Metso valve controls

Product offering

metso
Expect results

Comprehensive offering to suit your every need

For North America markets only

Valve Controls

Product Portfolio

Metso offers unique range of solutions to control your valves. With help of Metso's products you can fulfill end user requirements for control, emergency shutdown and on/off valve applications. Metso's products will ensure best possible valve performance and compliance to environmental regulations. Metso valve controls offering goes from limit switches to high performance intelligent valve controllers with third generation diagnostics. Our competitive valve control solutions allow you to get the best possible performance from your valves.

Peace of mind

Metso's valve controls product offering is known for reliability, ease of use, best in class operational performance and diagnostics enabling a predictive maintenance approach. These features are matured over 20 years experience in the most challenging applications providing you confidence and peace of mind in your valve workshop and later on in your customer's process facilities.

Proven quality

Metso follows high quality standards in manufacturing and offers its customers reliable high end products. Our extensive quality assurance program covers all manufacturing activities and all products go through quality inspection before delivery.

Metso valve controls product offering

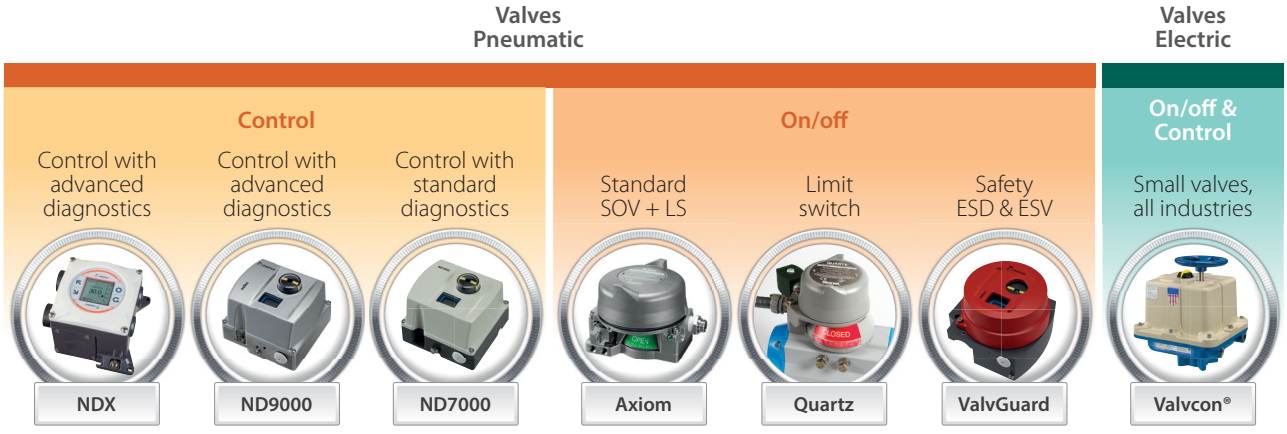


Table of content

	**NDX**	The next generation intelligent valve controller for all industrial applications	4-5
	**ND9000**	Intelligent valve controller for control applications with advanced diagnostics features	6-7
	**VG9000**	Intelligent safety solenoid and partial stroke testing device	8-9
	**SG9000**	Intelligent on-off valve controller for high cycling and process critical on-off applications	10-11
	**Axiom®**	Valve controller for standard on-off applications	12-13
	**Offshore offering**	Valve controls for offshore applications	14-15
	**Quartz®**	Limit switch for rotary valves with explosion proof or intrinsically safe protection	16-17
	**Eclipse®**	Limit switch for rotary valves with intrinsically safe protection	18
	**Prism®**	On-off valve controller for diaphragm and angle valves	19
	**Hawkeye®**	Limit switch for linear valves with intrinsically safe protection	20
	**B1-series actuators**	Piston-type quarter turn actuator for modulating control and on-off service	22
	**ADC-series actuators**	Universal PC board for on/off and modulating functionalities	23
	**V-series actuators**	Compact, rugged and reliable electric actuator for quarter-turn valves	24

Intelligent valve controller, series NDX

Metso's Neles NDX is the next generation intelligent valve controller working on all 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 life-time support for asset management.

Key features

- Reliable and robust design
- Industry leading pneumatic capacity
- Benchmark control performance
- Simple and fastest installation and commissioning
- Local / remote operation
- Wide language support
- Expandable architecture
- HART 6/7 communication as standard
- Diagnostics available in every unit
- Self-diagnostics
- Online diagnostics
- Communication diagnostics
- Extended off-line test capabilities
- 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) assessable 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 Metso NE700 and ND9000 positioners.
- Easy retro-fit to an extensive list of 3rd party control valves
- Installation to all common control systems

Options

- Gauge block
- Internal position transmitter
- Digital configurable outputs

Open solution

- Metso 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
- Support files for NDX are available from www.metso.com/NDX

Minimized process variability

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

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 position measurement

Neles® NDX
valve controller –
Performance perfected

Technical specifications

Intelligent valve controller NDX

General

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.
Action: Single acting or double acting, direct or reverse
Travel range: Linear: 5-120 mm / 0.2-4.7 in
>200 mm / 8 in (pending)
Rotary: 30-160 degrees
Measurement range: 110° with freely rotating feedback shaft.
Performance with moderate constant-load actuators:
Dead band: ≤ 0.2 %
Hysteresis: < 0.5 %
Linearity error: < 0.5 %
Repeatability: < 0.2 %

Environmental influence

Standard temperature range:
-40° – +85 °C / -40° – +185 °F
Influence of temperature on valve position:
Rotary, 0.5 % /10 °C
Linear, 0.1 mm /10 °C

Enclosure

Housing material: Epoxy coated anodized aluminum alloy, EN1706 AC - AlSi12 (b), copper free, Cu content max 0.4 %
Cover material: Polycarbonate, Lexan EXL1434 + Lexan 943A (Ex i)
Same than housing (Ex d)
Magnet holder: Glass fiber reinforced polyamide, PA66GF20
Protection class: IP66, NEMA 4X
IP67 for storage and transport
Pneumatic ports
Supply air: 1/4 NPT, G1/4 with gauge block
Actuator: 1/4 NPT, G1/4 with gauge block
Exhausts: 2 pcs. 3/8 NPT, G3/8 with gauge block
Cable entry: 2 pcs. 1/2" NPT (M20 with adapter)
Weight: 1.9 kg / 4.1 lbs (Exi)
3.7 kg / 8.2 lbs (Exd)

Pneumatics

Supply pressure: 1.4–8 bar / 20–116 psi (single acting)
2–8 bar / 29–116 psi (double acting)
Supply media: Air, nitrogen and sweet natural gas
Effect of supply pressure on valve position:
< 0.1 % at 10 % difference in inlet pressure
Air quality: Acc. to ISO 8573-1
Solid particles: Class 7 (40 µm filtration)
Humidity: Class 1 (at minimum dew point 10 °C/18 °F below minimum temperature is required)
Oil class: 3 (or < 1 ppm)
Air capacity$_1$: 80 Nm^3 /h / 47.1 scfm
Air consumption in steady state position:
< 0.1 Nm^3/h / 0.06 scfm$_1$ rated at 4 bar / 60 PSI supply pressure

Electronics

Supply power: Loop powered, 4–20 mA
HART Protocol rev. 6 / 7
Min. control signal: 3.8 mA
Current max: 120 mA
Load voltage: 9.7 VDC at 20 mA
9.0 VDC at 4 mA
Impedance at 20mA: 485 Ω
Maximum voltage: 30 VDC
Rev. polarity protection: -30 VDC
Over current protection: active over 35 mA
Wire size: 2.5/0.5 mm^2 (14/20 awg)

Position transmitter and digital output (optional)

Position transmitter
Output signal
4–20 mA (galvanic isolation; 600 VDC)
Supply voltage: 12–30 VDC
Linearity: < 0.05 % FS
Temperature effect: < 0.35 % FS
Failsafe output: 3.5 mA or 22.5 mA
Maximum external load: 690 Ω for I.S. Ex ia IIC T6 Ui ≤ 28 V
Digital output
Output signal: <1.0mA = state '0', >2.2mA = state '1' (NAMUR)
Supply voltage: 5…16VDC
Ex ia IIC T6 Ui <= 16V, Ii <= 25mA, Pi <= 100mW
DOs can be used like Namur limit switches or configured to be activated based on any device status.

Local User Interface (LUI) functions

- Accessible with the cover installed.
- PIN code lock to prevent unauthorized / unintended access with the cover installed or permanently (if configured).
- Guided-startup wizard
- Language selection; English, Chinese, Spanish, Italian, French, Korean, German, Turkish, Dutch, Portuguese
- Calibration: Automatic / Manual
- 3-point measurement linearization
- Configuration of the control valve
- Actuator type & valve type
- Valve dead angle
- Safety cut-off range
- Input signal direction
- Positioner fail action
- Monitoring of valve position, target position, input signal, temperature, supply and actuator pressure
- Manual control of the valve from Local User Interface
- HART 6 / 7 selection

ND9000 intelligent valve controller

Neles® 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. 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)
  - using 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

- Metso 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.metso.com/nd9000 – choose link downloads

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

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

State of the art diagnostics capabilities

Technical specifications

Intelligent valve controller ND9000

General

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.
Flush mounting on selected actuators
Action: Double or single acting
Travel range: Linear; 10–120 mm / 0.4-4.7 in rotary; 45–95 degrees.
Measurement range: 110° with freely rotating feedback shaft.
Performance with moderate constant-load actuators: Dead band acc. to IEC 61514: ≤ 0.1 %
Hysteresis acc. to IEC 61514: < 0.5 %

Environmental influence

Standard temperature range:
-40° – +85 °C / -40° – +185 °F
Artic version temperature range:
-53° – +85 °C / -64° – +185 °F
Influence of temperature on valve position:
0.5 % /10 °K
Influence of vibration on valve position:
< 1 % under 2g 5–150 Hz, 1g 150–300 Hz, 0.5g 300–2000 Hz

Enclosure

ND9100:
Anodized aluminum alloy and polymer composite
ND9200:
Anodised aluminum alloy and tempered glass
ND9300:
Stainless steel
ND9400:
Stainless steel and polymer composite
Protection class: IP66, Nema 4x
Pneumatic ports: G 1/4 (ND9100) 1/4 NPT (ND9200)
Cable gland thread: M20x1.5, 1/2 NPT (ND9200E2, ND9100U)
Weight: 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)

Pneumatics

Supply pressure: 1.4–8 bar / 20–115 psi
Effect of supply pressure on valve position:
< 0.1 % at 10 % difference in inlet pressure
Air quality: Acc. to ISO 8573-1 Solid particles: Class 5 (3 – 5 µm filtration is recommended)
Humidity: Class 1 (dew point 10 °C/ 18 °F below minimum temperature is recommended)
Oil class: 3 (or < 1 ppm)
Capacity with 4 bar / 60 psi supply:
5.5 Nm^3/h / 3.3 scfm low capacity
12 Nm^3/h / 7.1 scfm normal capacity
38 Nm^3 /h /22,4 scfm high capacity
Consumption with 4 bar / 60 psi supply in steady state position:
<0.6 Nm^3/h /0.35 scfm (low or normal capacity)
<1.0 Nm^3/h / 0.6 scfm (high capacity)

Electronics HART

Supply power: Loop powered, 4–20 mA
HART Protocol rev. 6 / 7
Minimum signal: 3.6 mA
Current max : 120 mA
Load voltage: up to 9.7 VDC/20 mA (corresponding 485 Ω)
Voltage: max. 30 VDC
Polarity protection: -30 VDC
Over current protection: active over 35 mA

Profibus PA and Foundation fieldbus

Supply power: voltage 9–32 VDC, reverse polarity protection
Max basic current 17.2 mA
Fault current (FDE) 3.9 mA
Foundation fieldbus function block execution times
AO 20 ms
AI 20 ms
PID 25 ms
DO 15 ms
DI 15 ms
IS 15 ms
OS 20 ms

Position transmitter (optional only HART)

Output signal: 4–20 mA (galvanic isolation; 600 VDC)
Supply voltage: 12–30 VDC
Resolution: 16 bit / 0.244 µA
Linearity: < 0.05 % FS
Temperature effect:
< 0.35 % FS
External load: 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

Local User Interface (LUI) functions

- Local control of the valve
- Monitoring of valve position, target position, input signal, temperature, supply and actuator pressure difference
- Guided-startup function
- LUI may be locked remotely to prevent unauthorized access
- Calibration: Automatic / Manual / 1-point calibration / Linearization
- Control configuration: aggressive, fast, optimum, stable, maximum stability
- Configuration of the control valve
- Rotation: valve rotation clockwise or counter-clockwise to close
- Dead Angle
- Low cut-off, cut-off safety range (default 2 %)
- Positioner fail action, open/close
- Signal direction: Direct/reverse acting
- Actuator type, double/single acting
- Valve type, rotary/linear
- Language selection: English, German and French
- HART 6/7 selection

VG9000 intelligent safety solenoid

Neles ValvGuard™ VG9000 is a new generation safety solenoid and partial stroke test device for emergency shutdown (ESD) or emergency venting (ESV) valves. It'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.

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 FDT 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 and FOUNDATION fieldbus communication options
- 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

- Metso 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.metso.com/vg9000 - choose link downloads

VG9000 with option P (Partial stroke test device)

When ValvGuard is used only for partial stroke testing and an additional solenoid valve is used for controlling the fail-safe action, VG9000 with P-option is an optimum choice. VG9000H_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 deenergized. ValvGuard VG9000 with P-option is available with HART communication and the device is powered by analog 4 to 20 mA signal. VG9000H with P-option 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.

Options

- Full stainless steel enclosure (VG9300)
- High pneumatic capacity (VG923_)
- Integrated limit switches
- SIL 2 certified position transmitter
- External junction box for wiring
- Version for partial stroke test only (VG9000H_P). Safety valves fail-safe action to be controlled via separate solenoid valve
- Remote Communication Interface RCI9H2 for 24 VDC retrofit installations
- Local Control Panel (LCP9H), also loop-powered version

TÜV Certificate

Neles ValvGuard VG9000 is TÜV approved to be used in safety applications up to and including Safety Integrity Level 3 (SIL 3).

Metso was the first manufacturer of SIL 3 certified intelligent partial stroke testing devices

Technical specifications

Neles ValvGuard VG9000

General

Suitable for rotary and linear valves. Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.
Action: Double or single acting
Travel range: Linear: 10–120 mm
Rotary: 45–95°
Measurement range 110° with freely rotating feedback shaft

Environmental influence

Standard temperature range:
-40° to +85 °C / -40° to +185 °F
Influence of temperature on valve position:
< 0,5 % / 10 °K
Influence of vibration on valve position:
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

Enclosure

VG9200:
Anodised aluminum alloy and tempered glass
VG9300:
Stainless steel
Protection class: IP66, NEMA 4X
Mechanical position indicator and LUI visible through the main cover
Pneumatic ports:
VG9_15 1/4 NPT
VG9235 1/2 NPT
VG9237 1 NPT (1/2 NPT supply) (single acting only)
Conduit entry thread: M20 x 1.5
Weight: 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

Pneumatics

Supply pressure: 3.0–7.5 bar / 44–109 psi
Output pressure: 3.0–7.5 bar / 44–109 psi
Air quality: According to ISO 8573-1:2001
Solid particles: Class 6
Humidity: Class 1
(dew point 10 °C / 18 °F below minimum temperature is recommended)
Oil class: 3 (or <1 ppm)
Capacity with 4 bar / 60 psi supply:
VG9215 90 Nm^3/h / 53 scfm (Cv = 0.7)
VG9235 380 Nm^3/h / 223 scfm (Cv = 3.2)
VG9237 feed 380 Nm^3/h / 223 scfm (Cv = 3.2)
exhaust 700 Nm^3/h / 412 scfm (Cv = 6.4)
Consumption with 4 bar/60 psi supply:
actuator pressurized 0.22 Nm^3/h / 0.13 scfm,
actuator vented 0.25 Nm^3/h / 0.15 scfm,

Electronics (input VG9000 HART)

Electrical connections:
0.25–2.5 mm^2
Supply power: Loop powered, 4–20 mA
Signal range: 3.7–22 mA
Signal details (VG9000H):
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)
Signal details (VG9000H_P):
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)
Load voltage: up to 9.7 V DC / 20 mA corresponding 485 Ω)
Voltage: max 30 V DC
Polarity protection: -30 V DC
Over current protection: active over 36 mA

Electronics (output VG9000 HART)

Usage: Position transmitter (T) / device status output (S)
Electrical connections:
0.25–2.5 mm^2
Output signal: 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
Supply voltage: 12–30 V
Resolution: 16 bit / 0.244 µA
Linearity: <0.05 % FS
Temperature effect:<0,35 % FS

Safety Signal (Binary input VG9000 FF)

Connections: 24 VDC: '+' and '-'
Min voltage: 11 V DC
Max output resistance:
Ro = 285 Ω

FOUNDATION fieldbus function block execution times

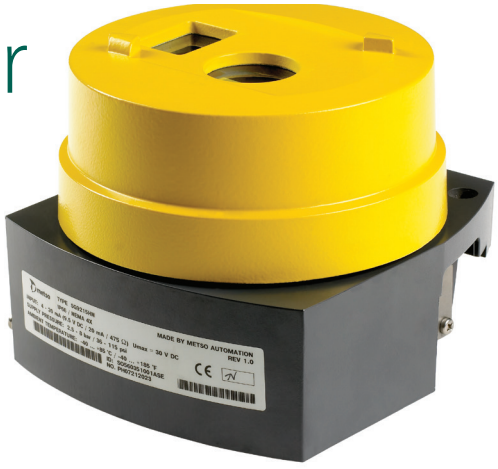
MDO 15 ms
MDI 15 ms
AI 20 ms

FOUNDATION fieldbus

Power supply: taken from bus
Bus voltage: 9 to 32 V DC, reverse polarity protection
Max basic current: 14.2 mA
Operating current: 20.7 mA
Fault current (FDE): 6.3 mA

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. 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)
  - using Distributed Control System (DCS) asset management tools
- Extensive selection of mounting kits for 3rd party actuators

Open solution

- Metso 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.metso.com/switchguard - choose link downloads

Options

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

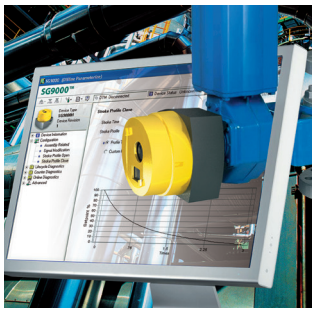
Product reliability

- 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
- Resistant to dirty air
- Wear resistant and sealed components
- Contact less 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

Metso is the only manufacturer of intelligent valve controllers that are especially designed for on-off applications



Technical specifications

Neles SwitchGuard SG9000

General

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.
Action: Double or single acting
Travel range:
Linear: 10–120 mm
Rotary: 45–95°
Measurement range 110° with freely rotating feedback shaft

Environmental influence

Standard temperature range:
-40° to +85 °C / -40° to +185 °F

Enclosure

SG9200:
Anodised aluminum alloy and tempered glass
SG9300:
Stainless steel
Protection class: IP66
Pneumatic ports: SG921_ 1/4 NPT SG9235 1/2 NPT SG9237 1 NPT (1/2 NPT supply)
Conduit entry thread:
M20 x 1.5
Weight: 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.

Pneumatics

Supply pressure: 3–8 bar / 44–116 psi
Air quality: According to ISO 8573-1:2001
Solid particles: Class 7
Humidity: Class 1
(dew point 10 °C / 18 °F below minimum temperature is recommended)
Oil class: 3 (or <1 ppm)
Capacity with 4 bar / 60 psi supply:
SG9212 7 Nm^3 /h / 4.1 scfm (Cv = 0.06)
SG9215 90 Nm^3 /h / 53 scfm (Cv = 0.7)
SG9235 380 Nm^3/h / 223 scfm (Cv = 3.2)
SG9237 feed 380 Nm^3/h / 223 scfm (Cv = 3.2) exhaust 700 Nm^3/h / 412 scfm (Cv = 6.4)
Consumption with 4 bar / 60 psi supply:
actuator pressurized 0.22 Nm^3 /h /0.13 scfm, actuator vented 0.25 Nm^3 /h /0.15 scfm

Electronics

Supply power: Loop powered, 4-20 mA
Minimum signal: 3.6 mA
Current max: 120 mA
Load voltage: up to 9.7 V DC / 20 mA (corresponding 485 Ω.)
Voltage: max. 30 V DC
Polarity protection: -30 V DC
Over current protection: active over 35 mA

Position transmitter (optional)

Output signal: 4–20 mA (galvanic isolation; 600 V DC)
Supply voltage: 12 - 30 V DC
Resolution: 16 bit / 0.244 µA
Linearity: <0.05 % FS
Temperature effect: <0.35 % FS
External load: max 0–780 Ω
max 0–690 Ω for intrinsically safe

Integrated limit switches (optional)

- SST Sensor Dual Module, NO, 8–125 V DC / 24–125 V AC
- NAMUR Sensor Dual Module, 6–29 V DC, > 3 mA; < 1 mA.
- Reed Type Proximity Switches
  Maxx-Guard G, SPDT, 300 mA, 24 V DC; 200 mA, 125 V AC
  Maxx-Guard M, Reed, SPDT, passive, intrinsically safe, 300 mA, 24 VDC
  Maxx-Guard H, Reed, SPDT, Vmax 240 v, Imax 3A, Vmax 100 W
- P+F; NJ2-12GK-SN, 2-wire type, DC; > 3 mA; < 1 mA.
  NAMUR NC Intrinsically safe according to ATEX II 2 G Ex ia IIC T6.
- P+F; NCB2-12GM35-N0, 2-wire type, DC; > 3 mA; < 1 mA.
  NAMUR NC Intrinsically safe according to ATEX II 2 G EEx ia IIC T6.
- Omron; E2E-X2Y1; 2-wire type; AC; <100 mA; 24–240 V AC.
- P+F; NJ3-13GK-S1N, 2-wire type, DC; > 3 mA; < 1 mA,
  NAMUR NO. Intrinsically safe according to ATEX II 1 G Ex ia IIC T6.
- ifm IFC2002-ARKG/UP, 2-wire type, DC; 150 mA, 10–36 V DC,
  leakage current < 0.6 mA.
- Omron D2VW-5L2A-1MS; 3 A – 250 V AC, 0.4 A – 125 V DC, 5 A – 30 V DC.
- D2VW-01L2A-1MS; gold plated contacts, 100 mA – 30 V DC / 125 V AC.
- D2VW-5L2A-1MS; 3 A – 250 V AC, 0.4 A – 125 V DC, 5 A – 30 V DC.
- D2VW-01L2A-1MS; gold plated contacts, 100 mA – 30 V DC / 125 V AC.

Axiom®

Advanced monitoring and control in explosionproof, nonincendive, intrinsically safe and general purpose applications

Axiom is a discrete on/off valve controller with proximity switches for quarter-turn automated valves. The advanced position sensor offers reliable long-life performance with convenient push-button settings. The integral pneumatic pilot valve offers features which further enhance the operating performance of the automated on/off valves. And, the Axiom's rugged construction will withstand the most challenging plant environments. Standard version of Axiom (AN) is epoxy coated anodized aluminum enclosure with Lexan polycarbonate cover and available as intrinsically safe and non-incendive versions. Explosion proof version of Axiom (AX) is available as epoxy coated anodized aluminum or stainless steel enclosure and cover.

Advanced performance

The Axiom features 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 of these design features is consistent reliable performance over the life of the automated valve system. Valve communication models with AS-Interface and DeviceNet protocols feature optional Wireless Link capabilities reducing set-up time, improving plant safety and displaying valve diagnostics. Devices communicate wirelessly via Bluetooth from up to 50 meters to standard iPhone or iPad app. enabling complete, easy access and set-up without specialized equipment.

Wide variety of functions offer exceptional value

Select from standard SST sensors for conventional switching, NAMUR sensors for intrinsically safe applications or a broad array of communication options including AS Interface, DeviceNet and FOUNDATION fieldbus. The Expeditor version provides the capability to offer additional value for special filling and flow dampening applications with intermediate control. And maintenance costs may be reduced by using the diagnostic systems available with AS-interface or in conventional 4-20 mA applications with the Hart protocol.

Corrosion-resistant

The intrinsically safe version of Axiom (AN) features an anodized epoxy-coated aluminum housing with a Lexan cover to withstand corrosive process environments.
The Lexan cover may also be optionally fusion coated for organic solvents. An aluminum cover may be selected for special highly corrosive applications.
Explosion proof version of Axiom (AX) is available as epoxy coated anodized aluminum or stainless steel enclosure and cover.

Features

- The Axiom is corrosion proof, temporarily submersible and suitable for use in hazardous areas.
- Designed for nonincendive and intrinsically safe (AN) or explosion proof (AX) areas.
- AX suitable for ingress protection classes IP66, IP67 or NEMA 4, 4X. AN suitable for IP66, IP67, NEMA 4, 4X and 6.
- High strength durable enclosure and pneumatic manifold are constructed of epoxy coated anodized aluminum or stainless steel. Impact resistant cover is made of high strength Lexan polycarbonate, aluminum or stainless steel. All fasteners are stainless steel.
- High visibility mechanical and electronic indication confirm open/closed position and solenoid status for greater safety and convenience.
- Universal voltage solenoid system operates on less than 0.6 W of power and standard version will accept either 24 VDC, 120 VAC or 250 VAC, reducing stocking requirements.
- Electronic components are sealed and potted inside function module to protect against residual moisture, vibration and corrosives.
- High accuracy position sensor system is solid state with no moving wear points for highly reliable and precise position feedback.
- Push button set points for open & closed accurately lock in position settings. Settings remain locked in when power is removed and reapplied.
- Large capacity integral pneumatic valve operates on standard plant air and will cycle most actuators in less than two seconds.
- Wiring and maintenance access is quick and convenient for easy set-up and installation.
- Internal manual pneumatic valve override is standard enabling local valve operation.
- Standard 5/2 (five-way, two-position) valve operates both double and single-acting actuators and features a re-breather to feed instrument air into spring side of actuator to keep out corrosives.
- Axiom directly attaches to VDI/VDE 3845 (NAMUR) actuators and many others using a compact mounting manifold system (sold separately).
- 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 through standard iPhone/iPad app.

Metso offers a full range of on-off valve controllers designed to perform in extreme process environments

Technical specifications

AXIOM AX and AN

General

Pneumatic valves
Valve design:
Pilot operated spool valve
Pilot operator options:
Solenoid coil or piezo
Configuration
Single pilot:
5-way, 2-position spring return
Dual pilot: shuttle piston, 5-way, 2-position
Flow rating: 0.70 Cv or 1.2 Cv
Axiom porting: ¼" NPT 0.7 or 0.9 (0.70 Cv); 3/8" (1.2 Cv)
Manifold porting: ¼" NPT (0.7, 0.9 and 1.2 Cv)
Operating pressure:
40 to 120 psi (2.7 to 7.5 bar), AX
45 psi to 120 psi (3.1 to 8.2 bar), AN
Filtration requirements:
40 micron (Piezo, 30 micron), AX
50 micron, AN
Operating life: 1 million cycles
Manual override: Internal momentary standard
External momentary available
External latching device available.

Materials of construction

Housing & mounting manifold:
Epoxy coated anodized aluminum or 316 stainless steel
Cover: Lexan® polycarbonate, epoxy coated anodized aluminum or 316 stainless steel
Visual indicator: Lexan polycarbonate
Fasteners & mounting:
Stainless steel

Pneumatic valve (AX)

Solenoid pilot (AX)
Electrical ratings:
_H option: 0.6 watt @ 22 to 250 VAC/VDC
_D option: 0.5 watt @ 24 VDC
_E option: 0.5 watt @ 12 VDC (intrinsically safe)
AC current consumption:
18 mA (1H or 2H) 220 VAC
Operating temperature:
0.7 Cv: Standard (S) -18° to 50 °C (0° to 122 °F)
Extended (T) -40° to 80 °C (-40° to 176 °F)
1.2 Cv: Standard (S) -10° to 50 °C (14° to 122 °F)
Extended (T) Consult factory

Piezo pilot (bus powered FOUNDATION fieldbus)
Operating temperature:
-10° to 60 °C (14° to 140 °F)
Electrical ratings:
_A option: 2 mA @ 6.5 VDC

Function options (AX)

Switches/Sensors
33S SST NO sensor
35S SST Universal; 20 - 250 volt (NO sensor)
44S NAMUR module (EN 60947-5-6; I.S)

Valve Communication Terminal
71D 4-20 mA HART with diagnostics
92S DeviceNet™
93S FOUNDATION Fieldbus (bus powered; I.S.)
96S AS-Interface
96D AS-Interface with diagnostics
97S AS-Interface with extended addressing

Pneumatic valve (AN)

Solenoid coil specifications (AN)
Operating temperature:
-40° C to 80° C (-40° F to 176° F)
Operating voltage:
35 option: 40 - 250 VAC; 20 - 55 VDC
45 option: 12 - 24 VDC (output of barrier)
92 and 97 option: 24 VDC
Power consumption:
35 option: 20 mA @ 40 - 250 VAC (1.1 watts typical)
20 mA @ 20 - 55 VDC (0.5 watts typical @ 24 VDC)
45 option: 0.5 watts @ 12 VDC; 1.0 watt @ 24 VDC
92 and 97 option: 0.5 watts
Inrush current:
35 option: 0.14 A @ 24 VDC (typical)

Function options (AN)

Switches/Sensors
35S SST Universal; 20 - 250 volt (NO sensor)
45S NAMUR module (EN 60947-5-6; I.S.)

Valve Communication Terminal
92S DeviceNet™
92W DeviceNet™ with Wireless Link
96S AS-Interface
97W AS-Interface with extended addressing and Wireless Link

Extreme ruggedness for extreme conditions

Smooth-operating, automated process valves play an important role on offshore platforms, as in many other process plants. However, there are still some factors that make the working environment on offshore platforms very different from that in onshore plants. For example, process valves on platforms 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 also on local decisions and procedures at the different platforms. The offshore environment also creates its own demands on the enclosures of these devices, the optimum material to be used being usually stainless steel.

Nowadays intelligent valve controllers are also available with stainless steel enclosures. Metso 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, 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.

Neles ND9300

Neles ND9300 and ND9400, with its stainless steel construction for corrosive environments, is part of the the field-proven ND9000 intelligent valve controller family. It is an ideal solution when top class performance, comprehensive diagnostics and resistance to tough environmental conditions are required. ND9300 and ND9400 operates 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

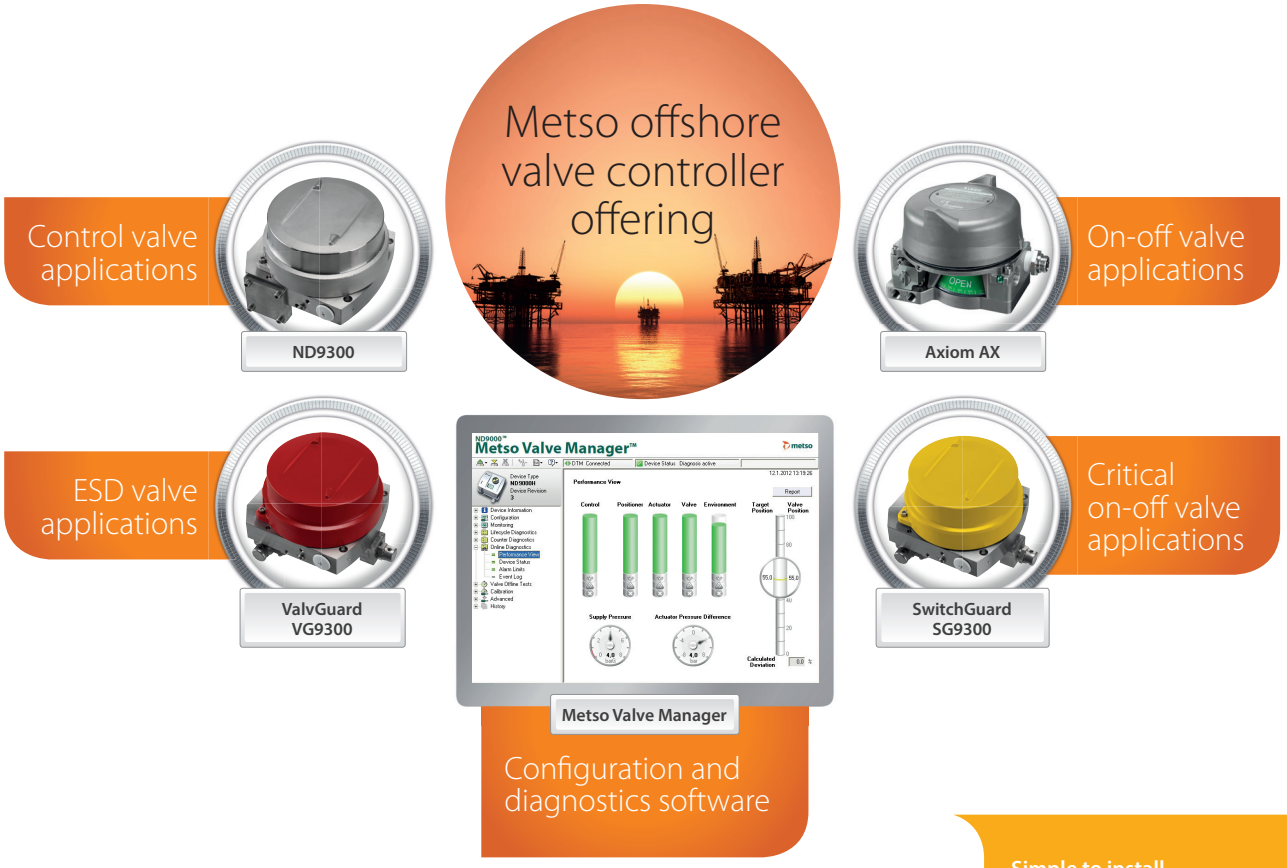
Neles ValvGuard VG9300, stainless steel version of the new safety solenoids and partial stroke test device for emergency shutdown and venting valves, is the latest addition to Metso's successful range of valve controllers. VG9300 is available both for HART and FOUNDATION fieldbus environments.

VG9300 is providing increased safety in the most cost-effective way:

- Simple to install and use
- Suitable for single- and double-acting actuators and rotary and linear valves
- Provides extensive safety valve testing capabilities
- Optional internal limit switches

HART COMMUNICATION PROTOCOL

FOUNDATION



Neles SwitchGuard

Neles SwitchGuard SG9300 is the stainless steel version of Metso's innovative intelligent on-off valve controller. Its unique diagnoctis features enable remote condition monitoring and predictive maintenance also with on-off valves.

SG9300 is especially designed for process critical and high-cycling on-off applications:

- Simple to install and use
- Suitable for single- and double-acting actuators and rotary and linear valves
- Speed control with the possibility to set different opening and closing valve stroke profiles
- Exact valve opening and closing times
- High pneumatics capacity eliminating the need for additional pneumatic accessories and simplifying the installation.
- Optional internal limit switches

Axiom AX

The stainless steel version of the explosion proof Axiom AX is an optimum solution for standard on-off applications. Axiom 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.

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 over 800 3rd party actuators and for all Neles actuators

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

Optimum process performance

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

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

Quartz®

Explosionproof valve monitoring

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), and general purpose (QG) versions. 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.

Enclosures optimized for environment

QX: *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 Lexan cover with mechanical switches. All enclosures are rated NEMA 4, 4x, and 6.*

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.

Technical specifications Quartz

Materials of construction

Housing & aluminum cover:
Epoxycoated anodized marine grade aluminum or stainless steel as option
Clear cover & indicator:
Lexan® polycarbonate
Elastomer seals Buna-N; optional EPDM
Drive shaft: Stainless steel
Drive bushing: Bronze, oil impregnated
Fasteners: Stainless steel

SST switching sensors (35)

Configuration:
(2) SST solid state sensors
Wire terminations for one or two solenoids
Operation:
Normally open (NO)
Ratings:
Maximum current inrush
1.0 amp @ 125 VAC/VDC
Maximum current continuous
0.1 amp @ 125 VAC/VDC
Minimum on current
0.5 mA
Maximum leakage current
0.25 mA (AC), 0.15 mA (DC)
Voltage range
20 to 250 VAC, 8 to 250 VDC
Maximum voltage drop
6.5 volts @ 10 mA
7.2 volts @ 100 mA

NAMUR sensors (45)

Configuration:
(2) NAMUR sensors (EN 60947-5-6)
Wire terminations for one or two solenoids
Voltage range: 5 to 25 VDC
Current ratings:
Target on I<1 mA
Target off I>3 mA

Valve Communication Terminal (VCT)

AS-Interface (96) Configuration (2) discrete sensor inputs (2) auxiliary discrete inputs (2) power outputs (solenoids)
AS-Interface with extended addressing (97) Configuration (2) discrete sensor inputs (2) auxiliary discrete inputs (1) power output (solenoid)
Foundation fieldbus, Bus Powered (93) Configuration (2) Discrete Inputs, DI (open and closed), (2) Discrete Outputs, DO (piezo valves) Multiple DI/DO blocks or modified output block
DeviceNet (92) 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

Temperature ratings

Mechanical components:
-40° to 80 °C
Dual modules:
-40° to 80 °C
Maxx-Guard & SST:
-40° to 80 °C

Mechanical switch (SPDT), (_V, _W)

Silver contacts (_V switch)
Electrical ratings:
10 amp @ 125/250 VAC 0.5 amp @ 125 VDC
Operating life: 400,000 cycles
Not recommended for electrical circuits operating at less than 20 mA @ 24 VDC
Gold contacts (_W switch)
Electrical ratings:
1 amp @ 125 VAC
0.5 amp @ 30 VDC
Operating life: 100,000 cycles

Mechanical switch (DPDT) (14)

Electrical ratings: 4.5 amp @ 125/250 VAC, 24 to 125 VAC

Maxx-Guard proximity switch Single-Pole Single-Throw (SPST)

J switch
Configuration SPST; passive (intrinsically safe)
Electrical ratings: 0.10 amp @ 10 to 30 VDC
Maximum voltage drop: 0.1 volts @ 10 mA, 0.5 volts @ 100 mA
Contact composition: Ruthenium
P switch:
Configuration SPST NO
Electrical ratings: 0.15 amp @ 30 VDC/125 AC
Maximum voltage drop: 0.1 volts @10 mA, 0.5 volts @ 100 mA
Contact composition: Ruthenium

Maxx-Guard proximity switch Single-Pole Double-Throw (SPDT)

G switch
Configuration SPDT
Electrical ratings: 0.30 amp @ 24 VDC, 0.2 amp @ 120 VAC
Maximum voltage drop: 0.1 volts @ 10 mA, 0.5 volts @ 100 mA
Contact composition: Rhodium
H switch
Configuration SPDT
Electrical ratings: 240 VAC max; 3 A max., 100 W max.; 2.0 W min.
Maximum voltage drop: 0.1 volts @ 10 mA, 0.5 volts @ 100 mA
Contact composition: Tungsten
M switch
Configuration SPDT; passive (intrinsically safe)
Electrical ratings: 0.10 amp @ 10 to 30 VDC
Maximum voltage drop: 0.1 volts @ 10 mA, 0.5 volts @ 100 mA
Contact composition: Rhodium
S switch
Electrical ratings: 0.1 amp @ 24 VDC 0.1 amp @ 120 VAC
Maximum voltage drop: 3.5 volts @ 10 mA, 6.5 volts @ 100 mA
Contact composition: Rhodium

SST switching sensors (_X)

Operation: NO/NC (cam selectable)
Maximum current inrush:
1.0 A @ 125 VAC/VDC
Maximum continuous current:
0.1 A @ 125 VAC/VDC
Minimum on current: 2.0 mA
Leakage current: Less than 0.50 mA
Voltage range: 8 to 125 VDC, 24 to 125 VAC
Maximum voltage drop: 6.5 volts @ 10 mA, 7.5 volts @ 100 mA

Position transmitter (5_, 7_, T_)

Output: Two-wire 4 to 20 mA
Supply source: 10-40 VDC
Span range: (5, 7) 35° to 270° (adjustable); (T) 35° to 320° (adjustable)
Maximum loading: 700 ohms @ 24 VDC
Linearity error: Standard (5) +/-0.85° maximum
High performance (7) and Digital (T) +/-0.35°

Eclipse®

Compact and modular with solid state reliability

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 series is available in nonincendive and intrinsically safe versions (EN) for hazardous areas and in a general purpose completely sealed microconnector version (EG).

EN: Nonincendive with integral wire-termination area

- Suitable for all hazardous areas.
- Rated for NEMA 4, 4X, 6 (intrinsically safe and nonincendive rated: 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.

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 Lexan® or stainless steel for corrosion resistance and durability.

Technical specifications

Eclipse

Materials of construction

Housing: Lexan® polycarbonate
Drum components Lexan® polycarbonate
Fasteners: Stainless steel
Triggers and coupling:
Stainless steel
Quick connectors:
Stainless steel

Valve Communication Terminals

DeviceNet (92)
AS-Interface (96)
AS-Interface with extended addressing (97)

Temperature range:

-40° to 80 °C (-40° to 176 °F)

Switching and sensor specifications

SST switching sensors (33, 34)
Configuration (2) SST Solid State Sensors (2) Wire terminations for one solenoid
Operation: Select either NO (33) or NC (34)
Maximum current inrush: 1.0 amp @ 125 VAC/VDC
Maximum current continuous: 0.1 amp @ 125 VAC/VDC
Minimum on current: 2.0 mA
Maximum leakage current: 0.5 mA
Voltage range: 8 to 125 VDC, 24 to 125 VAC
Maximum voltage drop: 6.5 volts @ 10 mA, 7.5 volts @ 100 mA

NAMUR sensors (44)
Configuration (2) NAMUR sensors (EN 60947-5-6; I.S.) (2) Wire terminations for one solenoid
Voltage range: 5 to 25 VDC
Current ratings:
Target on I < 1 mA
Target off I > 3 mA

Prism®

Compact and modular with integral pneumatic control

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

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.

Technical specifications

Prism PI

General pneumatic (solenoid & piezo)

Configuration: 3-way, 2-position, spring return
Porting: 1/8" NPT all pressurized ports. Rebreather port 4-40 size
Flow ratings: Cv - 0.20

Solenoid valve

Filtration requirements: 40 micron
Operating temperature: -10° to 50 °C

Materials of construction

Housing and cover: Polycarbonate
Fasteners: Stainless steel
Trigger system (magnetic:) Polysulfone
Shaft: Stainless steel
Valve manifold: Integral with stainless steel reinforced NPT
Operating life: Over 1 million cycles

Valve Communication Terminals

DeviceNet (92)
AS-Interface (96)
AS-Interface with extended addressing (97)

Ratings

Nonincendive (Ex n, Zone 2 or Class I and II, Div. 2)
Intrinsically safe: Function 45 (Ex ia, Zone 0 or Class I and II, Div. 1)
Enclosure protection:
NEMA 4, 4X and 6:
All models
Ingress Protection 66 and 67:
All models

Switching and sensor specifications

SST switching sensors (33)
Configuration:
(2) SST solid state sensors
(2) Wire terminations for one solenoid
Operation: Select NO (33)
Maximum current inrush:
1.0 amps @ 125 VAC/VDC
Maximum current continuous:
0.1 amps @ 125 VAC/VDC
Minimum on current: 2.0 mA
Maximum leakage current: 0.5 mA
Voltage range: 20 to 125 VAC/VDC
Maximum voltage drop: 6.5 volts @ 10 mA, 7.5 volts @ 100 mA

NAMUR sensors (45)
Configuration: (2) NAMUR sensors (EN 60947-5-6; I.S.)
Voltage range: 7 to 24 VDC
Current ratings:
Target on I < 1 mA
Target off I > 3 mA

Hawkeye® HK

Nonincendive and intrinsically safe for point sensing

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.

Linear applications

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.

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.
- 1/2"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.

Hawkeye® HX

Rugged, corrosion proof for all hazardous locations

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.

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.

Technical specifications

Hawkeye HK and HX

Materials of construction

Housing and fasteners:
316 stainless steel
Trigger: 316 stainless steel and urethane (HX models)
Sensing head cover: Lexan® polycarbonate (HK models)
LED Lens: Polycarbonate (HK models)

Other specifications

Conduit connection:
1/2"NPT or M20
Wiring:
36" (0.9 meter) length, 18 gauge multi-strand (HK)
72" (1.8 meters) length, 18 gauge multi-strand in a single jacket; ITC and PLTC rated (HX)
Sensing distance: 4-6 mm (sensing distance will vary depending on target material); extended range available
Temperature range:
-40° to 80 °C (-40° to 176 °F); consult factory for ultra-cold temperature

Ratings

Nonincendive
(Class I and II, Div. 2)
Functions 30 and 31

Intrinsically safe
(Ex ia, Zone 0 or Class I and II, Div. 1)
Functions 40 and 45

Explosionproof
(Ex d, Zone 1 or Class I and II, Div. 1)
Functions 35 and 45

Enclosure protection
NEMA 4, 4X and 6
All models

Ingress Protection 67
HK models

Ingress Protection 66/68
HX models

Switching and sensor specifications (HK)

SST switching sensors (30, 31)
Configuration: (1) SST solid state sensor
Operation: Select either NO (30) or NC (31)
Maximum current inrush: 1.0 amp
Maximum current continuous:
0.1 amp @ 125 VAC/VDC
Minimum current: 2.0 mA
Maximum leakage current: 0.5 mA
Voltage range: 8 to 125 VDC, 24 to 125 VAC
Maximum voltage drop: 6.5 volts @ 10 mA, 7.5 volts @ 100 mA

NAMUR sensors (40)
Configuration: (1) NAMUR sensor (EN 60947-5-6; I.S.)
Operation: Normally closed (NC) NAMUR sensor (solid state)
Voltage range: 5 to 25 VDC
Current ratings:
Target on I<1 mA
Target off I>3 mA

Sourcing sensor (50)
Configuration: (1) PNP (Sourcing) sensor
Operation: Normally open (solid state)
Maximum current: 200 mA
Minimum on current: 2.0 mA
Maximum leakage current: Negligible
Voltage range: 6 to 28 VDC
Maximum voltage drop: 0.65 VDC

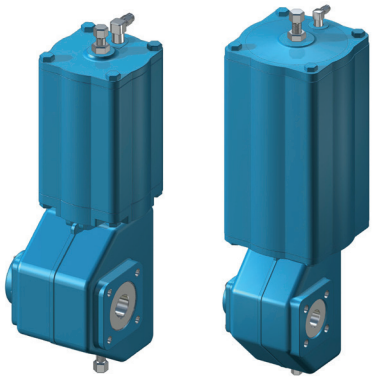
Switching and sensor specifications (HX)

SST switching sensors (35)
Configuration: (1) SST magnetic solid state sensor
Operation: Normally open (NO)
Maximum current inrush: 1.0 amp
Maximum current continuous: 0.1 amp
Maximum leakage current:
0.15 mA (VDC), 0.25 mA (VAC)
Voltage range: 8 to 250 VDC, 20 to 250 VAC
Maximum voltage drop: 6.5 volts @ 10 mA, 7.2 volts @ 100 mA

NAMUR sensors (45)
Configuration:
(1) NAMUR sensor (EN 60947-5-6; I.S.)
Operation: Normally closed NAMUR sensor (solid state)
Voltage range: 5 to 29 VDC
Current ratings:
Target on I<1 mA
Target off I>3 mA

B1 Series, Pneumatic

Metso's Neles 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
- Limited operating range

Product reliability

- Designed to operate in harsh enviromental conditions
- Certified to be used in in safety applications up to and including safety Integrity Leve 3 (SIL 3)
- IP66 enclosure
- Vast installed base

Technical specifications

B1 Series, Pneumatic cylinder actuator

General

Suitable for basically any type of quarter turn rotary valves. Actuator connections in accordance with ISO5211 and VDI/VDE3824.

Action: Double or single acting
Travel range: -5°...95°
Protection class: IP66
Certification: ATEX II 2 c, SIL 3

Pneumatics

Pneumatic ports: NPT threaded
Design pressure: 11 barg
Supply pressure range: 3.0 - 8.5/10 barg (43 - 120/145 psi)
Maximum supply pressure: 8.5/10 barg (120/45 psi)

Temperature range

Standard temperature range: -20° to +70 °C / -4° to 158 °F

High temperature option: -20° to +120 °C / -4° to 248 °F

Low temperature option: -40° to +70 °C / -40° to 158 °F

Arctic temperature option: -55° to +70 °C / -67° to 158 °F

Materials of construction

Cylinder pipe: Anodized aluminium (steel pipe with hard chrome plating option).

Gear box housing & piston: Cast iron (nodular cast iron option)

Cylinder ends: Nodular cast iron

Painting: Epoxy + polyurethane

Torque range

Spring return model: 28 Nm - 12200 Nm, 21 lb-ft - 9000 lb-ft (spring nominal)
Spring return model: 91 Nm - 20800 Nm, 60 lb-ft - 13870 lb-ft, (BTO @ 4.0 barg / 58 psi)
Double acting model: 60 Nm - 82300 Nm, 40 lb-ft - 54870 lb-ft (nominal @ 4.0 barg)
Double acting model: 78 Nm - 124900 Nm, 52 lb-ft - 83270 lb-ft (BTO @ 4.0 barg / 58 psi)

Metso ADC-series actuators

The universal ADC-series PC board includes both on/off and modulating functionalities, and accepts both AC and DC power inputs. 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 battery packs
  - 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
- Optional battery back-up capabilities within standard size actuator enclosures
- 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 two years
- Two year warranty

Technical specifications

Metso ADC-series actuator

Temperature range

-40° to 55 °C / -40° to 130 °F

Conduit connection

(2) 3/4" NPT (3/4" to 1/2" reducing bushings included)

Duty cycle

Continuous (120 starts/minute)

Motor

Brushless DC motor with Class B or better insulation; sub-fractional horsepower

Lubrication

Permanently lubricated gear train and bearings

Voltage

12VDC: 10.8 to 13.2 VDC
24VDC: 21.6 to 26.4 VDC
24VAC: 21.6 to 26.4 VAC, 60 Hz or 50 Hz
115 VAC: 103.5 to 126.5 VAC, 60 Hz or 50 Hz
230 VAC: 207 to 253 VAC, 60 Hz or 50 Hz

Limit switches

(4) Single pole, double throw switches rated for 1/2 HP, 11 amps @ 250 VAC, CSA certified, fuse protected.

Two limit switches can be used for end-of-travel control.
Two limit switches can be used for end-of-travel indication.

Output

150 to 600 in-lbs (12 to 50 lb-ft; 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 lb-ft; 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.

Gear train

Hardened steel spur gears

Approximate weight:

17 lbs (8 kg)
31 lbs (14 kg)

Enclosure

Die cast A380 aluminum

Protection class

IP66

Certifications (all models):

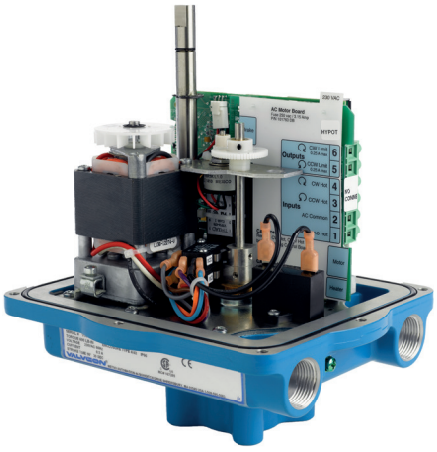
CSA (C US): NEMA 4/4X; CE compliant

Certifications (WX models):

CSA (C US): Class I, Div. 1, Gr. C & D; Class II, Div. 1, Gr. E, F & G; Class III
ATEX: Ex d IIB T6 Gb
IECEx CSA 14.0057X
ATEX and IECEx certification pending for units with optional battery back-up included

Metso V-series actuators

The V-series is a compact, rugged and reliable electric actuator designed for quarter-turn valve and damper applications. They are available in a variety of control configurations from on/off, to automatic cycling and analog modulating. With a host of other options available, they are extremely well suited to a multitude of demanding process applications.



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.

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
  - With coded connectors to make internal miswiring impossible
- Standard extended 75% duty cycle
  - At ambient temperatures up to 104 degrees F

Technical specifications

Metso V-series actuator

Temperatur Range

-40° to 66 °C / -40° to 150 °F

Conduit connection

(2) 3/4" NPT (3/4" to 1/2" reducing bushings included)

Duty cycle

75 % (between each full cycle), the actuator must rest for 1/3 of the 90 degree cycle time; 30 starts/minute. NOTE: At 50 Hz, the duty cycle is ~60 % @ 104° F.

Motor

Split phase, capacitor driven motor with Class B or better insulation; sub-fractional horsepower

Voltage

115 VAC: 103.5 to 126.5 VAC, 60 Hz or 50 Hz
230 VAC: 207 to 253 VAC, 60 Hz or 50 Hz

Limit switches

(2) Single pole, double throw switches rated for 1/2 HP, 11 amps @ 250 VAC, CSA certified, fuse protected.

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.

Lubrication

Permanently lubricated gear train and bearings

Output

150 to 600 in-lbs (12 to 50 lb-ft; 16 to 68Nm): 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 lb-ft; 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.

Gear train

Hardened steel spur gears

Approximate weight

17 lbs (8 kg)
31 lbs (14 kg)

Enclosure

Die cast A380 aluminum

Protection class

IP66

Certifications (all models):

CSA (C US): NEMA 4/4X; CE compliant

Certifications (WX models):

CSA (C US): Class I, Div. 1, Gr. C & D; Class II, Div. 1, Gr. E, F & G; Class III
ATEX: Ex d IIB T6 Gb
IECEx CSA 14.0057X

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