

1 EU-TYPE EXAMINATION CERTIFICATE



2 Equipment or Protective systems intended for use in Potentially
Explosive Atmospheres - Directive 2014/34/EU

3 EU-Type Examination Certificate No: FM10ATEX0039X

4 Equipment or protective system: Quartz QN, QX and QC Series Valve Position
(Type Reference and Name) Monitors

5 Name of Applicant: Neles USA Inc. dba StoneL

6 Address of Applicant: 26271 US Hwy 59
Fergus Falls, MN 56537,
United States of America

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3039143EC dated 17th November 2010

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN IEC 60079-0:2018; EN 60079-11:2012 and EN 60529:1991+A1:2000+A2:2013

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:



QN and QX Series:

II 1 G Ex ia IIC T6...T1 Ga Ta*, IP66 IP67

QC Series:

II 1 G Ex ia IIC T6...T5 Ga Ta*, IP66

*See description

Damien Mc Ardle
Damien Mc Ardle

Certification Manager, FM Approvals Europe Ltd.

Issue date: 22nd April 2020

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13 Description of Equipment or Protective System:

The “QN”, “QC” and “QX” Series Valve Position Monitors consist of sensors, potentiometers and transmitters of various designs enclosed in an aluminum alloy or stainless steel enclosure with either an aluminum, stainless steel or a clear Lexan cover that provide monitoring of a valves position. The enclosure is rated to IP66 and IP67. The sensors covered are: a) Dual Module Namur sensors, b) Maxx-Guard proximity sensors, c) N Type Namur sensors (P + F) d) A Type Namur sensors (P + F) and e) B Type Namur sensors (P + F). The transmitters covered are 5_, 7_ and T_. The potentiometers covered are B_ and C_.

The Dual Module Namur Sensors consist of two (top & bottom) solid state switches and a rotating cam which has a top and bottom metal target mounted on a plastic part connected to a cam. Access to field wiring is by way of separate cables which enter the enclosure through a cable entry and connect to terminals of a terminal block.

The Maxx-Guard proximity sensor models consist of top & bottom reed switches and a rotating cam which has magnets mounted on a plastic part connected to a cam. Access to field wiring is by way of separate cables which enter the enclosure through a cable entry and connect to terminals of a terminal block. The PCBA and all components except for two LEDs are encapsulated.

The Namur “N” proximity models consist of solid state inductive proximity sensors (P + F NJ2-V3-N-V5, PTB00ATEX2032X) and a rotating cam which has a metal target mounted on a plastic part connected to a cam. Access to field wiring is by way of separate cables which enter the enclosure through a cable entry and connect to terminals of a terminal block.

The Namur “A” proximity models consist of solid state inductive proximity sensors (P + F NJ2-12GK-SN, PTB00ATEX2049X) and a rotating cam which has a metal target mounted on a plastic part connected to a cam. Access to field wiring is by way of separate cables which enter the enclosure through a cable entry and connect to terminals of a terminal block.

The Namur “B” proximity models consist of solid state inductive proximity sensors (P + F NJ5-30GK-S1N, PTB00ATEX2049X) and a rotating cam which has a metal target mounted on a plastic part connected to a cam. Access to field wiring is by way of separate cables which enter the enclosure through a cable entry and connect to terminals of a terminal block.

The Transmitter option “5O” and “7O” consist of a direct drive potentiometer wired to a pcb that provides a 4-20mA signal. The transmitter option can include additional switches/sensors by replacing the second digit “O” with a sensor option digit (example “5N” or “7N”, etc...). Therefore the “transmitter” parameters (for “5” and “7”) are listed separately from the additional switch/sensor parameters (“N” or any other sensor option). Access to field wiring is by way of separate cables which enter the enclosure through a cable entry and connect to terminals of a terminal block.

The Transmitter option “TO” consists of a solid state sensing circuit that provides a 4-20mA signal. The transmitter option can include additional switches/sensors by replacing the second digit “O” with a sensor option digit (example “TR”, etc...). Therefore the “transmitter” parameters (for “T”) are listed separately from the additional switch/sensor parameters (“R” or any other sensor option). Access to field wiring is by way of separate cables which enter the enclosure through a cable entry and connect to terminals of a terminal block.

The Potentiometer option “BO” and “CO” consist of a direct drive potentiometer wired to a terminal block. The potentiometer option can include additional switches/sensors by replacing the second digit “O” with a sensor option digit (example “BN” or “CN”, etc...). Therefore the “Potentiometer” parameters (for “B” and “C”) are listed separately from the additional switch/sensor parameters (“N” or any other

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sensor option). Access to field wiring is by way of separate cables which enter the enclosure through a cable entry and connect to terminals of a terminal block.

QNabcdef-g. Valve Position Monitor.

a = Function: 2J, 4J, 5J, 7J, BJ, CJ, 2M, 4M, 5M, 7M, BM, CM, 5O, 7O, TO, BO, CO, 2N, 4N, 5N, 6N, 7N, TN, BN, CN, 2A, 4A, 5A, 7A, TA, BA, CA, 2B, 4A, 5A, 7A, B4, C4, 45, 5R, 7R, TR, BR or CR

b= Enclosure: D, R, A, K, T, N, Z, or Q

c= Junction: 02, 03, 05, or 06

d= Shaft Output: X, S, N or H

e= Visual Indication: X, G, R, C, 1, 2, 3, 4, 5, 0, B, E, Y, H, J, K, M, P, N, D, A, S, T, U, V or W

f= Branding: A or M

g= Options: '1-5 alpha or numeric digits for special and marketing identification'

*When a = 5O, 7O

For T4 Ta* = -40°C to +80°C

Entity Limitation Parameters: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = TO

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Transmitter: Ui = 30 Vdc, li = 100 mA, Ci = 3 nF, Li = 0 H, Pi = 0.75 W

Solenoid Connection Terminals: Ui = 30 Vdc, li = 120 mA

*When a = BO, CO

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters: Ui = 26 V, li = 14 mA, Pi = 50 mW, Ci = 0 nF, Li = 0 mH

*When a = 2J, 4J, 2M, 4M

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Switch/Sensor: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0.8 mH, Pi = 2.0 W

*When a = 5J, 7J, 5M, 7M

For T4 Ta* = -40°C to +80°C

Energy Limitation Parameters:

Switch/Sensor: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0.8 mH, Pi = 2.0 W

Transmitter: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = BJ, CJ, BM, CM

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Switch/Sensor: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0.8 mH, Pi = 2.0 W

Potentiometer: Ui = 26 Vdc, li = 14 mA, Ci = 0 nF, Li = 0 mH, Pi = 50mW

*When a = 44

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Sensor Module: Ui = 22V, li = 120 mA, Pi = 2W, Ci = 98 nF, Li = 0.8 mH

Solenoid Connection Terminals: Ui = 30V, li = 120mA

*When a = 54, 74

For T4 Ta* = -40°C to +80°C

Energy Limitation Parameters:

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Sensor Module: $U_i = 22V$, $I_i = 120\text{ mA}$, $P_i = 2W$, $C_i = 98\text{ nF}$, $L_i = 0.8\text{ mH}$
 Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$
 Transmitter: $U_i = 30\text{ Vdc}$, $I_i = 100\text{ mA}$, $C_i = 66\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$

*When a = B4, C4

For T5 $Ta^* = -40^\circ\text{C}$ to $+80^\circ\text{C}$; For T6 $Ta^* = -40^\circ\text{C}$ to $+65^\circ\text{C}$

Energy Limitation Parameters:

Sensor Module: $U_i = 22V$, $I_i = 120\text{ mA}$, $P_i = 2W$, $C_i = 98\text{ nF}$, $L_i = 0.8\text{ mH}$

Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

Potentiometer: $U_i = 26\text{ Vdc}$, $I_i = 14\text{ mA}$, $C_i = 0\text{ nF}$, $L_i = 0\text{ mH}$, $P_i = 50\text{ mW}$

*When a = 45

For T5 $Ta^* = -40^\circ\text{C}$ to $+80^\circ\text{C}$; For T6 $Ta^* = -40^\circ\text{C}$ to $+65^\circ\text{C}$

Energy Limitation Parameters:

Sensor Module: $U_i = 22V$, $I_i = 120\text{ mA}$, $P_i = 0.4W$, $C_i = 3\text{ nF}$, $L_i = 0\text{ mH}$

Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

*When a = 5R, 7R

For T4 $Ta^* = -40^\circ\text{C}$ to $+80^\circ\text{C}$

Energy Limitation Parameters:

Sensor Module: $U_i = 22V$, $I_i = 120\text{ mA}$, $P_i = 0.4W$, $C_i = 3\text{ nF}$, $L_i = 0\text{ mH}$

Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

Transmitter: $U_i = 30\text{ Vdc}$, $I_i = 100\text{ mA}$, $C_i = 66\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$

*When a = TR

For T5 $Ta^* = -40^\circ\text{C}$ to $+80^\circ\text{C}$; For T6 $Ta^* = -40^\circ\text{C}$ to $+65^\circ\text{C}$

Energy Limitation Parameters:

Sensor Module: $U_i = 22\text{Vdc}$, $I_i = 120\text{ mA}$, $P_i = 0.4W$, $C_i = 3\text{ nF}$, $L_i = 0\text{ mH}$

Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

Transmitter: $U_i = 30\text{ Vdc}$, $I_i = 100\text{ mA}$, $C_i = 3\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$

Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

*When a = BR, CR

For T5 $Ta^* = -40^\circ\text{C}$ to $+80^\circ\text{C}$; For T6 $Ta^* = -40^\circ\text{C}$ to $+65^\circ\text{C}$

Energy Limitation Parameters:

Sensor Module: $U_i = 22V$, $I_i = 120\text{ mA}$, $P_i = 0.4W$, $C_i = 3\text{ nF}$, $L_i = 0\text{ mH}$

Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

Transmitter: $U_i = 26\text{ Vdc}$, $I_i = 14\text{ mA}$, $C_i = 0\text{ nF}$, $L_i = 0\text{ mH}$, $P_i = 50\text{ mW}$

* When a = 2N, 4N, 6N

| For T6, $Ta^* =$ | For T5, $Ta^* =$ | For T4...T1, $Ta^* =$ | $U_i\text{ V}$ | $I_i\text{ mA}$ | $P_i\text{ mW}$ | $C_i\text{ nF}$ | $L_i\text{ mH}$ |
|--|--|--|----------------|-----------------|-----------------|-----------------|-----------------|
| -25°C to $+56^\circ\text{C}$ | -25°C to $+68^\circ\text{C}$ | -25°C to $+80^\circ\text{C}$ | 16 | 25 | 34 | 40 | 0.05 |
| -25°C to $+49^\circ\text{C}$ | -25°C to $+61^\circ\text{C}$ | -25°C to $+80^\circ\text{C}$ | 16 | 25 | 64 | 40 | 0.05 |
| -25°C to $+28^\circ\text{C}$ | -25°C to $+40^\circ\text{C}$ | -25°C to $+68^\circ\text{C}$ | 16 | 52 | 169 | 40 | 0.05 |
| -25°C to $+13^\circ\text{C}$ | -25°C to $+25^\circ\text{C}$ | -25°C to $+53^\circ\text{C}$ | 16 | 76 | 242 | 40 | 0.05 |

* When a = 5N, 7N

Switch/Sensor:

| For T4...T1, $Ta^* =$ | $U_i\text{ V}$ | $I_i\text{ mA}$ | $P_i\text{ mW}$ | $C_i\text{ nF}$ | $L_i\text{ mH}$ |
|--|----------------|-----------------|-----------------|-----------------|-----------------|
| -25°C to $+80^\circ\text{C}$ | 16 | 25 | 34 | 40 | 0.05 |
| -25°C to $+80^\circ\text{C}$ | 16 | 25 | 64 | 40 | 0.05 |

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|----------------|----|----|-----|----|------|
| -25°C to +68°C | 16 | 52 | 169 | 40 | 0.05 |
| -25°C to +53°C | 16 | 76 | 242 | 40 | 0.05 |

Transmitter; $U_i = 30\text{Vdc}$, $I_i = 100\text{ mA}$, $C_i = 66\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$

* When a = TN
Switch/Sensor

| For T6, Ta*= -25°C to +56°C | For T5, Ta*= -25°C to +68°C | For T4...T1, Ta*= -25°C to +80°C | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|--------------------------------|--------------------------------|-------------------------------------|------|-------|-------|-------|-------|
| -25°C to +56°C | -25°C to +68°C | -25°C to +80°C | 16 | 25 | 34 | 40 | 0.05 |
| -25°C to +49°C | -25°C to +61°C | -25°C to +80°C | 16 | 25 | 64 | 40 | 0.05 |
| -25°C to +28°C | -25°C to +40°C | -25°C to +68°C | 16 | 52 | 169 | 40 | 0.05 |
| -25°C to +13°C | -25°C to +25°C | -25°C to +53°C | 16 | 76 | 242 | 40 | 0.05 |

Transmitter: $U_i = 30\text{ Vdc}$, $I_i = 100\text{ mA}$, $C_i = 3\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$

Solenoid Connection Terminals: $U_i = 30\text{ Vdc}$, $I_i = 120\text{ mA}$

* When a = BN, CN
Switch/Sensor:

| For T6, Ta*= -25°C to +56°C | For T5, Ta*= -25°C to +68°C | For T4...T1, Ta*= -25°C to +80°C | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|--------------------------------|--------------------------------|-------------------------------------|------|-------|-------|-------|-------|
| -25°C to +56°C | -25°C to +68°C | -25°C to +80°C | 16 | 25 | 34 | 40 | 0.05 |
| -25°C to +49°C | -25°C to +61°C | -25°C to +80°C | 16 | 25 | 64 | 40 | 0.05 |
| -25°C to +28°C | -25°C to +40°C | -25°C to +68°C | 16 | 52 | 169 | 40 | 0.05 |
| -25°C to +13°C | -25°C to +25°C | -25°C to +53°C | 16 | 76 | 242 | 40 | 0.05 |

Potentiometer; $U_i = 26\text{Vdc}$, $I_i = 14\text{ mA}$, $C_i = 0\text{ nF}$, $L_i = 0\text{ mH}$, $P_i = 50\text{mW}$

* When a = 2A, 4A

| For T6, Ta*= -40°C to +57°C | For T5, Ta*= -40°C to +69°C | For T4...T1, Ta*= -40°C to +80°C | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|--------------------------------|--------------------------------|-------------------------------------|------|-------|-------|-------|-------|
| -40°C to +57°C | -40°C to +69°C | -40°C to +80°C | 16 | 25 | 34 | 50 | 0.15 |
| -40°C to +52°C | -40°C to +64°C | -40°C to +80°C | 16 | 25 | 64 | 50 | 0.15 |
| -40°C to +34°C | -40°C to +46°C | -40°C to +74°C | 16 | 52 | 169 | 50 | 0.15 |
| -40°C to +22°C | -40°C to +34°C | -40°C to +61°C | 16 | 76 | 242 | 50 | 0.15 |

* When a = 5A, 7A
Switch/Sensor:

| For T4...T1, Ta*= -40°C to +80°C | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|-------------------------------------|------|-------|-------|-------|-------|
| -40°C to +80°C | 16 | 25 | 34 | 50 | 0.15 |
| -40°C to +80°C | 16 | 25 | 64 | 50 | 0.15 |
| -40°C to +74°C | 16 | 52 | 169 | 50 | 0.15 |
| -40°C to +61°C | 16 | 76 | 242 | 50 | 0.15 |

Transmitter; $U_i = 30\text{Vdc}$, $I_i = 100\text{ mA}$, $C_i = 66\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$

* When a = TA
Switch/Sensor

| For T6, Ta*= -40°C to +57°C | For T5, Ta*= -40°C to +69°C | For T4...T1, Ta*= -40°C to +80°C | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|--------------------------------|--------------------------------|-------------------------------------|------|-------|-------|-------|-------|
| -40°C to +57°C | -40°C to +69°C | -40°C to +80°C | 16 | 25 | 34 | 50 | 0.15 |

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|----------------|----------------|----------------|----|----|-----|----|------|
| -40°C to +52°C | -40°C to +64°C | -40°C to +80°C | 16 | 25 | 64 | 50 | 0.15 |
| -40°C to +34°C | -40°C to +46°C | -40°C to +74°C | 16 | 52 | 169 | 50 | 0.15 |
| -40°C to +22°C | -40°C to +34°C | -40°C to +61°C | 16 | 76 | 242 | 50 | 0.15 |

Transmitter: $U_i = 30$ Vdc, $I_i = 100$ mA, $C_i = 3$ nF, $L_i = 0$ H, $P_i = 0.75$ W

Solenoid Connection Terminals: $U_i = 30$ Vdc, $I_i = 120$ mA

* When a = BA, CA

Switch/Sensor:

| For T6, Ta* = | For T5, Ta* = | For T4...T1, Ta* = | U _i V | I _i mA | P _i mW | C _i nF | L _i mH |
|----------------|----------------|--------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| -40°C to +57°C | -40°C to +69°C | -40°C to +80°C | 16 | 25 | 34 | 50 | 0.15 |
| -40°C to +52°C | -40°C to +64°C | -40°C to +80°C | 16 | 25 | 64 | 50 | 0.15 |
| -40°C to +34°C | -40°C to +46°C | -40°C to +74°C | 16 | 52 | 169 | 50 | 0.15 |
| -40°C to +22°C | -40°C to +34°C | -40°C to +61°C | 16 | 76 | 242 | 50 | 0.15 |

Potentiometer; $U_i = 26$ Vdc, $I_i = 14$ mA, $C_i = 0$ nF, $L_i = 0$ mH, $P_i = 50$ mW

* When a = 2B

| For T6, Ta* = | For T5, Ta* = | For T4...T1, Ta* = | U _i V | I _i mA | P _i mW | C _i nF | L _i mH |
|----------------|----------------|--------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| -25°C to +57°C | -25°C to +69°C | -25°C to +80°C | 16 | 25 | 34 | 100 | 0.20 |
| -25°C to +52°C | -25°C to +64°C | -25°C to +80°C | 16 | 25 | 64 | 100 | 0.20 |
| -25°C to +34°C | -25°C to +46°C | -25°C to +74°C | 16 | 52 | 169 | 100 | 0.20 |
| -25°C to +22°C | -25°C to +34°C | -25°C to +61°C | 16 | 76 | 242 | 100 | 0.20 |

QXabcdef-g. Valve Position Monitor.

a = Function: 2J, 4J, 5J, 7J, BJ, CJ, 2M, 4M, 5M, 7M, BM, CM, 5O, 7O, TO, BO, CO, 2N, 4N, 5N, 6N, 7N, TN, BN, CN, 2A, 4A, 5A, 7A, TA, BA, CA, 2B, 4A, 5A, 7A, B4, C4, 45, 5R, 7R, TR, BR or CR

b = Enclosure: R, T, K or N

c = Junction: 02, 03, 05, or 06

d = Shaft Output: X, S, N or H

e = Visual Indication: X, G, R, C, 1, 2, 3, 4, 5, 0, B, E, Y, H, J, K, M, P, N, D, A, S, T, U, V or W

f = Branding: A or M

g = Options: '1-5 alpha or numeric digits for special and marketing identification'

*When a = 5O, 7O

For T4 Ta* = -40°C to +80°C

Entity Limitation Parameters: $U_i = 30$ Vdc, $I_i = 100$ mA, $C_i = 66$ nF, $L_i = 0$ H, $P_i = 0.75$ W

*When a = TO

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Transmitter: $U_i = 30$ Vdc, $I_i = 100$ mA, $C_i = 3$ nF, $L_i = 0$ H, $P_i = 0.75$ W

Solenoid Connection Terminals: $U_i = 30$ Vdc, $I_i = 120$ mA

*When a = BO, CO

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters: $U_i = 26$ V, $I_i = 14$ mA, $P_i = 50$ mW, $C_i = 0$ nF, $L_i = 0$ mH

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*When a = 2J, 4J, 2M, 4M

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Switch/Sensor: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0.8 mH, Pi = 2.0 W

*When a = 5J, 7J, 5M, 7M

For T4 Ta* = -40°C to +80°C

Energy Limitation Parameters:

Switch/Sensor: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0.8 mH, Pi = 2.0 W

Transmitter: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = BJ, CJ, BM, CM

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Switch/Sensor: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0.8 mH, Pi = 2.0 W

Potentiometer: Ui = 26 Vdc, li = 14 mA, Ci = 0 nF, Li = 0 mH, Pi = 50mW

*When a = 44

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Sensor Module: Ui = 22V, li = 120 mA, Pi = 2W, Ci = 98 nF, Li = 0.8 mH

Solenoid Connection Terminals: Ui = 30V, li = 120mA

*When a = 54, 74

For T4 Ta* = -40°C to +80°C

Energy Limitation Parameters:

Sensor Module: Ui = 22V, li = 120 mA, Pi = 2W, Ci = 98 nF, Li = 0.8 mH

Solenoid Connection Terminals: Ui = 30V, li = 120mA

Transmitter: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = B4, C4

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Sensor Module: Ui = 22V, li = 120 mA, Pi = 2W, Ci = 98nF, Li = 0.8 mH

Solenoid Connection Terminals: Ui = 30V, li = 120mA

Potentiometer: Ui = 26 Vdc, li = 14 mA, Ci = 0 nF, Li = 0 mH, Pi = 50mW

*When a = 45

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Sensor Module: Ui = 22V, li = 120 mA, Pi = 0.4W, Ci = 3 nF, Li = 0 mH

Solenoid Connection Terminals: Ui = 30V, li = 120mA

*When a = 5R, 7R

For T4 Ta* = -40°C to +80°C

Energy Limitation Parameters:

Sensor Module: Ui = 22V, li = 120 mA, Pi = 0.4W, Ci = 3 nF, Li = 0 mH

Solenoid Connection Terminals: Ui = 30V, li = 120mA

Transmitter: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = TR

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°C

Energy Limitation Parameters:

Sensor Module: Ui = 22Vdc, li = 120 mA, Pi = 0.4W, Ci = 3 nF, Li = 0 mH

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SCHEDULE

to EU-Type Examination Certificate No. FM10ATEX0039X

Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$
 Transmitter: $U_i = 30\text{ Vdc}$, $I_i = 100\text{ mA}$, $C_i = 3\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$
 Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

*When a = BR, CR

For T5 $T_a^* = -40^\circ\text{C}$ to $+80^\circ\text{C}$; For T6 $T_a^* = -40^\circ\text{C}$ to $+65^\circ\text{C}$

Energy Limitation Parameters:

Sensor Module: $U_i = 22V$, $I_i = 120\text{ mA}$, $P_i = 0.4W$, $C_i = 3\text{ nF}$, $L_i = 0\text{ mH}$

Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

Transmitter: $U_i = 26\text{ Vdc}$, $I_i = 14\text{ mA}$, $C_i = 0\text{ nF}$, $L_i = 0\text{ mH}$, $P_i = 50\text{ mW}$

* When a = 2N, 4N, 6N

| For T6, $T_a^* =$ | For T5, $T_a^* =$ | For T4...T1, $T_a^* =$ | $U_i\text{ V}$ | $I_i\text{ mA}$ | $P_i\text{ mW}$ | $C_i\text{ nF}$ | $L_i\text{ mH}$ |
|--|--|--|----------------|-----------------|-----------------|-----------------|-----------------|
| -25°C to $+56^\circ\text{C}$ | -25°C to $+68^\circ\text{C}$ | -25°C to $+80^\circ\text{C}$ | 16 | 25 | 34 | 40 | 0.05 |
| -25°C to $+49^\circ\text{C}$ | -25°C to $+61^\circ\text{C}$ | -25°C to $+80^\circ\text{C}$ | 16 | 25 | 64 | 40 | 0.05 |
| -25°C to $+28^\circ\text{C}$ | -25°C to $+40^\circ\text{C}$ | -25°C to $+68^\circ\text{C}$ | 16 | 52 | 169 | 40 | 0.05 |
| -25°C to $+13^\circ\text{C}$ | -25°C to $+25^\circ\text{C}$ | -25°C to $+53^\circ\text{C}$ | 16 | 76 | 242 | 40 | 0.05 |

* When a = 5N, 7N

Switch/Sensor:

| For T4...T1, $T_a^* =$ | $U_i\text{ V}$ | $I_i\text{ mA}$ | $P_i\text{ mW}$ | $C_i\text{ nF}$ | $L_i\text{ mH}$ |
|--|----------------|-----------------|-----------------|-----------------|-----------------|
| -25°C to $+80^\circ\text{C}$ | 16 | 25 | 34 | 40 | 0.05 |
| -25°C to $+80^\circ\text{C}$ | 16 | 25 | 64 | 40 | 0.05 |
| -25°C to $+68^\circ\text{C}$ | 16 | 52 | 169 | 40 | 0.05 |
| -25°C to $+53^\circ\text{C}$ | 16 | 76 | 242 | 40 | 0.05 |

Transmitter; $U_i = 30\text{ Vdc}$, $I_i = 100\text{ mA}$, $C_i = 66\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$

* When a = TN

Switch/Sensor

| For T6, $T_a^* =$ | For T5, $T_a^* =$ | For T4...T1, $T_a^* =$ | $U_i\text{ V}$ | $I_i\text{ mA}$ | $P_i\text{ mW}$ | $C_i\text{ nF}$ | $L_i\text{ mH}$ |
|--|--|--|----------------|-----------------|-----------------|-----------------|-----------------|
| -25°C to $+56^\circ\text{C}$ | -25°C to $+68^\circ\text{C}$ | -25°C to $+80^\circ\text{C}$ | 16 | 25 | 34 | 40 | 0.05 |
| -25°C to $+49^\circ\text{C}$ | -25°C to $+61^\circ\text{C}$ | -25°C to $+80^\circ\text{C}$ | 16 | 25 | 64 | 40 | 0.05 |
| -25°C to $+28^\circ\text{C}$ | -25°C to $+40^\circ\text{C}$ | -25°C to $+68^\circ\text{C}$ | 16 | 52 | 169 | 40 | 0.05 |
| -25°C to $+13^\circ\text{C}$ | -25°C to $+25^\circ\text{C}$ | -25°C to $+53^\circ\text{C}$ | 16 | 76 | 242 | 40 | 0.05 |

Transmitter: $U_i = 30\text{ Vdc}$, $I_i = 100\text{ mA}$, $C_i = 3\text{ nF}$, $L_i = 0\text{ H}$, $P_i = 0.75\text{ W}$

Solenoid Connection Terminals: $U_i = 30\text{ Vdc}$, $I_i = 120\text{ mA}$

* When a = BN, CN

Switch/Sensor:

| For T6, $T_a^* =$ | For T5, $T_a^* =$ | For T4...T1, $T_a^* =$ | $U_i\text{ V}$ | $I_i\text{ mA}$ | $P_i\text{ mW}$ | $C_i\text{ nF}$ | $L_i\text{ mH}$ |
|--|--|--|----------------|-----------------|-----------------|-----------------|-----------------|
| -25°C to $+56^\circ\text{C}$ | -25°C to $+68^\circ\text{C}$ | -25°C to $+80^\circ\text{C}$ | 16 | 25 | 34 | 40 | 0.05 |
| -25°C to $+49^\circ\text{C}$ | -25°C to $+61^\circ\text{C}$ | -25°C to $+80^\circ\text{C}$ | 16 | 25 | 64 | 40 | 0.05 |
| -25°C to $+28^\circ\text{C}$ | -25°C to $+40^\circ\text{C}$ | -25°C to $+68^\circ\text{C}$ | 16 | 52 | 169 | 40 | 0.05 |
| -25°C to $+13^\circ\text{C}$ | -25°C to $+25^\circ\text{C}$ | -25°C to $+53^\circ\text{C}$ | 16 | 76 | 242 | 40 | 0.05 |

Potentiometer; $U_i = 26\text{ Vdc}$, $I_i = 14\text{ mA}$, $C_i = 0\text{ nF}$, $L_i = 0\text{ mH}$, $P_i = 50\text{ mW}$

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SCHEDULE

to EU-Type Examination Certificate No. FM10ATEX0039X

* When a = 2A, 4A

| For T6, Ta*=- | For T5, Ta*=- | For T4...T1, Ta*=- | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|----------------|----------------|--------------------|------|-------|-------|-------|-------|
| -40°C to +57°C | -40°C to +69°C | -40°C to +80°C | 16 | 25 | 34 | 50 | 0.15 |
| -40°C to +52°C | -40°C to +64°C | -40°C to +80°C | 16 | 25 | 64 | 50 | 0.15 |
| -40°C to +34°C | -40°C to +46°C | -40°C to +74°C | 16 | 52 | 169 | 50 | 0.15 |
| -40°C to +22°C | -40°C to +34°C | -40°C to +61°C | 16 | 76 | 242 | 50 | 0.15 |

* When a = 5A, 7A

Switch/Sensor:

| For T4...T1, Ta*=- | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|--------------------|------|-------|-------|-------|-------|
| -40°C to +80°C | 16 | 25 | 34 | 50 | 0.15 |
| -40°C to +80°C | 16 | 25 | 64 | 50 | 0.15 |
| -40°C to +74°C | 16 | 52 | 169 | 50 | 0.15 |
| -40°C to +61°C | 16 | 76 | 242 | 50 | 0.15 |

Transmitter; Ui = 30Vdc, Ii = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

* When a = TA

Switch/Sensor

| For T6, Ta*=- | For T5, Ta*=- | For T4...T1, Ta*=- | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|----------------|----------------|--------------------|------|-------|-------|-------|-------|
| -40°C to +57°C | -40°C to +69°C | -40°C to +80°C | 16 | 25 | 34 | 50 | 0.15 |
| -40°C to +52°C | -40°C to +64°C | -40°C to +80°C | 16 | 25 | 64 | 50 | 0.15 |
| -40°C to +34°C | -40°C to +46°C | -40°C to +74°C | 16 | 52 | 169 | 50 | 0.15 |
| -40°C to +22°C | -40°C to +34°C | -40°C to +61°C | 16 | 76 | 242 | 50 | 0.15 |

Transmitter: Ui = 30 Vdc, Ii = 100 mA, Ci = 3 nF, Li = 0 H, Pi = 0.75 W

Solenoid Connection Terminals: Ui = 30 Vdc, Ii = 120 mA

* When a = BA, CA

Switch/Sensor:

| For T6, Ta*=- | For T5, Ta*=- | For T4...T1, Ta*=- | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|----------------|----------------|--------------------|------|-------|-------|-------|-------|
| -40°C to +57°C | -40°C to +69°C | -40°C to +80°C | 16 | 25 | 34 | 50 | 0.15 |
| -40°C to +52°C | -40°C to +64°C | -40°C to +80°C | 16 | 25 | 64 | 50 | 0.15 |
| -40°C to +34°C | -40°C to +46°C | -40°C to +74°C | 16 | 52 | 169 | 50 | 0.15 |
| -40°C to +22°C | -40°C to +34°C | -40°C to +61°C | 16 | 76 | 242 | 50 | 0.15 |

Potentiometer; Ui = 26Vdc, Ii = 14 mA, Ci = 0 nF, Li = 0 H, Pi = 50mW

* When a = 2B

| For T6, Ta*=- | For T5, Ta*=- | For T4...T1, Ta*=- | Ui V | Ii mA | Pi mW | Ci nF | Li mH |
|----------------|----------------|--------------------|------|-------|-------|-------|-------|
| -25°C to +57°C | -25°C to +69°C | -25°C to +80°C | 16 | 25 | 34 | 100 | 0.20 |
| -25°C to +52°C | -25°C to +64°C | -25°C to +80°C | 16 | 25 | 64 | 100 | 0.20 |
| -25°C to +34°C | -25°C to +46°C | -25°C to +74°C | 16 | 52 | 169 | 100 | 0.20 |
| -25°C to +22°C | -25°C to +34°C | -25°C to +61°C | 16 | 76 | 242 | 100 | 0.20 |

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SCHEDULE

to EU-Type Examination Certificate No. FM10ATEX0039X

QCabcdef-g.Valve Position Monitor.

a = Function: 45

b= Enclosure: K, N, R or T

c= Junction: 03 or 06

d= Shaft Output: X, S, N or H

e= Visual Indication: X, G, R, C, 1, 2, 3, 4, 5, 0, B, E, Y, H, J, K, M, P, N, D, A, S, T, U, V or W

f= Branding: A or M

g= Options: '1-5 alpha or numeric digits for special and marketing identification'

*When a = 45

For T5 Ta* = -55°C to +80°C; For T6 Ta* = -55°C to +65°C

Energy Limitation Parameters:

Sensor Module: Ui = 22V, Ii = 120 mA, Pi = 0.4W, Ci = 3 nF, Li = 0 H

Solenoid Connection Terminals: Ui = 30V, Ii = 120mA

See also FM08ATEX0008X for Quartz QX and QC series with type of protection “d”..

14 **Specific Conditions of Use:**

1. Parts of the enclosure are non-conducting and may generate an ignition-capable level of electrostatic charge under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions which might cause a build up of electrostatic charge on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
2. When installed within a Zone 0 location, the aluminium alloy enclosure shall be installed in such a manner as to prevent the possibility of sparks resulting from friction or impact.
3. Using the box provided on the nameplate, the user shall permanently mark the type of protection chosen for the specific installation. Once the type of protection has been marked it shall not be changed.

15 **Essential Health and Safety Requirements:**

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

16 **Test and Assessment Procedure and Conditions:**

This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

17 **Schedule Drawings**

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

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SCHEDULE

to EU-Type Examination Certificate No. FM10ATEX0039X

18 Certificate History

Details of the supplements to this certificate are described below:

| Date | Description |
|--------------------------------|---|
| 25 th November 2010 | Original Issue. |
| 04 th June 2013 | <u>Supplement 1:</u> Report Reference: Report 3039143rev130430 dated 28 th May 2013. Description of the Change: Change to model code structure adding Chinese Visual. Indicator digits. Minor documentation change. |
| 11 th July 2014 | <u>Supplement 2:</u> Report Reference: Report 3048436 dated 01 st July 2014. Description of the Change: <ul style="list-style-type: none">• The following function options have been added: 5O,7O,5J,7J,5M,7M,5N,7N,5A,7A,54, and 74• Added function option 6N• Added enclosure options Z, T, Q, and N• Updated Temperature Class to T6• Updated entity parameters for _N and _A options to match P+F ATEX Certificates• Removed branding option "N"• Added Model "QX"• Updated editions of EN 60079-0 and EN 60529 |
| 22 nd February 2016 | <u>Supplement 3:</u> Report Reference: 3055582 dated 19 th February 2016. Description of the Change: <ul style="list-style-type: none">• Update Standards• Various revisions to the product• Update ambient temperature ratings• Consolidate model options and add new module options. |
| 15 th May 2017 | <u>Supplement 4:</u> Report Reference: RR208761 dated 11 th May 2017. Description of the Change: <ul style="list-style-type: none">• Reorganized and clarified model code.• Updated standards used for certification.• Added Specific Condition of Use 3.• Added reference to FM08ATEX0008X, covering protection concept 'd', in section 13.• Updated certificate to EU format. |
| 14 th August 2018 | <u>Supplement 5:</u> Report Reference: 3064023 dated 31 st July 2018. Description of the Change: Added sensor module option "T_". |
| 23 rd October 2019 | <u>Supplement 6:</u> Report reference - PR452032 dated 09 th October 2019. Description of the Change: Addition of "2B" function option. Added "QC" section. Addition of IP66. Updated to edition EN IEC 60079-0:2018 standard. Changed Notified Body information and number, now 2809. "5_" and "7_" function option parameters changes. Updated documentation. |
| 22 nd April 2020 | <u>Supplement 7:</u> Report reference – RR222856 dated 21 st April 2020. Description of the Change: Company name change. |

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Blueprint Report

Neles USA Inc. dba StoneL (1000001486)

Class No 3610

Original Project I.D. 3039143

Certificate I.D. FM10ATEX0039X

| <u>Drawing No.</u> | <u>Revision Level</u> | <u>Drawing Title</u> | <u>Last Report</u> |
|--------------------|-----------------------|---|--------------------|
| 000149 | G | Quartz QN Series ATEX Ex ia Models | RR222856 |
| 000185 | E | Model Description, Quartz QX Series, ATEX Ex ia | RR222856 |
| 000225 | B | Model Description, Quartz QC series, ATEX, IECEx Ex ia | RR222856 |
| 105026 | H | Electrical Information, Quartz QN-QX Series | PR452032 |
| 105180 | F | Enclosure Information, Quartz QX series, Ex d | PR452032 |
| 105193 | F | I.S. CONTROL, QUARTZ SERIES | PR452032 |
| 105283 | G | Quartz QN Ex ia Series Product Marking | RR222856 |
| 105406 | D | Installation, Maintenance and Operating Instructions | RR222856 |
| 105478 | A | Product Marking, Quartz QC Series, ATEX IECEx Ex d Ex i | PR452032 |
| 200011 | D | Schematic, 4-20mA Transmitter | 3048436 |
| 200134 | A | Schematic, Dual NAMUR Sensor, Ext range | 3039143 |
| 200219 | C | Schematic, 45 Dual Module, Namur | 3055582 |
| 200270 | B | SCHEMATIC, QUARTZ TRANSMITTER | 3064023 |
| 412016 | A | Switch, Proximity Sensor "N", P&F | 3039143 |
| 412021 | A | Switch, Bare reed, SPST | 3039143 |
| 412060 | D | Switch, Bare reed, SPST | 3055582 |
| 412145 | B | Sensor, NAMUR, P+F "A" Sensor | 3039143 |
| 412150 | A | Switch, SPDT. Low Power, 1 Amp Max | 3039143 |
| 412170 | B | Switch, BRD, ASSY., "M" | 3039143 |
| 414178 | C | Block, Terminal, 6 and 12 Pole | 3048436 |
| 418007 | G | PCB, 4-20mA Position Transmitter, Populated | RR222856 |
| 418022 | A | PCB, raw, StoneL Maxx-Guard switch | 3048436 |
| 418026 | R | Board, Populated, NAMUR Dual Module | PR452032 |
| 418028 | I | Board, unpopulated NAMUR | RR208761 |
| 418068 | C | PCB, 4-20mA Position Transmitter, Unpopulated | RR222856 |
| 418412 | C | Board, 45 Dual Module, Unpopulated | 3055582 |
| 418413 | C | Board, 45 Dual Module, Populated | 3055582 |
| 418442 | B | PCB, QUARTZ TRANSMITTER | 3064023 |
| 418443 | C | BOARD ASSEMBLY, QUARTZ TRANSMITTER | RR222856 |
| 422004 | B | Potentiometer | RR208761 |
| 422020 | A | Potentiometer, High Performance 0.1% Lin. | 3048436 |
| 432022 | A | Potting, SYLGARD, 170A/170B | 3039143 |
| 432029 | A | Urethane Potting, CONATHANE EN-14, Mixed | 3039143 |
| 432038 | B | Urethane potting, Epic Resins D9970 clear, mixed | 3055582 |
| 434365 | C | Block, Terminal, Sauro, 8 Pt, Hoz | PR452032 |