

MODEL HWX

Fail Safe Hydraulic Wire Cutting Actuator



Hydraulic Actuation



INTRO

Omni Model HWX hydraulic wire cutting actuators are designed to operate surface safety or shutdown valves on oil & gas wellhead, transmission, storage, manifold or other applications where fail-safe and wirecutting capabilities are required.

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

Model HWX actuators are provided as actuated bonnet assemblies ready to mount on wire cutting 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 HWX 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.

Wire Cutting Capability

Model HWX actuators utilize a dual spring system designed to provide return force capable of shearing slickline, wireline, logging or stainless steel cable in typical wellhead applications with 0 valve body pressure.

Over-Pressure Protection

Model HWX actuator 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.

Structural (Unpressured) Housing

Model HWX 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 HWX 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 tattletale weep port is located above the packing to provide visual confirmation of stem seal integrity during operation. All Model HWX ports can be used to pipe fugitive emissions to a containment vessel, if required.

Corrosion Protection

Model HWX 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 HWX 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 HWX Actuators.

AVAILABLE SIZES

Model	Size	Stroke
HWX 40	4 1/2"	Up to 4 1/16" bore
HWX 60	6 1/2"	Up to 7 1/16" bore
HWX 90	9"	Up to 7 1/16" bore
HWX 110	11"	Up to 7 1/16" bore

ACTUATOR OPERATION

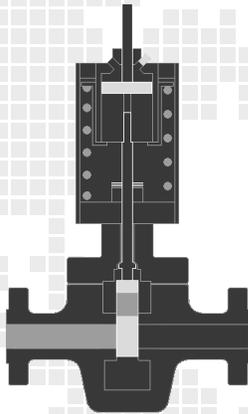
Fail "closed" operation is depicted.

Fail "open" operation is available upon request.

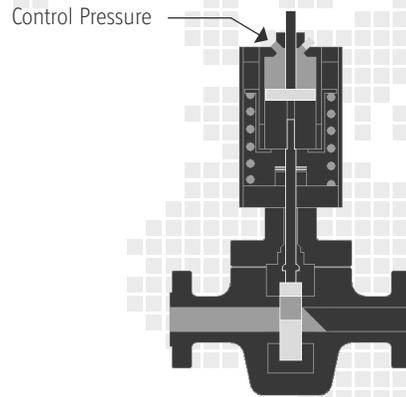


Hydraulic Actuation

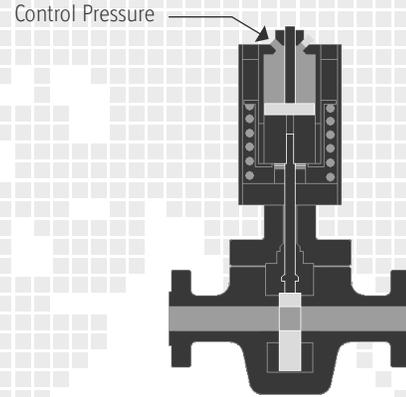
Open / close operation of a modified manually operated valve which utilizes a direct acting slab gate (DASG) is depicted. Utilize control pressure to the lower port to open the valve and control pressure to the upper port to close the valve.



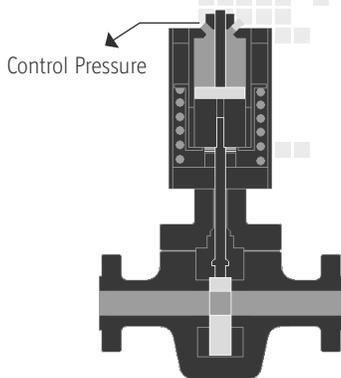
When no control pressure is applied to actuator, valve is in closed position (gate all the way up)



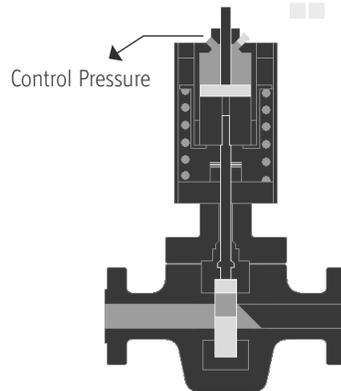
Upon application of adequate control pressure to the actuator port, valve begins to open (gate moves down)



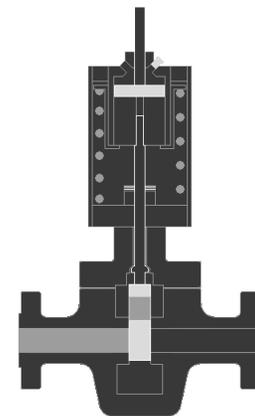
With continued application of adequate control pressure, valve moves to the fully open position (gate all the way down)



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



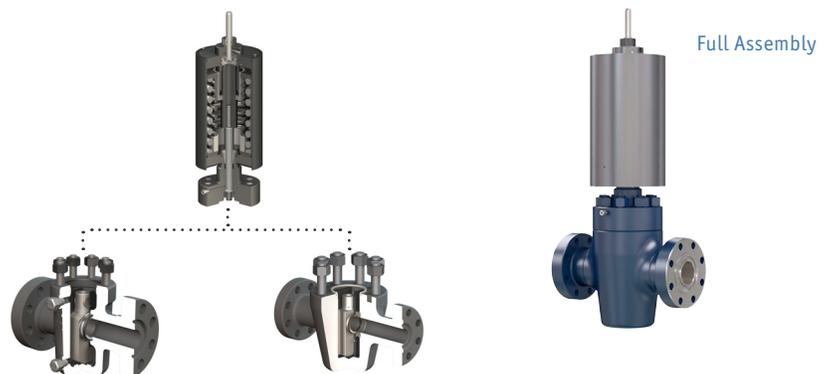
Upon loss of control pressure, valve begins to close (gate moves up)



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.

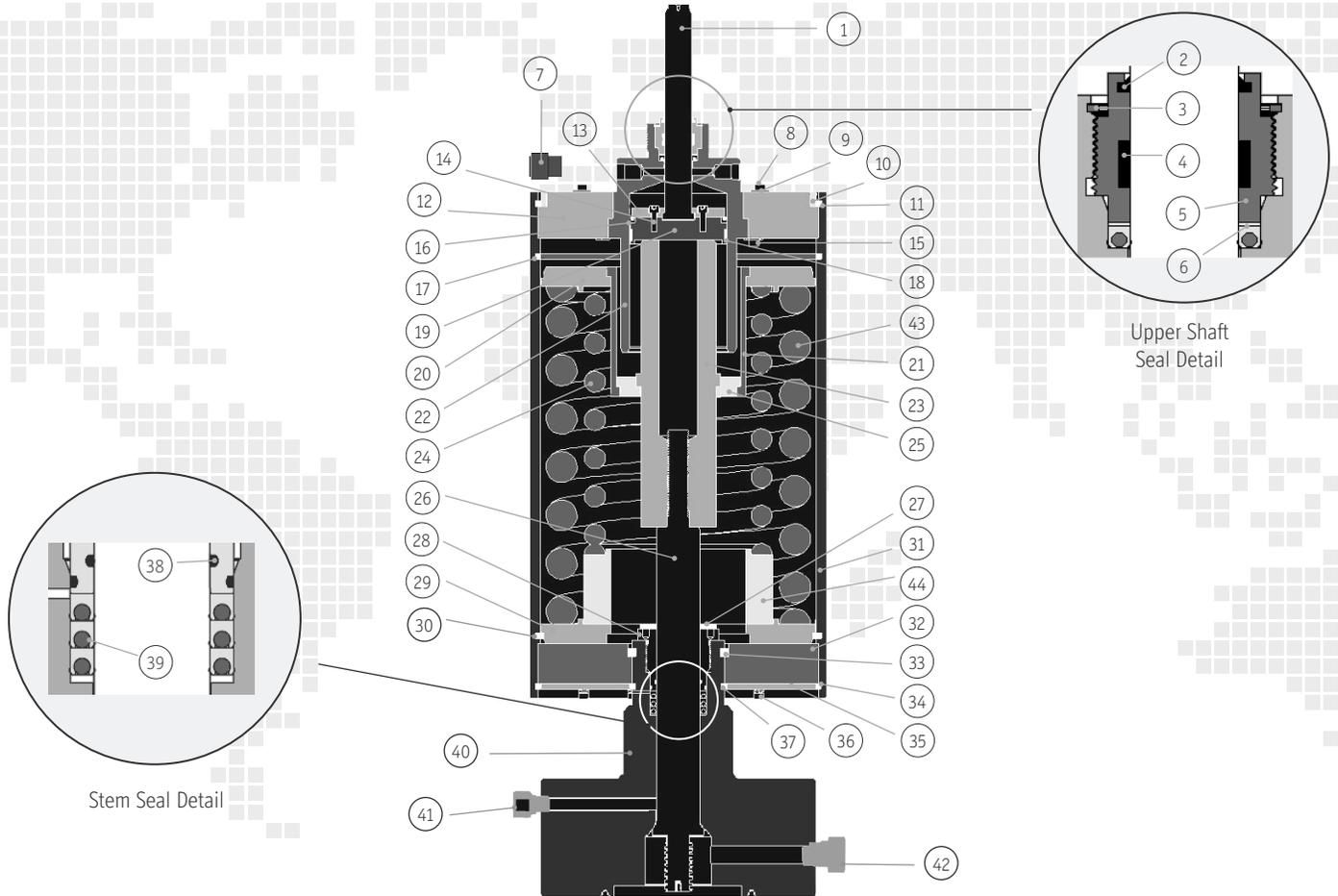


INTERNAL CONFIGURATION

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
22	Cylinder	1

(ARK = Actuator Redress Kit Item)

Component	Description	Qty
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
43	Outer Spring	1
44	Spacer	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.

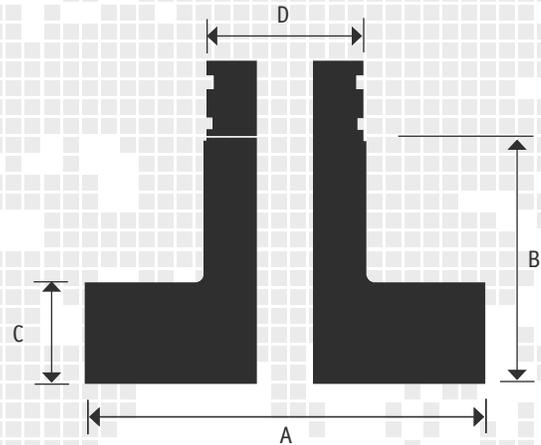
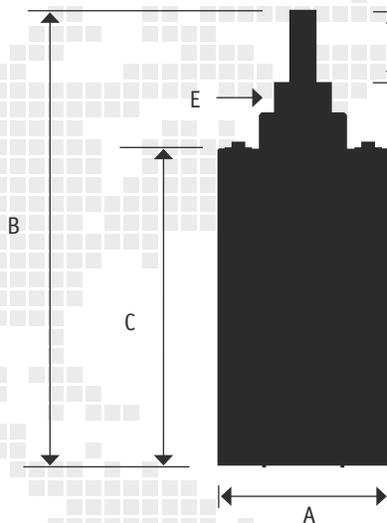
Note 3: Varies depending on valve size. Consult factory for exact quantity.

DIMENSIONAL DATA

Specifications



Hydraulic Actuator



ACTUATOR CLOSING DATA

Actuator Model	Stroke ID	Size	Max Valve Stroke	Estimated Closing Time at Maximum Stroke In Seconds
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 1: 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 2: 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)	lbs	kgs	
HXW-40	-4	4.5"	4 1/16"	13.73	349	32.21	818	23.50	597	5.51	140	3.0" - 8UNC 2A	70	1,147	565	256	
HXW-60	-7	6.5"	7 1/16"	16.50	419	36.00	914	25.00	635	8.10	206	3.0" - 8UNC 2A	258	4,228	842	382	
HXW-90	-7	9"	7 1/16"	19.75	502	39.00	991	28.00	711	8.10	206	3.0" - 8UNC 2A	590	9,668	965	438	
HXW-110	-7	11"	7 1/16"	22.00	559	42.00	1,067	31.00	787	8.10	206	3.0" - 8UNC 2A	944	15,469	1,289	585	

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	in	mm			lb	kg	in	mm	in	mm	in	mm	in	mm
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	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.											
7 1/16"	5,000	15.53	394	7.2	183	3	76	7.2	183	210	95												

ACTUATOR CONTROL PRESSURES

Model HDX



Hydraulic Actuation

Bore Size	Working Pressure	Actuator Models							
		HWX-40		HWX-60		HWX-90		HWX-110	
		Equation	PSI	Equation	PSI	Equation	PSI	Equation	PSI
2 1/16"	2,000								
2 9/16"	2,000	0.153 x WP + 545 psi =	851						
3 1/8"	2,000	0.216 x WP + 545 psi =	977						
4 1/16"	2,000	0.315 x WP + 545 psi =	1175						
5 1/8"	2,000			0.230 x WP + 250 psi =	710				
7 1/16"	2,000			0.405 x WP + 250 psi =	1060				
2 1/16"	3,000								
2 9/16"	3,000	0.153 x WP + 545 psi =	1004						
3 1/8"	3,000	0.216 x WP + 545 psi =	1193						
4 1/16"	3,000	0.315 x WP + 545 psi =	1490						
5 1/8"	3,000			0.230 x WP + 250 psi =	940				
7 1/16"	3,000			0.405 x WP + 250 psi =	1465				
2 1/16"	5,000								
2 9/16"	5,000	0.153 x WP + 545 psi =	1310						
3 1/8"	5,000	0.216 x WP + 545 psi =	1625						
4 1/16"	5,000	0.315 x WP + 545 psi =	2120						
5 1/8"	5,000			0.230 x WP + 250 psi =	1400				
7 1/16"	5,000			0.405 x WP + 250 psi =	2275	0.188 x WP + 115 psi =	1055		
1 13/16"	10,000	0.133 x WP + 545 psi =	1875						
2 1/16"	10,000	0.144 x WP + 545 psi =	1985						
2 9/16"	10,000	0.162 x WP + 545 psi =	2165						
3 1/8"	10,000	0.228 x WP + 545 psi =	2825	0.104 x WP + 250 psi =	1290				
4 1/16"	10,000			0.182 x WP + 250 psi =	2070				
5 1/8"	10,000			0.230 x WP + 250 psi =	2550	0.163 x WP + 115 psi =	1745		
7 1/16"	10,000					0.289 x WP + 115 psi =	3005	0.191 x WP + 86 psi =	1996
1 13/16"	15,000	0.133 x WP + 545 psi =	2540	0.061 x WP + 250 psi =	1165				
2 1/16"	15,000	0.144 x WP + 545 psi =	2705	0.067 x WP + 250 psi =	1255				
2-9/16"	15,000	0.199 x WP + 545 psi =	3530	0.091 x WP + 250 psi =	1615				
3 1/8"	15,000			0.126 x WP + 250 psi =	2140				
4 1/16"	15,000			0.182 x WP + 250 psi =	2980	0.094 x WP + 115 psi =	1525		
5 1/8"	15,000					0.163 x WP + 115 psi =	2560	0.108 x WP + 86 psi =	1706
7 1/16"	15,000							0.191 x WP + 86 psi =	2951

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)
Wire Cutting Data	Standard Wireline, Slickline, 7/32" Logging or 3/16" Stainless Steel Cable	

STANDARD BONNET SPECIFICATIONS

Adaptable to Following Valve Brands	Model HWX 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 HDX Actuator. Contact an Omni sales representative to order.

(ARK) Actuator Redress Kit Contents

#	Description	QTY
1	War Bearing	3
2	Piston Polypak	2
3	O-ring	2
4	Backup-Ring	2
5	Rod Wiper	1
6	Piston Retainer Ring	2
7	Socket Head Cap Screw	8
8	Cylinder Head Polypak	2
9	Cylinder Head Retainer Ring	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.

Omni will not be responsible for failures of products which have been in any way tampered with or altered by anyone other than an authorized representative of Omni, failures due to lack of compliance with recommended maintenance procedures or products which have been repaired or altered in such a way (in Omni's judgment) as to affect the products adversely.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, STATUTORY OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE WHICH EXCEED THE FOREGOING WARRANTY.

If you have questions regarding this warranty or if you would like information about other Omni products and services please call, click or write us at the following.

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