



Product Highlights

# HIPPS Gate Valve

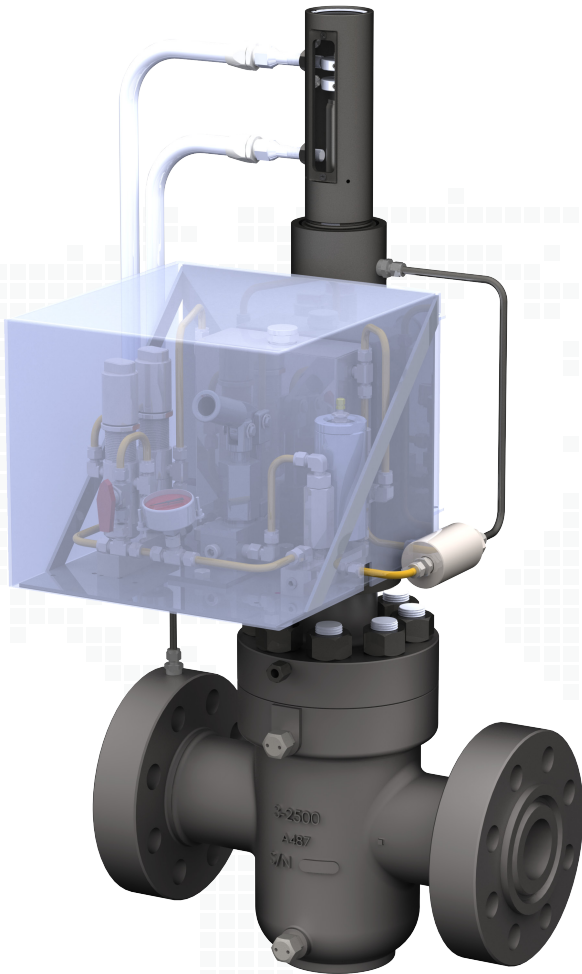
3" Class 2500 RTJ

Omni Model HXS Hydraulic Actuator with Sigma Self-Contained ESD



ACTUATORS & VALVES

## OMNI MODEL HXS HYDRAULIC ACTUATOR WITH SIGMA SELF-CONTAINED ESD



### INTRO

High integrity pressure protection systems (HIPPS) are designed to prevent over-pressurization of a plant or processing system by shutting down the source of the over-pressure condition. Such systems typically contain the following elements:

1. Sensors to detect the high pressure condition;
2. A logic solver to determine the correct action to take; and
3. Final elements that perform the shutdown and bring the system to a safe state.

The 3" Class 2500 Omni model CS-R gate valve, model HXS hydraulic actuator and Sigma self-contained hydraulic control system comprise a technically sound and economically attractive solution designed to replace more costly and complex final elements in common HIPPS applications.

### FEATURES » GATE VALVE

#### Reverse Acting Slab Gate

The reverse acting slab gate has the conduit opening on the upper portion of the gate. This means that the valve will be open when the gate is in the down position. The gate is moved to the down position by application of adequate control pressure to the actuator. Upon loss of control pressure, pressure acting on the gate and stem will cause the valve to close automatically under zero bore pressure conditions, valve closure is assisted by a spring contained in the actuator/bonnet assembly.

#### Full Through Conduit Bore

The full through conduit bore provides for smooth flow with minimal turbulence. It also provides an unobstructed passage for well intervention tools.

#### Seat Designs

The standard gate to seat and seat to body sealing interface is a slip-fit design, assisted by inserts in the face and o-rings in the rear of each seat. Metal-to-metal gate to seat and pressed-fit seat to body sealing is used for high-temp valves and is otherwise available upon request.

#### Grease Fittings

The valve body may be lubricated through the grease fittings provided in the valve body. All fittings meet the requirements of NACE MR0175.

#### Exposed Bolting

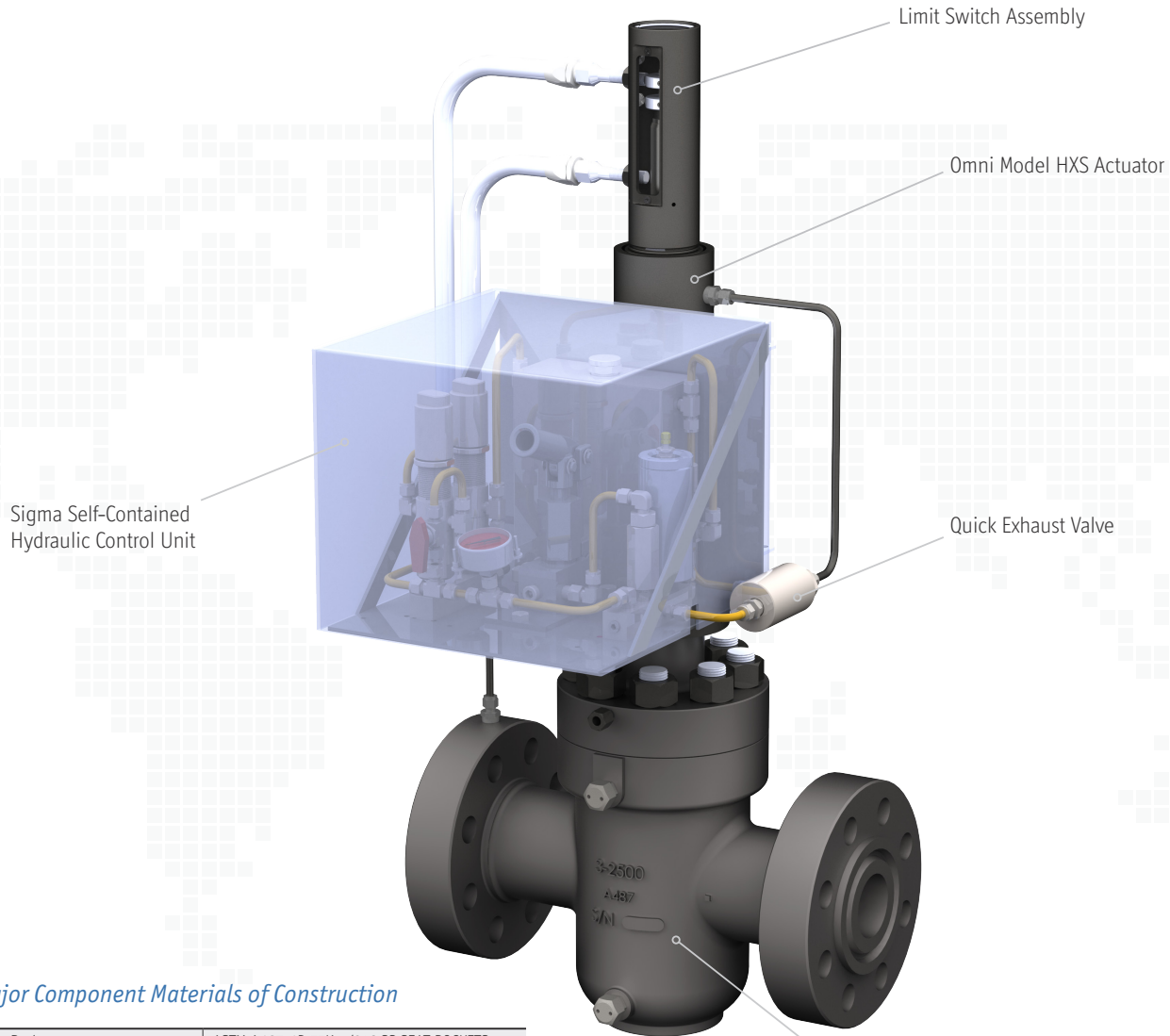
All exposed bolting meets the requirements of NACE MR0175.

### FEATURES » SELF CONTAINED HYDRAULIC CONTROL SYSTEM

- Self-Contained Unit with Reservoir
- 5,000 psi Single Stage Hand Pump
- Hi / Low Pressure Sensors
- All Components Are 316 SS
- Rigid Mounting Plate
- Low Pilot Override Valve
- Redundant Check Valve
- ESD 1/4 Turn Ball Valve
- Quick Exhaust Valve Included
- Hydraulic Accumulator
- Direct Mount
  - Horizontal or Vertical
  - U-Bolts Provided
- Compact Footprint
- Ideal For Use In Remote Locations
  - Simple Design With Fewer Components
- Manual Shutdown
- Single Technician Installation Capable

# SYSTEM OVERVIEW

## OMNI MODEL HXS HYDRAULIC ACTUATOR WITH SIGMA SELF-CONTAINED ESD

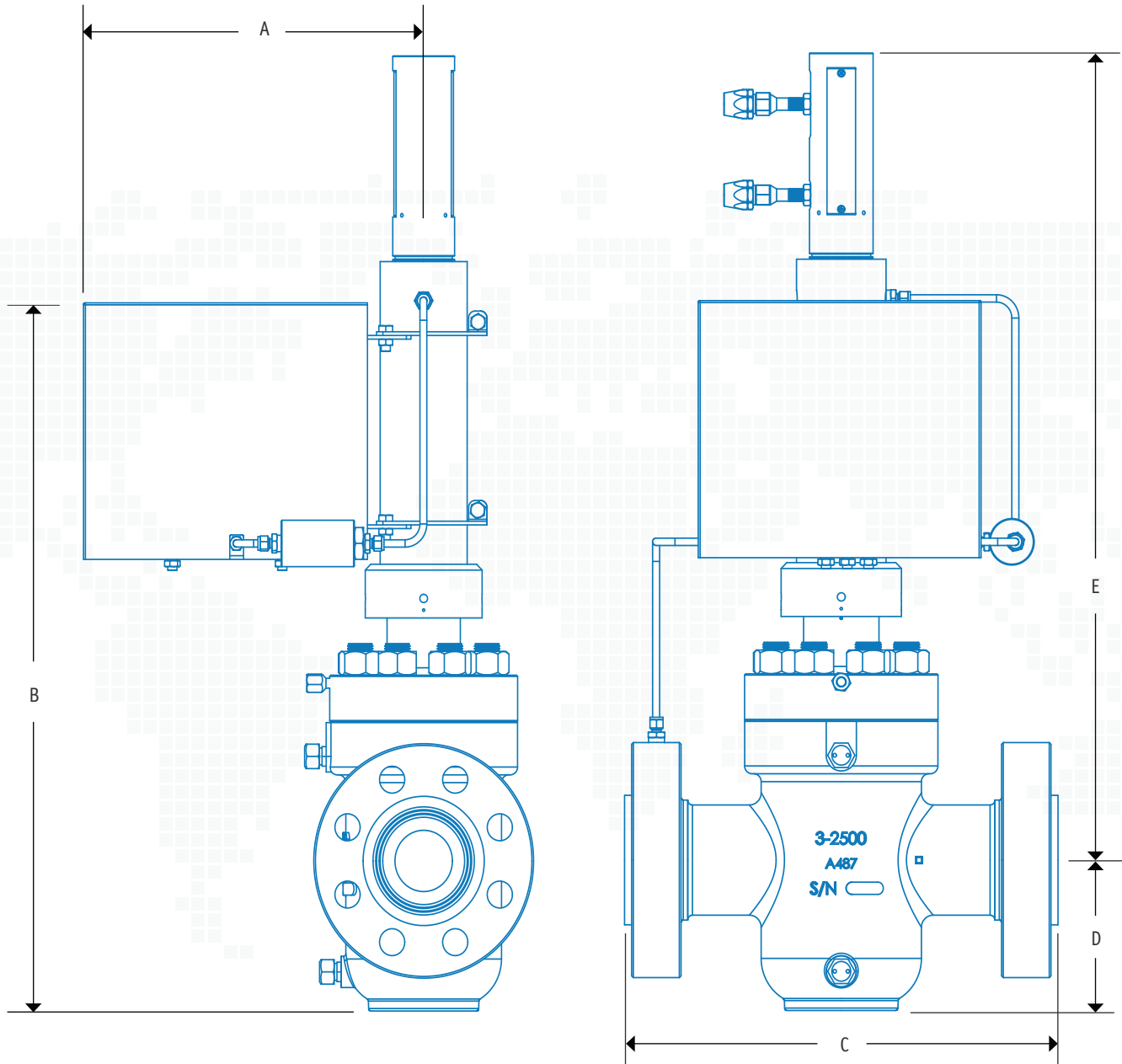


### Major Component Materials of Construction

Valve Body	ASTM A487-4D 75K w/316 SS SEAT POCKETS
Valve Bonnet	AISI 4130 75K
Valve Stem	17-4 PH HH1150 105K
Studs	ASTM A193 GR B7M
Nuts	ASTM A194 GR 2HM
Bonnet Seal Ring	AISI 316 SS
Gate Guide	AISI 304 SS
Gate Nut	17-4 PH HH1150 105K
Reverse Acting Slab Gate	AISI 410SS W/TUNGSTEN CARBIDE HF
Seats	AISI 410SS W/TUNGSTEN CARBIDE HF
Bonnet Stem Packing	PARKER POLYPAK (POLYMYTE W/VITON)

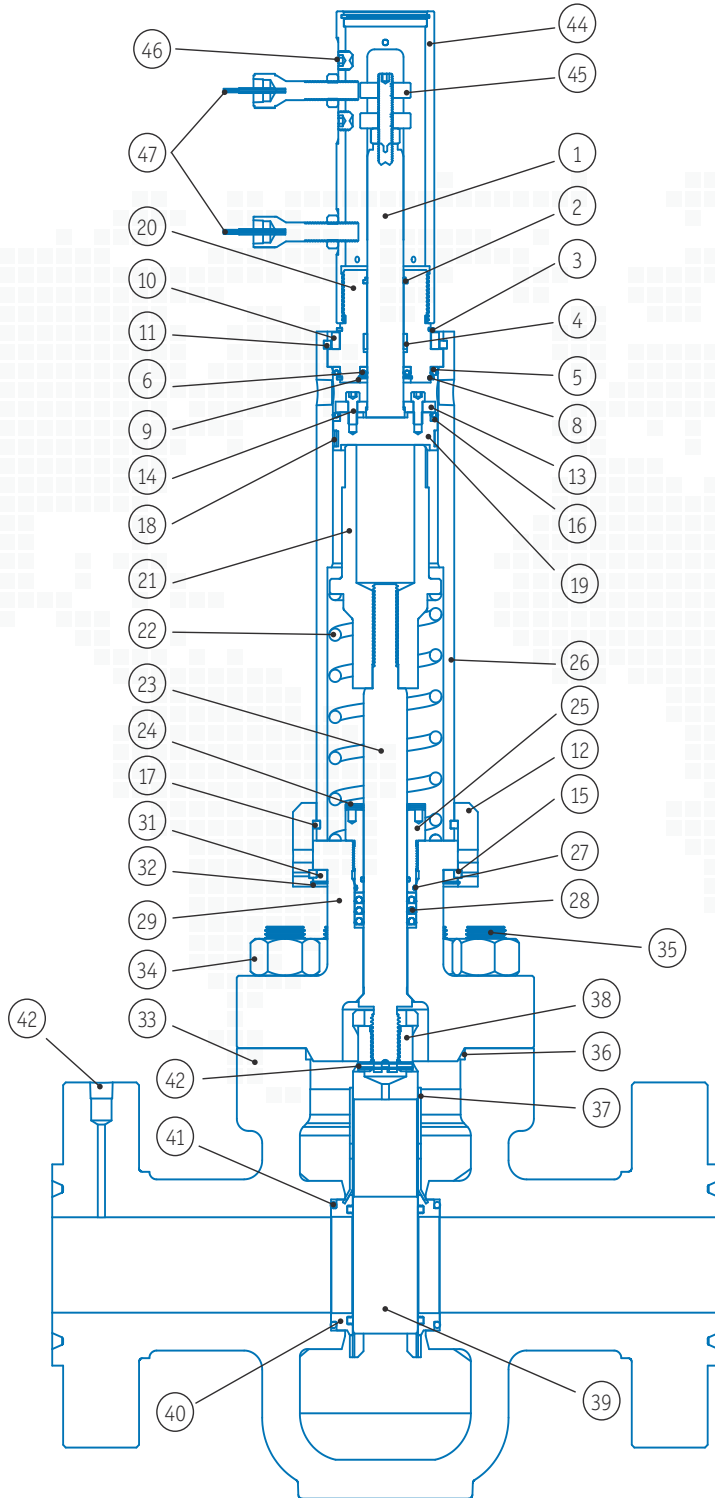
\* All Components to NACE MR0175/ISO15156

# OVERALL SYSTEM DIMENSIONS



A		B		C		D		E	
in	mm	in	mm	in	mm	in	mm	in	mm
18.57	471.7	36.24	920.5	22.99	584	7.68	195.07	41.2	1046.48

HXS Actuator



Component	Description	Qty
1	Upper Shaft	1
2	Rod Wiper	1 (ARK)
3	Retainer Ring	1 (ARK)
4	Wear Band	1 (ARK)
5	Cylinder Head Seal	1 (ARK)
6	Upper Shaft Seal	1 (ARK)
7	Burst Disc (Not Shown)	1 (ARK)
8	Retainer Ring	1
9	Retainer Ring	1
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	6
15	Spring Tube Retainer Ring Set, Lower	1
16	Piston Seal	1 (ARK)
17	Snap Ring	1
18	Piston Wear Band	1 (ARK)
19	Piston	1
20	Cylinder Head	1
21	Spring Adjustment Nut (See Note 1)	1
22	Spring	1
23	Operating Stem	
24	Drift Shims	3
25	Packing Retainer	1
26	Housing	1
27	Packing Retainer O-Ring	2 (BRK)
28	Stem Seal	3 (BRK)
29	Valve Bonnet	1
30	Bonnet Vent Fitting (Not Shown)	1
31	HXS Retainer Ring	1
32	Bonnet Retainer Ring	1

(ARK) = Actuator Redress Kit Item  
(BRK) = Bonnet Redress Kit Item

CS-R Gate Valve

Component	Description	Qty
33	Valve Body	1
34	Nut	8
35	Stud	8
36	Bonnet Seal Ring	1 (VRK)
37	Gate Guide	2 (VRK)
38	Gate Nut	1 (VRK)
39	Reverse Acting Slab Gate	1 (VRK)
40	Seat	2 (VRK)
41	Seat Seal	2 (VRK)
42	Stem Pin	1 (VRK)
43	1/2" NPT Tapped Flange	1

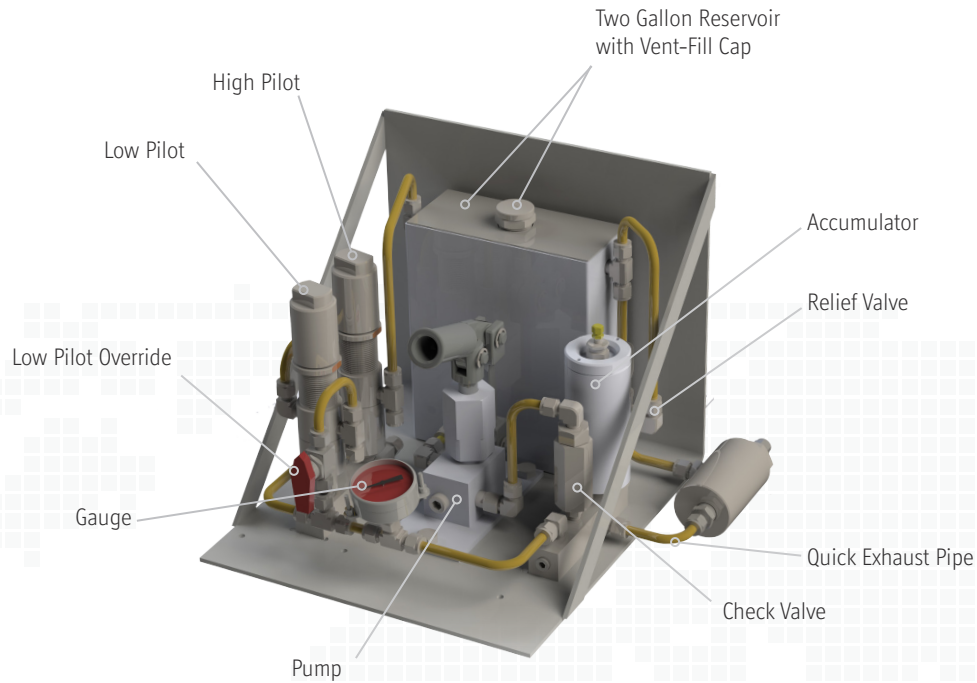
(VRK) = Valve Redress Kit Item

Limit Switch Assembly

Component	Description	Qty
44	Limit Switch Housing	1
45	Target Assembly	1
46	Switch Adjustment Nut	1
47	Limit Switches	*

\* Two switches depicted but if only one position is to be monitored, then second switch can be omitted.

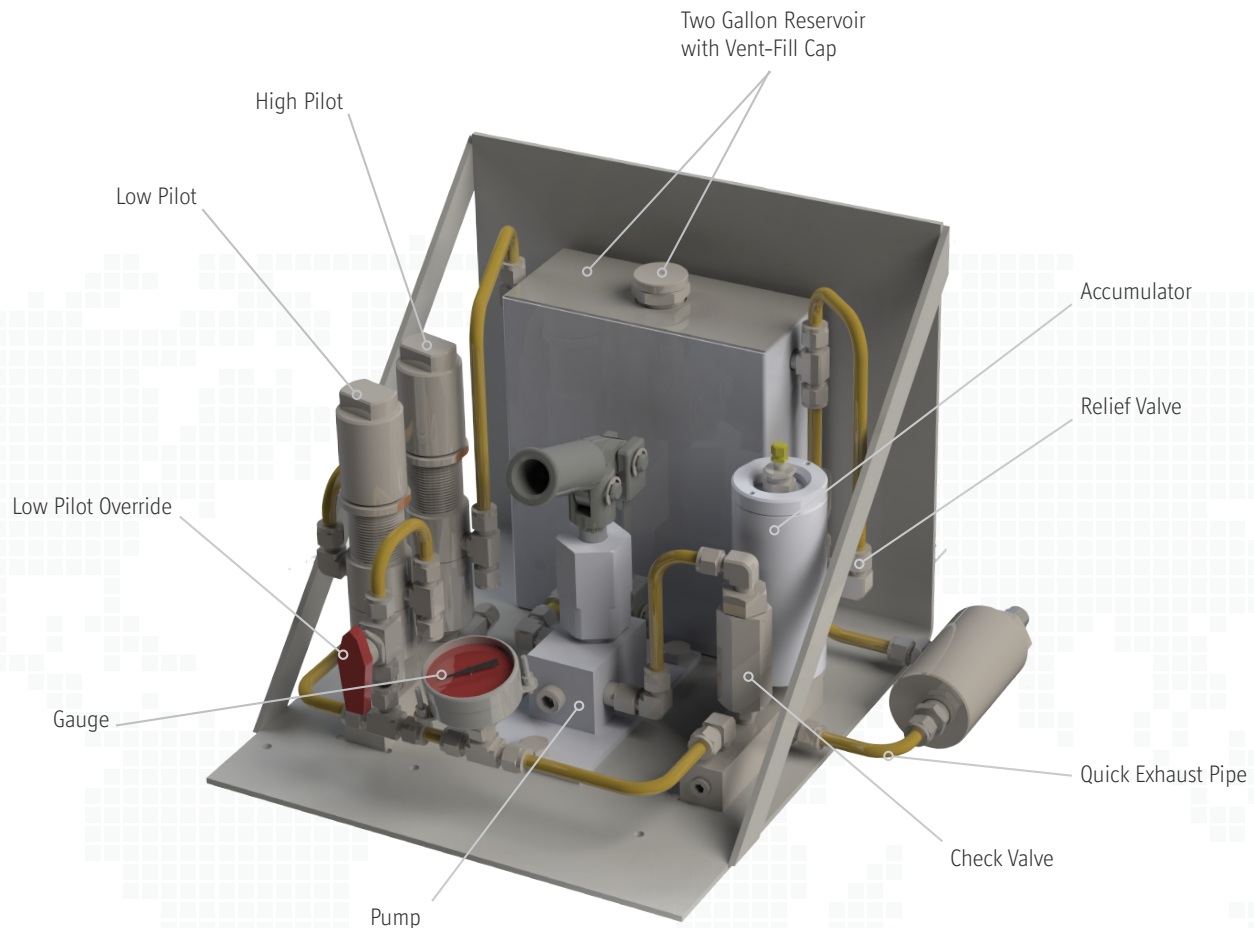
# BILL OF MATERIALS - SELF-CONTAINED UNIT



Bill Number	Quantity Per Bill	Unit of Measure	Description
256035-001	1	Each	Actuator Control Manifold 25 VACM35
Component Code	Quantity Per Bill	Unit of Measure	Description
251200-001	1	Each	25 ACM Universal Horizontal Mount
250880-002	1	Each	Hand Pump SP2A 3/4" Piston, 5
250212-001	1	Each	Reservoir 25C134 F/25ACM1
725200-062	2	Each	72HPH62 HP BLDR PLT NC.6M 130
243100-002	1	Each	24SRV12 ARV4 K316 6,000 Test Per SVTS24 2
210350-001	1	Each	HA 6 C1 1/4 FNPT HC 6M
140660-001	1	Each	CV HYD 1/4 FNPT 10M Test Per SVTS14 2
120360-001	1	Each	12RS45 Compact 11 MNPT Vent Cap
251215-001	1	Each	Swagelok Ball Valve 43GS6 RD R
380200-002	1	Each	Pilot Manifold Bar, w/o Bottom
191395-001	1	Each	19MM226 Mnfld Bar F/ ACM Sys
760340-001	8	Each	Male Elbow SS 600 2 4
760330-001	3	Each	Male Connector SS 600 1 4, SW
250130-001	3	Each	Pipe Plug 14SDS 1/4NPT SKT HD
251115-001	2	Each	Reducing Bushing SS 6 RB 4
760385-001	4	Each	Male Branch Tee SS 600 3TMM
251130-001	1	Each	Tube SS 6 TA 7 4 Stub, Female
490270-001	1	Each	Hex Nipple SS 4 HN
251120-001	2	Each	Tube Stub SS 6 TA 1 4, Male
760385-001	2	Each	Union Tee SS 600 3
250716-001	1	Each	Gauge 0 5000 3/8" Tubing Mount
740150-001	3	Each	Hex Head Bolt 1/2 13 X 1 SS
730250-001	3	Each	Jam Nut 1/2 13JAM, 1/2 13 316
760336-001	1	Each	Male Connector SS 600 1 8
130940-001	1	Each	QEV HYD 1/2 6M Test Per SVTS13 2
253000-004	1	Each	Universal Control System Mount
253000-007	1	Each	Universal Mount Cover Assembly
250660-001	2.25	Feet	Tubing, .375 X .035, 316SS SEA
250670-001	4	Feet	Tubing, .375 X .049, 316SS SEA

# SPECIFICATIONS

## SELF CONTAINED HYDRAULIC CONTROL SYSTEM



### Power Unit

The hydraulic power unit is rated for 5000 psi.

### Reservoir

Standard supplied reservoir is manufactured from 316 stainless steel and has a fluid capacity of two gallons.

### System Configuration Options

Units may be ordered with the following different pressure sensing/shutdown system configurations.

- High/Low Pilot
- High/Low Pilot w/ Low Pilot Override
- High Pilot Only
- Low Pilot Only
- Solenoid Only

### Hydraulic Accumulator

All units are provided with a hydraulic accumulator to prevent pressure fluctuations caused by ambient temperature change.

### Stainless Steel Components

All piping and components are manufactured from 316 stainless steel to prevent corrosion.

### Bleed-Off Protection

All units utilize redundant check valves in the pressure circuit to prevent creep or unwanted bleed off.

### ESD Manual Valve

All units are provided with a valve to facilitate manual shut-in of the well head. Valves can be handled quarter turn ball valves.

### Direct Mount

The ESD Control Unit is mounted directly to an Omni HXS actuator. The mounting bracket system is determined by the orientation of the valve operating stem.

### Service Conditions

Units will perform in variety of service conditions and temperatures. An Arctic service, -50°F (-46°C), model is available.

### Security/ Protection

A 316 stainless steel hinged and lockable cover is available to protect the unit and deter tampering.

## INSTALLATION

The unit is mounted along the axial plane of the actuator so that the handle for the hand pump is accessible from the stem end of the actuator for horizontal mounted actuators. For vertical configurations, the system is mounted to provide the most convenient access to the pump handle. The mounting plate has structural supports on the bottom with form fitting gussets to match the diameter of the actuator. The unit is placed on the actuator and the supplied U-bolts are placed over the actuator and through holes in the mounting plate and fixed in place with lock washers and hex nuts. Torque U-bolts are used as necessary so no movement is possible during pump actuation. The units' pressure outlet connection on the pressure manifold is connected directly to the actuator inlet port with 3/8" .065 wall SS tubing. The sensing port of the pressure sensor manifold bar is connected directly to the flow line at the desired sensing location with suitable tubing based on pressure requirements.

## OPERATION » INITIAL STARTUP PROCESS

1. Verify hydraulic reservoir contains 1-1/2 gallons of hydraulic fluid.
2. Nitrogen pre-charge is required on the hydraulic accumulator in order for the system to maintain proper pressure during thermal changes that will occur due to environmental temperature variations. This accumulator will absorb slight increases and "make-up" pressure during pressure loss from thermal expansion and contraction. The pre-charge should be applied with a charge hose to the Schrader valve located on the top side of the accumulator. The initial recommended charge pressure is 500 psi.
3. Close Low Pilot Override Ball Valve (LPOBV) located on the right side of the unit. This valve is connected to the pressure distributor bar and feeds the low pilot supply.
4. Manually operate hand pump to begin pressurization of the system. As pressure increases, the pressure gauge should begin to register the increasing pressure and the stem on the actuator should begin to retract. Continue the pump operation until required pressure is obtained on the gauge or the actuator is fully retracted.
5. When flow line pressure has normalized within desired operation range, open the low pilot override ball valve (LPOBV) to place the system in automatic mode. At this point, the pressure sensors are in control of the system. If upon opening of the LPOBV, the actuator begins to close and flow line pressure is within allowed limits, immediately re-close the LPOBV and reset the low pilot trip range to required trip settings to maintain in service condition.

## STANDARD OPERATIONS

1. The unit will maintain hydraulic pressure on the actuator until an abnormal condition in the sensing pilot is detected or a manual operation of the ESD ball valve is performed.
2. Occasional observation of the pressure gauge and the actuator stem position is recommended to make certain that normal conditions exist. Even though the system incorporated a small hydraulic accumulator, it may be necessary to "top off" the pressure with the hand pump as thermal conditions change repeatedly. In the event ambient temperatures cause an increase in hydraulic pressure due to thermal expansion beyond the acceptable range, the relief valve will operate and prevent over pressuring of the system. As the relief valve resets, the hydraulic pressure may fall below desired level and may require operation of the hand pump to reestablish proper hydraulic pressure.
3. To initiate system shutdown, simply turn the ESD ball valve to the open position which will exhaust all pressure from the actuator resulting in closure of the valve.



## SELF CONTAINED UNIT » REPAIR KITS

### URK – Unit Repair Kit

Part #	Description	Qty.
14KS30-RK	Check Valve Repair Kit	1
21HA21-RK	Accumulator Repair Kit	1
24ARV12-RK	Relief Valve Repair Kit	1
11SLV65A-RK	Relay Valve Repair Kit	1
28RG26-RK	Regulator Repair Kit	1
20AHM165-RK	Interface Repair Kit	1

### PCK – Pilot Configuration Kit

Part #	Description	Qty.
72HPH***-RK	High Pilot Repair Kit	1
72HPL***-RK	Low Pilot Repair Kit	1

## ACTUATOR » REPAIR KITS

### (ARK) Actuator Redress Kit Contents

Component	Description	Qty
1	Rod Wiper	1
2	Shaft Seal Retainer Ring	1
3	Wear Band	1
4	Upper Shaft Seal	1
5	Burst Disc	1
6	Piston Seal	1
7	Piston Wear Band	1
8	Cylinder Head Seal	1

### (BRK) Bonnet Redress Kit Contents

Component	Description	Qty
1	Packing Retainer	2
2	Stem Seal	3

## GATE VALVE » REPAIR KIT

Component	Description	Qty
1	Bonnet Seal Ring	1
2	Gate Guide	2
3	Gate Nut	1
4	Reverse Acting Slab Gate	1
5	Seat	2
6	Seat Seal	2
7	Stem Pin	1

## CONTROL PRESSURE

Size	Class	Working Pressure (WP)	Equation	Control Pressure
3"	2500	6,250 PSI	$0.349 \times WP + 39 \text{ psi} =$	2,220 PSI

Swept volume of the model HXS actuator as specified in this document is 0.15 gallons.

## MAINTENANCE

Under normal conditions, no routine maintenance is required. It is recommended that the pressure sensors be operated every six months to verify settings. The components in the system are designed to operate for extended periods without any maintenance. Repair Kits (above) for the pressure sensors and relief valve are available should the system experience contamination that warrants rebuilding of these major operating components.



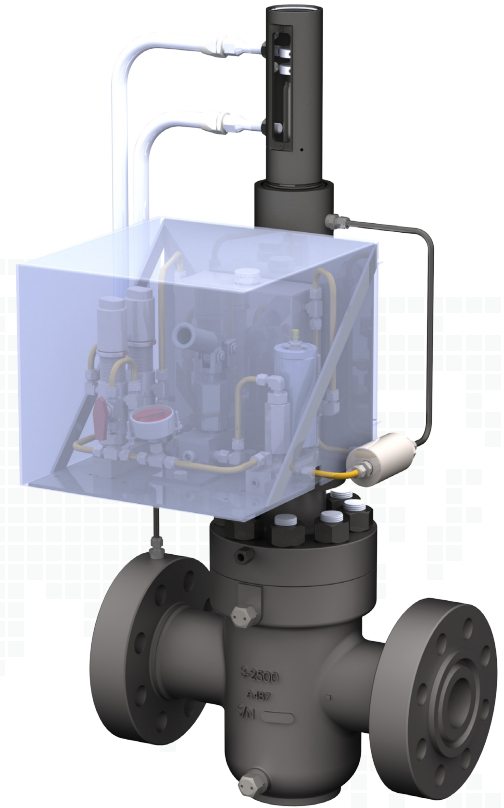
## ABOUT OMNI VALVE

Omni Valve is a leading provider of valve solutions used in the exploration, production and distribution of crude oil, natural gas & other hydrocarbons. Omni offers a full range of valve sizes and configurations within each of its core product lines and has both international and local manufacturing capabilities to respond to our customers' short and long-term procurement needs.

Omni is certified to ISO and API standards and adheres to strict HSE standards in all segments of the business.

## OMNI & SIGMA PARTNERSHIP

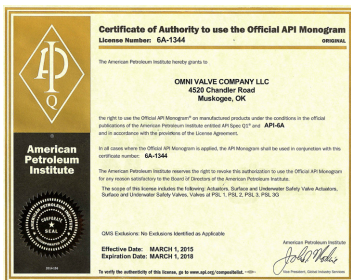
Omni Valve and Sigma Valves have joined forces to offer hydraulically-actuated surface safety valve assemblies complete with self-contained hydraulic control systems. Omni hydraulic actuators are designed to operate surface safety or shutdown valves on oil and gas wellhead, transmission, storage, manifold or other applications where fail-safe capability is required. Sigma Valves' self-contained hydraulic control systems are designed to provide complete actuator control and emergency shut-in capability in a compact and robust system that can be deployed in a variety of configurations based on site requirements.



The result is a complete emergency shutdown valve (ESD) system ready to be deployed on wellhead or flow-line applications where access to an external hydraulic control source is either unavailable or is not economical. The complete system can be used for land or off shore installations and is engineered to provide years of reliable service in even the most hostile and remote locations.

Omni also offers a full range of accessories including standard and fusible manual overrides, limit switch/position indicators and standard and fusible lock open devices that can be used in conjunction with Omni hydraulic actuators and the Sigma self-contained system.

## Commitment to Quality



API - 6A License



ISO 9001:2008



API - Specification Q1



ISO / TS 29001



Product Highlights

# HIPPS Gate Valve

3" Class 2500 RTJ

Omni Model HXS Hydraulic Actuator with Sigma Self-Contained ESD



ACTUATORS & VALVES

- 918.687.6100
- 918.687.6105
- sales@omnivalve.com
- quality@omnivalve.com
- www.omnivalve.com

OMNI VALVE  
Engineering, Quality, Service and Distribution  
4520 Chandler Rd. | Muskogee, OK 74403 | USA