

1 EC-TYPE EXAMINATION CERTIFICATE



2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 94/9/EC**

3 **EC-Type Examination Certificate No: FM10ATEX0039X**

4 **Equipment or protective system: QN / QX Series Valve Position Monitors (Type Reference and Name)**

5 **Name of Applicant: StoneL**

6 **Address of Applicant: 26271 US Hwy 59 Fergus Falls, MN 56537, USA**

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 Ltd, notified body number 1725 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, 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 60079-0:2012; EN 60079-11:2012; and EN 60529+A1:2013

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 EC-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. 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:



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



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Mick Gower
Certification Manager, FM Approvals Ltd.

Issue date: 22nd February 2016

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13 Description of Equipment or Protective System:

The "QN" and "QX" Series Valve Position Monitors consist of sensors 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 IP67. The sensors covered are: a) Dual Module Namur sensors, b) Maxx-Guard proximity sensors, c) N Type Namur sensors (P + F) and d) A Type Namur sensors (P + F).

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 single 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 single cable entry. 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 single cable entry.

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 single cable entry.

QNabcdef-g.Valve Position Monitor.

a = Function: 2J, 4J, 5J, 7J, BJ, CJ, 2M, 4M, 5M, 7M, BM, CM, 5O, 7O, BO, CO, 2N, 4N, 5N, 6N, 7N, BN, CN, 2A, 4A, 5A, 7A, BA, CA, 44, 54, 74 B4, C4, 45, 5R, 7R, 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 = 2J, 4J, 5J, 7J, BJ, CJ, 2M, 4M, 5M, 7M, BM, CM, 5O, 7O

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

Energy Limitation Parameters: Ui = 30 Vdc, li = 100 mA, Ci = 66 nF, Li = 0.8 mH, Pi = 2.0 W

*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 = 44, 54, 74, 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 = 98 nF, Li = 0.8 mH

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

*When a = 45, 5R, 7R, BR, CR

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

Energy Limitation Parameters:

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Sensor Module: $U_i = 22V$, $I_i = 120\text{ mA}$, $P_i = 0.4\text{ W}$, $C_i = 3\text{ nF}$, $L_i = 0\text{ mH}$
 Solenoid Connection Terminals: $U_i = 30V$, $I_i = 120\text{ mA}$

* When a = 2N, 4N, 5N, 6N, 7N, BN or CN

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 +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 = 2A, 4A, 5A, 7A, BA, CA

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

QXabcdef-g. Valve Position Monitor.

a = Function: 2J, 4J, 5J, 7J, BJ, CJ, 2M, 4M, 5M, 7M, BM, CM, 5O, 7O, BO, CO, 2N, 4N, 5N, 6N, 7N, BN, CN, 2A, 4A, 5A, 7A, BA, CA, 44, 54, 74 B4, C4, 45, 5R, 7R, 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 = 2J, 4J, 5J, 7J, BJ, CJ, 2M, 4M, 5M, 7M, BM, CM, 5O, 7O

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

Entity Limitation Parameters: $U_i = 30\text{ Vdc}$, $I_i = 100\text{ mA}$, $C_i = 66\text{ nF}$, $L_i = 0.8\text{ mH}$, $P_i = 2.0\text{ W}$

*When a = BO, CO

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

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

When a = 44, 54, 74, B4, C4,

For T5 Ta* = -40°C to +80°C; For T6 Ta* = -40°C to +65°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: $U_i = 30V$, $I_i = 120\text{ mA}$

*When a = 45, 5R, 7R, BR, CR

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

Energy Limitation Parameters:

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

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

* When $a = 2N, 4N, 5N, 6N, 7N, BN$ or CN

For T6, $T_{a^*} =$	For T5, $T_{a^*} =$	For T4...T1, $T_{a^*} =$	U_i V	I_i mA	P_i mW	C_i nF	L_i 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 $a = 2A, 4A, 5A, 7A, BA, CA$

For T6, $T_{a^*} =$	For T5, $T_{a^*} =$	For T4...T1, $T_{a^*} =$	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

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 aluminum alloy enclosure shall be installed in such a manner as to prevent the possibility of sparks resulting from friction or impact.

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 EC-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 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 Ltd's ATEX Certification Scheme.

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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.

18 Certificate History

Details of the supplements to this certificate are described below:

Date	Description
25th November 2010	Original Issue.
4th June 2013	<u>Supplement 1:</u> Report Reference: – Report 3039143rev130430 dated 28th May 2013 Description of the Change: Change to model code structure adding Chinese Visual Indicator digits. Minor documentation change.
11th July 2014	<u>Supplement 2:</u> Report Reference: – Report 3048436 dated 1st 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
22nd February 2016	<u>Supplement 3:</u> Report reference - 3055582 dated 19th 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.

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Blueprint Report

StoneL Corporation (1000001486)

Class No 3610 Date Printed Nov 17 2015

Original Project I.D. 3039143

Certificate I.D. FM10ATEX0039X

<u>Drawing No.</u>	<u>Revision</u>	<u>Drawing Title</u>	<u>Last Report</u>	<u>Electronic Drawing</u>
000149	D	Quartz QN Series ATEX Ex ia Models	3055582	Yes (pdf)
000163	D	Quartz QN Ex ia Series Schedule Documents	3055582	Yes (pdf)
000185	B	Model Description, Quartz QX Series, ATEX Ex ia	3055582	Yes (pdf)
105026	E	Electrical Information, Quartz QN-QX Series	3055582	Yes (pdf)
105030	C	Quartz QN Series Enclosure FM	3048436	Yes (pdf)
105193	C	Installation Instructions, IS Models with Maxx-Guard sensors QN_J, QN_M	3048436	Yes (pdf)
105199	D	Installation Instructions, Sensors with P+F Namur "A"	3055582	Yes (pdf)
105201	D	Installation Instructions, Sensors with P+F Namur "N"	3055582	Yes (pdf)
105202	C	Quartz, 4-20mA Position Transmitter Installation & Adjusting Instructions	3055582	Yes (pdf)
105203	C	Quartz, 4-20mA Position Transmitter w/Switches Installation & Adjusting Instructions	3055582	Yes (pdf)
105208	D	Installation Instructions, IS Models with "44" & "45" Dual module Namur Sensors	3055582	Yes (pdf)
105242	B	Visual Indicator, Quartz Series, Detail	3055582	Yes (pdf)
105279	C	Installation & Adjusting instructions addendum, QX Series	3055582	Yes (pdf)
105283	C	Quartz QN Ex ia Series Product Marking	3055582	Yes (pdf)
200011	D	Schematic, 4-20mA Transmitter	3048436	Yes (pdf)
200134	A	Schematic, Dual NAMUR Sensor, Ext range	3039143	Yes (pdf)
200219	C	Schematic, 45 Dual Module, Namur	3055582	Yes (pdf)
412016	A	Switch, Proximity Sensor "N", P&F	3039143	Yes (pdf)
412021	A	Switch, Bare reed, SPST	3039143	Yes (pdf)
412060	D	Switch, Bare reed, SPST	3055582	Yes (pdf)
412145	B	Sensor, NAMUR, P+F "A" Sensor	3039143	Yes (pdf)
412150	A	Switch, SPDT. Low Power, 1 Amp Max	3039143	Yes (pdf)
412170	B	Switch, BRD, ASSY., "M"	3039143	Yes (pdf)
414178	C	Block, Terminal, 6 and 12 Pole	3048436	Yes (pdf)
414717	B	Block, Terminal, 8 Point PBC Mount	3039143	Yes (pdf)
418007	F	PCB, 4-20mA Position Transmitter, Populated	3048436	Yes (pdf)
418022	A	PCB, raw, StoneL Maxx-Guard switch	3048436	Yes (pdf)
418026	P	Board, Populated, NAMUR Dual Module	3055582	Yes (pdf)
418028	H	Board, unpopulated NAMUR	3039143	Yes (pdf)
418068	B	PCB, 4-20mA Position Transmitter, Unpopulated	3048436	Yes (pdf)
418412	C	Board, 45 Dual Module, Unpopulated	3055582	Yes (pdf)
418413	C	Board, 45 Dual Module, Populated	3055582	Yes (pdf)
422004	A	Potentiometer	3048436	Yes (pdf)
422020	A	Potentiometer, High Performance 0.1% Lin.	3048436	Yes (pdf)
432022	A	Potting, SYLGARD, 170A/170B	3039143	Yes (pdf)
432029	A	Urethane Potting, CONATHANE EN-14, Mixed	3039143	Yes (pdf)
432038	B	Urethane potting, Epic Resins D9970 clear, mixed	3055582	Yes (pdf)
434365	B	Block, Terminal, Sauro, 8 Pt, Hoz	3055582	Yes (pdf)