

**VBG** intech.

PASSION FOR FLOW

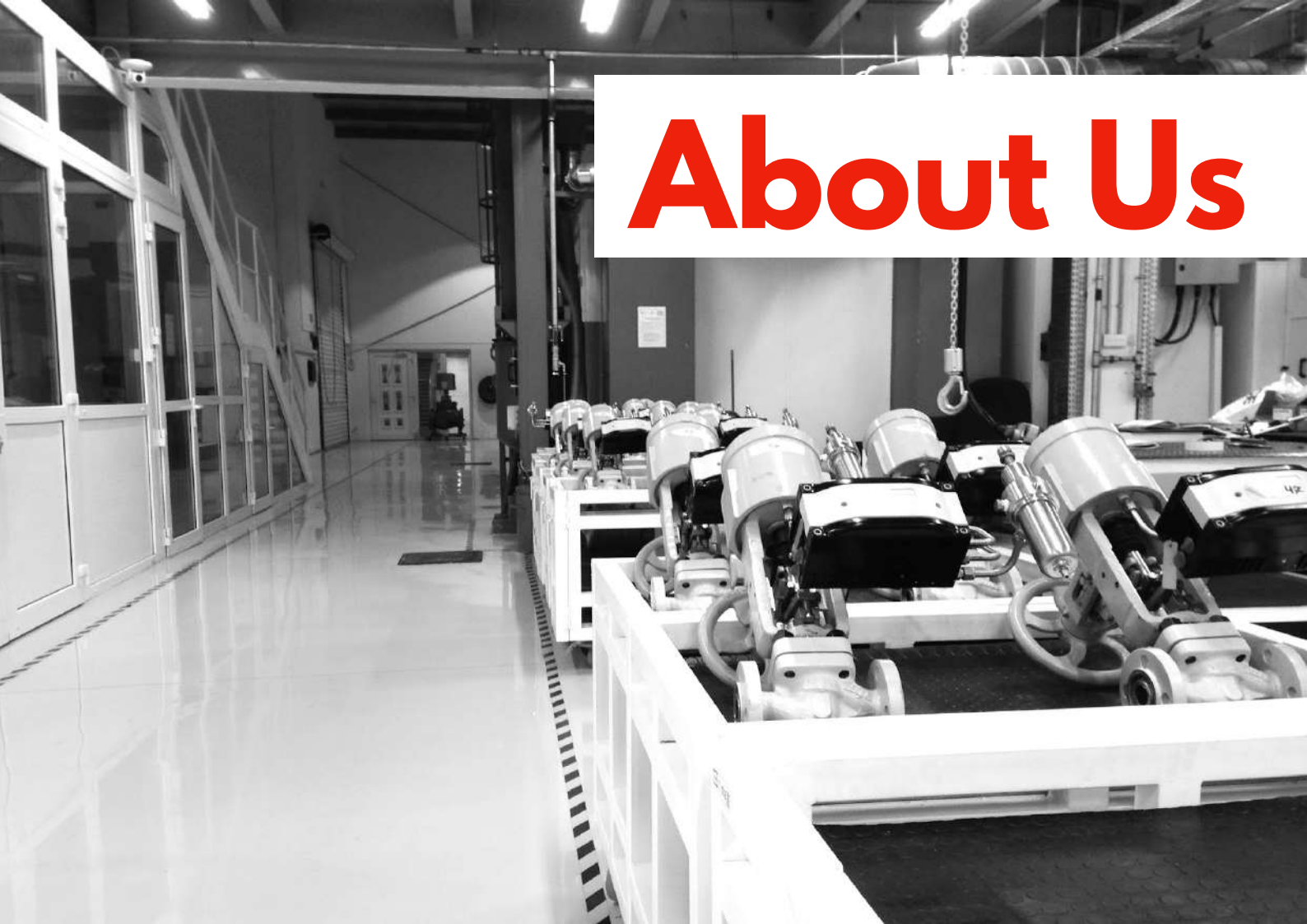
# BG Series

GLOBE CONTROL VALVE



TECHNICAL CATALOGUE

# About Us



With state-of-the-art manufacturing facilities located in Dubai, VBG Intech also has global presence with authorized service centers around the world. VBG Intech is able to provide the highest level of service to its customers.

From the beginning VBG Intech have adhered to the concept of excellence and customised service. These concepts permeate all stages of the design of our products, from the selection of materials, specification, and calculation to the manufacture of the final product, performed by an experienced and highly capable team.

VBG Intech has attained the highest degree of quality in the design and manufacture of control valves for special and severe applications such as: superheated steam, differential high pressure, volatile, corrosive, erosive and slurry fluids, in addition to solutions for cavitation and high noise levels.

VBG Intech constantly invests in new technologies, upholding the high quality of manufacturing processes and assuring high performance and durability of its products.

# Expertise

## PRODUCTION

Besides skilled and experienced staff and world-class machines VBG Intech also relies on a state-of-the art ERP system which provide powerful features to properly plan, procure, manufacture and deliver to customers efficiently.

## ENGINEERING

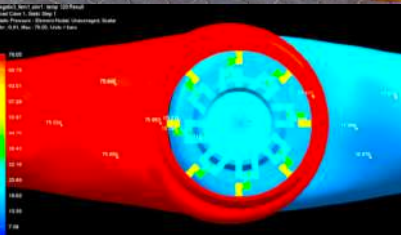
VBG Intech Engineering benefits from powerful tools for in-house design and development that cater to different challenges. A sophisticated software supports the well experienced crew.

## QUALITY

Modern machineries teamed with experienced and vigilant staff help VBG to maintain the highest level of quality, providing reliable and satisfactory ownership to our customers.

## 24 / 7

Whenever our customer requires support, wether site assisted or not, VBG Intech is on board to support 24/7 X 365.





# Layout

## CONTROL VALVES



The BG Series control valves from VBG Intech is recognised as a high-performance control valve for use in critical low and high pressure applications in the oil, gas, power, and process industries, all the while boasting easy, quick, and economical maintenance.

In contrast with other control valves operated by spring-diaphragm actuators, the BG Series is operated by a double acting piston actuator with a spring return fail action that takes advantage of its high pneumatic stiffness. This turn ensures excellent and accurate positioning during throttling as well as fast and reliable response to changes in the control signal.

As the actuator operates with an air supply pressure of up to 175 psi (12 Bar), the BG Series provides the required force to ensure that the specified shutoff class is achieved even under high differential pressures.

# Highlights

## MAIN ADVANTAGES



### **NON JAMMING TRIM**

The double upper guide system, located out of the flow passageway, assures a perfect alignment of the plug stem, while providing considerable clearance between the plug head and the seat retainer, eliminating friction problems related to the guiding system in the seat retainer (cage-guided designs).



### **VERSATILE**

In addition to conventional globe-style bodies, angle-styles, three-ways, or steam-jacketed bodies are also available; these bodies are compliant with several standards relevant to face-to-face dimensions. The modular concept of the BG Series design allows for a high degree of interchangeability between different valve sizes and versions, making VBG Intech a market leader in this regard, consequently benefiting the end user by reducing the need for a large inventory of spare parts.



### **SEATING**

In addition to providing accurate control, the concept of the BG Series valve with a single and self-centering seat ensures exceptional shutoff capability, normally assisted by the fluid pressure. In normal conditions, along with the air supply, the double acting spring-cylinder actuator ensures a high seating force; and in the event of an air supply loss, the actuator spring plus the resulting force from fluid pressure move the plug to the required fail-safe position.



### **RUGGED**

The BG Series control valve construction makes it less prone to corrosion attacks from process fluids when compared to conventional globe valves. The rugged plug stem, as well as other valve components, are designed for heavy-duty service and can withstand high differential pressures. When necessary, optional low-noise and anti-cavitation trim are also available, making the BG Series an ideal choice for severe service applications.



### **GUIDING & PACKING**

The BG Series guiding system deserves special recognition, not only does it eliminate the disadvantages of a guiding system at the seat retainer, but the BG Series guides, being well spaced and with large bearing support surfaces, eliminate problems related to vibration in control valves. Due to the use of this advanced guiding system, the rugged plug stem of the BG Series control valve may be subjected to twice the thrust produced by available oversized actuators, without the risk of buckling. The depth of the BG Series packing box allows the use of all packing options offered by VBG Intech, and the excellent surface finish of the bonnet bore and the plug stem contribute to a long packing life, with no leakage.

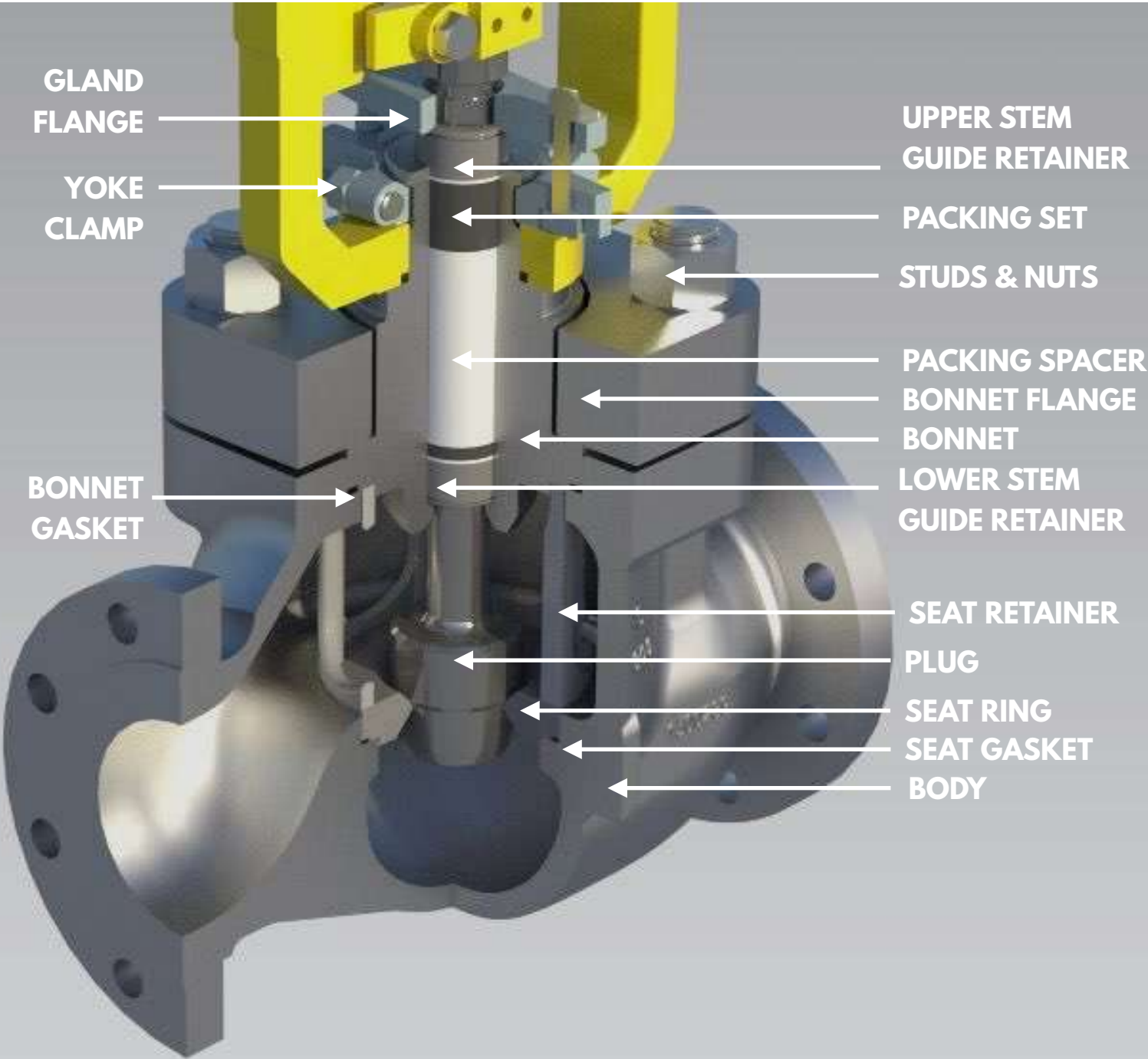


### **QUICK & EASY MAINTENANCE**

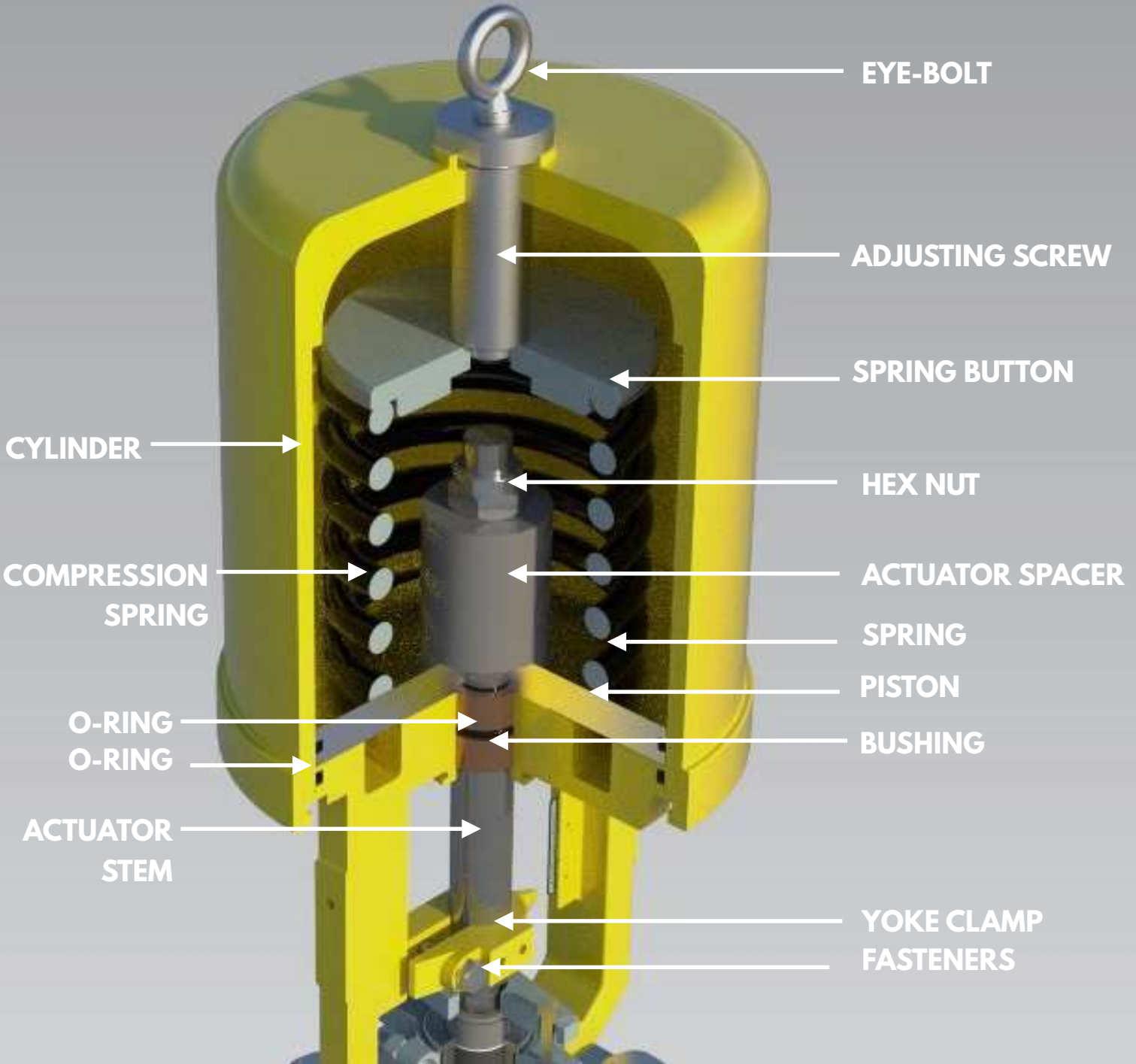
VBG Intech's top-entry assembly design simplifies maintenance tasks. Once the bonnet flange nuts are removed, the bonnet and plug can be easily removed from the valve body, allowing access to other internal components. The clamped-in seat ring, secured by the seat retainer, as well as all other components of the valve and the actuator, do not require the use of special tools for their disassembly or reassembly. The compact size of the valve and its low weight help its handling for maintenance and installation.

# Components

## BODY SUB-ASSEMBLY



# ACTUATOR SUB-ASSEMBLY



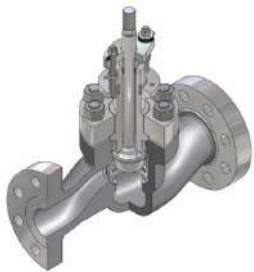
# Body Style

## LINEAR TYPE



### BG-S

The BG-S GLOBE TYPE is used in most continuous process industries and is recognised for its excellent sealing capacity and reliability.



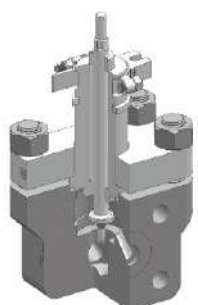
### BG-H

The BG-H GLOBE TYPE is the high pressure version for BG-S application, and it has incorporated the high performance characteristics such as, high performance, easy maintenance.



### BG-L

The BG-L GLOBE TYPE Recommended for use in utilities and general services, the BG-L model globe valve has compact sizes and reduced weights, which makes for easy installation and maintenance.



### BG-R

The BG-R GLOBE TYPE Made of rolled bars or forged material, it can be quickly machined in order to meet special requirements. The BG-R is available in pressure classes up to ANSI 4500.

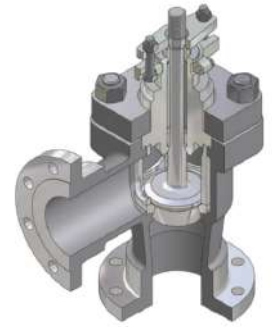






## BG-A

The BG-A ANGLE TYPE has been designed in order to provide a streamlined and smooth passageway.



## BG-3

The BG-3, 3-WAYS TYPE Control Valve from VBG Intech is a three way control valve used in applications that require converging (mixing) or diverging (bypass) flow.



## BG-M

The BG-M HAND-OPERATED GLOBE TYPE from VBG Intech is an option for control without pneumatic actuation.

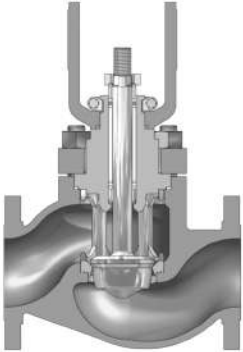
## BG-C

The BG-C GLOBE TYPE valve is used in cryogenic applications up to  $-423^{\circ}\text{F}$  ( $-253^{\circ}\text{C}$ ). It is designed with a special extended bonnet with cold box suitable for low temperature.



# Bonnet Type

## APPLICATION

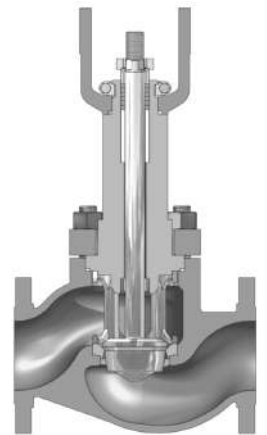


### Standard

The BG Series standard bonnet is generally manufactured with the same material as the valve body and withstands operating temperatures from  $-20^{\circ}\text{F}$  to  $750^{\circ}\text{F}$  ( $-28^{\circ}\text{C}$  to  $400^{\circ}\text{C}$ ), depending on the packing material (see temperature limits for different packing materials in Table IV).

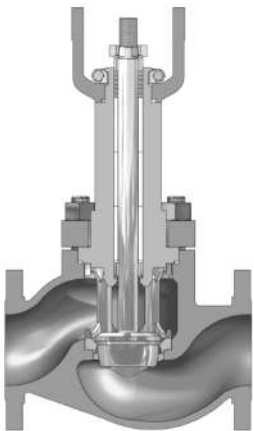
### Extended

The extended bonnet protects the packing against excessive heat or cold that could affect the performance of the valve. Extended bonnets manufactured with carbon steel can be used with operating temperatures from  $-20^{\circ}\text{F}$  to  $800^{\circ}\text{F}$  ( $-28^{\circ}\text{C}$  to  $426^{\circ}\text{C}$ ), extended bonnet manufactured with 304 or 316 stainless steel can work with operating temperatures from  $-150^{\circ}\text{F}$  to  $1500^{\circ}\text{F}$  ( $-100^{\circ}\text{C}$  to  $815^{\circ}\text{C}$ ). Alternative materials are also available.



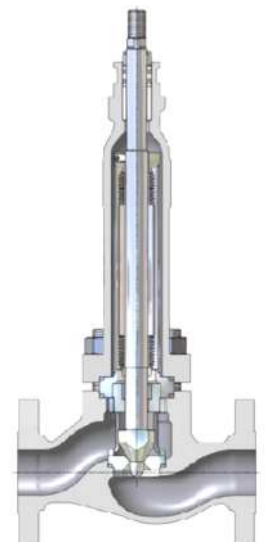
### Cryogenic

The design of the BG Series extended bonnet for cryogenic services allows a small portion of the vaporised cryogenic liquid to remain trapped inside the bonnet, creating a suitable temperature gradient that protects the packing. It is usually made from 304 or 316 stainless steel to withstand low temperatures down to  $-425^{\circ}\text{F}$  ( $-253^{\circ}\text{C}$ ). For this type of construction, the standard material of the bonnet flange and bolting is stainless steel.



### Bellows Seal

The Bellows seal option makes the BG Series control valve the right choice whenever the requirement for zero fugitive emissions to the atmosphere is to be achieved. This seal is generally specified for process fluids that are considered toxic or lethal. The Bellows seal configuration, is a one-piece extended bonnet equipped with a set of sealed chambers capable of high cycling capacity, along with a double packing system. For the configuration the bonnet is manufactured in the same material as the valve body, with the Bellow seal manufactured in special alloys.

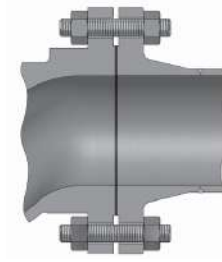


# End Connections

## TYPES

The BG Series valve body has raised face surfaces in valves equipped with separable flanges and/or in valves supplied with integral flanges. In order to have a better sealing with the adjacent piping flanges, the contact surfaces of valve flanges are machined with spiral grooves. Other optional flange facing surfaces are available, such as: smooth finish, flat face, RTJ, large and small tongue, and large and small groove.

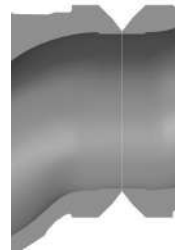
The connection to the process through separable flanges is optional BG-S Series valves up to 4 inches in ANSI Class 150, 300, and 600. Using separable flanges, an ANSI Class 600 body can easily be adapted to operate in ANSI Class 150, 300, or 600 services by means of a simple change of end flanges. Separable flanges may be supplied in different material.



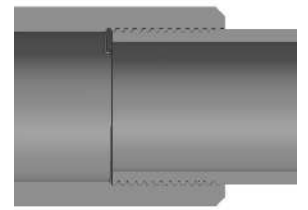
**Integral Flanges**



**Separable Flanges**



**Butt Weld/ Socket Weld**

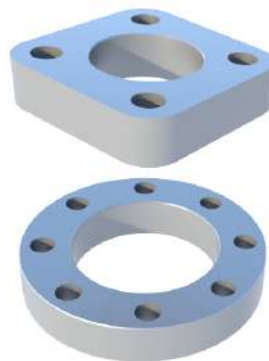


**NPT Threaded**

# Bonnet Flange

## CONFIGURATION

The bonnet flange is designed to provide the same concept of a separable end flange on the BG Series valve body. The standard material for a bonnet flange is carbon steel; however, it may be manufactured in customer- specified material as required, as it not come into contact with the process fluid. The BG Series bonnet is attached to the valve body by means of studs and nuts. The standard material is ASTM A193 Gr. B7M for studs and ASTM A194 Gr. 2HM for nuts, suitable for operating temperatures from - 20° to 800°F (-28° to 426°C). Optionally, studs and nuts may be supplied in stainless steel.



**Square Type**

Up to 4.00" CL150 - 600

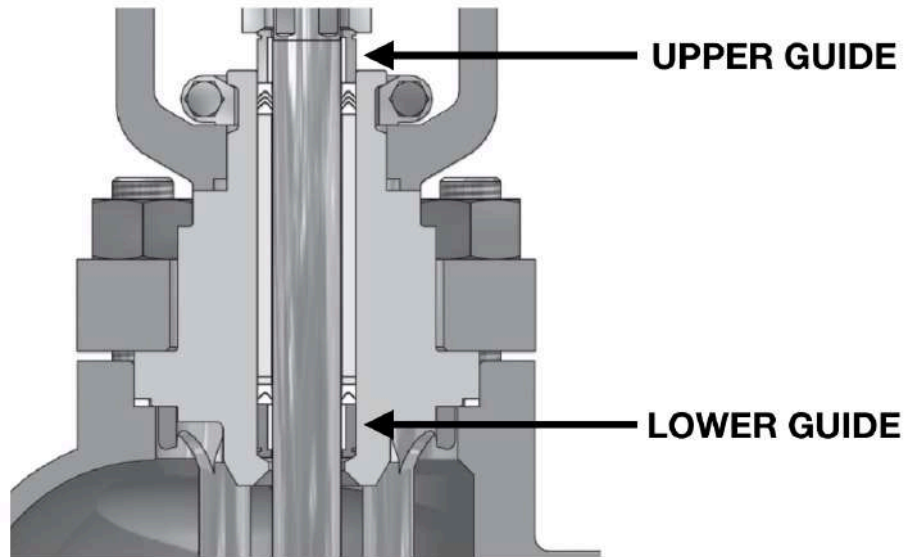
**Round Type**

From 6.00" onwards  
CL150 -2500

# Stem Guide

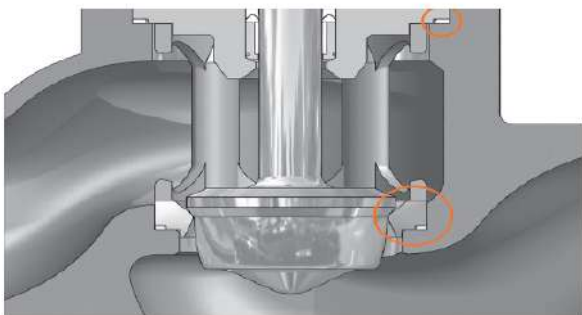
## UPPER & LOWER

The BG Series valve packing box is deep and has an excellent surface finish, allowing the use of all packing options offered by VBG Intech and offering the following additional advantages: Two large and widely spaced guides, located out of the flow path along with a large diameter plug stem, comprise the advanced guiding system of the BG Series. The upper guide works as a packing BG Series and, while the lower guide, located next to the plug head, assures a sturdy alignment between the plug and the seat ring.



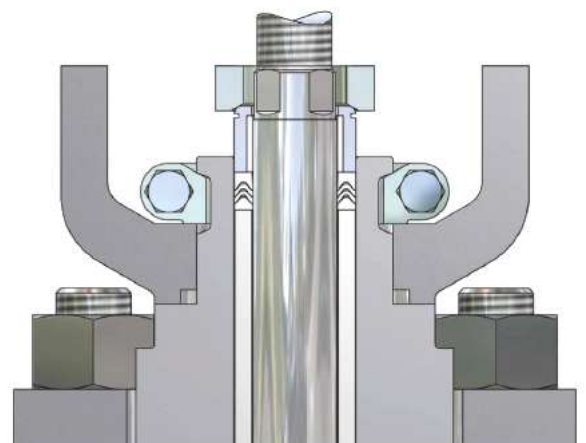
# Gaskets & Clamps

The BG Series is designed with the bonnet gasket totally enclosed. The BG Series valve bonnet has a shoulder projection that doubles as a mechanical stop, limiting the gasket compression. The body, the seat retainer, and the seat itself are machined within tight tolerances to assure proper gasket compression.



**Bonnet & Seat Gasket**

The BG Series actuator is attached to the valve body by means of two yoke clamps, manufactured with investment cast stainless steel. Each clamp has a flat-sloped surface, so when one clamp is bolted to the other, a force is generated, securing the actuator yoke firmly to the valve bonnet. In contrast to threaded clamps, used on conventional control valves, the design of BG Series clamps allows for easy removal, even under severe corrosion conditions. For valves with larger sizes or higher pressure classes, the actuator yoke is bolted directly to the valve bonnet.

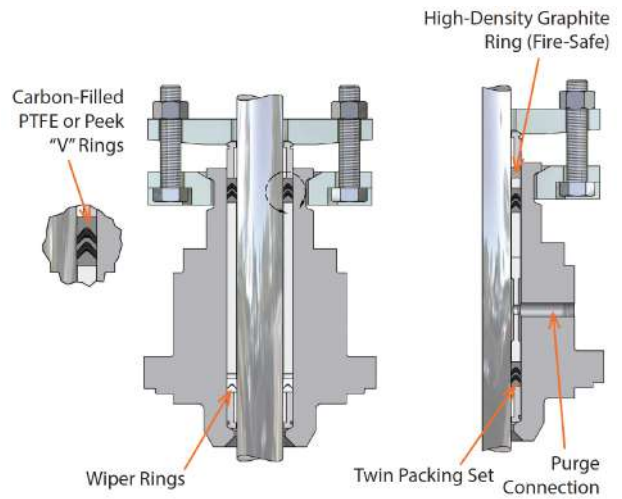




# Packing System

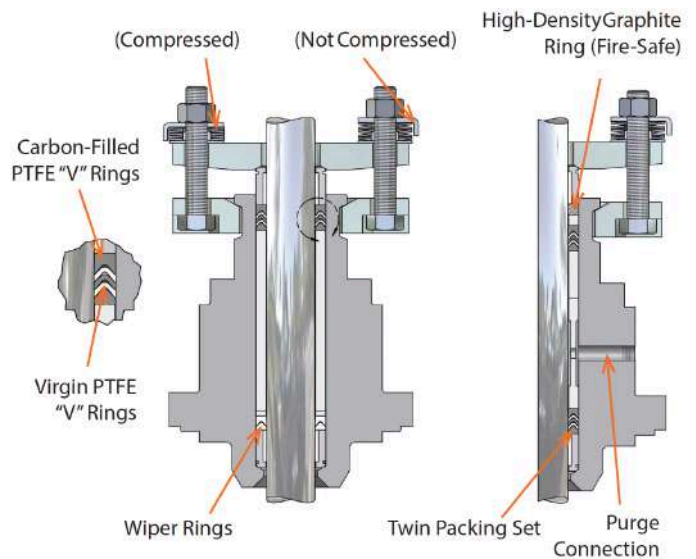
## APPLICATION

The BG Series valve packing box is deep and has an excellent surface finish, allowing the use of all packing options offered by VBG. The spacing between the lower wiper packing set and the upper packing set, which is effectively responsible for stem sealing, is designed to restrict the wetted portion of the plug stem from reaching the upper packing set. Despite globe control are not generally certified for Fire Safe services special packings are some of the arrangements possible to achieve such service.



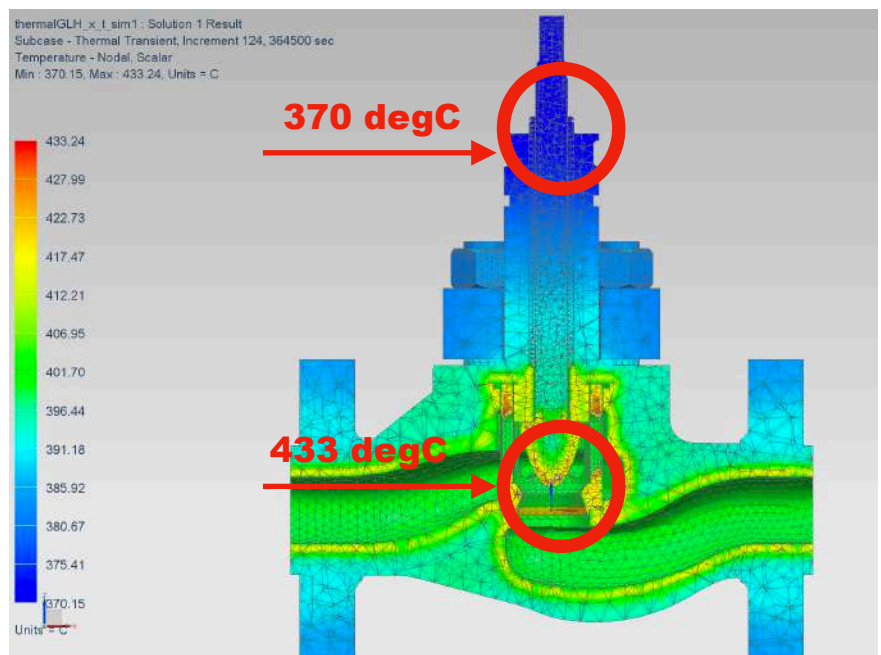
## BLUESEAL PACKING

The VBG Intech recommends BlueSeal range of packing is not designed for Fugitive Emissions control, for that VBG Intech offers the GreenSeal Packing. Composed of virgin PTFE V-rings combined with carbon-filled PTFE V-rings, the Blue Seal packing is optionally compressed by means of Belleville washer set that creates a "live load" effect, and is available for the majority of control valves manufactured by VBG Intech, ensuring that emissions levels are lower than 500 ppm. With a simple configuration that is easy to replace, the Blue Seal packing when live loaded does not require retightening, due to the pressure and temperature variations in the process. Optionally, fire-safe versions of Green packing are available, which guarantee no leaks through the stem, even with damages caused to V-rings by excessive heat.



## GREEN SEAL & SUPERMAX

The VBG Intech's GreenSeal & SuperMax Packing are fugitive emission control packing that ensure emissions levels are maintained lower than 500 ppm.



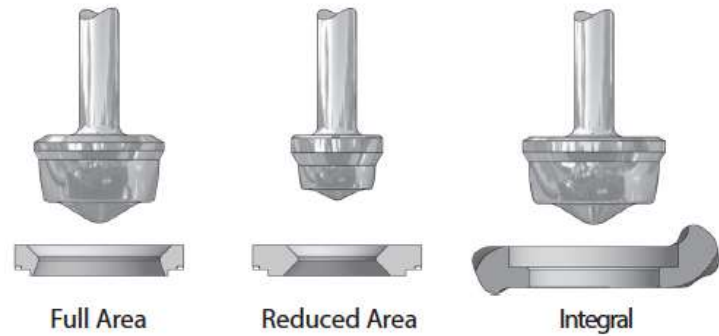
Packing Thermal Analysis

# Trim Characteristic

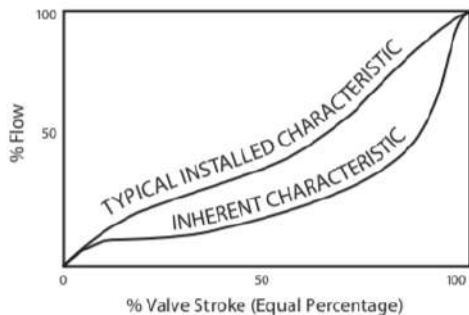
## FLOW

### TRIM SIZE

Two sizes of trim are normally available: the standard size, with full-area trims and the second size, with reduced area trim. Reduced area trims are available in a wide variety of dimensions are available in order to cater the calculated process Cv. In addition to these options, an integral trim may be supplied, which uses a special seat machined onto the valve body and an oversized plug to provide an even larger CV than the CV provided by the standard full-area trim. As the BG Series valve trim is completely interchangeable for a specific body size and pressure class.

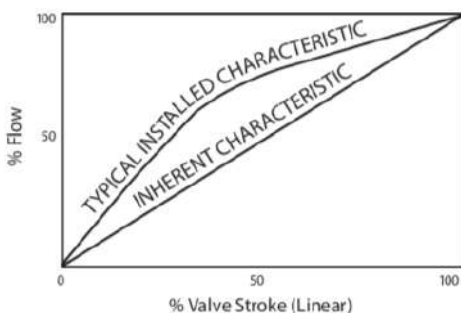


### TYPICAL FLOW CHARACTERISTICS



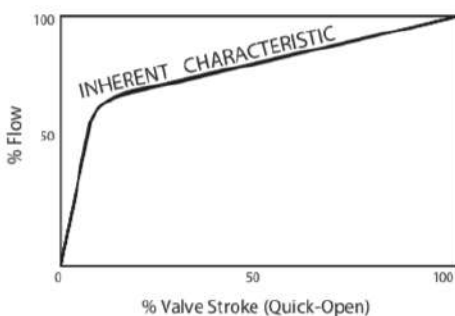
#### EQUAL PERCENTAGE

This is the most common characteristic used in process control. The flow rate change by valve stroke unit is directly proportional to the flow rate passing through the valve at the moment immediately before the stroke movement. Whenever the total differential pressure of the system is large when compared to the differential pressure through the valve, a valve with an Equal Percentage characteristic will perform in most control loops, similarly to a valve with a Linear characteristic.



#### LINEAR

The Linear characteristic creates equal changes in flow rate per unit of valve stroke, regardless of plug position. Linear plugs are frequently used in systems where the differential pressure through the valve corresponds to the major part of the total differential pressure of the system.



#### QUICK-OPEN

Quick-open plugs are used in on-off services and are designed to create large increments of flow rate, even from small opening percentages.

# Trim

## SEAT & PLUG

### METAL SEAT RING

The BG Series valve standard configuration, with an unbalanced trim and metal seat, complies with ANSI B16.104/FCI 70.2 and IEC 60534-4 class IV, which specifies a maximum allowable leakage of 0.01% of nominal valve capacity. The exceptional sealing capacity of the BG Series is easily reached due to its self-centering seat design. Higher seat leakage classes are available as an option.



**METAL SEAT CONFIGURATION**

### SOFT SEAT RING

Soft seats are used in applications requiring extreme tightness, complying with ANSI B16.104/FCI 70.2 and IEC 60534-4 class VI. The BG Series soft seat is composed of a polymer assembled between two metal pieces, and it is interchangeable with the metal seat. The soft seat inserts are usually manufactured in PTFE, and therefore the maximum operating temperature should be lower than 300 °F @ 290 psig (150°C @ 20 Barg). Also available in PTFE, Fiber BG Series ass and PEEK. For temperatures below -85°F (-65°C), soft seats may be used in high-pressure applications.

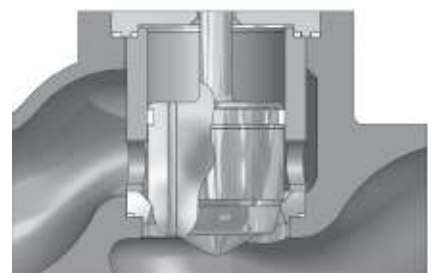
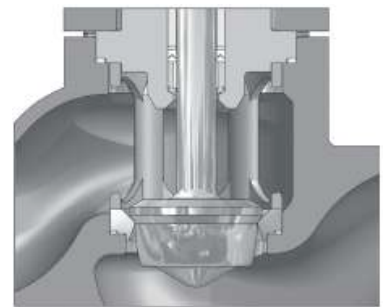


**SOFT SEAT CONFIGURATION**

### UNBALANCED & BALANCED PLUG

The BG Series trim was developed to eliminate issues normally associated with valves with threaded seats or with cage-guided plug designs. Since the seat is fixed onto the body by means of the bonnet and the seat retainer, its removal is quite simple. In contrast to trim with a guide in the seat retainer, which is easily susceptible to wear and jamming, the BG Series trim is guided by a double upper guide system that avoids contact between the seat retainer and the plug. Since there is no direct contact with the plug, the retainer may be manufactured in materials such as stainless steel, instead of costly hardened materials. The flow characteristic is determined by the plug shape, instead of by openings located in the retainer.

For services with very high differential pressures, a pressure-balanced trim design may be used to reduce the thrust needed to stroke the plug through the reduction of off-balance trim areas. Valves with pressure-balanced trim should be used with clean fluids only, considering also that flow direction for the safety fail-closed position is under the plug, and for the fail-open position is over the plug.



# Severe Service

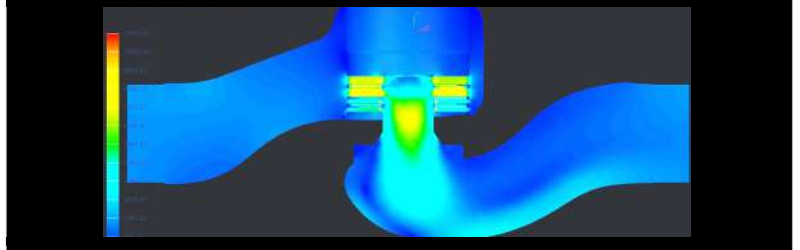
## SPECIAL TRIM



### ShockStream - Anti-Cavitation

Available Sizes:

- 1.00" to 12.00" (150#, 300#, 600#)
- 1.00" to 10.00" (900#, 1500#)
- 1.00" to 6.00" (2500#)



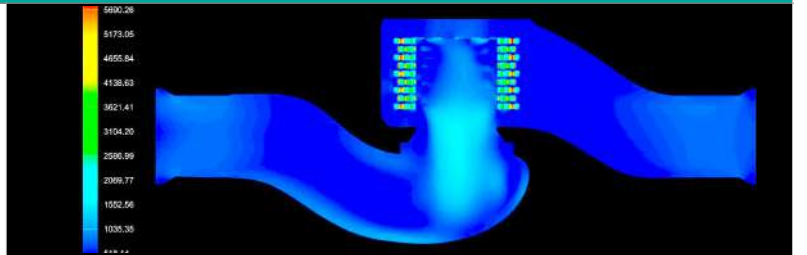
Designed to reduce minor cavitation damage in liquid applications, saving trim and body, the Shock Stream trim is offered as a single stage retainer with diametrically opposed jets that provide cavitation control by containing the cavitation away from the metal boundary layer in the valve retainer. ShockStream is generally offered when the application calls for low or medium-intensity cavitation control. ShockStream is a cage-guided trim that also benefits from VBG Intech's double upper guide system.



### DragonEye - Anti-Cavitation

Available Sizes:

- 1.50" to 42.00" (150#, 300#, 600#)
- 1.50" to 14.00" (900#, 1500#)
- 1.50" to 6.00" (2500#)



Designed for severe service liquid applications, the DragonEye trim is a multi-stage retainer with channels and expansion orifices that provide gradual pressure reduction. The trim is designed to ensure that the fluid pressure will never drop below the vapour pressure. This gradual pressure reduction is carried out by the following mechanisms:

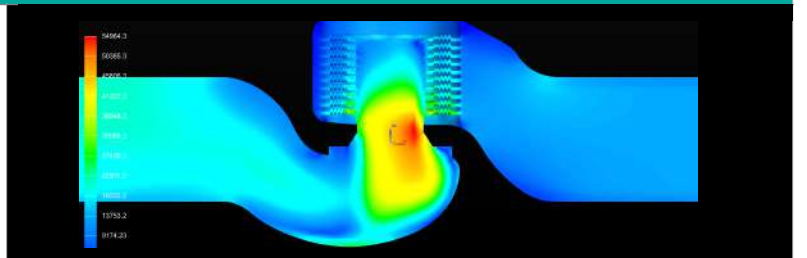
- Sudden expansion of the flow passageway.
- Turbulent mixing in the expansion orifices.
- Multiple small passageways energy losses due to friction.
- Passing thru the retainer, the fluid undergoes several direction.



### FlowShark - Anti-Cavitation & Noise Attenuation

Available Sizes:

- 1.50" to 42.00" (150#, 300#, 600#)
- 1.50" to 12.00" (900#, 1500#)
- 1.50" to 8.00" (2500#)



The FlowShark trim is an advanced severe service retainer (disc stack). It is composed of a series of discs that are made up of highly engineered concentric grooves, used in liquid or gas applications. The principle of operation is based on the gradual reduction of pressure. The pressure drop does not occur only at the vena-contracta, but is also distributed between the disc-stack stages. The fluid passing through each disc-stack stage undergoes sudden expansions and contractions, causing reduction of pressure in steps. The disc-stack retainer handles a considerable part of the total pressure drop, with control pressure ratios (P1/P2) up to 40:1.



# Severe Service

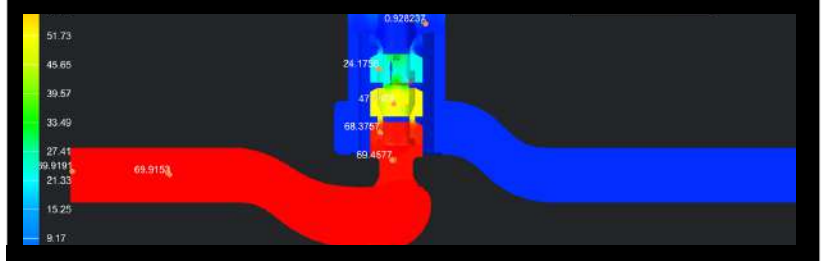
## SPECIAL TRIM



### BG-D - Anti-Cavitation

Available Sizes:

- 1.00" to 42.00" (150#, 300#, 600#)
- 1.00" to 24.00" (900#, 1500#)
- 1.00" to 12.00" (2500#)

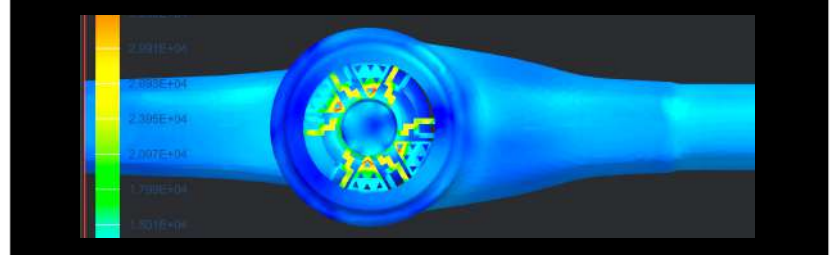


The BG-D trim type is recognised for its high resistance characteristic that control velocity effectively. With its particularity in develop high pressure drop at maximum opening BG-D is a effective trim for application where severe cavitation is expected and high tolerance to solid particles. Designed to cater harsh fluids the BG-D is reliable and easy to maintain.

### RockStack - Anti-Cavitation & Noise Attenuation

Available Sizes:

- 1.00" to 42.00" (150#, 300#, 600#)
- 1.00" to 24.00" (900#, 1500#)
- 1.00" to 12.00" (2500#)

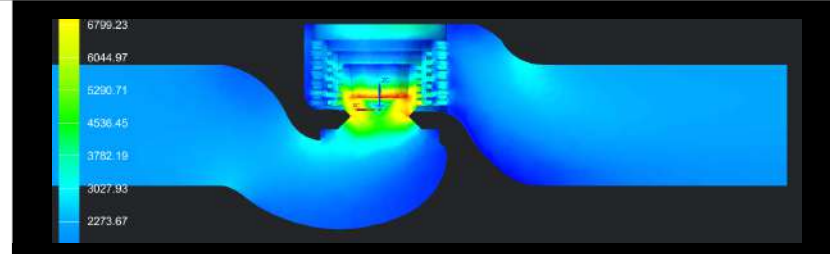


Similar to FlowShark, the RockStack trim takes advantages of the disc-stack technology. Highly engineered flow-path is designed in and implemented in each of the stacks in order to cater the pressure drop demanded for the specific application reducing fluid velocity due its intrinsic characteristic of high resistance trim.

### SonicDark - Noise Attenuation

Available Sizes:

- 1.00" to 12.00" (150#, 300#, 600#)
- 1.00" to 10.00" (900#, 1500#)
- 1.00" to 12.00" (2500#)



Used in gas applications, the SonicDark trim is a multi-hole retainer that absorbs a considerable amount of the total  $\Delta P$  across the valve. Its principle of operation is by the gradual reduction in pressure through the retainer. The pressure drop does not just occur at the vena-contracta, but is distributed across the multiple retainer stages. Gas passing through each attenuator stage experiences sudden expansions and contractions, help reduce the pressure gradually. With the gradual pressure drop, the velocity and turbulence carried into downstream pipes – the main source of noise generation – is controlled, and high noise levels are avoided. Completely compatible with all BG Series valves, for noise attenuation up to 15 dBA. Multi-stage versions can also be offered, for noise attenuation up to 25 dBA.



# Actuators

## DOUBLE ACTING

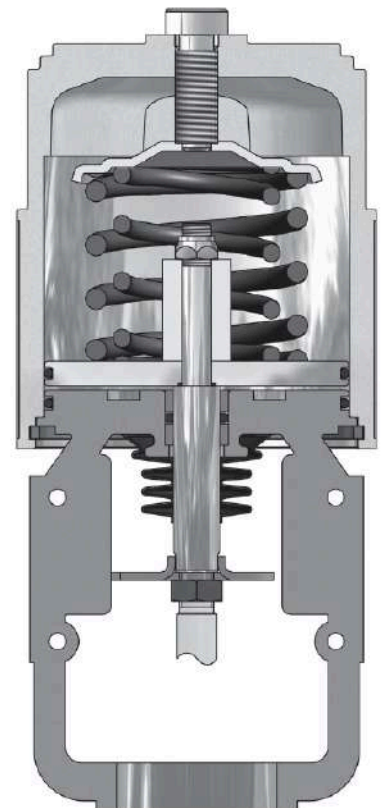
The Hercules HL Series manufactured by VGB Intech is a complete line of linear spring-cylinder actuators recognised by their high performance, actuating thrust, and high control sensitivity. Designed to operate with an air supply pressure of up to 175 psi (12Bar), they are equipped with internal springs to actuate in case of air supply failure and are field reversible, either to air-to-open or air-to-close configuration, without the need of additional parts.

The positioner simultaneously feeds air to both cylinder chambers, maintaining exceptional stiffness. This pneumatic stiffness makes the spring-cylinder actuator a superior choice when an accurate control of valve positioning is required, even when the valve is operating near the closed position.

The spring-cylinder actuators offer several advantages when compared to traditional spring-diaphragm actuators, including: high response frequency; dynamic positioning sensitivity due to the air present on both piston sides; high actuating thrust resulting from the use of air supply pressure up to 175 psi (12 Bar); compact, lightweight, easy, and long-lasting maintenance; Most importantly, the HL series actuators do not have diaphragms that are subject to stress failure and rupture.

ACTUATOR SPECIFICATION	
Type	Double acting piston actuator with spring return at fail position. Field reversible.
Sizes	15, 25, 50, 100, 200, 300, 400, 500, 600
Action	Fail Open, Fail Close, Fail Last Position
Air supply pressure	Up to 175 psi (12 Bar)
Medium	Air, Natural Gas, Nitrogen
Operating Temperature	- 40F to 350 F (-40 degC to 175 degC)

ACTUATOR CONSTRUCTION MATERIAL	
Yoke	Carbon Steel
Actuator Stem	UNS S 41600 Stainless Steel
Piston	Anodized Aluminum
Cylinder	Carbon Steel
O-Rings	BUNA N (Standard)/ Viton (Optional)
Actuator	- 40F to 350 F (-40 degC to 175 degC)
Cylinder Retaining Ring	Zinc-Plated Steel
Spring Button	Carbon Steel
Yoke Clamp	316 Stainless Steel
Adjusting Screw	Zinc-Plated Steel



# Standards

## MANUFACTURING STANDARDS

VBG Intech manufacture control valves in compliance with relevant standards for the control valves industries

- IEC 60534 - Control Valves - Selection, Sizing & Specification
- IEC 60534-4 - Inspection & Routine Testings
- ASME B16.5 - Pipe Flanges and Flanged Fittings
- ASME B16.34 - Valves - Flanged, Threaded and Welding Ends
- ISO 15848 - Measurement, Test and Qualification for Fugitive Emissions
- ANSI/FCI 70-2 - Control valve Seat Leakage

# Easy Maintenance

## CONTROL VALVES

RECOMMENDED SPARES *			
ITEM	Commissioning Spares	2 Years Operation Spares	5 Years Operation Spares
Gaskets	✓	✓	✓
Packing	✓	✓	✓
Stem Guide Liners			✓
Seat Ring			✓
Plug			✓
Actuator O-rings		✓	✓
Actuator Bushings		✓	✓

\* Recommended Spares for non-critical service. For certain critical services trims may be replaceable upon application.

# Selection

## DATA

BODY MATERIAL		
MATERIAL	TEMPERATURE LIMITS	
	°F	°C
Carbon Steel ASTM A216 Gr WCB/WCC	-20 / 1000	-28 / 537
Carbon Steel ASTM A352 Gr LCB/LCC	-50 / 650	-45 / 343
Chrome-Moly ASTM 217 Gr WC6	-20 / 1000	-28 / 537
Chrome-Moly ASTM 217 Gr WC9	-20 / 1050	-28 / 565
Stainless Steel ASTM A351 Gr CF8M	-425 / 1500	-253 / 815
Duplex ASTM A995 Gr 4A	-425 / 1500	-253 / 815
Super Duplex ASTM A995 Gr 5A/6A	-425 / 1500	-253 / 815
Monel ASTM A494 M35-1	-325 / 900	-198 / 482
Inconel 635, ASTM A494 CW6MC	-325 / 1200	-198 / 482
Bronze B148-C95800	-325 / 550	-198 / 482
Nickel	-325 / 500	-198 / 482
Alloy 20	-50 / 300	-45 / 148
Hastelloy C	-325 / 1000	-198 / 482

BODY CONFIGURATION		
TYPE	SIZES	PRESSURE CLASS
BG-S - Globe type	0.5in to 48in	150# to 600#
BG-H - Globe type	1in to 24in	900# to 2500#
BG-L - Globe type	0.5in to 4in	150# to 300#
BG-R - Bar stock globe type	0.5in to 4in	150# to 4500#
BG-A - Angle type	1in to 24in	150# to 2500#
BG-3 - Globe 3 ways type (Converging/ Diverging)	1in to 24in	150# to 2500#
BG-M - Globe type only manual operated	1in to 8in	150# to 2500#
BG-C - Cryogenic globe type	1in to 12in	150# to 600#
BG-Y - Y-Pattern type	1in to 24in	150# to 2500#

BONNET FLANGE & BOLTING SPECIFICATION			
BONNET FLANGE (STANDARD)	BONNET FLANGE (OPTIONAL)	BONNET FLANGE STUDS & NUTS (STANDARD)	BONNET FLANGE STUDS & NUTS (OPTIONAL)
Carbon Steel	Stainless Steel or same material as body	ASTM A193 Gr B7M/ ASTM A194 Gr 2HM	304 or 316 Stainless Steel

DIFFERENTIAL PRESSURE VALUES REQUIRING HARDENED TRIM																					
VALVE SIZE (INCH)	Water				Steam (Saturated)				Steam (Super-heated)				Process Fluids (General)				Clean Gases				
	Throttling		On-Off		Throttling		On-Off		Throttling		On-Off		Throttling		On-Off		Throttling		On-Off		
	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi
0.5 to 1.5	175	12.1	250	17.2	100	6.9	200	13.8	300	20.7	600	41.4	175	12.1	250	17.2	600	41.4	900	62.1	
2 & 3	150	10.3	200	13.8	25	1.7	50	3.4	200	13.8	300	20.7	150	10.3	200	13.8	350	24.1	600	41.4	
4 & 6	100	6.9	125	8.6	All	All	25	1.7	100	6.9	150	10.3	75	5.2	1256	8.6	200	13.8	300	20.7	
8 & 12	50	3.4	100	6.9	All	All	All	All	50	3.4	100	6.9	50	3.4	100	6.9	125	8.6	175	12.1	
14 & above	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F	C/F

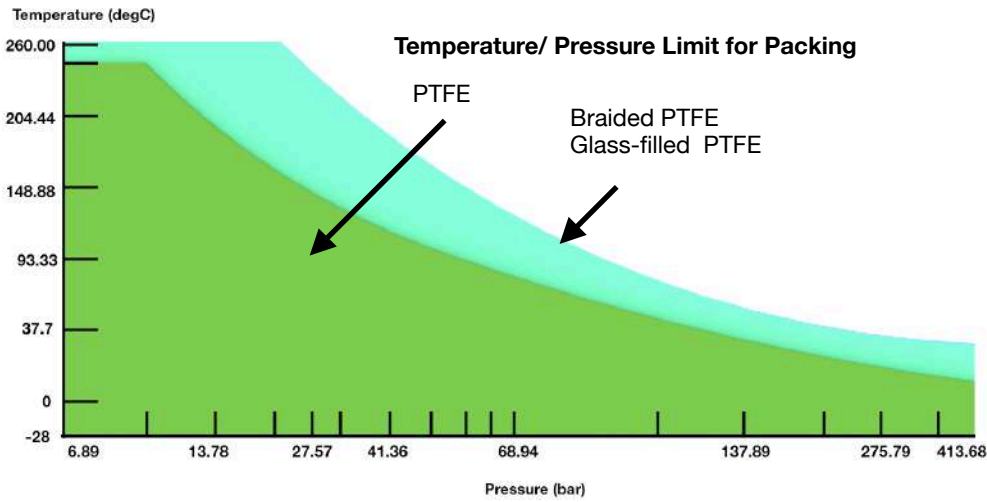
TRIM MATERIAL CHARACTERISTIC							
TRIM MATERIALS	HARDNESS (RC)	MAXIMUM RECOMMENDED TEMPERATURE		IMPACT STRENGTH	CORROSION RESISTANCE	EROSION RESISTANCE	ABRASION RESISTANCE
		°F	°C				
316 Stainless Steel	8	600	316	Excellent	Excellent	Fair	Fair
Alloy 6	44	1500	815	Excellent	Excellent	Good	Good
416/ 420 SS Heat Treated	40	800	426	Good	Fair	Good	Good
17-4 PH (H900)	44	800	426	Good	Good to excellent	Good	Good
440C Stainless Steel	55 - 60	800	426	Fair	Fair	Excellent	Excellent
Monel K-500	32	600	316	Good	Good to excellent	Fair to Good	Good
Tungsten	72	1200	650	Fair	Good on bases, poor on acids	Excellent	Excellent
Colmonoy 5	45 - 50	1200	650	Good	Fair	Good	Good

APPLICABLE LEAKAGE CLASSES FOR CONTROL VALVES	
LEAKAGE CLASS	ALLOWABLE LEAKAGE
Class I	As agree between manufacturer and customer.
Class II	Maximum 0.5% of the rated flow capacity of the valve
Class III	Maximum 0.1% of the rated flow capacity of the valve
Class IV	Maximum 0.01% of the rated flow capacity of the valve
Class V	Maximum 10.8 x 10 <sup>-6</sup> x 10 <sup>-6</sup> x (seat diameter in mm) Nm <sup>3</sup> /hr
Class VI	As per IEC 60534-4, Table 3

### FLOW COEFFICIENT (Cv)

Consult VBG Intech Cv Library.





BONNET		
MATERIAL	TEMPERATURE LIMITS	
	°F	°C
Standard	-20 / 750	-28 / 400
Extended carbon steel	-20 / 800	-28 / 426
Extended in stainless steel	-150 / 1500	-100 / 815
Cryogenic	-425 / 750	-253 / 400
Bellows Seal	CF	CF

PACKING			
BONNET TYPE	PACKING MATERIAL	TEMPERATURE LIMITS	
		°F	°C
Standard	Blue Seal - PTFE V Rings	-20 / 450	-28 / 232
	Blue Seal GF - Glass Filled PTFE	-20 / 500	-28 / 260
	Blue Seal BVG- Braided Virgin Graphite	-20 / 752	-28 / 400
	GreenSeal - "V" Ring Carbon Filled + PTFE Filled single	-20 / 630	-28 / 332
	GreenSeal SuperMax - Braided Exfoliated Reinforced Graphite	-328 / 390	-200 / 325
	GreenSeal SuperPlus - Exfoliated Reinformed Graphite + Inconel Wire (FS)	-328 / 752	-200 / 400
Extended	Blue Seal	-150 / 600	-100 / 316
	Blue Seal BVG	-20 / 1500	-28 / 815
	Blue Seal BGIW	-20 / 1200	-28 / 650
	GreenSeal Plus	-150 / 600	-100 / 316
	GreenSeal SuperMax	-150 / 600	-100 / 316
	GreenSeal SuperPlus	-20 / 1500	-28 / 815
Cryogenic	PTFE, with 15 or 18 in. extension length	-320	-196
	PTFE, with 24 or 27 in. extension length	-425	-253

PLUG BALANCING SEALING				
MATERIAL	TEMPERATURE LIMITS		SHUTOFF CLASS	
	°F	°C	WITH METAL SEAT	WITH SOFT SEAT
PTFE	0 / 350	-18 / 176	Up to 10% of Class IV	Up to 1% of Class IV
Reinforced PTFE	0 / 400	-18 / 204	Up to 10% of Class IV	Up to 1% of Class IV
Buna-N O-Ring	-40 / 200	-40 / 93	Class IV or V	Class VI
Viton A O-Ring	-10 / 400	-223 / 204	Class IV or V	Class VI
Metal Sealing	300 / 1600	149 / 871	Class IV	Not Applicable

SEAT GASKET & BONNET GASKET			
MATERIAL	TEMPERATURE LIMITS		PRESSURE LIMITS
	°F	°C	
PTFE	-200 / 350	-130 / 177	6000 psi @ -200°F (415 Bar @ -130°C) / 1000 psi @ 350°F (69 Bar @177°C)
304 SS/ Graphite (Spiral Wound)	-320 / 750	-196 / 400	6250 psi (431.0 Bar)
316 SS/ Graphite (Spiral Wound)	-320 / 1000	-28 / 538	6250 psi (431.0 Bar)
KEL-F	-320 / 350	-196 / 177	6000 psi @ -320°F (415 Bar @ -196°C) / 1000 psi @ 350°F (69 Bar @177°C)
PTFEG	-200 / 450	-130 / 232	6000 psi @ -200°F (415 Bar @ -130°C) / 500 psi @ 450F (35 Bar @232°C)
Hollow O-Ring	-20 / 1500	-28 / 815	15000 psi (1034 Bar)

STEM GUIDE RETAINER & STEM GUIDE INSERTS			
MATERIAL	TEMPERATURE LIMITS		PRESSURE LIMITS
	°F	°C	
Stainless Steel with Graphite Insert	-320 / 1500	-196 / 815	1000 psi (69.0Bar) for sizes up to 2 inch
			600 psi (41.4 Bar) for sizes 3 and 4 inch
			500 psi (34.5 Bar) for sizes 6 inch and larger
Stainless Steel with PTFEG Insert	-20 / 300	-28 / 150	850 psi @100F (58.6 Bar @38C); 100 psi @300F (6.9 Bar @150C)
Solid Bronze	-425 / 500	-253 / 260	Body rating
Solid Alloy 6	-425 / 1500	-253 / 815	Body rating

END CONNECTIONS			
TYPE OF END CONNECTIONS	VALVE SIZE (INCHES)	ANSI CLASS	STANDARD FACE-TO-FACE
Separable Flanges	0.5 to 4	150 - 600	ISA 75.08.07
Integral Flanges *	0.5 to 48	150 - 600	ISA 75.08.01/ IEC 60534-3-1
NPT Threaded	0.5 to 2	150 - 600	ISA 75.08.03
Socketweld (SW)	0.5 to 4	150 - 600	ISA 75.08.03
Buttweld (BW)	0.5 to 36	150 - 600	ISA 75.08.05
Customized			

\*For sizes not available on ISA or IEC refer to EN 558 Standard.

PAINTING			
PAINTING TYPE	BODY COLOR	ACTUATOR COLOR	Thickness for body only
Standard (from -29°C to 120°C)	White RAL9010	Yellow Sun RAL1037	Minimum 200 µm
Offshore (from -29°C to 120°C)	White RAL9010	Yellow Sun RAL1037	Minimum 280 µm
Onshore/ Offshore (from 120°C to 120°C)	Gray	Yellow Sun RAL1037	150 µm
Onshore/ Offshore 200 to 450)	Aluminum RAL9006	Yellow Sun RAL1037	125 µm

RANGEABILITY
30:1 Typical

SPECIAL TRIM CONFIGURATION				
TRIM TYPE	SEVERE SERVICE	APPLICATION	STAGES	FLOW DIRECTION
ShockStream	Incipient cavitation	Clean liquids with irrelevant solid particles size	Single-stage pressure reduction	Over
DragonEye	Moderate cavitation	Clean liquids	Multi-stage pressure reduction	Over
FlowShark	Severe cavitation & noise attenuation	Clean liquids with irrelevant solid particles size	Multi-stage pressure reduction	Under
RockStack	Severe cavitation & noise attenuation	Clean liquids with irrelevant solid particles size	Multi-stage pressure reduction	Under
BG-D	From incipient to severe cavitation	Liquids with relevant solid presence	Multi-stage pressure reduction	Under
SonicDark	Noise attenuation	Clean gases with irrelevant solid particles size	Multi-stage pressure reduction	Under
SonicDark Plate	Noise attenuation	Clean gases with irrelevant solid particles size	Multi-stage pressure reduction	Upstream of the control valve

FLOW CHARACTERISTIC	
TYPES	RECOMMENDED CONTROLLABILITY OPENING
Equal Percentage	Minimum 10%/ Maximum 85%
Linear	Minimum 10%/ Maximum 90%
Quick-Opening	Maximum opening (not recommended for control)
Modified Linear	Customized
Modified Equal Percentage	Customized
Customized	Customized

ACTUATOR SEALING MATERIAL		
TRIM MATERIALS	MAXIMUM RECOMMENDED TEMPERATURE	
	°F	°C
BUNA N	-20 to 350	-29 to 177
VITON A	-20 to 185	-29 to 85

RECOMMENDED FLOW DIRECTION TO REDUCE THRUST NEEDED FROM ACTUATOR		
TRIM TYPE	FAIL POSITION	
	CLOSE	OPEN
Standard Unbalanced	Over	Under
Standard Balanced	Under	Close
ShockStream & DragonEye Unbalanced	Over	Over
ShockStream & DragonEye Balanced	Over	Over
FlowShark, RockStack, SonicDark Unbalanced	Under	Under
FlowShark, RockStack, SonicDark Balanced	Under	Under

MAXIMUM STROKING TIME (critical condition)	
VALVE SIZE (INCHES)	MAXIMUM STROKING TIME
≤ 2.00"	10 seconds
3.00"	15 seconds
4.00"	15 seconds
6.00"	20 seconds
8.00"	35 seconds
10.00"	50 seconds
> 10.00"	Consult factory

FACE-TO-FACE FOR GLOBE CONTROL VALVES (IEC 60534-3-1 AND EN 558)*						
VALVE SIZE (INCH)	Pressure Class					
	150	300	600	900	1500	2500
0.5	184	190	203	-	-	-
0.75	184	194	206	-	-	-
1	184	197	210	292	292	318
1.5	222	235	251	333	333	381
2	254	267	286	375	375	413
3	298	318	337	441	460	660
4	353	368	394	511	530	737
6	451	473	508	714	768	864
8	543	568	610	914	972	1022
10	673	708	752	991	1067	1372
12	737	775	819	1130	1219	1575
14	889	927	972	1025	1257	1803
16	1016	1057	1108	1150	1422	**
18	1200	1200	1275	1275	1727	**
20	1400	1400	1400	1400	**	**
24	1752	1752	**	**	**	**

\* Dimensions in mm.  
\*\* Consult Factory.

ACTUATOR				
ACTUATOR SIZE	TUBING & FITTINGS	SPRING	CONSTRUCTION	HANDWHEEL (OPTIONAL)
Hercules M	Not applicable	Not applicable	Gear Box	Top mounted & top operated
Hercules 15	1/4"NPT	Single, Dual	Retainer ring type	Not applicable
Hercules 25	1/4"NPT	Single, Dual	Retainer ring type	Size mounted & side operated
Hercules 50	1/4"NPT, 3/8"NPT	Single, Dual, SHD	Retainer ring type	Size mounted & side operated
Hercules 100	3/8"NPT	Single, Dual, Heavy Duty, SHD	Retainer ring type	Top mounted & side operated
Hercules 200	3/8"NPT, 1/2" NPT	Single, Dual, Heavy Duty, SHD	Retainer ring type	Top mounted & side operated
Hercules 300	1/2"NPT	SHD	Rod type	Top mounted & side operated
Hercules 400	1/2"NPT	SHD	Rod type, Tandem	Top mounted & side operated
Hercules 500	1/2"NPT	SHD	Rod type	Top mounted & side operated
Hercules 600	1/2"NPT	SHD	Rod type, Tandem	Top mounted & side operated

For Electrical and electro-hydraulic actuators consult a VBG specialist.

HYDROSTATIC PRESSURE
ANSI B16.34/ IEC 60534-4
API 598



# Quality

## ASSURED

VBG Intech has a complete test facility able to attend to even the most demanding customers.

Dye Penetrant  
 UTG  
 PMI (w/ Carbon)  
 Shell Hydrotest  
 Assembled Hydrotest  
 Seat Leak Test  
 Positioner Step Response  
 Functional Test  
 Actuator Leak Test

Actuator Stroke Time  
 Packing Leak Test  
 Fugitive Emission  
 Cryogenic Test  
 Raw Material Inspection  
 Dimension Inspection  
 Open & Close Time  
 And others...



Lloyd's  
Register

Current issue date: 27 April 2021  
 Copy date: 2 February 2021  
 Certificate expiry number: 18362967

Original approval:  
 ISO 14001 - 2 February 2015  
 ISO 9001 - 2 February 2015  
 ISO 45001 - 27 April 2021

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## Certificate of Approval

This is to certify that the Management System of:

### VBG Intech Valves Manufacturing L.L.C.

Binghalib Building 24th B Street, Bin Ghalib Compound Al Qusais Industrial Area, Dubai, United Arab Emirates

has been approved by Lloyd's Register to the following standards:

ISO 14001:2015, ISO 9001:2015, ISO 45001:2018

Approval number(s): ISO 14001 – 0046195, ISO 9001 – 0046196, ISO 45001 – 0046197

The scope of this approval is applicable to:

Design, Development, Manufacturing and Testing of Control Valves



**Luis Cunha**  
 Area Operations Manager - SAMEA  
 Issued by: Lloyd's Register Quality Assurance Limited



U.K.A.S.  
ACCREDITED  
021

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Page 1 of 1



# OUR PRESENCE



PULP &  
PAPER

MINING

POWER

FOOD  
& BEVERAGE

FERTILIZER

OIL & GAS



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PASSION FOR FLOW

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VBG Intech Valves Manufacturing LLC  
Al Qusais Industrial Area 4  
Dubai, United Arab Emirates  
Tel +971 4 207 3933  
[info@vbgintech.com](mailto:info@vbgintech.com)  
[www.vbgintech.com](http://www.vbgintech.com)



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