Ultra reliable performance

NELES® and JAMESBURY® brand valves are the world leaders in reliable, high-performance industrial gas flow control solutions. Since the 1970s, Metso has been providing valves and accessories that meet the industry’s most difficult process challenges across the entire range of industrial gas processes; cryogenic, adsorption, and membrane technologies.

Our complete line of control, automated on-off and manual on-off valves and accessories answers the needs for tight shut-off, high reliability, and low maintenance. Our solutions include high-performance butterfly valves and ball control valves, as well as actuators and accessories. In addition, we offer industry-specific product innovations such as valves for cryogenic applications, high-cycle applications, and emissions control. We even offer a proprietary software system to help you size and select the right valve and accessory package.

OEM Service Center personnel are trained to maintain, diagnose and troubleshoot PSA, VSA and installations. As a result, downtime, upgrades, cycle changes and outages are greatly optimized.

Metso has a reputation built on delivering the right solution to you.
Sophisticated sizing and selection software reduces variability, increases reliability

NELPROF, our proprietary software system, plays a unique role in the ideal industrial gas solution. It is the latest in expert system software, with all the intelligence needed to select the right control valve for your application. NELPROF guides the product sizing and selection process based on a comprehensive database of control valve performance in industrial gas processes.

Accurate sizing and selection with NELPROF gives you a number of significant advantages:

- Helps avoid the costly oversizing of valves and undersizing of actuators
- Increases productivity and reliability
- Controls cavitation, erosion and noise
- Causes fewer installation delays
- Minimizes troubleshooting after installation
- Reduces plant maintenance costs
- Reduces environmental risks caused by poor performance
- Reduces costly downtime
- Maximizes uptime
- Reduces total life-cycle product costs

A user-friendly version of NELPROF software and a comprehensive self-help training program are available to help your staff increase their understanding of process control and valve performance.

After selecting and sizing, you can switch to Rapid-Draw™ and create a certified dimensional drawing in minutes. Contact your local representative for a copy of the software.
Cryogenic solutions: High reliability at low temperatures

Metso is uniquely equipped to help you meet the rigorous demands of cryogenic air separation. Our products and experience cover the entire process including cold box throttling valves, yard valves, cold box automated valves, as well as warm service and turbine trip.

We are the world leader in cryogenic control, with specialized products that include metal-seated NELDISC® and WAER-SPHERE® high-performance butterfly valves.

Our cryogenic testing facilities allow evaluation of a wide range of performance features at extreme temperatures for all critical functions and with complete inspector safety. This service can greatly reduce delays at installation as well as downtime during operation.

NELDISC high-performance valves equipped with B-series actuators provide the total reliability and immediate shut-off required for turbine trip applications.
Cryogenic Process

Answering the challenges of cryogenic applications

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Solutions</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cold Box</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Cool-down weight  
- Minimal heat absorption  
- Packing box freeze ups | 
- Absence of flange joints in cold box areas  
- NELDISC and WAFER-Sphere high-performance butterfly valves provide minimal heat absorption due to their small valve body plus low-temperature conduction through neck extension and stem  
- Unique packing design | 
- Millions of bi-directional cycles due to WAFER-Sphere design and bearings — Actuators capable of special stroking requirements for long periods without maintenance |
| **Yard Valves**                                | 
- Provide reliable, light weight valves for on/off and control outside of the cold box | 
- WAFER-Sphere or NELDISC high-performance butterfly valves | 
- Using WAFER-Sphere and NELDISC high-performance butterfly valves for both warm and cryogenic services provides standardization, as well as lightweight and compact positive shut-off |
| **Expander Trip**                              | 
- Provide reliable, light weight valves for on/off and control outside of the cold box | 
- WAFER-Sphere or NELDISC high-performance butterfly valves | 
- Using WAFER-Sphere and NELDISC high-performance butterfly valves for both warm and cryogenic services provides standardization, as well as lightweight and compact positive shut-off |
| **Vent Valves**                                | 
- Vent Valves | 
- Control noise on vent lines | 
- Q-R Series segmented ball valve permits a system to vent large volumes of gas without exceeding acceptable noise levels |

Diagrams are intended to be representations and are not to be viewed as actual process flow diagrams.

Cryogenic cold boxes, yard valves, and cryogenic liquid truck loading valves place unique temperature cycle demands on process flow control.
Swing adsorption solutions:
Tight Shut-off at high cycles

Metso valve solutions assure valve reliability over many thousands of cycles in pressure, temperature, and vacuum swing adsorption applications.

Our products answer the requirements of the temperature-based method for compression and liquefaction of air. We also handle the demands of Pressure-Swing Adsorption (PSA) and Vacuum Adsorption (VSA) processes. Swing adsorption systems which may be unmanned, make NELES and JAMESBURY valve integrity and reliability even more critical.

The cryogenic WAFER-SPHERE with JAMESBURY’s patented cryogenic seat design provides for long-reliable service in today’s tough cryogenic industrial gas applications. Extensions and Cold Box Seals are available per engineer’s specifications.
Vacuum Adsorption (VSA) Process

Diagrams are intended to be representations and are not to be viewed as actual process flow diagrams.

Answering the challenges of swing adsorption applications

<table>
<thead>
<tr>
<th>Challenges:</th>
<th>Solutions:</th>
<th>Benefits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Swing Adsorption Process</td>
<td>Maintain tight seal over millions of cycles</td>
<td>High-cycle option WAFER-SPHERE with B-Series actuator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Millions of bi-directional cycles due to WAFER-SPHERE design and bearings — Actuators capable of special stroking requirements for long periods without maintenance</td>
</tr>
<tr>
<td>Vacuum Swing Adsorption Process</td>
<td>Maintain tight shut-off seal over millions of cycles at a low total cost</td>
<td>WAFER-SPHERE 815 Series high-performance Butterfly Valves</td>
</tr>
<tr>
<td></td>
<td>Rapid stroke speed</td>
<td>Proven reliability over millions of cycles at stroke speeds faster than 1 second</td>
</tr>
<tr>
<td>Temperature Swing Adsorption Process</td>
<td>Long reliable life at high regeneration temperatures</td>
<td>WAFER-SPHERE or NELDISC high-performance Butterfly valves</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JAMESBURY offers both lower cost WAFER-SPHERE soft-seat for lower temperature applications and NELDISC metal-seat valves for high temperature regeneration, permitting standardization of topworks and other single-source advantages</td>
</tr>
</tbody>
</table>
Membrane process solutions: Meeting application needs with off-the-shelf products

Membrane processes require tight seals over the life of the system with the lowest possible downtime. In addition to valve design and manufacture, valve selection and sizing are particularly critical.

NELPROF software helps ensure correct valve selection and optimum operation. Depending on the amount of flow, rangeability, and valve size requirement, the valve selected may be a reliable NELES or JAMESBURY ball valve, high-performance butterfly valve or a segment control valve.

Answering the challenges of membrane system applications

- Tight shut-off over life of system
- Actuators on smaller systems
- WAFFER-SPHERE high performance butterfly valves on larger systems
- 4000 Series ball valves with VALV-POWR® actuators for on/off applications
- R-Series segmented control valves for control applications
- Low-cost, compact, valving for smaller systems

Membrane Air Separation

Membrane air separation is based on gas permeability. Feed gas is compressed, and then passed to a membrane system. Oxygen permeates the membrane retaining nitrogen...

Diagrams are intended to be representations and are not to be viewed as actual process flow diagrams.
Continuous improvement and constant innovation

At Metso we are constantly developing and testing innovative ways to improve valve performance and reliability.

Our product testing facilities allow our engineers to test new designs and product improvements under conditions similar to actual industrial gas applications. Metso’s most recent developments include our ND9000 Digital Positioner and CINTAC Digital on-off valve actuator. Both of these innovative products contain advanced preventative maintenance diagnostics that provide critical valve condition information needed to plan facility maintenance outages.

ND9000 digital valve controller adds a new level of valve accuracy and reliability to both single and double acting pneumatic actuators.

CINTAC Digital on-off valve actuator is a totally compact, integrated automation package.
World-class quality, worldwide support

When you choose Metso, you can count on more than high-quality, innovative products. You can also depend on total solutions that give you a competitive advantage in process reliability and accuracy. You can rely on after-sale service to keep your process competitive.

Metso’s after-sale solutions include field service, repair, and local technical support where needed. You have the confidence of knowing your valves are backed by a worldwide network of factory-trained and supported field technicians, as well as by maintenance innovations like our NELSCOPE® field diagnostic tool.
For more information about Metso valve solutions for industrial gas processes, or for any information about Metso products or services, contact your local sales office or service center.

**Finland:**
- Helsinki
- Tampere
- Kajaani
- Oulu

**Sweden:**
- Stockholm
- Karlstad
- Sundsvall

**Canada:**
- Toronto

**USA:**
- Shrewsbury, MA
- Atlanta, GA
- Lansdale, PA

**Brazil:**
- Aracruz
- Sorocaba
- Curitiba

**Chile:**
- Santiago

**South Africa:**
- Durban

**Australia:**
- Melbourne

**Indonesia:**
- Jakarta

**India:**
- Mumbai

**UAE:**
- Dubai

**Russia:**
- Moscow
- St. Petersburg

**Germany:**
- Leverkusen
- Munich

**Austria:**
- Vienna

**France:**
- Wittenheim
- Bordeaux

**UK:**
- Chineham

**The Netherlands:**
- Bunschoten

**Korea:**
- Seoul

**Japan:**
- Tokyo

**China:**
- Shanghai
- Beijing

**Singapore:**
- Singapore

**Thailand:**
- Bangkok
Corporate Office
Levytie 6, P.O. Box 310
00811 Helsinki
Finland
Tel. +358 20 483 150, fax +358 20 483 151

North America Corporate Office
44 Bowditch Drive, P.O. Box 8044
Shrewsbury, Massachusetts, 01545-8044
USA
Tel. +1 508 852 0200, fax +1 508 852 8172

Europe
6-8 rue du Maine
68271 Wittenheim Cedex
France
Tel. +33 (0)3 89 50 64 00, fax +33 (0)3 89 50 64 40

Latin America
Av. Independência, 2500-Iporanga
18087-101, Sorocaba-São Paulo
Brazil
Tel. +55 15 2102 9700, fax +55 15 2102 9748/49

Asia Pacific
238A Thomson Road
#25-09 Novena Square Tower A
307684 Singapore
Tel. +65 6511 1011, fax +65 6250 083

China
19/F, the Exchange Beijing, No. 118
Jianguo Lu Yi, Chaiyang Dist
100022 Beijing
China
Tel. +86-10-6566-6600, fax +86-10-6566-2575

Middle East
Roundabout 8
Unit A8-07, P.O. Box 17175
Jebel Ali Freezone, Dubai
United Arab Emirates
Tel. +971 4 883 6974, fax +971 4 883 6836

For further information please contact
one of our regional offices or visit our
web site www.metso.com/automation

Metso Automation Inc., Tulppatie 1, P.O. Box 310, FI-00811 Helsinki, Finland, tel. +358 20 483 150, fax +358 20 483 151,
www.metso.com/automation