Masoneilan™ Condensed Catalog

Process Control Solutions

- Control Valves
- Smart Valve Positioners
- Liquid Level Transmitters
- Pressure Regulators
- Control Equipment and Accessories

Masoneilan

a Baker Hughes business

Quality Control Solutions

Baker Hughes™ Masoneilan automated process control solutions are known throughout the world for their quality and dependability. These solutions, including the Masoneilan 41005 Series Cage-Guided Globe Valve, are part of the portfolio of Masoneilan valve technology that has helped customers maintain smooth operations for more than 100 years.

Global Customer Service

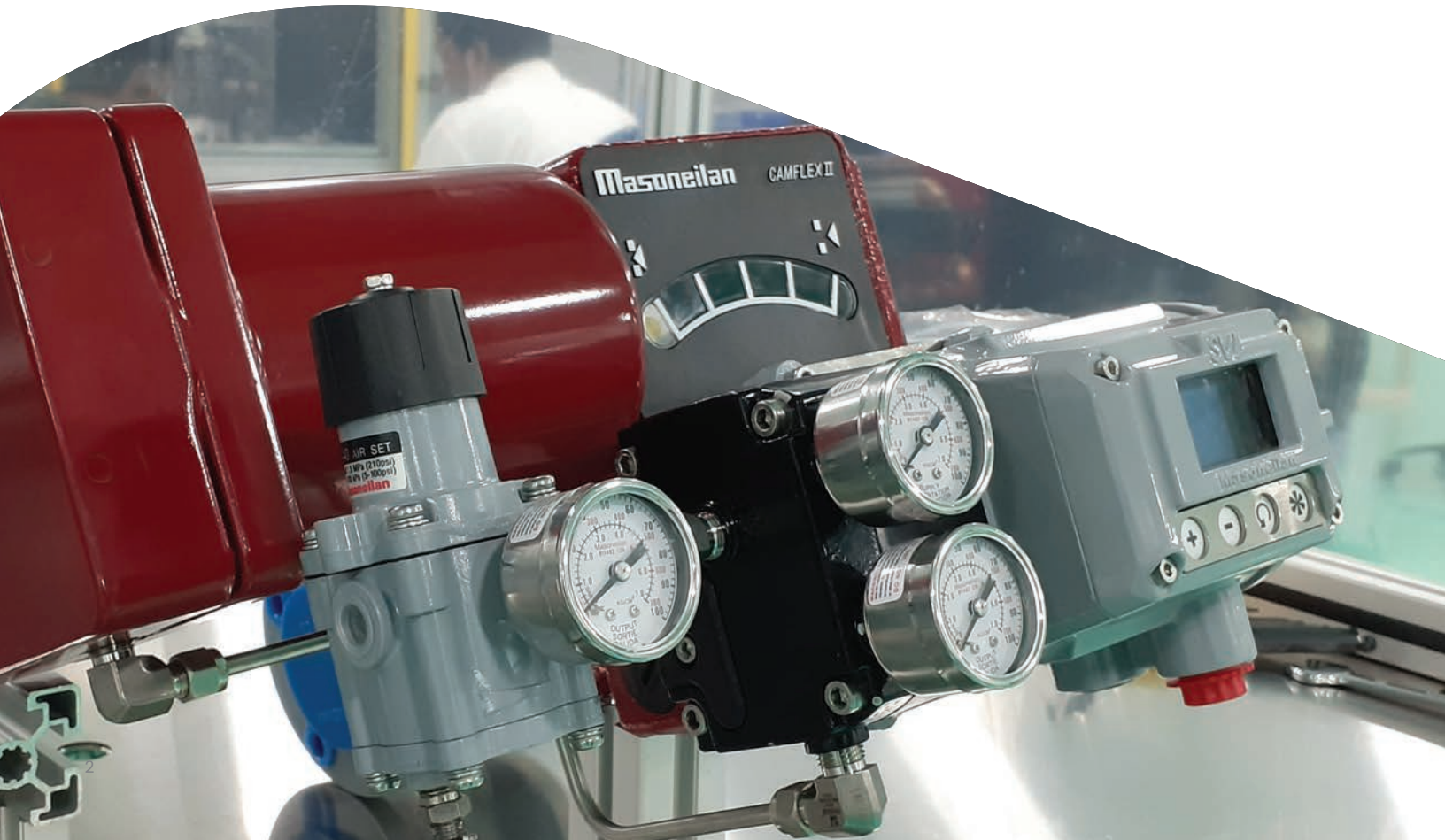
Our network of service and repair facilities around the world are ready to meet your needs day and night with onsite support, spare parts, and equipment maintenance programs.

Advanced Digital Technology

SVI™ provides industry leading control and diagnostic solutions for all your valve needs. We lead the industry with non-contact position sense technology and are well known for simple setup, rugged construction, and high performance control in critical service valve and level transmitter applications. SVI and accomanying *ValVue*™ diagnostics software works with all major DCS and plant asset management systems.

SVI3 Digital Valve Positioner - New Product!

The third generation Baker Hughes Masoneilan SVI is a user friendly digital valve positioner for pneumatic control valves. Utilizing advanced control and diagnostic algorithms, along with field-proven noncontact position sensing technology, the SVI delivers accurate, responsive, and reliable positioning performance.



Delivering for our customers

Global Capabilities

Baker Hughes global infrastructure of sales offices, manufacturing operations, and technical centers of excellence supports our worldwide customers throughout the plant's life cycle.

Field Support Services

The global network of Masoneilan Authorized Repair Centers *(MARC™)* and field service technicians offers factory-certified support including OEM components, onsite service , hands-on training, and post-installation analysis to support your MRO needs and maximize performance efficiencies.

Maintenance Management Services

Baker Hughes offers *ValvKeep™* for managing installed equipment and assets throughout your plant. Plant surveys, equipment data, maintenance schedules, project planning and repair details are all easily managed using a single interface regardless of valve type or brand

Genuine OEM Parts

We know you need us to respond quickly to your requests for the replacement parts and overhaul services that will keep your plants operating and efficient. Our global aftermarket program meets that critical need for fast responsiveness. Using OEM parts provides you with refurbished equipment meeting the original specifications.

Diagnostic Tools and Services

Masoneilan diagnostic tools and services from Baker Hughes improves process loop performance and reduces unplanned downtime. Available field diagnostic tools include: *ValScope™* - diagnostics for analog valve positioners, ValVue - control valve diagnostic and configuration tool, and Baker Hughes premier Valve Lifecycle Management service which offers online valve diagnostics with no impact to process control, regardless of valve positioner brand.

Enhancing your results

Automated Sizing and Selection

Baker Hughes user-friendly Masoneilan *ValSpeQ™* program for sizing and selecting valve solutions are based on current industry standards and calculation methods. These tools can significantly reduce the time needed to accurately specify and configure products so that you can select and implement the right solutions for your applications.

Resident Engineering

Our Resident Engineer Program gives you effective up-front design support. It provides onsite technical assistance early in the design process to help mitigate costly design changes that may happen late in the project cycle.

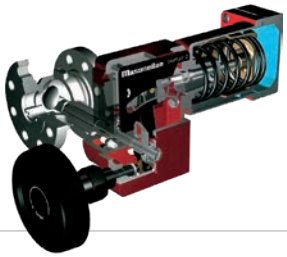
Advanced Process Control and Level Transmitter Technology

Masoneilan digital field instruments reduce costs throughout their lifecycle, by simplifying installation and setup, providing industry leading control performance, and reducing maintenance and support. SVI provides high precision HART® and FOUNDATION® Fieldbus valve positioning for both control valve and Emergency Shut Down (ESD) applications. For level transmitter applications, the 12400 DLT delivers high precision level output and control improving plant efficiency, performance, and safety.

The Masoneilan valve heritage: In 1882, William Mason invented an automatic steam reducing valve. Today, Masoneilan valves protect process industry assets around the world.

Masoneilan Control Valves

General Service



Rotary Control Valves

More than 1 million **35002 Series *Camflex***™ valves have been successfully installed in a variety of process industries and applications. Today's Masoneilan Camflex II valve continues to offer dependability through a concept that remains a standard of excellence for eccentric-plug rotary globe control valves. The standard version includes the *EF*™ Seal (Emission Free packing) with emissions rated less than 500 ppm up to 750,000 cycles.

The **36005 Series *V-Max***™ High Capacity Control Ball Valve incorporates a patented dual characterized V-Ported ball to offer a unique combination of high capacity and turndown capability. Available in ASME/ISA 75.08.02 (IEC 534-3-2) and ASME B16.10 short pattern face-to-face dimensions, it offers flexibility to match existing installations. Three seat types are available: MN-7 soft seat with class VI seat leakage, standard flexible metal seat , and the heavy-duty seat with class IV shutoff.

Reciprocating Control Valves

The **21000 Series** is a single-ported, heavy top-guided globe valve that can handle a wide variety of process control applications. The 21000 Series is available with many optional packages including bellows seals and angle body designs. Trim options include low-noise, anti-cavitation, and soft-seat trims to meet various application requirements.

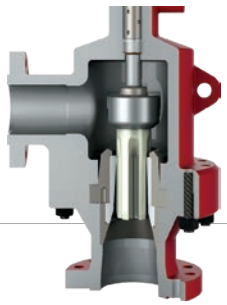
The versatile cage-guided **41005 Series** control valve offers solutions for demanding applications, such as high pressure drops, large capacities, and wide temperature ranges. The balanced trim design include options for reducing noise and vibration and for containing cavitation. Various balanced-seal options are available to meet a wide range of temperature and seat leakage requirements. *Lo-dB*™ cartridges or plates are also available to help maintain low outlet velocities and downstream noise.

Corrosive Service

31000 Series PFA-Lined

The 31000 Series is a PFA-lined control valve with an eccentric rotary globe plug that features tight shut-off capability, low dynamic forces, and control. This valve offers a solution for aggressive acids that tend to cause bellows permeation problems in reciprocating designs.

Erosive Service



73000 Series

The 73000 Series valve is a sweep-angle configuration for throttling erosive process media. It is available with a wide variety of engineered trim and body materials including high nickel, duplex, titanium, ceramic, and tungsten carbide alloys.

74000 Series

The 74000 Series is a split-body forged angle erosion control valve with captures trim and continuous guided fluted plug for superior stability under harsh conditions with particulate flow.

Severe Service

49000 Series

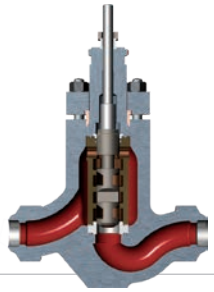
The 49000 Series is a large capacity control valve with an over-sized body area to house multi-stage *V-LOG™* Energy Management trim. The 49000 series can be applied through a wide range of applications from high-pressure drop, anti-cavitation liquid designs through low-noise gas and steam service. Available in both globe and angle-style designs and incorporating the Lo-dB and V-LOG trims, the 49000 series offers a flexible solution to fit high-pressure drop applications in any pipe size or process-fluid application.

72000 Series

The 72000 Series family of energy management and low-noise products is configured for use in compressor anti-surge, gas-to-flare, and other venting applications where high noise attenuation and high flow capacity are required. The 72000 Series is a fabricated angle valve offering an effective solution for customers' specific process needs. Custom V-LOG trim options are available to address severe, high-expansion ratio applications.

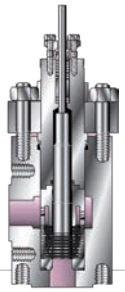
77003 Series

The 77003 Series multi-stage, expanding-area control valve is primarily for high-pressure compressible fluid or two-phase applications. It controls under conditions such as flow-entrained debris, damaging vibration, and high noise, making it an ideal solution for high-pressure, high-temperature, flashing hydrocarbon liquid services. Typical applications for this design include a range from hot high-pressure separator control in hydroprocessing applications to gas well-head control in off-shore choke valve applications as well as high-pressure gas letdown with entrained debris.



78400/18400 Series *LincolnLog™*

The axial flow 78400/18400 Series LincolnLog design utilizes a tortuous path to distribute pressure drop along the axis of the plug. The axial stages throttle in unison as the plug strokes to maintain staging ratios at all lift points. Velocity and pressure drop are controlled, thus reducing cavitation and the resulting trim damage. This valve is highly effective in pump recirculation and high-pressure liquid letdown applications, especially for dirty fluid conditions.



79003 Series

The 79003 Series is an angle body design developed to use the Variable Resistance Trim *(VRT™)* for high-pressure liquid letdown applications. The anti-cavitation VRT trim can be configured to match pump flow curves, allowing steady operation as the plant is brought up to speed and comes on line. The 79003 Series can be enhanced with a partial-stack design to allow higher flow rates as the travel is increased.

84003 Series *SteamForm™*

The 84003 Series SteamForm steam conditioning valve is built on a flexible platform to control steam under a full range of applications. Configured with a wide variety of trim options, the SteamForm operates from a range of low-pressure, steady-state process steam applications to intermittent, rapid-response turbine bypass. Built with patented technology, the SteamForm uses high rangeability spray nozzles and a proprietary water injection design for desuperheating, as well as thermally compensated trim designs for high temperature cycling in severe steam installations.

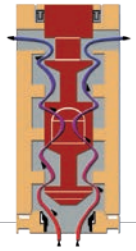
Masoneilan Valve & Instrument Technologies

Energy Management Trims

Baker Hughes offers a wide range of Masoneilan solutions to meet customers' fluid energy requirements.

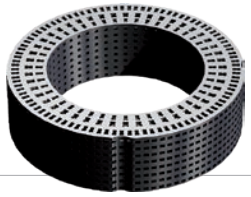
Drilled-Hole Technology

The Masoneilan product line includes a wide selection of **single-stage and multiple-stage trims** with both balanced and unbalanced globe and angle valve configurations. These designs, based on drilled-hole technology, are only recommended for clean-service applications. Balanced and unbalanced anti-cavitation options are also available with metal-to-metal seating meeting ASME Class V shut-off performance.



Axial Flow Technology

Axial Flow trims offer multi-stage designs for the control of high-pressure liquids without the damaging effects of cavitation, erosion, and vibration. The unique flow design of the LincolnLog develops the required resistance for throttling but also affords ample clearance for the passage of large particulate. The optional soft seat is specifically for boiler feedwater applications and offers long-term Class VI shut-off at demanding pressures. Similarly, the 77000 Series is a multi-stage trim with expanding areas for high-pressure gaseous applications.



Stacked Plate Technology

V-LOG Energy Management Trim is manufactured from a brazed stack of laser-cut plates, each with a series of 90 degree turns used to redirect the flow of the process fluid through a high-resistant flow path. Each stage also includes an expansion and contraction in area for maximum pressure reduction efficiency. Further, each valve body is contoured to account for flow expansion and trim area velocity to manage the total system noise, offering customers a compact energy management control valve.

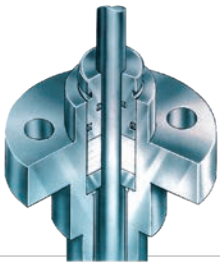
Differential Velocity Technology

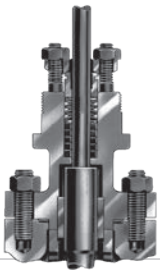
Baker Hughes patented **Masoneilan DVD™ (Differential Velocity Device)** is a highly efficient noise-reduction solution for rotary valves. Building on technology used in turbo-fan jet engines, the DVD device utilizes larger diameter outer holes to create a lower velocity annular flow stream around the flow area perimeter. This lower velocity flow stream reduces noise transmission from the higher velocity inner flow, resulting in lower external noise levels.

Variable Resistance Trim (VRT), consists of a brazed stack of drilled plates which efficiently channel the flow through multiple turns in a tortuous path configuration. The design is primarily used in high-pressure drop liquid applications. VRT is typically packaged within standard Masoneilan globe and angle valve bodies.

Fugitive Emissions Control

Masoneilan solutions for reduction of Volatile Organic Chemicals (VOCs) and Hazardous Air Pollutants (HAPs)





EF (Emission Free) Seal

The EF Seal is an emission containment feature that is standard on most Masoneilan rotary products. This seal design can be easily field-retrofitted on any existing valve in the field. It is a simple dual O-ring design that has undergone extensive testing including successful completion of 750,000 full-stroke cycles without failure. This design offers an extremely cost-effective solution for upgrading processes under the guidelines of the various regional and global emissions reduction regulations.

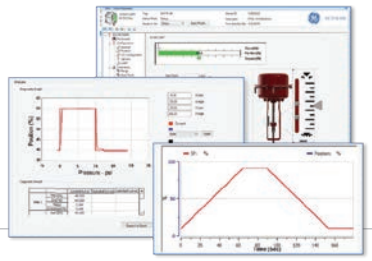
Low-E (Low Emission) Packing

Masoneilan reciprocating control valves can be equipped with the low emission packing systems for compliance up to Class A ISO-15848 Helium and Methane performance levels for both international and US EPA customers. These live-loaded packing systems maintain a constant sealing force within the packing box, providing low leakage performance with minimal field adjustment.

Bellows Seal

Bellows Seals are offered for applications as a hermetic metallic seal for valve stem interfaces providing zero leakage to atmosphere. Typical applications include handling of flammable, toxic, or explosive fluids where leakage may cause environmentally unsafe conditions. The design also includes a leak-off detection port and a redundant packing box for additional safety.

Advanced Control & Diagnostics



Digital Valve Positioners

SVI provides high performance and robust control delivered in a package that is simple to use and reliable.

Industry best technologies like environmentally shielded non-contact position technology, explosion-proof (Ex 'd') rated display and user-interface (no PC/Handheld required), auto calibration, auto tuning makes the SVI the easy choice for most control valve needs.

While capabilities such as advanced control valve diagnostics, integrated position retransmit and limit switches for valve position feedback, and full interoperability with all major DCSs and asset management systems makes the SVI valve positioner the best solution for all your critical valve needs.

12400 Digital Level Transmitter/ Controller HART®

The Masoneilan 12400 Series Digital Level Transmitter/Controller (DLT) is a smart instrument with HART communication protocol utilizing proven liquid displacement and torque tube technology. Easy to install and operate, it is the first torque tube-type level instrument that integrates level transmitter and switch functions in a single device.

Masoneilan Rotary Control Valves

35002 Series Camflex II
Eccentric Plug

Sizes: 1" through 16"
(25 through 400 mm)

Ratings and Connections:
- Flanged: Class 150-600
- Flangeless: Class 150-600
  PN 10-100
- Screwed: NPT (1" through 2")

Body Materials:
- Carbon steel
- Stainless steel
- High nickel alloy

Actuators:
- Model 35 spring diaphragm
- 70 Series cylinder

Trim:
- Eccentric rotary plug

Inherent Characteristic:
- Linear

As the original eccentric plug rotary valve, the 35002 Series Camflex valve combines quality performance and features with an economical design. The Camflex valve offers versatility and broad application. It is now supplied with the EF seal solution to reduce fugitive emissions.

31000 Series
PFA Lined

Sizes: 1" through 3"
(25 through 80 mm)

Ratings and Connections:
- Flanged: Class 150
  PN 10-16

Body Materials:
- Cast iron PFA lined

Actuator:
- Model 35 spring-opposed rolling diaphragm

Trim:
- Eccentric rotary plug

Inherent Characteristic:
- Linear

The 31000 Series is a PFA-lined control valve with an eccentric rotary plug that offers tight shut-off, low dynamic forces, and control. This valve is suitable for hydrofluoric and sulfuric acid applications.

33000 Series
Triple Offset Butterfly

Sizes: 3" through 48"
(25 through 1200 mm)

Ratings and Connections:
- Wafer, Lugged, Double Flanged Short & Long Pattern
- Class 150-600

Body Materials:
- Carbon steel
- Stainless steel
- Duplex

Actuator:
- Model 31/32 spring diaphragm
- Model 33 spring diaphragm

Trim:
- Torqued butterfly

Inherent Characteristic:
- Equal percentage

The 33000 Series Triple Offset Butterfly Valve incorporates new performance enhancing operational features, allowing for a more simplified manufacturing process. The result is exclusive patented range of superior performance zero leakage bi-directional triple offset butterfly valves, suitable for extreme pressure/temperature applications.

37002 Series Minitork™ II
Swing-Through Butterfly

Sizes: 2" through 24"
(50 through 600 mm)

Ratings and Connections:
- Wafer for mounting between flanges:
  - Class 150-300
  - PN 10-40

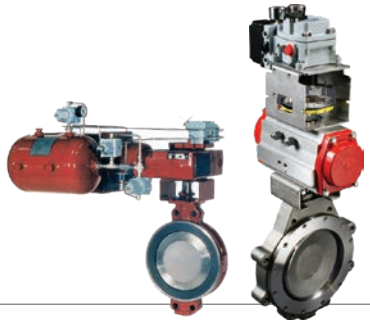
Body Materials:
- Carbon steel
- Stainless steel
- Liners in Buna-N, Viton and Nordel

Actuators:
- Model 33 spring diaphragm
- Model 35 spring diaphragm

Trim:
- Low torque butterfly

Inherent Characteristic:
- Equal percentage

The 37002 Series is a control valve used on large flow rates with low-pressure drop. It is available with complete PTFE lining (38002 Series) for corrosive fluids applications.



39004 Series
High-Performance Butterfly

Sizes: 3" through 48"
(80 through 1200 mm)

Ratings and Connections:
- Wafer and lug for mounting between flanges: Class 150-600

Body Materials:
- Carbon steel
- Stainless steel

Actuators:
- Model 33 spring diaphragm
- Model 34 scotch yoke cylinder
- Model 96/97 pneumatic rack and pinion

Trim:
- Double eccentric

Inherent Characteristic:
- Equal percentage

The 39004 Series is a heavy-duty automatic throttling butterfly control valve with an eccentric disc for large flow rates and moderate-pressure applications.

36005 Series V-Max
Control Ball Valve

Sizes: 1" through 12"
(25 through 300 mm)

Ratings and Connections:
- Flanged: Class 150-300

Body Materials:
- Carbon steel
- Stainless steel

Actuators:
- Model 33 spring diaphragm
- Model 31/32 spring diaphragm
- Model 34 scotch yoke cylinder

Trim:
- Dual characterized, v-ported segmented ball

Inherent Characteristic:
- Equal percentage

The 36005 Series V-Max valve is a high-capacity, control ball valve with a patented dual-characterized, segmented ball design combining high C_V ratings with 500:1 turndown. It is for high viscosity fluid applications (i.e. pulp and paper industry) as well as processes requiring high capacity abilities balanced with accurate control. Standard features include the environmental packing (EF seal).

Masoneilan Reciprocating Control Valves

10000 Series
Double Seated Globe Valve

Sizes: 2" through 24"
(50 through 600 mm)

Ratings and Connections:
- Flanged: Class 150-1500
  PN 10-250
- Welded: BW or SW
- Screwed: NPT 3/4" through 2"
  (20 through 50 mm)

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Cylinder

Trims:
- V-port or contoured plug
- Top and bottom guided

Inherent Characteristic:
- Llinear, quick opening or equal percentage

The 10000 Series is a double-ported valve with top and bottom stem guiding. This design is suitable for high-pressure drop applications where dirty fluid conditions exist. The 10000 Series is widely used in hydrocarbon processing applications.

21000 Series
Globe & Angle Top-Guided Valve

Sizes: 3/4" through 8"
(20 through 200 mm)

Ratings and Connections:
- Flanged: Class 150-2500
  PN 10-400
- Welded: BW or SW
- Screwed: NPT 3/4" through 2"
  (20 through 50 mm)

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 51/52/53 piston cylinder

Trims:
- Single seat plug top guided.
- Lo-dB and anti-cavitation trims, single or double stage are available

Inherent Characteristic:
- Linear or equal percentage

The 21000 Series control valve is a heavy top-guided unbalanced design with noise attenuation and anti-cavitation trim options. It can handle a variety of process applications ranging from standard service conditions to more severe applications. It also includes standard bellows seal and soft seat configurations.

28000 Series VariPak™
Micro-Trim Globe Valve

Sizes: 1" (25 mm) standard
1/2" through 3/4" (15 through 20 mm) available on request

Ratings and Connections:
- Flanged: Class 150-600
- Flangeless for mounting between flanges:
  Class 150-2500
  PN 10-400
- Screwed: NPT 1/2" through 1"
  (15 through 25 mm)

Body Materials:
- Stainless steel
- Monel
- Hastelloy C
- Alloy 20

Actuator:
- Integral spring diaphragm

Trims:
- Full stellite needle plug
- Multistep trim available

Inherent Characteristic:
- Linear

The 28000 Series Varipak is a compact globe style valve specifically for microflow control. The VariPak includes an adjustable C_V feature between 100 percent and 40 percent that can meet applications requiring finer control. It is available with bellows seal and anti-cavitation trim options.

41005 Series
Globe & Angle Cage-Guided Valve

Sizes: 2" through 24"
(50 through 600 mm)

Ratings and Connections:
- Flanged: Class 150-2500
  PN 10-400
- Welded: BW or SW
- Screwed: NPT 2" (50 mm)

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 51/52/53 piston cylinder

Trims:
- Balanced cage-guided trim.
- Lo-dB, anti-cavitation and VRT (Variable Resistance Trim), single and multiple cages are available

Inherent Characteristic:
- Linear or equal percentage

The 41005 Series is a heavy-duty valve design with balanced trim configurations. It offers cage guiding for added stability and the versatility to offer noise attenuation and anti-cavitation solutions. Available with various balancing seal options including auxiliary pilot design for unmatched high-temperature performance.

80000 Series
3-Way Diverting or Combining Valve

Sizes: 1" through 10"
(25 through 250 mm)

Ratings and Connections:
- Flanged: Class 150-600
  PN 10-100
- Threaded: NPT 3/4" through 2"
  (20 through 50 mm)
- Welded: BW or SW
  Class 900-2500 on request

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 51/52/53 piston cylinder

Trim:
- V-port plug

Inherent Characteristic:
- Linear

The 80000 Series is a line of three-way control valves for either combining or diverting applications. Its key features include high flow capacities and low-pressure recoveries, resulting in efficient flow control performance.

Masoneilan Angle Erosive Protection Valves

71000 Series
Streamlined Angle Valve

Sizes: 2" x 3" through 10" x 12"
(50 x 80 mm through 250 x 300 mm)

Ratings and Connections:
• Flanged: Class 150-2500

Body Materials:
• Carbon steel
• Stainless steel
• Chrome-moly

Actuators:
• Model 87/88 multi-spring diaphragm
• Model 51/52/53 piston cylinder

Trim:
• Heavy top plug guiding coupled with a threaded seat ring design to form an outlet venturi flow path for outlet area protection

Inherent Characteristic:
• Linear

The 71000 Series is a modified sweep-angle valve that can reduce fluid impingement through the body. This design includes heavy guiding and durable trim parts to withstand harsh operation.

Specific applications:
• Visbreaker
• Hot hydrocarbon fluid
• Coking applications

73000 Series
Sweep Angle Valve

Sizes: 1" x 1" through 10" x 12"
(25 x 25 mm through 250 x 300 mm)

Ratings and Connections:
• Flanged: Class 150-2500

Body Materials:
• Carbon steel
• Stainless steel
• Titanium
• Hastelloy
• Others

Actuators:
• Model 87/88 multi-spring diaphragm
• Model 51/52/53 piston cylinder

Trims:
• High capacity single stage
• Reduced port venturi outlet
• Ceramic and tungsten carbide optional

Inherent Characteristic:
• Linear

The 73000 Series control valve can throttle highly erosive, flashing, and two-phase flows.

Specific applications:
• Mining
• Coal slurry
• Ash handling
• Hydrocarbon bottoms

74000 Series
Erosion Control Valve

Sizes: 1" through 8"
(25 through 400 mm)

Ratings and Connections:
• Flanged: Class 150-2500

Body Materials:
• Carbon steel
• Stainless steel
• Chrome-moly
• Duplex stainless steel

Actuators:
• Model 87/88 multi-spring diaphragm
• Model 51/52/53 piston cylinder

Trims:
• Fluted single and multi-stage
• Continuous guided plug
• Ceramic and tungsten carbide optional
• Venturi trim to protect valve body

Inherent Characteristic:
• Linear

The 74000 Series is a split-body forged angle erosion control valve with captured trim and continuous guided fluted plug for superior stability under harsh conditions with particulate flow.

Specific applications:
• Resid hydro-cracking
• Service with entrained catalyst
• Pressure drops up to 4000 psi

75000 Series
Tank-Drain Valve

Sizes: 1" x 1" through 10" x 12"
(25 x 25 mm through 250 x 300 mm)

Ratings and Connections:
• Flanged: Class 150-1500

Body Materials:
• Stainless steel
• Titanium
• Hastelloy
• Others

Actuator:
• Model 51/52/53 piston cylinder

Trims:
• Single piece stem and plug design with both top and bottom guiding to eliminate trim vibration at high-pressure drops

Inherent Characteristic:
• Linear or contoured

The 75000 Series tank drain valve includes a full sweep-angle design and heavy-duty plug design to reduce erosion impact from solids or debris found in tank bottoms. It is available in 45, 60, and 90 degree-angle configurations.

Specific applications include tank level control and pressure letdown applications common in reactor or crystallizer tanks.

Masoneilan Severe Service Control Valves

72000 Series
Angle Valve with Lo-dB and V-LOG Trim

Sizes: 6" x 8" through 36" x 48"
(150 x 200 through 900 x 1200 mm)

Ratings and Connections:
- Flanged: Class 150-600
  PN 10-100 up to 600 mm
- Welded: BW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuator:
- Model 51/52/53 piston cylinder

Trims:
- Balanced cage guided trim (single or double cage)
- Lo-dB and V-LOG trims available

Inherent Characteristic:
- Linear or equal percentage

The 72000 Series offers precise capacity control while efficiently reducing noise and outlet velocities using single or multiple cages or V-LOG trim.

Specific applications:
- compressor antisurge
- flare to atmosphere

77003 Series
Multi-Stage Valves (Angle/Globe)

Sizes: 2" x 3" through 8" x 10"
(50 x 80 through 200 x 250 mm)

Ratings and Connections:
- Flanged: inlet Class 900-2500
  outlet Class 900-2500
  PN 150-400
- Welded: BW or SW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 51/52/53 piston cylinder
- Model 87/88 multi-spring diaphragm

Trims:
- Axial flow technology
- Multi-stage trim (expanding area type)
- Anti-cavitation, flashing, de-gassing, and low noise

Inherent Characteristic:
- Linear

The 77003 Series multi-stage, expanding-area control valve is primarily for high-pressure compressible fluid or two-phase flow applications. It controls erosion, de-gassing, and high noise levels.

Specific applications:
- hot separator letdown
- well-head choke

78400/18400 Series LincolnLog

Sizes: 1" through 12"
(25 through 300 mm)

Ratings and Connections:
- Flanged: Class 600-2500
  PN 100-400
  Welded: BW or SW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 51/52/53 piston cylinder

Trims:
- Axial flow technology
- Multi-stage, cage-guided, anti-cavitation trim
- Class VI available on request

Inherent Characteristic:
- Linear

The 18400 and 78400 Series valve is used in high-pressure liquid service applications to help eliminate cavitation.

Specific applications:
- Boiler feedwater recirculation

49000 Series
Globe and Angle Style with Lo-dB or V-LOG Trim

Sizes: 4" through 36"
(100 through 900 mm)

Ratings and Connections:
- Flanged: Class 150-2500
  PN 10-400
- Welded: BW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 51/52/53 piston cylinder

Trims:
- Single or double stage Lo-dB and V-LOG energy management trim available in low noise flow-to-open designs or anti-cavitation flow-to-close variety of balanced trim options for Class IV and V shutoff

Inherent Characteristic:
- Linear or equal percentage

The 49000 Series features enlarged body galleries to accommodate up to 36-stages of pressure reduction.

Specific applications include boiler feedwater start-up and control, steam letdown, pump discharge, water reinjection, gas recycle, and vent applications.

79003 Series
Angle Style with VRT Trim

Sizes: 1" through 6"
(25 through 150 mm)

Ratings and Connections:
- Flanged: Class 600-2500
  PN 100-400
- Welded: BW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 51/52/53 piston cylinder

Trim:
- Multi-stage VRT trim design and VRT partial stack design for control over a wide range of applications

Inherent Characteristic:
- Linear

The 79003 Series valves offers anti-cavitation service with control over a wide range of operating conditions, such as the ramp-up transition of a normal feedwater pump.

Specific applications:
- Feedwater control
- Feedwater pump start-up valve

84003 Series
SteamForm

Trim Sizes: 3" through 24"
(80 through 600 mm)
Pipe Sizes: 3" through 48"
(80 through 1200 mm)

Ratings and Connections:
- Flanged: Class 150-2500
  PN 10-400
- Welded: BW

Body Materials:
- Carbon steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 51/52/53 piston cylinder

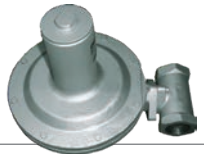
Trims:
- Single or double stage Lo-dB with optional diffuser, and V-LOG energy management trim
- Available with thermally compensated high temperature trim options for long life in high-cycling environments
- Variety of balanced trim options for Class IV and V shutoff

Inherent Characteristic:
- Linear or equal percentage

The 84003 Series SteamForm valve includes a patented water-injection system for efficient desuperheating in steam conditioning applications.

Specific applications:
- Turbine bypass
- Process steam conditioning

Masoneilan Regulators



525/526 Series

Sizes: 3/4" through 4"
(20 through 100 mm)

Ratings and Connections:
- Flanged: Class 150-600
  PN 10-100
- Screwed: NPT
- Welded: BW or SW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuator:
- Model 10900 with spring-opposed diaphragm

Trim:
- Disc plug, double seat

Working Range:
- 0.5 to 330 psi
  (0.034 to 22.7 bar)

The 525 Series regulators are configured for pressure reduction, and the 526 Series is for back-pressure applications. They are also available for differential-pressure applications in multiple configurations that can meet various combinations of capacity, pressure, and temperature requirements.

The 535V and 535H Series are available in multiple configurations for pressure reduction and differential-pressure applications.

535V/535H Series

3/4" through 2"
(20 through 50 mm)

Ratings and Connections:
- Flanged: Class 150-600
  PN 10-100
- Screwed: NPT
- Welded: SW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuator:
- Model 10900 with spring-opposed diaphragm

Trim:
- Single seat, disc plug (535H Series)

Working Range:
- 0.5 to 330 psi
  (0.034 to 22.7 bar)

170/172/173 Series

Sizes: 1/4"through 2"
(6 through 50 mm)

Ratings and Connections:
- Flanged: Class 150-600
  PN 10-100
- Screwed: NPT
- Welded: SW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuator:
- Sizes 80 through 515 spring opposed diaphragm

Trim:
- Single seat, disc plug
- Hard (metal) and soft (elastomer) seat options

Working Range:
- 0.035 psi to 667 psi
  (0.0024 to 46 bar)

The 170 through 173 Series regulators are a line of pressure reducing and relieving (back-pressure) and differential-pressure regulators for industrial liquid, steam, and gas applications.

The 174 Series is a low pressure regulator for gas service control. It is available in both pressure reducing and pressure relieving (back-pressure) constructions for industrial air and gas applications.

174 Series

1/2" through 1-1/2"
(15 through 40 mm)

Ratings and Connections:
- Screwed: NPT

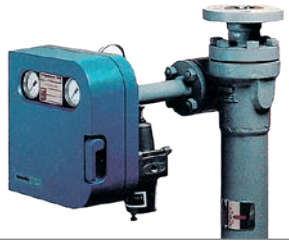
Body Materials:
- Carbon steel

Actuator:
- Integral spring diaphragm

Trim:
- Single seat, disc plug
- Elastomer disc for tight shutoff

Working Range:
- 1.4 inches W.C. to 8.8 psi
  (3.4 mbar to 0.61 bar)

Masoneilan Level Transmitters/Controllers



12800 Series
Pneumatic Level Transmitter/ Controller

Range: 14" through 120" (355 through 3048 mm)

Ratings and Connections:
- Flanged: Class 150-2500
  PN 10-100
- Screwed: NPT-F (1-1/2", 2")
- Welded

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Displacer Materials:
- Stainless steel
- Other materials on request

Torque Tube Materials:
- Inconel
- Stainless steel
- Other materials on request

Action:
- Proportional
- Proportional + reset
- Transmitter
- Differential gap
- Duplex

The 12800 Series pneumatic level controllers are used to control and/or transmit the level in a tank with one or two fluids (interface service).

The 12800 Series operates according to liquid displacement and torque tube principles.

12400 Series
Digital Level Transmitter/ Controller

Range: 14" through 120" (355 through 3048 mm)

Ratings and Connections:
- Flanged: Class 150-2500
  PN 10-100
- Screwed: NPT-F (1-1/2", 2")
- Welded

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Displacer Materials:
- Stainless steel
- Other materials on request

Torque Tube Materials:
- Inconel
- Stainless steel
- Other materials on request

Electronic Instrument:
- HART protocol
- 4-20mA signal
- ATEX, FM, CSA, JIS, CU TR, CRN, IEC, INMETRO, CCOE, IA, KOSHA, NEPSI, TAIWAN TS and IEC between main approvals
- SIL2 safety certified
- Optional 2 built-in level switches
- Optional second 4-20 mA output signal

The Masoneilan 12400 Series Instrument is a two-wire loop-powered, digital-displacement type level transmitter or controller with HART communication. This high performance instrument is easily set-up and calibrated with either ValVue communication software, EDDL, DTM, a hand-held communicator, or local pushbuttons and digital display. This versatility allows the operator to configure, calibrate, and perform other functions either at the instrument or from the control room.

Advanced Smart Instruments

NEW Product!

SVI3
Digital Valve Positioner

Communication / Control Platform:
- 4-20mA with HART®

Pneumatics:
- 20–120 psi Supply pressure
- Single-acting

Operating Temperature:
- Standard: -40°C to +85°C
- Optional Extreme Low : -55°C to +85°C

Materials:
- Chromated, Copper-free, Aluminum housing (Polyurethane paint, Epoxy primer)
- Composite Polymers and Stainless Steel Pneumatics

I/O:
- 4-20mA output
- Configurable Switches
- Discrete Input
- Remote Positioner Sensor Input (Masoneilan RPS)
- 1-5V input (Remote Sensor)

Mounting / Feedback:
- Non-Contact magnetic position feedback
- Rotary or Linear
- Stainless Steel brackets for all Masoneilan and major valve brands

Certifications:
- Explosion / Flame / Dust-proof and Intrinsically safe
- USA, Canada, ATEX, IECEx
- Regional – NEPSI, Taiwan TS, CCOE, CU-TR, AZS, UZ, INMETRO, JIS, KOSHA, IA

Diagnostics:
- Standard, Advanced, or Online Valve diagnostic levels available
- Continuous, Online, Online Valve, and Offline Diagnostics/Methods
- Up to 1 year of online valve diagnostic storage locally within device

Configuration / Monitoring Interfaces :
- Local Display with Pushbuttons (Optional)
- DTM – Full device configuration using FDT frame (ValVue recommended)
- eDDL – seamless integration into leading asset management systems

The third generation Baker Hughes Masoneilan SVI is a user friendly digital valve positioner for pneumatic control valves. Utilizing advanced control and diagnostic algorithms, along with field-proven noncontact position sensing technology, the SVI delivers accurate, responsive, and reliable positioning performance. The SVI3 is built on 20+ years and billions of hours of field proven valve position sensing technology, control algorithms, and advance performance pneumatic design. Exciting new features like online valve diagnostics take valve health predictivity to the next level, storing up to 1 year of real time valve diagnostics directly within the device. With an extended temperature range, greater air delivery, and reduced air consumption, the SVI3 performs top of class along with prior Masoneilan models. Single button SMART CAL commissioning and improved user interfaces allow for quick and easy setup on virtually any air operated actuator.

SVI Advanced Performance
Digital Valve Positioner

Communication / Control Platform:
- 4-20mA with HART® (SVI II AP)
- FOUNDATION® Fieldbus H1 (SVI FF)

Pneumatics:
- 20–150 psi Supply pressure
- Single, High Flow Single, or Double-acting

Operating Temperature:
- -40°C to +85°C

Materials:
- Aluminum (painted) or Stainless Steel Housing
- Composite Polymers and Stainless Steel Pneumatics

I/O:
- 4-20mA output (AP only)
- (2) Configurable Switches
- Discrete Input
- Remote Positioner Sensor Input (Remote Sensor optional)

Mounting / Feedback:
- Non-Contact magnetic position feedback
- Rotary or Linear
- Stainless Steel brackets for all Masoneilan and major valve brands

Certifications:
- Explosion / Flame / Dust-proof and Intrinsically safe
- USA, Canada, ATEX, IECEx
- Regional – NEPSI, Taiwan TS, CCOE, CU-TR, AZS, UZ, INMETRO, JIS, KOSHA, IA

Diagnostics:
- Standard or Advanced levels available
- Continuous, Online, and Offline Diagnostics/Methods

Configuration / Monitoring Interfaces :
- Local Display with Pushbuttons (Optional)
- ValVue Device Diagnostic and Configuration Tool
- DTM or eDDL – seamless integration into leading asset management systems

The Advanced Performance SVI Digital Valve Positioner models offer superior control technology for pneumatically actuated valves. Field proven, non-contact magnetic position feedback provides high precision with extreme reliability in harsh conditions. Mounting brackets for most major valve/actuator brands and optional Display with Pushbuttons promote quick and easy installation and commissioning. Available with either 4-20mA with HART® (SVI II AP) or FOUNDATION® Fieldbus (SVI FF), integration into control systems is seamless, especially when paired with ValVue software. Valve and Positioner health are monitored and analyzed through the various continuous, online, and offline diagnostics, which make the Advanced Performance positioners a perfect selection to increase control valve and plant efficiency.

Emergency Shutdown Device & PST Controller

SVi1000
Digital Valve Positioner

Communication / Control Platform:
- 4-20mA with HART®

Pneumatics:
- 20–100 psi Supply pressure
- Single-acting

Operating Temperature:
- -40°C to +85°C

Materials:
- Aluminum (painted)
- Composite Polymers and Stainless Steel Pneumatics

I/O:
- 4-20mA output or (2) Configurable Switches

Mounting / Feedback:
- Non-Contact magnetic position feedback
- Rotary or Linear
- Stainless Steel brackets for all Masoneilan and major valve brands
- Integrated magnet option for custom mounting

Certifications:
- Intrinsically safe / Non-Incendive / Limited Energy
- USA, Canada, ATEX, IECEx
- Regional – NEPSI, Taiwan TS, CCOE, CU-TR, AZS, UZ, INMETRO, IA

Diagnostics:
- Standard Continuous and Offline Diagnostics/ Methods

Configuration / Monitoring Interfaces :
- User-friendly "One button, one function" local interface
- ValVue Device Diagnostic and Configuration Tool
- DTM or eDDL – seamless integration into leading asset management systems

The SVi1000 is a user-friendly 4-20mA with HART® digital valve positioner for single-acting pneumatic control valves. Leveraging many of the same technologies from the SVI II AP, the SVi1000 is perfect for those that need a low maintenance valve positioner, and an ideal candidate for upgrading legacy electro-pneumatic positioners. Designed to be installed and operational in less than 5 minutes, the SVi1000 is easily through its "One button, one function" local pushbuttons or via its powerful DTM interface and ValVue software.

SVI II ESD
Emergency Shutdown Device and PST Controller

Communication / Control Platform:
- 24Vdc or 4-20mA Safety function trip signal (SIL3)
- HART® and Switch(Discrete Output) fault annunciation

Pneumatics:
- 20–120 psi Supply pressure
- Single-acting

Operating Temperature:
- -40°C to +85°C

Materials:
- Aluminum (painted) or Stainless Steel Housing
- Composite Polymers and Stainless Steel Pneumatics

I/O:
- 4-20mA output and discrete Input

Mounting / Feedback:
- Non-Contact magnetic position feedback
- Rotary or Linear
- Stainless Steel brackets for all Masoneilan and major valve brands

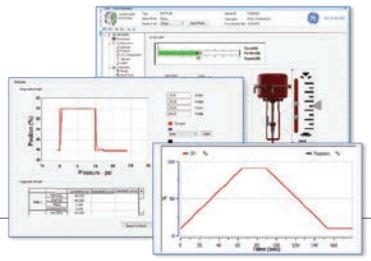
Certifications:
- Explosion / Flame / Dust-proof and Intrinsically safe
- USA, Canada, ATEX, IECEx
- Regional – NEPSI, Taiwan TS, CCOE, CU-TR, AZS, UZ, INMETRO, JIS, KOSHA, IA

Diagnostics:
- Partial Stroke Testing (PST)

Configuration / Monitoring Interfaces:
- Local Display with Pushbuttons
- ValVue ESD Device Diagnostic and Configuration Tool
- DTM or eDDL – seamless integration into leading asset management systems

The SVI II ESD is a SIL3 capable partial stroke test controller and emergency shutdown device. Its safety and PST function are independent of each other, allowing the device to respond to a safety function while a test is active. It can capture two shutdown events and allow continuous HART communications during a trip facilitating local panel annunciation using the built in discrete outputs. The SVI II ESD automatically captures and stores the PST results in its non-volatile memory while Valvue ESD software regularly interfaces and updates its database with PST and full stroke data.

Masoneilan Stand Alone or Integrated Softwares



ValVue 3
Device Diagnostics & Configuration Tool

Key Features:
- Common interface for all instruments
- Time stamped Audit Trail provides full documentation of all changes managed by the application
- Automatic device monitoring with NAMUR 107 compliant alerts
- Provide specific task authorization with user level access control
- Easy PDF Report generation

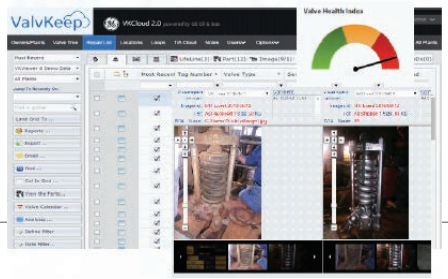
Benefits:
- Automates standard device commissioning steps with Sequencer to get more done, consistently and accurately
- Enables easy compliance validation for audit reports
- Enhances security by requiring user authentication
- Shorter training cycles by using the same basic interface for all field devices

ValVue 3 is compatible with:
- SVI II AP
- SVI II ESD
- SVi1000
- DLT 12400
- SVI FF
- DLT 12300

ValVue 3 supports the following connections:
- Hart Modem
- wirelessHART® gateways
- FF Modem
- Emerson AMS OPC
- HART® Multiplexors

Masoneilan additionally offers fully interoperable DTMs for host integration in the following systems:
- Yokogawa PRM v3.04+
- Honeywell FDM v400+
- Schneider Electric Foxboro FDM
- Emerson AMS v12.5+
- Rockwell Automation FactoryTalk v2.31+
- ABB 800xA v5+

ValVue 3 is a powerful and user-friendly interface designed for set-up, configuration, and diagnostics of Masoneilan instruments. ValVue improves Maintenance team efficiency by automating set up, calibration, and diagnostics procedures which is particularly helpful during plant outages.



Valve Lifecycle Management (VLM)
by Baker Hughes

Baker Hughes provides complete valve lifecycle management (VLM) solution from initial setup/ commissioning through turnaround/outage support. Utilizing Baker Hughes extensive valve experience, valve optimized tools, and local service teams help Reliability and Maintenance managers:

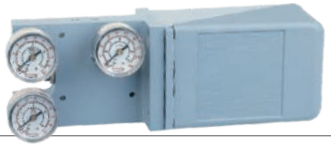
- Prioritize valve maintenance activities
- Identify opportunities for process optimization
- Simplify troubleshooting activities
- Optimize valve spares inventory

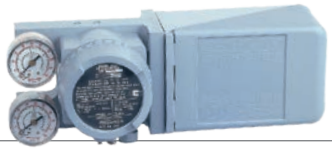
During plant operations, VLM service subscribers receive valve fleet health reports detailing which valves need to be slotted for repair BEFORE they impact process operations. Similarly, VLM reports can be used to plan valve overhaul operations during outages providing information to overhaul valves based on operating condition rather than time based techniques reducing valves repaired by as much as 50%.

These services are often provided with no additional hardware required, regardless of valve/positioner brand.

Unlock the hidden power of your digital invest with Baker Hughes Valve Lifecycle Management Services.

Masoneilan Instrumentation





4700/4800 Series
Pneumatic & Electro-Pneumatic Positioner

Control Signals:

4700/4800P
- 3-15 psig
- 6-30 psig

4700/4800E
- 4-20mA

Pneumatics:

4700/4800P
- Direct
- Reverse
- 100 psi maximum supply pressure

4700/4800E
- Direct
- 100 psi maximum supply pressure

Operating Temperature:
- -40°C to +85°C

Materials:
- Aluminum (painted) housing
- Stainless Steel Pneumatics

Mounting / Feedback:
- Integrated position feedback
- Rotary or Linear cam settings
- Stainless Steel brackets for all Masoneilan and major valve brands

Certifications:
- Explosion proof and Intrinsically safe
- North America, Canada, ATEX
- Regional – CCOE, CU-TR, INMETRO, IA, UA TR

The model 4700/4800P and 4700/4800E are control valve positioners that use a precision feedback cam for accurate positioning, fast response, and customized control characteristics. These positioners can be used with either rotary or liner actuators in applications where only pneumatic or 4-20mA control signals exist.

Model 4411
Electro-Pneumatic Transducer

Output capacity:
- 12 scfm (20.4 Nm^3/h)

Signals:
- Input: 4-20mA (100mA max)
- Output: 3-15 psig, 6-30 psig

Certification:
- Explosion proof and intrinsically safe enclosure rating per IP 66 and NEMA X

The 4411 I/P is manufactured with Reedex™ digital-micro valve technology for fast response. It is not sensitive to vibration.
- Low air consumption
- Adjustable tight shut-off feature

496 Series
Position Switches and Transmitters[1]

Configurations:
- Electromechanical Limit Switch:
  - quantity 1 or 2
  - single or double pole
  - double throw
- Inductive Proximity Detector Switch:
  - quantity 1 or 2
- Potentiometric Position Transmitter
- Opto-Electronics Position Transmitter

Certifications:
- Explosion-proof / Intrinsically safe
- North America, Canada, ATEX
- Regional – NEPSI / Taiwan TS, CCOE, CU-TR / AZ, UA, KOSHA, IA

The 496 Series instrumentation can be configured as electro-mechanical switches, proximity switches, or position transmitters. These devices offer high resistance to vibration and electrical interference for reliable valve-mounted performance.

Mechanical and electrical components can operate in harsh environments and are approved for use with various hazardous area ratings in most countries.

78 Series
Air Filter Regulator & Air Lock Up Valves[1]

Air Filter Regulator Model 78-40:
- Inlet pressure rating: 210 psi
- Pressure set range : 5-100 psi
- Filter: Polyethylene (5µm)
- Temperature range: -40°C to 83°C, option for -50°C to 60°C or 0 to 100°C

The Model 78-40 air filter regulators are compact, lightweight, high performance pressure reducing valves. They are used primarily for supplying a stable source of air to process control equipment, such as control valve positioners and current to pneumatic transducers. These regulators are externally adjustable for fine tuning and include a locking feature for maintaining output pressure at the desired level. The compact design is easy to mount onto a range of equipment using various methods and orientations.

Transfer/Lock Up Valves Model 78-80:
- Transfer valve pressure: 250 psi
- Max signal pressure: 150 psi
- Temperature range: -30°C to 83°C

Version 78-80S:
- Cv In to Out: 0.8
- Cv Out to Ex: 1.3

Version 78-80H:
- Cv In to Out: 4.5
- Cv Out to Ex: 5.0

The Model 78-80 transfer valve is used to switch the air flow from one port to another, when the signal pressure becomes lower than the set pressure in case of the air failure. The 3-way transfer valve can be also used as the lockup valve by plugging off the exhaust port. The lockup valve is used to lock the control valve in its last position (Air-Failure-Lock) by confining the air pressure in the actuator, when the signal pressure becomes lower than the set pressure in case of the air failure. When the failed air pressure is recovered above the set pressure, the locked position is released and the control valve will go back to the normal operation.

BR200/BR400
High Capacity Volume Booster Relays[1]

Input/Output Ratio:
- 1:1

Maximum Supply/Signal Pressure:
- 150 psi

Temperature range:
- -30°C to +83°C, option for -50°C to +60°C or 0°C to +100°C

Maximum Cv BR200:
- Supply: 1.2
- Exhaust: 1.2

Maximum Cv BR400:
- Supply: 2.6
- Exhaust: 2.4

Model BR200 and BR400 pneumatic booster relays offer high capacity air volume boost for faster, dynamic control valve system response. These devices feature a 1:1 input-to-output ratio with a maximum supply and signal pressure of 150 psi. The BR200 and BR400 also include an integrated internal bypass valve for sensitivity adjustment and dynamic response optimization. These devices also have integrated filters in both the supply and signal ports and are configured using stainless steel components and corrosion resistant finishes for a robust and reliable assembly.

1. Optional Stainless Steel housings available for marine offshore applications.

Direct Sales Office Locations

Australia
Brisbane
Phone: +61-7-3001-4319

Perth
Phone: +61-8-6595-7018

Melbourne
Phone: +61-3-8807-6002

Brazil
Phone: +55-19-2104-6900

China
Phone: +86-10-5738-8888

France
Courbevoie
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Mumbai
Phone: +91-22-8354790

New Delhi
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Italy
Phone: +39-081-7892-111

Japan
Tokyo
Phone: +81-03-6871-9008

Korea
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Malaysia
Phone: +60-3-2161-03228

Mexico
Phone: +52-55-3640-5060

Russia
Veliky Novgorod
Phone: +7-8162-55-7898

Moscow
Phone: +7-495-585-1276

Saudi Arabia
Phone: +966-3-341-0278

Singapore
Phone: +65-6861-6100

South Africa
Phone: +27-11-452-1550

South & Central America and the Caribbean
Phone: +55-12-2134-1201

Spain
Phone: +34-935-877-605

United Arab Emirates
Phone: +971-4-8991-777

United Kingdom
Phone: +44-7919-382-156

United States

Houston, Texas
Phone: +1-713-966-3600

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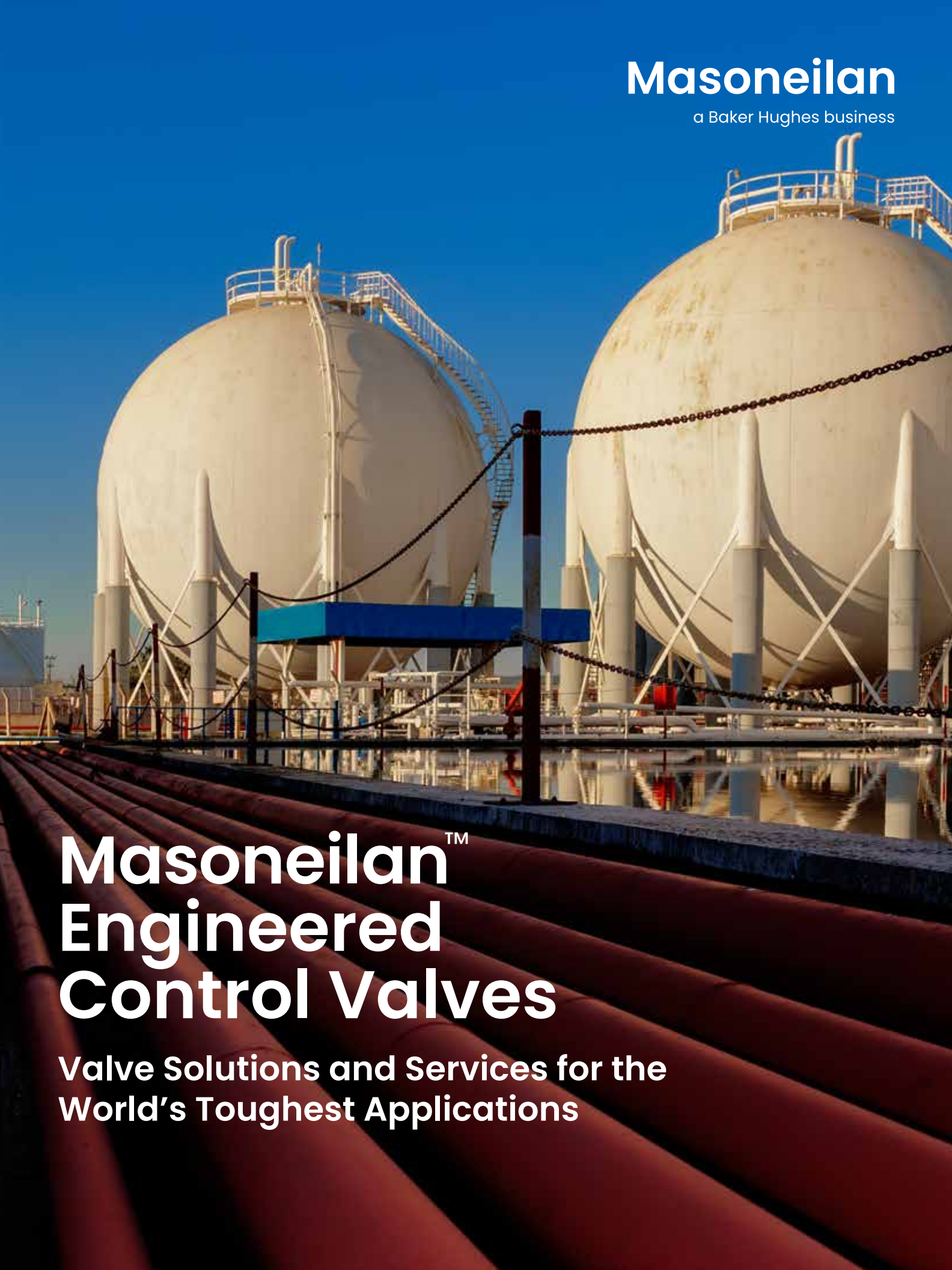

Masoneilan™ Engineered Control Valves

Valve Solutions and Services for the World's Toughest Applications

Integrated Smart Engineered Solutions

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Smart Severe-Service Technology

72000 Series Angle Valve with *Lo-dB™* and *V-LOG™* Trim

Sizes: 6" x 8" through 36" x 48"
(150 x 200 through 900 x 1200 mm)

Ratings and Connections:
- Flanged: ANSI 150 - 600
  UNI-DIN 10 - 100
  up to 600 mm
- Welded: BW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuator:
- Cylinder actuators

Trims:
- Balanced cage guided trim (single or double cage)
- Lo-dB and V-LOG trims available

Inherent Characteristic:
- Linear or equal percentage

72000 Series valves are designed for precise capacity control, while efficiently minimizing noise and outlet velocities using single or multiple cages or V-LOG trim.

Specific applications:
- compressor antisurge
- flare to atmosphere

77000 Series Multi-Stage Valves

Sizes: 2" x 3" through 8" x 10"
(50 x 80 through 200 x 250 mm)

Ratings and Connections:
- Flanged: inlet ANSI 2500
  outlet ANSI 150 - 2500
  UNI-DIN 10 - 400
- Welded: BW or SW

Body Materials:
Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 37/38 spring-opposed diaphragm
- Cylinder actuators

Trims:
- Axial flow technology
- Multi-stage trim (expanding area type)
- Anti-cavitation, flashing, de-gassing, and low noise

Inherent Characteristic:
- Linear

77000 Series valves are multi-stage, expanding area control valves are designed primarily for high-pressure compressible fluid or two phase flow applications. They effectively control erosion, de-gassing, and high noise levels.

Specific applications:
- hot separator letdown
- well-head choke

18400 & 78400 Series *LincolnLog™*

Sizes: 1" through 12"
(25 through 300 mm)

Ratings and Connections:
- Flanged: ANSI 600 - 2500
  UNI-DIN 100 - 400
- Welded: BW or SW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 37/38 spring-opposed diaphragm
- Model 87/88 multi-spring opposed diaphragm
- Cylinder actuators

Trims:
- Axial flow technology
- Multi-stage, cage-guided, anti-cavitation trim
- Class VI available on request

Inherent Characteristic:
- Linear

The **18400 and 78400 Series valves** used on liquid services eliminate cavitation.

Specific applications:
- boiler feedwater recirculation
- desuperheater spray water

49000 Series Globe and Angle Style with Lo-dB or V-LOG Trim

Sizes: 4" through 36"
(100 through 900 mm)

Ratings and Connections:
- Flanged: ANSI 150-2500
  UNI-DIN 10 - 400
- Welded: BW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 37/38 spring-opposed diaphragm
- Model 87/88 multi-spring opposed diaphragm
- Cylinder actuators

Trims:
- Single or double stage Lo-dB and V-LOG energy management trim
- Available in low noise flow-to-open designs or anti-cavitation flow-to-close
- Variety of balanced trim options for Class IV and V shutoff

Inherent Characteristic:
- Linear or equal percentage

The **49000 Series valves** are designed with enlarged body galleries to accommodate large stroke lengths and up to 36 stages of pressure reduction. Specific applications: boiler feed water start up and control, steam letdown, pump discharge, water reinjection, gas recycle and vent applications.

79003 Series Angle Style with *VRT*™ Trim

Sizes: 1" through 6"
(25 through 150 mm)

Ratings and Connections:
- Flanged: ANSI 600 - 2500
  UNI-DIN 100 - 400
- Welded: BW

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 37/38 spring diaphragm
- Cylinder actuators

Trim:
- Multi-stage VRT trim design and VRT partial stack design for control over a wide range of applications

Inherent Characteristic:
- Linear

The **79003 Series valves** are designed for anti-cavitation service with control over a wide range of operating conditions, such as the ramp-up transition of a normal feedwater pump.

Specific applications:
- Feedwater control
- Feedwater pump start-up valve

84003 Series *SteamForm*™ Valve

Trim Sizes: 3" through 24"
(80 through 600 mm)
Pipe Sizes: 3" through 48"
(80 through 1200 mm)

Ratings and Connections:
- Flanged: ANSI 150 - 2500
  UNI-DIN 10 - 400
- Welded: BW

Body Materials:
- Carbon steel
- Chrome-moly

Actuators:
- Model 87/88 multi-spring diaphragm
- Model 37/38 spring diaphragm
- Cylinder actuators

Trims:
- Single or double stage Lo-dB with optional diffuser, and V-LOG energy management trim
- Available with thermally compensated high temperature trim options for long life in high-cycling environments
- Variety of balanced trim options for Class IV and V shutoff

Inherent Characteristic:
- Linear or equal percentage

The **84003 Series SteamForm valve** is designed with a wide range of features, including a patented water injection system for best performance in steam conditioning applications.

Specific applications:
- Turbine bypass
- Process steam conditioning

72000 Series Streamlined Angle Valve

Sizes: 2" x 3" through 10" x 12" (50 x 80 mm through 250 x 300 mm)

Ratings and Connections:
• Flanged: ANSI 150 - 2500

Body Materials:
• Carbon steel
• Stainless steel
• Chrome-moly

Actuator:
• Model 87/88 spring-opposed diaphragm
• Cylinder actuators

Trims:
• Heavy top plug guiding coupled with a threaded seat ring design to form an outlet Venturi flow path for outlet area protection

Inherent Characteristic:
•Linear

The 71000 Series valve is a modified sweep angle valve designed to minimize fluid impingement through the body. This design includes very heavy guiding and durable trim

Specific applications:
• visbreaker, hot hydrocarbon fluid and coking applications

73000 Series Sweep Angle Valve

Sizes: 1" x 1" through 10" x 12" (25 x 25 mm through 250 x 300 mm)

Ratings and Connections:
• Flanged: ANSI 150 - 2500

Body Materials:
• Carbon steel
• Stainless steel
• Titanium
• Hastelloy
• Others

Actuators:
• Model 87/88 spring-opposed diaphragm
• Cylinder actuators

Trims:
• High-capacity single stage
• Reduced port Venturi outlet
• Ceramic and tungsten carbide optional

Inherent Characteristic:
• Linear

The **73000 Series valves** control valve is especially suited to throttle highly erosive, flashing, and two phase flows.

Specific applications:
• mining
• coal slurry
• ash handling
• hydrocarbon bottoms

75000 Series Tank-Drain Valve

Sizes: 1" x 1" through 10" x 12" (25 x 25 mm through 250 x 300 mm)

Ratings and Connections:
• Flanged: ANSI 150 - 1500

Body Materials:
• Stainless steel
• Titanium
• Hastelloy
• Others

Actuators:
• Cylinder actuators

Trims:
• Single-piece stem and plug design with both top and bottom guiding to eliminate trim vibration at high pressure drops

Inherent Characteristic:
• Linear or contoured

The **75000 Series** tank-drain valves includes a full sweep-angle design and heavy-duty plug design to minimize erosion impact from solids or debris found in tank bottoms. Valves are available in 45-, 60-,

Specific applications:
• tank level control and pressure letdown applications commonly found in reactor or crystallizer tanks

Valve Solutions and Services for the World's Toughest Applications

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Masoneilan™ Power Industry Control Solutions

Masoneilan

a Baker Hughes business

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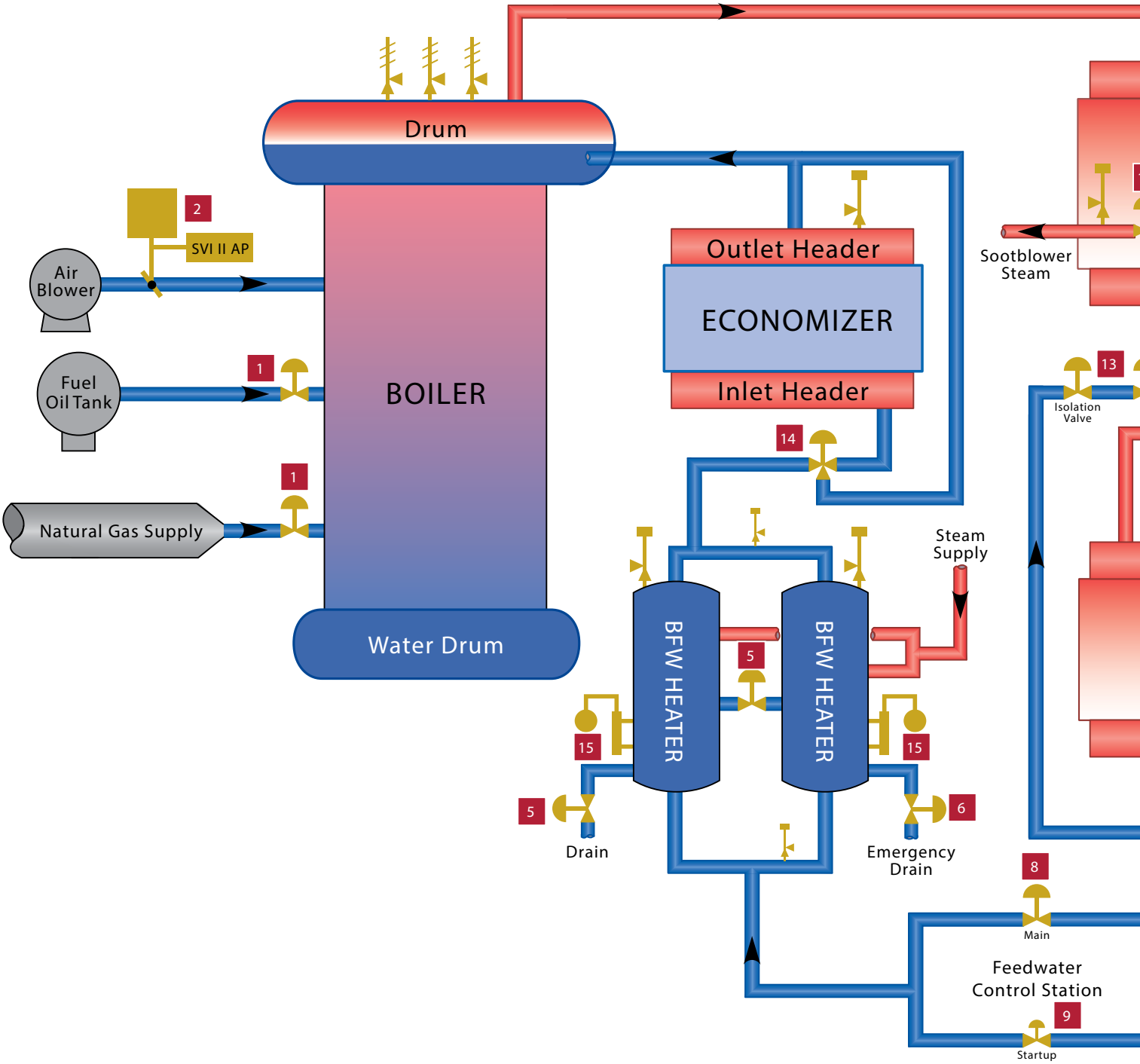
Valve Solutions and Services for the Energy Industry

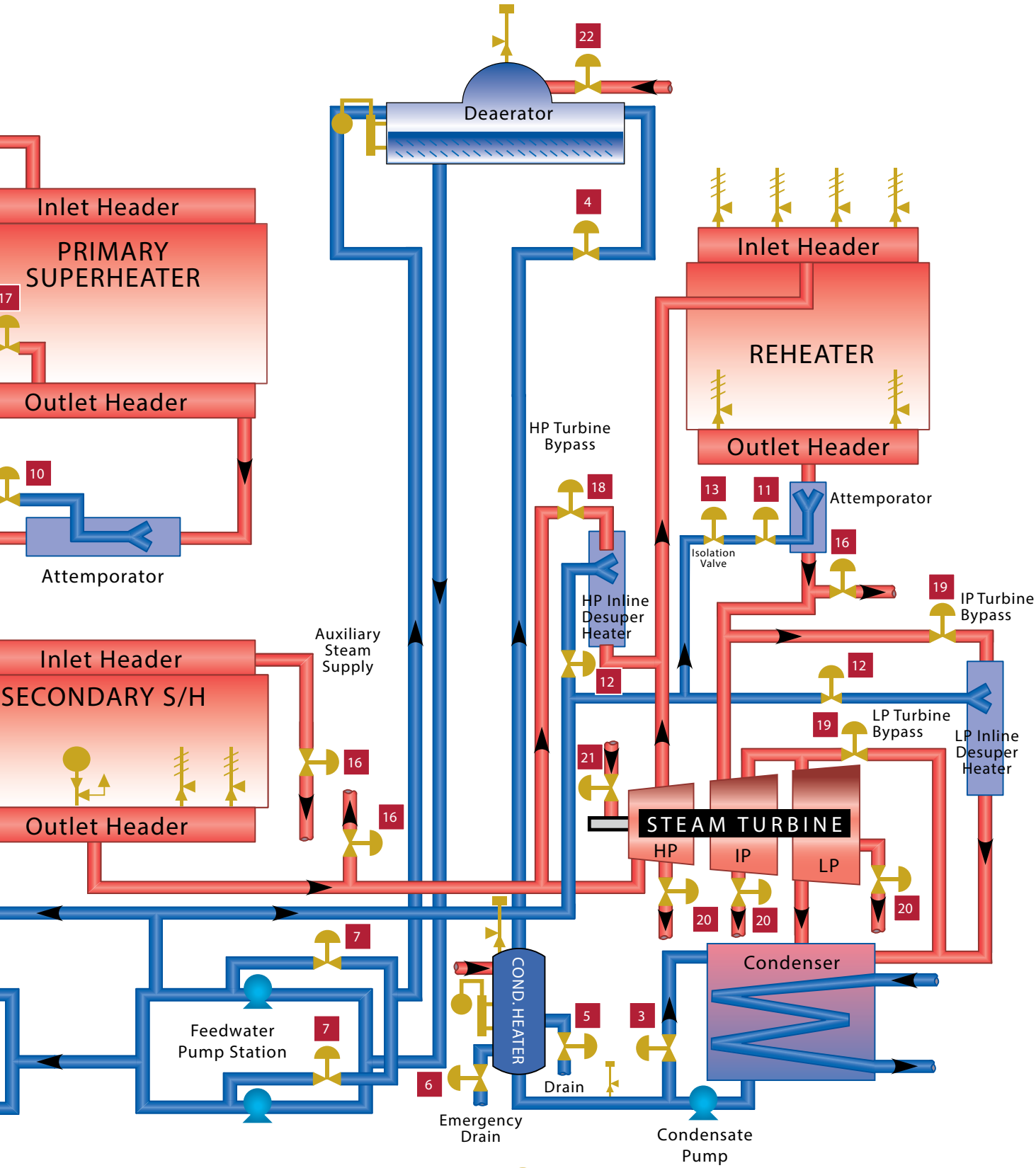
Baker Hughes provides the most complete control valve portfolio for the power industry with its wide range of engineered products and general service control valves. Baker Hughes valve technology, digital instrumentation, and advanced diagnostics will improve plant efficiency and reduce costly unplanned down time.

Innovation by Design

Baker Hughes Masoneilan Products created and patented the automatic governor for controlling steam pumps in 1883. Over the last 130 years, the brand has pioneered numerous industry firsts in technology and standards for the control valve industry including the standard measure of valve capacity, *Lo-dB™* trim, and unique engineered technology for the entire energy industry. Baker Hughes is here to provide the most effective technology and the complete solution for your plant.

Typical Fossil Fuel Power Plant System




Deaerator
22
4
Inlet Header
PRIMARY SUPERHEATER
17
Outlet Header
10
Attemporator
Inlet Header
SECONDARY S/H
Outlet Header
Auxiliary Steam Supply
16
16
HP Turbine Bypass
18
HP Inline Desuper Heater
12
Inlet Header
REHEATER
Outlet Header
13
11
Attemporator
Isolation Valve
16
19
IP Turbine Bypass
12
19
LP Turbine Bypass
LP Inline Desuper Heater
21
STEAM TURBINE
HP
IP
LP
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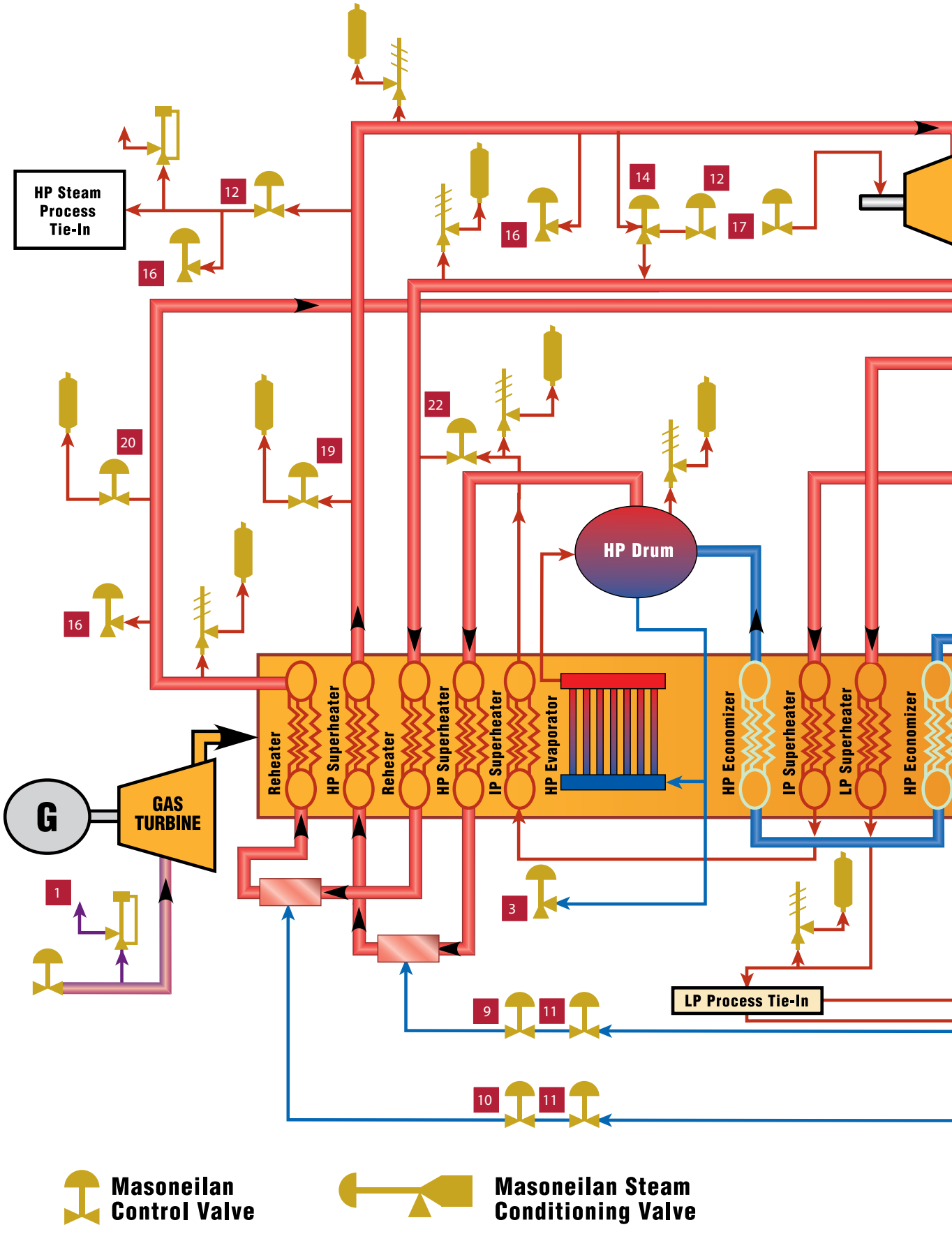
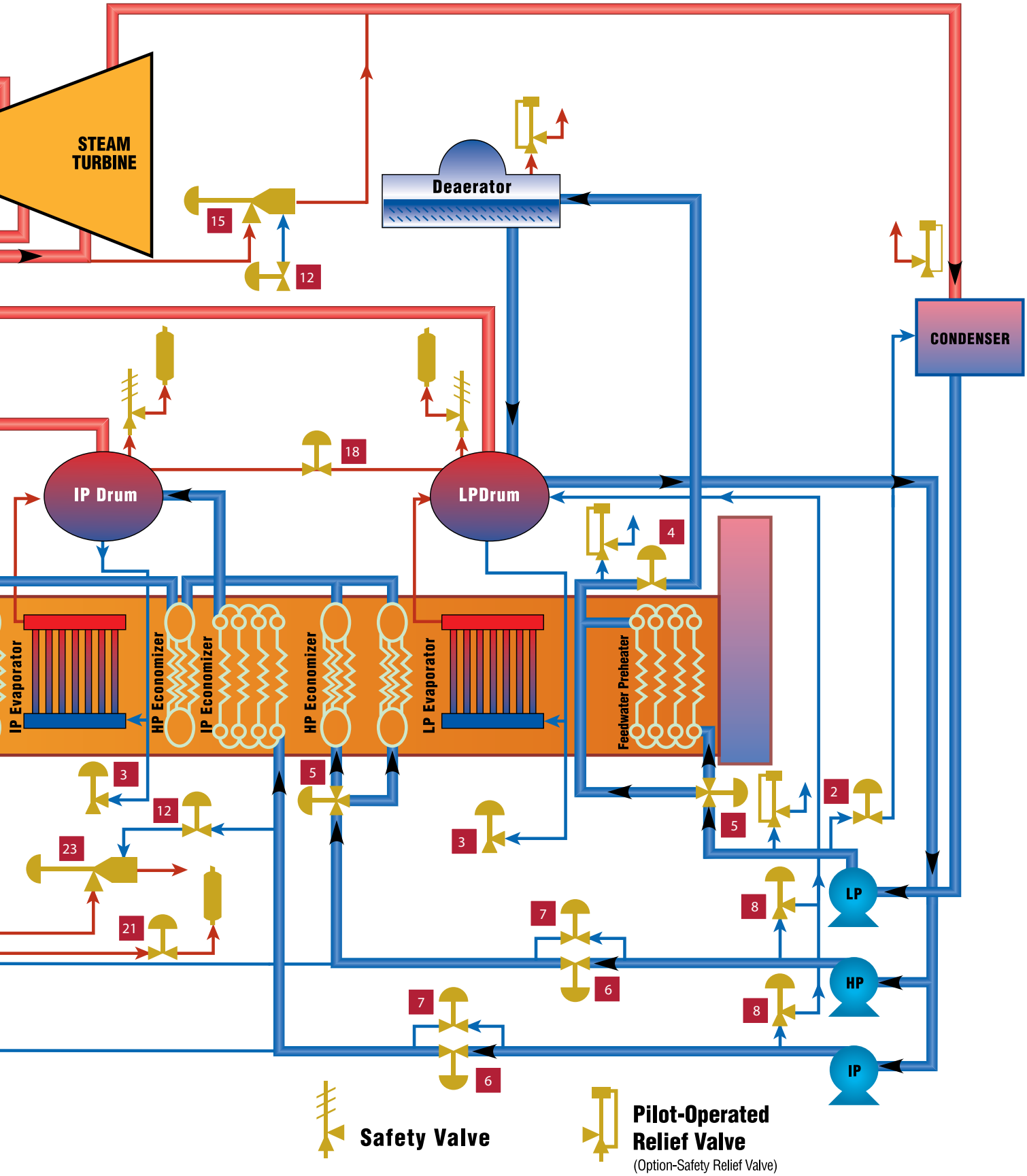
20
20
7
7
Feedwater Pump Station
COND. HEATER
5
3
6
Drain
Emergency Drain
Condenser
Condensate Pump
fety Valve
Safety Relief Valve
(Option - Pilot Operated Relief Valve)
Electromatic Ball Valve

Typical Combined-Cycle Power Plant System




STEAM TURBINE
Deaerator
CONDENSER
IP Drum
LPDrum
IP Evaporator
HP Economizer
IP Economizer
HP Economizer
LP Evaporator
Feedwater Preheater
LP
HP
IP
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Safety Valve
Pilot-Operated Relief Valve
(Option-Safety Relief Valve)

Fossil Fuel Power Plant Typical Applications

	Applications	Key Considerations	Valve Recommendations	Page
Auxiliary Systems				
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			21000, 41005	12, 14, 17
2	Air Damper	Precision Control, Diagnostics Feedback	*SVI*™ II AP & SVI FF	23
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3	Condensate Recirculation	Flashing, Erosion, Cavitation, Tight Shutoff	21000 (1 or 2 Stage Anti-Cavitation Trim)	13
			41005 (1 or 2 Stage Anti-Cavitation Trim)	14-15
4	Deaerator Level Control	Large-Load Fluctuation, Low-Load Cavitation, High Rangeability	41005 (1 or 2 Stage Characterized Anti-Cavitation Trim)	14-15
5	Cond./BFW Continuous Heater Drain	Saturated Water, Flashing, Erosion	35002 Camflex (Low Pressure)	18
			21000A (High Pressure)	12-13
6	Cond./BFW Emergency Heater Drain	Tight Shutoff, High Erosion, Flashing Water	41005	14-15
BFW System				
7	Boiler Feed Pump Recirculation	High-Pressure Drops, Cavitation, Erosion, Tight Shutoff	78400/18400 *LincolnLog*™	21
			41005 (*VRT*™ Type C Trim)	14-15
8	Main Feedwater Regulator	High Pressure, Varying Pressure Drops, Large Flows	41005 Standard Trim (VRT Type S Partial Stack Trim or 1/2 Stage Characterized Anti-Cavitation Trim)	14-15
9	Start-up Feedwater Regulator	High-Pressure Drops, Cavitation, Vibration	78400/18400 LincolnLog	21
			41005 (VRT Type C Trim)	14-15
10	Superheater Attemperator Spray	High Pressure, High Rangeability, Tight Shutoff	21000, 41005	12-15
			78400/18400 LincolnLog	21
11	Reheater Attemperator Spray	High Pressure Drop, High Rangeability, Tight Shutoff, Cavitation	21000, 78400/18400 LincolnLog	12, 21

Fossil Fuel Power Plant Typical Applications

	Applications	Key Considerations	Valve Recommendations	Page
BFW System (cont.)				
12	Turbine Bypass Attemperation	High-Pressure Drop, High Rangeability, Tight Shutoff, Cavitation	21000, 41005	12–15
			78400/18400 LincolnLog	21
13	Spraywater Isolation Valves	High Pressure, Tight Shutoff	21000, 41005	12–15
14	HP Economizer/FW Preheater Bypass	Large Flow, High Pressure	80000	16
15	Heater Level Control System	High-Pressure Drop High Rangeability Cavitation, Level Fluctuation	21000, 41005, 12400 DLT/C	12–15, 22
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16	Auxiliary Steam	High Pressure/High-Pressure Drops, High Temperature, Wide-Load Fluctuation, High Noise	48000	20
			41005 (1 or 2 Stage Lo-dB Trim)	14–15
			21000 (1 or 2 Stage Lo-dB Trim)	12–13
17	Soot Blower	High Cycle, High Temperature, High Flow Rates, High Pressure, Tight Shutoff	48000	20
			41005 (1 or 2 Stage Lo-dB Trim)	14–15
			21000 (1 or 2 Stage Lo-dB Trim)	12–13
18	HP Turbine Bypass	High Pressure/High-Pressure Drops, High Temperature, Tight Shutoff, High Noise	48000	20
			41005 (1 or 2 Stage Lo-dB Trim)	14–15
			84003 *SteamForm*™	21
19	IP/LP Turbine Bypass	Moderate Pressure/Large Flows, High Temperature, Tight Shutoff, High Noise	41005 (1 or 2 Stage Lo-dB Trim)	14–15
			84003 SteamForm	21
20	Main/Reheat Steam and Turbine Drains	High Pressure, Tight Shutoff, Erosion	21000, 21000A	12
21	Turbine Seal Pressure	High-Pressure Drop, Noise, High Rangeability	21000, 41005	12–15
22	Deaerator Pegging Steam	Noise, Wide Rangeability, Erosion, Saturated Steam	41005 (1 or 2 Stage Lo-dB Trim)	14–15
			48000	20

Combined-Cycle Power Plant Typical Applications

	Applications	Key Considerations	Valve Recommendations	Page
Auxiliary Systems				
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			21000, 41005	12, 16, 17
Condensate System				
2	Condensate Pump Recirculation	Flashing, Erosion, Cavitation, Tight Shutoff	21000 (1 or 2 Stage Anti-Cavitation Trim)	12–13
			41005 (1 or 2 Stage Anti-Cavitation Trim)	14–15
3	HP/IP/LP Cond. Blowdown	Saturated Water, Flashing, Erosion	21000A (Stellite Venturi)	12–13
			35002 Camflex II (Stellite Venturi)	18
4	Deaerator Level Control	Large-Load Fluctuation, Low-Load Cavitation, High Rangeability	41005 (1 or 2 Stage Characterized Anti-Cavitation Trim)	14–15
BFW System				
5	HP Economizer/FW Preheater Bypass	Large Flow, High Pressure	80000	16
6	HP/IP/LP Boiler Drum Level Control	High Pressure, Varying Pressure Drops, Large Flows	41005 Standard Trim (VRT Type S or ½ Stage Characterized Anti-Cavitation)	14–15
7	HP/IP Startup Boiler Drum Level Control	High-Pressure Drops, Cavitation, Vibration	78400/18400 LincolnLog	21
			41005 (VRT Type C Trim)	14–15
8	HP/IP Boiler Feedpump Recirculation	High-Pressure Drops, Erosion Cavitation, Tight Shutoff	78400/18400 LincolnLog	21
			41005 (VRT Type C Trim)	14–15
9	Superheater Attemperator Spray	High Pressure, High Rangeability, Tight Shutoff	21000, 41005	12–15
			78400/18400 LincolnLog	21
10	Reheater Attemperator Spray	High-Pressure Drop, High Rangeability, Tight Shutoff, Cavitation	21000, 41005	12–15
			78400/18400 LincolnLog	21
11	Spraywater Isolation Valves	High Pressure, Tight Shutoff	21000, 41005	12–15
12	Turbine Bypass Attemperation	High-Pressure Drop, High Rangeability, Tight Shutoff, Cavitation	21000, 41005	12–15
			78400/18400 LincolnLog	21

Combined-Cycle Power Plant Typical Applications

	Applications	Key Considerations	Valve Recommendations	Page
Steam Systems				
13	Process Steam PRV	High Pressure/High-Pressure Drops, High Temperature, Wide-Load Fluctuation, High Noise	48000	20
			41005 (1 or 2 Stage Lo-dB Trim)	14-15
14	HP Turbine Bypass	High Pressure/High-Pressure Drops, High Temperature, Tight Shutoff, High Noise	48000	20
			41005 (1 or 2 Stage Lo-dB Trim)	14-15
			84003 SteamForm	21
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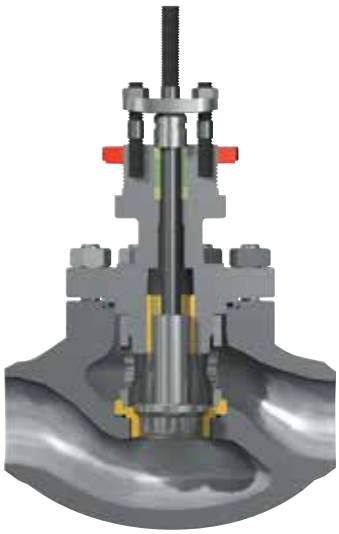
			84003 SteamForm	21
16	Main/Reheat Steam and Turbine Drains	High Pressure, Tight Shutoff, Erosion	21000, 21000A	12-13
17	Turbine Seal Pressure	High-Pressure Drop, Noise, High Rangeability	21000, 41005	12-15
18	LP Pegging Steam	Noise, Erosion, Wide Rangeability, Saturated Steam	41005 (1 or 2 Stage Lo-dB Trim)	14-15
19	Superheat Atmospheric Vent	High Pressure/High-Pressure Drops, High Temperature, High Noise/Velocity, Trash	48000	20
			41005 (1 or 2 Stage Lo-dB Trim w/silencer)	14-15
20	Reheat Atmospheric Vent	Moderate Pressure/ High-Pressure Drops, High Temperature, High Noise/Velocity, Trash	41005 (1 or 2 Stage Lo-dB Trim w/silencer)	14-15
21	LP Process Tie-In Atmospheric Vent	Large Flow Rates, High Noise/Velocity, Trash	41005 (1 or 2 Stage Lo-dB Trim w/silencer)	14-15
22	IP Superheat Stm. To Cold Reheat	Moderate Pressure, High Temperature, Wide Load Fluctuation, High Noise	41005	14-15
23	LP Process Tie-In	Low Pressure, Large Flow Rates High Noise	84003 SteamForm	21

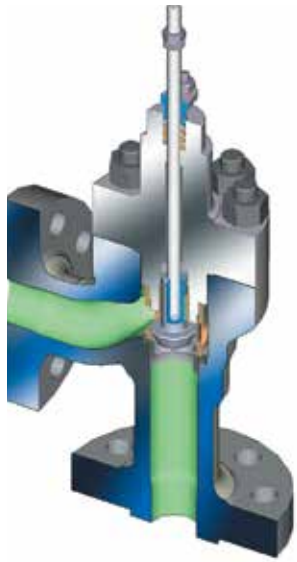
Power Industry Solutions
Reciprocating Control Valves

21000 Series
Top-Guided Globe/Angle Valve

The 21000 series single-ported, heavy top-guided control valves are designed with the versatility to handle a wide variety of power process applications. This includes optional trim designs for anti-cavitation and noise reduction.

Sizes:	**3/4" through 8"**
ANSI Ratings:	**Class 150 through 2500**
ANSI Leakage:	**Class IV, V, VI**
Cv Range:	**.11 to 640**
Temperature Range:	**-150°F to 1050°F**
Materials:	**Carbon Steel, stainless steel, chrome-moly, other alloys**
Connections:	**NPT, flanged, socket weld, butt weld**
Actuators:	**Multi-spring diaphragm, piston cylinder**
Applications:	**Low pressure steam & water, general services, flash tank, fuel gas, condensate recirculation, superheater and reheat spray, desuperheater water spray, gland-steam pressure, soot blower, steam pressure, auxiliary steam**





Heavy Top-Guiding

- Larger post-guide area vs. other globe valve designs
- Located away from flowstream
- Providing better stability and control

Various Trim Options

- Single- and double-stage low-noise and anti-cavitation trim
- Hardened-trim standard
- Quick-change or threaded-seat rings
- Reduced-capacities and microflow trim
- Equal percentage and linear contours
- Stellite Venturi seat
- Soft seat design

Design Flexibility

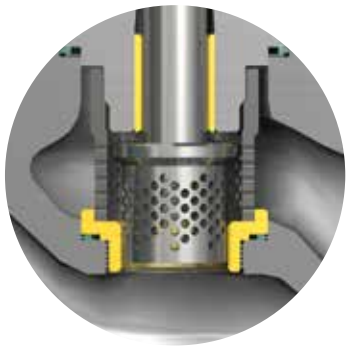
- Multiple-end connections

Various materials

- Angle-body configuration
- Bellows seal design
- Piston-actuation option
- Extension bonnet
- Low-emission packing
- DIN version available

Specifications	Lo-dB	Anti-Cavitation
Sizes:	3/4" through 6"	3/4" through 4"
ANSI Ratings:	Class 150 through 2500	Class 150 through 2500
Single Stage:	4 to 200	4 to 200
2 Stage:	3.5 to 125	2.3 to 62

Single Stage Anti-Cavitation Trim/Lo-dB trim



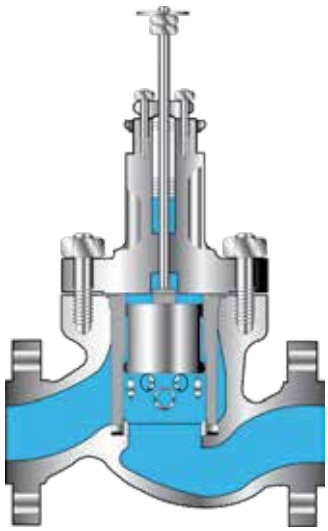
2 Stage Anti-Cavitation Trim/Lo-dB trim

Power Industry Solutions
Reciprocating Control Valves

41005 Series - Cage-Guided Globe/Angle Valve

The 41005 series cage-guided control valves are designed for high performance and to exceed the limits of other conventional valves. With numerous trim configurations (including Lo-dB and anti-cavitation) and the ability to handle large pressure drops, the 41000 Series can be applied in a variety of severe services.

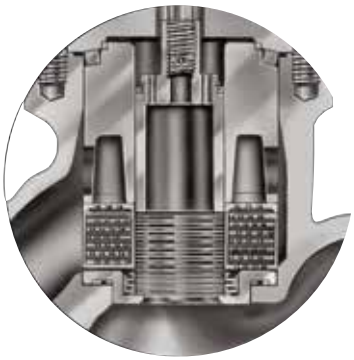
Sizes:	**2" through 24"**
ANSI Ratings:	**Class 150 through 2500**
ANSI Leakage:	**Class III, IV, V**
Cv Range:	**10 to 6600**
Temperature Range:	**-320°F to 1050°F**
Materials:	**Carbon Steel, stainless steel, chrome-moly, other alloys**
Connections:	**NPT, flanged, socket weld, butt weld**
Actuators:	**Multi-spring diaphragm, piston cylinder**
Applications:	**Auxiliary steam, boiler feedwater, condensate recirculation, deaerator pegging steam, deaerator level control, turbine bypass, and soot blower**



BFW Feedwater Control Valve Trim

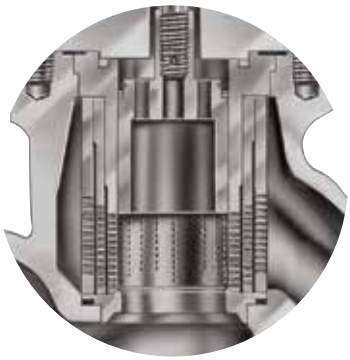
Trim Options

VRT Type S Stack Trim
Well-suited for incompressible fluids, such as feed-pump recirculation, injection-valve bypass, and boiler feedwater. Engineered to provide anti-cavitation for applications with pressure drops of up to 6000 psi.



VRT Type S Trim

VRT Type C Cage Trim
Designed to handle high pressure drops in severe-service applications for incompressible fluids. Complete cavitation protection is available for pressure drops up to 3000 psi.

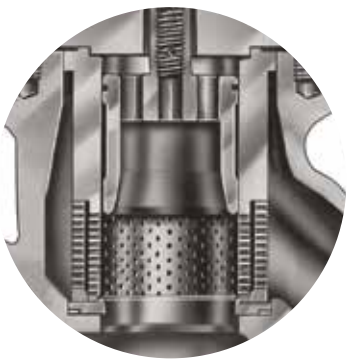


VRT Type C Trim

Single-Stage Trim
Providing excellent noise attenuation on gas or steam services and cavitation protection on liquid services.

Lo-dB Single-Stage Trim

Multi-Stage Trim
Providing excellent noise attenuation on gas or steam services and cavitation protection on liquid services.



Lo-dB Double-Stage Trim

Pilot-Balanced Trim
Providing tight shut-off on liquid, gas, or steam services.

Pilot Trim

Power Industry Solutions
Reciprocating Control Valves

80000 Series
3-Way Diverting or Combining Valve

The 80000 Series is a three-way control valve designed for either combining or diverting applications. It is well-suited for applications requiring high capacities with low-pressure recovery.

Sizes:	**1" through 10"**
ANSI Ratings:	**Class 150 through 2500**
ANSI Leakage:	**Class II, III, IV**
Cv Range:	**9 to 750**
Temperature Range:	**-20°F to 850°F**
Materials:	**Carbon Steel, stainless steel**
Connections:	**Flanged, socket weld, butt weld, RJT, threaded**
Actuators:	**Multi-spring diaphragm, piston cylinder**
Applications:	**Heat exchangers**

Power Industry Solutions Rotary Control Valves

35002 Series Camflex II Eccentric Plug

As the original eccentric-plug rotary valve, the Camflex combines top performance and features with an extremely economical design. The Camflex, which offers enormous versatility and broad application, remains the most widely used eccentric-plug control valve in the world and now features the EF seal solution to reduce fugitive emissions.

Sizes:	**1" through 16"**
ANSI Ratings:	**Class 150 through 600**
ANSI Leakage:	**Class IV, VI**
Cv Range:	**2.8 to 3650**
Materials:	**Carbon steel, stainless steel, chrome moly**
Connections:	**NPT, flangeless bolted, flanged**
Actuators:	**Spring-diaphragm, pneumatic cylinder**
Applications:	**Heater drain, general service, low pressure steam, flash tank**

36005 Series V-Max™ Control Ball

The 36005 V-Max is a high-capacity, control-ball valve with a patented dual-characterized, segmented-ball design combining high-Cv ratings with exceptional 500:1 turndown. It is an excellent solution for both high-viscosity fluid applications (i.e. pulp and paper industry) as well as processes requiring very high capacity balanced with accurate control. Standard features also include the environmental packing (EF) seal.

Sizes:	**1" through 12"**
ANSI Ratings:	**Class 150 through 300**
ANSI Leakage:	**Class IV or VI**
Cv Range:	**55 to 4400**
Materials:	**Carbon steel, stainless steel**
Connections:	**Flanged**
Actuators:	**Spring-diaphragm, Scotch yoke cylinder**
Applications:	**High-viscosity fluid and high-capacity applications.**

33000 Series Triple Offset Butterfly Valve

The 33000 Series Triple Offset Butterfly Valve incorporates new performance enhancing operational features, allowing for a more simplified manufacturing process. The result is exclusive patented range of superior performance zero leakage bi-directional triple offset butterfly valves, suitable for extreme pressure/temperature applications.

Sizes:	**3" through 48"**
ANSI Ratings:	**Class 150 through 600**
ANSI Leakage:	**Class IV, V, VI and API 598**
Cv Range:	**98 to 66,400**
Materials:	**Carbon steel, Stainless steel, Duplex**
Connections:	**Wafer, Lugged, Double Flanged Short & Long Pattern**
Actuators:	**Model 31/32 Spring Diaphragm, Model 33 Spring Diaphragm**
Applications:	**High-viscosity fluid and high-capacity applications**

39003 Series High-Performance Butterfly Valve

The Masoneilan 39003 Series High-Performance Butterfly Valve (HPBV) is designed for exceptional performance, application flexibility and long service life. This automatic-throttling control valve offers benefits such as enhanced sealing, double-offset operation, excellent flow characteristics, accurate positioning, and dynamic operation.

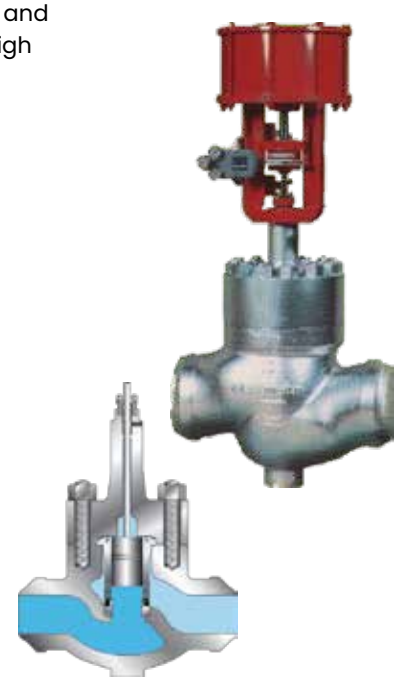
Sizes:	**3" through 48"**
ANSI Ratings:	**Class 150 through 600**
ANSI Leakage:	**Class IV or VI**
Cv Range:	**185 to 91000**
Materials:	**Carbon steel, stainless steel**
Connections:	**Flangeless, Lugged, Double Flanged**
Actuators:	**Spring diaphragm, Pneumatic rack and pinion, Scotch yoke cylinder**
Applications:	**High-viscosity fluid and high-capacity applications.**

Power Industry Solutions
Severe Service Control Valves

48000 Series Cage-Guided Control Valve

The 48000 Series control valves are designed especially for high-temperature and high-pressure steam services where the cages tend to be deformed due to high heat-cycle frequency or thermal stress from sudden changes in temperature.

Sizes:	**2" through 10"**
ANSI Ratings:	**1500 through 2500**
ANSI Leakage:	**Class II, III, IV, V**
Cv Range:	**3.8 to 640**
Materials:	**Carbon steel, Chrome-moly, Low-alloy steel**
Connections:	**SW, BW, flanged (RF, RTJ)**
Actuators:	**Cylinder**
Applications:	**Turbine bypass, boiler auxiliary steam pressure, turbine-gland steam pressure, soot-blower steam pressure, main air-ejector steam pressure**



49000 Series Globe and Angle Style with Lo-dB or V-Log™ Trim

The 49000 Series is designed with enlarged body galleries to accommodate large stroke lengths and up to 36 stages of pressure reduction.

Sizes:	**4" through 36"**
ANSI Ratings:	**Class 150 through 2500 UNI-DIN 10 through 400**
ANSI Leakage:	**Class III, IV or V**
Cv Range:	**6 to 4,910**
Materials:	**Carbon steel, stainless steel, chrome-moly**
Connections:	**Flanged, BW**
Actuators:	**Multi-spring, piston cylinder**
Applications:	**Boiler feed water-start-up and control, steam letdown, pump-discharge, water-reinjection, gas-recycle and vent applications**

78400/18400 Series LincolnLog

The Masoneilan LincolnLog is the premier high-pressure liquid-letdown valve in the process control industry. It is a field proven severe-service solution for cavitating and erosive applications in various industries. The LincolnLog is uniquely designed to operate reliably in harsh environments and dirty liquids.

Sizes:	**1" through 8"**
ANSI Ratings:	**Class 600 through 2500**
ANSI Leakage:	**Class IV, V or VI**
Cv Range:	**0.5 to 135**
Materials:	**Carbon steel, 316 stainless steel, chrome-moly, others**
Connections:	**RFF, RTJ, socket weld, butt weld, threaded-print flanges (forgings)**
Actuators:	**Multi-spring diaphragm, piston cylinder**
Applications:	**Cavitating and erosive applications in various industries**

79003 Series Angle Style with VRT Trim

The 79003 Series valves are designed for anti-cavitation service with control over a wide range of operating conditions, such as the ramp-up transition of a normal feedwater pump.

Sizes:	**1" through 6"**
ANSI Ratings:	**Class 600 through 2500 UNI-DIN 100 through 400**
ANSI Leakage:	**V or VI**
Cv Range:	**2 to 105**
Materials:	**Carbon Steel, stainless steel, chrome-moly**
Connections:	**Flanged, butt weld**
Actuators:	**Multi-spring diaphragm, piston cylinder**
Applications:	**Feedwater control, feedwater pump start-up valve**

84003 Series SteamForm

The 84003 Series SteamForm is designed with a wide range of features including a patented water-injection system for best performance in steam-conditioning applications.

Sizes:	**Trim: 3" through 24" | Pipe: 3" through 48"**
ANSI Ratings:	**Class 150 through 2500 UNI-DIN 10 through 400**
ANSI Leakage:	**Class II, III, IV, or V**
Cv Range:	**25 to 6,740**
Materials:	**Carbon Steel, Chrome-moly**
Connections:	**Flanged, butt weld**
Actuators:	**Spring-diaphragm, piston cylinder**
Applications:	**Turbine bypass, Process steam conditioning**

Power Industry Solutions Smart Instrumentation

SVi1000 - Digital Valve Positioner

The SVi1000 is a user-friendly 4-20mA with HART® digital valve positioner for single-acting pneumatic control valves. Leveraging many of the same technologies from the SVI II AP, the SVi1000 is perfect for those that need a low maintenance valve positioner, and an ideal candidate for upgrading legacy electro-pneumatic positioners. Designed to be installed and operational in less than 5 minutes, the SVi1000 is easily through its "One button, one function" local pushbuttons or via its powerful DTM interface and *ValVue*™ software.

Communication Platform:	**HART®**	
Signal - Supply:	**4-20 mA control signal**	
	No external power required	
	Supply pressure:	**20 - 100 psi, (1.4 - 7 bar)**
Communication Software Interface:	• ValVue standalone • Integrated (PLUG-IN, SNAP-ON, FDM) • eDDL or DTM	
Hazardous Area Certifications:	**ATEX, FM, IEC, CU TR, KOSHA approvals**	

SVI II AP - Advanced Performance Digital Positioner

The Masoneilan Smart Valve Interface Advanced Performance (SVI II AP) product is an intelligent digital valve positioner. SVI II AP offers advanced control technology for pneumatically actuated valves with a non-contact Hall Effect sensor, providing higher precision and reliability, greater flexibility and ease of use. ValVue 3 is a communication software tool used to configure, calibrate and perform valve diagnostics with the SVI II AP utilizing HART® communications protocol.

Communication Platform:	**HART®**	
Signal - Supply:	**4-20 mA control signal**	
	No external power required	
	Supply pressure:	**20 - 100 psi, (1.4 - 7 bar)**
Communication Software Interface:	• ValVue 3 standalone • Integrated (PLUG-IN, SNAP-ON, FDM) • eDDL or DTM	
Hazardous Area Certifications:	**ATEX, FM, IEC, CU TR, KOSHA approvals**	

SVI FF Advanced FOUNDATION® Fieldbus Positioner

The SVI FF is an advanced performance positioner with FOUNDATION® protocol, for single and double-acting pneumatic control valves, its universal and modular design with a proven non-contact position sensor fits many applications, offering high performance valve control with real-time diagnostics.

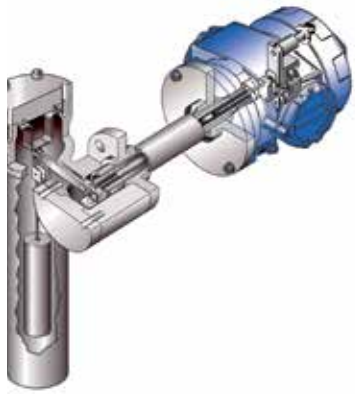
Communication Platform:	**FOUNDATION® Fieldbus**	
Input Signal:	**FOUNDATION® Fieldbus**	
	No external power required	
	Supply pressure: **(single and double acting)**	**20 - 150 psi (1.4 - 10.3 bar)**
Communication Software Interface:	• ValVue FF standalone • Integrated (PLUG-IN, SNAP-ON) • eDDL or DTM	
Hazardous Area ertifications:	• ATEX, FM, CU TR, KOSHA, NEPSI, INMETRO and CSA approvals • Explosion proof & intrinsically safe	

Level Transmitter/Controller

12400 Series Digital Level Transmitter/Controller

The Masoneilan 12400 Series Instrument is a two-wire, loop-powered digital displacement-type level transmitter or controller with HART® Communication. This high-performance instrument is easily set up and calibrated by using either ValVue communication software, EDDL, DTM, a hand-held communicator, or local pushbuttons and digital display. This versatility allows the operator to configure, calibrate, and perform other functions either at the instrument or from the control room.

Range:	**14" through 120", (355 through 3048 mm)**	
Ratings and Connections:	**Flanged:**	**ANSI 150 - 2500**
		UNI-DIN 10 - 100
	Screwed: NPT-F (1.5", 2")	
	Welded	
Body Materials:	**Carbon steel**	
	Stainless steel	
	Chrome-moly	
Displacer Materials:	**Stainless steel**	
	Other materials on request	
Torque Tube Materials:	**Inconel**	
	Stainless steel	
	Other materials on request	
Electronic Instrument:	**HART® protocol**	
	4 - 20 mA signal	
	ATEX, FM, JIS, CU TR, CSA, CRN, IEC, INMETRO, CCOE, NEPSI, IA, TAIWAN TS between main approvals	



ValVue 3 Device Diagnostics & Configuration Tool

Key Features:

- Common interface for all instruments
- Time stamped Audit Trail provides full documentation of all changes managed by the application
- Automatic device monitoring with NAMUR 107 compliant alerts
- Provide specific task authorization with user level access control
- Easy PDF Report generation

Benefits:

- Automates standard device commissioning steps with Sequencer to get more done, consistently and accurately
- Enables easy compliance validation for audit reports
- Enhances security by requiring user authentication
- Shorter training cycles by using the same basic interface for all field devices

ValVue 3 is powerful and user-friendly interface designed for set-up and diagnostics of control valves equipped with an SVI II AP, SVi1000, SVI FF, SVI II ESD, FVP or 12300/12400 Digital Level Transmitters/Controllers. ValVue enhances the diagnostics capabilities of your control valves and improves asset efficiency when setting up a digital valve positioner or level transmitter. It offers electronic documentation of configuration and calibration results as well as valve signature analysis. These solutions reduce the complexity in commissioning Foundation Fieldbus or HART digital valve positioners and transmitters.

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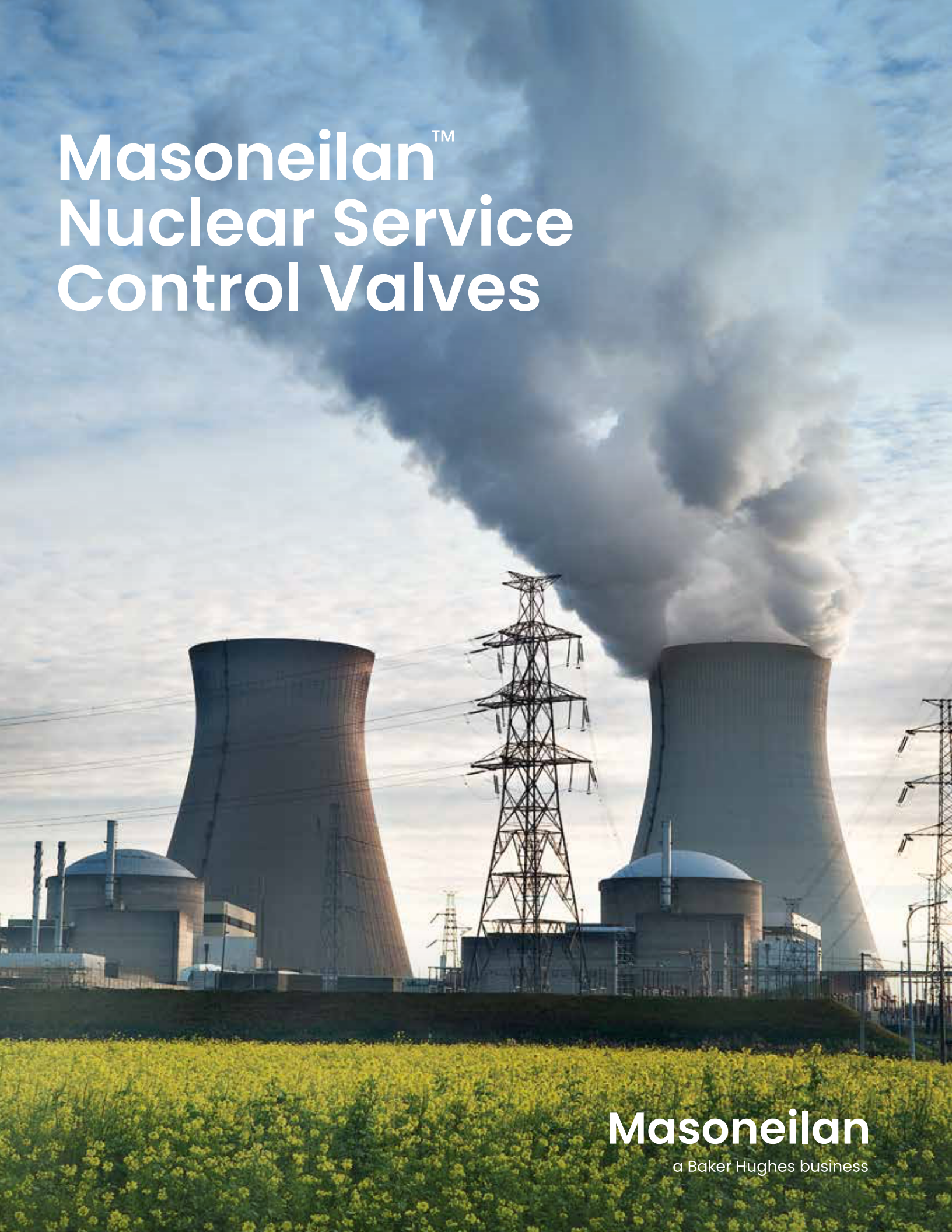
Masoneilan™ Nuclear Service Control Valves



Masoneilan
a Baker Hughes business


SVI-II

Our references

- **European Pressurized Reactors:** Globally the largest reference list covering 80 % of all applications for the EPR
  - Flamanville 3 (France) and Hinkley Point C (UK): roughly 80 valves each, including Turbine bypass to condenser, Turbine by pass to atm, Minflow FW valves, Moisture separators drains valves, feed tank supply and all BOP valves
  - **Taishan 1 & 2 (China):** roughly 200 valves, including Turbine bypass to condenser, Minflow FW valves, sampling valves, Emergency feed water valves, reactor coolant system with chemical and volumetric control valves, safety injection valves, liquid and gaseous effluent treatment, Generator drain valves - 70% of the control valves reactor scope
- **France: 900, 1300, 1500 MW plants:** 15,000 valves working inside the 58 Edf units, including inside and outside containment applications
- **Belgium:** Doel 3 & 4, Tihange 2 & 3
- **Spain:** Asco Vandellos, Almaraz 1 & 2, Cofrentes
- **UK:** Sizewell B
- **Sweden:** Ringhals 1/2/3/4, Forsmark 1/2/3, Oskarshamn 3
- **Romania:** Cernavoda with Candu reactors
- **China CPR 1000, AP 1000 and Candu reactors:** roughly 2,000 valves installed in 38 units of nuclear power plants. Ling Ao phase 1 & 2, Daya Bay 1 & 2, Liaoning Hongyanhe 3 to 6, Fujian Ningde 1 to 4, Yangjiang 1 to 6, Hainan Changjiang 1 & 2, Fujian Fuqing 1 to 4, Guangxi Fangchenggang 1 & 2, Lufeng 1 & 2, Tianwan 5 & 6, Qinshan phase I, II, III (including Fangjiashan) : Turbine bypass to condenser, FW control valves, Effluent treatment, Moisture separator drains valves, Atmosphere Steam Dump control valve
- **China Hualong N° 1 reactors:** Fangchenggang 3 & 4, Fuqing 5 & 6 : FW and effluent treatment, bypass to condenser
- **Korea:** Ulchin 1 & 2, Shin Kori
- **Japan:** 9,000 control valves in most of the PWR and BWR reactors, including outside containment applications, heater drains, and other turbine island valves
- **South Africa:** Koeberg 1 & 2
- **USA:** 9,000 control valves and safety valves in most of the 99 PWR and BWR reactors in the USA, including inside and outside containment applications, FW control, heater drains, atmospheric dump and other turbine Island valves
- **USA:** 1,100 main steam safety valves and pressurizer safety valves
- **Canada (Candu reactors):** inside containment valves roughly 50 each in Bruce, Darlington, Pickering stations.

Masoneilan control valves, rotary and reciprocating valves, severe service control valves, pneumatic regulators and field instrumentation are high technology products recognized worldwide in the nuclear industry since the 60's. From the first French nuclear power plant up to most recent EPR reactors, thousands of Masoneilan control valves and instruments have been installed and maintained on primary and secondary circuits (manufacturing according to DESP, RCCM or ASME codes).

In January 2015, a **Nuclear Centre Of Excellence** (COE) has been inaugurated in Condé French manufacturing plant.. More than 35 engineers are working to serve Best-In-Class our Customers and are fully dedicated to Nuclear segment.

- **Efficiency**: in one single place, experts are directly connected to nuclear processes. Nuclear activities are managed as a product line and Centre Of Excellence bears full responsibilities to give instructions and take decisions
- **Expertise:** Condé French plant has more than 50 years of experience in nuclear codes and technology and is tailored to customer's most demanding requirements.

Nuclear Certified Quality

Baker Hughes maintains strict standards for Masoneilan nuclear control valves manufacturing and testing through **ESPN-Module H** and **ASME Stamp N&NPT** approved Quality Assurance programs. In addition, Condé French facility holds ISO-9001 Quality System Certification, and is working to achieve further quality by setting internal standards that exceed those set by regulatory organizations. The Quality Management System and Design Control procedures outline design criteria and testing parameters.

Experts are providing Technical Support throughout the Product Life Cycle Service organization stands behind each Masoneilan nuclear service control valve, with the expertise, technical skills and application knowledge that Customers expect from Baker Hughes. We continually build upon a history of best practices, and our sales team is well qualified to help you select the right valve for your facility, application and specifications. Nuclear COE also provides guidance and technical solutions in solving difficult challenges and issues.

Our aftermarket support services team has the in-depth industry knowledge, product familiarity and implementation skills to help maintain continuous operations and cost-effective performance.

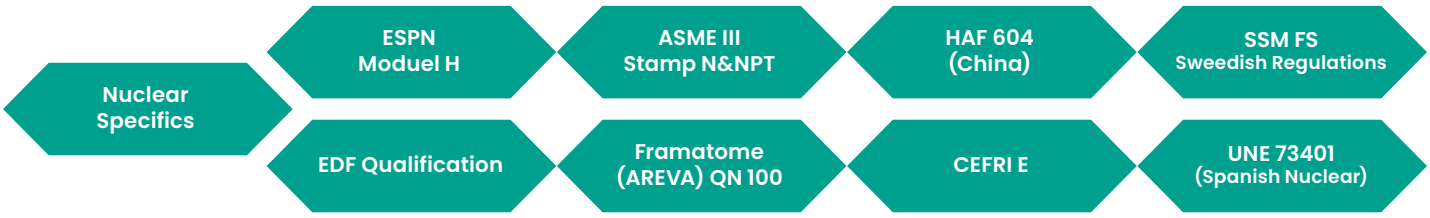
Culture of Nuclear Safety

Because Safety is the deed of every woman and man at her or his scale, Baker Hughes Condé France invites all employees to share concerns about Nuclear Safety.

Baker Hughes develops a genuine Culture of Nuclear Safety among them, encouraging communication, dialogue and interrogative attitude.

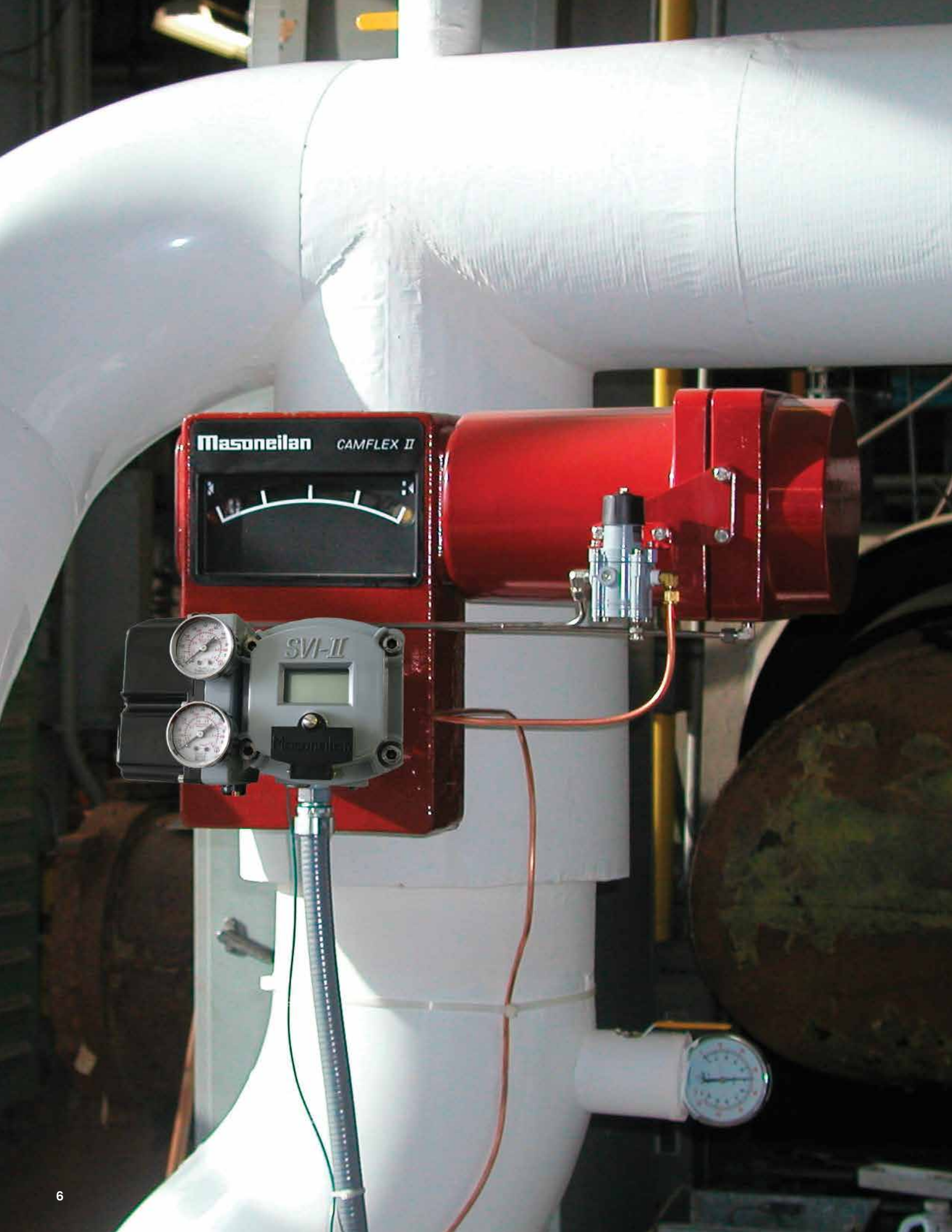
Condé Nuclear COE : Valve Solutions and Services Dedicated to the Nuclear Industry

Nuclear Center Of Excellence – Baker Hughes Condé Facility, France

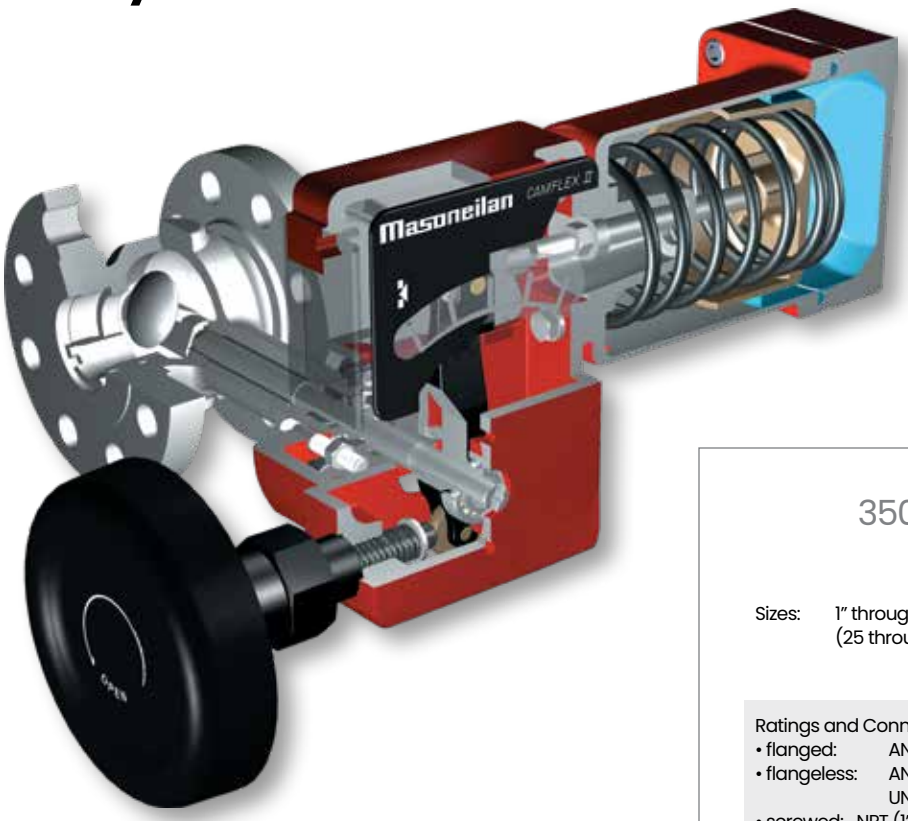


French Nuclear COE Certifications

I AM THE KEY TO NUCLEAR SAFETY


Masoneilan
CAMFLEX II
SVI-II

Rotary Control Valves



35002 Series *Camflex*™ II Eccentric Plug

Sizes: 1" through 16"
(25 through 400 mm)

Ratings and Connections:
- flanged: ANSI 150 - 600
- flangeless: ANSI 150 - 600
  UNI-DIN 10 - 100
- screwed: NPT (1" through 2")

Body Materials:
- carbon steel
- stainless steel
- high nickel alloy

Actuators:
- model 35 spring diaphragm
- 70 Series cylinder

Trim:
- eccentric rotary plug

Inherent Characteristic:
- linear

As the original eccentric plug rotary valve, the 35002 Series Camflex valve combines quality performance and features with an economical design. The Camflex valve offers versatility and broad application. It is now supplied with the EF seal solution to reduce fugitive emissions.

Typical Applications:
- Low pressure heaters drain
- Ventilation system

Single-Seat Control Valves

21000 Series Globe & Angle Top-Guided Valve

Sizes: 3/4" through 8" (20 through 200 mm)

Ratings and Connections:
- flanged: ANSI 150 - 2500
  UNI-DIN 10 - 400
- welded: BW or SW
- screwed: NPT 3/4" through 2" (20 through 50 mm)

Body Materials:
- carbon steel
- stainless steel
- chrome-moly

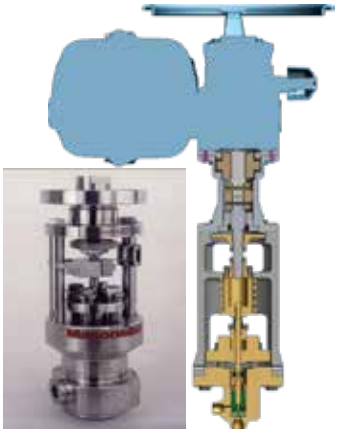
Actuators:
- model 87/88 multi-spring diaphragm
- cylinder
- electric

Trims:
- single seat plug top guided.
- *Lo-dB*™ and anti-cavitation trims, single or double stage are available
- bellow seal

Inherent Characteristic:
- linear or equal percentage

The 21000 Series control valve is a heavy top-guided unbalanced design with noise attenuation and anti-cavitation trim options. It can handle a variety of process applications ranging from standard service conditions to more severe applications. It also includes standard bellows seal and soft seat configurations.

Typical Applications:
- Low pressure heater drain
- Effluent treatment
- Gland steam system turbine



28000 Series *VariPak*™ Micro-Trim Globe Valve

Sizes: 1" (25 mm) standard
1/2" through 3/4" (15 through 20 mm) available on request

Ratings and Connections:
- flanged: ANSI 150 - 600
- flangeless for mounting between flanges: ANSI 150 - 2500
  UNI-DIN 10 - 400
- welded

Body Materials:
- stainless steel
- monel
- hastelloy C
- alloy 20

Actuator:
- integral spring diaphragm
- electric

Trims:
- full stellite needle plug
- multistep trim available
- bellow seal

Inherent Characteristic:
- linear

The 28000 Series VariPak is a compact globe style valve specifically for microflow control. The VariPak includes an adjustable C_V feature between 100 percent and 40 percent that can meet applications requiring finer control. It is available with bellows seal and anti-cavitation trim options.

Typical Applications:
- Microflow applications
- Waste treatment plant
- Primary pump cleaning injection
- Effluent treatment system
- Sampling system

Double-Seat Control Valves

10000 Series Double-Seated Globe Valve

Sizes: 2" through 24"
(50 through 600 mm)

Ratings and Connections:
- flanged: ANSI 150 - 1500
  UNI-DIN 10 - 250
- welded: BW or SW

Body Materials:
- carbon steel
- stainless steel
- chrome-moly

Actuators:
- model 87/88 multi-spring diaphragm
- cylinder
- electric

Trims:
- V-port or contoured plug
- top and bottom guided

Inherent Characteristic:
- linear, quick opening or equal percentage

The 10000 Series is a double-ported valve with top and bottom stem guiding. This design is suitable for high-pressure drop applications where dirty fluid conditions exist. The 10000 Series is widely used in hydrocarbon processing applications.

Typical Applications:
- Safety injection accumulator

80000 Series 3-Way Diverting or Combining Valve

Sizes: 1" through 10"
(25 through 250 mm)

Ratings and Connections:
- flanged: ANSI 150 - 600
  UNI-DIN 10 -100
- welded: BW or SW
  ANSI 900 - 2500 on request

Body Materials:
- carbon steel
- stainless steel
- chrome-moly

Actuators:
- model 87/88 multi-spring diaphragm
- model 37/38 spring diaphragm
- cylinder

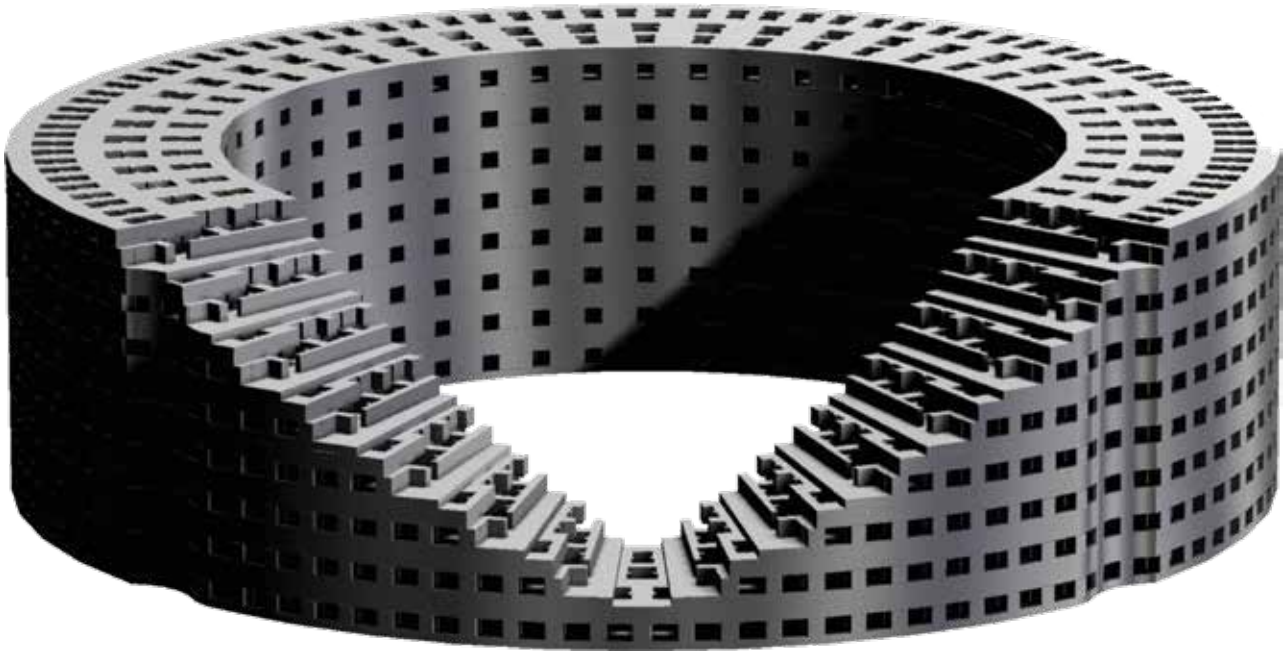
Trim:
- v-port plug

Inherent Characteristic:
- linear

The 80000 Series is a line of three-way control valves for either combining or diverting applications. Its key features include high flow capacities and low-pressure recoveries, resulting in efficient flow control performance.

Typical Applications:
- Volumetric and chemical control system
- Turbine bearings lubrification system
- Reactor coolant storage

Stacked Plate Technology



V-LOG™ Energy Management Trim is manufactured from a brazed stack of laser-cut plates, each with a series of 90 degree turns used to redirect the flow of the process fluid through a high-resistant flow path. Each stage also includes an expansion and contraction in area for maximum pressure reduction efficiency. Further, each valve body is contoured to account for flow expansion and trim area velocity to manage the total system noise, offering customers a compact energy management control valve.

Cage-Guided Control Valves

41005 Series Globe & Angle Style Valve

Sizes: 2" through 24"
(50 through 600 mm)

Ratings and Connections:
- flanged: ANSI 150 - 2500
  UNI-DIN 10 - 400
- welded: BW or SW

Body Materials:
- carbon steel
- stainless steel
- chrome-moly

Actuators:
- model 87/88 multi-spring diaphragm
- model 37/38 spring diaphragm
- cylinder
- electric

Trims:
- balanced with seal ring or pilot cage-guided trim
- Lo-dB: low noise for steam anti-cavitation for liquid

Inherent Characteristic:
- linear or equal percentage

The 41005 Series is a heavy-duty valve design with balanced trim configurations. It offers cage guiding for added stability and the versatility to offer noise attenuation and anti-cavitation solutions. Available with various balancing seal options including auxiliary pilot design for unmatched high-temperature performance.

Typical Applications:
- HP heaters drains
- Moisture separator drains
- Feed tank supply
- Main feedwater valves

41005 Series Turbine Bypass to Condenser 41005 Series Steam Bybass to Atmosphere

Sizes: 4" through 36"
(100 through 900 mm)

Ratings and Connections:
- flanged: ANSI 150-2500
  UNI-DIN 10 - 400
- welded: BW

Body Materials:
- carbon steel
- stainless steel
- chrome-moly

Actuators:
- model 37/38 spring-opposed diaphragm
- cylinder
- electric

Trims:
- balanced cage-guided trim.
- Lo-dB, anti-cavitation and *VRT™* (Variable Resistance Trim), single and multiple cages, V-LOG are available

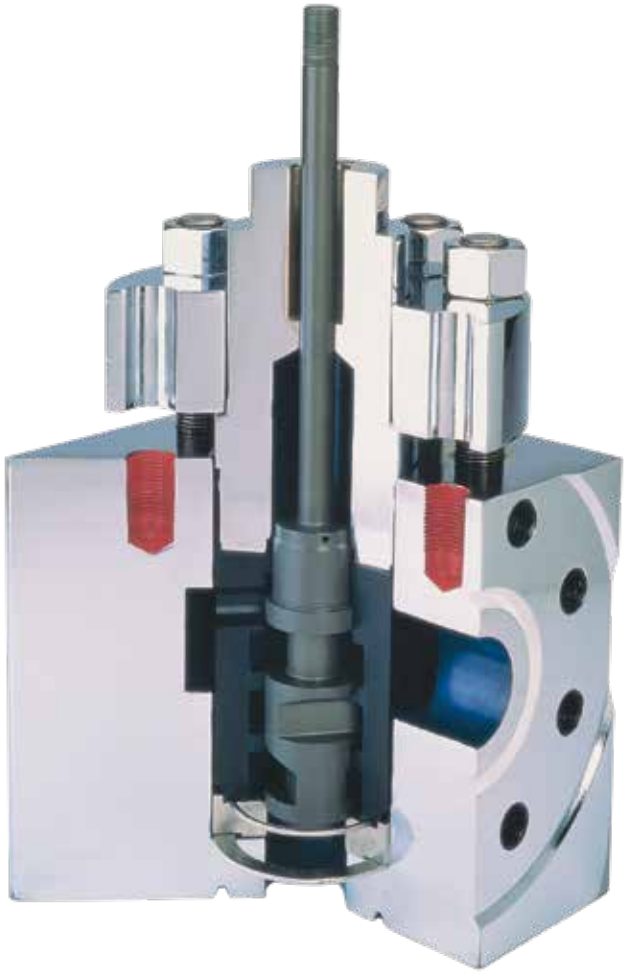
Inherent Characteristic:
- linear or equal percentage

The 41005 Series features an enlarged body. It offers cage guiding for added stability and the versatility to offer noise attenuation and anti-cavitation solutions. Available with various balancing seal options including auxiliary pilot design for unmatched high-temperature performance.

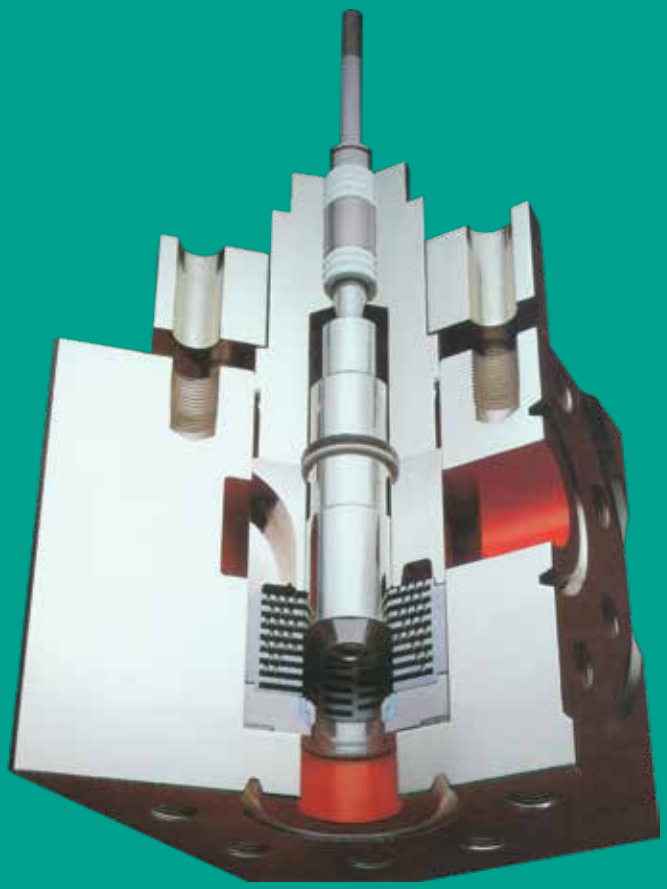
Typical Applications:
- Turbine bypass
- Bypass to atmosphere

Axial Flow Technology

Axial Flow trims offer multi-stage designs for the control of high-pressure liquids without the damaging effects of cavitation, erosion, and vibration. The unique flow design of the *LincolnLog*™ develops the required resistance for throttling but also affords ample clearance for the passage of large particulate. The optional soft seat is specifically for boiler feedwater applications and offers long-term Class VI shut-off at demanding pressures.



Variable Resistance Trim (VRT), consists of a brazed stack of drilled plates which efficiently channel the flow through multiple turns in a tortuous path configuration. The design is primarily used in high-pressure drop liquid applications. VRT is typically packaged within standard Masoneilan globe and angle valve bodies.



Severe Service Control Valves

78400-18400 Series LincolnLog

Sizes: 1" through 12"
(25 through 300 mm)

Ratings and Connections:
- flanged: ANSI 600 - 2500
  UNI-DIN 100 - 400
- welded: BW or SW

Body Materials:
- carbon steel
- stainless steel
- chrome-moly

Actuators:
- model 37/38 spring-opposed diaphragm
- model 87/88 multi-spring-opposed diaphragm
- cylinder
- electric

Trims:
- axial flow technology
- multi-stage, cage-guided, anti-cavitation trim
- Class VI available on request

Inherent Characteristic:
- linear

The 18400 and 78400 Series valve is used in high-pressure liquid service applications to help eliminate cavitation.

Typical applications:
- Emergency feed water
- Steam generator drains
- Minimum flow feed water pump

41017 Series Globe Style 79000 Series Angle Style with VRT Trim

Sizes: 1" through 6"
(25 through 150 mm)

Ratings and Connections:
- flanged: ANSI 600-2500
  UNI-DIN 100-400
- welded: BW

Body Materials:
- carbon steel
- stainless steel
- chrome-moly

Actuators:
- model 87/88 multi-spring diaphragm
- model 37/38 spring diaphragm
- cylinder
- electric

Trim:
- multi-stage VRT trim design and VRT partial stack design for control over a wide range of applications

Inherent Characteristic:
- linear

The 79000 Series valves offer anti-cavitation service with control over a wide range of operating conditions, such as the ramp-up transition of a normal feedwater pump.

Typical Applications:
- Small flow feed water control
- Feedwater pump start-up valve
- Charging valve : volumetric & chemical control system

Advanced Smart Instruments

SVI Advanced Performance Digital Valve Positioner

Communication / Control Platform:
- 4-20mA with HART® (SVI II AP)
- FOUNDATION® Fieldbus H1 (SVI FF)

Pneumatics:
- 20 – 150 psi Supply pressure
- Single, High Flow Single, or Double-acting

Operating Temperature:
- -40°C to +85°C

Materials:
- Aluminum (painted) or Stainless Steel Housing
- Composite Polymers and Stainless Steel Pneumatics

I/O:
- 4-20mA output (AP only)
- (2) Configurable Switches
- Discrete Input
- Remote Positioner Sensor Input (Remote Sensor optional)

Mounting / Feedback:
- Non-Contact magnetic position feedback
- Rotary or Linear
- Stainless Steel brackets for all Masoneilan and major valve brands

Certifications:
- Explosion / Flame / Dust-proof and Intrinsically safe
- FM, FMc, ATEX, IECEx
- Regional – NEPSI, Taiwan TS, CCOE, CU-TR, AZS, UZ, INMETRO, JIS, KOSHA, IA

Diagnostics:
- Standard or Advanced levels available
- Continuous, Online, and Offline Diagnostics/Methods

Configuration / Monitoring Interfaces :
- Local Display with Pushbuttons (Optional)
- ValVue Device Diagnostic and Configuration Tool
- DTM or eDDL – seamless integration into leading asset management systems

The Advanced Performance SVI Digital Valve Positioner models offer superior control technology for pneumatically actuated valves. Field proven, non-contact magnetic position feedback provides high precision with extreme reliability in harsh conditions. Mounting brackets for most major valve/actuator brands and optional Display with Pushbuttons promote quick and easy installation and commissioning. Available with either 4-20mA with HART® (SVI II AP) or FOUNDATION® Fieldbus (SVI FF), integration into control systems is seamless, especially when paired with ValVue software. Valve and Positioner health are monitored and analyzed through the various continuous, online, and offline diagnostics, which make the Advanced Performance positioners a perfect selection to increase control valve and plant efficiency.

12400 Series Digital Level Transmitter/ Controller

Range: 14" through 120" (355 through 3048 mm)

Ratings and Connections:
- Flanged: ANSI 150 - 2500
  UNI-DIN 10 - 100
- Screwed: NPT-F (1 1/2", 2")
- Welded

Body Materials:
- Carbon steel
- Stainless steel
- Chrome-moly

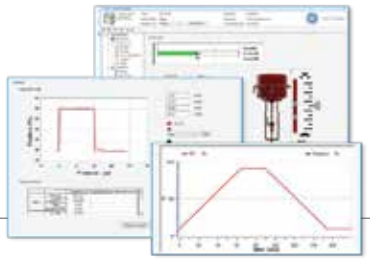
Displacer Materials:
- Stainless steel
- Other materials on request

Torque Tube Materials:
- Inconel
- Stainless steel
- Other materials on request

Electronic Instrument:
- HART protocol
- 4 - 20 mA signal
- ATEX, FM, CSA, JIS, CU TR, CRN, IEC, INMETRO, CCOE, IA, KOSHA, NEPSI, TAIWAN TS and IEC between main approvals
- SIL2 safety certified
- Optional 2 built-in level switches
- Optional second 4-20 mA output signal

The Masoneilan 12400 Series Instrument is a two-wire loop-powered, digital-displacement type level transmitter or controller with HART communication. This high performance instrument is easily set-up and calibrated with either ValVue communication software, EDDL, DTM, a hand-held communicator, or local pushbuttons and digital display. This versatility allows the operator to configure, calibrate, and perform other functions either at the instrument or from the control room.

Masoneilan Stand Alone or Integrated Softwares



ValVue 3 Device Diagnostics & Configuration Tool

Key Features:
- Common interface for all instruments
- Time stamped Audit Trail provides full documentation of all changes managed by the application
- Automatic device monitoring with NAMUR 107 compliant alerts
- Provide specific task authorization with user level access control
- Easy PDF Report generation

Benefits:
- Automates standard device commissioning steps with Sequencer to get more done, consistently and accurately
- Enables easy compliance validation for audit reports
- Enhances security by requiring user authentication
- Shorter training cycles by using the same basic interface for all field devices

ValVue 3 is compatible with:
- SVI II AP
- SVi 1000
- SVI FF
- SVI II ESD
- DLT 12400
- DLT 12300

ValVue 3 supports the following connections:
- Hart Modem
- FF Modem
- HART® Multiplexors
- wirelessHART® gateways
- Emerson AMS OPC

Masoneilan additionally offers fully interoperable DTMs for host integration in the following systems:
- Yokogawa PRM v3.04+
- Honeywell FDM v400+
- Schneider Electric Foxboro FDM
- Emerson AMS v12.5+
- Rockwell Automation FactoryTalk v2.31+
- ABB 800xA v5+

ValVue 3 is a powerful and user-friendly interface designed for set-up, configuration, and diagnostics of Masoneilan instruments. ValVue improves Maintenance team efficiency by automating set up, calibration, and diagnostics procedures which is particularly helpful during plant outages.

Valve Lifecycle Management by Baker Hughes

Baker Hughes provides complete valve lifecycle management (VLM) solution from initial setup/ commissioning through turnaround/outage support. Utilizing Baker Hughes extensive valve experience, valve optimized tools, and local service teams help Reliability and Maintenance managers:

- Prioritize valve maintenance activities
- Identify opportunities for process optimization
- Simplify troubleshooting activities
- Optimize valve spares inventory

During plant operations, VLM service subscribers receive valve fleet health reports detailing which valves need to be slotted for repair BEFORE they impact process operations. Similarly, VLM reports can be used to plan valve overhaul operations during outages providing information to overhaul valves based on operating condition rather than time based techniques reducing valves repaired by as much as 50%.

These services are often provided with no additional hardware required, regardless of valve/positioner brand.

Unlock the hidden power of your digital invest with Baker Hughes Valve Lifecycle Management Services.

Pneumatic Instruments

4700/4800 Series
Pneumatic & Electro-Pneumatic Positioner

Control Signals:

4700/4800P	4700/4800E
• 3-15 psig	• 4-20mA
• 6-30 psig	

Pneumatics:

4700/4800P	4700/4800E
• Direct	• Direct
• Reverse	• 100 psi maximum supply pressure
• 100 psi maximum supply pressure	

Operating Temperature:
- -40°C to +85°C

Materials:
- Aluminum (painted) housing
- Stainless Steel Pneumatics

Mounting / Feedback:
- Integrated position feedback
- Rotary or Linear cam settings
- Stainless Steel brackets for all Masoneilan and major valve brands

Certifications:
- Explosion proof and Intrinsically safe
- North America, Canada, ATEX
- Regional – CCOE, CU-TR, INMETRO, IA, UA TR

The model 4700/4800P and 4700/4800E are control valve positioners that use a precision feedback cam for accurate positioning, fast response, and customized control characteristics. These positioners can be used with either rotary or liner actuators in applications where only pneumatic or 4-20mA control signals exist.

Model 4411
Electro-Pneumatic
Transducer

Output capacity:
- 12 scfm (20.4 Nm^3/h)

Signals:
- Input: 4 - 20 mA (100 mA max)
- Output: 3 - 15 psig, 6 - 30 psig

Certification:
- Explosion proof and intrinsically safe enclosure rating per IP 66 and NEMA X

The 4411 I/P is manufactured with Reedex™ digital-micro valve technology for fast response. It is not sensitive to vibration.
- Low air consumption
- Adjustable tight shut-off feature

496 Series Position Switches and Transmitters[1]

Configurations:
- Electromechanical Limit Switch:
  - quantity 1 or 2
  - single or double pole
  - double throw
- Inductive Proximity Detector Switch:
  - quantity 1 or 2
- Potentiometric Position Transmitter
- Opto-Electronics Position Transmitter

Certifications:
- Explosion-proof / Intrinsically safe
- North America, Canada, ATEX
- Regional – NEPSI / Taiwan TS, CCOE, CU-TR / AZ, UA, KOSHA, IA

The 496 Series instrumentation can be configured as electro-mechanical switches, proximity switches, or position transmitters. These devices offer high resistance to vibration and electrical interference for reliable valve-mounted performance.

Mechanical and electrical components can operate in harsh environments and are approved for use with various hazardous area ratings in most countries.

78 Series Air Filter Regulator and Air Lock Up Valves[1]

Air Filter Regulator Model 78-40:
- Inlet pressure rating: 210 psi
- Pressure set range : 5-100 psi
- Filter: Polyethylene (5µm)
- Temperature range: -40°C to 83°C, option for -50°C to 60°C or 0 to 100°C

The Model 78-40 air filter regulators are compact, lightweight, high performance pressure reducing valves. They are used primarily for supplying a stable source of air to process control equipment, such as control valve positioners and current to pneumatic transducers. These regulators are externally adjustable for fine tuning and include a locking feature for maintaining output pressure at the desired level. The compact design is easy to mount onto a range of equipment using various methods and orientations.

Transfer/Lock Up Valves Model 78-80:
- Transfer valve pressure: 250 psi
- Max signal pressure: 150 psi
- Temperature range: -30°C to 83°C

Version 78-80S:
- Cv In to Out: 0.8
- Cv Out to Ex: 1.3

Version 78-80H:
- Cv In to Out: 4.5
- Cv Out to Ex: 5.0

The Model 78-80 transfer valve is used to switch the air flow from one port to another, when the signal pressure becomes lower than the set pressure in case of the air failure. The 3-way transfer valve can be also used as the lockup valve by plugging off the exhaust port. The lockup valve is used to lock the control valve in its last position (Air-Failure-Lock) by confining the air pressure in the actuator, when the signal pressure becomes lower than the set pressure in case of the air failure. When the failed air pressure is recovered above the set pressure, the locked position is released and the control valve will go back to the normal operation.

BR200/BR400 High Capacity Volume Booster Relays[1]

Input/Output Ratio:
- 1:1

Maximum Supply/Signal Pressure:
- 150 psi

Temperature range:
- -30°C to +83°C, option for -50°C to +60°C or 0°C to +100°C

Maximum Cv BR200:
- Supply: 1.2
- Exhaust: 1.2

Maximum Cv BR400:
- Supply: 2.6
- Exhaust: 2.4

Model BR200 and BR400 pneumatic booster relays offer high capacity air volume boost for faster, dynamic control valve system response. These devices feature a 1:1 input-to-output ratio with a maximum supply and signal pressure of 150 psi. The BR200 and BR400 also include an integrated internal bypass valve for sensitivity adjustment and dynamic response optimization. These devices also have integrated filters in both the supply and signal ports and are configured using stainless steel components and corrosion resistant finishes for a robust and reliable assembly.

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