

BETTIS™

WellGuard™ HWG-HL Piston Hydraulic Actuator

Actuation for
API 6A and 6D
through conduit
gate valves.

For shut down
(reverse acting)
or blow down
(direct acting)
applications.

Oil treating and
de-salting system
for an FPSO



EMERSON. CONSIDER IT SOLVED.™

The Company

Bettis has been providing quality valve actuation and control for more than 40 years, establishing itself as a pioneer and innovator in this industry, with products specifically engineered to your application. Today, as part of Emerson Process Management, we are the world's leading independent manufacturer of pneumatic and hydraulic valve actuators. Bettis products are used in almost every facet of the energy industry – oil and gas production, pipeline and processing. Our facility near Houston, Texas has more than 145,000 square feet of manufacturing capacity. We also operate modern manufacturing facilities in Edmonton, Canada and Mansfield, Ohio. We have been awarded the ISO 9001 designation indicating full compliance with worldwide standards for quality and documentation.

General Description

The WellGuard™ Piston range of hydraulic Control Fluid Powered linear actuators from Bettis Canada Ltd. is designed to be used in conjunction with Bettis valve bonnets to provide open and close control for major brands of API 6A through conduit reverse acting gate valves fitted to oil and gas wellheads and production flow lines. These actuators can also be used with API 6D and ANSI B16.34 valves where the bonnets are built to the Bettis design.

Suitable for offshore and onshore locations and ideal for use in H₂S and CO₂ applications, the Bettis range of hydraulic piston actuators provides a simple and reliable valve automation solution. These actuators will be available in 5", 6" and 8" diameters, suitable for valve sizes 1-13/16" thru 4-1/16" (bonnets for valve sizes 5-1/8" thru 7-1/16" are under development).

Operating Principle

Valve actuation is achieved by applying a mid pressure (maximum 3,000 psig) hydraulic control pressure to a piston in a closed housing thereby exerting a force which compresses a spring and extends a valve stem. This action is designed to open a reverse acting gate valve (or close a directing acting gate valve).

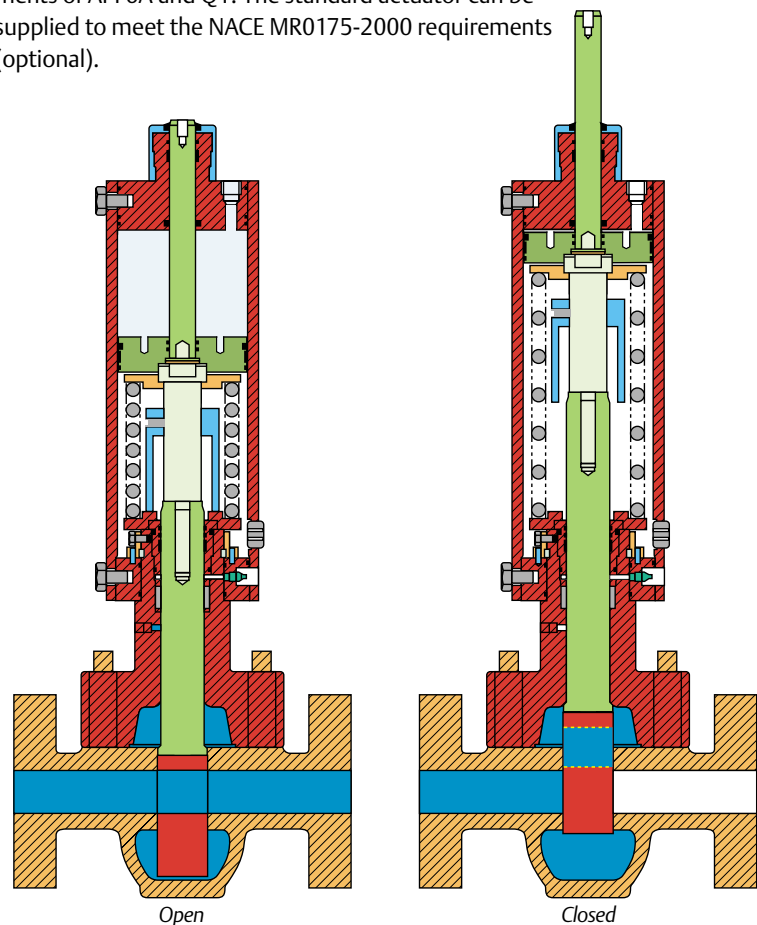
The valve is returned to its fail position upon release the

piston pressure. The actuator ensures that a fail position is achieved through the use of valve body pressure acting on the valve stem diameter assisted by a coiled spring. The spring provides rapid and reliable valve shut-down when there is little or no valve body or flowline pressure available.

The HWG actuator is available with a fusible manual override (FMO) as an option, built to API-6A-SSV, which mounts to the boss thread on the upper portion cylinder case and will operate the unit when control Pressure is not available.

A fusible lock open cap (FLC), made to API-6A-SSV, is also available to lock the actuator in the extended position while the Control Pressure is removed.

The HWG actuator can be supplied to API 6A SSV, SDV and BDV to meet the quality assurance and test requirements of API 6A and Q1. The standard actuator can be supplied to meet the NACE MR0175-2000 requirements (optional).

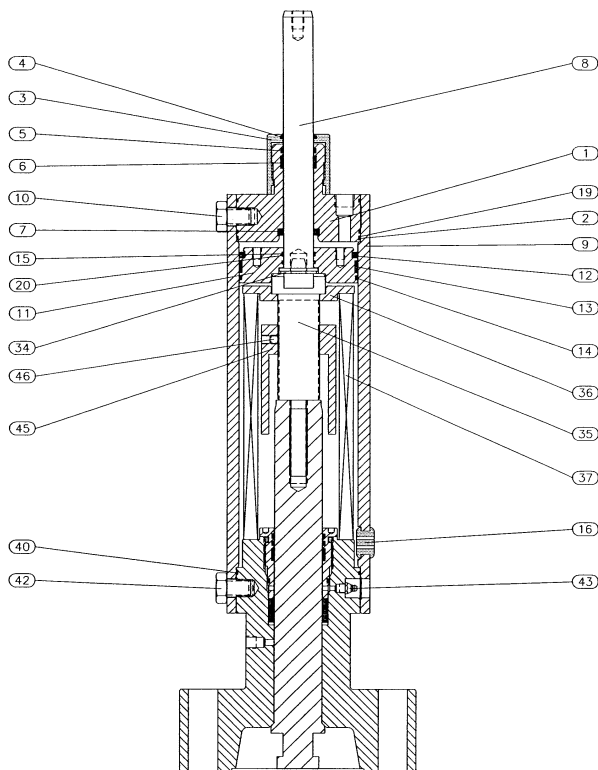


Features and Benefits

The simple and reliable design of the HWG provides a range of features:

- **Lightweight** – Simple design provides a lightweight actuator.
- **Excellent Corrosion Protection** – Internal and external surfaces coated with Xylan.
- **Sour Service** – Compatible with both sweet and sour (NACE MR0175-2000) control fluids.
- **Visual Indication** – The shaft of the actuator extends through the top of the housing, with dual stem seals to provide local visual indication of valve position.
- **Maintenance** – The simple and reliable design allows quick and simple maintenance without the need of any specialized tools.
- **Reliability** – Spring provides reliable and quick shutdown assistance when flowline pressure is low or not available.
- **Compliance** – Certified for API 6A, PR-2, SSV applications. Valve/actuator packages can be supplied for PSL-1 to 3 applications.

- **Versatile** – Suitable for operation over a wide temperature range:
Actuator -50°F (-46°C) to +150°F (+65°C),
Bonnet -50°F (-46°C) to +250°F (+121°C), (for most sizes).
- **Compatibility** – Designed to be interchangeable with Bettis linear diaphragm and pneumatic piston type actuators.
- **Accessories** – Suitable for use with fusible lock open device, fusible manual override, hydraulic override, stem protector, limit switch mounting and a wide range of industry standard control components.
- **Easy Installation** – No special tools required.



Notes: Shown in closed position
 Supply 1/2 NPT (shown)
 Service: Hydraulic Fluid
 Trim: Offshore, Low Temp, NACE
 Unit: Integral Bonnet Design (I) shown

ITEM	DESCRIPTION	MATERIAL	QTY	NOTE
1	END CAP	4130/XYLAN	1	
2	END CAP O-RING	NITRILE	3	(Y)
3	THREAD PROTECTOR	DELFIN	1	
4	WIPER	URETHANE	1	(Y)
5	INDICATOR O-RING	NITRILE	1	(Y)
6	INDICATOR GUIDE	DELFIN	1	(Y)
7	INDICATOR POLYPAK	MOLYTHANE/SS 302	1	(Y)
8	INDICATOR ROD	17-4 PH	1	
9	CYLINDER	CS/XYLAN	1	
10	END CAP CAPSCREW	HXHC GRADE 5 XYLAN	8	
11	PISTON	4130/XYLAN	1	
12	PISTON POLYPAK	MOLYTHANE/SS 302	1	(Y)
13	PISTON WEAR RING	MOLYGARD	1	(Y)
14	PISTON O-RING O.D.	NITRILE	1	(Y)
15	PISTON O-RING I.D.	NITRILE	2	(Y)
16	VENT GROMMET	EPDM	1	
17	NAMEPLATE	SS 304	1	(N)
18	DRIVE SCREW NAMEPLATE	SS 301	4	(N)
19	BACKUP RING, END CAP	NITRILE	1	(Y)
20	BACKUP RING, PISTON I.D.	NITRILE	1	(Y)
34	THRUST WASHER	BRASS	1	
35	SPRING BOLT	SS 410	1	
36	SPRING PLATE	4130/XYLAN	1	
37	SPRING	5160H T&G/XYLAN	1	
40	O-RING PLATE O.D.	NITRILE	1	(Y)
42	MOUNT PLATE CAPSCREW	HXHC GRADE 5 XYLAN	8	
43	VENT/LUBE FITTING	SS 304	1	
44	WARNING LABEL, SPRING	VINYL	1	(N, Y)
45	DOWNSTOP	4130/XYLAN	1	
46	DOWNSTOP SET SCREW	SS 304 W/ NYLON TIP	1	(Y)

(Y) Denotes recommended spare parts
 (N) Denotes parts not shown
 Bonnet parts shown but not listed

Thrust Characteristics

ACTUATOR MODEL	MAXIMUM STROKE (inches)	EFFECTIVE PISTON AREA (inches sq.)	INITIAL NET THRUST OUTPUT (lb.)	INITIAL NET THRUST OUTPUT @ MAWP (lb.)
HL x 5 x 3 x 3 HWG	3.5	18.4	18.4-900 ⁽¹⁾	54,300
HL x 5 x 3 x 1 HWG	3.5			
HL x 5 x 5 x 1 HWG	5.0			
HL x 6 x 3 x 3 HWG	3.5	27.0	27P-1200 ⁽¹⁾	79,800
HL x 6 x 3 x 1 HWG	3.5			
HL x 6 x 5 x 4 HWG	5.0			
HL x 6 x 5 x 1 HWG	5.0			
HL x 8 x 8 x 1 HWG	8.3	47.0	47P-1500 ⁽¹⁾	139,500

⁽¹⁾ P = actuator control pressure – 3,000 psi

Actuator Specifications

MODEL	WEIGHT (lbs.)	WEIGHT (kg.)
HL x 5 x X x X HWG	112	51
HL x 6 x X x X HWG	140	64
HL x 8 x X x X HWG	200	91

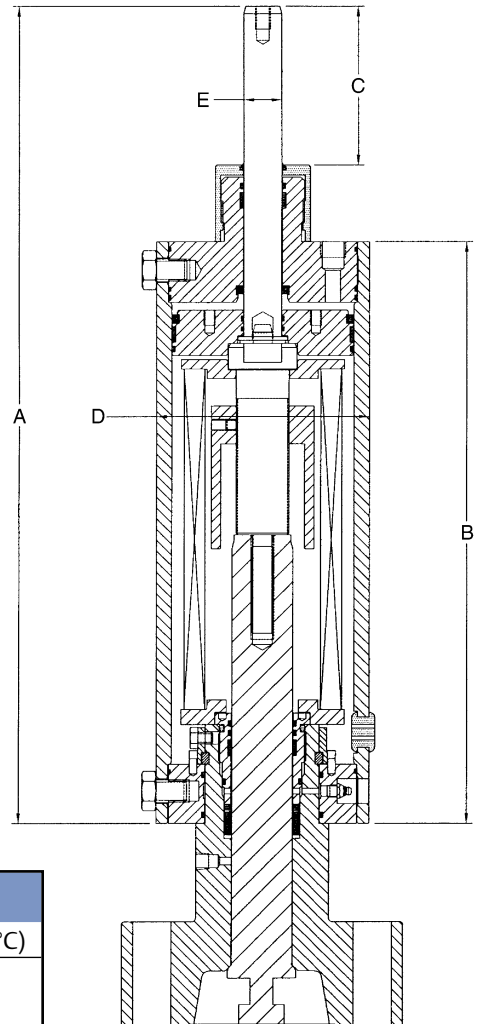
Dimensions

ACTUATOR MODEL	DIMENSIONS in inches and mm									
	A		B		C		D		E	
HL x 5 x 3 x 3	25.0	635	18.8	478	3.7	94	6.0	153	1.25	32
HL x 5 x 5 x 1	26.5	673	18.8	478	5.2	132	6.0	153	1.25	32
HL x 6 x 3 x 3	25.4	646	19.2	488	3.7	94	7.0	178	1.25	32
HL x 6 x 5 x 4	26.9	683	19.2	488	5.2	132	7.0	178	1.25	32
HL x 8 x 8 x 1	36.9	938	25.9	658	8.5	216	9.3	236	2.00	51

Supply Port Thread: 1/2 NPT

Features

	STANDARD SERVICE	OPTIONAL FEATURES
Operating Temp. Range	-20° TO +150°F (-29° TO +65°C)	-50° TO +150°F (-46° TO +65°C)
API 6A Monogramable	Control Fluid Powered, PR 1 or 2	NACE, SSV PR 1 or 2



Valve Bonnet Specifications

VALVE BONNET ASSEMBLY				
Operating Temp. Range	-50° TO +250°F	-46° TO +121°C		
Bonnet Size and Pressure Rating	Bonnet Weight (lb.)	Bonnet Weight (kg.)	Temp. Class	API Trim Class
1-13/16, 10,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
1-13/16, 15,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
2-1/16, 2,000 – 5,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
2-1/16, 10,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
2-1/16, 15,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
2-9/16, 2,000 – 5,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
2-9/16, 10,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
2-9/16, 15,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
3-1/8, 2,000 – 5,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
3-1/16, 10,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
3-1/16, 15,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
4-1/16, 2,000 – 5,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
4-1/16, 10,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
4-1/16, 15,000	TBA	TBA	L thru V	AA, BB, CC, DD, EE, FF
Bonnet in Conformance with API 6A		PSL 1, 2, or 3	SSV	PR 1 or 2

Service Conditions Reference Guide

MATERIAL CLASS	CLASSIFICATION, APPLICATION
AA	General Service, non-corrosive
BB	General Service, slightly corrosive
CC	General Service, moderate to high corrosive
DD	Sour Service, non-corrosive
EE	Sour Service, slightly corrosive
FF	Sour Service, moderate to high corrosive
HH	Very corrosive

TEMP. CLASS	MINIMUM AMBIENT TEMP.	MAXIMUM PROCESS TEMP.
K	-75°F (-60°C)	+180°F (+82°C)
L	-50°F (-46°C)	+180°F (+82°C)
P	-20°F (-29°C)	+180°F (+82°C)
R	+70°F (+21°C)	+70°F (+21°C)
S	0°F (-18°C)	+150°F (+66°C)
T	0°F (-18°C)	+180°F (+82°C)
U	0°F (-18°C)	+250°F (+121°C)
V	+35°F (+2°C)	+250°F (+121°C)
X	0°F (-18°C)	+350°F (+177°C)

API Certification Number 6A-0397

Bettis Canada is authorized to use the official API monogram on Actuators and Bonnets for Surface Safety Valves manufactured and assembled under API Specification 6A for Valve and Wellhead equipment.

ISO 9001



Cert. Num. 93-13
Bettis Canada Ltd.
 Edmonton, Alberta



API 6A Specification

This product is only intended for use in large-scale fixed installations excluded from the scope of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2).

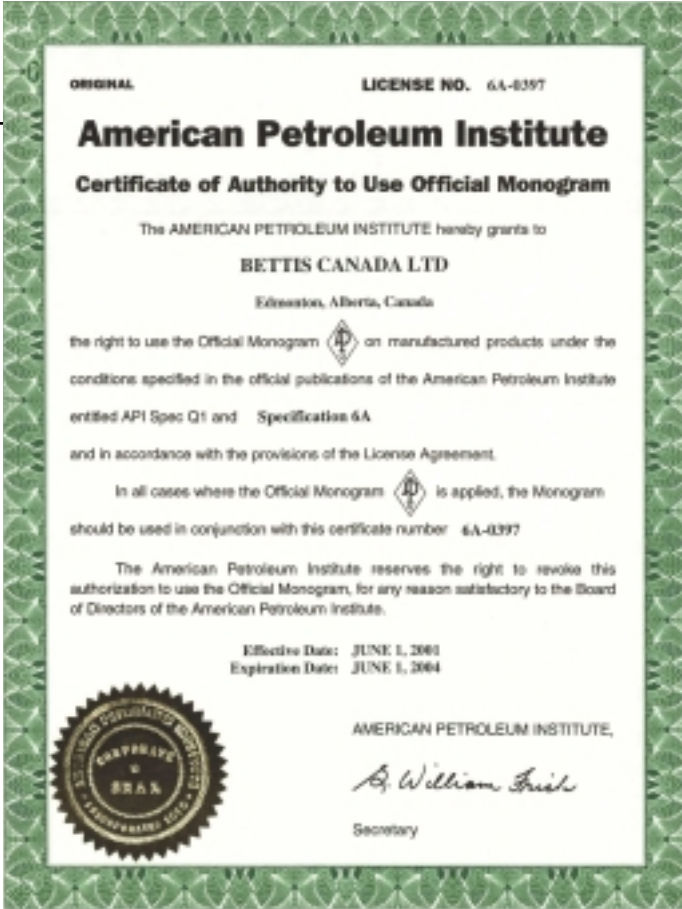
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