

# MODEL HDX

## Hydraulic Double-Acting Piston Actuator



Hydraulic Actuation



### FEATURES

#### **Flexibility**

The HDX actuators can be adapted to operate gate valves from any manufacturer and can be delivered with alternate materials of construction to meet various field conditions. The HDX actuators can be sized to meet most control pressure ranges.

#### **Over-Pressure Protection**

Model HDX actuators come equipped with a pressure relief device to protect personnel from harm 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.

#### **Corrosion Protection**

Model HDX actuators are internally and externally coated to prevent corrosion and wear due to environmental conditions. All internal components are either stainless steel or are coated to prevent corrosion due to any control pressure contamination.

#### **Maintenance**

Model HDX actuators are designed for ease of maintenance. All nonmetallic seals and other parts are easily replaceable. Omni stocks redress kits for all sizes of Model HDX actuators.

### INTRO

Omni Model HDX double-acting hydraulic actuators are designed to operate bi-directional sealing, through conduit gate valves in drilling, choke & kill, fracture, work over or other critical production applications.

Model HDX actuators are used to control the linear position of the valve gate and are used to either open or close the valve through application of hydraulic pressure to one of the actuator's designated pressure inlet ports.

Omni can provide complete valve assemblies with Model HDX actuators for immediate deployment or can adapt the actuators to valves from other valve manufacturers.

### AVAILABLE SIZES

Model	Size	Stroke
HDX 40	4 1/2"	Up to 7 1/8" bore
HDX 60	6 1/2"	Up to 7 1/16" bore
HDX 90	9"	Up to 7 1/16" bore

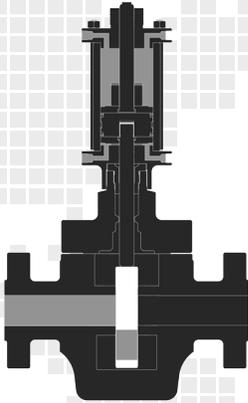
# ACTUATOR OPERATION

## Open / Close

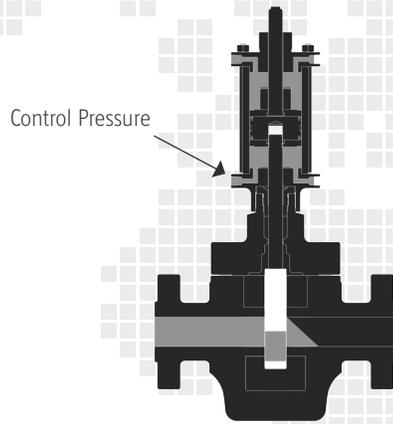


### Hydraulic Actuation

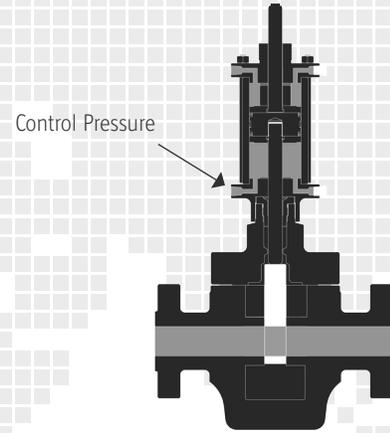
Open / close operation of a modified manually operated valve which utilizes a direct acting slab gate (DASG) is depicted. Utilize control pressure to the lower port to open the valve and control pressure to the upper port to close the valve.



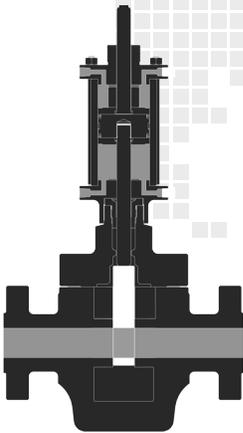
When no control pressure is applied to actuator, valve is in closed position (gate all the way down)



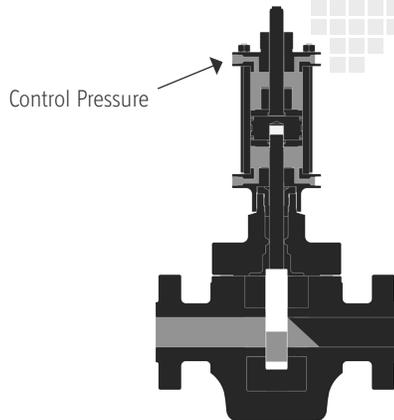
Upon application of adequate control pressure to the lower actuator port, valve begins to open (gate moves up)



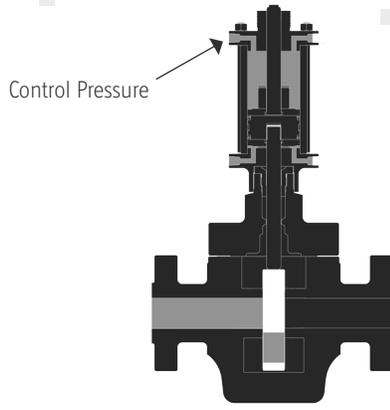
With continued application of adequate control pressure to the lower actuator port, valve moves to the fully open position (gate all the way up)



With the lose of control pressure the valve will remain in its current position. (gate all the way up)



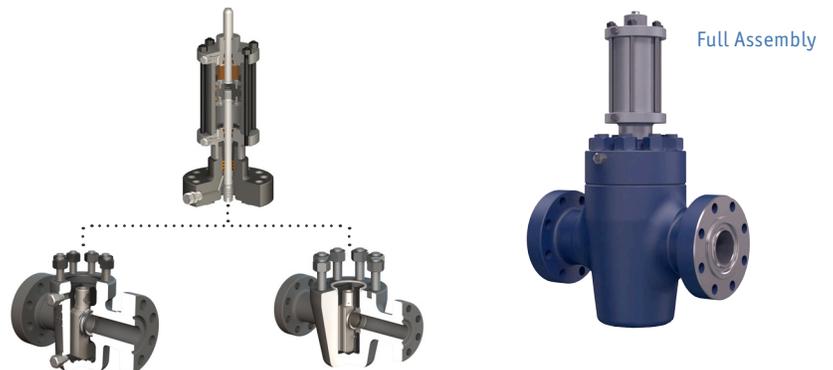
Apply pressure to the upper actuator port, valve begins to close (gate moves down)



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.

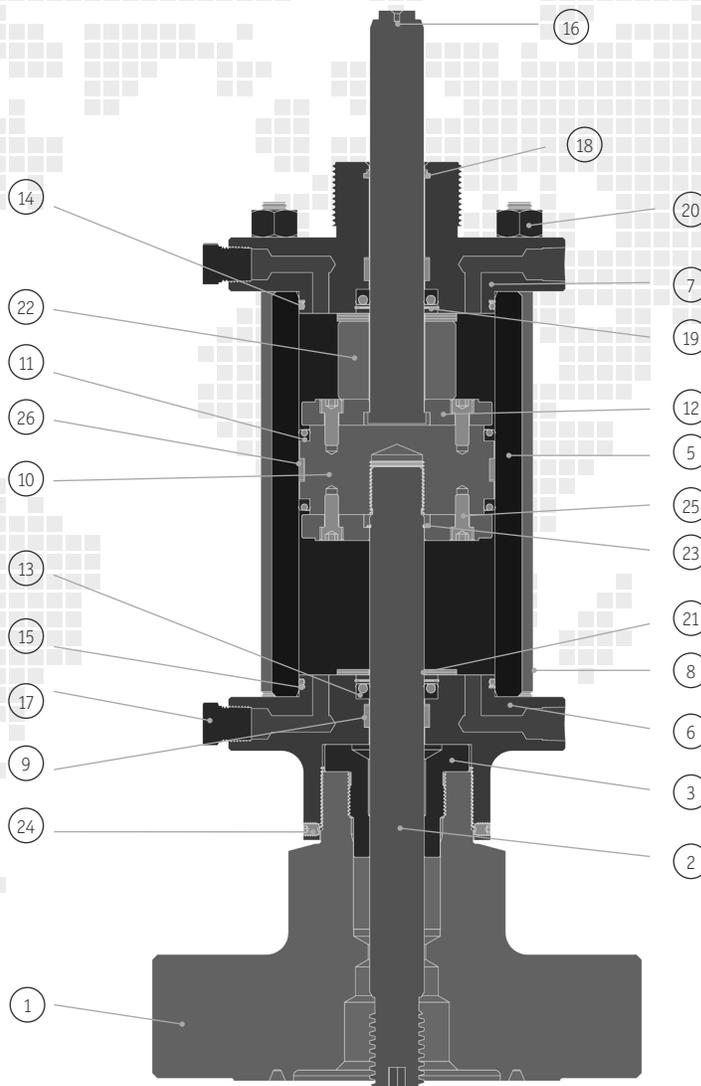


# INTERNAL CONFIGURATION

See note below



Hydraulic Actuation



Component	Description	Qty
1	Bonnet	1
2	Stem	1
3	Packing Retainer Bushing	1
4	Grease Fitting (Not shown)	1
5	Cylinder	1
6	Cylinder Head Lower	1
7	Cylinder Head Upper	1
8	Stud	6
9	Wear Bearing	2 (ARK)
10	Piston	1
11	Piston Polypak	2 (ARK)
12	Piston Seal Retainer	2
13	Cylinder Head Polypak	2 (ARK)

Component	Description	Qty
14	O-ring	2 (ARK)
15	Backup-Ring	2 (ARK)
16	Upper Shaft	1
17	Burst Disk	2
18	Rod Wiper	1 (ARK)
19	Cylinder Head Retainer Ring	2 (ARK)
20	Hex Nut	6
21	Drift Shim	5
22	Upper Piston Stop	1
23	Piston Retainer Ring	1 (ARK)
24	Socket Set Screw	2
25	Socket Head Cap Screw	8 (ARK)
26	Piston Wear Bearing	1 (ARK)

(ARK = Actuator Redress Kit Item)

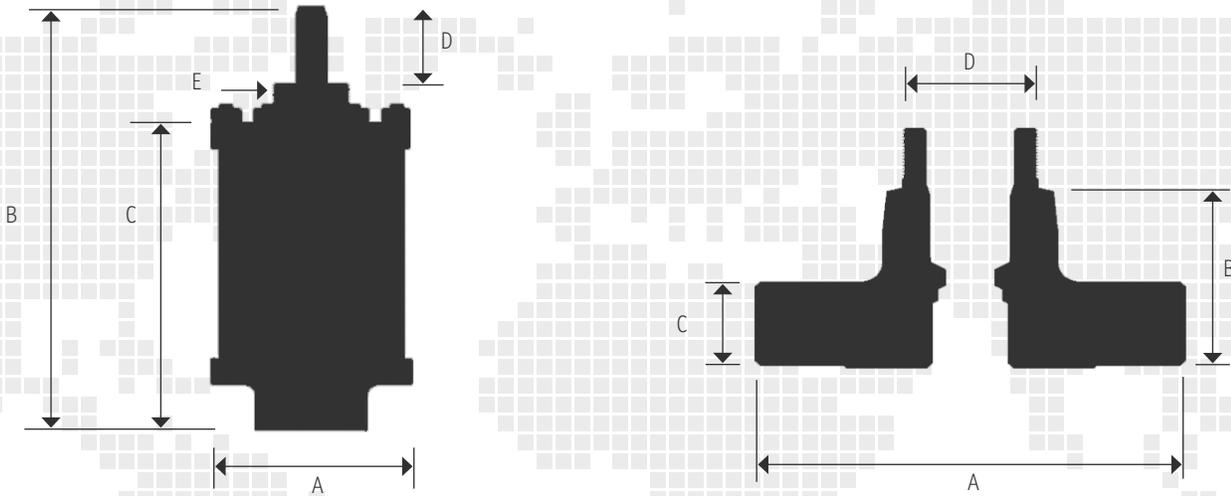
**Note:** The specific configuration of bonnet and operating stem is dependent on valve design. Omni HDX actuators can be adapted to operate valves from any valve manufacturer.

# DIMENSIONAL DATA

## Specifications



Hydraulic Actuation



### ACTUATOR DATA

Actuator Model	Stroke Identifier	Size	Max Valve Stroke	A		B		C		D		E Thread	Swept Volume		Weight	
				in	mm	in	mm	in	mm	in	mm		in (3)	cm (3)	lbs	kgs
HDX-40	-7	4.5"	7 1/16	7.75	197	19.07	484	13.86	352	3.48	88	3.0" - 8UNC 2A	80	1,303	91	41
HDX-60	-7	6.5"	7 1/16	9.75	248	24.07	611	17.86	454	8.10	206	3.0" - 8UNC 2A	258	4227	145	66
HDX-90	-7	9"	7 1/16	12.75	324	24.07	611	17.86	454	8.10	206	3.0" - 8UNC 2A	590	9668	218	99

### BONNET DATA

Valve Size	Working Pressure	A		B		C		D		Weight	
		in	mm	in	mm	in	mm	in	mm	lbs	kgs
2 1/16"	3,000	7.87	200	7.64	194	1.38	35	2.38	60	25	11
3 1/8"	3,000	9.09	231	8.58	218	1.65	42	2.50	64	38	17
4 1/16"	3,000	10.20	259	9.84	250	2.25	57	3.13	80	87	39
5 1/8"	3,000	13.07	332	11.30	287	2.68	68	3.38	86	119	54
7 1/16"	3,000	15.50	394	5.59	142	2.95	75	5.13	130	167	76
2 1/16"	5,000	7.20	183	7.56	192	1.25	32	2.38	60	21	10
2 9/16"	5,000	7.87	200	7.64	194	1.38	35	2.38	60	25	11
3 1/8"	5,000	9.09	231	8.58	218	1.65	42	2.50	64	38	17
4 1/16"	5,000	10.20	259	9.84	250	2.25	57	3.13	80	87	39
5 1/8"	5,000	13.07	332	11.30	287	2.68	68	3.38	86	119	54
7 1/16"	5,000	15.50	394	5.59	142	2.95	75	5.13	130	167	76
1 13/16"	10,000	8.94	227	4.68	119	2.30	58	3.00	76	39	18
2 1/16"	10,000	9.00	229	4.73	120	2.75	70	3.00	76	45	20
2 9/16"	10,000	9.38	238	4.67	119	3.22	82	3.00	76	52	24
3 1/16"	10,000	10.12	257	4.72	120	3.72	94	3.00	76	69	31
4 1/16"	10,000	12.69	322	5.41	137	4.25	108	3.50	89	129	59
1 13/16"	15,000	9.50	241	4.74	120	2.28	58	3.00	76	43	20
2 1/16"	15,000	9.50	241	4.70	119	2.28	58	3.00	76	43	20
2 9/16"	15,000	11.25	286	5.52	140	2.91	74	3.50	89	79	36
3 1/16"	15,000	13.38	340	6.00	152	4.00	102	4.50	114	152	69

NOTE: \* Designates that the B dimension is the overall height of the bonnet due to internal actuator threads.

# ACTUATOR CONTROL PRESSURES

## Model HDX



### Hydraulic Actuation

Bore Size	Working Pressure	Actuator Models							
		HDX-40 Closing		HDX-40 Opening		HDX-60 Closing		HDX-60 Opening	
		Equation	PSI	Equation	PSI	Equation	PSI	Equation	PSI
2 1/16"	3,000								
2 9/16"	3,000	0.111 x WP	333	0.028 x WP	83				
3 1/8"	3,000	0.216 x WP	648	-0.026 x WP	-77				
4 1/16"	3,000	0.315 x WP	946	-0.014 x WP	-41				
5 1/8"	3,000					0.231 x WP	692	-0.20 x WP	-60
7 1/16"	3,000					0.405 x WP	1217	-0.045 x WP	-135
2 1/16"	5,000								
2 1/16"	5,000	0.111 x WP	554	0.028 x WP	139				
3 1/8"	5,000	0.216 x WP	1080	-0.026 x WP	-128				
4 1/16"	5,000	0.315 x WP	1576	-0.014 x WP	-68				
5 1/8"	5,000					0.231 x WP	1153	-0.020 x WP	-100
7 1/16"	5,000					0.405 x WP	2029	-0.045 x WP	-224
1 13/16"	10,000	0.104 x WP	1036	-0.003 x WP	-33				
2 1/16"	10,000	0.114 x WP	1142	0.007 x WP	70				
2 9/16"	10,000	0.133 x WP	1326	0.025 x WP	248				
3 1/16"	10,000	0.228 x WP	2281	-0.013 x WP	-132	0.105 x WP	1048	-0.006 x WP	-59
4 1/16"	10,000	0.226 x WP	2662	0.098 x WP	990	0.122 x WP	1223	0.045 x WP	455
5 1/8"	10,000								
7 1/16"	10,000								
1 13/16"	15,000	0.104 x WP	1555	-0.003 x WP	-49				
2 1/16"	15,000	0.114 x WP	1713	0.007 x WP	105				
2 9/16"	15,000	0.181 x WP	2721	0.014 x WP	212	0.083 x WP	1250	0.007 x WP	98
3 1/16"	15,000					0.116 x WP	1746	0.006 x WP	89
4 1/16"	15,000								
5 1/8"	15,000								
7-1/16"	15,000								

### STANDARD ACTUATOR SPECIFICATIONS

Maximum Operating Pressure (See Note 1)	3,000 PSI	Pressure relief device on actuator is set at 4,000 PSI
Upper Housing Test Pressure	4,500 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 HDX 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 contact us at the address and phone numbers below.

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