

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: FM10ATEX0012

4 Equipment or protective system: MODEL 2410 TANK HUB
(Type Reference and Name)

5 Name of Applicant: Rosemount Tank Radar AB

6 Address of Applicant: Gamlestadsvägen 18B,
SE-40251 Göteborg
Sweden

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:

3035492EC dated March 17, 2014

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 60079-0:2009, EN 60079-1:2007, EN 60079-7:2007, EN 60079-11:2007, EN 60079-26:2007,
EN 60079-27:2008 and EN 60529:1992 + A1:2000

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe 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:

TANK HUB:

II 2(2) G Ex d e [ib] IIB T4 Ta = -50°C to +70°C, IP66 / IP67



TANK HUB (with Active Modem HART Board):

II 2(2) G Ex d e [ib] IIB T4 Ta = -50°C to +70°C, IP66 / IP67



II 2(1) G Ex d e [ia IIC] IIB T4 Ta = -50°C to +70°C, IP66 / IP67

TANK HUB (with Passive Modem HART Board):

II 2(2) G Ex d e [ib] IIB T4 Ta = -50°C to +70°C, IP66 / IP67



II 2(2) G Ex d e ib IIB T4 Ta = -50°C to +70°C, IP66 / IP67

Mick Gower

Certification Manager, FM Approvals Ltd.

Issue date: 04th August 2015

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13 Description of Equipment or Protective System:

The Model 2410 Tank Hub is powered with 24-48Vdc or 48-240Vac / 50Hz to 60Hz and handles data transmissions between the control room and a number of Fieldbus devices. It has a Flameproof enclosure, Increased Safety terminals, and also contains Intrinsically Safe circuitry for supplying energy to the Intrinsically Safe location. The Fieldbus terminals will either have a FISCO output or an Entity output depending on which fieldbus communications board is installed. The FISCO output electronics are distinguished by option b= Tank Bus (Fieldbus - Power and Communication): F and the Entity output electronics are distinguished by b = Tank Bus (Fieldbus Power and Communication): E. As an option, the Model 2410 Tank Hub can also contain a Modem HART communication board. The Active HART communications option has Intrinsically Safe entity output. The Passive HART Communications board is isolated and receives power from an Intrinsically Safe barrier.

The Model Codes are as follows:

2410-abcdefghijklmn. Tank Hub.

II 2(2) G Ex d e [ib] IIB T4 Ta = -50°C to +70°C; FISCO; IP66 / IP67

FISCO Parameters:

Uo = 15V, Io = 354mA, Po = 5.32W

a = Number of Tanks: Any single character.

b = Tank Bus (Fieldbus - Power and Communication): F.

c = Primary communication Bus: R, 4, E, A, B, 6 or 7.

d = Secondary Communication Bus (Non-IS): A, B, E, F, G, H, R, L, V, 0, 6, or 7.

e = Relay Output (SIS/SIL): 3, 2, F or 0. (Option 3 and 2 were 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: E1, K1, K2 or K3.

k = Custody Transfer Type Approval: Any single character.

l = Housing: A or S.

m = Cable/Conduit Connections: 1, 2, G, E or M.

n = Mechanical Mounting: P, W or 0.

2410-abcdefghijklmn. Tank Hub.

II 2(2) G Ex d e [ib] IIB T4 Ta = -50°C to +70°C; FISCO; IP66 / IP67

II 2(1) G Ex d e [ia IIC] IIB T4 Ta = -50°C to +70°C; Entity; IP66 / IP67

FISCO Parameters:

Uo = 15V, Io = 354mA, Po = 5.32W

Entity Parameters:

Uo = 23.1V; Io = 95.3mA; Po = 550mW

IIC: Co = 0.14µF, Lo = 3.9mH

IIB: Co = 1.0µF, Lo = 15mH

IIA: Co = 3.67µF, Lo = 33mH

a = Number of Tanks: Any single character.

b = Tank Bus (Fieldbus - Power and Communication): F.

c = Primary Communication Bus: R, 4, E, 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, F or 0. (Option 3 and 2 were 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.

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j = Hazardous Location Certification: E1, K1, K2 or K3.
k = Custody Transfer Type Approval: Any single character.
l = Housing: A or S.
m = Cable/Conduit Connections: 1, 2, G, E or M.
n = Mechanical Mounting: P, W or O.

2410-abcdefghijklmn. Tank Hub.

II 2(2) G Ex de [ib] IIB T4 Ta = -50°C to +70°C; FISCO; IP66 / IP67

II 2(2) G Ex d e ib IIB T4 Ta = -50°C to +70°C; Entity; IP66 / IP67

FISCO Parameters:

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

Entity Parameters:

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

a = Number of Tanks: Any single character.

b = Tank Bus (Fieldbus - Power and Communication): F.

c = Primary Communication Bus: R, 4, E, 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, F or 0. (Option 3 and 2 were 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: E1, K1, K2 or K3.

k = Custody Transfer Type Approval: Any single character.

l = Housing: A or S.

m = Cable/Conduit Connections: 1, 2, G, E or M.

n = Mechanical Mounting: P, W or O.

2410-abcdefghijklmn. Tank Hub

II 2(2) G Ex d e [ib] IIB T4 Ta = -50°C to +70°C; Entity; IP66/IP67

Entity Parameters (Fieldbus):

U_o = 15V, I_o = 200mA, P_o = 3W, C_o = 1.99µF, L_o = 143µH

a = Number of Tanks: Any single character.

b = Tank Bus (Fieldbus Power and Communication): E.

c = Primary Communication Bus: R, 4, E, A, B, 6 or 7.

d = Secondary Communication Bus (Non-IS): A, B, E, F, G, H, R, L, V, 0, 6, or 7.

e = Relay Output (SIS/SIL): 3, 2, F or 0. (Option 3 and 2 were 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: E1, K1, K2 or K3.

k = Custody Transfer Type Approval: Any single character.

l = Housing: A or S.

m = Cable/Conduit Connections: 1, 2, G, E or M.

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

2410-abcdefghijklmn. Tank Hub.

II 2(2) G Ex d e [ib] IIB T4 Ta = -50°C to +70°C; Entity; IP66/IP67

II 2(1) G Ex d e [ia IIC] IIB T4 Ta = -50°C to +70°C; Entity; IP66/IP67

Entity Parameters (Fieldbus):

U_o = 15V, I_o = 200mA, P_o = 3W, C_o = 1.99µF, L_o = 143µH

Entity Parameters (Active HART):

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

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Group IIC: Co = 0.14 μ F, Lo = 3.9mH
Group C, IIB: Co = 1.0 μ F, Lo = 15mH
Group D, IIA: Co = 3.67 μ F, Lo = 33mH
a = Number of Tanks: Any single character.
b = Tank Bus (Fieldbus - Power and Communication): E.
c = Primary Communication Bus: R, 4 E, 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, F or 0. (Option 3 and 2 were 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: E1, K1, K2 or K3.
k = Custody Transfer Type Approval: Any single character.
l = Housing: A or S.
m = Cable/Conduit Connections: 1, 2, G, E or M.
n = Mechanical Mounting: P, W or 0.

2410-abcdefghijklmn. Tank Hub.

II 2(2) G Ex d e [ib] IIB T4 Ta = -50°C to +70°C; Entity; IP66/IP67
II 2(2) G Ex d e ib IIB T4 Ta = -50°C to +70°C; Entity; IP66/IP67
Entity Parameters (Fieldbus):
Uo = 15V, Io = 200mA, Po = 3W, Co = 1.99 μ F, Lo = 143 μ H
Entity Parameters (Passive HART):
Ui = 30V, Ii = 300mA, Pi = 1W, Ci = 0, Li = 0
a = Number of Tanks: Any single character.
b = Tank Bus (Fieldbus - Power and Communication): E.
c = Primary Communication Bus: R, 4, E, 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, F or 0. (Option 3 and 2 were 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: E1, K1, K2 or K3.
k = Custody Transfer Type Approval: Any single character.
l = Housing: A or S.
m = Cable/Conduit Connections: 1, 2, G, E or M.
n = Mechanical Mounting: P, W or 0.

14 **Special Conditions for Safe Use:**

None

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.

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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.

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
20 th September 2010	Original Issue.
24 th February 2011	<u>Supplement 1:</u> Report Reference: – 3035492rev110818 dated 18 th January 2011. Description of the Change: Clarification of the triplicated voltage clamping of the FISCO output.
25 th April 2012	<u>Supplement 2:</u> Report Reference: – Supplement 2 to 3035492EC dated 19 th April 2012. Description of the Change: 1. Addition of the optional Modem HART Board and modification to the internal circuit; 2. Minor change to the product model code; 3. Examination of the equipment against EN60079-0:2009.
25 th March 2014	<u>Supplement 3:</u> Report Reference: – 3035492rev140317 dated 25 th March 2014. Description of the Change: Added an option for additional printed circuit board conformal coating type, HumiSeal 1B73 and HumiSeal 1B31.
11 th June 2014	<u>Supplement 4:</u> Report Reference: – 3035492rev140210 dated 6 th June 2014 1. Description of the Change: Minor modifications to drawings not affecting compliance.
04 th August 2015	<u>Supplement 5:</u> Report Reference: – 3055665 dated 3 rd August 2015 Description of the Changes: 1. Corrected Code structure for passive HART output which was not correct on previous revisions. 2. Added three new Model 2410 Tank Hub options having Entity outputs at the Fieldbus terminals 1 _{a-b} & 2 _{a-b} . 3. Updated the description section of the certificate to add the Entity output version.

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Blueprint Report

Rosemount Tank Radar A (1000003453)

Class No 3610

Original Project I.D. 3035492

Certificate I.D. FM10ATEX0012

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>	<u>Electronic Drawing</u>
00809-0100-2410	CA/June 2015	Reference Manual Rosemount 2410 Tank Hub	3055665	Yes (pdf)
03031-0589	A	Schematic Diagram 160 segment LCD Board	3035492	Yes (pdf)
03031-0590	AF	PWB LCD Board, 2 Line	2/10/14	Yes (pdf)
03031-0591	AR	CCA LCD Board, 2 Line	2/10/14	Yes (pdf)
125044-211	1	TRANSFORMER T1 DETAILED SPECIFICATIONS	3043551	Yes (pdf)
300530EN	BB	2410 Reference Manual	2/10/14	Yes (pdf)
7000001-082	2	PCB MH ACTIVE/PASSIVE NON-IS	2/10/14	Yes (pdf)
9240040-900	2	APPR. DWG. FM	3043551	Yes (pdf)
9240040-901	03	SYSTEM CONTROL DRAWING FM	3055665	Yes (pdf)
9240040-902	2	APPR. DWG. FM BLOCK DIAGRAM	3043551	Yes (pdf)
9240040-903	1	APPR. DWG. FM PCB PS	3035492	Yes (pdf)
9240040-904	1	APPR. DWG. FM PCB CB	3035492	Yes (pdf)
9240040-905	3	APPR. DWG. FM PCB MB	2/10/14	Yes (pdf)
9240040-906	1	APPR. DWG. FM PCB AR	3035492	Yes (pdf)
9240040-907	2	APPR. DWG. FM PCB MH ACTIVE	2/10/14	Yes (pdf)
9240040-908	2	APPR. DWG. FM NON IS PCB	2/10/14	Yes (pdf)
9240040-909	1	APPR. DWG. FM ½" NPT PLUG	3035492	Yes (pdf)
9240040-920	1	APPR. DWG. FM M16x1.5 PLUG	3035492	Yes (pdf)
9240040-921	1	APPR. DWG. FM ¾" NPT PLUG	3035492	Yes (pdf)
9240040-946	2	Coating/Potting	3035492	Yes (pdf)
9240040-946	03	APPR. DWG. FM CONFORMAL	140317	Yes (pdf)
9240040-971	03	Model Code Description	3055665	Yes (pdf)
9240040-988	2	APPR. DWG. FM PCB MH PASSIVE	2/10/14	Yes (pdf)
D7000002-610	01	APPR. DWG. FM PCB PS ENTITY ROSEMOUNT 2410	3055665	Yes (pdf)
D7000002-611	01	SYSTEM CONTROL DWG. ROSEMOUNT 2410 ENTITY	3055665	Yes (pdf)
D9240040-937	03	Appr. DWG. Main Label Rosemount 2410	3055665	Yes (pdf)
Raptor-DE-0061	4	Explosion Protection Description	3043551	Yes (pdf)