

# CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM16US0123X
3. **Equipment:** Model 2410 Tank Hub  
**(Type Reference and Name)**
4. **Name of Listing Company:** Rosemount Tank Radar AB
5. **Address of Listing Company:** Layoutvägen 1  
435 33 Mölnlycke  
Sweden
6. The examination and test results are recorded in confidential report number:  
  
3035492 dated 16<sup>th</sup> September 2010
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:  
  
FM Class 3600:2011, FM Class 3610:2015; FM Class 3615:2006; FM Class 3810:2005;  
ANSI/ISA 61010-1:2004 Ed.2 ANSI/NEMA 250:2003; ANSI/IEC 60529:2004: Ed 2.1;  
ANSI/ISA 60079-0:2013: Ed.6, ANSI/UL 60079-1:2015: Ed.7, ANSI/ISA 60079-7:2008: Ed.4,  
ANSI/ISA 60079-11:2014 Ed.6.2, ANSI 60079-26:2011; Ed.2
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  
Manager, Electrical Systems

31 March 2017

Date

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

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FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA  
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

# SCHEDULE



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## 10. Equipment Ratings:

For b = Tank Bus (Fieldbus - Power and Communication): F and when d = Secondary Communication Bus (Non-IS): R, E, 5, K, L, V, H, G, A, U, T, B, 6, 7, 0, or F:

Explosionproof for use in Class I, Division 1, Group C and D; Temperature Class T4 Ta = -50°C to +70°C; Dust-Ignitionproof for use in Class II and III, Division 1, Groups E, F and G; Temperature Class T4 Ta = -50°C to +70°C; Associated Fieldbus Intrinsically Safe Concept (FISCO POWER SUPPLY) connections to Class I, Division 1, Group C and D in accordance with control drawing 9240040-901; Flameproof and Increased Safety for use in Class I, Zone 1 Group IIB; Temperature Class T4 Ta = -50°C to +70°C with Associated Fieldbus Intrinsically Safe Concept (FISCO POWER SUPPLY) connections to Class I, Zone 1, Group IIB in accordance with control drawing 9240040-901; Explosive Atmospheres; indoor and outdoor; Type 4X; IP66/67.

FISCO Parameters;  
U<sub>o</sub> = 15V, I<sub>o</sub> = 354mA, P<sub>o</sub> = 5.32W

When b = Tank Bus (Fieldbus - Power and Communication): F and when d = Secondary Communication Bus (HART@/4-20mA Active IS Input/Output): W, C or 8.

Explosionproof for use in Class I, Division 1, Group C and D; Temperature Class T4 Ta = -50°C to +70°C; Dust-Ignitionproof for use in Class II and III, Division 1, Groups E, F and G; Temperature Class T4 Ta = -50°C to +70°C; Associated Fieldbus Intrinsically Safe Concept (FISCO POWER SUPPLY) connections to Class I, Division 1, Group C and D in accordance with control drawing 9240040-901 and with Associated Intrinsically Safe (Entity) connections to Class I, Division 1, Groups C and D in accordance with control drawing 9240040-901. Flameproof and Increased Safety for use in Class I, Zone 1 Group IIB; Temperature Class T4 Ta = -50°C to +70°C with Associated Fieldbus Intrinsically Safe Concept (FISCO POWER SUPPLY) connections to Class I, Zone 1, Group IIB and with Associated Intrinsically Safe (Entity) connections to Class I, Zone 0, Group IIC in accordance with control drawing 9240040-901; Hazardous Locations/Explosive Atmospheres; indoor and outdoor; Type 4X; IP66/67.

FISCO Parameters;  
U<sub>o</sub> = 15V, I<sub>o</sub> = 354mA, P<sub>o</sub> = 5.32W  
Entity Parameters (Active HART):  
U<sub>o</sub> = 23.1V, I<sub>o</sub> = 95.3mA, P<sub>o</sub> = 550mW  
Group IIC: C<sub>o</sub> = 0.14µF, L<sub>o</sub> = 3.9mH  
Group C, IIB: C<sub>o</sub> = 1.0µF, L<sub>o</sub> = 15mH  
Group D, IIA: C<sub>o</sub> = 3.67µF, L<sub>o</sub> = 33mH

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When b = Tank Bus (Fieldbus - Power and Communication): F and when d = Secondary Communication Bus (HART@/4-20mA Passive IS Input/Output): D or 9.

Explosionproof for use in Class I, Division 1, Group C and D; Temperature Class T4 Ta = -50°C to +70°C; Dust-Ignitionproof for use in Class II and III, Division 1, Groups E, F and G; Temperature Class T4 Ta = -50°C to +70°C; Associated Fieldbus Intrinsically Safe Concept (FISCO POWER SUPPLY) connections to Class I, Division 1, Group C and D in accordance with control drawing 9240040-901; Flameproof and Increased Safety for use in Class I, Zone 1 Group IIB; Temperature Class T4 Ta = -50°C to +70°C with Associated Fieldbus Intrinsically Safe Concept (FISCO POWER SUPPLY) connections to Class I, Zone 1, Group IIB in accordance with Control Drawing 9240040-901 and with Intrinsically Safe (Entity) connections for use in Class I, Zone 1, Group IIB in accordance with Control Drawing 9240040-901; Hazardous Location/Explosive Atmospheres; indoor and outdoor; Type 4X; IP66/67.

FISCO Parameters;

$U_o = 15V$ ,  $I_o = 354mA$ ,  $P_o = 5.32W$

Entity Parameters (Passive HART):

$U_i = 30.0V$ ,  $I_i = 300mA$ ,  $P_i = 1W$ ,  $C_i = 0$ ,  $L_i = 0$

When b = Tank Bus (Fieldbus - Power and Communication): E and when d = Secondary Communication Bus (Non-IS): R, E, 5, K, L, V, H, G, A, U, T, B, 6, 7, 0, or F:

Explosionproof for use in Class I, Division 1, Group C and D; Temperature Class T4 Ta = -50°C to +70°C; Dust-Ignitionproof for use in Class II and III, Division 1, Groups E, F and G; Temperature Class T4 Ta = -50°C to +70°C; Associated Intrinsically Safe (Entity) connections to Class I, Division 1, Group C and D in accordance with Control Drawing D7000002-611; Flameproof and Increased Safety for use in Class I, Zone 1 Group IIB; Temperature Class T4 Ta = -50°C to +70°C with Associated Intrinsically Safe (Entity) connections to Class I, Zone 1, Group IIB in accordance with Control Drawing D7000002-611; Hazardous Location/Explosive Atmospheres; indoor and outdoor; Type 4X; IP66/67.

Entity Parameters (Fieldbus Terminals):

$U_o = 15V$ ,  $I_o = 200mA$ ,  $P_o = 3W$ ,  $C_o = 1.99\mu F$ ,  $L_o = 143\mu H$

When b = Tank Bus (Fieldbus - Power and Communication): E and when d = Secondary Communication Bus (HART@/4-20mA Active IS Input/Output): W, C or 8.

Explosionproof for use in Class I, Division 1, Group C and D; Temperature Class T4 Ta = -50°C to +70°C; Dust-Ignitionproof for use in Class II and III, Division 1, Groups E, F and G; Temperature Class T4 Ta = -50°C to +70°C; Associated Intrinsically Safe (Entity) connections to Class I, Division 1, Group C and D in accordance with Control Drawing D7000002-611 and with Associated Intrinsically Safe (Entity) connections to Class I, Division 1, Groups C and D in accordance with Control Drawing D7000002-611. Flameproof and Increased Safety for use in Class I, Zone 1 Group IIB; Temperature Class T4 Ta = -50°C to +70°C with Associated Intrinsically Safe (Entity) connections to Class I, Zone 1, Group IIB in accordance with Control Drawing D7000002-611 and with Associated Intrinsically Safe (Entity) connections to Class I, Zone 0, Group IIC in accordance with Control Drawing D7000002-611; Hazardous Locations/Explosive Atmospheres; indoor and outdoor; Type 4X; IP66/67.

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Entity Parameters (Fieldbus Terminals):

$U_o = 15V$ ,  $I_o = 200mA$ ,  $P_o = 3W$ ,  $C_o = 1.99\mu F$ ,  $L_o = 143\mu H$

Entity Parameters (Active HART Terminals):

$U_o = 23.1V$ ,  $I_o = 95.3mA$ ,  $P_o = 550mW$

Group IIC:  $C_o = 0.14\mu F$ ,  $L_o = 3.9mH$

Group IIB:  $C_o = 1.0\mu F$ ,  $L_o = 15mH$

Group IIA:  $C_o = 3.67\mu F$ ,  $L_o = 33mH$

When b = Tank Bus (Fieldbus - Power and Communication): E and when d = Secondary Communication Bus (HART@/4-20mA Passive IS Input/Output): D or 9:

Explosionproof for use in Class I, Division 1, Group C and D; Temperature Class T4  $T_a = -50^{\circ}C$  to  $+70^{\circ}C$ ; Dust-Ignitionproof for use in Class II and III, Division 1, Groups E, F and G; Temperature Class T4  $T_a = -50^{\circ}C$  to  $+70^{\circ}C$ ; Associated Intrinsically Safe (Entity) connections to Class I, Division 1, Group C and D in accordance with Control Drawing D7000002-611; Flameproof and Increased Safety for use in Class I, Zone 1 Group IIB; Temperature Class T4  $T_a = -50^{\circ}C$  to  $+70^{\circ}C$  with Associated Intrinsically Safe (Entity) connections to Class I, Zone 1, Group IIB in accordance with Control Drawing D7000002-611 and with Intrinsically Safe (Entity) connections for use in Class I, Zone 1, Group IIB in accordance with Control Drawing D7000002-611; Hazardous Locations/Explosive Atmospheres; indoor and outdoor; Type 4X; IP66/67.

Entity Parameters (Fieldbus):

$U_o = 15V$ ,  $I_o = 200mA$ ,  $P_o = 3W$ ,  $C_o = 1.99\mu F$ ,  $L_o = 143\mu H$

Entity Parameters (Passive HART):

$U_i = 30V$ ,  $I_i = 300mA$ ,  $P_i = 1W$ ,  $C_i = 0$ ,  $L_i = 0$ .

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**11. The marking of the equipment shall include:**

For b = Tank Bus (Fieldbus - Power and Communication): F and when d = Secondary Communication Bus (Non-IS): R, E, 5, K, L, V, H, G, A, U, T, B, 6, 7, 0, or F:

FISCO POWER SUPPLY  
XP CL 1, DIV 1 GPS C, D & Associated  
Apparatus providing IS circuit to CL I,  
DIV 1, GPS C & D; DIP CL II/III, DIV. 1,  
GP E, F & G; CL I, ZONE 1 AEx db e [ib] IIB  
Amb. Temp. Limits -50°C to +70°C Temp. Class T4  
SEE CONTROL DRAWING D9240040-901  
ENCL. TYPE 4X, IP66, IP67

When b = Tank Bus (Fieldbus - Power and Communication): F and when d = Secondary Communication Bus (HART@/4-20mA Active IS Input/Output): W, C or 8:

FISCO POWER SUPPLY  
XP CL 1, DIV 1 GPS C, D & Associated  
Apparatus providing IS circuit to CL I,  
DIV 1, GPS C & D; DIP CL II/III, DIV. 1,  
GP E, F & G; CL I, ZONE 1 AEx db e [ib] IIB  
ENTITY IS I/O  
ACTIVE: XP CL 1, DIV 1 GPS C, D & Associated  
Apparatus providing IS circuit to CL 1, DIV 1, GPS C & D  
ACTIVE: CL I, ZONE 0 AEx db e [ ia IIC ] IIB  
Amb. Temp. Limits -50°C to +70°C Temp. Class T4  
SEE CONTROL DRAWING D9240040-901  
Type 4X; IP66/67

When b = Tank Bus (Fieldbus - Power and Communication): F and when d = Secondary Communication Bus (HART@/4-20mA Passive IS Input/Output): D or 9.

FISCO POWER SUPPLY  
XP CL 1, DIV 1 GPS C, D & Associated  
Apparatus providing IS circuit to CL I,  
DIV 1, GPS C & D; DIP CL II/III, DIV. 1,  
GP E, F & G; CL I, ZONE 1 AEx db e [ib] IIB  
ENTITY IS I/O  
PASSIVE: CL I, ZONE 1 AEx db e ib IIB  
Amb. Temp. Limits -50°C to +70°C Temp. Class T4  
SEE CONTROL DRAWING D9240040-901  
Type 4X; IP66/67

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When b = Tank Bus (Fieldbus - Power and Communication): E and when d = Secondary Communication Bus (Non-IS): R, E, 5, K, L, V, H, G, A, U, T, B, 6, 7, 0, or F:

**ENTITY IS POWER SUPPLY**

XP CL I, DIV 1 GPS C, D & Associated  
Apparatus providing IS circuit to CL I,  
DIV 1, GPS C & D; DIP CL II/III, DIV. 1,  
GP E, F & G; CL I, ZONE 1 AEx db e [ib] IIB  
ENTITY Uo: 15.0 V, Io: 200 mA, Po: 3.0 W  
Co: 1.9 µF, Lo: 143 µH

Amb. Temp. Limits -50°C to +70°C Temp. Class T4  
SEE CONTROL DRAWING D7000002-611  
Type 4X; IP66/67

When b = Tank Bus (Fieldbus - Power and Communication): E and when d = Secondary Communication Bus (HART@/4-20mA Active IS Input/Output): W, C or 8.

**ENTITY IS POWER SUPPLY**

XP CL I, DIV 1 GPS C, D & Associated  
Apparatus providing IS circuit to CL I,  
DIV 1, GPS C & D; DIP CL II/III, DIV. 1,  
GP E, F & G; CL I, ZONE 1 AEx db e [ib] IIB  
ENTITY IS I/O

ACTIVE: XP CL I, DIV 1 GPS C, D & Associated  
Apparatus providing IS circuit to CL I, DIV 1, GPS C & D  
ACTIVE: CL I, ZONE 0 AEx db e [ia IIC] IIB  
Amb. Temp. Limits -50°C to +70°C Temp. Class T4  
SEE CONTROL DRAWING D7000002-611  
Type 4X; IP66/67

When b = Tank Bus (Fieldbus - Power and Communication): E and when d = Secondary Communication Bus (HART@/4-20mA Passive IS Input/Output): D or 9:

**ENTITY IS POWER SUPPLY**

XP CL I, DIV 1 GPS C, D & Associated  
Apparatus providing IS circuit to CL I,  
DIV 1, GPS C & D; DIP CL II/III, DIV. 1,  
GP E, F & G; CL I, ZONE 1 AEx db e [ib] IIB  
ENTITY IS I/O

PASSIVE: CL I, ZONE 1 AEx db e ib IIB  
Amb. Temp. Limits -50°C to +70°C Temp. Class T4  
SEE CONTROL DRAWING D7000002-611  
Type 4X; IP66/67

**12. Description of Equipment:**

**General** - The Model 2410 is a tank hub unit which handles data transmissions between the control room and a number of Fieldbus devices.

**Construction** - The Model 2410 Tank Hub housing and covers are constructed of Stainless Steel 316 or die

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US Certificate Of Conformity No: FM16US0123X

cast Aluminum Alloy 360. The complete housing consists of a total of three compartments. Two field wiring compartments are situated on either side of the enclosures' electronics compartment. Terminal compartments are covered with identical thread-on blank covers while the electronics compartment is covered with a glass window thread-on cover. The terminal compartment situated on the left side, has two, 1/2-14 NPT, and two 3/4 -14 NPT conduit entries for field wiring purposes. The terminal compartment situated on the right side has two, 1/2 -14 inch conduit entries for intrinsically safe field wiring purposes.

**Ratings** - The Model 2410 Tank Hub is powered with a nominal 24-48Vdc or 48-240Vac / 50Hz to 60Hz. Intrinsically Safe entity and FISOC parameters can be found above in the equipment ratings section. The Model 2410 Tank Hub has an ambient temperature range of -50°C to +70°C.

### **2410-abcdefghijklmn. Tank Hub.**

- a = Number of Tanks: Any single character.
- b = Tank Bus (Fieldbus - Power and Communication): F.
- c = Primary Communication Bus (Non-IS): R, 4, E, L, V, H, G, U, T, A, B, 6 or 7.
- d = Secondary Communication Bus (Non-IS): R, E, 5, K, L, V, H, G, A, U, T, B, 6, 7, 0, or F.
- e = Relay Output (SIS/SIL): 3, 2, S, F or 0. (Option 3, 2 and S are not verified by FM Approvals).
- f = Relay Outputs (Non-SIS/SIL): 1, 2, F, A or 0. (Option A was not verified by FM Approvals)
- g = Integral Display: 1 or 0.
- h = Power Supply: P.
- i = Firmware: Any single character.
- j = Hazardous Location Certification: E5, K1, K4 or K5.
- k = Custody Transfer Type Approval: Any single character.
- l = Housing: A or S.
- m = Cable/Conduit Connections: 1 (required for Explosionproof installation), 2, G, E or M.
- n = Mechanical Mounting: P, W, X or 0.

### **2410-abcdefghijklmn. Tank Hub.**

- a = Number of Tanks: Any single character.
- b = Tank Bus (Fieldbus - Power and Communication): F.
- c = Primary Communication Bus (Non-IS): R, 4, E, L, V, H, G, U, T, A, B, 6 or 7.
- d = Secondary Communication Bus (HART@/4-20mA Active IS Input/Output): W, C or 8.
- e = Relay Output (SIS/SIL): 3, 2, S, F or 0. (Option 3, 2 and S are not verified by FM Approvals)
- f = Relay Outputs (Non-SIS/SIL): 1, 2, F, A or 0. (Option A was not verified by FM Approvals)
- g = Integral Display: 1 or 0.
- h = Power Supply: P.
- i = Firmware: Any single character.
- j = Hazardous Location Certification: E5, K1, K4 or K5.
- k = Custody Transfer Type Approval: Any single character.
- l = Housing: A or S.
- m = Cable/Conduit Connections: 1 (required for Explosionproof installation), 2, G, E or M.
- n = Mechanical Mounting: P, W, X or 0.

### **2410-abcdefghijklmn. Tank Hub.**

- a = Number of Tanks: Any single character.
- b = Tank Bus (Fieldbus - Power and Communication): F.
- c = Primary Communication Bus (Non-IS): R, 4, E, L, V, H, G, U, T, A, B, 6 or 7.
- d = Secondary Communication Bus (HART@/4-20mA Passive IS Input/Output): D or 9.
- e = Relay Output (SIS/SIL): 3, 2, S, F or 0. (Option 3, 2 and S are not verified by FM Approvals)

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f = Relay Outputs (Non-SIS/SIL): 1, 2, F, A or 0. (Option A was not verified by FM Approvals)  
g = Integral Display: 1 or 0.  
h = Power Supply: P.  
i = Firmware: Any single character.  
j = Hazardous Location Certification: E5, K1, K4 or K5.  
k = Custody Transfer Type Approval: Any single character.  
l = Housing: A or S.  
m = Cable/Conduit Connections: 1 (required for Explosionproof installation), 2, G, E or M.  
n = Mechanical Mounting: P, W, X or 0.

## **2410-abcdefghijklmn. Tank Hub.**

a = Number of Tanks: Any single character.  
b = Tank Bus (Fieldbus - Power and Communication): E.  
c = Primary Communication Bus (Non-IS): R, 4, E, L, V, H, G, U, T, A, B, 6 or 7.  
d = Secondary Communication Bus (Non-IS): R, E, 5, K, L, V, H, G, A, U, T, B, 6, 7, 0, or F.  
e = Relay Output (SIS/SIL): 3, 2, S, F or 0. (Option 3, 2 and S are not verified by FM Approvals)  
f = Relay Outputs (Non-SIS/SIL): 1, 2, F, A or 0. (Option A was not verified by FM Approvals)  
g = Integral Display: 1 or 0.  
h = Power Supply: P.  
i = Firmware: Any single character.  
j = Hazardous Location Certification: E5, K1, K4 or K5.  
k = Custody Transfer Type Approval: Any single character.  
l = Housing: A or S.  
m = Cable/Conduit Connections: 1 (required for Explosionproof installation), 2, G, E or M.  
n = Mechanical Mounting: P, W, X or 0.

## **2410-abcdefghijklmn. Tank Hub.**

a = Number of Tanks: Any single character.  
b = Tank Bus (Fieldbus - Power and Communication): E.  
c = Primary Communication Bus (Non-IS): R, 4, E, L, V, H, G, U, T, A, B, 6 or 7.  
d = Secondary Communication Bus (HART@/4-20mA Active IS Input/Output): W, C or 8.  
e = Relay Output (SIS/SIL): 3, 2, S, F or 0. (Option 3, 2 and S are not verified by FM Approvals)  
f = Relay Outputs (Non-SIS/SIL): 1, 2, F, A or 0. (Option A was not verified by FM Approvals)  
g = Integral Display: 1 or 0.  
h = Power Supply: P.  
i = Firmware: Any single character.  
j = Hazardous Location Certification: E5, K1, K4 or K5.  
k = Custody Transfer Type Approval: Any single character.  
l = Housing: A or S.  
m = Cable/Conduit Connections: 1 (required for Explosionproof installation), 2, G, E or M.  
n = Mechanical Mounting: P, W, X or 0.

## **2410-abcdefghijklmn. Tank Hub.**

a = Number of Tanks: Any single character.  
b = Tank Bus (Fieldbus - Power and Communication): E.  
c = Primary Communication Bus (Non-IS): R, 4, E, L, V, H, G, U, T, A, B, 6 or 7.  
d = Secondary Communication Bus (HART@/4-20mA Passive IS Input/Output): D or 9.  
e = Relay Output (SIS/SIL): 3, 2, S, F or 0. (Option 3, 2 and S are not verified by FM Approvals)  
f = Relay Outputs (Non-SIS/SIL): 1, 2, F, A or 0. (Option A was not verified by FM Approvals)  
g = Integral Display: 1 or 0.

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US Certificate Of Conformity No: FM16US0123X

h = Power Supply: P.

i = Firmware: Any single character.

j = Hazardous Location Certification: E5, K1, K4 or K5.

k = Custody Transfer Type Approval: Any single character.

l = Housing: A or S.

m = Cable/Conduit Connections: 1 (required for Explosionproof installation), 2, G, E or M.

n = Mechanical Mounting: P, W, X or 0.

13. **Specific Conditions of Use:**

The flamepaths of the equipment are not intended to be repaired. Consult the manufacturer if repair of the flamepath joints is necessary.

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

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

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
16 <sup>th</sup> September 2010	Original Issue.
14 <sup>th</sup> December 2016	<u>Supplement 5:</u> Report Reference: 3058394 dated 14 <sup>th</sup> December 2016 Description of the Change: 1. Transfer product to new certificate format 2. Update equipment to the latest standards
7 <sup>th</sup> March 2017	<u>Supplement 6:</u> Report Reference: RR208434 dated 7 <sup>th</sup> March 2017 Description of the Change: 1. Added Codes U and T (Keiso and Tokyo) to Secondary Communication Bus (Non-IS) options. 2. Added Polane HS Blue paint as an option for the enclosure.
31 <sup>st</sup> March 2017	<u>Supplement 7:</u> Report Reference: RR208840 dated 31 <sup>st</sup> March 2017 Description of the Change: 1. Non-Intrinsically Safe Communication board options added to Primary Communication (Pos 4), Model codes "L, V, H, G, U and T"

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

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