DRESSER Masoneilan

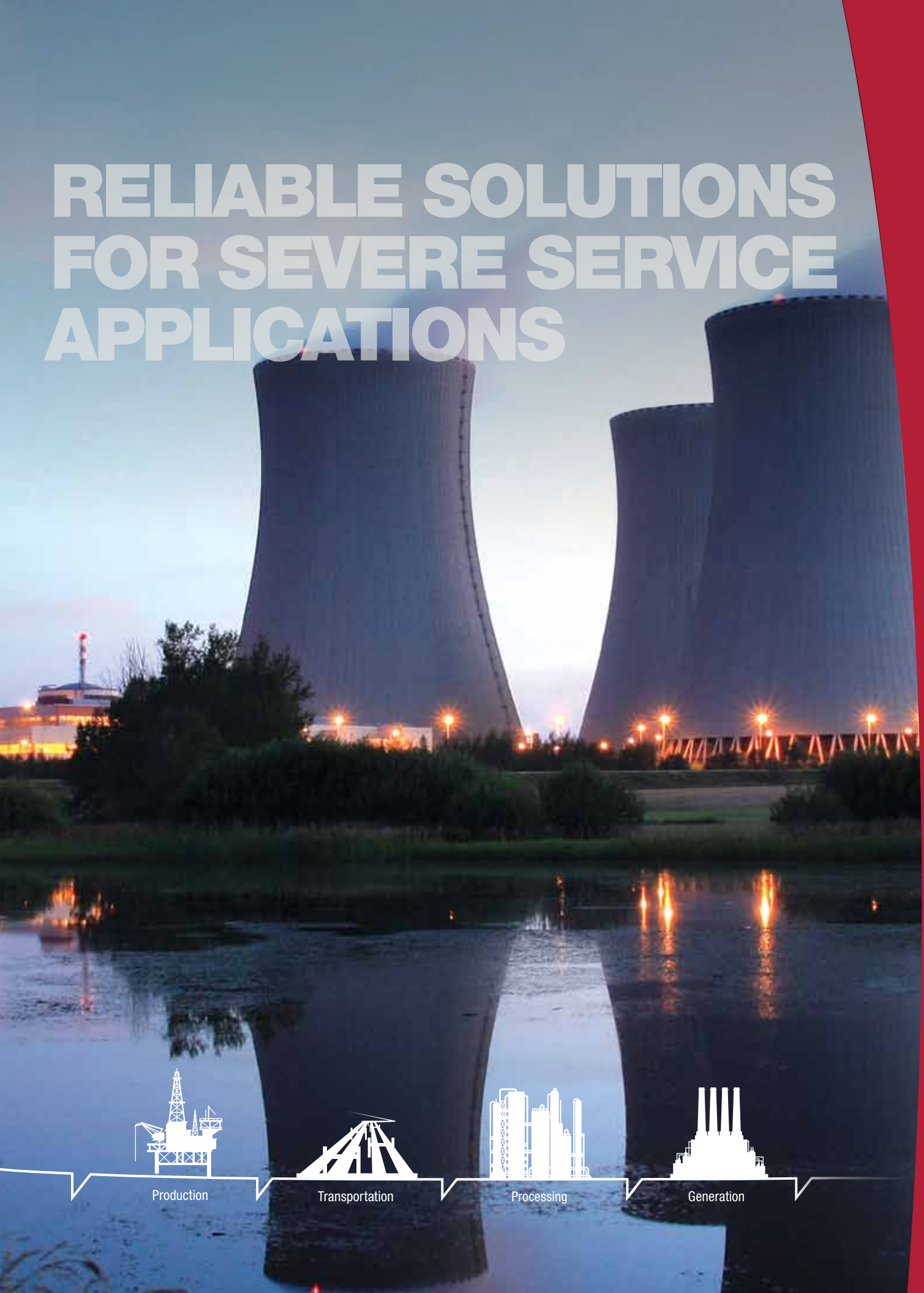
Putting You In Control

78400/18400 Series

LincolnLog®

High Pressure, Anti-Cavitation Control Valves

RELIABLE SOLUTIONS FOR SEVERE SERVICE APPLICATIONS



EXPERIENCE,
KNOWLEDGE,
TECHNOLOGY.

Engineering Expertise Leading Technology Longer Service Life

LincolnLog® Reliability

Long Term Reliability...

Dresser Masoneilan® offers over 125 years of innovation and control valve technology leadership to solve the most difficult process applications without compromise. Masoneilan, with 8 major manufacturing facilities worldwide, supported by an integrated network of sales offices, provides the widest range of control valve solutions and services for virtually every process control application. Our breadth of product offerings includes general and severe service valves, actuators, pressure regulators, and digital field instrumentation and software. Our product portfolio coupled with our global network of Masoneilan Authorized Repair Centers (MARCs) allows us to service our customers as a single source global supplier of control valves and instrumentation.

...Under Extreme Conditions

The LincolnLog valve is the industry's preferred product for long-term reliability in high-pressure, liquid letdown, anti-cavitation control valve applications. Engineering knowledge and expertise in control valve applications has made Dresser Masoneilan the world's Flexible Best Fit severe service solutions provider. Masoneilan's LincolnLog valve is the control valve solution of choice throughout the wide spectrum of severe service liquid flow applications.

Reliable Through Proven Performance

Dresser Masoneilan's LincolnLog design has over 20 years of proven field performance as the industry's Best Fit premier high-pressure liquid letdown solution. The Masoneilan LincolnLog is the process industry's most reliable and robust anti-cavitation control valve package with enhanced multi-stage and axial flow trim technology incorporated into a rugged valve design. Over the years Masoneilan's LincolnLog has successfully met the challenges of thousands of severe service applications around the globe.

Industries and Applications

UPSTREAM OIL & GAS
Pump Recirculation
Produced Water Injection
High Pressure Separator

REFINING:
Rich Amine Service
Cold High Pressure Separator Letdown

POWER GENERATION
Pump Recirculation
Boiler Feedwater Start-Up
High Pressure Spraywater Control

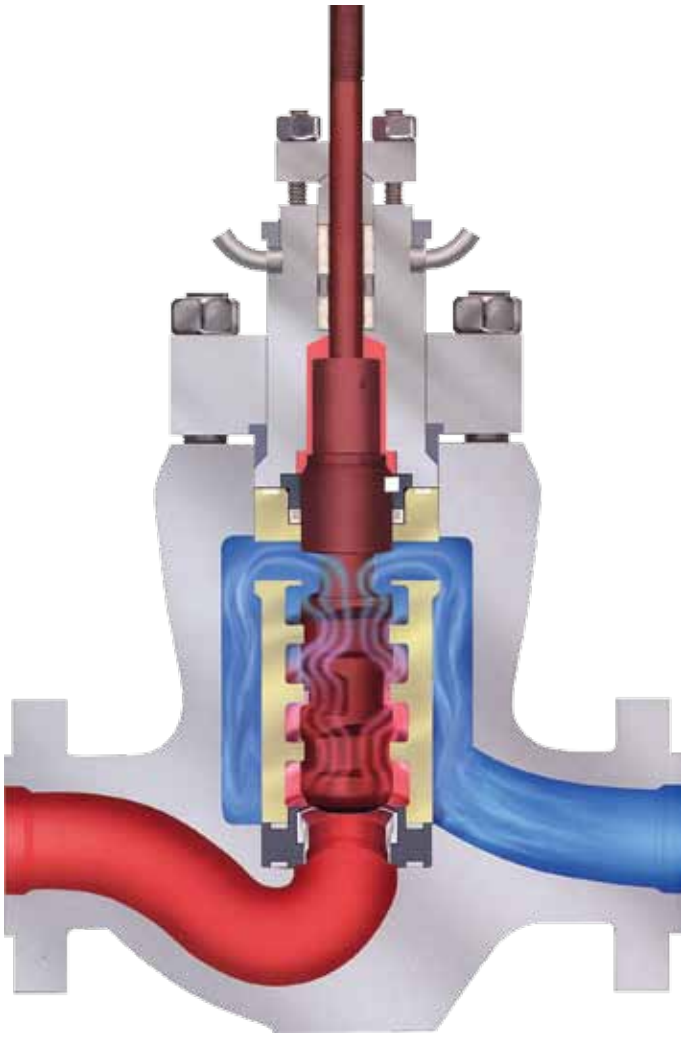
Flexible Best-Fit Solutions

Meets or Exceeds Exacting Industry Specifications

Demanding valve applications require innovative solutions. Dresser Masoneilan's knowledge and experience have fueled the innovation designed into the Flexible Best Fit anti-cavitation control valve product. The LincolnLog® valve is available in a variety of body configurations, sizes, materials, ratings, and trim types. The wide variety of trim designs in the LincolnLog valve includes options that offer up to 150:1 turndown ratio, enabling response to a wide range of process conditions. With a variety of combinations of forged or cast valve bodies, standard or exotic alloys, API or ANSI rated construction, and globe or angle configurations, the LincolnLog meets or exceeds exacting industry specifications such as corrosive service (NACE) and Pressure Equipment Directive (PED) compliance.

The LincolnLog, when coupled with Dresser Masoneilan's best in class digital positioners, Smart Valve Interface (SVI® II AP) or Fieldbus Valve Positioner (Masoneilan FVP®), provides one of the industry's most reliable and accurate control valve packages for severe service.

Dresser Masoneilan's experience, knowledge and skillful application of industry leading technology provides customers with reliable, long life, control valve solutions for the process industry.



18400 Series Globe Style LincolnLog

Reliability In Performance

Reliable Valve Performance

The leading cause of poor control valve performance and premature failure in high pressure liquid letdown service is cavitation. Some liquid applications cavitate so severely that the valve may experience diminished performance or even mechanical failure within hours of commissioning. The multi-stage design of the LincolnLog® valve prevents cavitation by directing the fluid through a series of 3-dimensional, high impedance pressure reduction areas, or stages. This highly tortuous flow path prevents cavitation by managing the pressure reduction and fluid velocity through every stage, ensuring repeatable performance over the life of the valve.

The LincolnLog valve provides reliable, long-term performance in the most extreme applications such as inaccessible high pressure liquid letdown wellhead injection valves. The LincolnLog anti-cavitation control valve can be custom engineered with as many as 10-stages of pressure reduction for applications with extreme pressure drops in excess of 8000 psi (550 Bar). These valves are custom engineered to control the pressure drop in multiple stages which allows for confident operation in remote locations such as offshore platforms. Furthermore, a flexible range of staging ratios is available to customize the pressure drop for a wide variety of fluids and conditions.

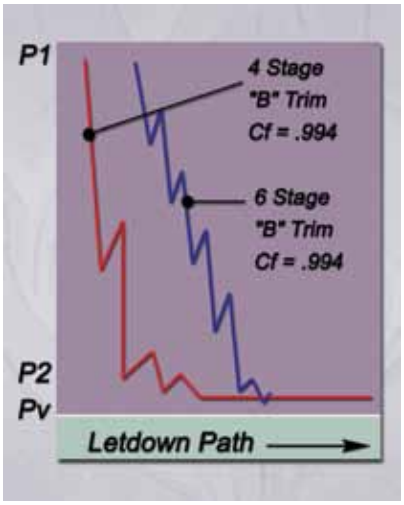
Multi-Stage Axial Flow Technology

High trim velocity can intensify cavitation damage inside the control valve. This damage is common in many single stage valve designs, which take the full pressure drop across a single region within the trim. This single region is typically the leading edge of the plug and seat where the highest velocity, and consequently, the most severe and excessive damage is experienced.

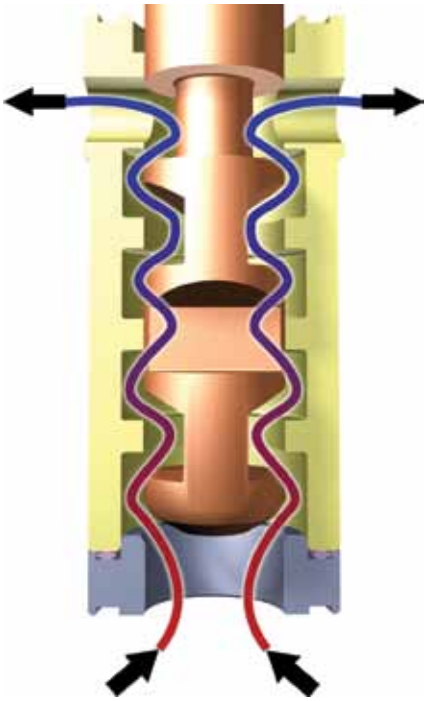
Similarly, many radial trim designs, such as drilled hole cages and stacked disks, often experience the same fate under extreme pressure drops. Unlike the axial flow design of the LincolnLog, many radial designs throttle the pressure drop at the innermost radial stage, adjacent to the plug seating surface. When this radial trim is only partially open, the outermost stages are oversized, essentially becoming inactive, and voiding any intended staging. In this case, the full pressure drop is taken across the final stage, resulting in high energy release right at the controlling and seating surface of the plug.

In contrast, the axial flow design of the LincolnLog provides reliable performance throughout the entire range of plug travel. By throttling at all stages in unison, the LincolnLog prevents short-circuiting of any pressure reduction stage, eliminating wear along the leading and controlling edge of the plug. The axial flow technology of the LincolnLog eliminates damage to any controlling surface (plug, cage or seat) by not exposing any one stage to excessive velocity or the full pressure drop.

Reliability In Service Life



Multi-Stage Trim Comparison for 4 & 6 Stage Trim



Axial Flow Technology:
3-D Multi-Stage Pressure Reduction

Reliable Installed Life

The LincolnLog® is repeatedly applied in some of the most severe liquid service applications because of its robust design. Some of the most challenging control valve applications require the valve to prevent cavitation, while withstanding direct impingement from metal, sand, or other abrasive particles traveling within the process fluid.

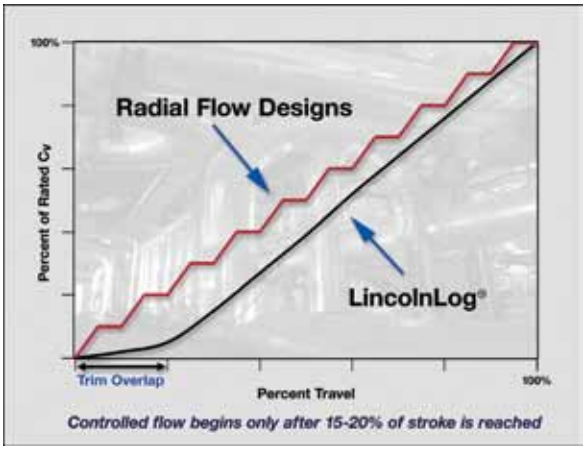
For applications such as wellhead chokes and processing of reclaimed oil, the LincolnLog reduces particle impact damage by minimizing the trim velocity via its high impedance tortuous flow path. Additionally, hardened materials such as 440C Stainless Steel and solid Tungsten Carbide have been successfully incorporated into the trim design to further withstand erosive attack. For these applications, LincolnLog provides a reliable and long lasting solution by combining hardened materials with a low velocity, multi-stage, anti-cavitation design.

Vibration is also a cause of premature failure of valve trim parts, specifically the valve plug and stem. Vibration can be process induced or can be caused by the throttling effects of very high pressure liquid flow streams. Dresser Masoneilan has oversized the stem and guiding areas of the LincolnLog to overcome premature failure due to vibration. The oversized stem is mated to the plug with a unique male-female coupling configuration which positively aligns the plug and stem. This eliminates fatigue failure due to vibration caused by trim misalignment. Secure guiding exists across the full length of the valve plug, as continuous plug guides are present in each of the staged reduction areas.

Reliability In Control

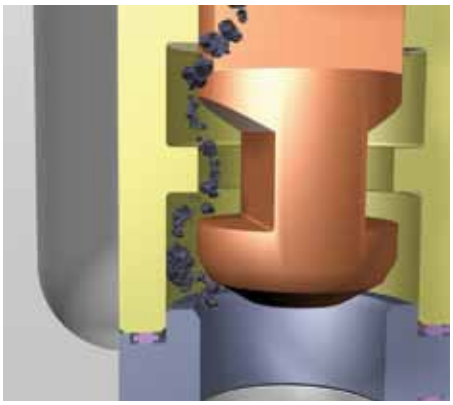
Reliable Valve Control

The axial flow technology of the LincolnLog® provides a smooth control characteristic across the entire range of operation. Each pressure reduction stage is throttling simultaneously across the plug, thus avoiding a stair-stepped control response, which is commonly found in valves with radial flow designs. The smooth and continuous throttling control of the LincolnLog is achieved by the notches, or stages, designed into the plug. The unique notched design coupled with the staged liner/cage enables the LincolnLog to control process conditions over an extremely large range of operation - in some applications up to 150:1 turndown ratio.



Axial Flow Technology: Smooth Control Through Continuously Active Stages

As an added feature, the enlarged flow passages of the axial flow design protect the trim from clogging with pipeline debris. This inherent “debris tolerant” feature provides the benefit of uninterrupted service and repeatable control, which sets the LincolnLog apart from the competition. Applications such as Pump Recirculation rely on this technology to ensure that continuous flow is passed through the pump, preventing burn-out or overheating of this critical piece of equipment. LincolnLog can be confidently applied in this service as flow will continue to recirculate with no risk of interruption resulting from blocked flow passages.



Trash Tolerant Design:
Large Flow Passages Prevent Clogging

Dresser Masoneilan’s smart instrumentation including the SVI®II AP (HART® digital positioner) and the Masoneilan FVP® (FOUNDATION Fieldbus™ Positioner) allow for greater sensitivity and increased control accuracy. Masoneilan’s digital positioners also increase the repeatability and reliability of the control valve assembly, allowing for the precise control enabled by 1/10,000th of an inch plug travel resolution. Both positioners are available in single or double-acting configurations.

FVP Foundation Fieldbus Positioner/Controller

Reliability In Service Life

Reliable Tight Shutoff

Many valve applications result in poor shutoff or excessive seat leakage after short-term use because the seating area also serves as the primary control element. Designs that throttle the flow near the seating surfaces often experience high fluid velocity in this region and direct the pressure drop across the leading edge of the plug and seat. Once early signs of erosion or wire drawing develop on the seating surface, quick deterioration of valve shutoff performance follows as a result of the high pressure drop condition.

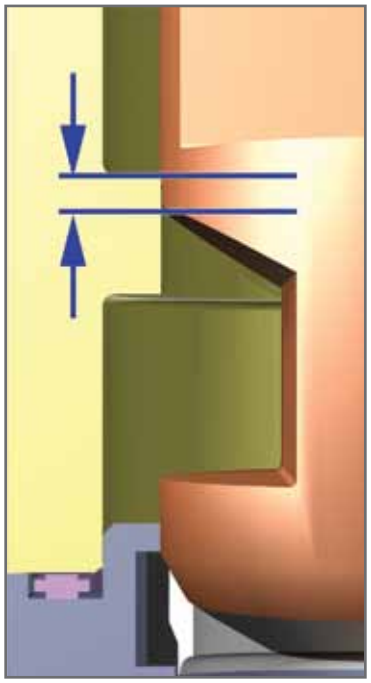
The Dresser Masoneilan® LincolnLog® is designed to maintain long-term shutoff by separating the two functions of shutoff and control into separate areas within the trim. As the plug lifts off the seat, fluid begins to fill the first plug chamber until the valve reaches approximately 15% open. With continued travel, the downstream stages begin to open and the fluid is throttled using the remaining trim stages. Thus, the seating surfaces are never used for throttling at low flow, which commonly produces erosion damage in radial flow designs. This seat protection feature is critical for Process Start-Up Valves since they are typically used to throttle high upstream pressure down to near vacuum conditions for downstream deaerators or condensers at low plant loads.

Tight Shutoff Designs

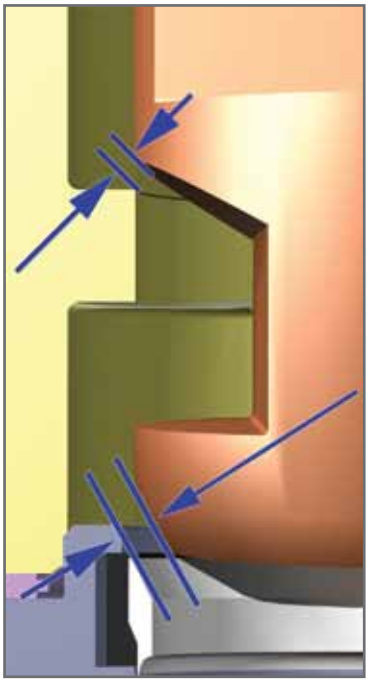
Shutoff performance consistent with ANSI/FCI Classes IV, V, and VI, as well as MSS-SP-61 are available with the LincolnLog. For temperatures up to 600 °F (316 °C), Dresser Masoneilan offers a TFE inserted, soft seat design for best in class tight shutoff. This soft seat is protected by a sliding metal collar that shields the TFE from direct exposure to the flow stream and erosive particles when the valve is open.

Maintaining long-term shutoff is critical in high pressure liquid service, as high pressure differential leakage may lead to wire drawing, cavitation, or flashing damage to the valve, downstream piping, or other equipment.

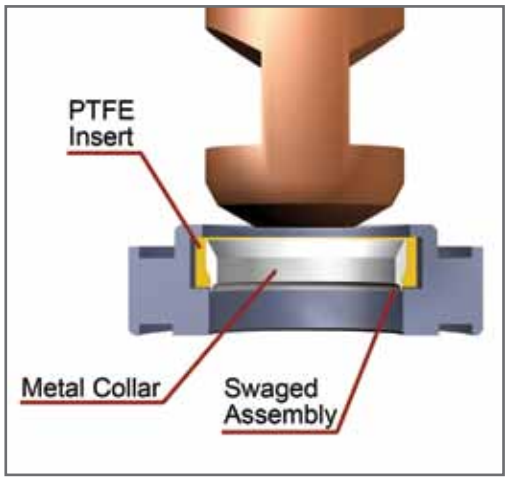
Seat Protection Feature



Trim Surface Overlap with Valve in Closed Position

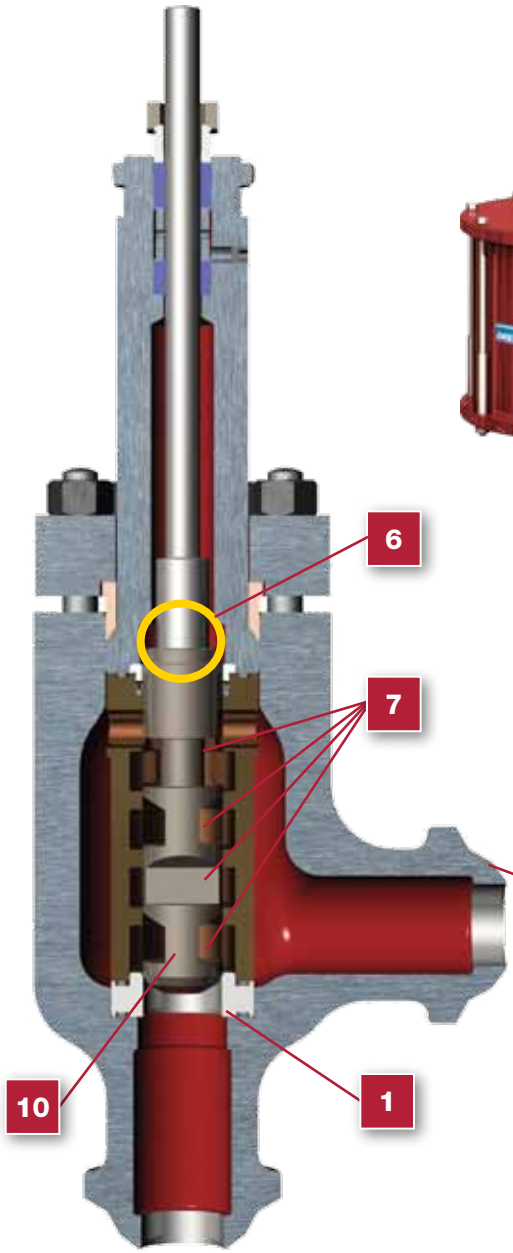


Larger Flow Area at Seat Region with Valve in Open Position



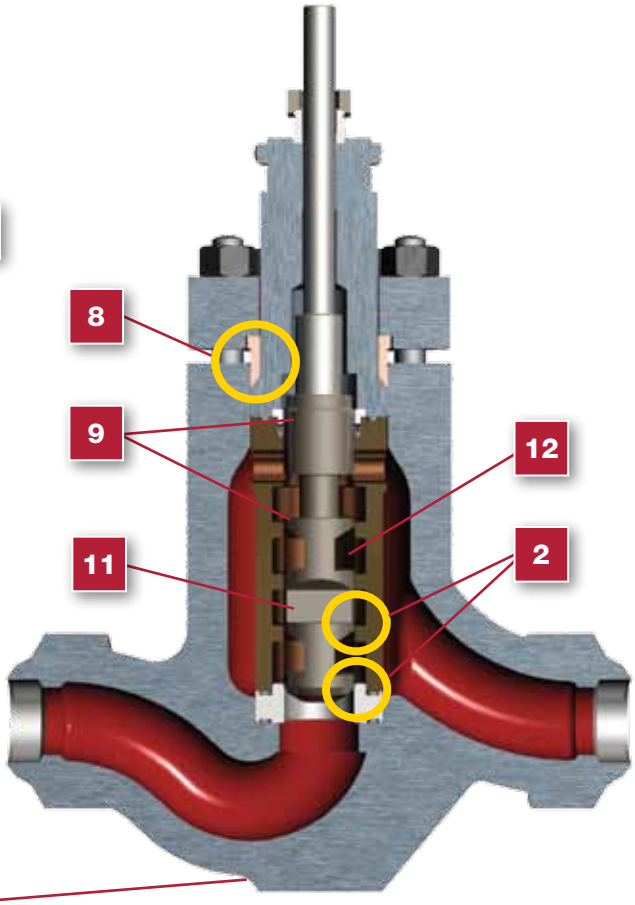
Protected Soft Seat: Class VI Shutoff Design

Features & Benefits



78400 Series
Angle Style LincolnLog® with Soft Seat

High
Performance
Actuation



18400 Series
Globe Style LincolnLog® with Metal Seat

SVI® II AP Digital Positioner

	FEATURE	ADVANTAGE	END USER BENEFIT	
1	Protected Soft Seat	Long-term, Reliable Class VI Shutoff	Prevents Loss of Product	Revenue Enhancement
2	Trim Overlap	Protects Seating Area from High Velocity Flow, Maintaining Shutoff	Prevents Loss of Product	
3	SVI® II AP Positioner or Masoneilan FVP®	Optimized Control Performance	Precise Process Control	
4	High Performance Actuation	Trim Stability and Control Reliability	Repeatable Process Control	
5	Forged or Cast Angle & Globe Configurations	Flexible, Best Fit Installation	Flexible Installation	Cost Reduction
6	Robust Plug/Stem Connection	Trim Durability	Longer Installed Trim Life	
7	Multi-Stage Trim	Cavitation Elimination	Longer Installed Trim Life	
8	Compact Metal Seal Design	Reduces Bolting Torque Requirements	Ease of Maintenance	
9	Continuous Plug Guiding	Eliminates Vibration Induced Damage	Minimizes Downtime	Risk Mitigation
10	High Resistance Tortuous Flow Path	Provides Flow Energy Management	Minimizes Valve Damage	
11	Axial Flow Technology	Trim Stability and Seat Protection	Reduces Trim Wear	
12	Large Flow Passages	Flow Entrained Particulate Tolerance	Minimizes Downtime	

Specifications

- **Flow Direction**

standard:	flow-to-open
optional:	flow-to-close

- **Body**

type:	cast or forged globe style (18400 Series) cast or forged angle style (78400 Series)
sizes:	1” to 12” (DN 25 to DN 300)
ratings:	ANSI Class 600 to 4500 (ISO PN 100 to 400) API 5000 & 10000
end connections:	RF, RTJ, socket weld, butt weld, threaded, print flanges (forgings)

- **Bonnet**

type:	bolted standard extension

- **Body and Bonnet**

materials:	carbon steel 316 stainless steel chrome-moly others on request

- **Trim**

plug type:	multi-step axial flow (3, 4, 6, 8 and 10 stages)
seat type:	quick change integral with plug liner (1” & 1.5” sizes) metal seat protected soft seat
guide:	continuous top guided (liner acts as primary guide)
C_V ratio:	up to 150:1
flow characteristics:	modified linear
materials:	standard, NACE, cryogenic

- **Actuator**

type:	spring-diaphragm spring-return cylinder double-acting cylinder electrohydraulic (such as REXA)
handwheel:	optional

- **Positioner**

type:	SVI® II AP - HART® (single or double-acting) FVP™ - Foundation Fieldbus® (single or double-acting) others

Optional designs are also available, such as larger sizes, higher pressure ratings, special materials, or additional trim stages as required. Consult factory for design details and specifications.

design innovation

78400 Series Forged Angle Body LincolnLog

Customer For Life

Dresser Masoneilan is driven by a "Customer for Life" philosophy, focused on supporting our customers through a comprehensive suite of aftermarket services, including OEM Rapid Parts, on-site diagnostics, field service, repair, and replacement. The service offerings from Dresser Masoneilan span all phases of the equipment life cycle from engineering to start-up through operation, maintenance, and replacement or retirement:

- Technical support from custom design to applications analysis
- Support of installation, set-up and commissioning
- Products with best in class control performance
- Diagnostic tools that can support process control optimization objectives
- Tools providing the intelligence necessary for preventive maintenance

Life-Cycle Services

Engineering
Applications Engineering
Interoperability Engineering
Extreme Service Valve Design
Custom Valve Testing

Procurement / Start-Up & Commissioning
Valve Sizing & Selection – ValSpeQ®
Resident Engineer
Project Management
Start-Up Assistance
Configuration Services
Systems Integration
Factory Technical Support

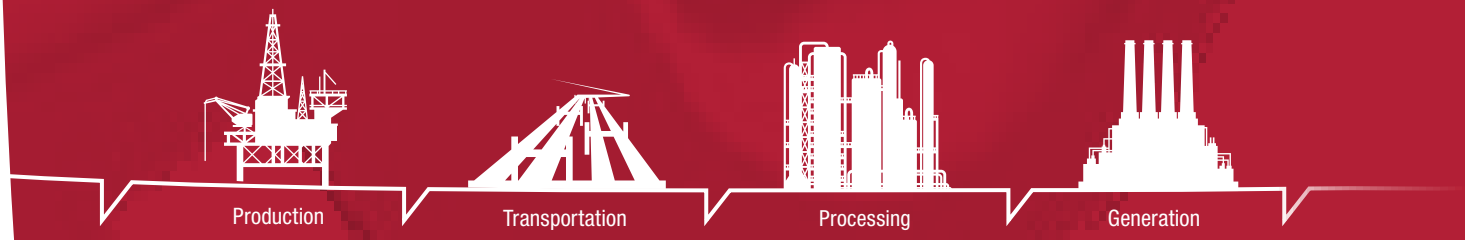
Operations
OEM Parts Performance Optimization
- SVI® II AP / FVP Digital Instruments

Diagnostics Hot Swap Program
Inventory Management
Valve Survey / Assessment

Maintenance
Factory Certified Repair - MARC®
Turnaround Management
Valve Technician Training
Asset Data Management
- ValvKeep® Preventive Maintenance
- ValScope® On-Line Diagnostics Mobile Valve Servicing

Life Extension
Re-Manufactured Valves
Smart Instrument Refurbishment
Valve Trim Retrofits
Re-Instrumentation

Valve Solutions & Services for the Toughest Applications in the World



DIRECT SALES OFFICE LOCATIONS

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

BRAZIL
Phone: +55-11-2146-3600
Fax: +55-11-2146-3610

CANADA
Ontario
Phone: +905-335-3529
Fax: +905-336-7628

CHINA
Phone: +86-10-8486-4515
Fax: +86-10-8486-5305

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

GERMANY
Viersen
Phone: +49-2162-8170-0
Fax: +49-2162-8170-280

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

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

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

JAPAN
Chiba
Phone: +81-43-297-9222
Fax: +81-43-299-1115

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

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

MEXICO
Phone: +52-5-310-9863
Fax: +52-5-310-5584

THE NETHERLANDS
Phone: +31-15-3808666
Fax: +31-18-1641438

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

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

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

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

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

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

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

UNITED ARAB EMIRATES
Phone: +971-4-8991-777
Fax: +971-4-8991-778

UNITED KINGDOM
Wooburn Green
Phone: +44-1628-536300
Fax: +44-1628-536319

UNITED STATES
Massachusetts
Phone: +1-508-586-4600
Fax: +1-508-427-8971

Corpus Christi, Texas
Phone: +1-361-881-8182
Fax: +1-361-881-8246

Dresser Direct
Deer Park, Texas
Phone: +1-281-884-1000
Fax: +1-281-884-1010

Dresser Flow Technologies
Houston, Texas
Phone: +1-281-671-1640
Fax: +1-281-671-1735

California
Phone: +1-562-941-7610
Fax: +1-562-941-7810

About Dresser, Inc.

Dresser Inc. is a global leader in providing highly-engineered infrastructure products for the global energy industry. Leading brand names within the Dresser portfolio include Dresser Wayne® retail fueling systems, Waukesha® natural gas-fired engines, Masoneilan® control valves, Consolidated® pressure relief valves, and ROOTS® blowers and rotary gas meters. The company has manufacturing and customer service facilities strategically located worldwide and a sales presence in more than 150 countries. www.dresser.com.

About Dresser Masoneilan

Dresser Masoneilan, headquartered in Houston, Texas, has been the leading global partner in process control valves and solutions for more than 100 years. A business segment of Dresser, Inc., the company delivers customized products, services and diagnostic solutions for oil and gas, process and power generation applications. www.dresser.com

Dresser Masoneilan
Dresser, Inc., Flow Technologies
10343 Sam Houston Park Drive
Houston, Texas 77064 U.S.A
T. +1-281-671-1640
F. +1-281-671-1735
E. sales@masoneilan.com

ISO 14001™ CERTIFIED

DRESSER Masoneilan

www.dresser.com

© 2011 Dresser, Inc. All rights reserved.

BP78400 03/11