

# Severn Glocon Series 3000 Cryogenic Valve for Ratings ANSI 150 – 600



## Specification Bulletin SG 300

### Application

The Severn Glocon Series 3000 was initially developed over three decades ago specifically for installation in cryogenic cold box's. As such the Series 3000 now benefits from extensive experience in providing cost effective and easily maintained valves in an industry which makes stringent demands upon its suppliers. Construction materials of the body are generally aluminium or stainless steel to suit adjoining pipework, while the fully machined flowpath minimises particle pick up and ensures a degree of cleanliness necessary for the Industrial Gas Market.

### Design Features

- Smooth profile barstock globe, angle and 3-way body construction.
- Extension & body lengths to suit installation.
- Cold box flange adjustable or welded.
- Screwed in seat standard, cage trim options.
- Large choice of trim sizes available with low noise and anti-cavitation options.
- Robust parts for trouble free service and low cost of ownership.
- Inherently characterised trims available in linear, equal percentage or semi-throttle.
- Cleaned and degreased for Oxygen service as standard.
- Soft seat insert option for ANSI Class VI.
- Various options of weld end connection.

### Benefits

- Top-entry servicing with direct access to plug and seat.
- Reduced inspection and maintenance costs.
- Extensive trim selection.
- Excellent flow capacity and control rangeability.
- Reliable leakage performance, bubble tight shut off available.
- High interchangeability between sizes and other products.
- X – ray option available on all welds.

### Quality Engineered

- Rigorously proven on-site performance
- BS EN ISO 9001 1994, Certificate No. FM01959.



Figure 1. Severn Glocon Series 3310 Globe Valve

## Engineering Data - Severn Glocon Series 3300 Valve

### General

The Series 3300 range of bar stock valves was developed to provide a cost effective, reliable and easily maintained control valve capable of being applied in a flexible manner to accommodate various approaches to insulated pipework design. This series of valves is used extensively in the Air Separation Market and therefore all valves are cleaned and assembled suitable for Oxygen service as standard

The quick-change trim option provides for easily accessible seat and trim components to minimise any parts replacement times.

Heavy stem guided contoured trim configuration gives excellent rigidity and resistance to vibration and service wear. The valve is also designed to accommodate other products within the Severn Glocon range e.g C.C. cages, and anti-cavitation trims.

### End Connection Sizes

½ in (12mm) – 10 in (250mm)

### Design Standards

ANSI B16.34 & Design rated.

### Valve Body Ratings

ANSI 150 – ANSI 600 lb.

### Body Face to Face Dimensions

Severn Glocon standard.

### Body Configurations

Z pattern globe, angle & 3-way.

### Body / Seat Gaskets

PTFE, Spiral wound PTFE,  
Metal O ring.

### Bonnet

Cryogenic extended stem

### Bonnet Packing

Braided PTFE  
PTFE chevrons  
Graphite  
Low Emission

### Trim Options

Unbalanced contoured, cage,  
Multi – step & trickle  
See table 2&3 for materials.

### Inherent Trim Characteristics

Equal %, Linear, Semi – throttle.

### Sizing and Noise Reduction

See SG10 and Sizing Programme.

### Actuation

Various types of actuation are available including:-  
Series P Linear spring return pneumatic cylinder and  
manually operated versions are available.

See Bulletin SGP 10

### Instruments

A wide range of control instruments are available  
from Severn Glocon including:-

Positioners, Volume Boosters, Solenoid Valves,  
Switches, Air-filter Regulators etc.

### Materials of Construction

The standard body materials are Aluminium and  
Stainless Steel with other options as required.

For full listing see table 1

### Temperature Range

-196°C to 220°C ( -320° F to 428° F )

For temperatures outside this range consult factory.

### Available Connection Styles:

End Connection:	Valve Size:	Rating
Screwed	½ - 2 ins	150-600lb
Socketweld	½ - 2 ins	150-600lb
Buttweld	2 – 10 ins	150-600 lb
Pipe Stubs	All sizes and ratings	

### Maximum Plug/Seat Leakage Class

ANSI/FCI 70.2 Class IV as standard  
Class VI with soft seat.

## Valve Body Style Options

The Severn Glocon Series 3300 barstock valve is available in three body styles of either Z pattern globe, angle or 3-way. Within the long and short Z pattern globe style bodies there are numerous options of body length to suit pipework location.

Many parts are interchangeable with the exception of the valve bodies. The angle pattern has an optional venturi seat which may be specified in order to provide additional protection to the valve outlet.

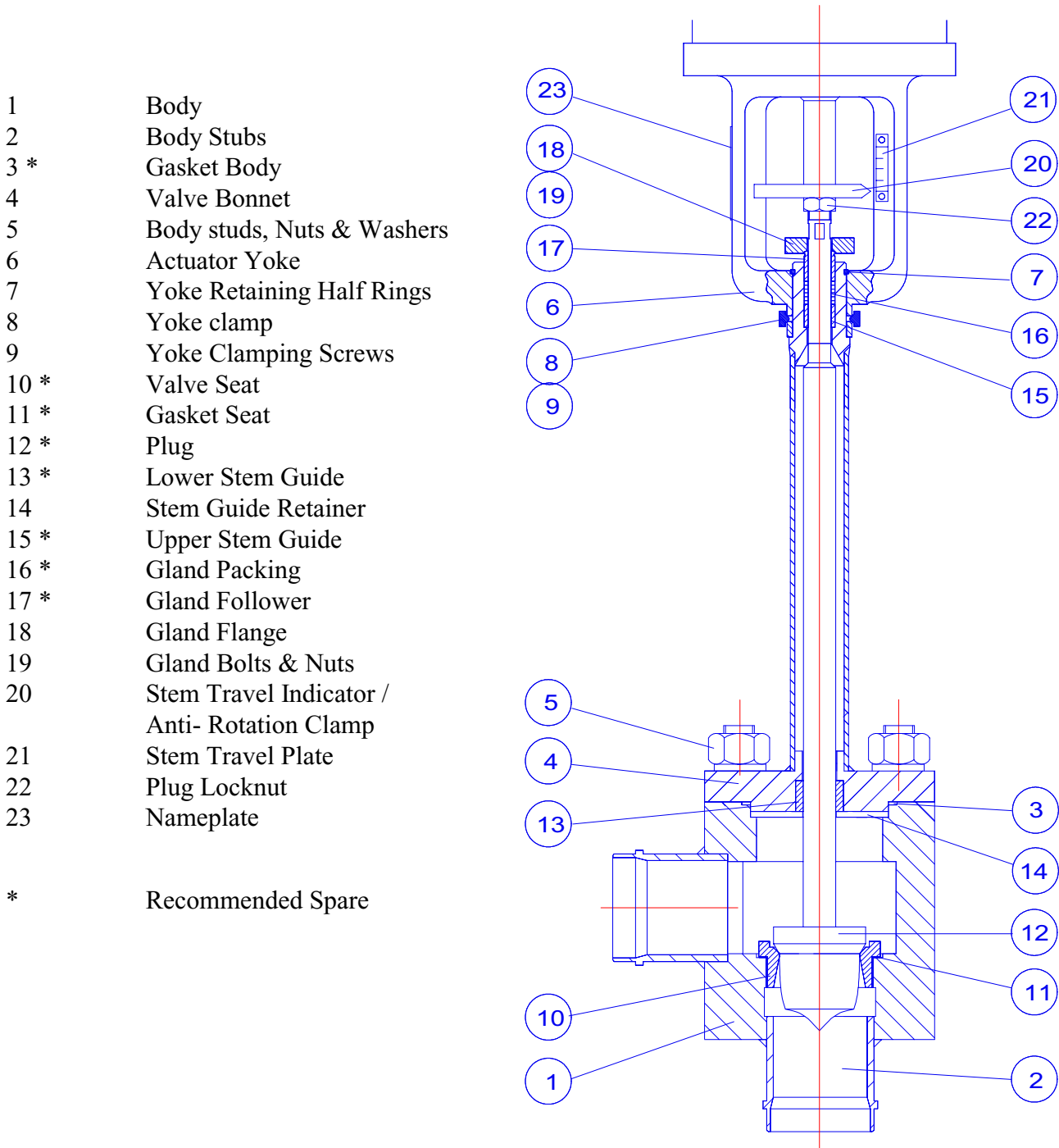


Fig 2. Series 3330 Angle Style Body.

## Valve Body Style Options Continued

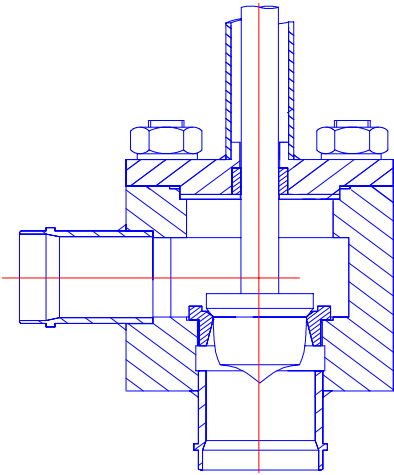


Fig 3. Series 3350 Short Globe Body .

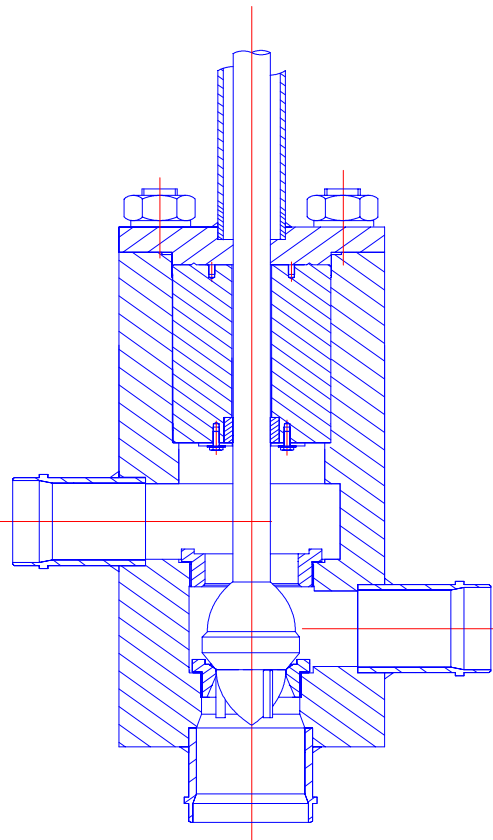


Fig 4 Series 3320 3 way Style Body

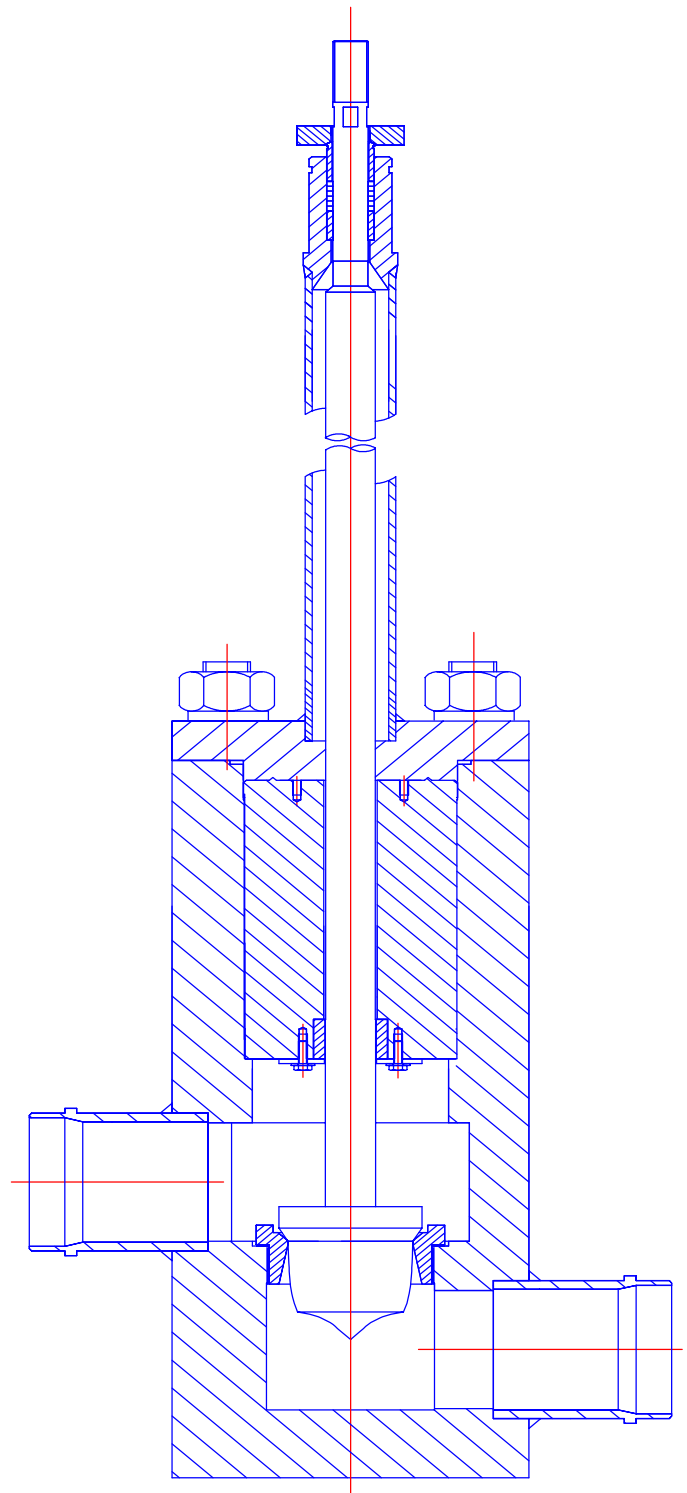


Fig 5 Series 3380 Long Globe Body

### **Standard Cryogenic Bonnet.**

The standard bonnet enables the forming of a deep packing box together with a long guide housing, thereby providing a robust and vibration resistant assembly that can allow gassing off to occur which protects the packing from coming into contact with liquid gas. Teflon rings are the standard packing. Application temperature for the standard bonnet -196°C up to 220°C.

### **Cold Box Flanges.**

A sliding weather proof or welded cold box flange of any size or shape can be fitted as required.

**Table 1. Materials of Construction**

Valve Body Material	Bonnet	Valve Plug / Stem Assembly	Seat Ring	Soft Seat Option	Cage Option
Aluminium ASTM 5083	Stainless Steel (AISI 321)	Stainless Steel (AISI 316)	Stainless Steel (AISI 321)	PTFE	Stainless Steel (AISI 321)
Stainless Steel	Alloy Steel	Stainless Steel / HT Brass	HT Brass	PCTFE (KELF)	Monel
Monel		Stainless Steel / Stellite 6	Stainless Steel / Stellite 6	Copper	Alloy steel
HT Brass		Monel	Monel	Aluminium	H T Brass
Alloy Steel		Alloy Steel	Alloy Steel		

**Severn Glocon Series 3000 – Design Cv Values**

**Flow Coefficient Cv**

The values detailed in the tables are stated in US units. The figures by definition are related to the flow of water (SG=1) through the valve at full lift in US Gallons per minute with a pressure drop of 1lb/in<sup>2</sup>.

**Table 2. Contoured and Multi-step Trims.**

Valve Size		Available Trim Cv's													
ins	mm	0.01	0.05	0.10	0.15	0.25	0.5	2.5							
1½	12	<b>0.01</b>	<b>0.05</b>	<b>0.10</b>	<b>0.15</b>	<b>0.25</b>	<b>0.5</b>	2.5							
¾	20	<b>1</b>	<b>1.5</b>	<b>2.5</b>	<b>4</b>	<b>7</b>									
1	25	<b>1</b>	<b>1.5</b>	<b>2.5</b>	<b>4</b>	<b>7</b>	15								
1½	40				<b>4</b>	<b>7</b>	16	20	30						
2	50						16	20	30	50					
3	80							20	30	50	80	120			
4	100									50	80	120	195	215	
6	150										120	215	325	400	440
8	200											215	325	440	650
10	250											325	440	650	1000

Note: Multi-step trim range in bold digits. For other options - Consult Factory.

**Table 3. Single Stage Cage Trims.**

Valve Size	ins	mm	Available Trim Cv													
1	25				<b>4</b>	<b>7</b>	<b>15</b>									
1½	40					<b>15</b>	<b>20</b>	<b>30</b>								
2	50						20	30	50							
3	80							50	75	110						
4	100							50	75	110	195					
6	150								110	195	275	400				
8	200											400	650			
10	250											650	1000			

Note: For valve and trim sizes outside this range - Consult Factory

## Actuator selection

**Table 4. Series P Actuators – Cylinder and Stem Size Details**

Valve Size	Actuator Dimensions			Effective Area of cylinders		Stem Dimensions		Max Vol O/Piston Cu cms
	Model	Stroke mm	Diameter cms	Upper Area Sq cm	Lower Area Sq cm	Stem Dia cm	Stem Area Sq cm	
1/2"-1"	A	20	15.2	182	179	1.90	2.80	1,721
1 1/2"	A	20	15.2	182	179	1.90	2.80	1,721
2"	A	20	15.2	182	179	1.90	2.80	1,721
1 1/2"	B	25	20.3	325	316	3.17	7.7	4834
2"	B	25	20.3	325	316	3.17	7.7	4834
3"	B	25	20.3	325	316	3.17	7.7	4834
4"	B	25	20.3	325	316	3.17	7.7	4834
3"	C	63	30.5	729	718	3.81	11.60	15,239
4"	C	63	30.5	729	718	3.81	11.60	15,239
6"	C	63	30.5	729	718	3.81	11.60	15,239
8"	C	63	30.5	729	718	3.81	11.60	15,239
6"	D	125	40.6	1271	1258	5.72	25.70	54,732
8"	D	125	40.6	1271	1258	5.72	25.70	54,732
10"	D	125	40.6	1271	1258	5.72	25.70	54,732

**Table 5. Maximum Available Seating Thrust Lbf**

Supply Pressure PSIG	Actuator Size				Actuator Size			
	Standard Spring – Air Fail Close				Standard Spring – Air Fail Open			
	A	B	C	D	A	B	C	D
40	1428	2780	5550	8320	663	1387	1987	6620
60	1985	3270	7780	12,180	1,220	2,367	4,205	10,480
80	2,540	4,250	10,000	16,040	1,776	3,348	6,432	14,340
100	3,098	5,230	12,230	19,900	2,333	4,329	8,659	18,200
150	4490	7,680	17,800	29,550	3,724	6,780	14,226	27,850

Note: The air pressure is applied above the piston in each case

**Table 6. Weights**

Size	1/2"-1"	1.5"	2"	3"	4"	6"	8"	10"
Weight lbs	59	75	84	138	143	278	450	500
“ kg	27	34	38	63	65	126	204	226.7

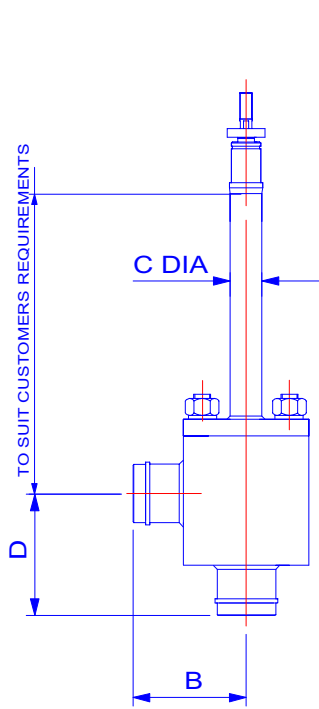
Note: Weights apply to short body globe valve, actuator, positioner and airstet.

**Table 7. Model Numbering for Series 3000 Valve**

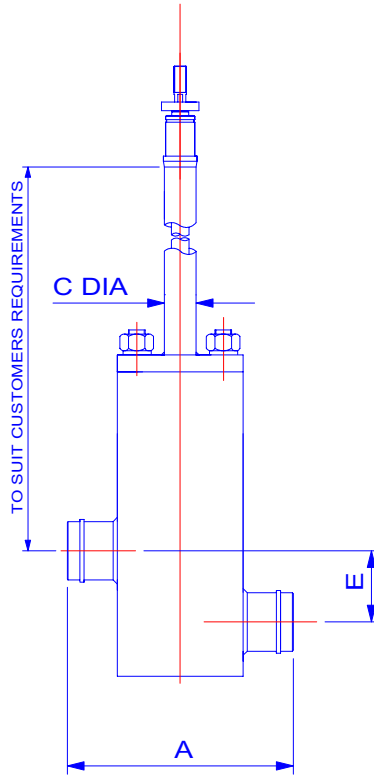
Product Family	Style	Pressure Group
<b>33</b>	<b>2</b> 3-Way	<b>0</b> ANSI 125
	<b>3</b> Angle	<b>1</b> ANSI 150
	<b>5</b> Z Pattern	<b>2</b> ANSI 300
	<b>8</b> Long Z Pattern	<b>3</b> ANSI 600
Product Type	Size	Ancillaries
<b>M</b> Manual Handwheel	<b>A</b> 25 SQ"	<b>H</b> Side Mounted H/W
<b>P</b> Pneumatic Cylinder	<b>B</b> 50 SQ"	<b>T</b> Top Mounted H/W
	<b>C</b> 100 SQ"	<b>J</b> Top Mounted Jacking Screw
	<b>D</b> 200 SQ"	<b>M</b> Limit Stop – Max
		<b>L</b> Limit Stop – Min

Example Model No 3321P2AN

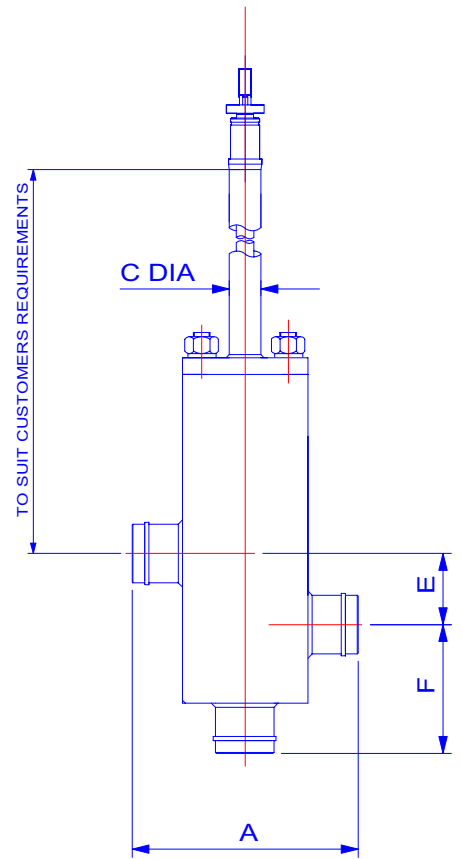
### Angle Style



### Globe Style



### 3 – Way Style



Valve Size		A		B		C		D		E		F		Actuator
INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	Selection
0.5	(12.5)	10.5	267	5.25	133	1.9	48	4.25	108	2.25	57	5.63	143	A
0.75	(19)	10.5	267	5.25	133	1.9	48	4.25	108	2.25	57	5.63	143	A
1	(25)	10.5	267	5.25	133	1.9	48	4.38	111	2.25	57	5.63	143	A
1.5	(40)	12	305	6	152	2.38	60	4.75	121	2.75	70	6.5	165	A/B
2	(50)	12	305	6	152	2.38	60	5.0	127	3.5	89	6.5	165	A/B
3	(80)	13.5	343	6.75	171	3.0	75	6.25	159	4.25	108	7.0	178	B/C
4	(100)	14.5	368	7.25	184	3.0	75	6.75	171	5.25	133	9.0	229	B/C
6	(150)	17	432	8.5	216	3.0	75	8.0	203	7.75	197			B/C
6	(150)	17	432	8.5	216	4.5	114	8.0	203	7.75	197			D
8	(200)	20	508	10	254	4.5	114			10.5	267			D
10	(250)	24	610	12	305	4.5	114			12.8	324			D
12	(300)	30	762	15	381	4.5	114			15.0	381			D



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Cat Ref 03/2000 SG3000 REV 01

# Severn Glocon Series 4000 Cryogenic Valve for Ratings ANSI 150 – 600



## Specification Bulletin SG 400

### Application

The Severn Glocon Series 4000 was initially developed over two decades ago specifically to satisfy the installation in cryogenic ASU and Hyco cold box's of an all welded in construction thus preventing any possibility of process leakage within the insulated area whilst giving full access to the valve trim from outside the cold box.. As such the Series 4000 now benefits from extensive experience in providing cost effective and easily maintained valves in an industry which makes stringent demands from its suppliers

Construction materials of the body is either stainless steel (model 4400 ) or aluminium (model 4300) to suit adjoining pipework,

Internal surface finish is considered to be of major importance to ensure degrees of cleanliness that are necessary for the Industrial Gas Market and therefore all valves are cleaned and assembled suitable for oxygen service as standard.

### Design Features

- Model 4400 - one piece stainless steel body / extension
- Model 4300 – aluminium body / stainless steel extension factory assembled with life time seal
- Smooth profile globe body construction.
- Extension lengths to suit installation
- Cold box flange adjustable or welded
- Screwed in seat standard, cartridge cage trim options.
- Large choice of trim sizes available with low noise and anti-cavitation options.
- Robust parts for trouble free service and low cost of ownership.
- Inherently characterised trims available in linear, equal percentage or semi-throttle.
- Cleaned and degreased for Oxygen service as standard.
- Soft seat insert option for ANSI Class VI .
- Various options of end connection

### Benefits

- Top-entry servicing with direct access to plug and seat.
- Reduced inspection and maintenance costs.
- Extensive trim selection.
- Reliable leakage performance, bubble tight shut off available.
- High interchangeability between sizes and other products.
- X – ray option available on all welds

### Quality Engineered

- Extensive proven on-site performance
- BS EN ISO 9001 1994, Certificate No. FM01959.



Figure 1. Severn Glocon Series 4443 Globe valve fitted with a Series "P" Cylinder Actuator and I/P Positioner.

## Engineering Data - Severn Glocon Series 4000 Valve

### General

The Series 4000 range of cryogenic valves was developed to provide a cost effective, reliable and easily maintained control valve capable of being applied in a flexible manner to accommodate various approaches to insulated cold box or valve chest design. Reliability and ease of maintenance are essential features of any good control valve and the quick-change trim provides for easily accessible seat and trim components to minimise any parts replacement times.

The specially designed extended bodies incorporate top guided contoured trim configuration which provides excellent rigidity and resistance to vibration and service wear. The valve is designed to accommodate other options within the Severn Glocon range e.g C C cages and anti-cavitation trims.

### Valve / End Connection Sizes

½ in (12mm) – 10 in (250mm)

### Design Standards

ANSI B16-34 & Design rated

### Valve Body Ratings

ANSI 150 - 600

### Body Configurations:

Globe, Angle and Z pattern

### Body Face to Face Dimensions

ISA S75.03 see table ???

### Bonnet Styles

Cryogenic

### Standard bonnet Packing

Braided PTFE  
PTFE Chevrons.  
Graphite  
Low Emission

### Trim Options

Unbalanced Contoured, Cage,  
Multi-step & trickle.

### Inherent Trim Characteristics

Equal %, Linear & Semi-throttle

### Maximum Plug/Seat Leakage Class

ANSI/FCI 70-2 Class IV as standard  
Class VI with soft seat

### Valve Plug Options

Unbalanced Top Guided  
Balanced  
For port diameters see table

### Sizing and Noise Reduction

See SG10 and SizinG programme

### Actuation

Various types of actuation are available including:  
Series P Linear spring pneumatic cylinder.  
Manually operated.

### Instruments

A wide range of control instruments are available from Severn Glocon including:  
Positioners, Volume Boosters, Solenoid valves,  
Switches, Air-filer Regulators etc.

### Materials of Construction

The standard body materials are Stainless steel and aluminium.  
For full listing see table .

### Temperature Range

-196° C to 220° C. ( -320° F to 428° F )  
For temperatures outside this range consult Factory.

### Available Connection Styles

#### End Connection : Valve Size : Rating

Screwed  
Socket Weld  
Flanged

## Valve Body Style Options

The Severn Glocon Series 4000 valve is available in three body styles of either globe, angle or Z pattern. Many parts are interchangeable, with the exception of the valve bodies.

The angle pattern has an optional venturi seat which may be specified in order to provide additional protection to the valve outlet.

- 1 Body
- 2 Guide Plug
- 3 \* Gasket Body
- 4 Valve Bonnet
- 5 Body studs, Nuts & Washers
- 6 Actuator Yoke
- 7 Yoke Retaining Half Rings
- 8 Yoke clamp
- 9 Yoke Clamping Screws
- 10 \* Valve Seat
- 11 \* Gasket Seat
- 12 \* Plug
- 13 \* Lower Stem Guide
- 14 Packing Spacer
- 15 \* Upper Stem Guide
- 16 \* Gland Packing
- 17 \* Gland Follower
- 18 Gland Flange
- 19 Gland Bolts & Nuts
- 20 Stem Travel Indicator / Anti- Rotation Clamp
- 21 Stem Travel Plate
- 22 Plug Locknut
- 23 Nameplate

\* Recommended Spare

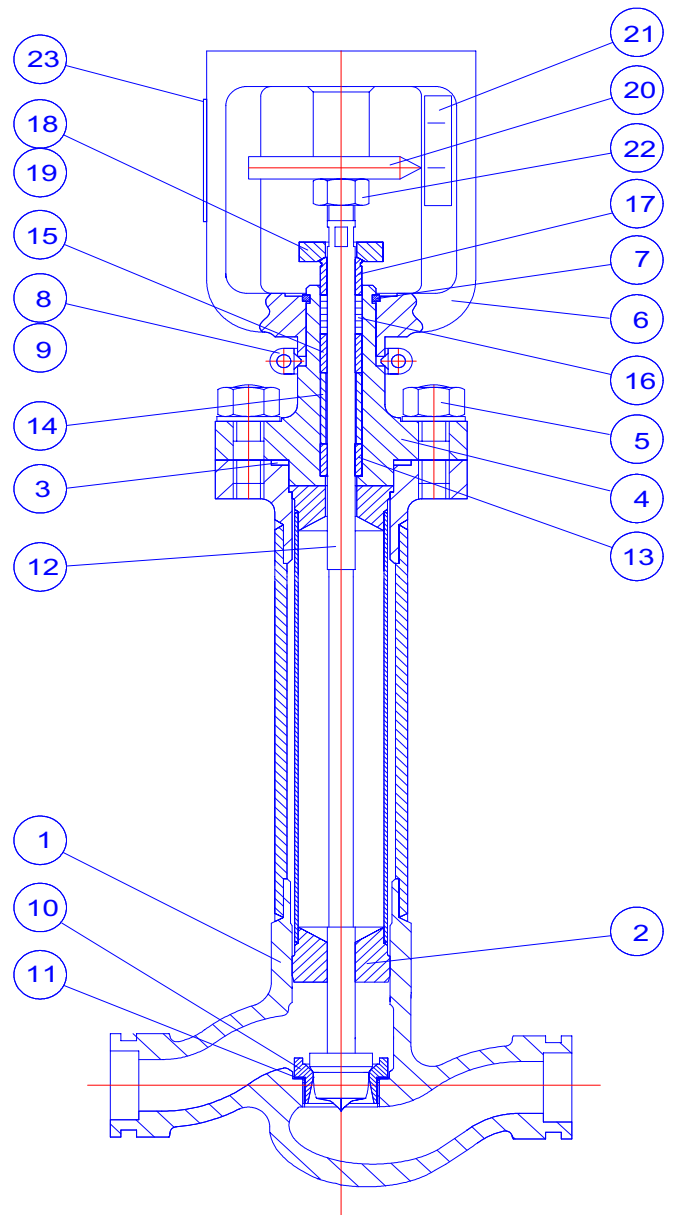


Fig 2. Model 4410 Globe Style Body.

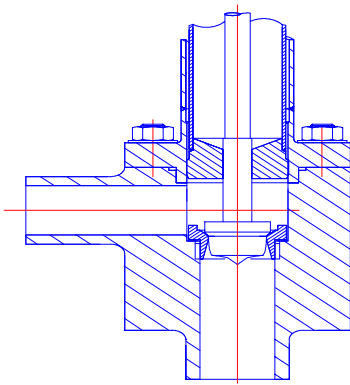


Fig 3. Model 4330 Angle Style Body

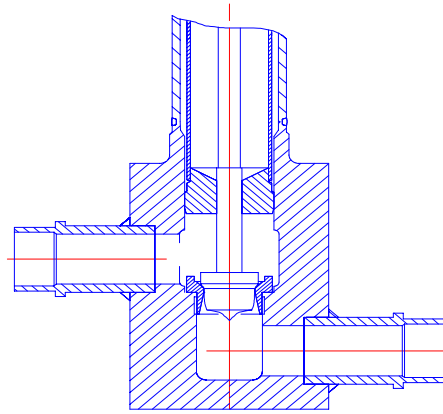


Fig 4. Model 4350 Z Pattern Style Body

**Bonnet**

The standard bonnet provides a deep packing box together with a long guide housing, which is a robust and vibration resistant assembly. The standard packings used are Teflon rings which are suitable for application temperatures of -196°C up to 220°C,

**Extended Body.**

The body extension is available in a selection of lengths to suit the depth of associated pipework. The guide design located in close proximity to the plug head and allows controlled gassing off to occur into the body extension chamber thereby protecting the packing from coming into contact with liquid gas.

**Bellows Seal Option.**

This arrangement provides for a positive metallic gland seal, within the rated pressure and temperature of the bellows material selected. Generally used on semi UHP service to ensure non ingress of impurities into the process. An auxiliary packing in the bonnet serving as a back-up seal in the unlikely event of a bellows failure.

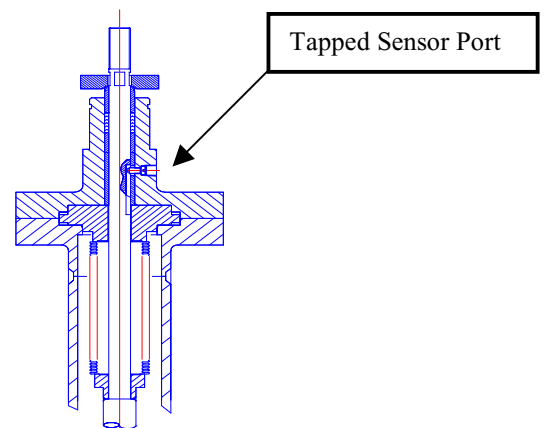


Figure 6. Bellows Seal Bonnet.

**Cold Box Flanges.**

A sliding weather proof or welded cold box flange of any size or shape can be fitted as required.

**Materials of Construction**

Valve Body Material	Bonnet	Valve Plug / Stem Assembly	Seat Ring	Soft Seat Option	Cage Option
Aluminium ASTM 5083	Stainless Steel (AISI 321)	Stainless Steel (AISI 316)	Stainless Steel (AISI 321)	PTFE	Stainless Steel (AISI 321)
Stainless Steel	Alloy Steel	Stainless Steel / HT Brass	HT Brass	PCTFE (KELF)	Monel
Monel		Stainless Steel / Stellite 6	Stainless Steel / Stellite 6	Copper	Alloy steel
HT Brass		Monel	Monel	Aluminium	
Alloy Steel		Alloy Steel	Alloy Steel		

## Severn Glocon Series 4000 – Design Cv Values

### Flow Coefficient Cv

The values detailed in the tables are stated in US units. The figures by definition are related to the flow of water (SG=1) through the valve at full lift in US Gallons per minute with a pressure drop of 1lb/in<sup>2</sup>.

**Table 1. Contoured and Multi-step Trims.**

Valve Size		Available Trim Cv's													
ins	mm														
1/2	12	<b>0.01</b>	<b>0.05</b>	<b>0.10</b>	<b>0.15</b>	<b>0.25</b>	<b>0.5</b>	2.5							
3/4	20	<b>1</b>	<b>1.5</b>	<b>2.5</b>	<b>4</b>	7									
1	25	<b>1</b>	<b>1.5</b>	<b>2.5</b>	<b>4</b>	7	15								
1 1/2	40				<b>4</b>	7	16	20	30						
2	50						16	20	30	50					
3	80							20	30	50	80	120			
4	100									50	80	120	195	215	
6	150										120	215	325	400	440
8	200											215	325	440	650
10	250												325	440	650 1000

Note: Multi-step trim range in bold digits. For other options - Consult Factory.

**Table 3. Single Stage Cage Trims.**

Valve Size		Available Trim Cv													
ins	mm														
1	25			4	7	15									
1 1/2	40				15	20	30								
2	50					20	30	50							
3	80						50	75	110						
4	100						50	75	110	195					
6	150							110	195	275	400				
8	200										400	650			
10	250										650	1000			

Note: For valve and trim sizes outside this range - Consult Factory

### Actuator selection

**Table 4. Series P Actuators – Cylinder and Stem Size Details**

Valve Size	Actuator Dimensions			Effective Area of cylinders		Stem Dimensions		Max Vol O/Piston Cu cms
	Model	Stroke mm	Diameter cms	Upper Area Sq cm	Lower Area Sq cm	Stem Dia cm	Stem Area Sq cm	
1/2"-1"	A	20	15.2	182	179	1.90	2.80	1,721
1 1/2"	A	20	15.2	182	179	1.90	2.80	1,721
2"	A	20	15.2	182	179	1.90	2.80	1,721
1 1/2"	B	25	20.3	325	316	3.17	7.7	4834
2"	B	25	20.3	325	316	3.17	7.7	4834
3"	B	25	20.3	325	316	3.17	7.7	4834
4"	B	25	20.3	325	316	3.17	7.7	4834
3"	C	63	30.5	729	718	3.81	11.60	15,239
4"	C	63	30.5	729	718	3.81	11.60	15,239
6"	C	63	30.5	729	718	3.81	11.60	15,239
8"	C	63	30.5	729	718	3.81	11.60	15,239
6"	D	125	40.6	1271	1258	5.72	25.70	54,732
8"	D	125	40.6	1271	1258	5.72	25.70	54,732
10"	D	125	40.6	1271	1258	5.72	25.70	54,732

**Table 5. Maximum Available Seating Thrust Lbf**

Supply Pressure PSIG	Actuator Size				Actuator Size			
	Standard Spring – Air Fail Close				Standard Spring – Air Fail Open			
	A	B	C	D	A	B	C	D
40	1428	2780	5550	8320	663	1387	1987	6620
60	1985	3270	7780	12,180	1,220	2,367	4,205	10,480
80	2,540	4,250	10,000	16,040	1,776	3,348	6,432	14,340
100	3,098	5,230	12,230	19,900	2,333	4,329	8,659	18,200
150	4490	7,680	17,800	29,550	3,724	6,780	14,226	27,850

Note: The air pressure is applied above the piston in each case

**Weights**

Size	1”	1.5”	2”	3”	4”	6”	8”	10”
Weight lbs	77	82	88	154	205	310	580	750
“ kg	35	37	40	70	93	140.6	263	340

Note: Weights apply to Stainless steel bodied valve, actuator, positioner and airset.

**Model Numbering for Series 4000 Valve**

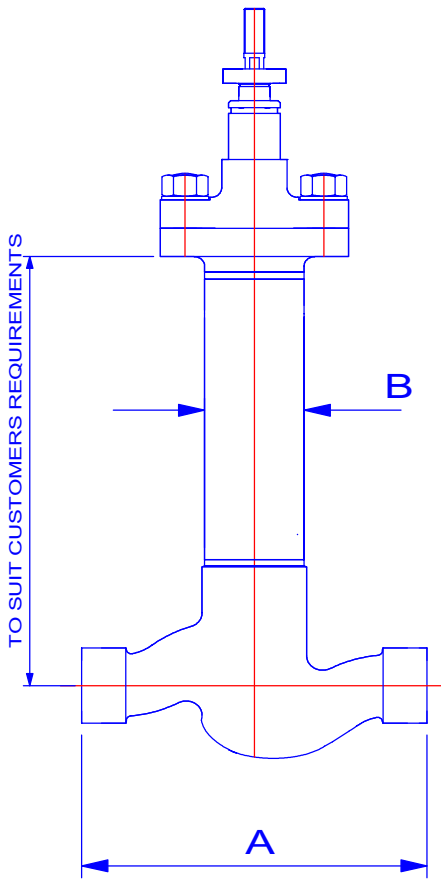
Product Family	Construction	Style	Pressure Group
<b>4</b>	<b>3</b> Barstock <b>4</b> Casting <b>5</b> Forged	<b>1</b> Globe <b>3</b> Angle <b>5</b> Z Pattern	<b>0</b> ANSI 125 <b>1</b> ANSI 150 <b>2</b> ANSI 300 <b>3</b> ANSI 600

Model Numbering for Actuators.

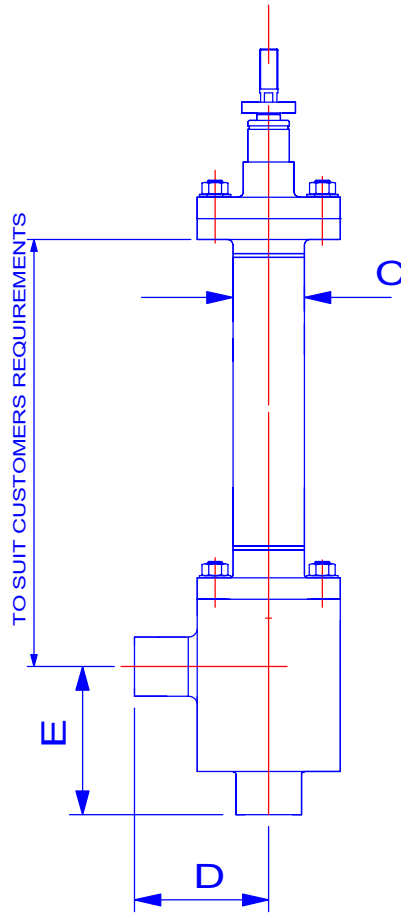
Product Type	Action	Size	Ancillaries
<b>M</b> Manual Handwheel	<b>0</b> Manual Operation	<b>A</b> 25 SQ”	<b>H</b> Side Mounted H/W
<b>P</b> Pneumatic Cylinder	<b>1</b> Modulating (AFO)	<b>B</b> 50 SQ”	<b>T</b> Top Mounted H/W
	<b>2</b> Modulating (AFC)	<b>C</b> 100 SQ”	<b>J</b> Top Mounted Jacking Screw
	<b>3</b> Modulating (AFS)	<b>D</b> 200 SQ”	<b>M</b> Limit Stop – Max
	<b>5</b> On/Off (AFO)		<b>L</b> Limit Stop – Min
	<b>6</b> On/Off (AFC)		
	<b>7</b> On/Off (AFS)		

Example Model No **4411P2BN**

**Series 4410  
Globe Style**



**Series 4330  
Angle Style**



**Series 4350  
Z – Pattern Globe Style**



Valve Size		A		B		C		D/E		F		G		H		Actuator
INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	INS	MM	Selection
0.5	(12.5)	8.25	210	2.375	60.3	1.9	48	3.93	100	2.375	60.3	9.438	250	2.25	143	A
0.75	(19)	8.25	210	2.375	60.3	1.9	48	3.93	100	2.375	60.3	9.438	250	2.25	143	A
1	(25)	8.25	210	2.375	60.3	1.9	48	3.93	100	2.375	60.3	9.438	250	2.25	143	A
1.5	(40)	9.875	251	2.88	73	2.88	73	4.92	125	2.88	73	10.82	275	2.75	165	A/B
2	(50)	11.25	286	3.5	88.9	3.25	82.5	4.92	125							A/B
3	(80)	13.25	337	4.5	115	4.5	115	6.10	155							B/C
4	(100)	15.5	394	5.55	142	5.55	142	7.25	184							B/C
6	(150)	18.62	473	8.62	219											B/C
6	(150)	20	508	8.62	219											C
8	(200)	22.37	568	10.75	273											D
8	(200)	24	610	10.75	273											D
10	(250)	26	660	12.75	324											D
10	(250)	28	711	12.75	324											D



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Cat Ref 03/2000 SG3000 REV 01

# Severn Glocon Series 5000 Cryogenic Valve for Ratings ANSI 150 - 900

## Specification Bulletin SG 500

### Application

The Severn Glocon Series 5000 Cryo valve was developed over four decades ago specifically to satisfy the need for installation in cryogenic ASU cold box's . As such the Series 5000 Cryo valve now benefits from extensive experience in providing cost effective and easily maintained valves in an industry which makes stringent demands from its suppliers.

Construction materials of the body & bonnet is normally stainless steel with options of monel and bronze in various grades.

Internal surface finish and a high degree of cleanliness is considered to be of major importance especially when controlling fluids such as high pressure Oxygen in the Industrial Gas Market and to this end Severn Glocon take the matter very seriously.

### Design Features

- One piece body with extensive size range.
- Smooth profile globe body construction.
- Extension lengths to suit installation
- Cold box flange adjustable or welded
- Screwed in seat standard, cage trim options.
- Large choice of trim sizes available with low noise and anti-cavitation options.
- Robust parts for trouble free service and low cost of ownership.
- Inherently characterised trims available in linear, equal percentage or semi-throttle.
- Cleaned and degreased for Oxygen service as standard.
- Soft seat insert option for ANSI Class VI .
- Various options of weld end connection

### Benefits

- Top-entry servicing with immediate access to plug and seat.
- Reduced inspection and maintenance costs.
- Trims compact and easy to install.
- Reliable leakage performance, bubble tight shut off available.
- High interchangeability between sizes and other products.
- X – ray option available on all extension welds

### Quality Engineered

- Extensive proven on-site performance
- BS EN ISO 9001 1994, Certificate No. FM01959.



Figure 1. Severn Glocon Series 5413 Globe Valve fitted with a Series "P" Cylinder Actuator and Smart I/P Positioner.

# Engineering Data - Severn Glocon Series 5000 Valve

## General

The Series 5000 range of cryogenic valves was developed to provide a cost effective, reliable and easily maintained control valve capable of being applied in a flexible manner to accommodate various approaches to insulated cold box or valve chest design. Reliability and ease of maintenance are essential features of any good control valve and the quick-change trim provides for easily accessible seat and trim components to minimize any parts replacement times.

Special consideration is given to incorporating substantial guiding which provides excellent rigidity and resistance to vibration and service wear. The valve is designed to accommodate other options within the Severn Glocon range such as CC cages and Multi – Labyrinth trims.

### Valve / End Connection Sizes

½ in (12mm) – 10 in (250mm)

### Design Standards

ANSI B16-34 & Design rated

### Valve Body Ratings

ANSI 150 - 900

### Body Configurations:

Globe, Angle & 3 Way styles

### Body Face to Face Dimensions

ISA S75.03 see Figure 7

### Bonnet Styles

Cryogenic

### Standard bonnet Packing

Braided PTFE

PTFE Chevrons.

Graphite

Low Emission

### Trim Options

Unbalanced Contoured, Cage, Multi-step,

Trickle & Multi Labyrinth Trim.

### Inherent Trim Characteristics

Equal %, Linear & Semi-throttle

### Maximum Plug/Seat Leakage Class

ANSI/FCI 70-2 Class IV as standard

Class VI with soft seat

### Valve Plug Options

Unbalanced Top Guided

Balanced

For port diameters see table

### Sizing and Noise Reduction

See SG10 and SizinG programme

### Actuation

Various types of actuation are available including:

Series P Linear spring pneumatic cylinder.

Manually operated.

### Instruments

A wide range of control instruments are available from Severn Glocon including:

Positioners, Volume Boosters, Solenoid valves,

Switches, Air-filter Regulators etc.

### Materials of Construction

See table for materials

### Temperature Range

-196° C to 220° C. ( -320°F to 428°F )

For temperatures outside this range consult Factory.

### Available Connection Styles

#### End Connection : Valve Size : Rating

Screwed

Socket Weld

Flanged

## Valve Body Style Options

The Severn Glocon Series 5000 Cryo valve is available in three body styles of either globe, angle or 3 way. Many parts are interchangeable, with the exception of the valve bodies, and the angle pattern has an optional venturi seat, which may be specified in order to provide additional protection to the valve outlet. As this design is derived from the multi purpose 5000 series it benefits from all the options and versatility that has been developed over many years of supplying into a numerous variety of applications. This enables Severn Glocon to take a very open attitude to adapting a very broad existing range and customise where necessary to suit. Not only this apply to varying materials, but also customized end connections and even high capacity over size bodies.

- 1 Body
- 2 Valve Bonnet
- 3 \* Gasket Body
- 4 \* Gasket Seat
- 5 \* Gland Packing
- 6 \* Upper Stem Guide
- 7 \* Lower Stem Guide
- 8 Stem Guide Retainer
- 9 Gland Follower
- 10 Gland Flange
- 11 Gland Bolts
- 12 Gland Nuts
- 13 Nameplate
- 14 Cage (when fitted)
- 15 \* Cage Gasket (when fitted)
- 16 \* Plug
- 17 \* Seat
- 18 Body Studs
- 19 Body Nuts
- 20 Body Washers
- 21 Yoke
- 22 Yoke Clamps
- 23 Yoke Nuts
- 24 Half Rings

\* Recommended Spare

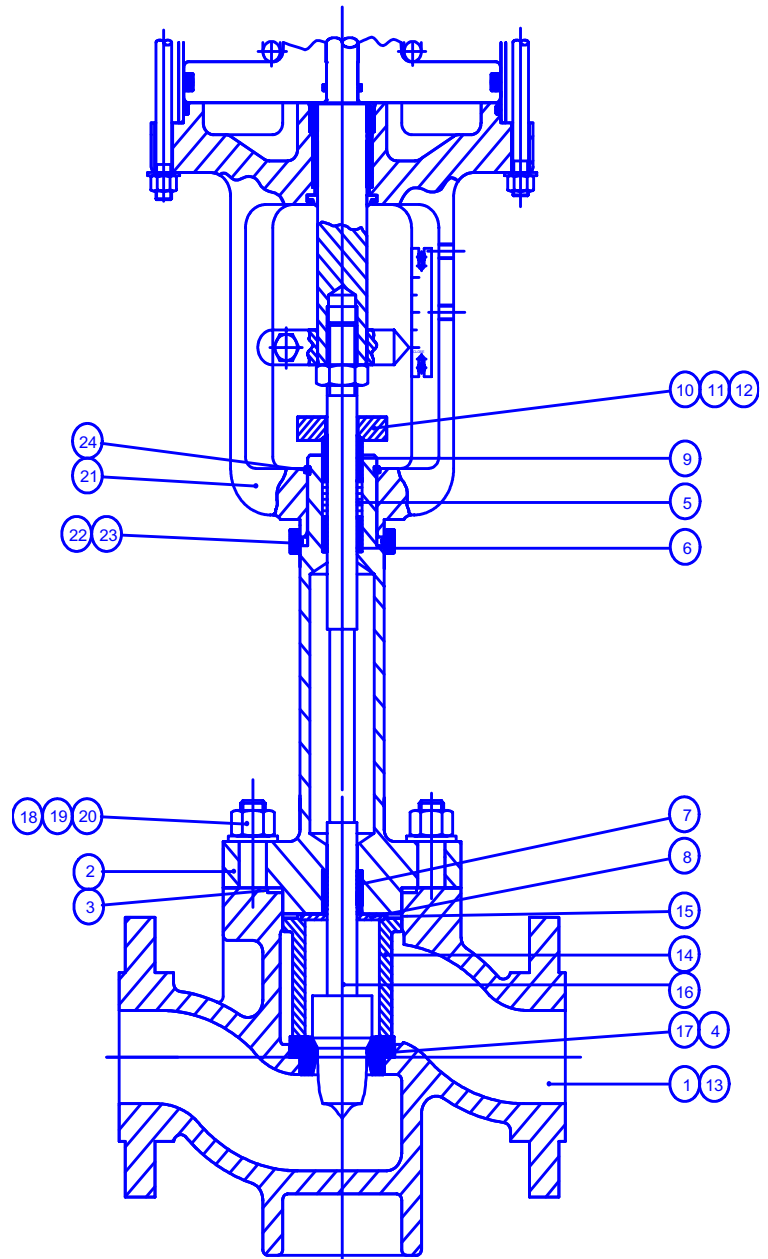


Fig 2 Model 5412 Globe Style Body

## Valve Body Style Options contd

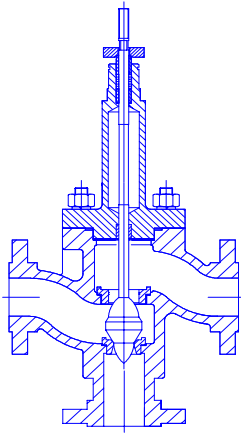


Fig 3. Model 5420 3 Way Style Body.

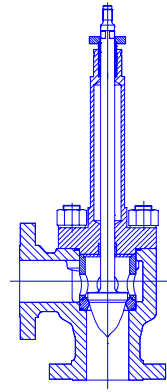


Fig 4. Model 5430 Angle Style Body.

## Bonnet Options

Usually constructed in stainless steel material with selection of the bonnet design length being a function of the depth of associated pipework.

Within the Series 5400 bonnets available, a temperature range of  $-196^{\circ}\text{C}$  to  $580^{\circ}\text{C}$  is offered together with a bellows seal for valves on semi UHP applications..

### Standard Cryogenic Bonnet.

The standard bonnet enables the forming of a deep packing box together with a long guide housing, thereby providing a robust and vibration resistant assembly that can allow gassing off to occur which protects the packing from coming into contact with liquid gas. Teflon rings are the standard packing. application temperature for the standard bonnet  $-196^{\circ}\text{C}$  up to  $220^{\circ}\text{C}$ ,

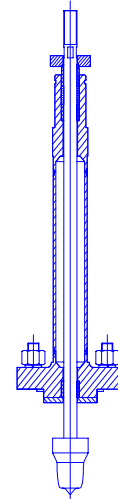


Figure 5. Standard Cryogenic Bonnet.

### Bellows Seal Bonnet.

This bonnet arrangement provides for a positive metallic gland seal, within the rated pressure and temperature of the bellows material selected. Generally used on semi UHP service to ensure non ingress of impurities into the process. Also has an auxiliary packing box in the upper bonnet serving as a back-up seal in the unlikely event of a bellows failure.

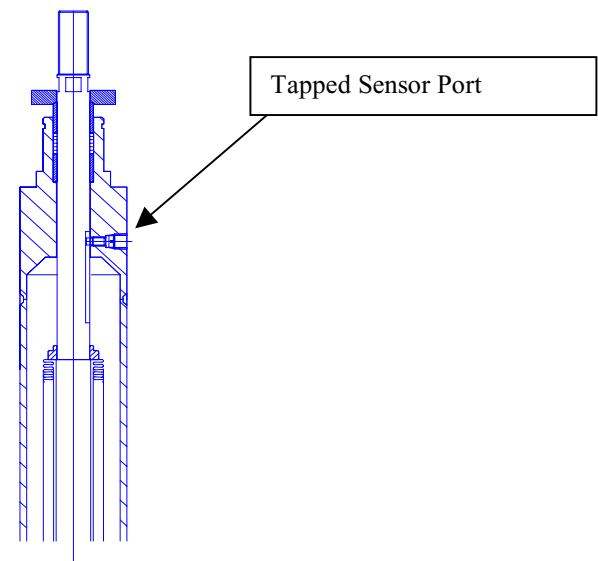


Figure 6. Bellows Seal Bonnet.

## Severn Glocon Series 5430 - Design Cv Values

### Flow Coefficient Cv

The values detailed in the tables are stated in US units. The figures by definition are related to the flow of water (SG=1) through the valve at full lift in US Gallons per minute with a pressure drop of 1lb/in<sup>2</sup>.

**Table 1 . Contoured and Multi-step Trims**

Valve Size		Available Trim Cv													
		ANSI 150 – 600lb													
Ins	mm														
½	12	<b>.01</b>	<b>.05</b>	<b>.10</b>	<b>.15</b>	<b>.25</b>	<b>.50</b>	2.5							
¾	20	<b>1</b>	<b>1.5</b>	<b>2.5</b>	<b>4</b>	7									
1	25	<b>1</b>	<b>1.5</b>	<b>2.5</b>	<b>4</b>	7	15								
1½	40				<b>4</b>	7	16	20	30						
2	50						16	20	30	50					
3	80							20	30	50	80	120			
4	100									50	80	120	195	215	
6	150										120	215	325	400	440
8	200											215	325	440	650
10	250											325	440	650	1000

Note: Multi-step trim range in bold digits. For other options – Consult Factory.

**Table 2 . Single Stage Cage Trims**

Valve Size		Available Trim Cv														
		ANSI 150 – 600lb														900lb
Ins	mm															
1	25	1	1.5	2.5	4	7	15									8
1½	40					15	20	30								20
2	50						20	30	50							36
3	80							50	75	110						76
4	100							50	75	110	195					135
6	150								110	195	275	400				300
8	200											400	650			500
10	250												650	1000		800

Note: For valve and trim sizes outside this range – Consult Factory

**Table 3 Materials of Construction**

Valve Body Material	Bonnet	Valve Plug / Stem Assembly	Seat Ring	Soft Seat Option	Cage Option
Stainless Steel	Stainless Steel (AISI 321)	Stainless Steel (AISI 316)	Stainless Steel (AISI 321)	PTFE	Stainless Steel (AISI 321)
Monel	Alloy Steel	Stainless Steel / HT Brass	HT Brass	PCTFE (KELF)	Monel
H T Brass		Stainless Steel / Stellite 6	Stainless Steel / Stellite 6	Copper	Alloy steel
Alloy Steel		Monel	Monel	Aluminium	
		Alloy Steel	Alloy Steel		

**Table 4 Recommended Materials & Maximum Velocities for Globe Valves on Gaseous O<sub>2</sub> Service**

Internal Gas Pressure psig			100	200	250	300	400	500	600	700	800	1000	>1000
Material Series	Working Temp		Maximum Valve Body Velocities Ft / sec										
	C max	C min											
300 St St	93	200	830	800	500	70	45	30	25	20	15	10	5
400 St St	93	200	830	800	450	60	40	30	25	20	15	10	5
300 St St	149	300	110	110	80	65	45	30	25	20	15	10	5
400 St St	149	300	100	100	75	60	40	30	25	20	15	10	5
Tin Bronze	204	400	830	830	830	830	830	830	830	830	650	650	470
Cu.Alloys	205	400	830	830	830	830	830	830	830	830	650	650	470
Monel	205	400	830	830	830	830	830	830	830	830	830	830	650
Inconel	205	400	830	830	830	830	830	830	830	830	830	830	650

Note: The values given are the average calculated velocities based upon the valve flange dimensions.

The maximum Aluminium content for the Cu Alloys is 2.5%.

The velocity values given are based upon a minimum wall thickness of 0.25 ins.

**Table 5 Recommended Materials and Maximum Velocities for Liquid O<sub>2</sub> Service**

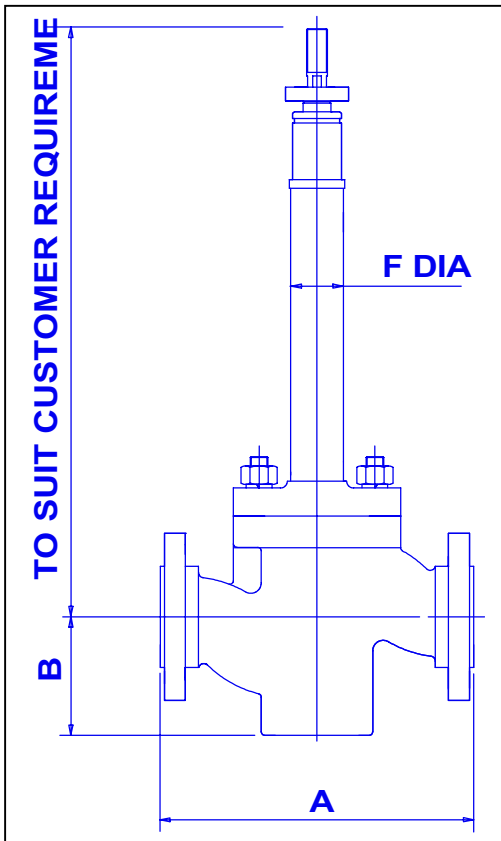
Material Series	Body Velocity ft/sec	Trim Velocity ft/sec
Stainless Steel 316	25 for Valve Body sizes up to 6 ins NB 21 for Valve Body sizes 8 ins to 16 ins	105
Stellite 6 Hard Facing		180
Copper Alloy & H T Brass		110
Monel		145
Inconel		160

**Table 6 Valve Trim Materials Recommended Temperature Limits**

Materials	Temperature Limits °C	
300 Stainless Steel	-250	300
316 Stainless Steel / Stellite	-250	800
Bronze	-198	285
Inconel	-240	650
Monel	-198	485
Nitronic 50	-250	300
TFE	-250	230
PCTFE / KEL F	-250	230

**Table 7 Model Numbering for Series 5000 Valve**

Product Family	Construction	Style	Pressure Group
5	3 Bar Stock	1 Globe	0 ANSI 125
	4 Casting	2 3-Way	1 ANSI 150
		3 Angle	2 ANSI 300
			3 ANSI 600
			4 ANSI 900
Model Numbering for Actuators.			
Product Type	Action	Size	Ancillaries
M Manual Handwheel	0 Manual Operation	A 25 SQ"	H Side Mounted H/W
P Pneumatic Cylinder	1 Modulating (AFO)	B 50 SQ"	T Top Mounted H/W
	2 Modulating (AFC)	C 100 SQ"	J Top Mounted Jacking Screw
	3 Modulating (AFS)	D 200 SQ"	M Limit Stop – Max
	5 On/Off (AFO)		N Limit Stop - Min
	6 On/Off (AFC)		
	7 On/Off (AFS)		



Valve Size (mm)	A			B	F
	Ansi 150	300	600		
½ (12)	7¼ (184)	7½ (191)	8 (203)	2 5/8 (67)	1.34 (34.03)
¾ (20)	7¼ (184)	7 5/8 (194)	8 1/8 (206)	2 5/8 (67)	1.34 (34.03)
1 (25)	7¼ (184)	7 3/4 (197)	8 1/4 (210)	2 5/8 (67)	1.34 (34.03)
1 ½ (40)	8 3/4 (222)	9 1/4 (235)	9 7/8 (251)	3 1/4 (83)	1.9 (48.26)
2 (50)	10 (254)	10 1/2 (267)	11 1/4 (286)	4 1/4 (108)	1.9 (48.26)
3 (80)	11 3/4 (298)	12 1/2 (318)	13 1/4 (337)	5 (127)	1.9 (48.26)
4 (100)	13 7/8 (352)	14 1/2 (368)	15 1/2 (394)	5 (127)	1.9 (48.26)
6 (150)	17 3/4 (451)	18 5/8 (473)	20 (508)	6 ¾ (171)	1.9 (48.26)
8 (200)	21 3/8 (543)	22 3/8 (568)	24 (610)	8 ¼ (210)	1.9 (48.26)
10 (250)	26 ½ (673)	26 (660)	28 5/8 (711)	9 (229)	1.9 (48.26)
12 (300)	29 (737)	33 (838)	33 ¼ (844)	11 ¼ (286)	1.9 (48.26)

Figure 7. dimensions.



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Cat Ref 03/2000 SG3000 REV 01