CERTIFICATE OF CONFORMITY

1. **HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**
2. **Certificate No:** **FM17CA0072X**
3. **Equipment:** **Quartz QN and QC Series Valve Position Monitor**
   (Type Reference and Name)
4. **Name of Listing Company:** **Neles USA Inc. dba StoneL**
5. **Address of Listing Company:** **26271 US Hwy 59**
   Fegus Falls, MN 56537
   USA
6. The examination and test results are recorded in confidential report number:

   3033392 dated 5th September 2008

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   CSA C22.2 No. 0-10:R2015, C22.2 No. 0.4-17:2017, C22.2 No. 0.5-16:2016, C22.2 No. 25-17:2017, C22.2 No. 30-M1986:R2016, C22.2 No. 94.2-15: 2015, CSA C22.2 No. 60529:2005, CAN/CSA-C22.2 No. 61010-1-12:2012, CAN/CSA C22.2 No. 61010-2-030-12:2016, CSA C22.2 No. 60079-0:2019, CAN/CSA C22.2 No. 60079-7:2016, CAN/CSA C22.2 No. 60079-7A:2018, CAN/CSA C22.2 No. 60079-11:2018, CAN/CSA C22.2 No. 60079-18:2016, CAN/CSA C22.2 No. 60079-18A:2018, ANSI/ISA 12.27.01:2011, CSA C22.2 No. 142:R2014, CSA C22.2 No. 157:R2012, CSA C22.2 No. 94:R2011, CSA C22.2 No. 213:R2013

8. 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.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

Certificate issued by:

J.E. Marquedant
VP. Manager -Electrical Systems

21 April 2020
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

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10. Equipment Ratings:

    Nonincendive for Class I / II / III, Division 2, Groups ABCDEFG, T5
    Intrinsically Safe for Class I / II / III, Division 1, Groups ABCDEFG, T6…T1
    Class I, Zone 0, Ex ia IIC T6…T1 Ga
    Type 4 / 4X / 6 / IP66 / IP67
    -50°C ≤ Ta ≤ +80°C

11. The marking of the equipment shall include:

    Hazardous location ratings per Section 12

    Ambient temperature rating

    Manufacturer's name and address

    Model number

    Serial number

    Date code

    Electrical ratings

12. **Description of Equipment:**

    The "QN" and "QC" Series Valve Position Monitors consist of sensors, potentionmeters 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. 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 cableentry 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

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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 addional 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 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.
NI / I-II-III / 2 / ABCDEFG / T5; IP66 / IP67; Ta* = -40°C to +80°C

*When a = 2E, 4E, 5E, 7E, BE, CE, 2F, 4F, 5F, 7F, BF or CF, Ta = -25°C to +70°C

a = Function 2P, 4P, 5P, 7P, BP, CP, 2L, 4L, 5L, 7L, BL, CL, 2H, 4H, 5H, 7H, 8H, BH, CH, 2S, 4S, 5S, 7S, BS, CS, 8Y, 2G, 4G, 5G, 7G, BG, CG, 4X, 6X, 2E, 4E, 5E, 7E, TE, BE, CE, 2F, 4F, 5F, 7F, TF, BF, CF, 33, 53, 73, B3, C3, 35, 5T, 7T, TT, BT, CT, 92, 93, 96, 97, 82, 83, 86 or 87.
b = Enclosure C, E, P, B, Y, S, U or J
c = Junction 02 or 03
d = Output X, S, N, or H
e = Visual Indication X, G, R, C, 1, 2, 3, 4, 5, 0, N, D, A, S, T, U, V or W
f = Branding A, or M
g = Options 'Special Unit Digits'
Note: 'Special Unit Digits' do not affect the integrity of the housing, the electrical safety, or the title plate.

QNabcdef-g. Valve Position Monitor.
NI / I-II-III / 2 / ABCDEFG / T5; Type 4 / 4X / 6 / IP66 / IP67; Ta* = -40°C to +80°C

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IS / I-II-III / 1 / ABCDEFG / T6…T1*; Type 4 / 4X / 6 / IP66 / IP67; Ta* = -40°C to +80°C
I / 0 / Ex ia IIC T6…T1* Ga; Type 4 / 4X / 6 / IP66 / IP67; Ta* = -40°C to +80°C

*When a = 5O, 7O
For T4 Ta* = -40ºC to +80ºC
Entity Limitation Parameters: Ui = 30 Vdc, Ii = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = TO
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters:
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 = BO, CO
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters: Ui = 26 V, Ii = 14 mA, Pi = 50 mW, Ci = 0 nF, Li = 0 mH

*When a = 2J, 4J, 2M, 4M
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters:
Switch/Sensor: Ui = 30V, Ii = 100 mA, Pi = 2.0W, Ci = 66 nF, Li = 0.8 mH

*When a = 5J, 7J, 5M, 7M
For T4 Ta* = -40ºC to +80ºC
Energy Limitation Parameters:
Switch/Sensor: Ui = 30 Vdc, Ii = 100 mA, Ci = 66 nF, Li = 0.8 mH, Pi = 2.0 W
Transmitter: Ui = 30 Vdc, Ii = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = BJ, CJ, BM, CM
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters:
Switch/Sensor: Ui = 30V, Ii = 100 mA, Pi = 2.0W, Ci = 66 nF, Li = 0.8 mH
Transmitter: Ui = 26V, Ii = 14 mA, Pi = 50mW, Ci = 0 nF, Li = 0 mH

*When a = 44
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters:
Sensor Module: Ui = 22V, Ii = 120 mA, Pi = 2.0W, Ci = 98 nF, Li = 0.8 mH
Solenoid Connection Terminals: Ui = 30V, Ii = 120 mA

*When a = 54, 74
For T4 Ta* = -40ºC to +80ºC
Energy Limitation Parameters:
Sensor Module: Ui = 22V, Ii = 120 mA, Pi = 2W, Ci = 98 nF, Li = 0.8 mH
Solenoid Connection Terminals: Ui = 30V, Ii = 120mA
Transmitter: Ui = 30 Vdc, Ii = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = B4, C4
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters:
Sensor Module: Ui = 22V, Ii = 120 mA, Pi = 2.0W, Ci = 98 nF, Li = 0.8 mH
Solenoid Connection Terminals: Ui = 30V, Ii = 120 mA

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

*When a = 45
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters:
Sensor Module: Ui = 22V, Ii = 120 mA, Pi = 0.4 W, Ci = 3 nF, Li = 0 mH
Solenoid Connection Terminals: Ui = 30V, Ii = 120mA

*When a = 5R, 7R
For T4 Ta* = -40ºC to +80ºC
Energy Limitation Parameters:
Sensor Module: Ui = 22V, Ii = 120 mA, Pi = 0.4W, Ci = 3 nF, Li = 0 mH
Solenoid Connection Terminals: Ui = 30V, Ii = 120mA
Transmitter: Ui = 30 Vdc, Ii = 100 mA, Ci = 66 nF, Li = 0 H, Pi = 0.75 W

*When a = TR
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters:
Sensor Module: Ui = 22Vdc, Ii = 120 mA, Pi = 0.4W, Ci = 3 nF, Li = 0 mH
Solenoid Connection Terminals: Ui = 30V, Ii = 120 mA
Transmitter: Ui = 30 Vdc, Ii = 100 mA, Ci = 3 nF, Li = 0 H, Pi = 0.75 W
Solenoid Connection Terminals: Ui = 30V, Ii = 120 mA

*When a = BR, CR
For T5 Ta* = -40ºC to +80ºC; For T6 Ta* = -40°C to +65°C
Energy Limitation Parameters:
Sensor Module: Ui = 22V, Ii = 120 mA, Pi = 0.4 W, Ci = 3 nF, Li = 0 mH
Solenoid Connection Terminals: Ui = 30V, Ii = 120mA
Potentiometer: Ui = 26V, Ii = 14 mA, Pi = 50mW, Ci = 0 nF, Li = 0 mH

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

For T6, Ta*=	For T5, Ta*=	For T4…T1, Ta*=	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

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

For T4…T1, Ta*=	Ui V	Ii mA	Pi mW	Ci nF	Li mH
-25°C to +80°C	16	25	34	40	0.05
-25°C to +80°C	16	25	64	40	0.05
-25°C to +68°C	16	52	169	40	0.05
-25°C to +53°C	16	76	242	40	0.05

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

* When a = TN
Switch/Sensor

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For T6, Ta*=	For T5, Ta*=	For T4…T1, Ta*=	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: 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 = BN, CN
Switch/Sensor:

For T6, Ta*=	For T5, Ta*=	For T4…T1, Ta*=	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: Ui = 26V, Ii = 14 mA, Pi = 50mW, Ci = 0 nF, Li = 0 mH

* 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

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-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 = 26V, Ii = 14 mA, Pi = 50mW, Ci = 0 nF, Li = 0 mH

* 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

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, 44, 54, 74, B4, C4, 45, 5R, 7R, TR, BR or CR
b = Enclosure C, E, P, B, Y, S, U or J
c = Junction 02 or 03.
d = Output X, S, N, or H.
e = Visual Indication X, G, R, C, 1, 2, 3, 4, 5, 0, N, D, A, S, T, U, V or W.
f = Branding A, or M
g = Options 'Special Unit Digits'
Note: 'Special Unit Digits' do not affect the integrity of the housing, the electrical safety, or the title plate

QCabcdef-g.Valve Position Monitor.
IS / I-II-III / 1 / ABCDEFG / T5*; Type 4 / 4X / 6 / IP66; Ta* = -50°C to +80°C
I / 0 / Ex ia IIC T5* Ga; Type 4 / 4X / 6 / IP66; Ta* = -50°C to +80°C

*When a = 45
For Divisions T5 Ta* = -50ºC to +80ºC; For T6 Ta* = -50°C to +65°C
For Zones T5 Ta* = -50ºC to +80ºC; For T6 Ta* = -50°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

a = Function: 45
b= Enclosure: E, B, S or J
c= Junction: 03.

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d= Output: X, S, N or H
e= Visual Indication: X, G, R, C, 1, 2, 3, 4, 5, 0, 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'

13. **Specific Conditions of Use:**

1. Part of the enclosure is constructed from plastic. To prevent the risk of electrostatic sparking the plastic surface should only be cleaned with a damp cloth.

2. The apparatus enclosure may contain aluminum which is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
5th September 2008	Original Issue.
11th May 2017	Supplement 3: Report Reference: RR208761 dated 11th May 2017. Description of the Change: Model code updates (remove function option K). Transfer to new certificate format.
31st July 2018	Supplement 4: Report Reference: 3064023 dated 31st July 2018. Description of the Change: Removed Approval Guide code from description. Added sensor module option "T_".
9th October 2019	Supplement 5: Report Reference: PR452032 dated 9th October 2019. Description of the Change: Addition of "2B" function option. Revision to "96", "97", "86", and "87" function options. Removed 2X, 5X, 7X, BX, and CX function options. Added "QC" section. Addition of IP66. "5_" and "7_" function option parameters changes. Function option "_A" parameters corrected. Updated documentation.

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21st April 2020	Supplement 6: Report reference – RR222856 dated 21st April 2020. Description of the Change: Company name change.