



**OIML Member State**  
Sweden

**OIML Certificate No.**  
R85/2008-A-SE1-2021.01  
Revision 1

## OIML CERTIFICATE ISSUED UNDER SCHEME A

### OIML Issuing Authority

Name: RISE Research Institutes of Sweden AB  
Address: Box 857, SE-50115 Borås, Sweden  
Person responsible: Martin Tillander

### Applicant

Name: Rosemount Tank Radar AB  
Postal address: Box 150, SE-435 23 Mölnlycke, Sweden  
Visiting address: Layoutvägen 1, SE-435 33 Mölnlycke, Sweden

### Manufacturer

Name: Rosemount Tank Radar AB  
Postal address: Box 150, SE-435 23 Mölnlycke, Sweden  
Visiting address: Layoutvägen 1, SE-435 33 Mölnlycke, Sweden

**Identification of the certified type** *(the detailed characteristics will be defined in the additional pages and in appendix to this certificate)*

Raptor Tank Gauging System

**Designation of the module** (if applicable)

5900S Radar Level Gauge

This OIML Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML type evaluation report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 85

Edition (year):2008

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This OIML Certificate relates only to metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML Recommendation identified above.

This OIML Certificate does not bestow any form of legal international approval.

The conformity was established by the results of tests and examinations provided in the associated OIML type evaluation report:

No. 105101-157159 dated 2021-09-14 that includes 59 pages

The technical documentation relating to the identified type is contained in documentation file:

No. 157159

#### OIML Certificate History

The product 5900S Radar Level Gauge was earlier certified by SP/RISE according to OIML R85:2008, number R85/2008-SE-11.01

Revision No.	Date	Description of the modification
First issue (CS)	2021-02-18	
Revision 1	2021-09-20	Measurement range extended to 0-40 m Components added

Identification, signature and stamp

**The OIML Issuing Authority**  
RISE Research Institutes of Sweden AB

Martin Tillander

Date: 2021-09-20

*Important note:* Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate is issued, partial quotation of the Certificate and of the associated OIML type evaluation report(s) is not permitted, although either may be reproduced in full.



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**ANNEX to an OIML Certificate of Conformity**

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**Correction**

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Identification, signature and stamp

**The Issuing Authority**

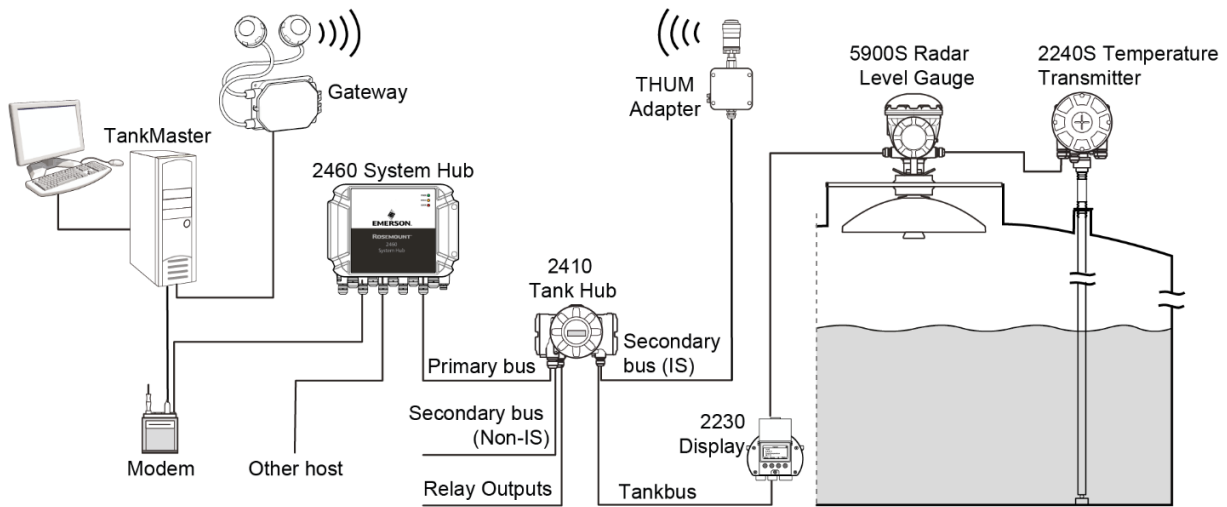
RISE Research Institutes of Sweden AB

Date: 2021-09-20

# Identification and description of the certified type of tank radar

## 1 Design of the Raptor Tank Gauging System

### 1.1 Overview



### 1.2 Description of tested components

5900S Radar level gauge with:

- Parabolic antenna 1P
- Horn antenna 1H
- Still-pipe array antenna 1A5
- Still-pipe array antenna 1A6
- Still-pipe array antenna 1A8
- Still-pipe array antenna 1AA
- Still-pipe array antenna 1AB
- LPG/LNG antenna G1/G2/G3/Gx
- 2410 Tank Hub
- 2230 Graphical Field Display
- 2160/61 Field Communication Unit
- 2460 System Hub
- 2180 Field Bus Modem
- Wireless 775 THUM adapter
- Wireless 1420 Gateway
- Emerson Wireless 1410 Gateway
- Emerson Wireless 1410S Gateway with 781S
- Emerson™ Wireless 1410D Gateway with 781
- Rosemount™ 702 Wireless Discrete Transmitter
- Smart Wireless Gateway
- General purpose PC with TankMaster for display of measured level
- Printer.

#### Rosemount 5900S Radar Level Gauge

The Rosemount 5900S radar level gauge is an instrument for measuring the product level inside a tank. The 5900S can measure the level of almost any product, including bitumen, crude oil, refined products, aggressive chemicals, LPG and LNG. The Rosemount 5900S sends microwaves towards the surface of the product in the tank. The level is calculated based on the echo from the surface. No part of the 5900S is in contact with the product in the tank, and the antenna is the only part of the gauge that is exposed to the tank atmosphere. Different antennas can be used in order to meet the requirements of different applications:

Antenna type	Model
Parabolic antenna	1P

Horn antenna	1H
Still-pipe array antenna	1A5, 1A6, 1A8, 1AA, 1AB
LPG/LNG antenna	G1/G2/G4/Gx

### **Rosemount 2410 Tank Hub**

The Rosemount 2410 tank hub acts as a supply to the connected field devices in the hazardous area using the intrinsically safe Raptor Tankbus. The Rosemount 2410 tank hub collects measurement data and status information from field devices on a tank. It has two external buses for communication with various host systems.

### **Rosemount 2460 System Hub**

The 2460 System Hub is a data concentrator and calculator that continuously polls and stores data from field devices such as radar level gauges and temperature transmitters in a buffer memory. When a request for data or calculated values is received over any of the communication ports (RS485, TRL/2, Ethernet etc), the 2460 sends data from a group of tanks from the updated buffer memory.

### **Rosemount 2230 Graphical Field Display**

The Rosemount 2230 graphical field display presents inventory tank gauging data such as level, temperature, and pressure. The unit allows navigation through the different menus to provide all tank data, directly in the field. The Rosemount 2230 supports up to 10 tanks.

### **Rosemount 2160 Field Communication Unit**

The 2160 field communication unit (FCU) is a data concentrator that continuously polls and stores data from field devices such as radar level gauges and temperature transmitters in a buffer memory. When a request for data is received, the FCU sends data from a group of tanks from the updated buffer memory.

### **Rosemount 2180 Field Bus Modem**

The Rosemount 2180 field bus modem (FBM) is used for connecting a TankMaster PC to the TRL/2 communication bus. The 2180 is connected to the PC using either the RS232 or the USB interface.

### **2240S Multi-input Temperature Transmitter**

The Rosemount 2240S Multi-input Temperature Transmitter provides multiple spot temperature measurement in liquid storage tanks. It is used for calculation of the average temperature of the liquid and corrects for stratification

### **Wireless 1410D Gateway**

The Emerson Smart Wireless Gateway 1410 connects Wireless HART® self-organizing networks with host systems and data applications

### **Wireless 1410S Gateway with 781S Smart Antenna**

The Emerson Wireless 1410S Gateway is the next generation of wireless infrastructure. Network flexibility allows users to strengthen or add to WirelessHART™ networks seamlessly, while connecting with host systems and data applications. The gateway uses the 781S Smart Antenna to enable flexible remote antenna locations of up to 1300 feet (400 m) allowing the gateway to be in an easily accessible location, while the 781S Smart Antenna can be in hazardous areas near your data points.

### **Wireless 1410D Gateway with 781 Field Link**

Designed to connect WirelessHART® networks with host systems and data applications, the Emerson™ Wireless 1410D Gateway with 781 Field Link allows users with limited safe locations to strengthen and add to wireless networks quickly and easily. This wireless gateway uses the 781 Field Link to enable flexible remote antenna locations of up to 650 feet (200 meters) allowing the gateway to be in the control room while placing the 781 Field Link into a hazardous area.

### Wireless 1420 Gateway

The Emerson Smart Wireless Gateway 1420 connects Wireless HART® self-organizing networks with host systems and data applications

### Wireless 775 THUM Adapter

The THUM Adapter is connected to a HART sub-device. With simple HART configuration, the THUM transmits the HART information from the sub-device into the Wireless network.

### 702 Wireless Discrete Transmitter

By using simple HART configuration, the transmitter converts the switch signal to a wireless-enabled signal. The 702 Wireless Discrete Transmitter is commonly used as a repeater to strengthen the Wireless HART® network

### TankMaster Software

The software identification number is 6.xx (where .xx is not concern-ing metrological functions).

*TankMaster* – provides configuration, service, set-up, inventory, and custody transfer functions for Rosemount Raptor systems and other supported instruments. TankMaster is designed to be used in the Microsoft® Windows environment providing access to measurement data from Local Area Network.

*TankMaster WinOpi* – the program lets the operator monitor measured tank data. It includes alarm handling, batch reports, automatic report handling, historical data sampling as well as inventory calculations such as Volume, Observed Density and other parameters. A plant host computer can be connected for further processing of data.

*TankMaster WinSetup* – the program is a graphical user interface for installation, configuration and service of the different devices in the Rosemount Raptor system.

## 2 Technical data

### 2.1 Measurement range

5900Swith antenna:	Distance
- Horn antenna 1H - Still-pipe array antenna 1A5 - Still-pipe array antenna 1A6 - Still-pipe array antenna 1AA	0-30m
- Parabolicantenna1P - Still-pipearrayantenna1AB - Still-pipe array antenna 1A8 - LPG/LNG antenna G1/G2/G4/Gx	0-40m

## 2.2 Rated operating conditions

Ambient temperatures	Low	-40 °C
	High	+70 °C
Relative humidity	upto100%	
DC mains voltage	24-48 VDC (-15%...+10%)	
AC mains voltage	48-240 VAC (-15%...+10%)	
Temperature extreme values	Liquid	N/A antenna not in contact with liquid
	Medium above the liquid	-40 - 230 °C (LPG/LNG antenna -170 °C to 90 °C, -55 °C - 90 °C close to ball-valve)
Pressure extreme values	Varies with antenna type -0.2 - 2 bar (horn- and still-pipe antenna), - 0.2-10 bar (parabolic antenna), upto 25 bar (LPG antenna)	
Liquid characteristics	N/A, liquid does not affect measurement performance	
Liquid density. extreme values	N/A, liquid density does not affect measurement performance	
Medium characteristics	Typical petroleum products	
Medium density. extreme values		
Remarks: Normal petroleum products have no measurable influence on performance. Certain special products (e.g. ketons) may influence velocity of the radar wave and may result in performance outside m.p.e. See manufacturer's recommendation on which products to avoid. Tank design with internal floating roof may reduce influence for critical products.		

## 3 Technical documentation

The manuals include technical specifications and descriptions.

## 4 Securing

The housing and data plate can be sealed using wire or filling depending on national practice. Verification marks can be placed on top or side of each unit.

## 5 Marking/labelling/inscriptions

A data plate is placed on the side or top of each unit including the:

- manufacturer's name,
- type,
- serial number,
- year of manufacture,
- EC type-approval number, (when applicable)
- ranges of operations range and
- CE mark (when applicable)