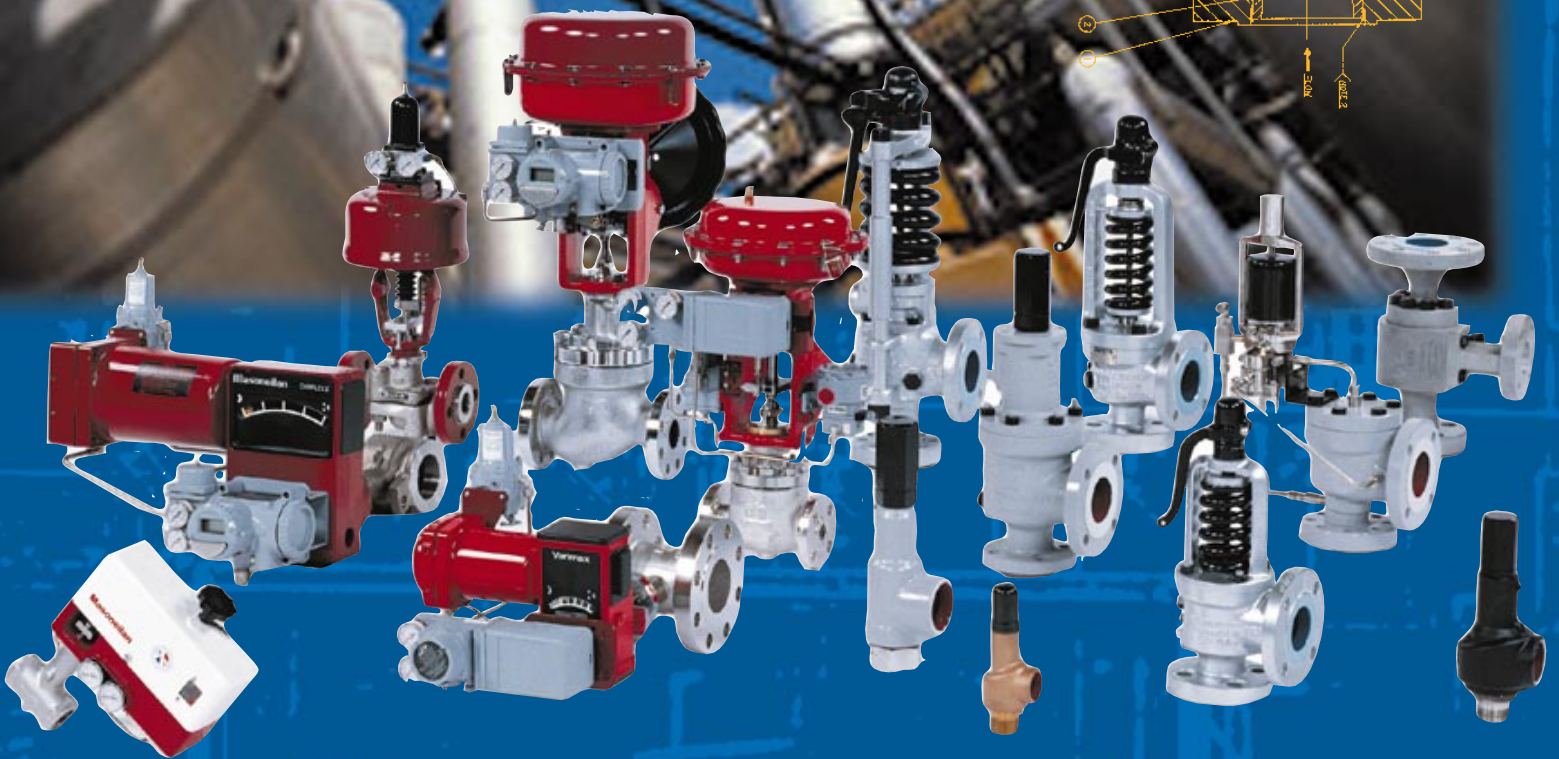
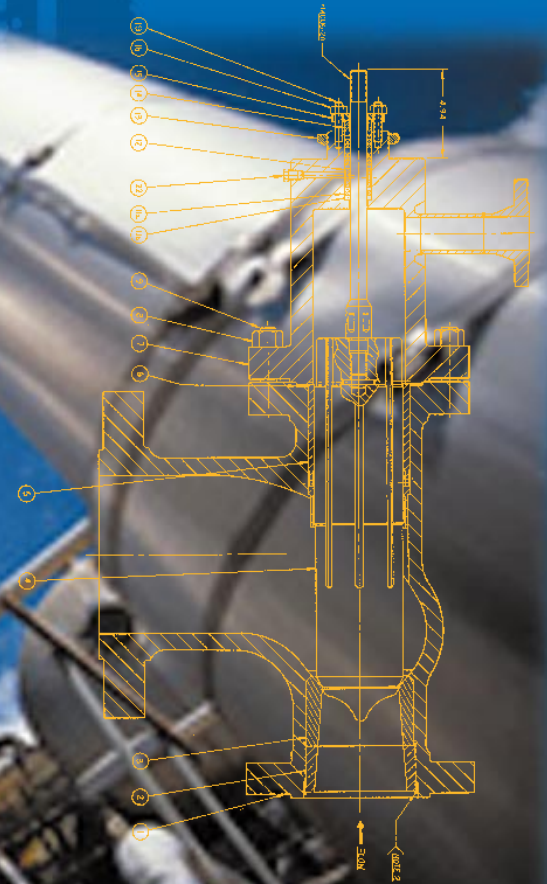


Refining Industry Solutions

Experience, Knowledge, and Technology... In Refining



A Halliburton Company

Consolidated®

Masoneilan®



Nil-Cor®



World Class Knowledge... World Class Products... World Class Support... In Refining.

Dependable Solutions

Dresser Valve Division (DVD) is a full service provider of dependable valve solutions for the Refining Industry. DVD offers a full range of valves and accessories for pressure relief, automated process control, and corrosive applications. As a major part of Dresser Equipment Group, Inc., DVD is primed and committed to be your principal source for integrated solutions and unparalleled support.

Market Leadership

DVD's leadership position was built on a long history of innovation, technical leadership and pioneering, as well as successful application experience and expertise. These attributes are key factors in the growth and sustained success of the brand name products offered by DVD, which includes:

- Consolidated® Pressure Relief Valve Solutions
- Masoneilan® Automated Process Control Valve Solutions
- Nil-Cor® Corrosion-Resistant Valve Solutions

Improved Life-Cycle Costs

DVD has successfully leveraged strengths in all areas of the business to provide customers with significant improvements throughout a product's life cycle. This starts with up front system design support and consistent product specification, resulting in improved operational efficiencies and ease of maintenance throughout the refinery.

Technical Expertise

DVD offers the best technical solutions in the market today providing improved process operating efficiencies and continuous uptime. DVD's primary focus is to provide the best solution for the specific application through proper product selection and configuration. This includes handling the toughest problems using field proven solutions.

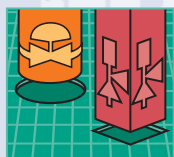
Innovation and Flexibility

DVD continues to improve its products and services through on going market-driven R&D efforts. This has resulted in the development of new innovative products and services, as well as improvements on established offerings.

Integrated Aftermarket Support...

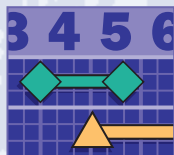
Plant Information and Project Support

DVD offers a true integrated support and service program starting with involvement early in the design process, using innovative tools and programs to help customers select and implement the right solutions for each specific application.



Automated Sizing & Selection

DVD has developed user-friendly software programs for sizing and selecting valve solutions. These programs use current industry standards and calculation methods, provides specific recommendations, and automated error checking. These tools significantly reduce the time required to accurately specify and configure products.



Project Administration

DVD offers project management support to help you easily implement products and services in a timely and cost effective manner. This service is offered with the unique capability to provide a wide range of integrated products and solutions.



Resident Engineering

DVD has implemented the Resident Engineer Program in order to facilitate effective up front design support. This program is focused on providing on-site technical assistance early in the design process, resulting in the reduction or elimination of costly design changes later in the project cycle. Our technical experts would physically “reside” with your engineers to ensure design optimization and define requirements right from the start.



Smart Technology

DVD provides microprocessor-based field instrumentation that can help you realize tangible cost savings from initial installation and set-up, through on-going maintenance and support. The Smart Valve Interface (SVI®) digital valve positioners and controllers can help you drastically improve performance and maintenance management. It communicates with the Hart® protocol over existing 4-20mA wires, and is field upgradable to operate in a fieldbus environment.

...Around the Globe.

Aftermarket Valuesm Services

DVD's Aftermarket Value Services Program offers complete support for safety, safety relief and control valve products, including on-site installation, start-up, predictive/preventive maintenance programs, testing, rebuilding and trouble-shooting. The program also includes on-site inventory planning, diagnostic data interpretation services, on-site machining, field retrofitting, and hands-on training.



Local Support

DVD provides factory-certified support for all products through established local service centers. This global support network consists of Green Tag Centers (GTC[®]) for safety and safety relief valves, Masoneilan Authorized Repair Centers (MARC[®]) for control valves, and DVD field service technicians for all products.



Maintenance Management

DVD also provides integrated programs, such as Valv-Keep[™], to help manage the support of your installed equipment. These programs are location specific and include plant surveys, data management, scheduling/planning of maintenance, repairs, and overhauls.



OEM Parts

DVD provides OEM parts and technical expertise to guarantee your plants uptime performance. Proper product application results in longer lasting components, less downtime, and lower maintenance costs.



Field Support

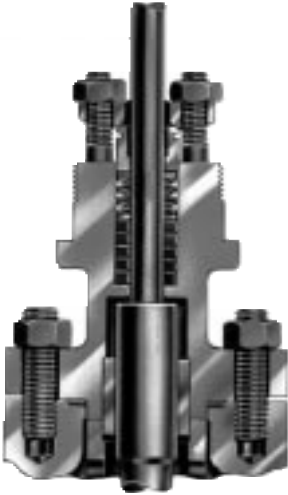
In most instances, customers are able to address questions regarding installation, start-up, or trouble-shooting, using DVD's comprehensive product documentation. DVD also provides highly proficient technical field support whenever necessary to keep your processes tuned to perfection.



Diagnostic Services

In order to help you avoid costly downtime, DVD has developed advanced diagnostic tools and services to assist in the prevention of unexpected or unnecessary maintenance, repair, or overhaul. Available diagnostic tools include the Electronic Valve Tester (EVT[™]) for pressure relief valves, and the ValScope[™] and the Smart Valve Interface (SVI[®]) digital positioner and controller for control valves.

VOC/HAP Reduction



Reciprocating Valves in all Units

Reduction of Volatile Organic Chemicals (VOCs) and Hazardous Air Pollutants (HAPs) can be economically achieved through the use of live-loaded packing. Masoneilan® reciprocating control valves can be equipped with the LE Packing System® option to reduce fugitive emissions by maintaining a constant sealing force within the packing box. Emissions also create hazardous fire safety issues. The LE Packing System will significantly lower the risks by compensating for wide variations in operating conditions.

- Simple retrofit/replacement
- Low maintenance
- Low friction

Request brochure TA3010 for more information.



BTX Extraction Units

Bellows seals can be used to provide a hermetic seal for valve stem interfaces. This is the best available technology for achieving zero leakage of fugitive emissions. Typical applications include handling of flammable, toxic, lethal or explosive fluids, where leakage could cause environmentally unsafe conditions.

Option is available in various product lines.

VOC/HAP Reduction (continued)



Hydroprocessing Units (H_2 Service) **Hydrogen Plant** **BTX Extraction Units**

Dual seal extensions are supplied on control valves for handling toxic or hazardous fluids as an alternative to Bellows seals. The assembly consists of primary and secondary packing sets within an extended bonnet. The packing sets are separated by a spacer (or lantern ring), providing a void section, which can be pressurized with an inert gas to eliminate the differential across the lower packing.

Option is available in various product lines.



Flammable Liquid or Vapor Service

Fire safety requirements can be handled using a packing configuration that has a Grafoil ring placed above the standard LE packing construction. This creates a secure barrier in the event of fire with compliance to API 607. This has been verified through tests conducted at an independent laboratory. The residual fibers from the carbon filled Teflon remains intact during a fire, and packs around the graphite ring to maintain sealing integrity.

Request brochure TA3010 for more information.

VOC/HAP Reduction (continued)



Rotary Valves in all Units

The EF Seal® is an emission containment feature that can be field-retrofitted on any Masoneilan® rotary style control valve. It is a simple dual o-ring design that has undergone extensive FM 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 Clean Air Act, and is offered as the standard configuration in all Masoneilan rotary valves.

Request brochure TA3010 for more information.



Flare Header Backpressure Applications

A Bellows seal configuration is also available with the Consolidated® Type 1900 Safety Relief Valve. This option is extremely useful for applications where backpressure (from the flare header), corrosion, or secure sealing between the bonnet and process are of primary concern.

Request catalog SRV-1 for more information.

Waste Water Management



Waste Water Pump Isolation Chemical Injection Pump Isolation

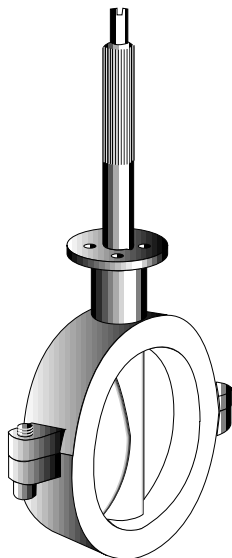
Nil-Cor® composite ball & butterfly valve lines offer exceptional corrosion resistance against more than 1000 standard chemical combinations. The engineered advanced composites are a family of high-performance materials consisting of a fiber-reinforced matrix. All valves can be equipped with a reliable double acting or spring return pneumatic piston actuator.



Chemical Waste Water Injection Neutralization of Spent Caustic pH Control of Waste Water

The Masoneilan® 700 Series is a PTFE-lined globe-style control valve used for corrosive services. It includes a standard bellows seal design, which insures packing box tightness and a safety-sealing ring with a leak detector to monitor the condition of the bellows. Request spec. data CH9020 for more information.

Waste Water Management (continued)



HCL Vapor Recovery System Acid Gas Service

The Masoneilan® 38002 Series is a Teflon®-lined butterfly valve designed for corrosive services and low pressure drop requirements. All internal components are protected for extremely high corrosion resistance. The body liner is encapsulated within a ductile iron body for improved strength and support.

Request spec. data CM3006 for more information.



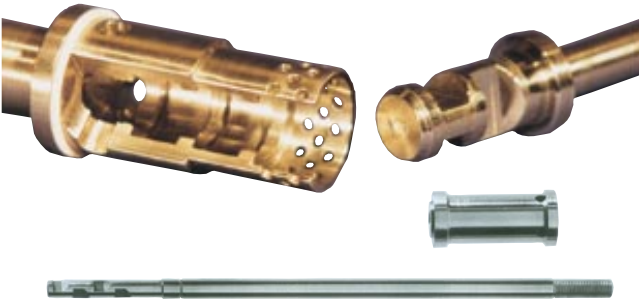
Wastewater Pump Discharge Control Wastewater Pump Recirculation

The Masoneilan 31000 Series is a PFA lined control valve with an eccentric rotary plug, which provides tight shut off, low dynamic forces, and excellent control. This valve provides an excellent solution for hydrofluoric and sulfuric acid applications. The packing is a PTFE Chevron ring construction backed up by a double o-ring follower, thus optimizing packing box integrity.

Request spec. data CF3000 for more information.



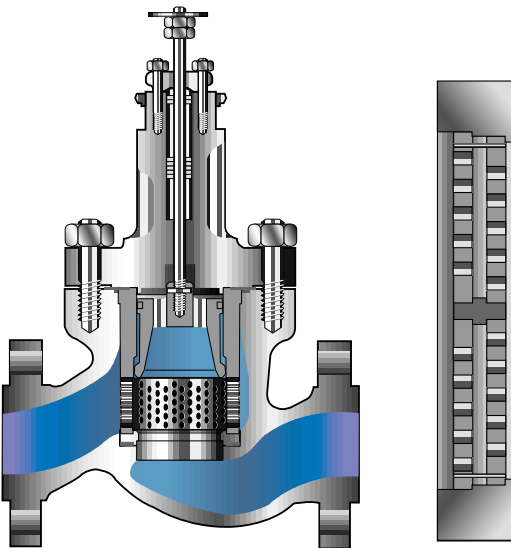
Desuperheating



Spraywater Control Desuperheating Valve Spraywater Control

Difficult desuperheating temperature control applications can be effectively addressed using the patented Masoneilan® Lincolnlog® trim installed within the 28000 Series and the SE30 Series control valves. The Lincolnlog is configured as a 3-stage throttling plug, which provides anti-cavitation and velocity control features with low flow capacities (minimum of 0.02 Cv). Both valve designs are light weight with low profiles, making them ideal for tight installation envelopes such as in a desuperheating station.

Request spec. datas CH4501 and CH6050 for more information.



Steam Pressure Reducing Valves Steam Header Breakover

Masoneilan's versatile cage-guided 41000 Series control valve provides solutions for high pressure drop steam applications. This includes a highly reliable trim design for reducing noise and vibration. Material selection and part design account for thermal expansion, thus preventing binding of critical trim components at high temperature conditions. Lo-dB cartridges or plates can also be provided to maintain low outlet velocities and minimize downstream noise.

Request spec. data CH3000 for more information.

Safety/Protection Systems



Steam Safety Relief

The Consolidated® Types 1511, 1811, and 1900 pressure relief valves meet 90% of all overpressure protection applications. This includes applications in coded areas requiring conformance to ASME Section I and Section VIII guidelines. These valves offer a combination of low pressure design, high capacity, cost effectiveness, and versatility to meet numerous steam applications within a refinery.

Request catalogs SV-4 and SRV-1 for more information.



Steam Vent to Atmosphere

Masoneilan's energy management trim design, the V-LOG™, reduces pressure in controlled stages through a series of discrete flow channels. The V-LOG combines right angle turns with intermediate expansions and contractions to achieve efficient pressure reduction within a very compact design. Other possible solutions for this application are the Masoneilan 41000 Series and 30000 Series Varimax® valves. Noise reductions in the 35 to 40 dBA range are achievable with this valve and trim combination.

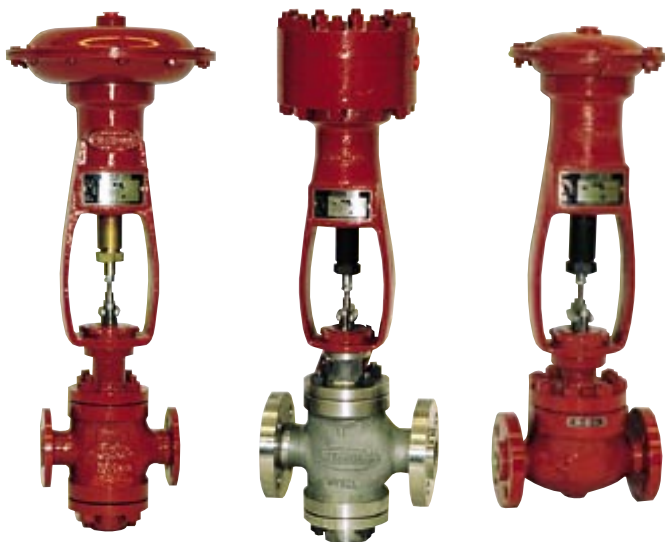
Request brochure BP7510 for more information.

Centrifugal Compressors



Surge Protection

Maseilan® offers a wide range of control valves for compressor surge protection applications. Our knowledgeable sales engineers can recommend the most economical valve design for your particular compressor requirements. Aerodynamic noise reduction configurations include single stage, double stage, or multi-stage V-LOG trim. These designs can reduce noise levels up to 35 to 40 dBA. Additionally, these valve designs provide quick response with stroking speeds within one second.

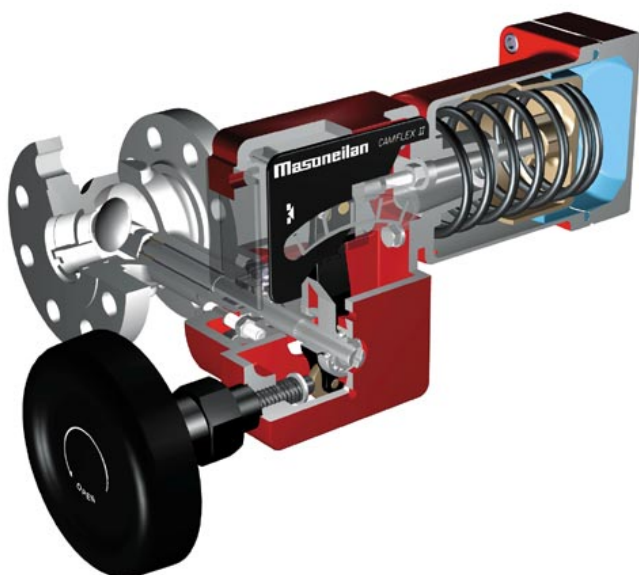


Seal Gas Control Lube Oil Pressure

The Maseilan 500 Series regulators are designed for pressure reduction, back pressure, and differential pressure applications. It is available in multiple configurations to meet various combinations of capacity, pressure, and temperature requirements. This includes optional designs for the 10900 Series actuators, which can be configured as spring diaphragm or differential pressure depending on the application.

Request spec. data CY5256 and CY5352 for more information.

Gas Turbines



Double Block & Bleed Fuel Gas Control Fuel Gas Isolation

The Masonellan® 35002 Series Camflex® eccentric plug control valve is offered with a soft seat option, which provides bubble tight shutoff for this critical application. The Camflex design also includes the EF Seal as a standard packing configuration, which effectively prevents fuel gas leaks from the valve.

Request spec. data CF5000 for more information.



Lube Oil Return

The Masonellan 17 Series pressure regulators are direct-operated designs for steam, gas and liquid services in reducing and back pressure configurations. The low profile of the 17 Series makes it ideal for mounting on gas turbine skids. This design is also available in a stainless steel construction for high temperature and corrosive applications.

Request spec. data CY1700 for more information.

Steam Turbines



Extraction Steam Relief

The Consolidated® Type 1700 Maxiflow® high-pressure safety valve has been installed in thousands of steam extraction applications worldwide. It provides premium protection with unmatched seat tightness and blowdown accuracy. The product line has been enhanced over the years with features such as the patented Thermodisc® seat design, which reduces plant operating costs through reduction of steam leaks.

Request catalog SV-5 for more information.

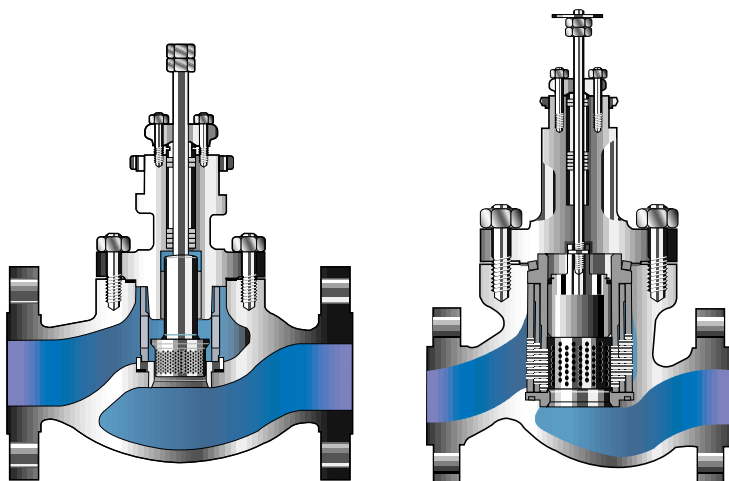


Turbine Bypass

Masonellan's energy management trim design, the V-LOG™, reduces pressure in controlled stages through a series of discrete flow channels. The V-LOG combines right angle turns with intermediate expansions and contractions to achieve efficient pressure reduction within a very compact design. It can be packaged within the SE20 Series control valve, which provides design flexibility for capacity, outlet velocity control, thermal shock, and expansion. Noise reductions in the 35 to 40 dBA range are achievable with this valve and trim combination.

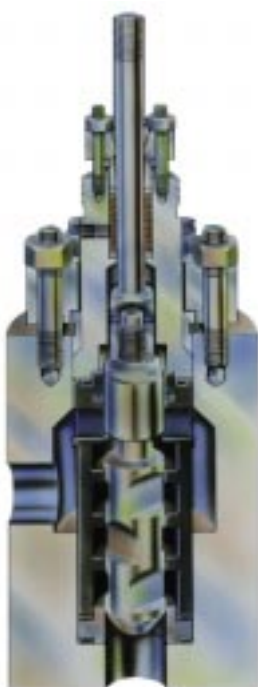
Request brochures BP7510 and TS-SE-20 for more information.

Centrifugal Pumps



Clean or Low Pressure Pump Recirculation Service

Maseoilan® offers a wide selection of single and double stage trims in unbalanced and balanced globe valve configurations. These designs are based on drilled hole technology, thus they are recommended only for clean service applications. Both balanced and unbalanced anti-cavitation options are available with metal-to-metal seating to meet ANSI Class V shutoff performance standards.



Dirty or High Pressure Pump Recirculation Service

Maseoilan's Lincolnlog® trim is designed for application in high pressure and/or dirty pump recirculation service. The Lincolnlog permits particles up to one tenth of the valve size to pass through without affecting valve operation. Various material options are available for services that include hydrogen sulfide (H_2S), ammonia (NH_3), amine, or high amounts of foreign particles. ANSI Class V and VI shutoff are available.

Request spec. data CP6020 for more information.

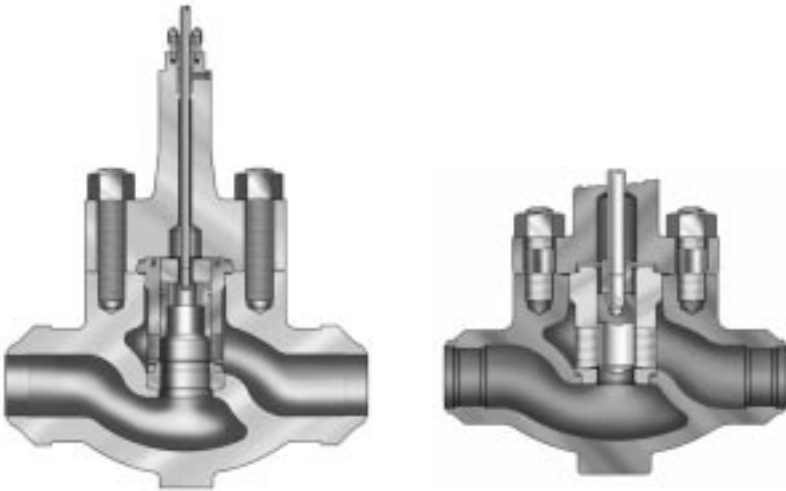
Powerhouse



Boiler Drum Overpressure Protection Extraction Steam Relief

The Consolidated® Type 1700 Maxiflow® high-pressure safety valve has been installed in thousands of boiler drum applications worldwide. It provides premium boiler protection with unmatched seat tightness and blowdown accuracy. The product line has been enhanced over the years with features such as the patented Thermodisc® seat design, which reduces plant operating costs through reduction of steam leaks.

Request catalog SV-5 for more information.

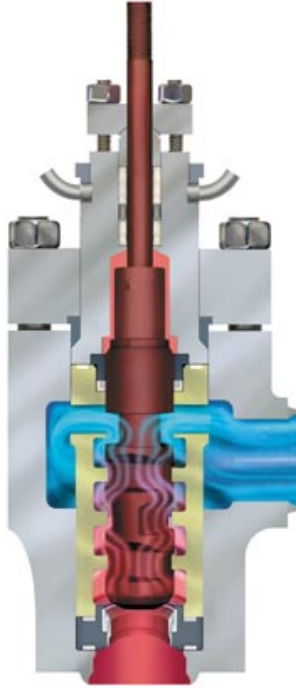


Soot Blower Auxiliary Steam High Pressure Bypass High Pressure Vent Deaerator Steam Pegging

Masoncilan® provides a variety of solutions for high pressure and high temperature steam applications. This includes the 48000 Series hung-cage globe valve, the 21000 Series two-stage Lo-dB globe valve, and the SE20 Series custom engineered control valve. Steam noise reduction up to 40 dBA is achievable with these designs, including the use of V-Log trim design options.

Request spec. data CH1080 and TS-SE-20 for more information.

Powerhouse (continued)



Boiler Feedpump Recirculation

Masoncilan's Lincolnlog® trim provides multi-stage letdown to eliminate cavitation and erosion, thus it is ideal for high-pressure boiler feedpump protection. The large flow passages allow particles up to one-tenth of the valve size to pass through without affecting operation. It can also be supplied with a soft seat option, which prevents damage and minimizes valve leakage through compliance with ANSI Class VI shutoff requirements.

Request spec. data CP6020 for more information.

HVAC/Air, Nitrogen, & Fuel Gas Systems



Chill Water Control

The Masoncilan 37000 Series is a heavy-duty butterfly valve that provides superior automated throttling control performance. A low dynamic torque is maintained through a unique cupped shaped disc, which provides stable control throughout the disc rotation. A triple bearing arrangement provides exceptional stiffness, support, and guiding for the shaft.

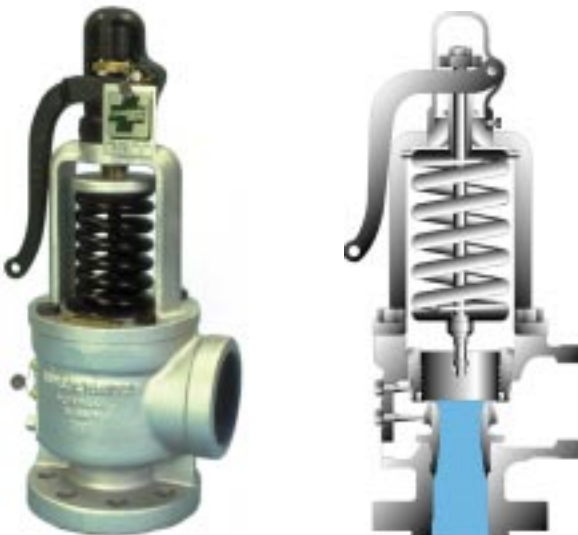
HVAC/Air, Nitrogen, & Fuel Gas Systems (continued)



***Nitrogen Header Press Control
Plant Air Header Press Control
Instrument Air Header Press Control***

The Masoneilan® 25000 Series is a stem-guided globe valve optimized for light duty applications. It has an extremely low profile, and is available in cast iron, bronze, carbon steel, and stainless steel construction to meet a number of different applications.

Request spec. data CH1250 for more information.



***Nitrogen Header Relief
Plant Air Compressor Relief
Instrument Air Compressor Relief***

The Consolidated® Type 1511 safety valve product line is designed for compressible fluids under light duty conditions, such as air service and low-pressure steam. This product line is available in cast iron and bronze configurations, and meets ASME code requirements for Sections I, IV, and VIII.

Request catalog SV-4 for more information.

HVAC/Air, Nitrogen, & Fuel Gas Systems (continued)



Plant Air/Instrument Air/Nitrogen Pressure Reduction to Units

Maseoilan® provides a diverse line of pressure regulators, including externally and internally pressure reducing, backpressure, and differential pressure control options. Regulator body sizes range from 1/2" to 4" and are available in various material options.

Blending/Tank Farms/Land & Marine Base Loading



Fuel Oil Blending
Diesel Blending
Gasoline Blending
Crude Tanker Unloading
Fuel Truck Loading
Railcar Loading

The Masonoilan® 35002 Series Camflex® eccentric plug control valve offers simplicity of design with enormous flexibility and capability. An optional soft seat design meets ANSI Class VI shutoff requirements. The Camflex design also includes the EF Seal as a standard packing configuration, which effectively minimizes hazardous emissions.

Request spec. data CF5000 for more information.



Diesel Blending
Gasoline Blending
Crude Tanker Unloading
Fuel Truck Loading
Rail Car Loading

The Masonoilan 30000 Series Varimax® control valve provides globe valve type capabilities within a compact rotary style package. Varimax offers a unique flow capacity adjustment feature, which can be externally adjusted in the field to compensate for valve oversizing. This feature can be used to effectively minimize instability in the control loop due to valve oversizing. Each valve size has eight different C_v settings available, thus providing blending skid designers an enormous amount of rangeability. The Varimax also includes Lo-dB® trim options for effective noise attenuation, and soft seat designs meeting Class VI shutoff requirements.

Request spec. data CN3000 for more information.

Blending/Tank Farms/Land & Marine Base Loading *(continued)*



Gasoline Blending

The Maseoilan® 36004 Series Paramax™ Control Ball Valve is a heavy-duty automatic throttling valve assembly that uses a parabolic segmented ball design. The Paramax provides high flow capacities along with low operating torque levels. A high temperature configuration is available that includes graphite packing, a metal seal ring, and Stellite® bearings.

Request spec. data CM6004 for more information.

Sour Water Stripping/Amine Recovery

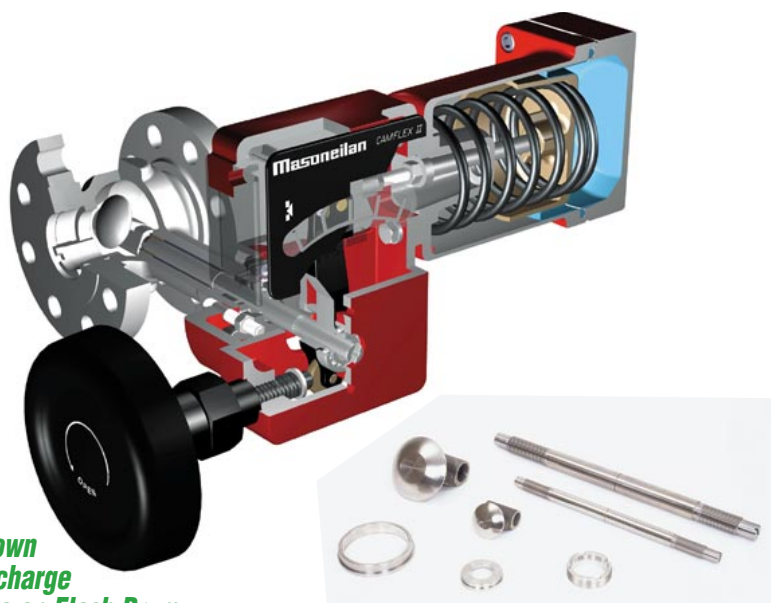


Amine Accumulator Overhead Accumulator to Flare Header Acid Gas to Sulfur Recovery Unit

The Maseoilan 39002 Series High Performance Butterfly Valve (HPBV) is a heavy-duty automatic throttling control valve that incorporates tight shutoff (ANSI Class VI), lugged designs, heavy shafts, and optional spring diaphragm or piston actuation. The 39002 Series also includes an eccentric disc and shaft alignment, which improves the metal and energized PTFE seal ring performance.

Request spec. data CM9002 for more information.

Sour Water Stripping/Amine Recovery (continued)



Condensate Pot Letdown
Sour Water Pump Discharge
Pressure Maintenance on Flash Drum
SWS Reflux Pump Discharge
Reflux Cooler Bypass
Steam to Stripper Reboiler
Reflux Temp Control

Masoneilan's Camflex® eccentric plug control valve provides a cost-effective solution to various low pressure and corrosive media applications within Sulfur Recovery and Tail Gas Cleaning units. The standard and extended bonnet designs permit the application of Teflon and low emissions packing for process temperatures up to 750°F. Other trim options include soft seat, NACE, hard-faced and solid Stellite configurations.

Request spec. data CF5000 for more information.



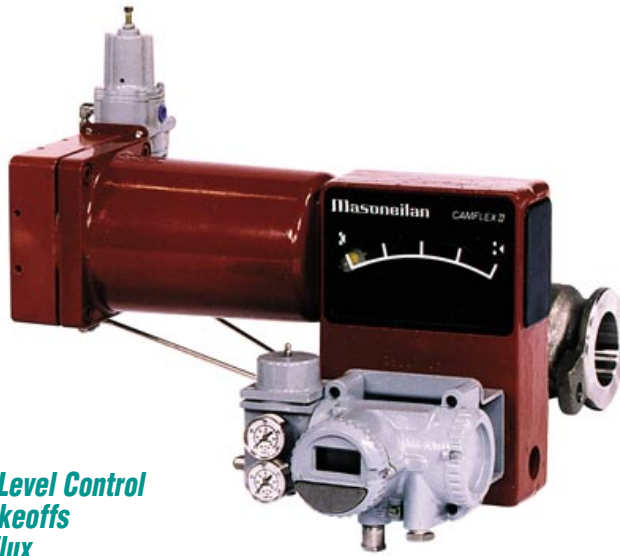
Flash Drum
Amine Contactor
Accumulator
Condensate Pot

Liquid level measurements can be difficult on water and crude interfaces, as typically found in the refining process. Masoneilan provides the 12000 Series and 12300 Series (Digital-HART®) liquid level instrumentation product lines, which include pneumatic and electronic feedback, torque tube extensions for elevated temperatures (850°F), and standard ranges from 14"-120". These instrument product lines provide efficient and proven solutions in a variety of materials and configurations.

Request spec. data CU3000 and CU7000 for more information.



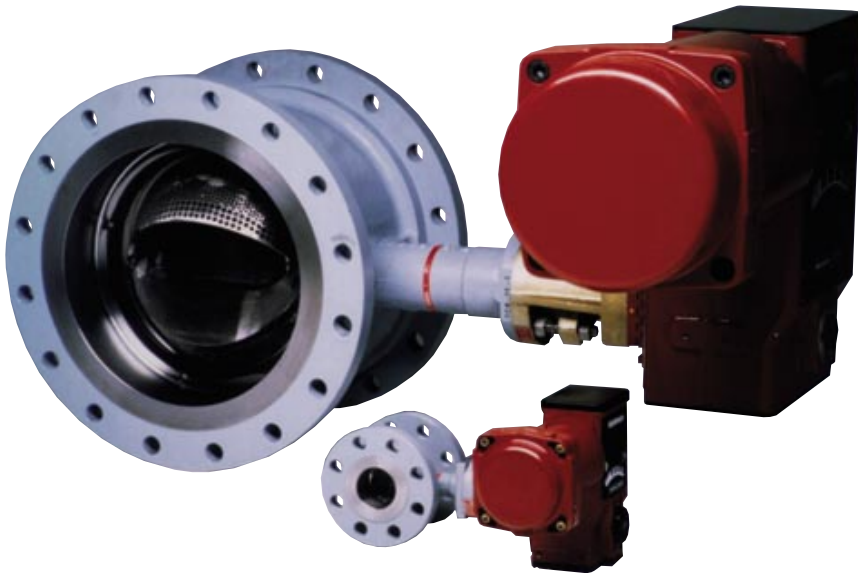
Saturate Gas Plant/Polymerization/Ethers



Interstage Reflux
Naphtha Accumulator Level Control
LSRN/HSRN Product Takeoffs
Naphtha Stabilizer Reflux
Naphtha Splitter Reflux
Oxygenate Storage Tank

Masonoil's 35002 Series Camflex® eccentric plug control valve offers simplicity of design with enormous flexibility and capability. The Camflex design also includes the EF Seal as a standard packing configuration, which effectively minimizes hazardous emissions.

Request spec. data CF5000 for more information.



Offgas Compressor Surge Control
Offgas Compressor Suction Control
Naphtha Stabilizer Pressure Control
Naphtha Splitter Pressure Control

The Masonoil 30000 Series Varimax® control valve provides globe valve type capabilities within a compact rotary style package. Varimax offers a unique flow capacity adjustment feature, which can be used to minimize instability in the control loop due to valve oversizing. The Lo-dB® trim option in the Varimax provides efficient aerodynamic noise reduction. The Varimax also includes a soft seat option that meets ANSI Class VI shutoff requirements. This feature can help minimize seat leakage and thus limit costly product loss to the flare header.

Request spec. data CN3000 for more information.

Saturate Gas Plant/Polymerization/Ethers *(continued)*



Naphtha Stabilizer/Overhead Reflux Drum Relief Offgas Compressor Overpressure Protection

The Consolidated® MPV™ 3900 Series pilot operated safety relief valve includes large flow areas in the pilot valve assembly to prevent plugging from foreign particles. The Consolidated MPV is available in either a pop pilot or a modulating pilot configuration. Conversion from one design to the other is accomplished by simply assembling or disassembling a separate Modulator assembly. The modulating pilot provides efficient performance by relieving the minimum amount required to prevent overpressurization. This results in significant cost savings as product waste to the flare header is minimized.

Request POSRV-Catalog for more information.

Alkylation

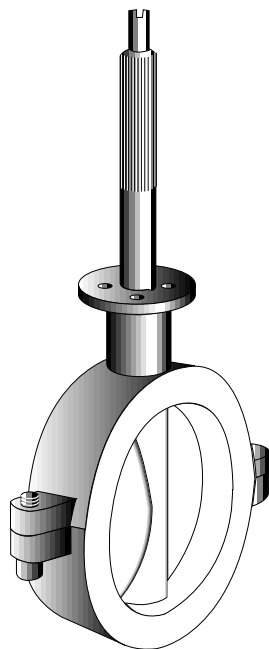


Hydrofluoric Acid Stripper Depropanizer Acid Regenerator Overpressure Protection

The Consolidated Type 1900 conventional safety relief valve product line is a versatile design created to meet numerous application requirements. The 1900 includes features such as corrosion resistant materials, bellows seal design, and stress relieving procedures to prevent stress corrosion cracking. Field-proven solutions for vapor or liquid acid service are also available. This includes optional Monel trim components and a bellows seal assembly.

Request catalog SRV-1 for more information.

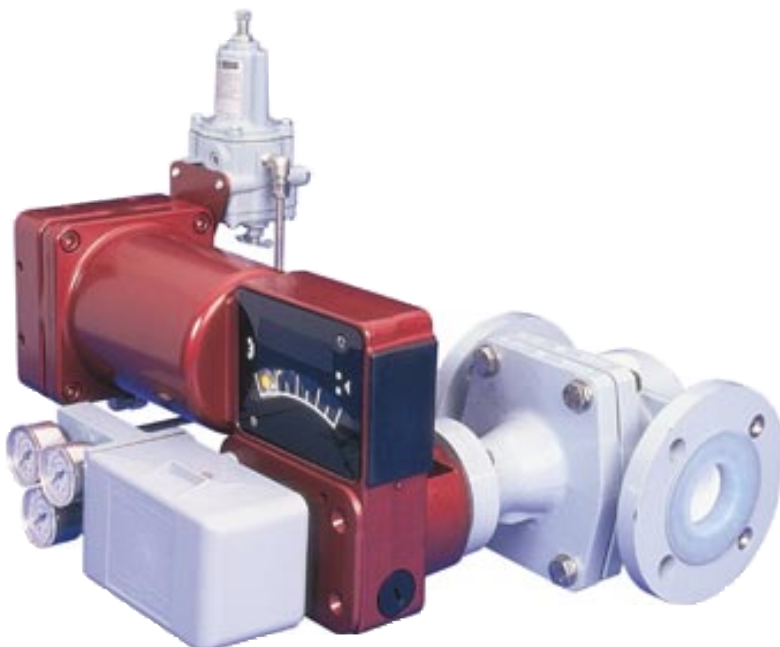
Alkylation (continued)



Acid Circulation to Reactor

The Masoneilan® 38002 Series is a Teflon®-lined butterfly valve designed for corrosive services and low pressure drop requirements. All internal components are protected for extremely high corrosion resistance. The body liner is encapsulated within a ductile iron body for improved strength and support.

Request spec. data CM3006 for more information.

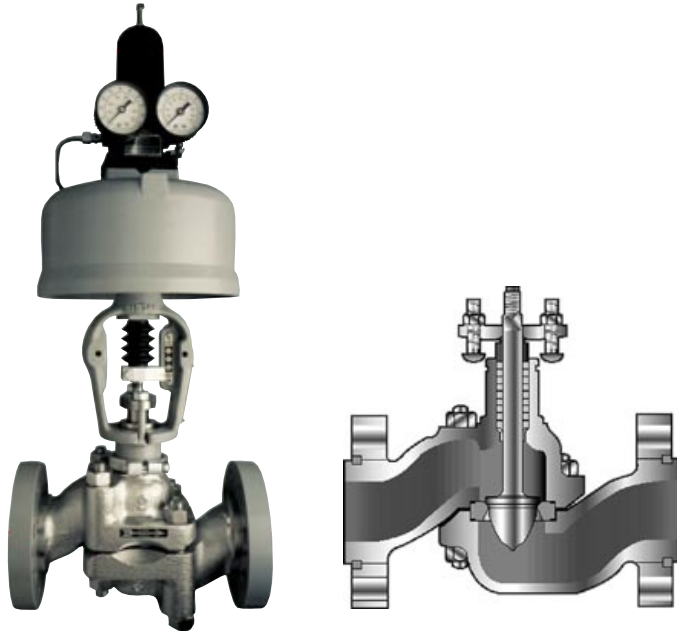


Hydrofluoric Acid Stripper Overhead Acid Regenerator Reflux Relief Gas Scrubber

The Masoneilan 31000 Series is a PFA lined control valve with an eccentric rotary plug, which provides tight shut off, low dynamic forces, and excellent control. This valve provides an excellent solution for hydrofluoric and sulfuric acid applications, which includes optional trim materials where necessary. The packing is a PTFE Chevron ring construction backed up by a double o-ring follower, thus optimizing packing box integrity.

Request spec. data CF3000 for more information.

Alkylation *(continued)*



Acid Settler Vent
Hydrofluoric Acid Stripper Feed
Acid Pump Spillback
Acid to Alkylate Reactor

The Masoneilan® 2600 Series split body control valve is a versatile product line that meets many standard applications, but also provides a cost effective solution for services requiring use of exotic materials. This is accomplished through a low weight modular design, that includes the use of separable flanges with low cost alloy bodies made of Hastelloy B, Hastelloy C, Monel, Alloy 20, and Stainless Steel.

Request spec. data CK5000 for more information.

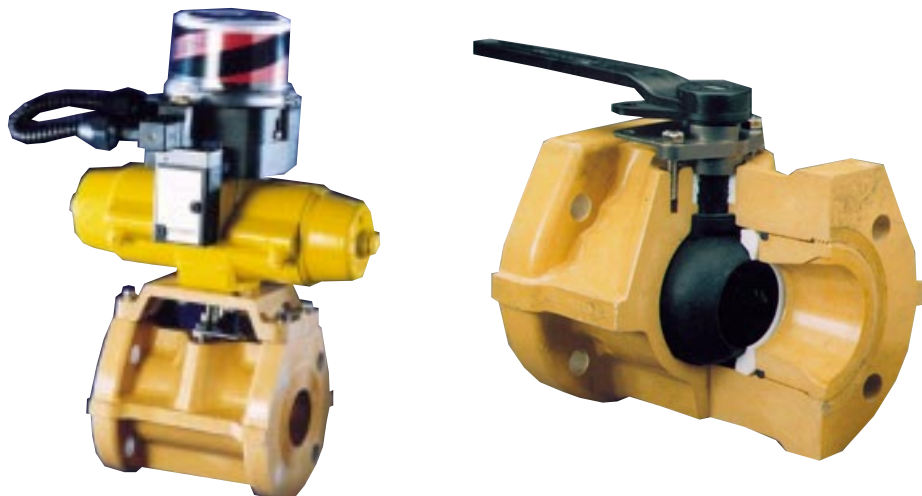


Isostripper Reflux
Feed Settler
Acid Regenerator
Acid to Isostripper
Alkylate Pump Spillback
Caustic Pump Recirculation

The Masoneilan 700 Series is a PTFE-lined globe-style control valve used for corrosive services. It includes a standard bellows seal design, which insures packing box tightness and a safety-sealing ring with a leak detector to monitor the condition of the bellows.

Request spec. data CH9020 for more information.

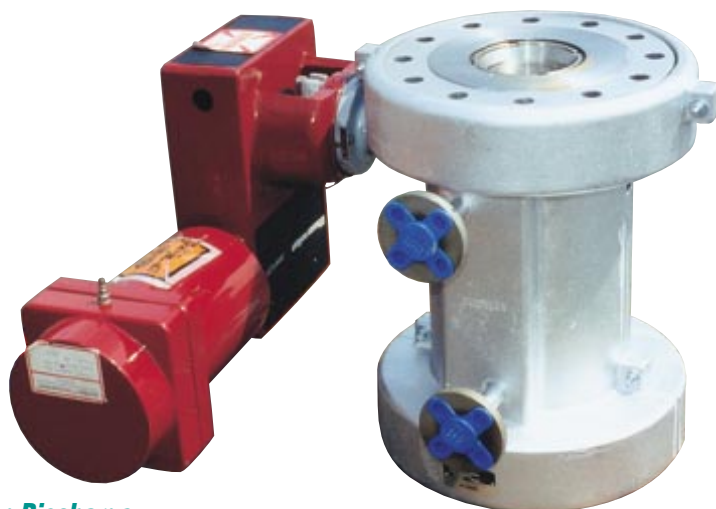
Alkylation (continued)



Wastewater Waste Isolation Acid Service Emergency Shutdown & Isolation Caustic Isolation

Nil-Cor® composite ball & butterfly valve lines offer exceptional corrosion resistance against more than 1000 standard chemical combinations. The engineered advanced composites are a family of high-performance materials consisting of a fiber-reinforced matrix. All valves can be equipped with a reliable double acting or spring return pneumatic piston actuator.

Sulfur Recovery/Tail Gas Cleanup

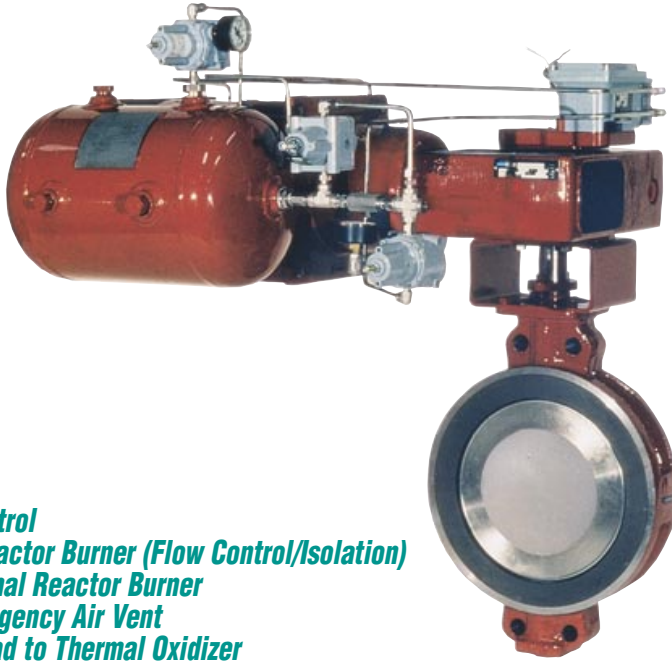


Sour Water Pump Discharge Acid Gas KO Drum Level Nitrogen/Natural Gas to Burner Pilot Air Double Block & Bleed on Natural Gas/Pilot Gas Atomizing Steam Sulfur Pit Overhead to Thermal Oxidizer CW to Quench Tower

Masonilan's Camflex® eccentric plug control valve provides a cost-effective solution to various low pressure and corrosive media applications within Sulfur Recovery and Tail Gas Cleaning units. The standard and extended bonnet designs permit the application of Teflon and low emissions packing for process temperatures up to 750°F. Other trim options include soft seat, NACE, hard-faced and solid Stellite configurations, and a steam-jacket design for difficult liquid sulfur applications.

Request spec. data CF5000 for more information.

Sulfur Recovery/Tail Gas Cleanup *(continued)*



- Blower Surge Control**
- Air to Thermal Reactor Burner (Flow Control/Isolation)**
- Acid Gas to Thermal Reactor Burner**
- Sulfur Pit to Emergency Air Vent**
- Sulfur Pit Overhead to Thermal Oxidizer**
- Cond Overhead to Inline Burner/Mixer**

The Masoneilan® 39002 Series High Performance Butterfly Valve (HPBV) is a heavy-duty automatic throttling control valve that incorporates tight shutoff (ANSI Class VI), lugged designs, heavy shafts, and optional spring diaphragm or piston actuation. The 39002 Series also includes an eccentric disc and shaft alignment, which improves the metal and energized PTFE seal ring performance. The 39002 Series is also provided with a steam jacket option to handle difficult liquid sulfur applications.

Request spec. data CM9002 for more information.

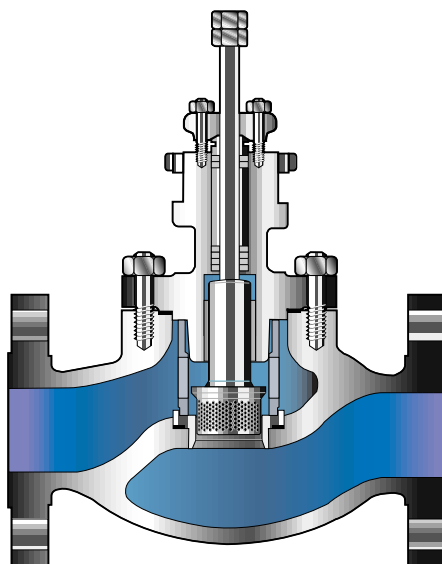


- Overpressure Protection for Waste Heat Steam Drum**
- Sulfur Condenser**
- Reactor Waste Heat Exchanger**
- Thermal Oxidizer Waste Heat Boiler**

Consolidated® Type 1811 and Type 2700 safety valve product lines are constructed to meet ASME Sections I and VIII code requirements using cost effective designs. Consolidated's unique Thermodisc® seat design for eliminating distortion due to thermal stresses, is an available option for each of these product lines. The Thermodisc is designed to quickly equalize any temperature differentials, which results in less seat distortion and effectively maintains tight shutoff after many blowdowns.

Request catalogs SV-4 and SV-9 for more information.

Hydrogen Management



Absorber Regeneration Absorber Switching

The Masoncilan® 21000 Series is a single ported, heavy top-guided globe valve designed to handle a wide variety of process control applications. The 21000 Series can be provided with a variety of actuation packages, including a spring cylinder actuator for applications requiring a low profile design and high thrust requirements. Other options include low noise and soft seat trims to meet noise reduction and tight shutoff needs respectively.

Request spec. data CH1080 for more information.



Absorber Overpressure Protection Membrane Overpressure Protection

The Consolidated® MPV™ 3900 Series pilot operated safety relief valve is available in pressure ratings up to 2500# ANSI. The Consolidated MPV is available in either a pop pilot or a modulating pilot configuration. Conversion from one design to the other is accomplished by simply assembling or disassembling a separate Modulator assembly. The modulating pilot provides efficient performance by relieving the minimum amount required to prevent overpressurization. This results in significant cost savings as lost hydrogen is minimized.

Request POSRV-Catalog for more information.

Isomerization/Hydrotreating



Amine Booster Pump Recirculation Sour Water Letdown Washwater Injection Pump Spillback Cold Separator Letdown Charge Pump Recirculation

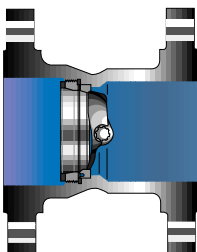
The Masoneilan SE 30 Series heavy duty, bottom entry globe valve provides an effective solution for applications requiring long-term performance with operating pressure drops up to 1400 psi. This is accomplished through a variety of options such as the patented Lincolnlog® 3-stage axial flow trim. Trim options are also available for handling corrosive services with entrained hydrogen sulfide and ammonia.

Request spec. data CH6050 for more information.

Fractionator Bottoms Diesel/Naphtha Pumparound Reflux Return

The Masoneilan 30000 Series Varimax® control valve provides globe valve type capabilities within a compact rotary style package. Varimax offers a unique flow capacity adjustment feature, easily accessed in the field to compensate for valve undersizing or oversizing. This feature can be used to effectively minimize instability in the control loop due to valve oversizing.

Request spec. data CN3000 for more information.



Reactor Switching Effluent/Preheat Exchanger Bypass Recycle Gas/Effluent Exchanger Bypass

The Masoneilan 80000 Series three-way control valve is designed for either combining or diverting flow applications. Key features include high flow capacities and low pressure recoveries, resulting in a highly efficient flow control solution. Additionally, the valve is designed with flow tending to open both ports, thus inherently maintaining valve plug stability.

Request spec. data CH7000 for more information.

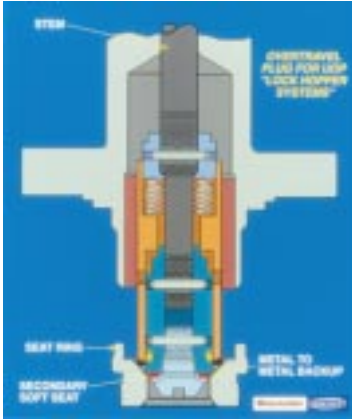
Fractionator Bottoms Bottoms Pump Recirculation Bottoms Takeoff

The Masoneilan 10000 Series double-seated control valve provides a simple balanced design configuration, which allows for effective application in high-pressure drop conditions. It has been used extensively in the refining industry for many years. This includes severe service conditions and applications with high viscosity fluids. It is available in sizes up to 16" and pressure ratings of 1500# ANSI, with optional NACE configurations, extension bonnets, high capacities, and special trim materials.

Request spec. data CH2500 for more information.



Catalytic Reforming



Vent Gas **Vent Gas to Vent Drums** **Nitrogen Purge** **Flare Vent** **Recycle Gas**

The Masoneilan 215X1 Series top-guided globe valve is designed for application in severe on-off service. The 215X1 is an extension of Masoneilan's 21000 Series product line. It was originally designed for use in the Lock Hopper systems of UOP's Continuous Catalyst Regeneration Units. The trim has been designed specifically for this high cycle application, and has been successfully installed in CCR units worldwide.

Consult factory for more information.

Nitrogen to Regeneration Tower **Air to Regeneration Tower**

The Masoneilan 28000 Series Varipak® is a compact globe style valve designed specifically for microflow control. The Varipak includes an adjustable C_v feature to meet applications requiring finer control. It is a lightweight design with a low profile making it ideal for applications with small installation space. The Varipak has been used frequently in air, HC, hydrogen, liquid catalyst, and water service control to reactors.

Request spec. data CH4501 for more information.

Aromatics Extraction



BTX Columns Depressurization **Compressor Recycle**

Masoneilan provides various fabricated angle designs to meet applications with flow capacity and noise attenuation requirements beyond conventional globe valve capabilities. The Masoneilan 72000 Series and SE 10 Series are designed for precise capacity control, while efficiently minimizing noise and outlet velocities. These valves are available with a number of different instrument packages to meet various specifications, including fast stroke and controlled depressurization with backup air or nitrogen. Masoneilan's patented V-LOG™ energy management trim is also available to handle more demanding applications.

Request CP7500, TS-SE-10, and BP7510 for more information.

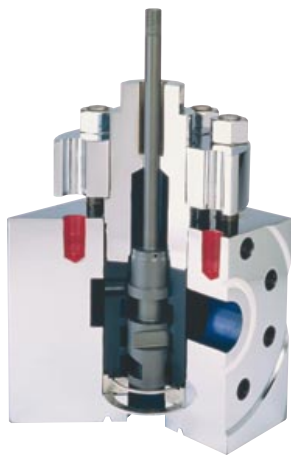
BTX Column Overpressure Protection

Column overpressure can be caused by a number of separate equipment failures, which requires different system relieving capacities. The traditional solution has been to use a series of spring-loaded safety relief valves set at varying set pressures to insure overpressure protection. The Consolidated MPV™ type 3900 pilot operated safety relief valve can provide this same function using a single assembly. The large port modulating design provides significant savings in equipment installation, operating efficiencies, and maintenance costs.

Request POSRV-Catalog for more information.



Hydroprocessing (Treating/Cracking/Refining/Dewaxing/Finishing)



Amine Booster Pump Recirculation Charge Pump Recirculation Sour Water Letdown Cold-High-Pressure Separator Letdown High Pressure Amine Contactor Letdown Washwater Pressure Control

The Masoneilan 78200 and 18200 Series Lincolnlog® valves were originally introduced in 1988, and have become the premier high pressure multi-step letdown solution in the refining industry. The Lincolnlog is ideally constructed for safe operation with dirty fluids, and is designed for use in pressure letdown applications up to 10000 psi. Other features include a trim option for corrosive environments, and an unbalanced design for high temperature applications.

Request spec. data CP6020 for more information.



Hot/Cold Separator Depressurization Power Recovery Turbine Protection Stabilizer/Stripper/Fractionator Overpressure Protection

The Consolidated® MPV™ 3900 Series pilot operated safety relief valve is available in pressure ratings up to 2500# ANSI. The Consolidated MPV is available in either a pop pilot or a modulating pilot configuration. Conversion from one design to the other is accomplished by simply assembling or disassembling a separate Modulator assembly. Both designs are non-flowing configurations, thus significant cost savings are achievable through reductions in wasted product.

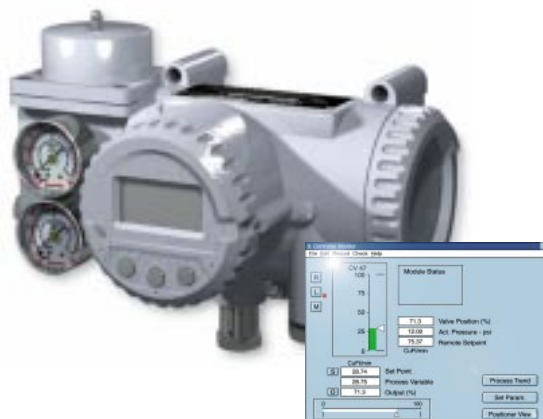
Request POSRV-Catalog for more information.



Hot-High-Pressure Separator Letdown Power Recovery Turbine Bypass

The Masoneilan 77000 Series Lo-dB® multi-step control valve is designed primarily for high-pressure compressible fluid applications. It effectively controls erosion, vibration, and high noise conditions making it an ideal solution for hot-high-pressure flashing hydrocarbon liquid services. The 77000 Series is an extremely rugged design that includes top and bottom plug guiding, short operating strokes, and velocity control trim.

Request spec. data CP5500 for more information.



Hydrogen Reactor Bed Quench

The Masoneilan Smart Valve Interface (SVI®) is an intelligent digital valve positioner and process controller. This device provides advanced control functionality for any pneumatically operated control valve assembly. The SVI provides extremely precise field-based control, and is available for integration with any of Masoneilan's broad line of control valves. A companion software product, ValVue™, is also available to access the full capabilities of the SVI product. This includes valve diagnostic features used as a preventative maintenance tool to monitor possible failure of critical valve components.

Request manuals EW1000 and EW2000 for more information.

Hydroprocessing (Treating/Cracking/Refining/Dewaxing/Finishing) (continued)



Hydrogen Quench Make-up Hydrogen Cold/Hot Recycle Gas Reactor Feed Reformed Gas Vent Steam Vent

The Masoneilan 41400 Series balanced, cage-guided globe valve design is offered with an optional pilot balanced construction that provides ANSI Class V metal-to-metal seat leakage. Increasing upstream system pressure acts to increase the valve's seat tightness in this design. The 41000 Series is available in valve sizes from 2" - 20" and pressure ratings up to 2500# ANSI. Alloy materials are also available in 347, 321 and 316 stainless steel for applications where hydrogen embrittlement is a concern.

Request spec. data CH3000 for more information.



Reactor/Separator/Fractionator/Stripper Depressurization

Masoneilan's energy management trim design, the V-LOG™, reduces pressure in controlled stages through a series of discrete flow channels. The V-LOG combines right angle turns with intermediate expansions and contractions to achieve efficient pressure reduction within a very compact design. It can be packaged within the SE 20 Series control valve, which provides design flexibility for capacity and outlet velocity control. Noise reductions in the 35 to 40 dBA range are achievable with this valve and trim combination.

Request spec. data BP7510 and TS-SE-20 for more information.



Cooler Bypass Reboiler Bypass Effluent Heat Exchangers Reactor Switching Valve

The Masoneilan 80000 Series is a line of three-way control valves designed for either combining or diverting applications. Key features include high flow capacities and low pressure recoveries, resulting in a highly efficient flow control solution. The 80000 Series is designed with flow to open ports, which inherently creates a dynamically stable valve plug operating characteristic. Various trim and body material options are available for application in services approaching 900°F.

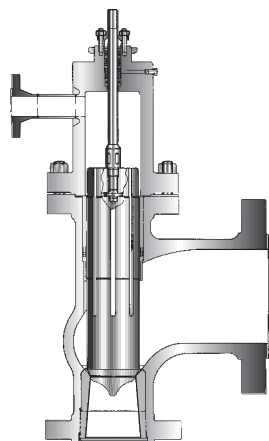
Request spec. data CH7000 for more information.



High Pressure Heat Exchanger Bypass Reactor Switching Valve Power Recovery Turbine Throttle Recycle Compressor Suction Control

The Masoneilan 32000 Series is a swing through butterfly valve design that provides high capacities and excellent control characteristics for low pressure drop applications. The 32000 Series is a rugged design that includes an inboard and outboard bearing for smooth operation. This design is available in sizes up to 36" and pressure ratings up to 2500# ANSI.

Visbreaking



Visbreaker Valve Soaker Letdown Fractionator/Stripper Feed

Masoncilan has led the industry in the development of arduous duty valves for the visbreaking process. The 71000 Series has been used in many visbreaking applications worldwide, and has been optimized for maximum performance over the years. It includes features such as quench connections, steam cleaning ports, tungsten/chromium carbide coated bodies, and pneumatic and electric actuation. These innovative features and improvements have made this design an industry standard.



Visbreaker Heater Flow Control Valves Vacuum Flasher Feed Vacuum Flasher to Fuel Oil Blending

Masoncilan offers upgraded valve materials to meet tough applications where buildup due to coking presents potential problems. The Masoncilan 10000 Series product line is available with solid Stellite guide bushings, and coated trim components to prevent erosion and galling of the guiding and seating surfaces.

Request spec. data CH2500 for more information.



Fractionator Pumps Heat Exchanger/Reboiler Bypass

The Masoncilan 35002 Series Camflex® and 30000 Series Varimax® eccentric plug control valves provide cost-effective solutions to various applications in the crude desalting and distillation process. The standard and extended bonnet designs permit the application of Teflon and low emissions packing for process temperatures up to 750°F. Other trim options include soft seat, NACE, hard-faced and solid Stellite configurations.

Request spec. data CF5000 and CN3000 for more information.



Pilot Gas to Burners Plant Air Nitrogen Supply Pump Seal Nitrogen

The Masoncilan 17 Series pressure regulators are direct-operated designs for steam, gas, and liquid services in reducing and back pressure configurations. The low profile of these products make them ideal for mounting on gas turbine skids.

Request spec. data CY1700 for more information.

Coking/Deasphalting



Solvent Recycle
Asphaltene Separator Bottoms
Residual Oil Separator Bottoms
Coking Furnace Pass Flow Control
Overhead Drum Sour Water
CGO Product Draw
Coker Naptha Product Draw
Naphtha Rundown

Applications in the delayed/flexible coking and solvent deasphalting processes typically exhibit high temperatures and coking conditions. Masoneilan's 35002 Series Camflex® eccentric plug control valve provides an ideal solution for many of these applications. Optional upgrades for the Camflex include solid Stellite or ceramic trim for erosive applications. The valve body can also be coated for erosion protection.

Request spec. data CF5000 for more information.



Coke Drum Water Quench
Steam Drum Boiler Feedwater
Steam Pressure Relief Valve
Sour Water Letdown

The Masoneilan 21000 Series is a single ported, heavy top-guided globe valve designed to handle a wide variety of process control applications. NACE trim options are available with single and double stage anti-cavitation capabilities. Standard trim materials in the 21000 Series are ideal for feedwater and high temperature steam applications.

Request spec. data CH1080 for more information.



Steam Pressure Reducing Valve
Steam Vent to Atmosphere
Coker Steam Drum Flow Control

The Masoneilan 41000 Series cage-guided globe style control valve product line has been engineered to handle the most demanding applications. Optional configurations include Lo-dB® trim designs for reducing noise and vibration, and solid Stellite seal rings for the most severe steam letdown applications. The 41000 Series valve can be supplied as part of a complete desuperheating station with the addition of a desuperheater and spraywater valve.

Request spec. data CH3000 for more information.

Catalytic Cracking



Feed Surge Drum Flow Control **Feed Pump Recycle** **Heavy/Light Cycle Oil Recycle** **Torch Fuel Control** **Mogas to Offsite** **Coker Unit Fractionator Bottoms**

The Masoneilan 35002 Series Camflex® valve has been used extensively worldwide due to its simple design construction, and unparalleled control performance. Available options include upgrades to solid Stellite, ceramic, and tungsten carbide trim components. Tungsten and chromium carbide coatings for the valve bodies have been used successfully in low to moderate level slurry applications. The bushings and packing box are also protected using an o-ring seal design.

Request spec. data CF5000 for more information.



Lift Air to Regenerator **Blow Air to Heater** **Air Blower Surge Protection** **Wet Gas Compressor (WGC) Surge Protection** **WGC Suction Control**

The Masoneilan 39002 Series High Performance Butterfly Valve (HPBV) is a heavy-duty automatic throttling control valve that incorporates tight shut-off (ANSI Class VI), lugged designs, heavy shafts, and optional spring diaphragm or piston actuation. The 39002 Series also includes an eccentric disc and shaft alignment, which improves the metal and energized PTFE seal ring performance.

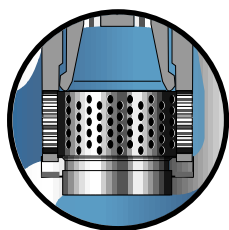
Request spec. data CM9002 for more information.



Catalyst Hopper Relief **Fractionator/Debutanizer Overpressure Protection** **WGC Knockout Drums/Interstage Coolers**

The Consolidated Type 1900 safety relief valve provides reliable overpressure protection for critical equipment in refining units. The unique “educator” tube design reduces pressure in the bonnet, which minimizes chatter and ensures that ASME certified relieving capacity is available. Some additional options that make this product line the most versatile SRV in the industry, includes liquid/vapor/steam trims, bellows construction, NACE trim, and corrosion resistant materials.

Request catalog SRV-1 for more information.

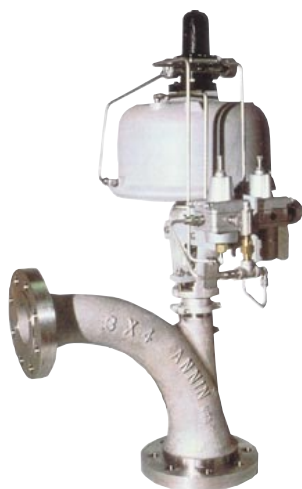


Reactor Stripping Steam **WGC Recycle/Surge** **Debutanizer Depressurization** **Dispersion Steam**

Masoneilan's versatile cage-guided 41000 Series globe valve provides proven solutions for handling difficult high temperature and high pressure drop steam applications. The 41000 Series also provides a highly reliable low noise trim option, which efficiently reduces both noise and vibration. High temperature trim options are designed to compensate for thermal expansion through careful material selection and trim configuration, thus eliminating potential binding of critical valve components.

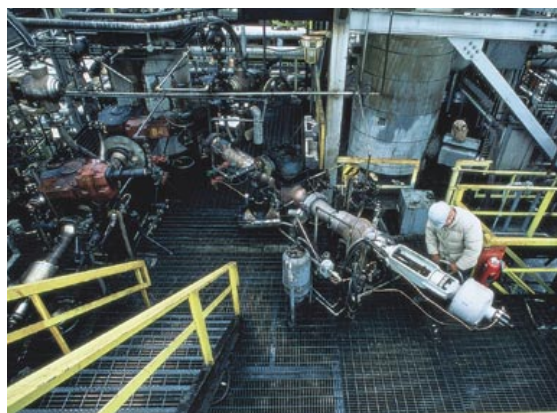
Request spec. data CH3000 for more information.

Gasification



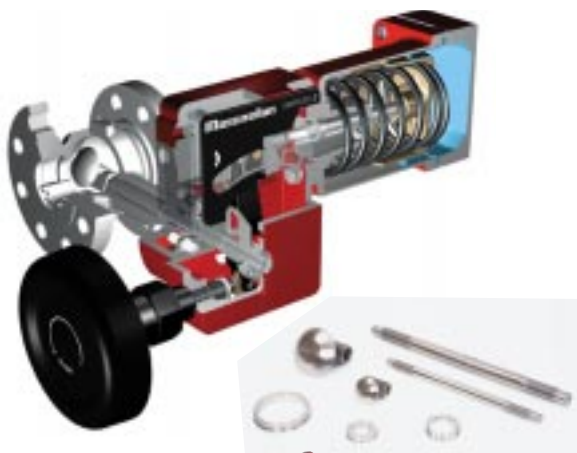
Gasifier Flow Control Separator Bottoms Letdown Syngas Depressurization Slurry Pump Recirculation

The Masoneilan 73000 Series sweep angle control valve provides a field-proven solution for slurry applications. The heavy stem-guided configuration eliminates the fluid chambers above the valve plug typically associated with top-guided designs. This significantly reduces the potential problems due to coking and buildup of particulates around the guide areas. The valve body is designed to minimize fluid momentum change and surface erosion. High efficiency and maintainability are achieved through retention of the seat ring using the piping system line flange. This design is also available in a direct vessel mount configuration and various trim options, including tungsten carbide, ceramic, and solid Stellite trim.



High Pressure Slurry Letdown

Masoneilan's coal slurry letdown valve design has been constructed using advanced engineering techniques, including the use of tungsten carbide trim materials. This valve has been designed to drop reactor pressure for second generation coal liquefaction processes. As a result, it can handle pressure drops over 2000 psi, temperatures in the 900-1000°F range, and services such as a flashing hydrocarbon containing coal ash fines and char. The severe erosion characteristic of this type of service has caused conventional valves to fail in a matter of days. Masoneilan has successfully designed valves that compensate for erosion.



Ash Handling Petroleum Coke to Gasification Unit Soot/Black Water Level Control

The Masoneilan 35002 Series Camflex® valve has been used extensively worldwide due to its simple design construction, and unparalleled control performance. Available options include upgrades to solid Stellite, ceramic, and tungsten carbide trim components. Tungsten and chromium carbide coatings for the valve bodies have been used successfully in low to moderate level slurry applications. The bushings and packing box are also protected using an o-ring seal design.

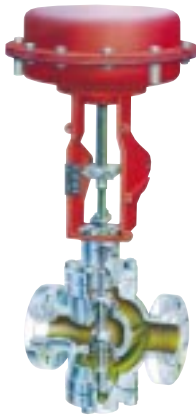
Request spec. data CF5000 for more information.



Gasifier Flow Control Gasifier Bottoms Letdown Slurry Pump Recirculation

The Masoneilan 71000 Series has been used successfully as the main letdown valve for gasifiers. This control valve features large body cavities limiting fluid velocities prior to reaching the throttling area, thereby eliminating potential body erosion. Maximum throat efficiency is achieved with the streamlined body contours and venturi outlet. The 71000 Series is an extremely rugged design, which features heavy plug guiding for vibration free operation.

Crude Desalting



Crude Flash Pump Recirculation Mixing Valves Desalted Crude to Atm Unit

The Masoneilan 10000 Series control valve features a double-seated plug with top and bottom post guiding. This valve design is ideal for services where sand, salt, and particulates are entrained within the fluid stream. The 10000 Series is available in sizes up to 16", and pressure ratings up through 1500# ANSI. Options include a NACE configuration, extension bonnets, higher capacity versions, and special trim materials to control corrosion and erosion.

Request spec. data CH2500 for more information.



Interface on Desalter Crude Tower Overhead Product Drums Reflux Drums

Liquid level measurements can be difficult on water and crude interfaces, as typically found in the refining process. Masoneilan provides the 12000 Series and 12300 Series (Digital-HART®) liquid level instrumentation product lines, which include pneumatic and electronic feedback, torque tube extensions for elevated temperatures (850°F), and standard ranges from 14"-120". These instrument product lines provide efficient and proven solutions in a variety of materials and configurations.

Request spec. data CU7000 and CU3000 for more information.

Atmospheric/Vacuum Distillation



Vac/Atm Residue Furnace Fuel Gas Fuel Gas Block & Bleed VGO/AGO/LDO/HDO/AR/VR Pumps Bottoms Pump Recirculation

Masoneilan's Camflex eccentric plug control valve provides a cost-effective solution for various desalting and distillation applications. The standard and extended bonnet designs permit the application of Teflon and low emissions packing for process temperatures up to 750°F. Other trim options include soft seat, NACE, hard-faced and solid Stellite configurations, and a steam-jacket design for difficult liquid sulfur applications.

Request spec. data CF5000 for more information.

Furnace Pass Flow Control Crude Tower Pumps Exchanger Bypass Product & Unit Tower Cuts Stripping Steam Flow Control

The Masoneilan 30000 Series Varimax® control valve provides globe valve type capabilities within a compact rotary style package. Varimax offers a unique flow capacity adjustment feature, which can be externally adjusted in the field to compensate for valve oversizing. This feature can be used to effectively minimize instability in the control loop due to valve oversizing. Each valve size has eight different C_v settings available, thus providing blending skid designers an enormous amount of rangeability.

Request spec. data CN3000 for more information.



Atmospheric/Vacuum Distillation (continued)**Crude Tower
Reflux Drum
Hotwell Drum Overpressure Protection**

The Consolidated 1900 Series safety relief valve provides reliable overpressure protection for critical equipment in refining units. The unique “eductor” tube design reduces pressure in the bonnet, which minimizes chatter and ensures that ASME certified relieving capacity is available. Some additional options that make this product line the most versatile SRV in the industry, includes liquid/vapor/steam trims, bellows construction, NACE trim, and corrosion resistant materials.

Request catalog SRV-1 for more information.

**Fuel Gas
C_v Bypass
Plant Air**

The Masoneilan 500 Series regulators are designed for pressure reduction, back pressure, and differential pressure applications. It is available in multiple configurations to meet various combinations of capacity, pressure, and temperature requirements. This design uses the same body platform as the Masoneilan 10000 Series product line, resulting in reduced inventory and training requirements.

Request spec. data CY5256 for more information.

**Crude & Product Exchangers (Tube & Shell Sides)
Ejector Exchangers Overpressure Protection**

The Consolidated 19000 Series portable safety relief valve provides superior performance relative to seat tightness, capacity, and blowdown. This valve design can be used with various media using the same components. The 19000 Series is available in a wide range of orifice sizes and connections, meeting various pressure and temperature conditions.

Request SRV-19000 for more information.

AUSTRIA

Masoneilan HP+HP GmbH
Hans Kudlich-Strasse 35
A2100 Korneuburg (b. Wien), Austria
Telephone/Fax (43) 2262 63689

BELGIUM

Masoneilan Division of Dresser Europe, S.A.
281-283 Chaussee de Bruxelles
281-283 Brusselsesteenweg
1190 Brussels, Belgium
Telephone (32) 2 344 0970
Fax (32) 2 344 1123

BRAZIL

Dresser Industria E Comercio Ltda
Divisao Masoneilan
Rua Senador Vergueiro, 433
09521-320 Sao Caetano Do Sul
Sao Paulo, Brazil
Telephone (55) 11 453 5511
Fax (55) 11 453 5565

CANADA

Dresser Canada, Inc.
Valve Division
5010 North Service Road
Burlington, Ontario L7L 5R5
Canada
Telephone 905-335-3529
Fax 905-336-7628

Dresser Canada, Inc.
Valve Division
#300, 444-58th Avenue S.E.
Calgary, Alberta T2H 0P4
Telephone 403-299-2565
Fax 403-299-2575

FRANCE

Dresser Produits Industriels
Division Masoneilan
4, place de Saverne
92971 Paris La Defense Cedex
France
Telephone (33) 1 49 04 90 00
Fax (33) 1 49 04 90 10

GERMANY

Masoneilan HP+HP GmbH
Klein-Kollenburg-Strasse 78-80
47877 Willich, Germany
Mail:
P.O. Box 1208
47860 Willich, Germany
Telephone (49) 2156 9189-0
Fax (49) 2156 41058

INDIA

Dresser Masoneilan Valves, Pvt. Ltd. (DMVPL)
305/306 "Midas" - Sahar Plaza
Mathurdas Vasanji Road
J.B. Nagar - Andheri East
Mumbai, India 400 059
Telephone (91) 22 835 4790
Fax (91) 22 835 4791

ITALY

Masoneilan Division
Dresser Italia S.p.A.
Via Cassano 77, P.O. Box 123
80020 Casavatore (Naples), Italy
Telephone (39) 81 7892 111
Fax (39) 81 7892 208

JAPAN

Industrial Valve Operation - Japan
Dresser Japan, Ltd.
11F-Shinagawa KY Building
1-8-11 Kita-Shinagawa
Shinagawa-Ku
Tokyo 140-0001, Japan
Telephone (81) 3 5462 8191
Fax (81) 3 5462 8195
Telex 781-382-2665

Dresser Valve Division
Joint Venture
Niigata Masoneilan Company, Ltd.
26th Floor, Marive East Tower
WBG 2-6 Nakase, Mihama-Ku
Chiba-shi, Chiba 261-71, Japan
Telephone (81) 43 2979211
Fax (81) 43 2991115
Telex J36598 NIMALNJ

KOREA

Dresser Korea, Inc.
#2107 Kuk Dong Building
60-1, 3-Ka, Choongmu-ro
Chung-Ku
Seoul, Korea
Telephone (82) 2 274 0792
Fax (82) 2 274 0794

KUWAIT

Dresser Masoneilan
P.O. Box 242
Safat 13003, Kuwait
Courier:
Flat No. 36, Floor 8
Gaswa Complex, Mahboula
Kuwait
Telephone (965) 9061157

MEXICO

Masoneilan Internacional, S.A. de C.V.
Henry Ford No. 114, Esq. Fulton
Fraccionamiento Industrial San Nicolas
54030 Tlalnepantla Estado de Mexico
Telephone (52) 5 310 9863
Fax (52) 5 310 5584

THE NETHERLANDS

Dresser Industrial Products B.V.
Masoneilan Division
Steenhouwerstraat 11
3194 AG Hoogvliet
The Netherlands
Mail:
P.O. Box 640
NL3190 AN Hoogvliet RT
The Netherlands
Telephone (31) 10 438 4122
Fax (31) 10 438 4443
Telex 20138 MASON NL

SAUDI ARABIA

TIG-Masoneilan Arabia, Ltd. - TMAL
P.O. Box 10284
Jubail Industrial City
31961 Saudi Arabia
Telephone (966) 3 341 2446
Fax (966) 3 341 2447
Telex 832146 SJ

Dresser Al Rushaid Valve &
Instrument Co., Ltd. - DARVICO
P. O. Box 10145
Jubail Industrial City
31961 Saudi Arabia
Telephone (966) 3 341 0278
Fax (966) 3 341 7624

SINGAPORE

Asia Pacific Operations
Dresser Singapore, Pte. Ltd.
Valve Division
16, Tuas Avenue 8
Singapore 639231
Telephone (65) 861 6100
Fax (65) 861 7172

SOUTH AFRICA

Dresser Limited, South Africa Branch
Valve Division
P.O. Box 2234, 16 Edendale Road
Eastleigh, Edenvale 1610
South Africa
Telephone (27) 11 452 1550
Fax (27) 11 452 6542

SPAIN

Masoneilan S.A.
Sales Office
Zona Franca
Sector M, Calle Y
08040 Barcelona, Spain
Telephone (34) 93 223 4175
Fax (34) 93 223 4754

SWITZERLAND

Dresser U.K. Ltd.
Frauntalweg 76
CH-8045 Zurich, Switzerland
Telephone (41) 1 462 1819
Fax (41) 1 450 2895

UNITED ARAB EMIRATES

Dresser Valve Division
Middle East Operations
P.O. Box 61302
Jebel Ali Free Zone
United Arab Emirates
Courier:
Units Nos. JA01 + JA02
Roundabout 8
Jebel Ali Free Zone
United Arab Emirates
Telephone (971) 4 838 752
Fax (971) 4 838 038

UNITED KINGDOM

Valve Division
Dresser U.K. Limited
Trevithick Works
Gillibrands Estate, Skelmersdale
Lancashire WN8 9TU, England
United Kingdom
Telephone (44) 1695 52600
Fax (44) 1695 720175

Valve Division
U.K. Southern Sales Office
Unit 5, Brook Business Centre
Cowley Mill Road, Uxbridge
Middlesex UB8 2FX, England
United Kingdom
Telephone (44) 1895 454900
Fax (44) 1895 454919
Telex 935174

UNITED STATES

Dresser Valve Division
11100 West Airport Blvd.
Stafford, TX 77477-3014
Telephone 281-568-2211
Toll Free 800-847-1099
Fax 281-568-1414

Dresser Valve Division
LA Highway 3225 @ US Hwy 167 N
PO Box 1430
Alexandria, LA 71309-1430
Telephone 318-640-2250
Fax 318-640-6222

Dresser Valve Division
85 Bodwell Street
Avon, MA 02322-1190
Telephone 508-586-4600
Fax 508-427-8971

Nil-Cor Operations
Dresser Valve Division
12241 Rockhill Avenue, N.E.
P.O. Box 2058
Alliance, OH 44601
Telephone 330-823-0500
Toll Free 800-321-9865
Fax 330-821-6722

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