

# Comprehensive offering to suit your every need

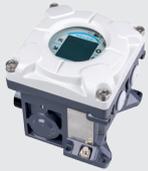
Valve controls and  
actuators product offering



# Valmet valve automation offering

Neles™, Neles Easyflow™, Jamesbury™, Stonel™ and Valvcon™

## Valve controllers and limit switches



Control valve controllers



On/off valve controllers



Limit switches



Safety solenoids



Mounting parts



## Actuators



Pneumatic cylinder actuators



Rack & Pinion actuators (RNP)



Scotch yoke actuators



Linear actuators



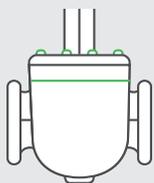
Electric actuators



Mounting parts



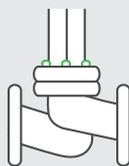
## Your valve



Ball valves



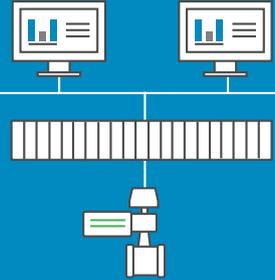
Butterfly valves



Linear valves

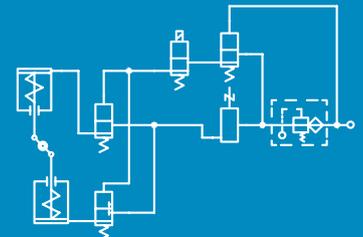
## DCS integration

Interoperability tested with all major DCS vendors for ensured functionality



## Instrumentation

- Predefined instrumentation drawings
- Needed pneumatic components available
- Instrumentation sizing support
- Actuator sizing



## Global expert services

- ~40 Flow control service centers
- 300+ Field service experts
- Local service support





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# Valve automation excellence

Valmet offers a unique and complete range of solutions for your valve automation needs. With our actuator and controller products you can fulfill end user requirements for control, emergency shutdown and on/off valve applications.

Our valve automation solutions will ensure the best possible valve performance and compliance to environmental regulations, regardless of valve make, model or manufacturer. Our offering ranges from limit switches to reliable actuators and intelligent valve controllers with third generation diagnostics.

## Universal performance

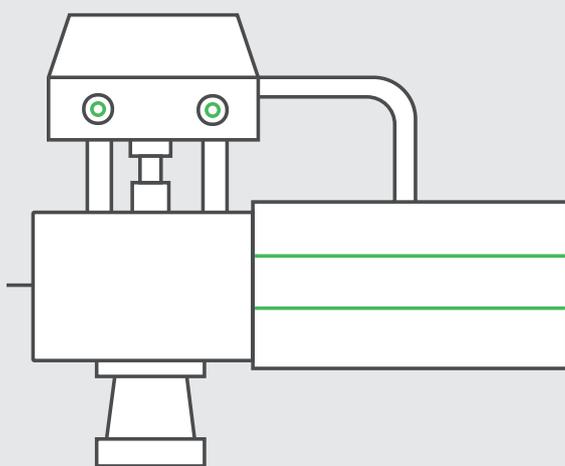
Whatever the valve in your process, our valve automation offering

brings a high level of reliability, ease of use and best in class operational performance to the entire valve assembly. Our valve automation products have been designed to work with all valves by major valve manufacturers, regardless of type or end use application. They are easy to incorporate into all valve assemblies and are based on proven technologies.

Over the past 30 years we have perfected manufacturing quality

to the highest standard and developed features that deliver reliable performance in even the most challenging applications and operating environments. The added level of automation and intelligence delivers a new level of diagnostics capabilities for the planning and execution of effective predictive maintenance.

## Valmet's valve automation offering



### Valve controllers

- Neles and Stonel valve controllers (for control and on-off valves)
- Neles intelligent safety solenoids
- Neles Easyflow and Stonel limit switches

### Actuators

- Neles, Neles Easyflow and Jamesbury pneumatic actuators (linear and rotary)
- Neles hydraulic actuators
- Valvcon electric actuators
- Neles Easyflow linear cylinders
- Neles Easyflow instrumentation components

### Your valve

- Any valve type
- Control or on/off
- Rotary or globe
- Other applications



Ball valves



Butterfly valves



Linear valves

# Neles B1-series pneumatic cylinder actuators



The double acting and spring return B1-series piston type quarter turn actuators are designed for use in both modulating control and on-off service. These actuators offer an extremely long cycle life and are well suited to operate almost any type of rotary valve.

## Key features

- Double acting and spring return version available
- Wear and corrosion resistant design
- Safe and easy maintenance
- Suitable for various services, from control to demanding ESD
- Vast number of optional features
- Rugged design
- Wide torque range

## Benefits

- Long cycle life
- Fast and sensitive response
- Unified design thru the whole product range
- Proven reliable design

## Options

- Temperature range options
- High cycle and over sizes pneumatic connections
- Material options
- Manual operators: Hand wheel and hydraulic pump
- Locking devices
- Adjustable operating range

## Product reliability

- Designed to operate in harsh environmental conditions
- Certified to be used in safety applications up to and including Safety Integrity Level 3 (SIL 3)
- IP66 enclosure, IP66M and IP67M optional
- Vast installed base

**Bulletin reference:** [6B20](#)

## Technical specifications

General	Materials of construction
<p>Suitable for basically any type of quarter turn rotary valves. Actuator connections in accordance with ISO5211 and VDI/VDE3845.</p> <p><b>Action:</b> Double or single acting</p> <p><b>Travel range:</b> -5 to 95°</p> <p><b>Protection class:</b> IP66</p> <p><b>Certification:</b> ATEX II 2 GD, SIL 3</p>	<p><b>Cylinder pipe:</b> Anodized aluminium (steel pipe with hard chrome plating option)</p> <p><b>Gear box housing &amp; piston:</b> Cast iron (nodular cast iron option)</p> <p><b>Cylinder ends:</b> Nodular cast iron</p> <p><b>Painting:</b> Epoxy + polyurethane</p>
Pneumatics	Torque range
<p><b>Pneumatic ports:</b> NPT threaded</p> <p><b>Supply pressure range:</b> 3.0 – 8.5/10 barg (43–120/145 psi)</p> <p><b>Maximum supply pressure:</b> 8.5/10 barg (120/145 psi)</p>	<p><b>Spring return model:</b> Nominal spring 28 – 12200 Nm, 21 – 900 ft-lb. Air (BTO @ 4.0 barg / 58 psi) 91 – 20800 Nm, 67 – 15339 ft-lb.</p> <p><b>Double acting model:</b> 60 – 82300 Nm, 40 – 54870 ft-lb. (nominal @ 4.0 barg)</p>
Temperature range	
<p><b>Standard temperature range:</b> -20 to +70 °C / -4 to 158 °F</p> <p><b>High temperature option:</b> -20 to +120 °C / -4 to 248 °F</p> <p><b>Low temperature option:</b> -40 to +70 °C / -40 to 158 °F</p> <p><b>Arctic temperature option:</b> -55 to +70 °C / -67 to 158 °F</p>	

# Jamesbury QPX-series spring diaphragm actuators



The spring return QPX-series diaphragm actuators are designed for use in both modulating control and on-off service. These actuators offer an long cycle life and are well suited to operate almost any type of rotary valve.

## Key features

- Spring return
- Field reversible fail action by inverting the actuator
- Wear and corrosion resistant design
- Safe and easy maintenance
- Suitable for various services, from control to on-off
- Vast number of optional features
- Rugged design
- Wide torque range

## Benefits

- Long cycle life
- Fast and sensitive response
- Unified design thru the whole product range
- Proven reliable design

## Options

- Mechanical lockout option
- Fusible plug
- Manual override
- Adjustable operating range
- Field reversible

## Product reliability

- Certified to be used in safety applications up to and including Safety Integrity Level 3 (SIL 3)

**Bulletin reference:** [A110-4](#)

## Technical specifications

General	Materials of construction
<p>Suitable for basically any type of quarter turn rotary valves. Actuator connections in accordance with ISO5211 and VDI/VDE3824.</p> <p><b>Action:</b> Single acting</p> <p><b>Travel range:</b> -5 to 95°</p> <p>ISO 5211 and Jamesbury mounting standards.</p> <p><b>Certification:</b> ATEX II 2 GD, SIL 3</p>	<p><b>Cylinder &amp; Diaphragm Casing:</b> Carbon steel</p> <p><b>Housing/Cover &amp; driver arm:</b> Gray or Ductile Iron</p> <p><b>Diaphragm:</b> Nitrile/Polyamide fabric blend</p> <p><b>Painting:</b> Epoxy + polyurethane</p>
Pneumatics	Torque range
<p><b>Pneumatic ports:</b> NPT threaded</p> <p><b>Supply pressure range:</b> 1.4 – 7 bar (20 – 100 psi)</p> <p><b>Maximum supply pressure:</b> 7 bar (100 psi)</p> <p><b>Supply media:</b> Air, water, mineral-based hydraulic fluid, sweet natural gas, nitrogen</p>	<p><b>Spring return model:</b> 15 – 796 Nm, 11 – 587 ft-lb.</p>
Temperature range	
<p><b>Standard temperature range:</b> -20 to +66 °C / -4 to 150 °F</p>	

# Neles Easyflow RNP-series rack and pinion actuators



The RNP-series double piston rack and pinion actuators combine the benefits of high cycle life, a rugged construction, and an extremely compact and symmetrical design with a unique range of features and options. They are specifically designed for fast efficient operation of ball, butterfly, and other rotary type valves.

## Key features

- Double acting and spring return version available
- Modular designs with same body and end caps for double-acting and spring-return
- Rugged wear and corrosion resistant design
- Safe and easy maintenance
- Suitable for various services
- Number of optional features
- Wide torque range

## Benefits

- Long cycle life
- Fast and sensitive response
- Proven reliable design

## Options

- Temperature range options
- High cycle and over sizes pneumatic connections
- Material options: aluminium, carbon steel, stainless steel
- Adjustable operating range

## Product reliability

- Designed to operate in harsh environmental conditions
- Certified to be used in in safety applications up to and including Safety Integrity Level 3 (SIL 3)
- Vast installed base

**Bulletin reference:** [A112-1](#)

## Technical specifications

General	Materials of construction
<p>Suitable for basically any type of quarter turn valves. Actuator connections in accordance with ISO5211 and VDI/VDE3845.</p> <p><b>Action:</b> Double or single acting</p> <p><b>Travel range:</b> +5° to +95° and -5° to +85°</p> <p><b>Certification:</b> ATEX II 2 GD, SIL 3</p> <p><b>Supply media:</b> Air, sweet gas</p>	<p><b>Frame, cover, end caps:</b> Aluminium alloy</p> <p><b>Cylinder pipe, spring barrel:</b> Aluminum</p> <p><b>Springs:</b> Spring steel</p> <p><b>End caps:</b> Painted anodised aluminum</p>
Pneumatics	Torque range
<p><b>Pneumatic ports:</b> NPT threaded</p> <p><b>Supply pressure range:</b> 2.5 – 8.0 barg (36 – 116 psi)</p> <p><b>Maximum supply pressure:</b> 8.0 barg (116 psi)</p>	<p><b>Spring return model:</b> Spring nominal: 4 - 1770 Nm Air break @ 4.0 barg: 6 – 2132 Nm</p> <p><b>Double acting model:</b> Air break @ 4.0 barg: 14 – 3080 Nm</p>
Temperature range	
<p><b>Standard:</b> -20 to +80 °C / -4 to 176 °F</p> <p><b>High:</b> -20 to +125 °C / -4 to 257 °F</p> <p><b>Arctic:</b> -60 to +80 °C / -76 to 176 °F</p>	

# Neles N1-series scotch yoke actuators



The N1-series pneumatic scotch yoke actuator is designed for use with quarter turn valves in on-off services. The high performance heavy duty design offers extremely reliable valve execution even in to most demanding customer service.

## Key features

- Double acting and spring return version available
- Wear and corrosion resistant design
- Safe and easy maintenance
- Suitable for various services, from control to demanding ESD
- Vast number of optional features
- Rugged design
- Wide torque range

## Benefits

- Scotch yoke design
- Heavy duty high performance
- Wide torque range
- Proven reliable design

## Options

- Temperature range options
- Painting options
- Manual operators: Hand wheel and hydraulic pump

## Product reliability

- Designed to operate in harsh enviromental conditions
- Certified to be used in in safety applications up to and including Safety Integrity Level 3 (SIL 3)
- IP67 enclosure

**Bulletin reference:** [6N120](#)

## Technical specifications

General	Materials of construction
<p>Suitable for on/off, modulating and control valve applications in general service, protective service and safety applications eg. ESD or HIPPS. Actuator connections in accordance with ISO5211 and VDI/VDI3824.</p> <p><b>Action:</b> Double or single acting  <b>Travel range:</b> +5 to +95° and -5 to +85°  <b>Protection class:</b> IP66M, IP67M  <b>Certification:</b> ATEX II 2 GD, SIL 3</p>	<p><b>Cylinder:</b> Carbon steel (hard chrome plating)  <b>Gear box housing &amp; piston:</b> Nodular cast iron  <b>Cylinder ends:</b> Nodular cast iron  <b>Painting:</b> Epoxy + polyurethane</p>
Pneumatics	Torque range
<p><b>Pneumatic ports:</b> NPT threaded  <b>Supply pressure range:</b> 3.0 – 8.0 barg (43 – 116 psi)  <b>Maximum supply pressure:</b> 8 barg (116 psi). Consult factory for checks related to maximum supply pressure based on sizes.</p>	<p><b>Spring return model:</b>                      Nominal spring: 25 Nm – 147425 Nm, 18 ft-lb. – 108735 ft-lb.                      Air break @ 4.0 barg / 58 psi: 26 Nm – 218765 Nm, 19 ft-lb. – 161353 ft-lb.  <b>Double acting model:</b>                      Air break @ 4.0 barg / 58 psi: 71 Nm – 311333 Nm, 52 ft-lb. – 229627 ft-lb.</p>
Temperature range	
<p><b>Standard:</b> -20 to +80 °C / -4 to 176 °F  <b>High:</b> -20 to +125 °C / -4 to 257 °F  <b>Arctic:</b> -55 to +80°C / -67 to 176 °F</p>	

# Neles VD-series linear diaphragm actuators

The spring return VD-series diaphragm type linear actuators are designed for use in both modulating control and on-off service. These actuators offer an extremely long cycle life and are well suited to operate linear valves with small to medium thrust requirements.



## Key features

- Multi springs with a rolling diaphragm design
- Wear and corrosion resistant design
- Safe and easy maintenance
- Suitable for various services
- Rugged design
- Wide thrust range
- Field reversible air fail position

## Benefits

- Long cycle life
- Fast and sensitive response
- Unified design thru the whole product range
- Proven reliable design
- Excellent linearity for wide travel range

## Options

- Temperature range options
- Hand wheel
- Locking devices
- Min or Max mechanical limit stopper option
- Various spring range option

## Product reliability

- Designed to operate in harsh environmental conditions
- Certified to be used in in safety applications up to and including safety Integrity Level 3 (SIL 3)
- Vast installed base

**Bulletin reference:** [6DA20](#)

## Technical specifications

General	Materials of construction
Suitable for linear valves. Actuator connections in accordance with Neles mounting standard or customized design. <b>Action:</b> Single acting <b>Travel range:</b> 0% to 100% <b>Stroke range:</b> up to 80mm <b>Certification:</b> ATEX II 2 GD, SIL 3	<b>Housing and yoke:</b> Carbon steel <b>Diaphragm:</b> EPDM or silicone <b>Painting:</b> Epoxy + Polyurethane
Pneumatics	Spring range
<b>Pneumatic ports:</b> NPT threaded <b>Supply pressure range:</b> 3.2 – 4.2 barg (46 – 60 psi) <b>Maximum operating pressure:</b> 4.2 barg (60 psi)	<b>General spring:</b> 0.8 – 2.6 bar / 11 – 37 psi <b>Strong spring:</b> 1.5 – 3.4 bar / 21 – 48 psi
Temperature range	Thrust range
<b>Standard temperature range:</b> -20 to +85 °C / -4 to 185 °F <b>Low temperature option:</b> -40 to +70 °C / -40 to 158 °F <b>Arctic temperature option:</b> -55 to +70 °C / -67 to 158 °F	1890 – 22800 N / 424 – 5125 ft-lb.

# Neles VB-series linear cylinder actuators



The double acting and spring return VB-series piston type linear actuators are designed for use in both modulating control and on-off service. These actuators offer an extremely long cycle life and are well suited to operate linear valves with medium to high thrust requirements.

## Key features

- Double acting and spring return version available
- Wear and corrosion resistant design
- Safe and easy maintenance
- Suitable for various services
- Vast number of optional features
- Rugged design

## Benefits

- Long cycle life
- Fast and sensitive response
- Unified design thru the whole product range
- Proven reliable design

## Options

- Temperature range options
- High cycle and over sizes pneumatic connections
- Material options
- Hand wheel
- Locking devices
- Min or Max mechanical limit stopper option

## Product reliability

- Designed to operate in harsh environmental conditions
- Certified to be used in in safety applications up to and including safety Integrity Level 3 (SIL 3)

**Bulletin reference:** [6VB20](#)

## Technical specifications

General	Materials of construction
Suitable for linear valves. Actuator connections in accordance with Neles mounting standard or customized design. <b>Action:</b> Double or single acting <b>Travel range:</b> 0% to 100% <b>Stroke range:</b> up to 280 mm <b>Certification:</b> ATEX II 2 GD, SIL 3	<b>Cylinder pipe:</b> Anodized aluminium (steel pipe with hard chrome plating option). <b>Piston:</b> Cast iron (nodular cast iron option) <b>Cylinder ends:</b> Nodular cast iron <b>Painting:</b> Epoxy + polyurethane
Pneumatics	Spring range
<b>Pneumatic ports:</b> NPT threaded <b>Supply pressure range:</b> 2.0 – 8.5 barg (29 – 145 psi) <b>Maximum supply pressure:</b> 8.5/10 barg (123/145 psi)	<b>Light spring:</b> 1.3 – 1.8 bar / 19 – 25 psi <b>General spring:</b> 1.8 – 2.4 bar / 26 – 35 psi <b>Strong spring:</b> 2.3 – 2.9 bar / 33 – 41 psi
Temperature range	Thrust range
<b>Standard temperature range:</b> -20 to +70 °C / -4 to 158 °F <b>High temperature option:</b> -20 to +120 °C / -4 to 248 °F <b>Low temperature option:</b> -40 to +70 °C / -40 to 158 °F <b>Arctic temperature option:</b> -55 to +70 °C / -67 to 158 °F	13033 – 235406 N / 2930 – 52921 ft-lb.

# Neles VC-series linear cylinder actuators



The double acting VC-series piston type linear actuators are designed for use in both modulating control and on-off service. These actuators offer an extremely long cycle life and are well suited to operate linear valves with medium to high thrust requirements.

## Key features

- Double acting
- Wear and corrosion resistant design
- Safe and easy maintenance
- Suitable for various services
- Rugged design
- Wide thrust range

## Benefits

- Long cycle life
- Fast and sensitive response
- Unified design thru the whole product range
- Proven reliable design

## Options

- Temperature range options
- Hand wheel
- Locking devices
- Min or Max mechanical limit stopper option
- Air fail safe by a built-in chamber option

## Product reliability

- Designed to operate in harsh environmental conditions
- Certified to be used in in safety applications up to and including safety Integrity Level 3 (SIL 3)

**Bulletin reference:** [6CA20](#)

## Technical specifications

General	Materials of construction
Suitable for linear valves. Actuator connections in accordance with Neles mounting standard or customized design. <b>Action:</b> Double acting <b>Travel range:</b> 0% to 100% <b>Stroke range:</b> up to 280mm <b>Certification:</b> ATEX II 2 GD, SIL 3	<b>Cylinder pipe:</b> Carbon steel (hard chrome plating) <b>Piston:</b> Aluminium <b>Cylinder ends:</b> Carbon steel <b>Painting:</b> Epoxy zinc + polyurethane finish
Pneumatics	Thrust range
<b>Pneumatic ports:</b> NPT threaded <b>Supply pressure range:</b> 2.0 – 10 barg (29 – 145 psi) <b>Maximum supply pressure:</b> 10 barg (145 psi)	27480 – 264860 N / 6177 – 59542 ft-lb.
Temperature range	
<b>Standard temperature range:</b> -20 to +85 °C / -4 to 185 °F <b>Low temperature option:</b> -30 to +70 °C / -22 to 158 °F	

# Gas over oil actuators

The gas over oil range of actuators are designed for use in pipelines. They use high-pressure gas supplied from the pipeline suspended above a hydraulic fluid to move the mechanics of the actuator. They are ideal for pipeline applications in the most extreme environments.



## Key features

- Build over double acting N1 scotch yoke actuator for quarter turn valves
- Storage tank for manual override as well for extra stroke
- Sour gas and sweet gases can be used
- Gas reservoir for operation of actuator on absence of main steam pressure
- Solenoid operated system can be operated remotely
- Wear and corrosion resistant design
- Safe and easy maintenance
- Vast number of optional features
- Wide torque range
- Modular design: Enables ease of maintenance and reduced inventory costs

## Benefits

- Scotch yoke design
- Heavy duty high performance
- Wide torque range
- Proven product
- Modular and rugged design
- Explosion proof junction box

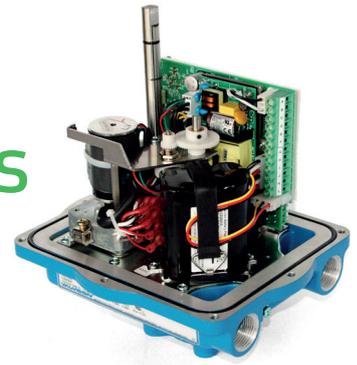
## Options

- Coalescing filter
- Local/remote option
- Handpump
- Control cabinet (IP66)
- Back up gas tank
- High pressure open inhibit
- Low pressure auto closure
- Dielectric fittings

## Technical specifications

General	Materials of construction
<p>Suitable for valves located on gas pipelines in on-off and modulating heavy-duty service with medium as sweet or sour high-pressure gas, nitrogen or instrument air. Actuator connections in accordance with ISO5211 and VDI/VDE3824</p> <p><b>Action:</b> Double acting  <b>Protection class:</b> IP67 (Actuator)  <b>Certification:</b> ATEX II 2 GD, SIL 3 (Actuator)                      Pressure containing parts as per ASME Sec. 8, Div. 1</p>	<p><b>Cylinder:</b> Carbon steel (hard chrome plating)  <b>Central frame and cylinder caps:</b> Nodular cast iron  <b>Instrumentation enclosure:</b> Carbon steel / stainless steel  <b>Painting:</b> Epoxy + polyurethane</p>
Hydraulics/ Gas Cylinder	Torque range
<p><b>Pneumatic ports:</b> NPT threaded  <b>Working pressure:</b> 10 to 105 bar</p>	<p><b>Double acting model:</b> Torque range up to 600000 Nm</p>
Temperature range	
<p><b>Temperature range:</b> -20 to +85 °C</p>	

# Valvcon ADC-series actuators



The universal ADC-series PC board includes both on/off and modulating functionalities, and accepts both AC and DC power inputs.

## Back-up power

The optional back-up power feature incorporates an internal battery pack that plugs right in to the PC board, which includes a built-in charging circuit, all fitting in the standard enclosure. Upon loss of external power the battery automatically activates as the main power supply and can immediately drive the actuator to a designated safe position or continue to respond to a control signal, if present.

## ADC-series features at a glance

- Universal input power
  - Actuator accepts 24/115/230 AC and 12/24 DC
- Universal control
  - On/Off or modulating from the same package
- Included heater/thermostat feature
  - Can be enabled for “low-temp” or “humidity control” use
  - Can be disabled to reduce power consumption

- Optional internal Li Ion battery back-up capabilities within standard size actuator enclosure
  - Allow for continued operation during power outages (provided control signal remains)
- Field-settable for “fail clockwise” or “fail counter-clockwise” or “fail” to a mid-travel position
- Two auxiliary limit switches for indication purposes
- Dual conduit openings
  - Easier to wire and keep power and control wiring separate
- Replacement battery available for units equipped with battery back-up
  - Recommended that the battery is replaced every four years
- Two year warranty

**Bulletin reference:** [V201-2](#)

## Technical specifications

Temperature range	Output configuration
-40 to 66 °C / -40 to 150 °F; ATEX temperature range: -20 to 66 °C	150 to 600 in-lbs (12 to 50 ft-lb.; 16 to 68 Nm): ISO 5211 F05 and F07 bolt circles, ¾" female square; 14 mm and 17 mm female squares, as well as 15 mm and 20 mm female keyed drives are available. 1000 to 3000 in-lbs (83 to 250 ft-lb.; 113 to 339 Nm): ISO 5211 F07 and F10 bolt circles, 1" female square; 17 mm, 19 mm, and 22 mm female squares, as well as 20 mm and 25 mm female keyed drives are available.
Duty cycle	Voltage
Continuous @ 40 °C/104 °F, or below (120 starts/minute); 75% maximum duty cycle @ maximum temperature rating	<b>12VDC:</b> 10.8 to 13.2 VDC <b>24VDC:</b> 21.6 to 26.4 VDC <b>24VAC:</b> 21.6 to 26.4 VAC, 60 or 50 Hz <b>115 VAC:</b> 103.5 to 126.5 VAC, 60 or 50 Hz <b>230 VAC:</b> 207 to 253 VAC, 60 or 50 Hz
Construction details and materials	Limit switches
<b>Approximate weight:</b> 17 lbs (8 kg), 31 lbs (14 kg) <b>Enclosure:</b> Die cast A380 aluminum <b>Protection class:</b> IP66 <b>Gear train:</b> Hardened steel spur gears <b>Motor:</b> Brushless DC motor with Class B or better insulation; sub-fractional horsepower <b>Lubrication:</b> Permanently lubricated gear train and bearings <b>Conduit connection:</b> (2) ¾" NPT (¾" to ½" reducing bushings included)	(4) Single pole, double throw switches rated for ½ HP, 11 amps @ 250 VAC, CSA certified. Two limit switches can be used for end-of-travel control. Two limit switches can be used for end-of-travel indication.
Limit switches	Certifications
(4) Single pole, double throw switches rated for ½ HP, 11 amps @ 250 VAC, CSA certified. Two limit switches can be used for end-of-travel control. Two limit switches can be used for end-of-travel indication.	<b>All models:</b> CSA (C US): NEMA 4/4X; CE compliant <b>WX models:</b> CSA (C US): Class I, Div. 1, Gr. C & D; Class II, Div. 1, Gr. E, F & G; Class III ATEX: Ex db IIB T6 Gb IECEx CSA 14.0057X

# Valvcon V-series actuators



The V-series is a compact, rugged and reliable electric actuator designed for quarter-turn valve and damper applications.

## Modular solution

The innovative Valvcon™ V-series pioneers the concept of plug-in, modular electronics in valve automation, redefining and simplifying the entire valve actuation process. Upgrades and modifications can now be done in the field, in a matter of minutes, with no hard wiring, soldering or factory returns. This technology vastly simplifies set-up and calibration and enhances actuator performance.

Available in a variety of control configurations, from on/off to automatic cycling, and with several standard features, they are extremely well suited to a multitude of demanding process applications.

## V-series features at a glance

- Electronics are simple to use
  - Clearly labeled terminal strip and easy access to user wiring
- Plug-in electronics for simple upgrades and modifications
  - Coded connectors make internal mis-wiring impossible
- Standard extended 75% duty cycle
  - At ambient temperatures up to 40 °C / 104 °F.
- Auxiliary limit switches for indication, heater/ thermostat and brake
  - Brake prevents the actuator from being backdriven

**Bulletin reference:** [V200-1](#)

## Technical specifications

Temperature range	Output configuration
-40 to 66 °C / -40 to 150 °F; ATEX temperature range: -20 to 66 °C	150 to 600 in-lbs (12 to 50 ft-lb.; 16 to 68 Nm): ISO 5211 F05 and F07 bolt circles, 3/4" female square; 14 mm and 17 mm female squares, as well as 15 mm and 20 mm female keyed drives are available. 1000 to 3000 in-lbs (83 to 250 ft-lb.; 113 to 339 Nm): ISO 5211 F07 and F10 bolt circles, 1" female square; 17 mm, 19 mm, and 22 mm female squares, as well as 20 mm and 25 mm female keyed drives are available.
Duty cycle	
75% (between each full cycle), the actuator must rest for 1/3 of the 90 degree cycle time; 30 starts/minute <b>NOTE:</b> At 50 Hz, the duty cycle is ~60% @ 40 °C / 104 °F.	
Construction details and materials	Voltage
<b>Approximate weight:</b> 17 lbs (8 kg), 31 lbs (14 kg) <b>Enclosure:</b> Die cast A380 aluminum <b>Protection class:</b> IP66 <b>Gear train:</b> Hardened steel spur gear <b>Motor:</b> Split phase, capacitor driven motor with Class B or better insulation; sub-fractional horsepower <b>Lubrication:</b> Permanently lubricated gear train and bearings <b>Conduit connection:</b> (2) 3/4" NPT (3/4" to 1/2" reducing bushings included)	<b>115 VAC:</b> 103.5 to 126.5 VAC, 60 or 50 Hz <b>230 VAC:</b> 207 to 253 VAC, 60 or 50 Hz
Limit switches	Certifications
(4) Single pole, double throw switches rated for 1/2 HP, 11 amps @ 250 VAC, CSA certified. Two standard switches are used for end of travel control, and for pilot or position indication at terminal 5 and terminal 6. Indication outputs are protected by 0.25 AMP permanent auto reset polyfuses – reset time approximately 3 mins. Two standard switches are also included to provide dry contact output position indication.	<b>All models:</b> CSA (C US): NEMA 4/4X; CE compliant <b>WX models:</b> CSA (C US): Class I, Div. 1, Gr. C & D; Class II, Div. 1, Gr. E, F & G; Class III ATEX: Ex db IIB T6 Gb, IECEx CSA 14.0057X

# Manual actuators

Manual actuators					
Product	Series	Design	Action	Specifications	Bulletin
<p><b>Neles Easyflow manual valve gears</b></p> 	MEG-series	Manual gear operated	Handwheel	<p><b>Recommended input:</b> 26 – 152 Nm (19 – 112 ft-lb.)</p> <p><b>Torque output:</b> Up to 6000 Nm (4425 ft-lb.)</p>	A400-1
<p><b>Jamesbury™ manual valve gears</b></p> 	MGR-series	<p>Manual gear operated</p> <p>Fully enclosed, weather-proof, all-cast-iron and carbon-steel construction</p> <p>Factory lubricated for lifetime, no future lubrication required</p> <p>Pointer to indicate valve position</p>	Handwheel	<p><b>Recommended input:</b> 16 – 145 Nm (12 – 170 ft-lb.)</p> <p><b>Torque output:</b> 150 – 260000 Nm (111 – 19177 ft-lb.)</p>	A100-3

# Piston-barrel linear actuators

Neles Easyflow comprehensive range of pneumatic cylinder meets the demands of modern automation and offers suitable solutions for all applications.

## Key features

- Neles standard and ISO 15552, VDMA 24562 based with wide range of mounting options
- Double acting and spring return version available
- SC/SN series: standard aluminum profile micro honed and special anodized with two sensor slots
- CC/AC series: Sturdy tie rod design complete in steel / aluminum and cast-iron construction
- Self-adjusting pneumatic end-position cushioning
- Heavy duty mountings
- Safe and easy maintenance
- Vast number of optional features

## Benefits

- Long cycle life
- Fast and sensitive response
- Proven reliable design

## Options

- Temperature range options
- Material options
- Hand wheel

## Product reliability

- Designed to operate in harsh environmental conditions
- Approvals and certifications : SIL 3 (CC,SC), ISO 15552 and VDMA with SC and SN series, IP 66 M and 67 M for all.

## Technical specifications

Technical specifications	SC, SN, CC, AC Series
Piston diameter	32 mm to 350 as standard & above on ETO basis
Operating pressure	1 to 10 bar
Force range	As defined in chart below
Temperature. range	Standard: -20°C to +125°C
Travel range	Up to 2500 mm

Linear cylinder actuators				
Series	Design	Version	Specifications	Bulletin
<b>AC-series</b> 	Pneumatic piston-barrel type linear actuator	Double acting For single acting versions contact manufacturer	<b>Max. operation pressure:</b> 10 bar <b>Force range:</b> 453 N to 96220 N <b>Temperature range:</b> -20 to +80 °C (For high & low temp. version, consult factory)	A300-4
<b>CC-series</b> 	Pneumatic piston-barrel type linear actuator	Double acting For single acting versions contact manufacturer	<b>Max. operation pressure:</b> 10 bar <b>Force range:</b> 3016 N to 96220 N <b>Temperature range:</b> -20 to +80 °C (For high & low temp. version, consult factory)	A300-2
<b>SC-series</b> 	Pneumatic piston-barrel type linear actuator	Double acting For single acting versions contact manufacturer	<b>Max. operation pressure:</b> 10 bar <b>Force range:</b> 69 N to 7850 N <b>Temperature range:</b> -20 to +80 °C (For high & low temp. version, consult factory) <b>Mounting interface:</b> ISO 15552 VDMA 24562	A300-3
<b>SN-series</b> 	Pneumatic piston-barrel type linear actuator	Double acting For single acting versions contact manufacturer	<b>Max. operation pressure:</b> 10 bar <b>Force range:</b> 1147 N to 20107 N <b>Temperature range:</b> -20 to +80 °C (For high & low temp. version, consult factory) <b>Mounting interface:</b> ISO 15552 VDMA 24562	A300-1

# Neles NDX intelligent valve controller



The NDX™ is the next generation intelligent valve controller working on all types of control valves and in all industry areas. It guarantees end product quality in all operating conditions with incomparable performance, unique diagnostics, and years of reliable service. The NDX is a futureproof investment with lifetime support for asset management.

## Key features

- Reliable and robust design
- Industry leading pneumatic capacity
- Benchmark control performance
- Simple and fast installation and commissioning
- Local / remote operation
- Wide language support
- Expandable architecture
- HART 6/7 communication as standard
- Advanced device diagnostics including
  - Self-diagnostics
  - Online diagnostics
  - History trends
  - Performance diagnostics
  - Communication diagnostics
  - Extended off-line tests
  - Performance view
  - Online Valve Signature
- Worldwide support for hazardous area approvals

## Easy installation and configuration

- Simple / fast configuration and calibration using one of the following:
  - Standard Local User Interface (LUI) accessible without opening the device cover
  - LUI can be rotated according to mounting position
  - Distributed Control System (DCS) asset management program
- Backwards compatible with retrofit kits for easy
- Replacement of Neles NE700 and ND9000™ positioners
- Easy retro-fit to an extensive list of 3rd party control valves
- Installation to all common control systems

## Open solution

- Valmet is committed to delivering products that freely interface with software and hardware from a variety of manufacturers; NDX is no exception. This open architecture allows the NDX to be integrated with other field devices to give an unprecedented level of controllability.
- FDT and EDD based multi-vendor support configuration

## Options

- Internal position transmitter
- Digital configurable outputs
- Gauge block

## Product reliability

- Designed to operate in harsh environmental conditions
- Rugged modular design
- Excellent temperature characteristics
- Vibration and impact tolerant
- IP66 enclosure
- Protected against humidity
- Resistant to dirty air
- Wear resistant and sealed components
- Fully contactless and maintenance free position measurement

## Minimised process variability

- Linearization of the valve flow characteristics
- Excellent dynamic and static control performance
- Fast response to control signal change
- Accurate valve control

**Bulletin reference:** [7NDX22](#), [7NDX23](#)

## Technical specifications



General	Electronics
<p>Loop powered 4 – 20 mA, no external power supply required. Suitable for linear and rotary valves. Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.</p> <p><b>Action:</b> Single acting or double acting, direct or reverse  <b>Travel range:</b>            Linear: 5 – 120 mm / 0.2 – 4.7 in &gt; 200 mm / 8 in (pending)            Rotary: 30 – 160°  <b>Measurement range:</b> 110° with freely rotating feedback shaft  <b>Performance with moderate constant-load actuators:</b>            Dead band: ≤ 0.2%, Hysteresis: &lt; 0.5%,            Linearity error: &lt; 0.5%,            Repeatability: &lt; 0.2%</p>	<p><b>Supply power:</b> Loop powered, 4 – 20 mA, HART Protocol rev. 6/7  <b>Min. signal:</b> 3.8 mA  <b>Current max:</b> 120 mA  <b>Load voltage:</b> 9.7 VDC at 20 mA, 9.0 VDC at 4 mA  <b>Impedance at 20mA:</b> 485 Ω  <b>Maximum voltage:</b> 30 VDC  <b>Rev. polarity protection:</b> -30 VDC  <b>Over current protection:</b> Active over 35 mA  <b>Wire size:</b> 2.5/0.5 mm<sup>2</sup> (14/20 awg)</p>
Environmental influence	Position transmitter and digital output (optional)
<p><b>Standard temperature range:</b> -40 to +85 °C / -40 to +185 °F  <b>Influence of temperature on valve position:</b>            Rotary: 0.5% / 10 °C            Linear: 0.1 mm / 10 °C  <b>LUI usable range:</b> -30 to +60 °C  <b>Temperature cycling/Dry heat:</b> Acc. to IEC 60068-2-2  <b>Humidity limits:</b> Acc. to IEC 61514-2  <b>Magnetic fields:</b> Negligible at 30 A/m, Acc. to IEC 61000-4-8  <b>Vibration:</b> Tested acc. to ANSI/ISA-75.13.01-2013  <b>Influence of vibration on valve position:</b>            &lt; 1% under 2 g 5 – 150 Hz, 1 g 150 – 300 Hz,            0.5 g 300 – 2000 Hz</p>	<p><b>Position transmitter</b>  <b>Output signal:</b> 4 – 20 mA (galvanic isolation; 600 VDC)  <b>Supply voltage:</b> 12 – 30 VDC  <b>Linearity:</b> &lt; 0.05% FS  <b>Temperature effect:</b> &lt; 0.35% FS  <b>Failsafe output:</b> 3.5 mA or 22.5 mA  <b>Maximum external load:</b> 690 Ω for I.S. Ex ia IIC T6 Ui ≤ 28 V</p> <p><b>Digital output</b>  <b>Output signal:</b> &lt; 1.0 mA = state '0', &gt; 2.2 mA = state '1' (NAMUR)  <b>Supply voltage:</b> 5 – 16 VDC            Ex ia IIC T6 Ui ≤ 16V, li ≤ 25 mA, Pi ≤ 100mW DOs can be used like Namur limit switches or configured to be activated based on any device status.</p>
Enclosure	Local User Interface (LUI) functions
<p><b>Housing material:</b> Epoxy coated anodized aluminum alloy, copper free, Cu content max 0.4%  <b>Cover material:</b> Compact - polycarbonate, Standard - polycarbonate, Explosion Proof - same as housing and glass window  <b>Magnet holder:</b> Glass fiber reinforced polyamide, PA66GF20  <b>Protection class:</b> IP66, NEMA 4X, IP67 for storage and transport</p> <p><b>Pneumatic ports</b>  <b>Supply air:</b> ¼ NPT, G¼ with gauge block  <b>Actuator:</b> ¼ NPT, G¼ with gauge block  <b>Exhausts:</b> 2 pcs. ¾ NPT, G¾ with gauge block  <b>Cable entry:</b> 2 pcs. ½" NPT (M20 with adapter)  <b>Weight:</b> 2.0 kg / 4.4 lbs (Compact), 2.8 kg / 6.2 lbs (Standard), 3.8 kg / 8.4 lbs (Explosion proof)</p>	<ul style="list-style-type: none"> <li>• Accessible with the cover installed</li> <li>• PIN code lock to prevent unauthorized / unintended access with the cover installed or permanently (if configured).</li> <li>• Guided startup wizard</li> <li>• Language selection: English, Chinese, Spanish, Italian, French, Korean, German, Turkish, Dutch, Portuguese</li> <li>• Calibration: Automatic / Manual</li> <li>• 3-point measurement linearization</li> <li>• Configuration of the control valve               <ul style="list-style-type: none"> <li>- Actuator type &amp; valve type</li> <li>- Valve dead angle</li> <li>- Safety cut-off range</li> <li>- Input signal direction</li> <li>- Positioner fail action</li> </ul> </li> <li>• Monitoring of valve position, target position, input signal, temperature, supply and actuator pressure</li> <li>• Manual control of the valve from Local User Interface</li> <li>• HART 6/7 selection</li> </ul>
Pneumatics	
<p><b>Supply pressure:</b> 1.4 – 8 bar / 20 – 116 psi (single acting), 2 – 8 bar / 29 – 116 psi (double acting)  <b>Effect of supply pressure on valve position:</b>            &lt; 0.1% at 10% difference in inlet pressure  <b>Supply media:</b> Air, nitrogen and sweet natural gas  <b>Effect of supply pressure on valve position:</b>            &lt; 0.1% at 10% difference in inlet pressure  <b>Air quality:</b> Acc. to ISO 8573-1  <b>Solid particles:</b> Class 7 (40 µm filtration)  <b>Humidity:</b> Class 1 (at minimum dew point 10 °C / 18 °F below minimum temperature is required)  <b>Oil class:</b> 3 (or &lt; 1 ppm)  <b>Air capacity:</b> 80 Nm<sup>3</sup>/h / 47.1 scfm  <b>Air consumption in steady state position:</b>            &lt; 0.1 Nm<sup>3</sup>/h / 0.06 scfm 1 rated at 4 bar / 60 psi supply pressure</p>	



# Neles ND9000 intelligent valve controller

The ND9000™ is a top class intelligent valve controller designed to operate on every control valve actuator and in all industry areas. It improves the end product quality in all operating conditions with unique diagnostics and incomparable performance features. The ND9000 is a reliable and future-proof investment.

## Key features

- Benchmark control performance on rotary and linear valves
- Reliable and robust design
- Easy commissioning and operation
- Language selection: English, German and French
- Local / remote operation
- Expandable architecture
- HART 6/7 communication as standard
- Third generation diagnostics
  - Performance view
  - Self diagnostics
  - Online diagnostics
  - Performance diagnostics
  - Communication diagnostics
  - Extended off-line tests

## Easy installation and configuration

- Same device can be used for linear and rotary valves, double and single-acting actuators
- 1-point calibration feature enables mounting without disturbing the process
- Simple fast calibration and configuration
  - Guided start-up using Local User Interface (LUI)
  - Distributed Control System (DCS) asset management tools
- Low power consumption enables installation to all common control systems
- Extensive selection of mounting kits for 3rd party actuators

## Open solution

- Valmet is committed to delivering products that freely interface with software and hardware from a variety of manufacturers; ND9000 is no exception.
- This open architecture allows the ND9000 to be integrated with other field devices to give an unprecedented level of controllability.

- FDT and EDD based multi-vendor support configuration
- Support files for ND9000 are available from our internet page, at [www.valmet.com/flowcontrol/valves/valve-software/](http://www.valmet.com/flowcontrol/valves/valve-software/)

## Options

- Interchangeable communication options:
  - HART
  - FOUNDATION™ Fieldbus
  - Profibus PA
- Integrated limit switches
- Position transmitter (in HART only)
- Exhaust adapter

## Product reliability

- Designed to operate in harsh environmental conditions
- Rugged modular design
- Excellent temperature characteristics
- Vibration and impact tolerant
- IP66 enclosure
- Protected against humidity
- Maintenance free operation
- Resistant to dirty air
- Wear resistant and sealed components
- Contactless position measurement

## Minimised process variability

- Linearization of the valve flow characteristics
- Excellent dynamic and static control performance
- Fast response to control signal change
- Accurate valve control

**Bulletin reference:** [7ND9021](#)



General	Electronics HART
<p>Loop powered, no external power supply required. Suitable for rotary and linear valves. Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.</p> <p><b>Action:</b> Double or single acting <b>Travel range:</b> Linear: 10 – 120 mm / 0.4 – 4.7 Rotary: 45 – 95° <b>Measurement range:</b> 110° with freely rotating feedback shaft <b>Performance with moderate constant-load actuators:</b> Dead band acc. to IEC 61514: ≤ 0.1% Hysteresis acc. to IEC 61514: &lt; 0.5%</p>	<p><b>Supply power:</b> Loop powered, 4 – 20 mA HART Protocol rev. 6/7 <b>Minimum signal:</b> 3.6 mA <b>Current max :</b> 120 mA <b>Load voltage:</b> Up to 9.7 VDC/20 mA (corresponding 485 Ω) <b>Voltage:</b> Max. 30 VDC <b>Polarity protection:</b> -30 VDC <b>Over current protection:</b> Active over 35 mA</p>
Environmental influence	Profibus PA and FOUNDATION Fieldbus
<p><b>Standard temperature range:</b> -40 to +85 °C / -40 to +185 °F <b>Arctic version temperature range:</b> -53 to +85 °C / -64 to +185 °F <b>Influence of temperature on valve position:</b> 0.5% /10 °K <b>Influence of vibration on valve position:</b> &lt; 1% under 2 g 5 – 150 Hz, 1 g 150 – 300 Hz, 0.5 g 300 – 2000 Hz</p>	<p><b>Supply power voltage:</b> 9 – 32 VDC, reverse polarity protection Max basic current 17.2 mA Fault current (FDE) 3.9 mA <b>FOUNDATION Fieldbus function block execution times:</b> AO 20 ms, AI 20 ms, PID 25 ms, DO 15 ms, DI 15 ms, IS 15 ms, OS 20 ms</p>
Enclosure	Position transmitter (optional only HART)
<p><b>ND9100:</b> Anodized aluminum alloy and polymer composite <b>ND9200:</b> Anodised aluminum alloy and tempered glass <b>ND9300:</b> Stainless steel <b>ND9400:</b> Stainless steel and polymer composite</p> <p><b>Protection class:</b> IP66, Nema 4x <b>Pneumatic ports:</b> G ¼ (ND100) ¼ NPT (ND9200, ND9300 &amp; ND9400) <b>Cable gland thread:</b> M20x1.5, ½ NPT (ND9200E2, ND9100U) <b>Weight:</b> 1.8 kg / 4.0 lbs (ND9100), 3.4 kg / 7.5 lbs (ND9200), 8.6 kg / 19.0 lbs (ND9300), 5.6 kg / 12.4 lbs (ND9400)</p>	<p><b>Output signal:</b> 4 – 20 mA (galvanic isolation; 600 VDC) <b>Supply voltage:</b> 12 – 30 VDC <b>Resolution:</b> 16 bit / 0.244 µA <b>Linearity:</b> &lt; 0.05% FS <b>Temperature effect:</b> &lt; 0.35% FS <b>External load:</b> Max 0 – 780 Ω Max 0 – 690 Ω for intrinsically safe Ex ia IIC T6 Ui ≤ 28 V Ex d IIC T4/T5/T6 Ui ≤ 30 V</p>
Pneumatics	Local User Interface (LUI) functions
<p><b>Supply pressure:</b> 1.4 – 8 bar / 20 – 115 psi <b>Effect of supply pressure on valve position:</b> &lt; 0.1% at 10% difference in inlet pressure <b>Air quality:</b> Acc. to ISO 8573-1 <b>Solid particles:</b> Class 5 (3 – 5 µm filtration is recommended) <b>Humidity:</b> Class 1 (dew point 10 °C/ 18 °F below minimum temperature is recommended) <b>Oil class:</b> 3 (or &lt; 1 ppm) <b>Capacity with 4 bar / 60 psi supply:</b> 5.5 Nm³/h / 3.3 scfm low capacity 12 Nm³/h / 7.1 scfm normal capacity 38 Nm³/h / 22.4 scfm high capacity <b>Consumption with 4 bar / 60 psi supply in steady state position:</b> &lt; 0.6 Nm³/h / 0.35 scfm (low or normal capacity) &lt; 1.0 Nm³/h / 0.6 scfm (high capacity)</p>	<ul style="list-style-type: none"> <li>Local control of the valve</li> <li>Monitoring of valve position, target position, input signal, temperature, supply and actuator pressure difference</li> <li>Guided-startup function</li> <li>LUI may be locked remotely to prevent unauthorized access</li> <li>Calibration: Automatic / Manual / 1-point calibration / Linearization</li> <li>Control configuration: aggressive, fast, optimum, stable, maximum stability</li> <li>Configuration of the control valve             <ul style="list-style-type: none"> <li>Rotation: Valve rotation clockwise or counter-clockwise to close</li> <li>Dead Angle</li> <li>Low cut-off, cut-off safety range (default 2%)</li> <li>Positioner fail action: Open/close</li> <li>Signal direction: Direct/reverse acting</li> <li>Actuator type: Double/single acting</li> <li>Valve type: Rotary/linear</li> </ul> </li> <li>Language selection: English, German and French</li> <li>HART 6/7 selection</li> </ul>

# Neles ND7000 digital valve controller



The ND7000™ is a digital valve controller designed to operate on all kind of actuators. The ND7000 is a reliable and future-proof investment.

## Key features

- Benchmark control performance on rotary and linear valves
- Reliable and robust design
- The rugged cover protects the unit from environmental hazards and external abuse
- Easy commissioning and operation
- Language selection: English, German and French
- Local / remote operation
- HART 6/7 communication as standard
- Standard control valve diagnostics
  - Self-diagnostics
  - Control deviation trend
  - Counters
  - Extended off-line tests

## Easy installation and configuration

- Same device can be used for linear and rotary valves, double and single-acting actuators
- 1-point calibration feature enables mounting without disturbing the process
- Simple fast calibration and configuration
  - Guided start-up using Local User Interface (LUI)
  - Distributed Control System (DCS) asset management tools
- Low power consumption enables installation to all common control systems
- Extensive selection of mounting kits for 3rd party actuators

## Open solution

- Valmet is committed to delivering products that freely interface with software and hardware from a variety of manufacturers; ND7000 is no exception. This open architecture allows the ND7000 to be integrated with other field devices to give an unprecedented level of controllability.
- FDT and EDD based multi-vendor support configuration
- Support files for ND7000 are available from our internet page, at [www.valmet.com/flowcontrol/valves/valve-software/](http://www.valmet.com/flowcontrol/valves/valve-software/)

## Product reliability

- Designed to operate in harsh environmental conditions
- Vibration and impact tolerant
- IP66 enclosure
- Protected against humidity
- Rugged modular design
- Excellent temperature characteristics
- Maintenance free operation
- Resistant to dirty air
- Wear resistant and sealed components
- Contact less position measurement

## Minimised process variability

- Linearization of the valve flow characteristics
- Excellent dynamic and static control performance
- Fast response to control signal change
- Accurate valve control

**Bulletin reference:** [7ND720](#)



General	Electronics HART
<p>Loop powered, no external power supply required. Suitable for rotary and linear valves. Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.</p> <p><b>Action:</b> Double or single acting  <b>Travel range:</b>            Linear: 10 – 120 mm / 0.4 – 4.7            Rotary: 45 – 95°  <b>Measurement range:</b> 110° with freely rotating feedback shaft  <b>Performance with moderate constant-load actuators:</b>            Dead band acc. to IEC 61514: ≤ 0.1%            Hysteresis acc. to IEC 61514: &lt; 0.5%</p>	<p><b>Supply power:</b> Loop powered, 4 – 20 mA, HART Protocol rev. 6/7  <b>Minimum signal:</b> 3.6 mA  <b>Current max:</b> 120 mA  <b>Load voltage:</b> up to 9.7 VDC/20 mA (corresponding 485 Ω)  <b>Voltage: max.</b> 30 VDC  <b>Polarity protection:</b> -30 VDC  <b>Over current protection:</b> Active over 35 mA</p>
Environmental influence	Position transmitter (optional)
<p><b>Standard temperature range:</b> -40 to +85 °C / -40 to +185 °F  <b>Influence of temperature on valve position:</b> 0.5% / 10 °K  <b>Influence of vibration on valve position:</b>            &lt; 1% under 2 g 5 – 150 Hz, 1 g 150 – 300 Hz, 0.5 g 300 – 2000 Hz</p>	<p><b>Output signal:</b> 4 – 20 mA (galvanic isolation; 600 VDC)  <b>Supply voltage:</b> 12 – 30 VDC  <b>Resolution:</b> 16 bit / 0.244 µA  <b>Linearity:</b> &lt; 0.05% FS  <b>Temperature effect:</b> &lt; 0.35% FS  <b>External load:</b>            Max 0 – 780 Ω            Max 0 – 690 Ω for intrinsically safe            Ex ia IIC T6 Ui ≤ 28 V            Ex d IIC T4/T5/T6 Ui ≤ 30 V</p>
Enclosure	Local User Interface (LUI) functions
<p><b>Material ND7100:</b> Anodized aluminium alloy and polymer composite  <b>Material ND7200:</b> Anodised aluminum alloy and tempered glass</p> <p><b>Protection class:</b> IP66, Nema 4x  <b>Pneumatic ports:</b> G ¼ (ND7100), ¼ NPT (ND7200)  <b>Cable gland thread:</b> M20x1.5, ½ NPT (ND7200 E2)  <b>Weight:</b> 1.8 kg / 4.0 lbs (ND7100), 3.4 kg / 7.5 lbs (ND7200)            Mechanical and digital position indicator visible through main cover.</p>	<ul style="list-style-type: none"> <li>Local control of the valve</li> <li>Monitoring of valve position, target position, input signal, temperature, supply and actuator pressure difference</li> <li>Guided-startup function</li> <li>LUI may be locked remotely to prevent unauthorized access</li> <li>Calibration: Automatic / Manual / 1-point calibration / Linearization</li> <li>Control configuration: aggressive, fast, optimum, stable, maximum stability</li> <li>Configuration of the control valve               <ul style="list-style-type: none"> <li>Rotation: Valve rotation clockwise or counter-clockwise to close</li> <li>Dead Angle</li> <li>Low cut-off, cut-off safety range (default 2%)</li> <li>Positioner fail action: Open/close</li> <li>Signal direction: Direct/reverse acting</li> <li>Actuator type: Double/single acting</li> <li>Valve type: Rotary/linear</li> </ul> </li> <li>Language selection: English, German and French</li> <li>HART 6/7 selection</li> </ul>
Pneumatics	
<p><b>Supply pressure:</b> 1.4 – 8 bar / 20 – 115 psi  <b>Effect of supply pressure on valve position:</b>            &lt; 0.1% at 10% difference in inlet pressure  <b>Air quality:</b> Acc. to ISO 8573-1  <b>Solid particles:</b> Class 5 (3 – 5 µm filtration is recommended)  <b>Humidity:</b> Class 1 (dew point 10 °C / 18 °F below minimum temperature is recommended)  <b>Oil class:</b> 3 (or &lt; 1 ppm)  <b>Capacity with 4 bar / 60 psi supply:</b>            5.5 Nm³/h / 3.3 scfm low capacity            12 Nm³/h / 7.1 scfm normal capacity            38 Nm³/h / 22.4 scfm high capacity  <b>Consumption with 4 bar / 60 psi supply in steady state position:</b>            &lt; 0.6 Nm³/h / 0.35 scfm (low &amp; normal capacity)            &lt; 1.0 Nm³/h / 0.6 scfm (high capacity)</p>	

# Neles SG9000 intelligent on-off valve controller



Neles™ SwitchGuard™ SG9000 is a top class intelligent on-off valve controller designed to operate on any valve actuator. Unique embedded diagnostic features are integrated into its design enabling predictive maintenance for on-off applications.

The SwitchGuard™ can be easily fitted to the actuator and its controlled pneumatic capacity replaces any solenoid valve providing a simple, reliable interface with the process control system. Diagnostic information is presented in easily understandable way using FDT technology to enable planned maintenance of potentially failing valve assemblies before they have chance to impact on the process.

## Key features

- Unique advanced on-off diagnostics including
  - Self-diagnostics
  - Online diagnostics
  - Performance diagnostics
- High pneumatic capacity eliminates the need of additional instrumentation in most cases
- Speed control for switching
  - Stroking time and profile configuration, separately for open and close strokes
- Integrated limit switches simplifying installation
- Reliable and robust design
- Easy of use
- Local / remote operation
- Wide range of hazardous area approvals

## Easy installation and configuration

- Same unit for linear and rotary valves, double and single acting actuators
- Simple fast calibration and configuration
  - Guided start-up using Local User Interface (LUI)
  - Distributed Control System (DCS) asset management tools
- Extensive selection of mounting kits for 3rd party actuators

## Open solution

- Valmet is committed to delivering products that freely interface with software and hardware from a variety

of manufacturers; and, the Neles SwitchGuard is no exception. This open architecture allows the SwitchGuard to be integrated with other field devices and systems.

- FDT and EDD based multi-vendor support configuration
- Support files for SG9000H are available from our internet page, at [www.valmet.com/flowcontrol/valves/valve-software/](http://www.valmet.com/flowcontrol/valves/valve-software/)

## Options

- High pneumatic capacity
- Integrated limit switches
- Position transmitter
- U/I converter to support binary control

## Product reliability

- Designed to operate in harsh environmental conditions
- Vibration and impact tolerant
- IP66 enclosure
- Protected against humidity
- Rugged modular design
- Excellent temperature characteristics
- Maintenance free operation
- Wear resistant and sealed components
- Contactless position measurement

## Designed to switch

- Several pre-selected opening and closing profiles
  - Opening and closing can be configured separately
  - Freely adjustable stroking time
- Minimised pressure impacts in piping
- Excellent speed control performance
- Highly reliable pneumatics unit
- Wide pneumatics capacity

**Bulletin reference:** [7SG20](#)

## Technical specifications



General	Electronics
<p>Loop powered, no external power supply required. Suitable for rotary and linear valves. Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.</p> <p><b>Action:</b> Double or single acting <b>Travel range:</b> Linear: 10 – 120 mm Rotary: 45 – 95° Measurement range 110° with freely rotating feedback shaft</p>	<p><b>Supply power:</b> Loop powered, 4 – 20 mA <b>Minimum signal:</b> 3.6 mA <b>Current max:</b> 120 mA <b>Load voltage:</b> Up to 9.7 V DC / 20 mA (corresponding 485 Ω.) <b>Voltage:</b> Max. 30 V DC <b>Polarity protection:</b> -30 V DC <b>Over current protection:</b> Active over 35 mA</p>
Environmental influence	Position transmitter (optional)
<p><b>Standard temperature range:</b> -40 to +85 °C / -40 to +185 °F</p>	<p><b>Output signal:</b> 4 – 20 mA (galvanic isolation; 600 V DC) <b>Supply voltage:</b> 12 – 30 V DC <b>Resolution:</b> 16 bit / 0.244 μA <b>Linearity:</b> &lt; 0.05% FS <b>Temperature effect:</b> &lt; 0.35% FS <b>External load:</b> Max 0 – 780 Ω, max 0 – 690 Ω for intrinsically safe</p>
Enclosure	
<p><b>SG9200:</b> Anodised aluminum alloy and tempered glass <b>SG9300:</b> Stainless steel <b>Protection class:</b> IP66 <b>Pneumatic ports:</b> SG921_ ¼ NPT SG9235 ½ NPT, SG9237 1 NPT (½ NPT supply) <b>Conduit entry thread:</b> M20 x 1.5 <b>Weight:</b> SG921_ 3.0 kg / 6.6 lbs, SG9235 4.6 kg / 10.1 lbs, SG9237 5.0 kg / 11 lbs Limit switches +1.0 kg / 2.2 lbs Mechanical and digital position indicator visible through the main cover.</p>	
Pneumatics	
<p><b>Supply pressure:</b> 3 – 8 bar / 44 – 116 psi <b>Air quality:</b> According to ISO 8573-1:2001 <b>Solid particles:</b> Class 7 <b>Humidity:</b> Class 1 (dew point 10 °C / 18 °F below minimum temperature is recommended) <b>Oil class:</b> 3 (or &lt; 1 ppm) <b>Capacity with 4 bar / 60 psi supply:</b> SG9212 7 Nm³/h / 4.1 scfm (Cv = 0.06) SG9215 90 Nm³/h / 53 scfm (Cv = 0.7) SG9235 380 Nm³/h / 223 scfm (Cv = 3.2) SG9237 feed 380 Nm³/h / 223 scfm (Cv = 3.2) exhaust 700 Nm³/h / 412 scfm (Cv = 6.4) <b>Consumption with 4 bar / 60 psi supply:</b> Actuator pressurized 0.22 Nm³/h / 0.13 scfm Actuator vented 0.25 Nm³/h / 0.15 scfm</p>	

# Stonel Axiom



The Axiom™ provides advanced monitoring and control in explosionproof, non-incendive, intrinsically safe and general-purpose applications. It is a discrete on/off valve controller with proximity switches for quarter-turn automated valves. Its rugged construction will withstand the most challenging plant environments.

### Advanced performance

The Axiom features a non-contact continuous position sensing system which eliminates shafts, bushings, and wear parts prone to failure. It also has an o-ring sealed pneumatic valve spool with pilot that is tolerant of contaminants found in most process plant air systems. The result is consistent reliable performance over the life of the automated valve system. Valve communication models feature optional Stonel Wireless Link capabilities reducing setup time, improving plant safety and displaying valve diagnostics. Devices communicate wirelessly via *Bluetooth*® technology from up to 50 meters to standard iPhone or iPad app.

### Wide variety of functions offer exceptional value

Select from standard SST sensors for conventional switching, Namur sensors for intrinsically safe applications or communication options including AS-Interface and DeviceNet. Maintenance costs may be reduced by using the diagnostic systems available with Stonel Wireless Link.

### Corrosion-resistant

The Axiom (AN) series features an anodized epoxy-coated aluminum housing with a polycarbonate cover to withstand corrosive process environments. The polycarbonate cover may also be optionally fusion coated for organic solvents. The explosionproof Axiom (ANX) series is available with either an epoxy coated anodized aluminum or a stainless steel enclosure and cover.

### Key features

- Corrosion proof, temporarily submersible and suitable for use in hazardous areas
- Designed for non-incendive and intrinsically safe (AN) or explosion proof (AX) areas
- High-strength durable enclosure and pneumatic manifold constructed of epoxy coated anodized aluminum or stainless steel
- Impact resistant cover made of high strength polycarbonate, aluminum or stainless steel
- High visibility mechanical and electronic indication of open/closed position and solenoid status for safety and convenience
- Universal voltage solenoid system operates on less than 0.6 W of power (standard version accepts either 24 VDC, 120 VAC or 250 VAC), reducing stocking requirements
- Electronic components sealed and potted inside function module for residual moisture, vibration and corrosives protection
- High accuracy position sensor system is solid state with no moving wear points for highly reliable position feedback
- Push button set points accurately lock in position settings, remaining locked in even when power is removed and reapplied
- Large capacity integral pneumatic valve operates on standard plant air and cycles most actuators in less than two seconds
- Quick and convenient wiring and maintenance access for easy set-up and installation
- Internal manual pneumatic valve override as standard enables local valve operation
- Standard 5/2 (five-way, two-position) valve operates double and single-acting actuators
- Standard 5/2 valve features a re-breather to feed instrument air into actuator to keep out corrosives
- Directly attaches to VDI/VDE 3845 (Namur) actuators using a compact mounting manifold system (sold separately)
- Stonel Wireless Link reduces set-up time and provides easy access to monitoring, control and diagnostics from up to 50 meters with standard iPhone/iPad app

**Bulletin reference:** [7AN21ST](#), [7STWL70](#)

General	Materials of construction
<p><b>Pneumatic valves</b>  <b>Valve design:</b> Pilot operated spool valve  <b>Pilot operator options:</b> Solenoid coil</p> <p><b>Configuration</b>  <b>Single pilot:</b> 5-way, 2-position spring return  <b>Dual pilot:</b> Shuttle piston, 5-way, 2-position  <b>Flow rating:</b> 0.80 Cv or 1.2 Cv                      Axiom porting: ¼" NPT 0.80 Cv; 3/8" NPT 1.2 Cv                      Manifold porting: ¼" NPT</p> <p><b>Operating pressure:</b>                      45 psi to 120 psi                      (3.1 to 8.2 bar)</p> <p><b>Filtration requirements:</b> 50 micron  <b>Operating life:</b> 1 million cycles  <b>Manual override:</b>                      Internal momentary standard                      External momentary available                      External latching device available</p>	<p><b>Housing &amp; mounting manifold:</b>                      Epoxy coated anodized aluminum or 316 stainless steel  <b>Cover:</b> Polycarbonate, epoxy coated anodized aluminum or 316 stainless steel  <b>Visual indicator:</b> Polycarbonate  <b>Fasteners &amp; mounting:</b> Stainless steel</p>
	<h3>Ratings</h3>
<h3>Pneumatic valve (AN / ANX)</h3> <p><b>Operating temperature:</b>                      -40 to 80° C (-40 to 176° F)</p> <p><b>Operating voltage:</b>                      35 option: 20 – 250 VAC; 20–55 VDC                      45 option: 18 - 28 VDC                      92 and 97 option: 24 VDC</p> <p><b>Power consumption:</b>                      35 option: 12 mA @ 20 - 250 VAC (1.0 watts typical)                      20 mA @ 20 - 55 VDC (0.5 watts typical)                      45 option: 0.3 watts @ 18 - 28 VDC                      92 and 97 option: 0.5 watts @ 24 VDC</p>	<p><b>Explosionproof</b> Ex d or Class I and II, Div. 1: All ANX models  <b>Nonincendive</b> Class I and II, Div. 2: All models  <b>Intrinsically safe</b> Ex ia Zone 0; Class I and II, Div. 1: Function 45S only  <b>Enclosure protection</b>                      Type 4, 4X and 6: All models                      Ingress Protection 66, 67 and 69K: All models</p>
<h3>Function options (AN/ANX)</h3>	
<p><b>Switches/Sensors</b>                      35S SST Universal; 20 – 250 volt (NO sensor)                      45S NAMUR module (EN 60947-5-6; I.S.)</p> <p><b>Valve Communication Terminal</b>                      92S DeviceNet™                      92W DeviceNet™ with Wireless Link                      96S AS-Interface                      97W AS-Interface with extended addressing and Wireless Link</p>	

# Neles VG9000 intelligent safety solenoid



Neles™ ValvGuard™ VG9000 is an intelligent safety solenoid and partial stroke test device for emergency shutdown (ESD) or emergency venting (ESV) valves.

The ValvGuard™ VG9000's unique and advanced functions and features are specially designed to meet ESD application requirements. Together with HART or FOUNDATION Fieldbus communication it offers unbeatable value for end users with increased efficiency, reliability and safety.

The VG9000 is IEC 61508 compliant up to SIL 3. Based on the automatic partial stroke testing (PST) and other diagnostics data, VG9000 increases safety and plant safety targets can be reached more economically than with traditional solutions. Also, unnecessary and expensive manual testing can be avoided. VG9000 is capable of recording emergency trips with graph and key figures related to it.

The availability of the safety valves is maximized through unique diagnostics features, directly integrated into device functionality. Diagnostic information is presented in easily understandable form by using graphical user interface.

## Key features

- Valve and self tests
  - Partial stroke test (automatic or manual)
  - Self test for internal electronics and pneumatics
  - Emergency trip test
- High pneumatic capacity eliminates the need of additional instrumentation in most cases
- Device is powered during the trip and can collect diagnostics information
- Easy of use
- Local / remote operation
- Advanced device diagnostics including
  - Self-diagnostics
  - Online diagnostics
  - Performance diagnostics
- HART (6/7) and FOUNDATION Fieldbus communication options
- Wide range of hazardous area approval

## Easy installation and configuration

- Same unit for linear and rotary valves, double and single acting actuators
- Simple fast calibration and configuration
  - guided start-up using Local User Interface (LUI)
  - using Distributed Control System (DCS) asset management tools
- Extensive selection of mounting kits for 3rd party actuators

## Open solution

- Valmet is committed to delivering products that freely interface with software and hardware from a variety of manufacturers. This open architecture allows the ValvGuard™ to be integrated with other field devices and systems.
- FDT and EDD based multi-vendor support configuration
- Support files for VG9000 are available from our internet page, at [www.valmet.com/flowcontrol/valves/valve-software/](http://www.valmet.com/flowcontrol/valves/valve-software/)

## Options

- Full stainless steel enclosure (VG9300)
- High pneumatic capacity (VG923\_)
- Integrated limit switches
- SIL 2 certified position transmitter
- External junction box for wiring
- Remote Communication Interface RCI9H2 for 24 VDC retrofit installations
- Local Control Panel (LCP9H), also loop-powered version (LCP9HL)
- TÜV Certificate
- Neles ValvGuard VG9000 is TÜV approved to be used in safety applications up to and including Safety Integrity Level 3 (SIL 3).

**Bulletin reference:** [9VG921](#)

## Technical specifications

General	Electronics (input VG9000 HART)
<p>Suitable for rotary and linear valves. Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.</p> <p><b>Action:</b> Double or single acting <b>Travel range:</b> Linear: 10 – 120 mm Rotary: 45 – 95° Measurement range 110° with freely rotating feedback shaft</p>	<p><b>Electrical connections:</b> 0.25 – 2.5 mm<sup>2</sup> <b>Supply power:</b> Loop powered, 4 – 20 mA <b>Signal range:</b> 3.7 – 22 mA <b>Signal details:</b> 0.0 – 3.7 mA (trip state; diagnostics not available) 3.7 – 6.0 mA (trip state; diagnostics available) 6.0 – 16.0 mA (hysteresis range; diagnostics available) 16.0 – 22.0 mA (normal state; diagnostics available) <b>Load voltage:</b> Up to 9.7 V DC / 20 mA corresponding 485 Ω) <b>Voltage:</b> Max 30 V DC <b>Polarity protection:</b> -30 V DC <b>Over current protection:</b> Active over 36 mA</p>
Environmental influence	
<p><b>Standard temperature range:</b> -40 to +85 °C / -40 to +185 °F <b>Influence of temperature on valve position:</b> &lt; 0,5% / 10 °K <b>Influence of vibration on valve position:</b> No effect when measured impulse 2 g 5 – 150 Hz, 1 g 150 – 300 Hz, 0.5 g 300 – 2000 Hz. No effect on PST if max. response 4 g measured at housing. No unintended valve movements if max. response 15 g measured at housing</p>	
Enclosure	Electronics output (VG9000 HART)
<p><b>VG9200:</b> Anodised aluminum alloy and tempered glass <b>VG9300:</b> Stainless steel</p> <p><b>Protection class:</b> IP66, NEMA 4X Mechanical position indicator and LUI visible through the main cover</p> <p><b>Pneumatic ports:</b> VG9_15 ¼ NPT VG9235 ½ NPT VG9237 1 NPT (½ NPT supply) (single acting only) <b>Conduit entry thread:</b> M20 x 1.5 <b>Weight:</b> VG9215 3.0 kg / 6.6 lb VG9235 4.6 kg / 10.1 lb VG9237 5.0 kg / 11 lb VG92_ with extension housing plus 1.0 kg / 2.2 lb</p>	<p><b>Usage:</b> Position transmitter (T) / device status output (S) <b>Electrical connections:</b> 0.25 – 2.5 mm<sup>2</sup> <b>Output signal:</b> Defined by type code option T or S T: 4 – 20 mA = 0 – 100% position S: 4 mA = OK 5 mA = Pneumatics test 6 mA = PST test 7 mA = ETT test 8 mA = Warning 10 mA = Alarm 12 mA = Safety position requested by LCP Fault modes indicated by levels 3.5 and 22 mA Galvanic isolation 600 V DC <b>Supply voltage:</b> 12 – 30 V <b>Resolution:</b> 16 bit / 0.244 µA <b>Linearity:</b> &lt; 0.05% FS <b>Temperature effect:</b> &lt; 0.35% FS</p>
Pneumatics	Safety signal (Binary input of VG9000 FF)
<p><b>Supply pressure:</b> 3.0 – 7.5 bar / 44 – 109 psi <b>Output pressure:</b> 3.0 – 7.5 bar / 44 – 109 psi <b>Air quality:</b> According to ISO 8573-1:2001 <b>Solid particles:</b> Class 6 <b>Humidity:</b> Class 1 (dew point 10 °C / 18 °F below minimum temperature is recommended) <b>Oil class:</b> 3 (or &lt; 1 ppm) <b>Capacity with 4 bar / 60 psi supply:</b> VG9215 90 Nm<sup>3</sup>/h / 53 scfm (Cv = 0.7) VG9235 380 Nm<sup>3</sup>/h / 223 scfm (Cv = 3.2) VG9237 feed 380 Nm<sup>3</sup>/h / 223 scfm (Cv = 3.2) exhaust 700 Nm<sup>3</sup>/h / 412 scfm (Cv = 6.4) <b>Consumption with 4 bar/60 psi supply:</b> Actuator pressurized 0.22 Nm<sup>3</sup>/h / 0.13 scfm Actuator vented 0.25 Nm<sup>3</sup>/h / 0.15 scfm</p>	<p><b>Connections:</b> 24 VDC: '+' and '-' <b>Min voltage:</b> 11 V DC <b>Max output resistance:</b> Ro = 285 Ω</p>
	FOUNDATION Fieldbus function block execution times
	<p>MDO 15 ms MDI 15 ms AI 20 ms</p>
	Electronics (FOUNDATION Fieldbus VG9000F)
	<p><b>Power supply:</b> Taken from bus <b>Bus voltage:</b> 9 to 32 V DC, reverse polarity protection <b>Max basic current:</b> 14.2 mA <b>Operating current:</b> 20.7 mA <b>Fault current (FDE):</b> 6.3 mA</p>

# Neles VG9000\_P partial stroke testing device



Neles™ ValvGuard™ VG9000\_P is a partial stroke test device for emergency shutdown (ESD) or emergency venting (ESV) valves with HART communication.

The ValvGuard™ VG9000\_P's unique and advanced functions and features are specially designed to meet ESD application requirements. Together with HART communication it offers unbeatable value for end users with increased efficiency, reliability and safety.

The ValvGuard VG9000\_P is used only for partial stroke testing and an additional solenoid valve is used for controlling the fail-safe action. VG9000\_P partial stroke test device provides excellent protection against the spurious trips. Even an electric failure or a cable break does not create an unwanted trip as the valve remains in the normal position even when ValvGuard is de-energized. ValvGuard VG9000\_P is available with HART communication and the device is powered by analog 4 to 20 mA signal. VG9000\_P will give additional security against unauthorized usage by disabling all the testing, if input signal from the DCS is below 8 mA and also prevents an accidental calibration, if the signal is below 12 mA.

## Key features

- Valve and self tests
  - Partial stroke test (automatic or manual)
  - Self test for pneumatics
- High pneumatic capacity eliminates the need of additional instrumentation in most cases
- Device is powered during the trip and can collect diagnostics information
- Easy of use
- Local / remote operation
- Advanced device diagnostics including
  - Self-diagnostics
  - Online diagnostics
  - Performance diagnostics
- HART 6/7 communication
- Wide range of hazardous area approvals

## Easy installation and configuration

- Same unit for linear and rotary valves, double and single acting actuators

- Simple fast calibration and configuration
  - guided start-up using Local User Interface (LUI)
  - using Distributed Control System (DCS) asset management tools
- Extensive selection of mounting kits for 3rd party actuators

## Open solution

- Valmet is committed to delivering products that freely interface with software and hardware from a variety of manufacturers. This open architecture allows the ValvGuard to be integrated with other field devices and systems.
- FDT and EDD based multi-vendor support configuration
- Support files for VG9000 are available from our internet page, at [www.valmet.com/flowcontrol/valves/valve-software/](http://www.valmet.com/flowcontrol/valves/valve-software/)

## Options

- Full stainless steel enclosure (VG9300)
- High pneumatic capacity (VG923\_)
- Integrated limit switches
- SIL 2 certified position transmitter
- External junction box for wiring
- Local Control Panel (LCP9H), also loop-powered version (LCP9HL)

## TÜV Certificate

- The ValvGuard VG9000 is TÜV approved to be used in safety applications up to and including Safety Integrity Level 3 (SIL 3).
- VG9000H\_P does not adversely affect the safety function of a connected ESD solenoid valve. It can therefore be used in safety related systems to enable partial stroke testing to improve the diagnostics coverage (DC).

**Bulletin reference:** [9VG921](#)

## Technical specifications

General	Electronics input
<p>Suitable for rotary and linear valves. Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.</p> <p><b>Action:</b> Double or single acting <b>Travel range:</b> Linear: 10 – 120 mm Rotary: 45 – 95° Measurement range 110° with freely rotating feedback shaft</p>	<p><b>Electrical connections:</b> 0.25 – 2.5 mm<sup>2</sup> <b>Supply power:</b> Loop powered, 4 – 20 mA <b>Signal range:</b> 3.7 – 22 mA <b>Signal details:</b> 0.0 – 3.7 mA (de-energized state; diagnostics not available) 3.7 – 6.0 mA (normal state; diagnostics available) 6.0 – 8.0 mA (normal state; PST and diagnostics available) 8.0 – 22.0 mA (normal state; PST, calibration and diagnostics available) <b>Load voltage:</b> Up to 9.7 V DC / 20 mA corresponding 485 Ω) <b>Voltage:</b> Max 30 V DC <b>Polarity protection:</b> -30 V DC <b>Over current protection:</b> Active over 36 mA</p>
Environmental influence	
<p><b>Standard temperature range:</b> -40 to +85 °C / -40 to +185 °F <b>Influence of temperature on valve position:</b> &lt; 0,5% / 10 °K <b>Influence of vibration on valve position:</b> No effect when measured impulse 2 g 5 – 150 Hz, 1 g 150 – 300 Hz, 0.5 g 300 – 2000 Hz. No effect on PST if max. response 4 g measured at housing. No unintended valve movements if max. response 15 g measured at housing</p>	
Enclosure	Electronics output
<p><b>VG9200:</b> Anodised aluminum alloy and tempered glass <b>VG9300:</b> Stainless steel</p> <p><b>Protection class:</b> IP66, NEMA 4X Mechanical position indicator and LUI visible through the main cover</p> <p><b>Pneumatic ports:</b> VG9_15 ¼ NPT VG9235 ½ NPT</p> <p><b>Conduit entry thread:</b> M20 x 1.5 <b>Weight:</b> VG9215 3.0 kg / 6.6 lb, VG9235 4.6 kg / 10.1 lb, VG9237 5.0 kg / 11 lb, VG92_ with extension housing plus 1.0 kg / 2.2 lb</p>	<p><b>Usage:</b> Position transmitter (T) / device status output (S) <b>Electrical connections:</b> 0.25 – 2.5 mm<sup>2</sup> <b>Output signal:</b> Defined by type code option T or S T: 4 – 20 mA = 0 – 100% position S: 4 mA = OK 5 mA = Pneumatics test 6 mA = PST test 7 mA = ETT test 8 mA = Warning 10 mA = Alarm Fault modes indicated by levels 3.5 and 22 mA Galvanic isolation 600 V DC <b>Supply voltage:</b> 12 – 30 V <b>Resolution:</b> 16 bit / 0.244 µA <b>Linearity:</b> &lt; 0.05% FS <b>Temperature effect:</b> &lt; 0.35% FS</p>
Pneumatics	
<p><b>Supply pressure:</b> 3.0 – 7.5 bar / 44 – 109 psi <b>Output pressure:</b> 3.0 – 7.5 bar / 44 – 109 psi <b>Air quality:</b> According to ISO 8573-1:2001 <b>Solid particles:</b> Class 6 <b>Humidity:</b> Class 1 (dew point 10 °C / 18 °F below minimum temperature is recommended) <b>Oil class:</b> 3 (or &lt; 1 ppm) <b>Capacity with 4 bar / 60 psi supply:</b> VG9215 90 Nm<sup>3</sup>/h / 53 scfm (Cv = 0.7) VG9235 380 Nm<sup>3</sup>/h / 223 scfm (Cv = 3.2) <b>Consumption with 4 bar/60 psi supply:</b> 0.25 Nm<sup>3</sup>/h / 0.15 scfm</p>	

# Stonel Quartz

The Quartz™-series is durable, corrosion resistant, and versatile, making it ideal for most of your process valve monitoring requirements. The Quartz is available in explosionproof (QX), nonincendive, intrinsically safe (QN), low temperature (QC), and general purpose (QG) versions.



## Enclosures optimized for environment

The robust epoxy-coated anodized aluminum construction makes this platform extremely durable and well-suited for use in corrosive, heavy washdown environments. A broad range of switching, position transmitter and communication options may be selected to accommodate most applications. This versatile platform adapts to a wide variety of valve systems. Attach the Quartz to quarter-turn actuators, manual operators, linear operators and positioners using readily available mounting systems.



**QX/QC:** Explosionproof, water tight and corrosion-resistant enclosure is approved for use in Div.1/Zone 1 hazardous areas. Available in epoxy-coated, anodized aluminum or stainless steel.



**QN:** Nonincendive is approved for Div. 2/Zone 2 hazardous environments with proximity sensors using a clear cover. Intrinsically safe Namur sensors or passive switches are available for Div. 1/Zone 0 applications.



**QG:** General purpose features a clear polycarbonate cover with mechanical switches.

## Key features

- Enclosures optimized for environment
  - Available in three enclosure styles
- Rapid enclosure access
  - Screw-on cover allows quick enclosure access, saving you valuable maintenance and set-up time. The cover provides a vapor tight seal
- Faster wiring
  - Pre-wired and labeled terminal strip enables quick, convenient attachment of field wires
- Wide variety of switching & communication
  - Switching options include dual module sensors and communication, Maxx-Guard proximity switches, and mechanical switches. Continuous signal output is available in a 4 to 20 mA position transmitter.
- Quick set cams are easy to adjust
  - Touch and tune switch settings allow you to make adjustments in seconds without the use of tools
- Dual shaft o-ring seals eliminate corrosion
  - Top inner and bottom outer shaft o-rings seal the drive bushing from both external corrosives and internal contaminants that enter the enclosure
- Special drive bushing assures long cycle life
  - The oil impregnated bronze bushing maintains smooth operation and eliminates the potential for shaft seizure due to actuator shaft eccentricity.
- Space saving visual indication
  - Visual indicator offers excellent viewability without sacrificing accessibility or adding to space requirements. Indicators are also available with continuous percentage or three-way indication.

**Bulletin reference:** [7QZ22](#)

<p><b>Materials of construction</b></p>	<p><b>Maxx-Guard proximity switch Single-Pole Single-Throw (SPST)</b></p>
<p><b>Housing &amp; aluminum cover:</b> Epoxycoated anodized marine grade aluminum or stainless steel as option  <b>Clear cover &amp; indicator:</b> Polycarbonate, Elastomer seals Buna-N; optional EPDM  <b>Drive shaft:</b> Stainless steel  <b>Drive bushing:</b> Bronze, oil impregnated  <b>Fasteners:</b> Stainless steel</p>	<p><b>J switch</b>  <b>Configuration:</b> SPST; passive (intrinsically safe)  <b>Electrical ratings:</b> 0.10 amp @ 10 to 30 VDC  <b>Maximum voltage drop:</b> 0.1 volts @ 10 mA, 0.5 volts @ 100 mA  <b>Contact composition:</b> Ruthenium</p> <p><b>P switch</b>  <b>Configuration:</b> SPST NO  <b>Electrical ratings:</b> 0.15 amp @ 30 VDC/125 VAC  <b>Maximum voltage drop:</b> 0.1 volts @10 mA, 0.5 volts @ 100 mA  <b>Contact composition:</b> Ruthenium</p>
<p><b>Temperature ratings</b></p>	<p><b>Maxx-Guard proximity switch Single-Pole Double-Throw (SPDT)</b></p>
<p><b>Mechanical components:</b> -40 to 80 °C  <b>Dual modules:</b> -40 to 80 °C  <b>Maxx-Guard &amp; SST:</b> -40 to 80 °C  <b>QC models:</b> -55 to 80 °C</p>	<p><b>G switch</b>  <b>Configuration:</b> SPDT  <b>Electrical ratings:</b> 0.30 amp @ 24 VDC, 0.20 amp @ 120 VAC  <b>Maximum voltage drop:</b> 0.1 volts @ 10 mA, 0.5 volts @ 100 mA  <b>Contact composition:</b> Rhodium</p>
<p><b>Mechanical switch (SPDT), (_V, _W)</b></p>	<p><b>H switch</b>  <b>Configuration:</b> SPDT  <b>Electrical ratings:</b> 240 VAC max; 3 A max., 100 W max.; 2.0 W min.  <b>Maximum voltage drop:</b> 0.1 volts @ 10 mA, 0.5 volts @ 100 mA  <b>Contact composition:</b> Tungsten</p>
<p><b>Silver contacts (_V switch)</b>  <b>Electrical ratings:</b> 10 amp @ 125/250 VAC 0.5 amp @ 125 VDC  <b>Operating life:</b> 400,000 cycles          Not recommended for electrical circuits operating at less than 20 mA @ 24 VDC</p> <p><b>Gold contacts (_W switch)</b>  <b>Electrical ratings:</b> 1 amp @ 125 VAC, 0.5 amp @ 30 VDC  <b>Operating life:</b> 100,000 cycles</p>	<p><b>M switch</b>  <b>Configuration:</b> SPDT; passive (intrinsically safe)  <b>Electrical ratings:</b> 0.10 amp @ 10 to 30 VDC  <b>Maximum voltage drop:</b> 0.1 volts @ 10 mA, 0.5 volts @ 100 mA  <b>Contact composition:</b> Rhodium</p>
<p><b>Mechanical switch (DPDT) (14)</b></p>	<p><b>S switch</b>  <b>Electrical ratings:</b> 0.1 amp @ 24 VDC 0.1 amp @ 120 VAC  <b>Maximum voltage drop:</b> 3.5 volts @ 10 mA, 6.5 volts @ 100 mA  <b>Contact composition:</b> Rhodium</p>
<p><b>Electrical ratings:</b> 4.5 amp @ 125/250 VAC, 24 to 125 VDC</p>	
<p><b>SST switching sensors (35)</b></p>	<p><b>Valve Communication Terminal (VCT)</b></p>
<p><b>Configuration:</b> (2) SST solid state sensors          Wire terminations for one or two solenoids  <b>Operation:</b> Normally open (NO)  <b>Maximum current inrush:</b> 1.0 amp @ 125 VAC/VDC  <b>Maximum continuous current:</b> 0.1 amp @ 125 VAC/VDC  <b>Minimum on current:</b> 0.5 mA  <b>Maximum leakage current:</b> 0.25 mA (AC), 0.15 mA (DC)  <b>Voltage range:</b> 20 to 250 VAC, 8 to 250 VDC  <b>Maximum voltage drop:</b> 6.5 volts @ 10 mA, 7.2 volts @ 100 mA</p>	<p><b>AS-Interface (96)</b> Configuration (2) discrete sensor inputs (2) auxiliary discrete inputs (2) power outputs (solenoids)  <b>AS-Interface with extended addressing (97)</b> Configuration (2) discrete sensor inputs (2) auxiliary discrete inputs (1) power output (solenoid)  <b>DeviceNet (92)</b> Configuration (2) discrete inputs (open and closed) (2) power outputs (solenoids) (1) 4 – 20 mA auxiliary analog input, 10-bit resolution; no additional power source required</p>
<p><b>Namur sensors (45)</b></p>	<p><b>SST switching sensors (_X)</b></p>
<p><b>Configuration:</b> (2) Namur sensors (EN 60947-5-6)          Wire terminations for one or two solenoids  <b>Voltage range:</b> 5 to 25 VDC  <b>Current ratings:</b> Target on I &lt; 1 mA, Target off I &gt; 3 mA</p>	<p><b>Operation:</b> NO/NC (cam selectable)  <b>Maximum current inrush:</b> 1.0 A @ 125 VAC/VDC  <b>Maximum continuous current:</b> 0.1 A @ 125 VAC/VDC  <b>Minimum on current:</b> 2.0 mA  <b>Leakage current:</b> Less than 0.50 mA  <b>Voltage range:</b> 8 to 125 VDC, 24 to 125 VAC  <b>Maximum voltage drop:</b> 6.5 volts @ 10 mA, 7.5 volts @ 100 mA</p>
<p><b>Position transmitter (5_, 7_, T_)</b></p>	
<p><b>Output:</b> Two-wire 4 to 20 mA  <b>Supply source:</b> 10 – 40 VDC  <b>Span range:</b> (5, 7) 35° to 270° (adjustable); (T) 35° to 320° (adjustable)  <b>Maximum loading:</b> 700 ohms @ 24 VDC  <b>Linearity error:</b> Standard (5) +/-0.85° maximum          High performance (7) and Digital (T) +/-0.35°</p>	

# Stonel Eclipse EC

Stonel Eclipse features dual solid state sensors with optional communications neatly integrated into a sealed module. The function module and trigger/indicator attach quickly and conveniently to standard VDI/VDE 3845 (NAMUR) actuator accessory mounting pads. The Eclipse EC series is compact and available for hazardous areas.



### Compact valve with integral wire termination area

- Rapid enclosure entry for convenient access to wiring
- Easy commissioning and configuration
- Withstands high-pressure washdowns and typical process environment corrosives
- Wireless Link app for commissioning and diagnostics



### Advanced notification diagnostics

The Eclipse EC with IO-Link features advanced diagnostics that minimizes failure risks, optimizes maintenance and scheduling, and reduces effort needed for troubleshooting.

- Easily change diagnostic settings using the advanced configuration feature in the Stonel Wireless Link app
- Enable alarm conditions to generate an event on the IO-Link network
- Experience faster commissioning with the simple 3-wire sensor connection
- Automatically adjust circuits accordingly with device's patented auto-detection feature for PNP/NPN input and outputs (I/O) to PLC

### Key features

- Red/green visual indicator boldly displays valve status, and coordinates with red/green LEDs.
- Direct attachment to ISO/NAMUR mounting pads with simple mounting kit (sold separately).
- High intensity red and green LEDs indicate electronic switch status to confirm electrical operation.
- Sensor settings on touch pad enable position settings to be conveniently locked in. Switch settings are retained even after power is removed.
- Submersible and capable of high pressure washdown, Eclipse sensors and electronics are fully sealed to eliminate hazard threat and corrosion problems.
- Extremely compact, rugged enclosure integrates position sensors, communication, electronics, and power outputs for solenoids.
- All mechanical parts are made of polycarbonate or stainless steel for corrosion resistance and durability.

**Bulletin reference:** [7EC20ST](#), [7STWL70](#)

## Technical specifications



Materials of construction	Function options
<p><b>Housing</b> Polycarbonate  <b>Drum components</b> Polycarbonate  <b>Fasteners</b> Stainless steel  <b>Triggers and coupling</b> Stainless steel  <b>Quick connectors</b> Stainless steel</p>	<p><b>Switches/sensors</b>            30S, 30W 3-wire DC solid state sensing with IO-Link            34S, 35S 2-wire AC/DC solid state sensing (20 - 250 volt)            45S NAMUR sensors (EN 60947-5-6; I.S.)</p>
Ratings	<p><b>Valve communication terminals</b>            96 AS-Interface            97S AS-Interface with extended addressing            97W AS-Interface with extended addressing and Wireless Link</p>
<p><b>Nonincendive</b> Class I and II, Div. 2: All EC models  <b>Intrinsically safe</b> Ex ia, Zone 0 or Class I and II, Div. 1: EC45  <b>Enclosure protection</b> Type 4, 4X and 6: All models            Ingress Protection 67: All models</p>	
Temperature range	
-40° C to 80° C (-40° F to 176° F)	

# Stonel Eclipse EN/EG

The Eclipse™ EN and EG series features dual solid state sensors with optional communications neatly integrated into a sealed module. The function module and trigger/indicator attach quickly and conveniently to standard VDI/ VDE 3845 (Namur) actuator accessory mounting pads.

## Safety for hazardous environments



**EN: Nonincendive or intrinsically safe with integral wire termination**

- Rated for Type 4, 4X, 6 / IP67
- Additional termination points and dual conduit entries eliminate junction boxes for solenoid valve termination
- Convenient wiring compartment and pre-labeled terminal strip enables rapid installation



**EG: General purpose with convenient micro-connector wiring**

- Available with additional built-in connector for solenoid termination
- Micro-connectors with potted and sealed enclosure eliminate any threat of moisture contamination in wiring
- Electronic module integrated permanently into enclosure

## Key features

- No moving mating parts assure long life and trouble-free operation
- Red/green visual indicator boldly displays valve status
- Direct attachment to ISO/Namur mounting pads with simple mounting kit (sold separately)
- High intensity red and green LEDs indicate electronic switch status to confirm electrical operation
- Sensor triggers are adjustable in 3.5 degree increments through 360 degrees for precision and flexibility
- Submersible and capable of high pressure washdown, Eclipse sensors and electronics are fully sealed
- Extremely compact, rugged enclosure integrates position sensors, communication, electronics, and power outputs for solenoids
- All mechanical parts are made of polycarbonate or stainless steel for corrosion resistance and durability

**Bulletin reference:** [7ECL21](#)

## Technical specifications



DeviceNet

Materials of construction	Switching and sensor specifications
<p><b>Housing:</b> Polycarbonate Drum components polycarbonate <b>Fasteners:</b> Stainless steel <b>Triggers and coupling:</b> Stainless steel <b>Quick connectors:</b> Stainless steel</p>	<p><b>SST switching sensors (33, 34)</b> <b>Configuration (2)</b> SST Solid State Sensors (2) Wire terminations for one solenoid <b>Operation:</b> Select either NO (33) or NC (34) <b>Maximum current inrush:</b> 1.0 amp @ 125 VAC/VDC <b>Maximum current continuous:</b> 0.1 amp @ 125 VAC/VDC <b>Minimum on current:</b> 2.0 mA <b>Maximum leakage current:</b> 0.5 mA <b>Voltage range:</b> 8 to 125 VDC, 24 to 125 VAC <b>Maximum voltage drop:</b> 6.5 volts @ 10 mA, 7.5 volts @ 100 mA</p> <p><b>Namur sensors (44)</b> <b>Configuration (2)</b> Namur sensors (EN 60947-5-6; I.S.) (2) Wire terminations for one solenoid <b>Voltage range:</b> 6 to 29 VDC <b>Current ratings:</b> Target on I &lt; 1 mA, Target off I &gt; 3 mA</p>
Valve communication terminals	
<p>DeviceNet (92) AS-Interface (96) AS-Interface with extended addressing (97)</p>	
Temperature range	
-40 to 80 °C (-40 to 176 °F)	

# Neles Easyflow K-series

The K-series features versatile limit switches for quarter turn actuators and valve assemblies. With the K-series limit switches our customers receive reliable information of the limits of desired rotary travel set by the customer.

## Key features

- K-series limit switches can be mounted on top of virtually any rotary actuator - VDI/VDE 3845 mounting face
- Compact size makes K-series easy to fit even in tight spaces
- Suitable even for the most harsh weather conditions with three different housing material options and IP67/IP68 ingress protection class as standard
- Switching elements can be chosen between mechanical, inductive and Reed type switches
- SOV termination provided inside the limit switch box (with mechanical switches)

**Bulletin reference:** [S100-1](#)



## Technical specifications

Construction details and materials	Switching and sensor specifications
<p><b>Enclosure material:</b></p> <ul style="list-style-type: none"> <li>• Epoxy powder coated, low copper die cast aluminum (LM6)</li> <li>• Stainless steel (CF8M, equivalent to AISI316)</li> <li>• Polycarbonate (LEXAN 3412R) (only for KC-series)</li> </ul> <p><b>Visual indicator dome:</b> Shatterproof polycarbonate</p> <p><b>Sealings:</b> NBR, Silicon, Flouro silicon and Viton</p> <p><b>Screws:</b> AISI 304</p> <p><b>Shaft:</b> AISI 304/AISI 316 (SS enclosure)</p> <p><b>Protection class:</b> IP67 and IP68 according to DIN EN 60529</p> <p><b>Cable entries:</b></p> <p>K5-series: 2 x M20 or 2 x ½ NPT</p> <p>KC-series: 3 x M20 or 3 x ½ NPT</p> <p><b>Weight:</b></p> <p>K5-series: Die cast aluminum 1.7 kg / 3.8 lbs, stainless steel 4.5 kg / 9.9 lbs</p> <p>KC-series: Die cast aluminum 0.7 kg / 1.6 lbs, stainless steel 2.5 kg / 5.5 lbs, polycarbonate 0.6 kg / 1.3 lbs</p>	<p><b>Mechanical limit switch (V1)</b>  <b>Honeywell V15S05-CZ100A05-01, SPDT type</b></p> <p><b>Electrical values:</b></p> <p>5 A, 125 V AC or 250 V AC</p> <p>100 mA, 48 V DC</p> <p>30 mA, 250 V DC</p> <p><b>Temperature range:</b> -20 to +80 °C</p> <p><b>Inductive proximity switch (A1)</b>  <b>P+F NJ2-12GM-N 2-wire type, Namur NC</b></p> <p><b>Supply voltage:</b> nominal 8 VDC (Ri = approx. 1 kOhm)</p> <p><b>Output current:</b></p> <p>Active face free: &gt; 3 mA</p> <p>Active face covered: &lt; 1 mA</p> <p><b>Nominal sensing range:</b> 2 mm</p> <p><b>Temperature range:</b> -20 to +80 °C</p>

# Stonel Prism

The Prism™, designed for corrosive process environments, attaches directly to sanitary diaphragm and angle valves. This rugged, feature-rich platform offers a full array of network communications and switching options, as well as discrete integral pneumatic control for single-acting valve actuator operation.



## Key features

- The Prism may be washed down and temporarily submersed with no adverse affects
- Enclosure features high strength polycarbonate with excellent corrosion-resistance and exceptional temperature stability
- Visual electronic and mechanical position indication
- Solid state proximity sensors monitor open and closed
- Integral pneumatic valve is isolated from environmental contamination, offers high tolerance to dirty air and enables rapid valve operation
- Solenoid options available for 120 VAC and 24 VDC
- Self-adjusting triggering system provides consistent open and closed indication even with diaphragm compression. No resetting is required.

- Manual override enables valve operation without electrically energizing
- Dual module system seals all position sensing, communication and control electronics in a compact vibration proof package
- Water proof quick connectors, compression fittings or conduit connections are available for convenient, reliable attachment to plant electrical systems.
- Stonel Wireless Link, available in AS-Interface and DeviceNet models, reduces set-up time and provides easy access to monitoring, control and diagnostics from up to 50 meters with standard iPhone/iPad app

**Bulletin reference:** [7PI21](#), [7STWL70](#)

## Technical specifications

General pneumatic	Ratings
<p><b>Configuration:</b> 3-way, 2-position, spring return  <b>Porting:</b> 1/8" NPT all pressurized ports.  <b>Flow ratings:</b> 0.10 to 0.20 Cv</p>	<p><b>Nonincendive</b> Zone 2 or Class I and II, Div. 2: All models  <b>Intrinsically safe:</b> Ex ia, Zone 0 or Class I and II, Div. 1: Function 45  <b>Enclosure protection:</b> Type 4, 4X and 6: All models                      Ingress Protection 66, 67 and 69K: All models</p>
Solenoid valve	Switching and sensor specifications
<p><b>Filtration requirements:</b> 40 micron  <b>Operating temperature:</b> -10 to 50 °C</p>	<p><b>SST switching sensors (33)</b>  <b>Configuration:</b> (2) SST solid state sensors                      (2) Wire terminations for one solenoid  <b>Operation:</b> Select NO (33)  <b>Maximum current inrush:</b> 1.0 amps @ 125 VAC/VDC  <b>Maximum current continuous:</b> 0.1 amps @ 125 VAC/VDC  <b>Minimum on current:</b> 2.0 mA  <b>Maximum leakage current:</b> 0.5 mA  <b>Voltage range:</b> 20 to 125 VAC/VDC  <b>Maximum voltage drop:</b> 6.5 volts @ 10 mA, 7.5 volts @ 100 mA</p>
Materials of construction	
<p><b>Housing and cover:</b> Polycarbonate  <b>Fasteners:</b> Stainless steel  <b>Trigger system (magnetic):</b> Polysulfone  <b>Shaft:</b> Stainless steel  <b>Valve manifold:</b> Integral with stainless steel reinforced NPT  <b>Operating life:</b> Over 1 million cycles</p>	
Valve Communication Terminals	
<p>DeviceNet (92)                      AS-Interface (96)                      AS-Interface with extended addressing (97)</p>	<p><b>Namur sensors (45)</b>  <b>Configuration:</b> (2) Namur sensors (EN 60947-5-6; I.S.)  <b>Voltage range:</b> 7 to 24 VDC  <b>Current ratings:</b> Target on I &lt; 1 mA, Target off I &gt; 3 mA</p>

# Stonel Hawkeye HK



The solid state Hawkeye™ sensor is ideal for point sensing in corrosive and hazardous process environments. The standard red/green LEDs also speed your setup and installation by confirming power up and switch status.

## Easy installation

Each pair (red and green) of Hawkeye sensors is tuned to operate independently in either long stroke or short stroke applications down to 6 mm [¼ inch]. The Hawkeye may be triggered by existing valve hardware eliminating costly magnets and triggering systems and cutting installation time.

## Key features

- Sensing head triggers on any metal. Inductive sensing technology detects metal targets at distances up to 4 – 6 mm, depending on target material.
- Stainless steel body is rugged and corrosion proof. Hawkeye sensors are machined from 316 stainless steel.

- Stainless steel washers and fasteners secure Hawkeye permanently to mount.
- Circuit is conformally coated and potted. Hawkeye sensor may be temporarily submersed and electronics are shock and vibration tolerant.
- High intensity LED brightly displays switch status. Red and green LEDs may be selected to indicate open or closed.
- ½”conduit entry or mini-connector available. Choose from a direct conduit entry for hazardous areas or a plug-in mini-connector for rapid attachment in general purpose environments.

**Bulletin reference:** [7HK21](#)

## Technical specifications

Materials of construction	Switching and sensor specifications (HK)
<p><b>Housing and fasteners:</b> 316 stainless steel  <b>Sensing head cover:</b> Polycarbonate  <b>LED Lens:</b> Polycarbonate</p>	<p><b>SST switching sensors (30, 31)</b>  <b>Configuration:</b> (1) SST solid state sensor  <b>Operation:</b> Select either NO (30) or NC (31)  <b>Maximum current continuous:</b> 0.1 amp @ 125 VAC/VDC  <b>Minimum current:</b> 2.0 mA  <b>Maximum leakage current:</b> 0.5 mA  <b>Voltage range:</b> 8 to 125 VDC, 24 to 125 VAC  <b>Maximum voltage drop:</b> 6.5 volts @ 10 mA, 7.5 volts @ 100 mA</p> <p><b>NAMUR sensors (40)</b>  <b>Configuration:</b> (1) NAMUR sensor (EN 60947-5-6; I.S.)  <b>Operation:</b> Normally closed (NC) NAMUR sensor (solid state)  <b>Voltage range:</b> 5 to 25 VDC  <b>Current ratings:</b> Target on I &lt; 1 mA, Target off I &gt; 3 mA</p> <p><b>Sourcing sensor (50)</b>  <b>Configuration:</b> (1) PNP (Sourcing) sensor  <b>Operation:</b> Normally open (solid state)  <b>Maximum current:</b> 200 mA  <b>Minimum on current:</b> 2.0 mA  <b>Maximum leakage current:</b> Negligible  <b>Voltage range:</b> 6 to 28 VDC  <b>Maximum voltage drop:</b> 0.65 VDC</p>
Other specifications	
<p><b>Conduit connection:</b> 1/2”NPT  <b>Wiring:</b> 36” (0.9 meter) length, 18 gauge multi-strand  <b>Sensing distance:</b> 4 – 6 mm (sensing distance will vary depending on target material)  <b>Temperature range:</b> -40 to 80 °C (-40 to 176 °F)</p>	
Ratings	
<p><b>Nonincendive</b> Class I and II, Div. 2: Functions 30 and 31  <b>Intrinsically safe</b> Ex ia, Zone 0 or Class I and II, Div. 1: Function 40  <b>Enclosure protection</b> Type 4, 4X and 6: All models  Ingress Protection 67: All models</p>	

# Stonel Hawkeye HX



The explosionproof Hawkeye, with its stainless steel enclosure, is designed for service in harsh process environments. It features a solid state proximity sensor which is encased in a shock absorbent urethane potting material. Outputs for universal switching or NAMUR (EN 60947-5-6; I.S.) are standard options.

## Key features

- 316 stainless steel enclosure is extremely durable and corrosion resistant.
- Stainless steel washers and fasteners included with HX enable secure vibration resistant mounting.
- Solid state magnetic sensor detects trigger at distances up to 6 mm (extended sensing range also available).
- Magnetic trigger is embedded and sealed with a wide-temperature, corrosion-resistant urethane in the included stainless steel bolt.
- Sensor electronics are urethane sealed in a module which is additionally sealed within the stainless steel

enclosure assuring high tolerance to shock and vibration.

- All conduit/connector options (½" NPT, M20 and cable gland) are available with standard 6-foot cord lengths allowing flexible wiring options.
- No seal offs are required with explosionproof conduit systems, reducing installation costs.
- Suitable for most hazardous locations explosionproof, flame proof Div 1/Zone 1; intrinsically safe Div 1/Zone 0.

**Bulletin reference:** [7HX21](#)

## Technical specifications

Materials of construction	Switching and sensor specifications (HX)
<p><b>Housing and fasteners:</b> 316 stainless steel  <b>Trigger:</b> 316 stainless steel and urethane</p>	<p><b>SST switching sensors (35)</b>  <b>Configuration:</b> (1) SST magnetic solid state sensor  <b>Operation:</b> Normally open (NO)  <b>Maximum current continuous:</b> 0.1 amp  <b>Maximum leakage current:</b> 0.15 mA (VDC), 0.25 mA (VAC)  <b>Voltage range:</b> 8 to 250 VDC, 20 to 250 VAC  <b>Maximum voltage drop:</b> 6.5 volts @ 10 mA, 7.2 volts @ 100 mA</p> <p><b>NAMUR sensors (45)</b>  <b>Configuration:</b> (1) NAMUR sensor (EN 60947-5-6; I.S.)  <b>Operation:</b> Normally closed NAMUR sensor (solid state)  <b>Voltage range:</b> 5 to 29 VDC  <b>Current ratings:</b> Target on I &lt; 1 mA, Target off I &gt; 3 mA</p>
Other specifications	
<p><b>Conduit connection:</b>                      ½" NPT or M20  <b>Wiring:</b>                      72" (1.8 meters) length, 18 gauge multi-strand in a single jacket; ITC and PLTC rated  <b>Sensing distance:</b>                      4 – 6 mm (sensing distance will vary depending on target material); extended range available  <b>Temperature range:</b>                      -40 to 80 °C (-40 to 176 °F);                      Consult factory for ultra-cold temperature</p>	
Ratings	
<p><b>Explosionproof</b> Ex d, Zone 1 or Class I and II, Div. 1: All models  <b>Intrinsically safe</b> Ex ia, Zone 0 or Class I and II, Div. 1: Function 45  <b>Enclosure protection</b> Type 4, 4X and 6: All models                      Ingress Protection 66 and 68: All models</p>	



# Solenoid valves

Spool type solenoid valves							
Product	Design	Model	Orifice	Flow factor (kv)	Port	Specifications	Bulletin
<b>Neles Easyflow 3/2 way spool type solenoid valve</b> 	Single coil, spring return direction control valve	DSQ113	3 mm	4 L / min	1/8"	<b>Operating pressure:</b> 2 – 10 bar <b>Temperature:</b> -20 to +80 °C	S150-7
		DSQ213	4.5 mm	7 L / min	1/4"		
<b>Neles Easyflow 3/2 way spool type solenoid valve</b> 	Double coil, direction control valve	DSQ114	3 mm	4 L / min	1/8"	<b>Operating pressure:</b> 2 – 10 bar <b>Temperature:</b> -20 to +80 °C	
		DSQ214	4.5 mm	7 L / min	1/4"		
<b>Neles Easyflow 5/2 way spool type solenoid valve</b> 	Single coil, spring return direction control valve	VSQ113	3 mm	4 L / min	1/8"	<b>Operating pressure:</b> 2 – 10 bar <b>Temperature:</b> -20 to +80 °C	
		VSQ213	4.5 mm	7 L / min	1/4"		
<b>Neles Easyflow 5/2 way spool type solenoid valve</b> 	Double coil, direction control valve	VSQ114	3 mm	4 L / min	1/8"	<b>Operating pressure:</b> 2 – 10 bar <b>Temperature:</b> -20 to +80 °C	
		VSQ214	4.5 mm	7 L / min	1/4"		

# High capacity solenoid valves

High capacity solenoid valves							
Product	Design	Model	Orifice	Flow factor (kv)	Port	Specifications	Bulletin
<b>Neles Easyflow 3/2 way solenoid valves</b> 	Spool design, single coil, spring & air return direction control valve	DAQ213	6.7 mm	15 L / min	¼"	<b>Operating pressure:</b> 3 – 10 bar <b>Temperature:</b> -20 to +80 °C	S150-1
		DAQ313	10 mm	38 L / min	⅜"		
		DAQ413	10 mm	38 L / min	½"		
<b>Neles Easyflow 3/2 way solenoid valves</b> 	Spool design, double coil, direction control valve	DAQ214	6.7 mm	15 L / min	¼"	<b>Operating pressure:</b> 3 – 10 bar <b>Temperature:</b> -20 to +80 °C	
		DAQ314	10 mm	38 L / min	⅜"		
		DAQ414	10 mm	38 L / min	½"		
<b>Neles Easyflow 5/2 way solenoid valves</b> 	Spool design double coil, direction control valve	VAQ213	6.7 mm	15 L / min	¼"	<b>Operating pressure:</b> 3 – 10 bar <b>Temperature:</b> -20 to +80 °C	
		VAQ313	10 mm	38 L / min	⅜"		
		VAQ413	10 mm	38 L / min	½"		
<b>Neles Easyflow 5/2 way solenoid valves</b> 	Spool design, single coil, spring & air return direction control valve	VAQ214	6.7 mm	15 L / min	¼"	<b>Operating pressure:</b> 3 – 10 bar <b>Temperature:</b> -20 to +80 °C	
		VAQ314	10 mm	38 L / min	⅜"		
		VAQ414	10 mm	38 L / min	½"		

# Namur solenoid valves

Namur solenoid valves				
Product	Design	Model	Specifications	Bulletin
<b>Neles Easyflow 5/2 and 3/2 way Namur solenoid valve</b> 	Convertible, single coil spring return direction control valve	VAQNC-213	<b>Port:</b> ¼" <b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -20 to +80 °C	S150-5
	Convertible, double coil direction control valve	VAQNC-214		
<b>Neles Easyflow 5/2 and 3/2 way Namur solenoid valve</b>	Convertible, single coil spring return direction control valve with flow control	VAQNCFC-213	<b>Port:</b> ¼" <b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -20 to +80 °C	S150-8
	Convertible, double coil direction control valve with flow control	VAQNCFC-214		

# Air operated spool valves

Air operated spool valves							
Product	Design	Model	Orifice	Flow factor (kv)	Port	Specifications	Bulletin
<b>Neles Easyflow 3/2 way spool valve</b> 	Spool design, single external pilot operated spring return valve	DAQ210	6.7 mm	15 L / min	¼"	<b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -10 to +70 °C	S150-2
		DAQ310	10 mm	38 L / min	⅜"		
		DAQ410	10 mm	38 L / min	½"		
		DAQ610	16 mm	75 L / min	¾"		
		DAQ810	20 mm	110 L / min	1"		
<b>Neles Easyflow 3/2 way spool valve</b> 	Spool design, dual external pilot operated valve	DAQ211	6.7 mm	15 L / min	¼"	<b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -10 to +70 °C	
		DAQ311	10 mm	38 L / min	⅜"		
		DAQ414	10 mm	38 L / min	½"		
		DAQ611	16 mm	75 L / min	¾"		
		DAQ811	20 mm	110 L / min	1"		
<b>Neles Easyflow 5/2 way spool valve</b> 	Spool design, single external pilot operated spring return valve	VAQ210	6.7 mm	15 L / min	¼"	<b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -10 to +70 °C	
		VAQ310	10 mm	38 L / min	⅜"		
		VAQ410	10 mm	38 L / min	½"		
		VAQ610	16 mm	75 L / min	¾"		
		VAQ810	20 mm	110 L / min	1"		
<b>Neles Easyflow 5/2 way spool valve</b> 	Spool design, dual external pilot operated valve	VAQ211	6.7 mm	15 L / min	¼"	<b>Operating pressure:</b> 2 – 10 bar <b>Temperature:</b> -20 to +80 °C	
		VAQ311	10 mm	38 L / min	⅜"		
		VAQ411	10 mm	38 L / min	½"		
		VAQ611	16 mm	75 L / min	¾"		
		VAQ811	20 mm	110 L / min	1"		

# Hand operated valves

Hand operated valves						
Product	Design	Model	Orifice	Flow factor (kv)	Specifications	Bulletin
<b>Neles Easyflow 3/2 way hand operated spool valve</b> 	Spool design, hand operated direction control valve, manual return	DAQ204	6.7 mm	15 L / min	<b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -10 to +70 °C	S150-6
		DAQ404	10 mm	38 L / min		
<b>Neles Easyflow 3/2 way hand operated spool valve</b> 	Spool design, hand operated direction control valve, spring return	DAQ205	6.7 mm	15 L / min	<b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -10 to +70 °C	S150-6
		DAQ405	10 mm	38 L / min		
<b>Neles Easyflow 5/2 way hand operated spool valve</b> 	Spool design, hand operated direction control valve, manual return	VAQ204	6.7 mm	15 L / min	<b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -10 to +70 °C	S150-6
		VAQ404	10 mm	38 L / min		
<b>Neles Easyflow 5/2 way hand operated spool valve</b> 	Spool design, hand operated direction control valve, spring return	VAQ205	6.7 mm	15 L / min	<b>Operating pressure:</b> 0 – 10 bar <b>Temperature:</b> -10 to +70 °C	S150-6
		VAQ405	10 mm	38 L / min		

# Pneumatic lock relays

Pneumatic lock relays				
Product	Design	Model	Specifications	Bulletin
<b>Neles Easyflow 3/2 way spool valve</b> 	Spool design air lock relay with manual override	ALRQ-3-2	<b>Operating pressure:</b> 0 – 10 bar <b>Pilot pressure:</b> 3 – 10 bar <b>Temperature:</b> -10 to +70 °C	S150-3
		ALRQ-3-4		
<b>Neles Easyflow 5/2 way spool valve</b> 	Spool design air lock relay with manual override	ALRQ-5-2	<b>Operating pressure:</b> 0 – 10 bar <b>Pilot pressure:</b> 3 – 10 bar <b>Temperature:</b> -10 to +70 °C	
		ALRQ-5-4		

# Pneumatic pressure switches

Pneumatic pressure switches				
Product	Design	Model	Specifications	Bulletin
<b>Neles Easyflow 3/2 way pressure switch</b> 	Spool design sensitive air lock relay	SENALRQ-3-2	<b>Operating pressure:</b> 0 – 10 bar <b>Pilot pressure:</b> 2 – 10 bar <b>Temperature:</b> -10 to +70 °C	S150-4
		SENALRQ-3-4		
<b>Neles Easyflow 5/2 way pressure switch</b> 	Spool design air lock relay with manual override	SENALRQ-5-2	<b>Operating pressure:</b> 0 – 10 bar <b>Pilot pressure:</b> 2 – 10 bar <b>Temperature:</b> -10 to +70 °C	
		SENALRQ-5-4		



## Extreme ruggedness for extreme conditions

Smooth-operating, automated process valves play an important role on offshore platforms. Process valves are often difficult to access and the on-site delivery of spare parts is more challenging than when operating onshore.

Traditionally, process valves on offshore platforms have been controlled by either solenoid valves or by positioners, depending on the application and on local decisions and procedures. The offshore environment also creates its own demands on the enclosures of these devices.

Nowadays, intelligent valve controllers are also available with stainless steel enclosures. Our stainless steel valve controller offering includes Neles ND9300 intelligent valve controllers for control valves, Neles SwitchGuard intelligent on-off valve controllers for demanding on-off applications, Stonel Axiom on-off valve controllers for standard on-off applications and Neles ValvGuard intelligent safety solenoids and partial stroke testing devices for safety valves.

This way the whole network of automated valves on platforms can be controlled by intelligent valve controllers, thereby creating many new opportunities – for example, in the field of condition monitoring and predictive diagnostics. By means of intelligent valve controllers and predictive diagnostics, condition monitoring and maintenance planning can also be performed remotely from an onshore location.

### Stainless steel valve control offering

#### Control applications

- Neles ND9300 and ND9400

#### ESD applications

- Neles ValvGuard VG9300

#### On/off applications

- Stonel Axiom
- Stonel Quartz
- Neles Easyflow K-series
- Neles Easyflow RNP stainless steel version

#### Critical on/off applications

- Neles SwitchGuard SG9300

#### Configuration and diagnostics

- FDT and EDD capable for multi-vendor support of remote configuration and diagnostics access

# Our stainless steel valve control offering

### Neles ND9300 and ND9400



Neles ND9300 and ND9400, with its stainless steel construction for corrosive environments, are ideal solutions for when top class performance, comprehensive diagnostics and resistance to tough environmental conditions are required. ND9300 and ND9400 operate on every valve, on all field buses and integrates smoothly into all major control systems. It enables financial savings during all life cycle phases of the valve from engineering and commissioning to operations and maintenance.

### Neles ValvGuard VG9300



Neles ValvGuard VG9300 is our stainless steel version of the new safety solenoids and partial stroke test device for emergency shutdown and venting valves, completing our successful range of valve controllers. VG9300 is available both for HART and FOUNDATION Fieldbus environments. It is simple to install and use, and is suitable for use with single- and double-acting actuators and rotary and linear valves. It offers extensive safety valve testing capabilities as well as optional internal limit switches.

### Neles SwitchGuard SG9300



Neles SwitchGuard SG9300 is the stainless steel version of our innovative intelligent on-off valve controller. Its unique diagnostics features enable remote condition monitoring and predictive maintenance also with on-off valves. It too is simple to install and use and is suitable for use with single- and double-acting actuators and rotary and linear valves. Its highlights include exact valve opening and closing times and speed control with the possibility to set valve stroke profiles. The high pneumatics capacity eliminates the need for additional pneumatic accessories. The product is available with optional internal limit switches.

### Stonel Axiom



The stainless steel version of the explosion proof Axiom ANX is an optimum solution for standard on-off applications. It is a discrete on-off valve controller that combines a solenoid valve and proximity switches into one integrated package. The advanced position sensing system of Axiom offers reliable long-life performance with convenient push-button settings. The internal pneumatic valve has high tolerance to dirty air and it enables perfect operation in demanding off-shore environment.

## Superior offshore performance

### Process upsets eliminated

- Detecting performance degrading with online diagnostics before it affects the process
- Enhanced field device availability due to predictive maintenance and reliable product design

### Low life cycle costs

- Predictive tooling enables the shutdown work list to be planned in advance
- Unnecessary maintenance work is eliminated
- Longer maintenance cycle due to enhanced product reliability

### Simple to install

- The same units can be used for all actuators – small and large, single- and double acting, and for both rotary and linear valves
- Mounting kit designs are available for all our actuators and over 800 3rd party actuators

### Optimum process performance

- Automatic tuning of control performance with ND9300
- Advanced control algorithm of ND9300 maintains valve performance in changing conditions





Valmet's professionals around the world work close to our customers and are committed to moving our customers' performance forward – every day.

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