 13/16" | 15,000 | 9.53 | 242 | 6.21 | 158 | 3.23 | 82 | 3.5 | 89 | 61 | 28 |
| 5 1/8" | 3,000 | 13.07 | 331 | 6.54 | 166 | 2.68 | 68 | 5.2 | 132 | 106 | 48 | 2 1/16" | 15,000 | 9.53 | 242 | 6.43 | 163 | 3.29 | 84 | 3.5 | 89 | 61 | 28 |
| 7 1/16" | 3,000 | 15.53 | 394 | 7.2 | 183 | 3 | 76 | 7.2 | 183 | 210 | 95 | 2 9/16" | 15,000 | 11.25 | 286 | 7.23 | 184 | 3.75 | 95 | 3.5 | 89 | 95 | 43 |
| 2 1/16" | 3/5,000 | 7.16 | 182 | 4.23 | 107 | 1.58 | 40 | 3 | 76 | 19 | 8 | 3 1/16" | 15,000 | 13.38 | 340 | 8.41 | 214 | 4.13 | 105 | 3.5 | 89 | 153 | 69 |
| 2 9/16" | 3/5,000 | 7.8 | 198 | 5.31 | 135 | 2.14 | 54 | 3.5 | 89 | 30 | 14 | 4 1/16" | 15,000 | 13.75 | 349 | 9 | 228 | 5 | 127 | 6.5 | 165 | 160 | 72 |
| 3 1/8" | 5,000 | 9.03 | 229 | 5.48 | 139 | 2.43 | 62 | 3.5 | 89 | 41 | 19 | 5 1/8" | 15,000 | 16.5 | 419 | 8 | 203 | 6.1 | 155 | 9 | 228 | 220 | 99 |
| 4 1/16" | 5,000 | 11.9 | 302 | 5.5 | 140 | 2.59 | 66 | 4.25 | 108 | 80 | 36 | 7 1/16" | 15,000 | 19.8 | 503 | 10 | 254 | 6.75 | 171 | 10.1 | 257 | 253 | 114 |
| 5 1/8" | 5,000 | 13.07 | 331 | 6.88 | 174 | 2.68 | 68 | 5.2 | 132 | 109 | 49 | <p>Note: Bonnet dimensions provided are for Omni standard actuated bonnets. Dimensions for other manufacturers' bonnets could vary from those provided. In cases where Omni will provide actuators on valves provided by other manufacturers, Omni will supply complete dimensional drawings as part of the documentation package associated with the order.</p> | | | | | | | | | | | |
| 7 1/16" | 5,000 | 15.53 | 394 | 7.2 | 183 | 3 | 76 | 7.2 | 183 | 210 | 95 | | | | | | | | | | | | |

ACTUATOR CONTROL PRESSURES

Model HX



Hydraulic Actuation

| Bore Size | Working Pressure | Actuator Models | | | | | | | | | | | | | |
|-----------|------------------|-----------------------|------|----------------------|------|-----------------------|------|----------------------|------|----------------------|------|----------------------|------|--|--|
| | | HX-20 | | HX-30 | | HX-40 | | HX-60 | | HX-90 | | HX-110 | | | |
| | | Equation | PSI | Equation | PSI | Equation | PSI | Equation | PSI | Equation | PSI | Equation | PSI | | |
| 2 1/16" | 2,000 | 0.461 x WP + 109 psi= | 1031 | 0.202 x WP + 60 psi= | 464 | | | | | | | | | | |
| 2 9/16" | 2,000 | 0.612 x WP + 109 psi= | 1333 | 0.268 x WP + 60 psi= | 596 | 0.153 x WP + 102 psi= | 408 | | | | | | | | |
| 3 1/8" | 2,000 | | | 0.378 x WP + 60 psi= | 816 | 0.216 x WP + 102 psi= | 534 | | | | | | | | |
| 4 1/16" | 2,000 | | | | | 0.315 x WP + 102 psi= | 732 | | | | | | | | |
| 5 1/8" | 2,000 | | | | | | | 0.230 x WP + 63 psi= | 523 | | | | | | |
| 7 1/16" | 2,000 | | | | | | | 0.405 x WP + 63 psi= | 873 | | | | | | |
| 2 1/16" | 3,000 | 0.461 x WP + 109 psi= | 1492 | 0.202 x WP + 60 psi= | 666 | | | | | | | | | | |
| 2 9/16" | 3,000 | 0.612 x WP + 109 psi= | 1945 | 0.268 x WP + 60 psi= | 865 | 0.153 x WP + 102 psi= | 563 | | | | | | | | |
| 3 1/8" | 3,000 | | | 0.378 x WP + 60 psi= | 1193 | 0.216 x WP + 102 psi= | 750 | | | | | | | | |
| 4 1/16" | 3,000 | | | | | 0.315 x WP + 102 psi= | 1048 | 0.145 x WP + 63 psi= | 497 | | | | | | |
| 5 1/8" | 3,000 | | | | | | | 0.230 x WP + 63 psi= | 755 | | | | | | |
| 7 1/16" | 3,000 | | | | | | | 0.405 x WP + 63 psi= | 1280 | | | | | | |
| 2 1/16" | 5,000 | 0.461 x WP + 109 psi= | 2414 | 0.202 x WP + 60 psi= | 1070 | | | | | | | | | | |
| 2 9/16" | 5,000 | 0.612 x WP + 109 psi= | 3169 | 0.268 x WP + 60 psi= | 1402 | 0.153 x WP + 102 psi= | 870 | | | | | | | | |
| 3 1/8" | 5,000 | | | 0.378 x WP + 60 psi= | 1949 | 0.216 x WP + 102 psi= | 1183 | | | | | | | | |
| 4 1/16" | 5,000 | | | | | 0.315 x WP + 102 psi= | 1678 | 0.145 x WP + 63 psi= | 787 | | | | | | |
| 5 1/8" | 5,000 | | | | | | | 0.230 x WP + 63 psi= | 1216 | | | | | | |
| 7 1/16" | 5,000 | | | | | | | 0.405 x WP + 63 psi= | 2092 | 0.188 x WP + 29 psi= | 969 | | | | |
| 1 13/16" | 10,000 | | | 0.234 x WP + 60 psi= | 2398 | 0.133 x WP + 102 psi= | 1440 | 0.061 x WP + 63 psi= | 677 | | | | | | |
| 2 1/16" | 10,000 | | | 0.252 x WP + 60 psi= | 2583 | 0.144 x WP + 102 psi= | 1545 | 0.067 x WP + 63 psi= | 725 | | | | | | |
| 2 9/16" | 10,000 | | | 0.284 x WP + 60 psi= | 2905 | 0.162 x WP + 102 psi= | 1729 | 0.075 x WP + 63 psi= | 810 | | | | | | |
| 3 1/8" | 10,000 | | | | | 0.228 x WP + 102 psi= | 2383 | 0.104 x WP + 63 psi= | 1110 | | | | | | |
| 4 1/16" | 10,000 | | | | | | | 0.182 x WP + 63 psi= | 1883 | | | | | | |
| 5 1/8" | 10,000 | | | | | | | 0.230 x WP + 63 psi= | 2363 | 0.163 x WP + 29 psi= | 1659 | | | | |
| 7 1/16" | 10,000 | | | | | | | | | 0.289 x WP + 29 psi= | 2919 | 0.191 x WP + 21 psi= | 1931 | | |
| 1 13/16" | 15,000 | | | 0.234 x WP + 60 psi= | 3567 | 0.133 x WP + 102 psi= | 2108 | 0.061 x WP + 63 psi= | 984 | | | | | | |
| 2 1/16" | 15,000 | | | 0.252 x WP + 60 psi= | 3845 | 0.144 x WP + 102 psi= | 2267 | 0.067 x WP + 63 psi= | 1057 | | | | | | |
| 2 9/16" | 15,000 | | | | | 0.199 x WP + 102 psi= | 3086 | 0.091 x WP + 63 psi= | 1433 | | | | | | |
| 3 1/8" | 15,000 | | | | | | | 0.126 x WP + 63 psi= | 1953 | | | | | | |
| 4 1/16" | 15,000 | | | | | | | 0.182 x WP + 63 psi= | 2793 | 0.094 x WP + 29 psi= | 1439 | | | | |
| 5 1/8" | 15,000 | | | | | | | | | 0.163 x WP + 29 psi= | 2474 | 0.108 x WP + 21 psi= | 1641 | | |
| 7 1/16" | 15,000 | | | | | | | | | | | 0.191 x WP + 21 psi= | 2886 | | |

STANDARD ACTUATOR SPECIFICATIONS

| | | |
|---|--------------------|--|
| Maximum Operating Pressure (See Note 1) | 4,000 PSI | Pressure relief device on actuator is set at 4,000 PSI |
| Upper Housing Test Pressure | 6,000 PSI | Cylinders are subjected to pressure test |
| API Material Class | AA / BB / CC | Not appropriate if control source contains H2S (is sour) |
| API Temperature Rating | P (-20 F to 180 F) | (-29 C to 82 C) |

STANDARD BONNET SPECIFICATIONS

| | | |
|---|--|---|
| Adaptable to Following Valve Brands | Model HX actuator can be adapted to fit valves from any manufacturer that can supply accurate valve interface information. | |
| Available Sizes (See Note 4) | API 6A 1 13/16" to 7 1/16" | |
| Available Pressure Ratings | API 6A 2,000 to 15,000 PSI | API 6D / ANSI Class 150 to 2500 |
| Available API Material Classes (See Note 2) | AA BB CC | For Non-Sour (Non-NACE) Service |
| | DD-0,5 DD-1,5 DD-NL | EE-0,5 EE-1,5 EE-NL FF-0,5 FF-1,5 FF-NL HH-0,5 HH-1,5 HH-NL |
| Available API Product Specification Level (PSL) | PSL-1, 2, or 3 | |
| Available API Temperature Ratings (See Note 5) | L (-50 F) to X (350 F) | (-46 C) to (177 C) |

Note 1: All specifications listed on this technical bulletin are subject to change without notice.

Note 2: If control source contains H2S, please contact Omni for alternate materials of construction. Specific materials of construction for all material classes and temperature ratings can be changed upon customer request; however, Omni reserves the right to monogram Actuators and Bonnets with material class "ZZ" as per API requirements if those requested by the customer do not meet the current requirements of NACE MR 0175 / ISO 15156.

Note 3: Maximum Operating Pressure refers to the control pressure source.

Note 4: Omni will develop actuated solutions for other valve sizes upon request.

Note 5: In cases where the bonnet carries a temperature rating above P (U or X for example), mating the bonnet to an actuator will not cause the actuator's temperature rating to be increased. In these cases, it is appropriate to consider the actuator and bonnet assembly to have a temperature rating equivalent to the lower rating of the bonnet or actuator.

ACTUATOR REDRESS KITS AND ACCESSORIES

Product Warranty



Hydraulic Actuation

Omni stocks redress kits for all of its actuator models. Kit contents are listed below for the three different redress kits available for the Model HX Actuator. Contact an Omni sales representative to order.

(ARK) Actuator Redress Kit Contents

| # | Description | Qty |
|---|--------------------------|-----|
| 1 | Rod Wiper | 1 |
| 2 | Shaft Seal Retainer Ring | 1 |
| 3 | Wear Band | 1 |
| 4 | Upper Shaft Seal | 1 |
| 5 | Burst Disk | 1 |
| 6 | Piston Seal | 1 |
| 7 | Piston Wear Band | 1 |

(BRK) Actuator Redress Kit Contents

| # | Description | Qty |
|---|-------------------------|-----|
| 1 | Packing Retainer O-Ring | 2 |
| 2 | Stem Seals | 3 |

Note 1: Actuators for some valve sizes have a counter-bore on the upper portion of the nut - (example pg. 3) shows counter-bore. Some sizes have all-thread.

Note 2: The specific configuration of bonnet and operating stem is dependent on valve design. Omni Model HX actuators can be adapted to operate valves from any from any valve manufacturer. Location and configuration of bonnet fittings is also dependent on valve manufacturer's design. Example depicts standard Omni 10,000 psi bonnet design.

Note 3: Varies depending on valve size. Consult factory for exact quantity.

(AAK) Actuator Redress Kit Contents

| # | Description | Qty |
|---|------------------------------------|-----|
| 1 | Bonnet Retainer Ring - Upper | 2 |
| 2 | Spring Tube Retaining Ring - Lower | 4 |
| 3 | Bonnet Clamp Ring | 2 |
| 4 | Socket Head Cap Screw (See Note 3) | * |
| 5 | Bonnet Retaining Ring - Lower | 2 |

LIMITED PRODUCT WARRANTY

All products manufactured or sold by Omni are warranted against defects of material and workmanship for a period of twelve (12) months from the date of installation or eighteen (18) months from date of shipment, whichever period first expires, when all such products are used in the service and within the pressure range for which they were manufactured.

In the case of products or parts not wholly of Omni's manufacture, Omni's liability shall be limited to the extent of Omni's recovery from the original manufacturer of such products or parts under its warranty or liability to Omni.

Any repair work performed by Omni is warranted for one year from completion of such repairs and applies only to work performed. If, within these specified periods, Omni receives notice from Buyer of any alleged defect in or nonconformance of any product or repair and if in Omni's sole judgment the product or repair does not conform or is found to be defective in material or workmanship, then, Buyer shall, at Omni's request, return the part or product F.O.B. to Omni's designated plant or service location.

Omni has no liability for removal or reinstallation of products or equipment. Omni, at its option and expense, shall repair or replace the defective part or product, or repay to Buyer the full price paid by Buyer for such defective part, repair or product. Any repayment of purchase price shall be without interest.

Omni's warranty liability, including defects caused by Omni's negligence, shall be limited to such repair, replacement or refund, and shall not include claims for labor costs, expenses of Buyer resulting from such defects, recovery under general tort law or strict liability or for damages resulting from delays, loss of use, or other direct, indirect, incidental or consequential damages of any kind.

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