

Rosemount™ 5900C Radar Level Gauge

Reliable level measurement



1 Product certifications

Rev 8.16

1.2 European directive information

A copy of the EU Declaration of Conformity can be found at the end of the document. The most recent revision of the EU Declaration of Conformity can be found at [Emerson.com/Rosemount](https://www.emerson.com/Rosemount).

1.3 Ordinary Location Certification

As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA). Complies with FM 3810:2021 and CSA: C22.2 No. 61010-1:2012.

1.4 Environmental conditions

Table 1-1: Environmental Conditions (Ordinary Location and Low Voltage Directive (LVD))

Type	Description
Location	Indoor or outdoor use, wet
Maximum altitude	6562 ft. (2000 m)
Ambient temperature	-40 to 158 °F (-40 to 70 °C)
Electrical supply	9–32 Vdc, 51 mA
Mains supply voltage fluctuations	Safe at ±10%
Overvoltage category	I
Pollution degree	2

1.5 Telecommunication compliance

Measurement principle

Frequency Modulated Continuous Wave (FMCW), 10 GHz

Maximum output power

-18 dBm (0.02 mW)

Frequency range

8.905 to 10.599 GHz

TLPR (Tank Level Probing Radar) equipment are devices for measurement of level in a closed space only (i.e metallic, concrete or reinforced fiberglass tanks, or similar enclosure structures made of comparable attenuating material).

1.6 FCC

This device complies with Part 15C of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Certificate: K8C5900

1.7 IC

This device complies with RSS210-7.

Certificate: 2827A-5900

This device complies with Industry Canada's licence-exempt RSS standard. Operation is subject to the following conditions:

1. This device may not cause interference.
2. This device must accept any interference received, including interference that may cause undesired operation.
3. The installation shall be done by trained installers in strict compliance with the manufacturer's instructions.
4. The use of this device is on a "no-interference, no-protection" basis. That is, the user shall accept operations of high-powered radar in the same frequency band which may interfere with or damage this device. However, devices found to interfere with primary licensing operations will be required to be removed at the user's expense.
5. Devices shall be installed and operated in a completely enclosed container to prevent RF emissions, which can otherwise interfere with aeronautical navigation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage.
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
3. L'installation doit être effectuée par des installateurs qualifiés, en pleine conformité avec les instructions du fabricant.

4. Ce dispositif ne peut être exploité qu'en régime de non-brouillage et de non-protection, c'est-à-dire que l'utilisateur doit accepter que des radars de haute puissance de la même bande de fréquences puissent brouiller ce dispositif ou même l'endommager. D'autre part, les capteurs de niveau qui perturbent une exploitation autorisée par licence de fonctionnement principal doivent être enlevés aux frais de leur utilisateur.
5. L'appareil doit être installé et exploité dans un réservoir entièrement fermé afin de prévenir les rayonnements RF qui pourraient autrement perturber la navigation aéronautique.

1.8 Radio Equipment Directive (RED) 2014/53/EU and Radio Equipment Regulations S.I. 2017/1206

This device complies with ETSI EN 302 372 and EN 62479. The device shall be installed according to requirements ETSI EN 302372.

1.9 Installing Equipment in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions.

The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

1.10 North America

1.10.1 I5 USA Intrinsic Safety

Certificate	FM 17US0030X
Standards	FM Class 3600:2018, FM Class 3610:2021, FM Class 3810:2021, ANSI/ISA 61010-1:2012, ANSI/NEMA 250:2003, ANSI/IEC 60529:2004, ANSI/UL 60079-0:2020, ANSI/UL 60079-11:2014 Ed 6.3, ANSI/UL 60079-26:2017 Ed 3
Markings	IS/I,II,III/1/ABCDEFGF/T4 DIP/II,III/1/EF/T5 CL 1 ZN 0 AEx ia IIC T4 Ga CL 1 ZN 0/1 AEx ib IIC T4 Ga/Gb Ta = -50°C to 80°C - 9240040-917;

Type 4X; IP66; IP67

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH

Specific Conditions for Safe Use (X):

1. The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. When installed as EPL Ga, care must be taken during installation and use to prevent impact or friction.
2. Non-metallic surfaces and the surface of the painted housing may, under certain extreme conditions, generate an ignition-capable level of electrostatic. Appropriate measures must be taken to prevent electrostatic discharge.
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.
4. When installed as Ex ib Ga/Gb, the partition wall materials separating EPL Ga from EPL Gb are constructed of different materials depending on the antenna option. Please refer to Control Drawing D9240040-917 for the material type of each antenna. The material shall not be subject to environmental conditions which might adversely affect the partition wall.
5. Maximum Process Temperatures are as follows:

When option n=Tank Seal	O-ring Type	Min/Max Process Temperature Range
PV or QV	Viton®	-15°C to +180°C
PK, HK or QK	Kalrez®	-20°C to +230°C
FK	Kalrez	-20°C to +120°C
PE or QE	EPDM	-40°C to +110°C
PB or QB	BUNA-N	-35°C to +90°C
PM, FF, HH or QM	FVMQ	-60°C to +155°C
PF or QF	FEP	-60°C to +180°C

1.10.2 I6 Canada Intrinsic Safety

Certificate	FM17CA0016X
Standards	CSA-C22.2 No. 25-2017 CSA-C22.2 No. 94-M91:1991 (R2011) CSA-C22.2 No. 61010-1:2012 CSA-C22.2 No. 60529:2016 CSA-C22.2 No. 60079-0:2019 CSA-C22.2 No. 60079-11:2014 CSA-C22.2 No. 60079-26:2016
Markings	IS/I,II,III/1/ABCDEFG/T4 Ex ia IIC T4 Ga Ex ib IIC T4 Ga/Gb DIP/II,III/1/EFG/T5 Ta = -50°C to 80°C 9240040-917 Type 4X; IP66; IP67

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH

Specific Conditions for Safe Use (X):

1. The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. When installed as EPL Ga, care must be taken during installation and use to prevent impact or friction.
2. Non-metallic surfaces and the surface of the painted housing may, under certain extreme conditions, generate an ignition-capable level of electrostatic. Appropriate measures must be taken to prevent electrostatic discharge.
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.
4. When installed as Ex ib Ga/Gb, the partition wall materials separating EPL Ga from EPL Gb are constructed of different materials depending on the antenna option. Please refer to Control Drawing D9240040-917 for the material type of each


antenna. The material shall not be subject to environmental conditions which might adversely affect the partition wall.

5. Maximum Process Temperatures are as follows:

When option n=Tank Seal	O-ring Type	Min/Max Process Temperature Range
PV or QV	Viton	-15°C to +180°C
PK, HK or QK	Kalrez	-20°C to +230°C
FK	Kalrez	-20°C to +120°C
PE or QE	EPDM	-40°C to +110°C
PB or QB	BUNA-N	-35°C to +90°C
PM, FF, HH or QM	FVMQ	-60°C to +155°C
PF or QF	FEP	-60°C to +180°C

1.11 Europe

1.11.1 I1 ATEX Intrinsic Safety

Certificate	FM09ATEX0057X
Standards	EN IEC 60079-0:2018, EN 60079-11:2012, EN 60079-26:2015, EN 60529:1991+A1:2000+A2:2013
Markings	 II 1 G Ex ia IIC T4 Ga II 1/2 G Ex ib IIC T4 Ga/Gb Ta = -50°C to 80°C; IP66, IP67

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH

Specific Conditions for Safe Use (X):

1. The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. When installed as EPL Ga, care must be taken during installation and use to prevent impact or friction.
2. Non-metallic surfaces and the surface of the painted housing may, under certain extreme conditions, generate an ignition-capable level of electrostatic. Appropriate measures must be taken to prevent electrostatic discharge.

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.
4. When installed as Ex ib Ga/Gb, the partition wall materials separating EPL Ga from EPL Gb are constructed of different materials depending on the antenna option. Please refer to Control Drawing D9240040-917 for the material type of each antenna. The material shall not be subject to environmental conditions which might adversely affect the partition wall.
5. Maximum Process Temperatures are as follows:

When option n=Tank Seal	O-ring Type	Min/Max Process Temperature Range
PV or QV	Viton	-15°C to +180°C
PK, HK or QK	Kalrez	-20°C to +230°C
FK	Kalrez	-20°C to +120°C
PE or QE	EPDM	-40°C to +110°C
PB or QB	BUNA-N	-35°C to +90°C
PM, FF, HH or QM	FVMQ	-60°C to +155°C
PF or QF	FEP	-60°C to +180°C

1.12 International

1.12.1 I7 IECEx Intrinsic Safety

Certificate	IECEX FMG 09.0009X
Standards	IEC 60079-0:2017, IEC 60079-11:2011, IEC 60079-26:2014-10
Markings	Ex ia IIC T4 Ga Ex ib IIC T4 Ga/Gb Tamb = -50°C to +80°C; IP66, IP67

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH

Specific Conditions for Safe Use (X):

1. The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. When installed as EPL Ga, care must be taken during installation and use to prevent impact or friction.
2. Non-metallic surfaces and the surface of the painted housing may, under certain extreme conditions, generate an ignition-capable level of electrostatic. Appropriate measures must be taken to prevent electrostatic discharge.
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.
4. When installed as Ex ib Ga/Gb, the partition wall materials separating EPL Ga from EPL Gb are constructed of different materials depending on the antenna option. Please refer to Control Drawing D9240040-917 for the material type of each antenna. The material shall not be subject to environmental conditions which might adversely affect the partition wall.
5. Maximum Process Temperatures are as follows:

When option n=Tank Seal	O-ring Type	Min/Max Process Temperature Range
PV or QV	Viton	-15°C to +180°C
PK, HK or QK	Kalrez	-20°C to +230°C
FK	Kalrez	-20°C to +120°C
PE or QE	EPDM	-40°C to +110°C
PB or QB	BUNA-N	-35°C to +90°C
PM, FF, HH or QM	FVMQ	-60°C to +155°C
PF or QF	FEP	-60°C to +180°C

1.13 Brazil

1.13.1 I2 INMETRO Intrinsic Safety

Certificate	UL-BR 17.0982X
Standards	ABNT NBR IEC 60079-0:2020, 60079-11:2013, 60079-26:2016
Markings	Ex ia IIC T4 Ga Ex ib IIC T4 Ga/Gb

Tamb: -50 °C to + 80 °C
 IP66/IP67

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

1.14 China

1.14.1 I3 China Intrinsic Safety

Certificate GYJ21.1117X

Standards GB 3836.1 - 2010, GB 3836.4 - 2010, GB 3836.20 - 2010

Markings Ex ia IIC T4 Ga
 Ex ib IIC T4 Ga/Gb

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

1.15 Technical Regulations Customs Union (EAC)

TR CU 020/2011 “Electromagnetic Compatibility of Technical Products”

TR CU 032/2013 “On safety of equipment and vessels under pressure”

1.15.1 Ex

TR CU 012/2011 “On safety of equipment intended for use in explosive atmospheres”

1.15.2 IM EAC Intrinsic Safety

Certificate EAЭC KZ 7500525.01.01.00617

Markings 0 Ex ia IIC T4 Ga X

Ga/Gb Ex ib IIC T4 X
 Tamb: -50 °C to + 80 °C
 IP66/IP67

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

1.16 Japan

1.16.1 I4 Japan Intrinsic Safety

Certificate CML 17JPN2301X

Markings Ex ia IIC T4 Ga
 Ex ib IIC T4 Ga/Gb
 -50 °C ≤ Ta ≤ +80 °C

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

1.17 Republic of Korea

1.17.1 IP Korea Intrinsic Safety

Certificate 14-KB4BO-0573X

Markings Ex ia IIC T4 Ga
 Ex ib IIC T4 Ga/Gb
 (-50 °C ≤ Ta ≤ +80 °C)

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 µH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 µH

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

1.18 India**1.18.1 IW CCOE/PESO Intrinsic Safety**

Certificate	P538024/1
Markings	Ex ia IIC T4 Ga Ex ib IIC T4 Ga/Gb (-50 °C ≤ Ta ≤ +80 °C)

	Ui (Vmax)	Ii (Imax)	Pi	Ci	Li
Entity parameters	30 V	300 mA	1.3 W	1.1 nF	1.5 μH
FISCO parameters	17.5V	380 mA	5.32 W	1.1 nF	1.5 μH

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

1.19 United Arab Emirates**1.19.1 Intrinsic Safety**

Certificate	23-11-22694/Q23-11-048838/NB0002
Markings	Same as IECEx (I7)

1.20 Additional certifications

1.20.1 Functional Safety Certification (SIS)

S Functional Safety

Certificate ROS 1312032 C004
SIL 2 1-in-1 (1oo1) option, with 4-20mA or K1/K2 relay

Standards IEC 61508:2010 Parts 1-7

1.20.2 Germany WHG Certification (DIBt)

Certificate Z-65.16-500

1.20.3 Belgium Overfill Certification (Vlarem)

Certificate 99/H031/13072201

1.21 Pattern approvals

1.21.1 China pattern approval

CPA Pattern Approval

Certificate 2015-L206 (5900C)

1.21.2 Kazakhstan Metrology Approval

Certificate KZ.02.01.02353-2023 No.2354 (5900)
KZ.02.01.02402-2023 No. 2402 (System)

1.22 Product Certifications Rosemount 2051

Rosemount 2051 is available with various hazardous location certifications, for more information refer to Rosemount 2051 [Quick Start Guide](#).

1.23 Approval Drawings

Follow the installation guidelines presented in Factory Mutual system control drawings in order to maintain certified ratings for installed devices.

The following drawing is included in the documentation for the Rosemount 5900C Radar Level Gauge:


9240040-917 System Control Drawing for hazardous location installation of intrinsically safe FM ATEX, FM IECEx, FM-US, and FM-C approved apparatus.

See the “Manuals & Drawings” CD ROM that is shipped with the Rosemount 5900C Radar Level Gauge for electronic copies of the system control drawings.

Drawings are also available on the Emerson web site www.Emerson.com.

1.24 EU Declaration of conformity

Figure 1-1: EU Declaration of Conformity



Declaration of Conformity



Rev. #3

We,

Rosemount Tank Radar AB
Layoutvägen 1
S-435 33 MÖLNLYCKE
Sweden

declare under our sole responsibility that the product,


Rosemount™ 5900 Radar Level Gauge

manufactured by,

Rosemount Tank Radar AB
Layoutvägen 1
S-435 33 MÖLNLYCKE
Sweden

to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule.

 <hr style="border: 0; border-top: 1px solid black;"/> <p>(signature)</p>	<p>Sr. Manager Product Approvals</p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(function)</p>
<p>Dajana Prastalo</p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(name)</p>	<p>5-Mar-24; Mölnlycke</p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(date of issue & place)</p>

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Declaration of Conformity

EMC Directive (2014/30/EU)

Harmonized Standards: EN 61326-1:2013
EN 61326-3-1 :2017

ATEX Directive (2014/34/EU)

FM09ATEX0057X

Intrinsic Safety:

Equipment Group II, Category 1G, Ex ia IIC T4 Ga
Equipment Group II, Category 1/2G, Ex ib IIC T4 Ga/Gb

Harmonized Standards:
EN IEC 60079-0:2018
EN 60079-11:2012
EN 60079-26:2015
EN 60529:1991/A1:2000/A2:2013

Radio Equipment Directive (RED) (2014/53/EU)

Harmonized Standards:
ETSI EN 302 272:2016
EN 62479:2010

Low Voltage Directive (2014/35/EU)

Harmonized Standards: EN 61010-1:2010/A1:2019/AC:2019-04

RoHS Directive (2011/65/EU) Amended 2015/863

Harmonized Standards: EN IEC 63000:2018



Declaration of Conformity

ATEX Notified Body for EU Type Examination Certificates and Type Examination Certificates

FM Approvals Europe Ltd. [Notified Body Number: 2809]
One Georges Quay Plaza
Dublin, D02 E440
Ireland

ATEX Notified body for Quality Assurance

DNV Product Assurance AS [Notified Body Number: 2460]
Veritasveien 3
1363 Høvik
Norway



1.25 China RoHS

Figure 1-2: Rosemount 5900C China RoHS

含有 China RoHS 管控物质超过最大浓度限值的部件型号列表 5900
List of 5900 Parts with China RoHS Concentration above MCVs

部件名称 Part Name	有害物质 / Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr +6)	多溴联苯 Polybrominated biphenyls (PBB)	多溴联苯醚 Polybrominated diphenyl ethers (PBDE)
电子组件 Electronics Assembly	X	O	O	O	O	O
壳体组件 Housing Assembly	O	O	O	O	O	O

本表格系依据 SJ/T11364 的规定而制作。

This table is proposed in accordance with the provision of SJ/T11364.

O: 意为该部件的所有均质材料中该有害物质的含量均低于 GB/T 26572 所规定的限量要求。

O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为在该部件所使用的的所有均质材料里，至少有一类均质材料中该有害物质的含量高于 GB/T 26572 所规定的限量要求。

X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

部件名称 Part Name	组装备件说明 Spare Parts Descriptions for Assemblies
电子组件 Electronics Assembly	电子组件 Electronics Assembly 电子线路板组件 Electronic Board Assemblies 端子块组件 Terminal Block Assemblies 升级套件 Upgrade Kits 调制解调器和电缆 Modem and cables
壳体组件 Housing Assembly	电子外壳 Electrical Housing



Product Certifications
00880-0100-5901, Rev. AB
May 2024

For more information: [Emerson.com/global](https://www.emerson.com/global)

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ROSEMOUNT™

