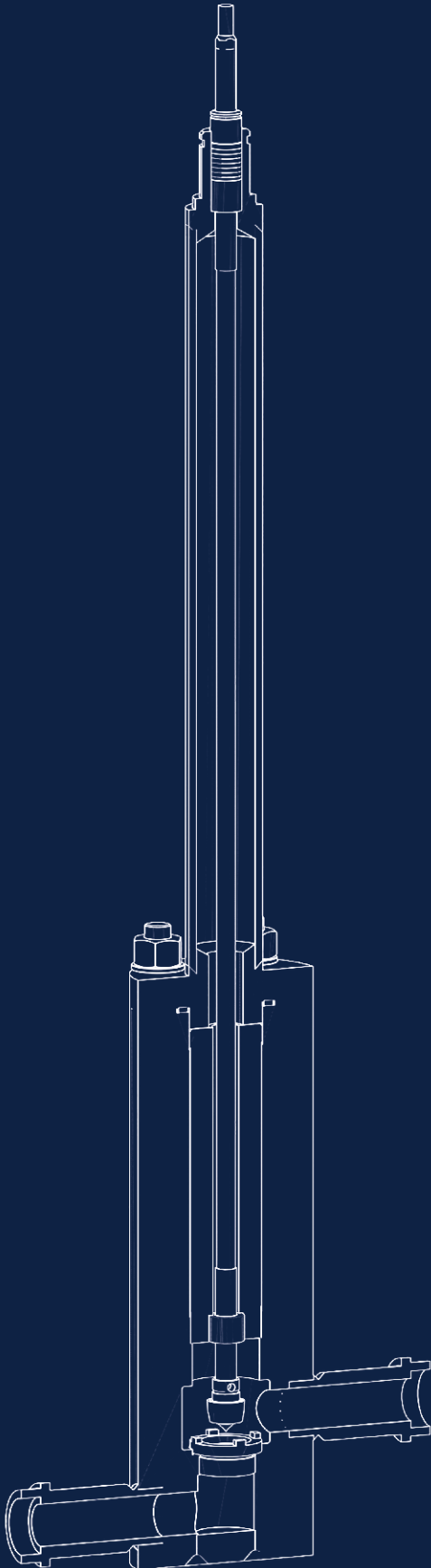




# 3000 Series Cryogenic Valves

For ratings ANSI 150 – 600



It all flows from expertise.



# Contents

Introduction	01
Engineering data	02
Valve body style options	04
Design Cv Valves	04
Actuator selection & dimensions	05





# 3000

## SERIES

The Severn Series 3000 was initially developed over five decades 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 it's 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.

# Engineering Data

## Design features

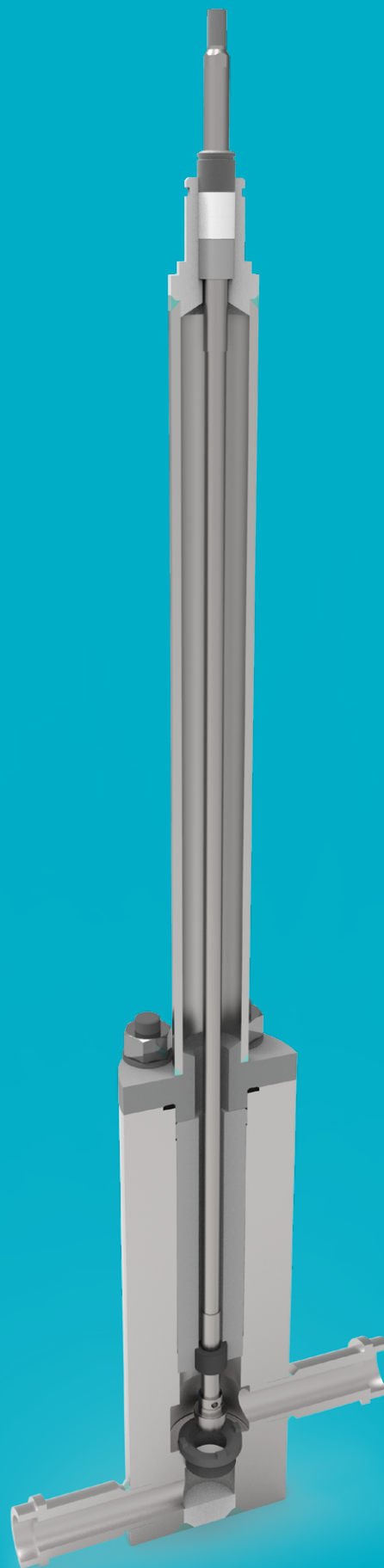
- ✓ Smooth profile barstock globe, angle and 3 way body construction
- ✓ Extension & body lengths to suit installation
- ✓ Cold box flange adjustable or welded
- ✓ Clamped or screwed in seat standard, cage trim options
- ✓ Large choice of trim sizes available with low noise and anti-cavitation options
- ✓ 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 required
- ✓ Soft seat insert option for ANSI Class VI
- ✓ Various options of weld end connections

## Quality engineered

- ✓ Rigorously proven on-site performance
- ✓ BS EN ISO 9001

## Benefits

- ✓ Top-entry servicing with direct access to plug and seat reducing 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



# Engineering Data

## General

The Series 3000 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.

### End connection sizes/types

1/2in (12mm) – 10in (250mm)

### Design standards

ANSI B16.34 and Design rated

### Valve body ratings

ANSI 150 – ANSI 600

### Body face to face dimensions

Severn Standard. See table 7.

### Body configurations

Z pattern globe, angle and 3-way.

### Body/seat gaskets

PTFE, Spiral wound PTFE, Metal O ring.

### Bonnet

Cryogenic extended stem.

### Bonnet packing

Braid PFTE, PTFE chevrons, Graphite and low emission.

### Trim options

Unbalanced contoured, cage, multi-step and trickle. See table 2 and 3 for materials.

### Inherent trim characteristics:

Equal %, Linear and 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 SGP10.

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 range e.g C.C. cages and anti-cavitation trims.

### Instrumentation

A wide range of control instruments are available from Severn including:- Positioners, Volume Boosters, Solenoid Valves, Switches and Air Filter Regulators etc.

### Materials of construction

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

### Temperature range

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

### Available connection styles

End Connections	Valve Size in	Rating lb
Screwed	1/2 – 2	150 – 600
Socketweld	1/2 – 2	150 – 600
Buttweld	2 – 10	150 – 600
Pipe Stubs	All sizes and ratings	

### Maximum plug/Seat leakage class

ANSI/FCI 70.2 Class IV as standard.

Class IV with soft seat.

## Valve body style options

The Severn Series 3000 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.

### 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 is -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 321)	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	HT Brass
Alloy Steel		Alloy Steel	Alloy Steel		

## Severn 3000 Series – Design Cv Valves

### 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													
in	mm	0.01	0.05	0.10	0.15	0.25	0.5	2.5							
1/2	12	<b>0.01</b>	0.05	0.10	0.15	0.25	0.5	2.5							
3/4	20	1	1.5	2.5	4	7									
1	25	1	1.5	2.5	4	7	15								
1 1/2	40				4	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**

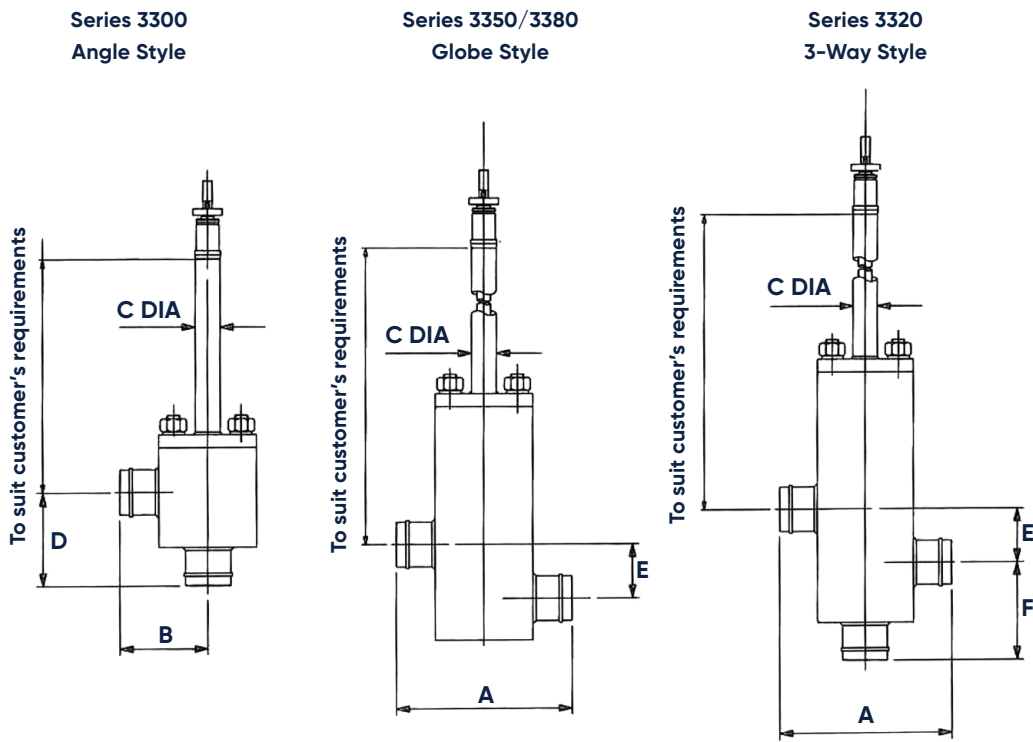
Valve Size		Available Trim Cv's													
in	mm														
1	25				4	7	15								
1 1/2	40					15	20	30							
2	50						20	30	50						
3	80							50	75	110					
4	100							50	75	110	195				
6	150								110	195	275	400			
8	200											400	650		
10	250											650	1000		

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

# Actuator selection

**Table 4**

Valve Size		A		B		C		D		E		F		Actuator Selection
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
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	6.75	6.75	171	3.0	75	6.25	159	4.25	108	7.0	178	B/C
4	100	14.5	7.25	7.25	184	3.0	75	6.75	171	5.25	133	9.0	229	B/C
6	150	17	8.5	8.5	216	3.0	75	8.0	203	7.75	197			B/C
6	150	17	8.5	8.5	216	4.5	114	8.0	203	7.75	197			D
8	200	20	10	10	254	4.5	114			10.5	267			D
10	250	24	12	12	305	4.5	114			12.8	324			D



**Table 5. Weights**

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

Note: Weights apply to short body globe valve, actuator and airset



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Our policy is one of continuous improvement and we reserve the right to modify these specification details without notice.

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