

Masoneilan* 84003 Series SteamForm* Steam Conditioning Valves

Excellent noise control, temperature control, and fast operation while maintaining smooth flow control and reliable shut-off.



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Features and Benefits

Applications

Steam conditioning requirements vary across every industry. Process plants, for example, require steady operation and precise temperature control, while Power plants rely on fast response and low noise emittance. Masoneilan SteamForm valves serve the entire range of steam conditioning, offering excellent noise control, temperature control, and fast operation while maintaining smooth flow control and reliable shut-off.

The Masoneilan SteamForm valves combines over 25 years of proven pressure reducing performance with a robust desuperheating design. Available with a wide selection of performance enhancing configurations, BHGE offers the Best Fit solution for virtually every steam conditioning application. Each SteamForm valve solution provided by BHGE is custom designed by an experienced engineering team to meet specific customer requirements. Masoneilan Steam Conditioning valves are designed using only robust and proven technology, materials, quality control practices, and manufacturing methods. The technology and material combinations used in the SteamForm are based on over 50 years of successful field experience in various industries.

Various Trim Types and Seal Options

The 84003 Series is available with a variety of trim types and seal designs to meet all requirements for shut-off, pressure/temperature regulation, and noise.

High Rangeability with up to 50:1 Turndown

Many applications use steam conditioning valves to throttle across a wide range of operating conditions. An example of this is turbine bypass, which often requires low-flow control for regulating pressure during startup, and high-flow capacity for full load rejection. Some applications require flow rangeability up to 50:1. For these applications, BHGE engineers optimize the lift characteristic and pressure staging to ensure excellent control and performance at low-flow conditions.

Fast Response and Precision Control

The 84003 Series SteamForm Valves can be equipped with a rapid stroke actuator, capable of achieving full opening and/or closing in less than 1 second. This is a critical feature, necessary for protecting plant equipment during an upset condition, such as a turbine trip. Masoneilan actuators are equipped with a Masoneilan SVI* II AP digital positioner, which provides best-in-class control accuracy and response.

General Data

Body Configurations: Globe / Angle / Custom Offset (Z Body)

Seat Diameter: 50 mm (2 in.) to 600 mm (24 in.)

Rated Cv: Up to 5800

Connections: Butt Weld, RFF, RTJ, Socket Weld

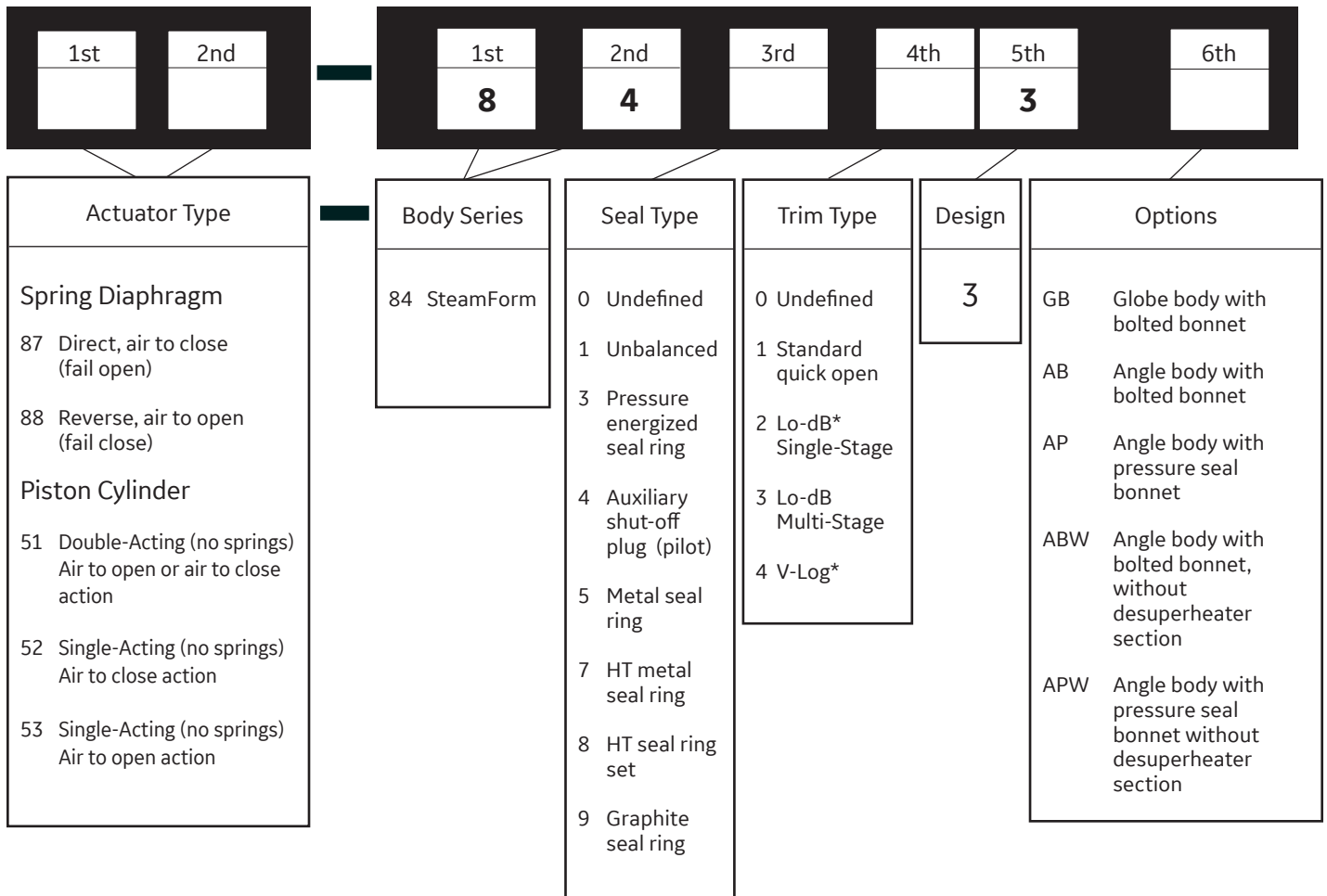
Pressure Class Ratings: Up to ASME Class 4500, Special and Intermediate (job rated)

Temperature: Up to 650°C (1200°F)

Applicable Codes / Standards: ASME B16.34 / B31.1 / B31.3, PED, GOST, SIL3, CRN, IBR, ISO9001

Actuator Types: Pneumatic or Hydraulic

Numbering System



84003 Series Seal Types

Seal Type (3rd Designation In Numbering System)							
Designation	Seal Type	Description	Rated Leakage	Flow Direction	Design Temperature Range	Design Pressure Range	Pressure Class Range
0	Undefined	Custom Engineered / Non-Standard	As Engineered	As Engineered	As Engineered	Up to 776 Bar (1125 psig)	As Engineered
1	Unbalanced	Solid Plug, Relies Only on Main Seat For Valve Closure. Radial Seal Ring May Be Used For Plug Stability	Class V	FTO or FTC	38°C (100°F) - 648°C (1200°F)	Up to 776 Bar (11250 psig)	150-4500
3	Pressure Energized Seal Ring	Balanced Plug With High Temperature Radial Polymer Seal	Class V	FTO or FTC	38°C (100°F) - 316°C (600°F)	Up to 776 Bar (11250 psig)	150-2500
4	Auxiliary Shut-Off Plug (Pilot)	Balanced Plug With Pilot	Class V	FTC	38°C (100°F) - 607°C (1125°F)	Up to 431 Bar (6250 psig)	150-4500
5	Metal Seal Ring	Balanced Plug With Metal Seal	Class III	FTO or FTC	38°C (100°F) - 566C (1050°F)	Up to 431 Bar (6250 psig)	150-2500
7	HT Metal Seal Ring	Balanced Plug With Metal Compression Radial Seal	Class V	FTO or FTC	38°C (100°F) - 427°C (800°F)	Up to 431 Bar (6250 psig)	150-2500
8	HT Seal Ring Set	Balanced Plug With Precision Metal & Graphite Radial Seal	Class IV	FTO or FTC	38°C (100°F) - 573C (1065°F)	Up to 431 Bar (6250 psig)	150-2500
9	Graphite Seal Ring	Balanced Plug With Graphite Radial Seal	Class IV	FTO or FTC	38°C (100°F) - 427°C (800°F)	Up to 431 Bar (6250 psig)	150-2500

84003 Series Seal Types



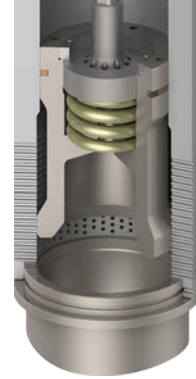
Seal Type 1

Seal Type: Unbalanced
Leakage: Class V
Flow Action: FTO or FTC
Temperature: 648°C(1200°F)



Seal Type 3

Seal Type: Pressure Energized
Leakage: Class V
Flow Action: FTO or FTC
Temperature: 316°C (600°F)



Seal Type 4

Seal Type: Auxiliary Shut-Off (Pilot)
Leakage: Class V
Flow Action: FTC
Temperature: 607°C (1125°F)



Seal Type 5

Seal Type: Metal Seal
Leakage: Class III
Flow Action: FTO or FTC
Temperature: 566°C (1050°F)



Seal Type 7

Seal Type: High Temperature Metal Seal
Leakage: Class V
Flow Action: FTO or FTC
Temperature: 427°C (800°F)



Seal Type 8

Seal Type: Precision Ring Set
Leakage: Class IV
Flow Action: FTO or FTC
Temperature: 573°C (1065°F)



Seal Type 9

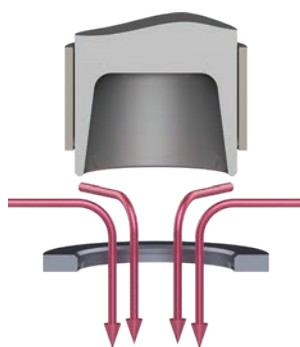
Seal Type: Graphite Seal
Leakage: Class IV
Flow Action: FTO or FTC
Temperature: 427°C (800°F)

84003 Series Trim Types

Trim Type (4th designation in numbering system)

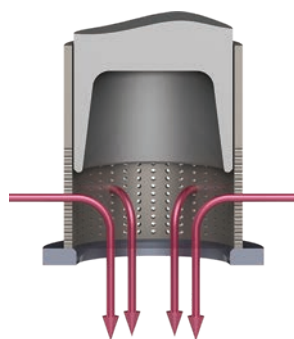
Designation	Trim Type	Description	Available Flow Directions
0	Undefined	Custom Engineered / Non-Standard	FTO or FTC
1	Standard Quick Open	Basic ON/OFF Function With No Control Element	FTC only
2	Lo-dB Single-Stage	Drilled Hole Cage With No Diffusers	FTO or FTC
3	Lo-dB Multi-Stage	Drilled Hole Cage With Diffuser(s)	FTO or FTC
4	V-Log	Disk Stack Cage With Tortuous Flow Channels	FTO only

FLOW TO CLOSE



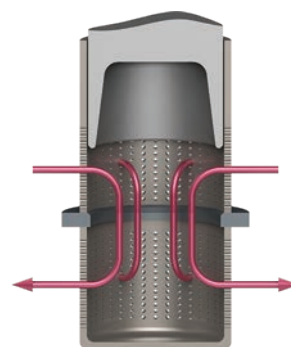
Trim Type 1

Trim Type: Standard Quick Open
Description: No Controlling Element, On/ Off Function.



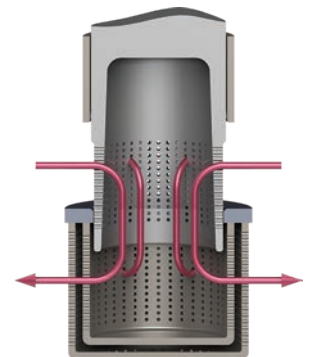
Trim Type 2

Trim Type: Lo-dB Single-Stage
Description: Control and noise reduction is achieved through a single drilled hole cage.



Trim Type 3 (AB)

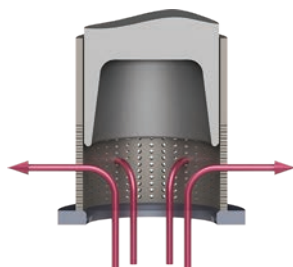
Trim Type: Lo-dB Multi-Stage
Description: Control and noise is achieved through a single drilled hole cage, and additional diffusers are added downstream of the seat to further reduce noise.



Trim Type 3 (AP)

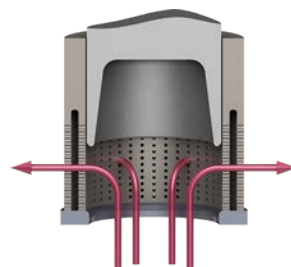
Trim Type: Lo-dB Multi-Stage
Description: Control and noise is achieved through a drilled hole plug skirt, and additional diffusers are added downstream of the seat to further reduce noise.

FLOW TO OPEN



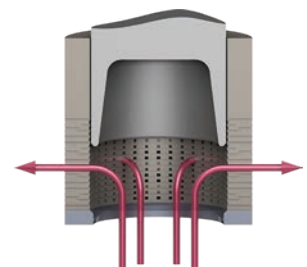
Trim Type 2

Trim Type: Lo-dB Single-Stage
Description: Control and noise reduction is achieved through a single removable cage.



Trim Type 3

Trim Type: Lo-dB Multi-Stage
Description: Control and noise reduction is achieved through a Multi-Stage cage.



Trim Type 3

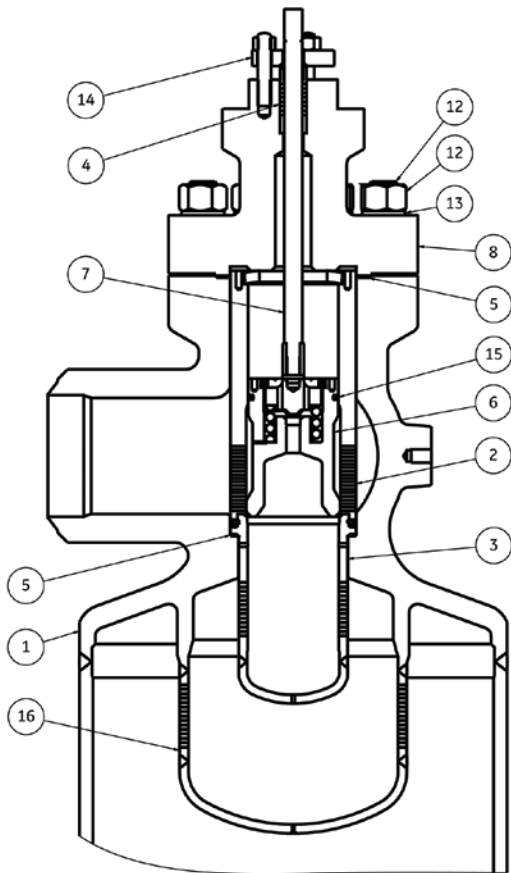
Trim Type: V-Log
Description: Control and noise reduction is achieved through a stack of precision machined plates, which create a tortuous flow path.

84003 Series Optional Configuration

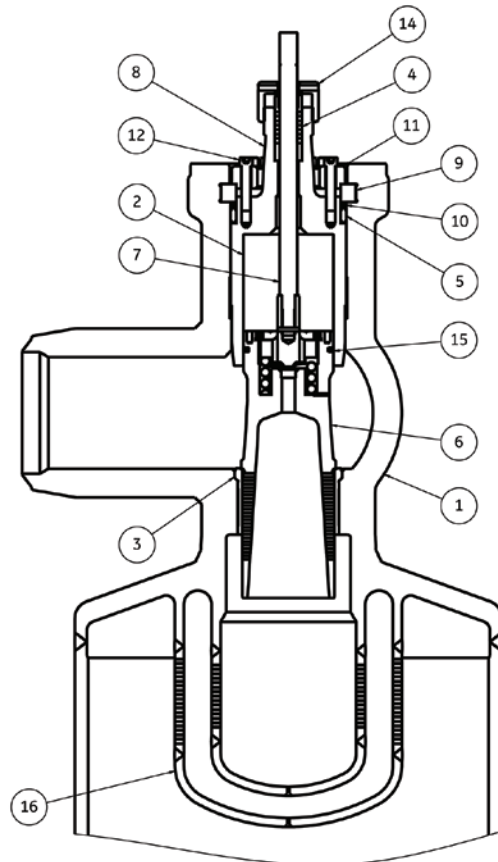
Optional Configuration (6th designation in numbering system)

Designation	Optional Configuration	Available Flow Direction	Temperature Range	Pressure Class Range	Design Pressure Range
GB	Globe Body with Bolted Bonnet	FTC or FTO	38°C (100°F) - 566°C (1050°F)	150-2500	0 - 430 barg / (0 - 6250 psig)
AB	Angle Body with Bolted Bonnet	FTC or FTO	38°C (100°F) - 648°C (1200°F)	150-4500	0 - 775 barg / (0 - 11250 psig)
AP	Angle Body with Pressure Seal Bonnet	FTC only	38°C (100°F) - 607°C (1125°F)	600-2500	69 - 430 barg / (1000 - 6250 psig)
ABW	Angle Body with Bolted Bonnet, without Desuperheater Section	FTC only	38°C (100°F) - 648°C (1200°F)	150-4500	0 - 775 barg / (0 - 11250 psig)
APW	Angle Body with Pressure Seal Bonnet, without Desuperheater Section	FTC only	38°C (100°F) - 607°C (1125°F)	600-2500	69 - 430 barg / (1000 - 6250 psig)

84003 Series Body S/A Construction



Bolted Bonnet Design (-84433AB)



Pressure Seal Bonnet Design (-84433AP)

84003 Series Materials of Construction

ITEM	PART DESCRIPTION	TEMPERATURE LIMIT	MATERIALS OF CONSTRUCTION	
1	BODY	427°C (800°F)	Carbon Steel	
			ASTM A 216 Gr WCC	
		510°C (950°F)	1-1/4Cr 1/2Mo	
			ASTM A105	
		565°C (1050°F)	2-1/4Cr 1Mo	ASTM A105 N
				ASTM A 217 Gr WC6
649°C (1200°F)	9Cr 1Mo V	ASTM A182 Gr F11		
		ASTM A 217 Gr WC9		
649°C (1200°F)	9Cr 1/2Mo 1-3/4W	ASTM A182 Gr F22		
2	CAGE	510°C (950°F)	ASTM A487 Gr CA6NM + NITRIDING	
		565°C (1050°F)	ASTM A182 Gr F22 + NITRIDING	
		607°C (1125°F)	ASTM A182 Gr F91 + NITRIDING	
		649°C (1200°F)	ASTM A182 Gr F91 + NITRIDING+ HVOF	
3	SEAT	343°C (650°F)	17-4 PH STAINLESS STEEL	
		510°C (950°F)	ASTM A487 Gr CA6NM + STELLITE HF SEAT	
		649°C (1200°F)	ASTM A182 Gr F91 + STELLITE HF SEAT	
		427°C (800°F)	CARBON STEEL	
		510°C (950°F)	1-1/4Cr 1/2Mo	
		565°C (1050°F)	2-1/4Cr 1Mo	
		649°C (1200°F)	9Cr 1Mo V	
		649°C (1200°F)	9Cr 1/2Mo 1-3/4W	
4	PACKING	649°C (1200°F)	STELLITE 6	
5	GASKETS / PRESSURE SEAL	649°C (1200°F)	GRAPHITE	
		510°C (950°F)	316L + GRAPHITE	
		649°C (1200°F)	INCONEL + GRAPHITE	
6	MAIN PLUG ⁽¹⁾	343°C (650°F)	GRAPHITE with STAINLESS CAPS (PSB)	
		510°C (950°F)	17-4 PH STAINLESS STEEL	
		510°C (950°F)	ASTM A182 Gr F6NM + NITRIDING	
		565°C (1050°F)	ASTM A182 Gr F6NM + STELLITE HF SEAT + NITRIDING	
		565°C (1050°F)	ASTM A182 Gr F22 + NITRIDING	
		607°C (1125°F)	ASTM A182 Gr F22 + STELLITE HF SEAT + NITRIDING	
		607°C (1125°F)	ASTM A182 Gr F91 + NITRIDING	
		649°C (1200°F)	ASTM A182 Gr F91 + STELLITE HF SEAT + NITRIDING	
7	STEM	343°C (650°F)	ASTM A182 Gr F91 + STELLITE HF SEAT & GUIDES	
		510°C (950°F)	17-4 PH STAINLESS STEEL	
		649°C (1200°F)	ASTM A38 GR 660	
8	BONNET	427°C (800°F)	ASTM B637 N07718	
		510°C (950°F)	ASTM A 216 Gr WCC or ASTM A105	
		565°C (1050°F)	ASTM A 217 Gr WC6 or ASTM A182 Gr F11	
		649°C (1200°F)	ASTM A 217 Gr WC9 or ASTM A182 Gr F22	
9	SEAL RETAINER	427°C (800°F)	ASTM A 217 Gr C12A or ASTM A182 Gr F91	
		649°C (1200°F)	ASTM A 216 Gr WCC or ASTM A105	
10	BACKUP RING	649°C (1200°F)	ASTM A 217 Gr C12A or ASTM A182 Gr F91	
11	COMPRESSION FLANGE	427°C (800°F)	ASTM A 479 TYPE 316	
		649°C (1200°F)	ASTM A 216 Gr WCC or ASTM A105	
12	BODY BOLT / NUT	427°C (800°F)	ASTM A 217 Gr WC9 or ASTM A182 Gr F22	
		510°C (950°F)	ASTM A193 Gr B7 / ASTM A194 2H	
		649°C (1200°F)	ASTM A193 Gr B16 / ASTM A194 Gr 4 or ASTM A194 Gr 7	
14	GUIDE BUSHING	649°C (1200°F)	ASTM B637 N07718 / ASTM A194 Gr 8	
	PACKING FOLLOWER	649°C (1200°F)	HARDENED 440C STAINLESS STEEL	
	PACKING FLANGE	649°C (1200°F)	STELLITE 6	
	PACKING BOLT	649°C (1200°F)	ASTM A 479 TYPE 316	
	PACKING NUT	649°C (1200°F)	ASTM A 479 TYPE 316	
	PACKING COLLAR	649°C (1200°F)	ASTM A 193 Gr B8	
15	PLUG SEAL RING ⁽²⁾	316°C (600°F)	ASTM A194 Gr 8	
		454°C (850°F)	ASTM A194 Gr 8	
		607°C (1125°F)	ASTM A 106 Gr B or ASTM A105	
		649°C (1200°F)	ASTM A335 Gr P11 or ASTM A182 Gr F11	
16	WELDED DIFFUSER (S)	427°C (800°F)	ASTM A335 Gr P22 or ASTM A182 Gr F22	
		510°C (950°F)	ASTM A335 Gr P91 or ASTM A182 Gr F91	
		565°C (1050°F)	ASTM A335 Gr P11 or ASTM A182 Gr F11	
		649°C (1200°F)	ASTM A335 Gr P22 or ASTM A182 Gr F22	

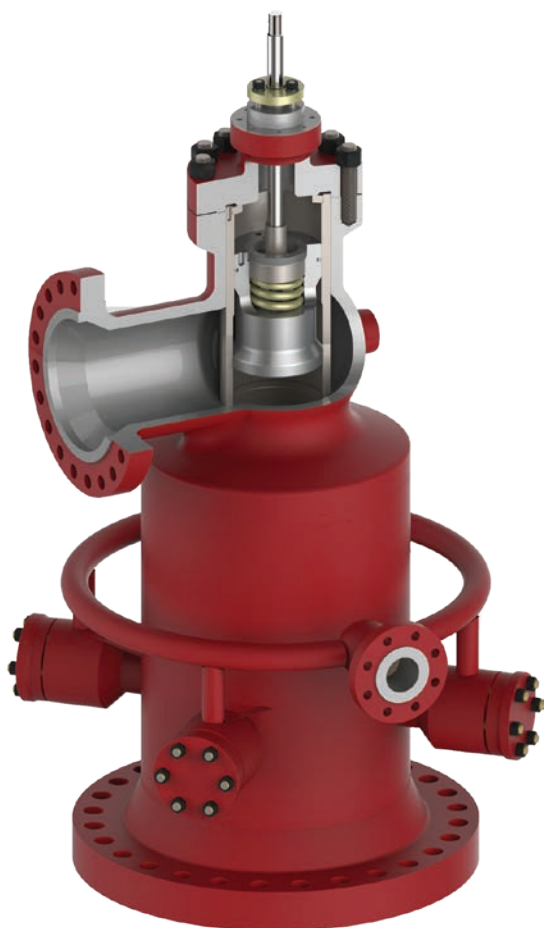
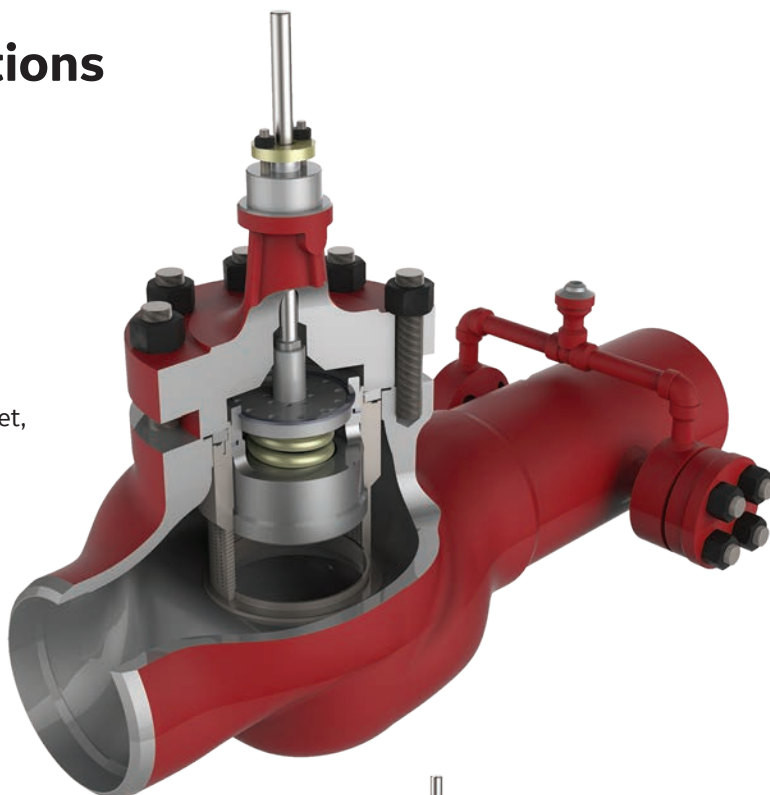
Notes:

(1) Main Plug - materials apply for all seal types.

(2) Plug Seal Ring - options are dependent on the seal type.

84003 Series Configurations

88-84423GB
Globe Body with Bolted Bonnet,
Pilot Balanced Plug,
Flow To Close.



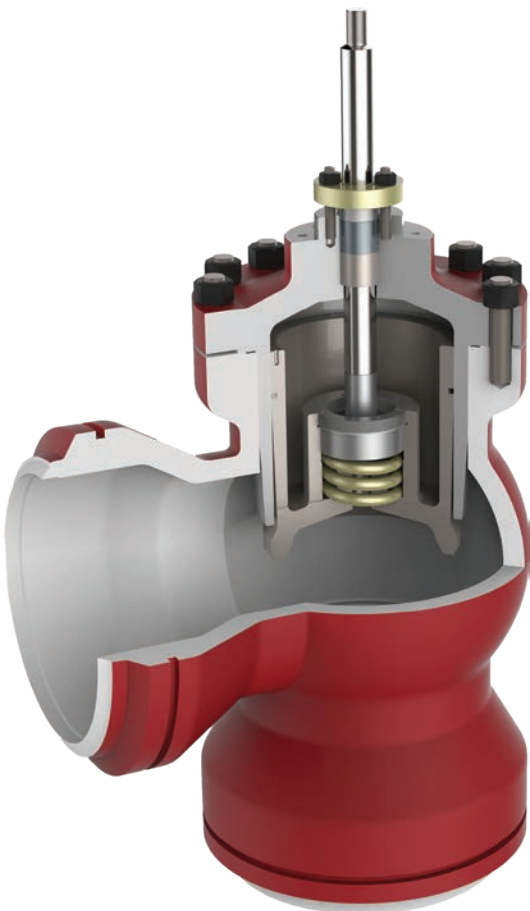
51-84433AB
Angle Body with Bolted Bonnet,
Pilot Balanced Plug,
Flow To Close.



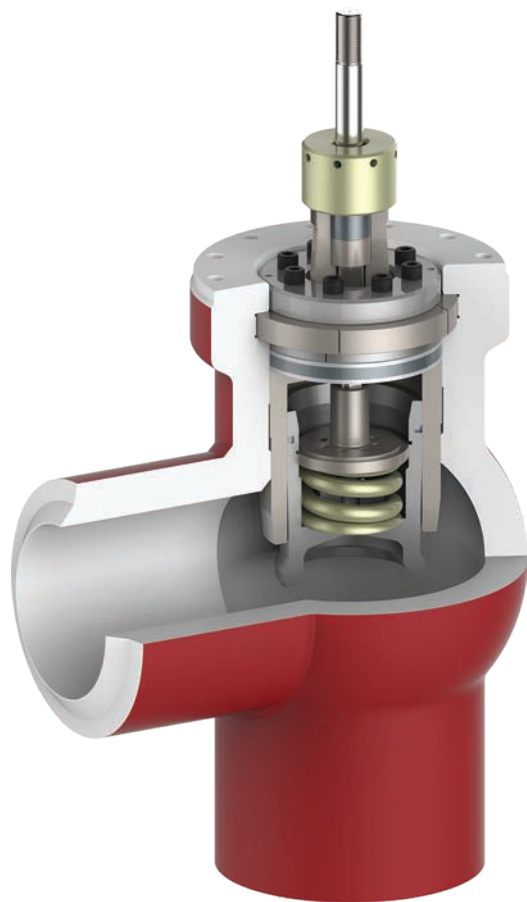
51-84433AP
Angle Body with Pressure Seal Bonnet,
Pilot Balanced Plug,
Flow To Close.



51-84923AB
 Angle Body with Bolted Bonnet,
 Balanced Plug,
 Flow To Open.



53-84413ABW
 Angle Body with Bolted Bonnet,
 Pilot Balanced Plug,
 Flow To Close.



88-84413APW
 Angle Body with Pressure Seal Bonnet,
 Pilot Balanced Plug,
 Flow To Close.

DIRECT SALES OFFICE LOCATIONS

AUSTRALIA

Brisbane:
Phone: +61-7-3001-4319
Fax: +61-7-3001-4399

Perth:
Phone: +61-8-6595-7018
Fax: +61-8-6595-7299

Melbourne:
Phone: +61-3-8807-6002
Fax: +61-3-8807-6577

BELGIUM

Phone: +32-2-344-0970
Fax: +32-2-344-1123

BRAZIL

Phone: +55-19-2104-6900

CHINA

Phone: +86-10-5738-8888
Fax: +86-10-5918-9707

FRANCE

Courbevoie
Phone: +33-1-4904-9000
Fax: +33-1-4904-9010

GERMANY

Ratingen
Phone: +49-2102-108-0
Fax: +49-2102-108-111

INDIA

Mumbai
Phone: +91-22-8354790
Fax: +91-22-8354791

New Delhi

Phone: +91-11-2-6164175
Fax: +91-11-5-1659635

ITALY

Phone: +39-081-7892-111
Fax: +39-081-7892-208

JAPAN

Tokyo
Phone: +81-03-6871-9008
Fax: +81-03-6890-4620

KOREA

Phone: +82-2-2274-0748
Fax: +82-2-2274-0794

MALAYSIA

Phone: +60-3-2161-0322
Fax: +60-3-2163-6312

MEXICO

Phone: +52-55-3640-5060

THE NETHERLANDS

Phone: +31-15-3808666

RUSSIA

Veliky Novgorod
Phone: +7-8162-55-7898
Fax: +7-8162-55-7921

Moscow

Phone: +7 495-585-1276
Fax: +7 495-585-1279

SAUDI ARABIA

Phone: +966-3-341-0278
Fax: +966-3-341-7624

SINGAPORE

Phone: +65-6861-6100
Fax: +65-6861-7172

SOUTH AFRICA

Phone: +27-11-452-1550
Fax: +27-11-452-6542

SOUTH & CENTRAL

AMERICA AND THE CARIBBEAN
Phone: +55-12-2134-1201
Fax: +55-12-2134-1238

SPAIN

Phone: +34-93-652-6430
Fax: +34-93-652-6444

UNITED ARAB EMIRATES

Phone: +971-4-8991-777
Fax: +971-4-8991-778

UNITED KINGDOM

Bracknell
Phone: +44-1344-460-500
Fax: +44-1344-460-537

Skelmersdale

Phone: +44-1695-526-00
Fax: +44-1695-526-01

UNITED STATES

Jacksonville, Florida
Phone: +1-904-570-3409

Deer Park, Texas

Phone: +1-281-884-1000
Fax: +1-281-884-1010

Houston, Texas

Phone: +1-281-671-1640
Fax: +1-281-671-1735

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