Product Certifications
00825-0900-4408, Rev AE
September 2024

Rosemount™ 5408 Level Transmitter

Non-Contacting Radar with Modbus® Protocol

ROSEMOUNT™

EMERSON

1 Product certifications

Rev 0.15

1.1 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.

1.2 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).

1.3 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	-76 to 158 °F (-60 to 70 °C)
Electrical supply	9-36 Vdc, 1 W
Mains supply voltage fluctuations	Safe at ±10%
Overvoltage category	II
Pollution degree	2

1.4 Telecommunication compliance

Measurement principle

Frequency Modulated Continuous Wave (FMCW), 26 GHz

Maximum output power

-5 dBm (0.32 mW)

Frequency range

24.05 to 26.5 GHz (LPR, TLPR)

LPR (Level Probing Radar) equipment are devices for measurement of level in the open air or in a closed space. Hardware Version Identification Number (HVIN) is 5408L.

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). Hardware Version Identification Number (HVIN) is 5408T.

1.5 FCC

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC ID K8C5408L

1.6 IC

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 of the LPR/TLPR device 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 operating under TLPR conditions (i.e. not operating in "Open Air" Mode) 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 d'un dispositif LPR ou TLPR 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. Un dispositif visé comme TLPR doit être installé et exploité dans un réservoir entièrement fermé afin de prévenir les rayonnements RF qui pourraient autrement perturber la navigation aéronautique.

Certificate 2827A-5408L

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

This device complies with ETSI EN 302 372 (TLPR), ETSI EN 302 729 (LPR) and EN 62479.

For the receiver test that covers the influence of an interferer signal to the device, the performance criterion has at least the following level of performance according to ETSI TS 103 361 [6].

- Performance criterion: measurement value variation Δd over time during a distance measurement

- Level of performance: Δd ≤ ±2 mm

LPR (Level Probing Radar)

Install at a separation distance of >4 km from Radio Astronomy sites, unless a special authorization has been provided by the responsible National regulatory authority (a list of Radio Astronomy sites may be found at www.craf.eu).

Between 4 km to 40 km around any Radio Astronomy site the LPR antenna height shall not exceed 15 m height above ground.

TLPR (Tank Level Probing Radar)

The device must be installed in closed tanks. Install according to requirements in ETSI EN 302 372 (Annex E).

1.8 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.

1.9 USA

1.9.1 E5 Explosionproof (XP)

Certificate	FM-US FM16US0010X
Standards	FM Class 3600 – 2022; FM Class 3615 – 2022; FM Class 3810 – 2021; ANSI/ISA 60079-0 – 2013; ANSI/UL 60079-1 – 2015; ANSI/UL 60079-26 – 2017; ANSI/ISA 60079-31 – 2015; ANSI/NEMA 250 – 1991; ANSI/IEC 60529 – 2004, ANSI/ISA 12.27.01:2011
Markings	XP CL I, DIV 1, GRPS A, B, C, D T6...T2 CL I Zone 0/1 AEx db IIC T6...T2 Ga/Gb (-40 °C ≤ Ta ≤ +70 °C)(1); Type 4X/IP6X SINGLE SEAL

Specific Conditions of Use (X):

1. Flamepath joints are not for repair. Contact the manufacturer.
2. Plastic wire-on tag, Plastic part of Process Seal Antenna and Non-standard paint options (paint options other than Rosemount Blue) may cause risk from Electrostatic discharge.

(1) *Other temperature ranges may apply, see Specific Conditions of Use (X).*

Avoid installation that could cause electrostatic build-up, and only clean with a damp cloth.

3. Appropriate cable, glands, and plugs need to be suitable for a temperature of 5 °C greater than the maximum specified ambient temperature for location where installed.
4. The Transmitter can be installed in the boundary wall between a Zone 0 and Zone 1 area. In this configuration, the process connection is installed in Zone 0, while the transmitter housing is installed in Zone 1. Refer to Control Drawing D7000005-811.
5. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP6X and/or Type 4X rating. To maintain the ingress protection ratings. Covers and Sensor Module to be fully tightened and PTFE tape or pipe dope is required for cable entries and blanking plugs. See Instruction Manual on application requirements.
6. Install per Control drawing D7000005-811.
7. 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.
8. Display glass shall be positioned in such a way as to minimize the risk of mechanical impact.
9. The applicable temperature class, ambient temperature range and process temperature range of the equipment is as follows;

Table 1-2: For Divisions:

Temperature class	Ambient temperature range	Process temperature range
T2	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 250 °C
T3	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 195 °C
T4	-40 °C ≤ Ta ≤ 70° C	-40 °C to 130 °C
T5	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 95 °C
T6	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 80 °C

Table 1-3: For Zones:

Temperature class	Ambient temperature range	Process temperature range
T2	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 250 °C
T3	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 195 °C
T4	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 130 °C
T5	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 95 °C
T6	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 80 °C

1.10 Canada

1.10.1 E6 Explosionproof

Certificate FM-C FM16CA0011X

Standards CSA C22.2 NO. 0.4-17:2017(R2022), CSA C22.2 NO. 0.5-16:2016 (R2020), CSA C22.2 No. 25-17:2017, CSA C22.2 No.30:1986 (R2016), CSA C22.2 No.94:1991 (R2011), CSA C22.2 No. 61010-1-12 (R2022), CSA C22.2 No. 60079-0:2015, CSA C22.2 No. 60079-1:2016, CSA C22.2 No. 60079-26:2016; CSA-C22.2 No. 60079-31:2015, C22.2. 60529:2016, ANSI/ISA 12.27.01:2011.

Markings XP CL I, DIV 1, GRPS A-D T6...T2
Ex db IIC T6...T3 Gb
(-40 °C ≤ Ta ≤ +70 °C) [(2)]; Type 4X/IP6X
SINGLE SEAL

Specific Conditions of Use (X):

1. Flamepath joints are not for repair. Contact the manufacturer.
2. Plastic wire-on tag, Plastic part of Process Seal Antenna and Non-standard paint options (paint options other than Rosemount Blue) may cause risk from Electrostatic discharge. Avoid installation that could cause electrostatic build-up, and only clean with a damp cloth.
3. Appropriate cable, glands, and plugs need to be suitable for a temperature of 5 °C greater than the maximum specified ambient temperature for location where installed.
4. Metric Field Wiring Entries are not allowed for Divisions.

(2) Other temperature ranges may apply, see Specific Conditions of Use (X).

5. The Transmitter can be installed in the boundary wall between a Zone 0 and Zone 1 area. In this configuration, the process connection is installed in Zone 0, while the transmitter housing is installed in Zone 1. Refer to Control Drawing D7000005-811.
6. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP6X and/or Type 4X rating. To maintain the ingress protection ratings. Covers and Sensor Module to be fully tightened and PTFE tape or pipe dope is required for cable entries and blanking plugs. See Instruction Manual on application requirements.
7. Install per Control Drawing D7000005-811.
8. 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.
9. Display glass shall be positioned in such a way as to minimize the risk of mechanical impact.
10. The applicable temperature class, ambient temperature range and process temperature range of the equipment is as follows;

Table 1-4: For Divisions:

Temperature class	Ambient temperature range	Process temperature range
T2	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 250 °C
T3	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 195 °C
T4	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 130 °C
T5	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 95 °C
T6	-40 °C ≤ Ta ≤ 70 °C	-40 °C to 80 °C

Table 1-5: For Zones:

Temperature class	Ambient temperature range	Process temperature range
T2	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 250 °C
T3	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 195 °C
T4	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 130 °C
T5	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 95 °C
T6	-50 °C ≤ Ta ≤ 70 °C	-50 °C to 80 °C

1.11 Europe

1.11.1 E1 ATEX Flameproof

Certificate	FM15ATEX0055X
Standards	EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-26:2015, EN 60079-31:2014, EN 60529+A1+A2:2013
Markings	⟨Ex⟩ II 1/2G Ex db IIC T6...T2 Ga/Gb, IP6X II 2D Ex tb IIIC T85 °C... T250 °C Db, IP6X -60 °C ≤ Ta ≤ +70 °C

Specific Conditions of Use (X):

1. Flamepath joints are not for repair. Contact the manufacturer.
2. Plastic wire-on tag, Plastic part of Process Seal Antenna and Non-standard paint options (paint options other than Rosemount Blue) may cause risk from Electrostatic discharge. Avoid installation that could cause electrostatic build-up, and only clean with a damp cloth.
3. Appropriate cable, glands, and plugs need to be suitable for a temperature of 5 °C greater than the maximum specified ambient temperature for location where installed.
4. The Transmitter can be installed in the boundary wall between EPL Ga and EPL Gb location. In this configuration, the process connection is EPL Ga, while the transmitter housing is EPL Gb. Refer to Control Drawing D7000005-811.
5. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP6X. To maintain the ingress protection ratings. Covers and Sensor Module to be fully tightened and PTFE tape or pipe dope is required for cable entries and blanking plugs. See Instruction Manual on application requirements.
6. Install per Control Drawing D7000005-811.
7. 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.
8. Display glass shall be positioned in such a way as to minimize the risk of mechanical impact.
9. The applicable temperature class, ambient temperature range and process temperature range of the equipment is as follows;

Temperature class	Ambient temperature range	Process temperature range
T2	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 250 °C
T3	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 195 °C
T4	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 130 °C
T5	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 95 °C
T6	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 80 °C

1.12 International

1.12.1 E7 IECEx Flameproof

Certificate IECEx FMG15.0033X

Standards IEC 60079-0:2017, IEC 60079-1:2014; IEC 60079-26:2014; IEC 60079-31:2013

Markings Ex db IIC T6...T2 Ga/Gb IP6X
Ex tb IIIC T85 °C...T250°C Db IP6X
-60 °C ≤ Ta ≤ +70 °C

Specific Conditions of Use (X):

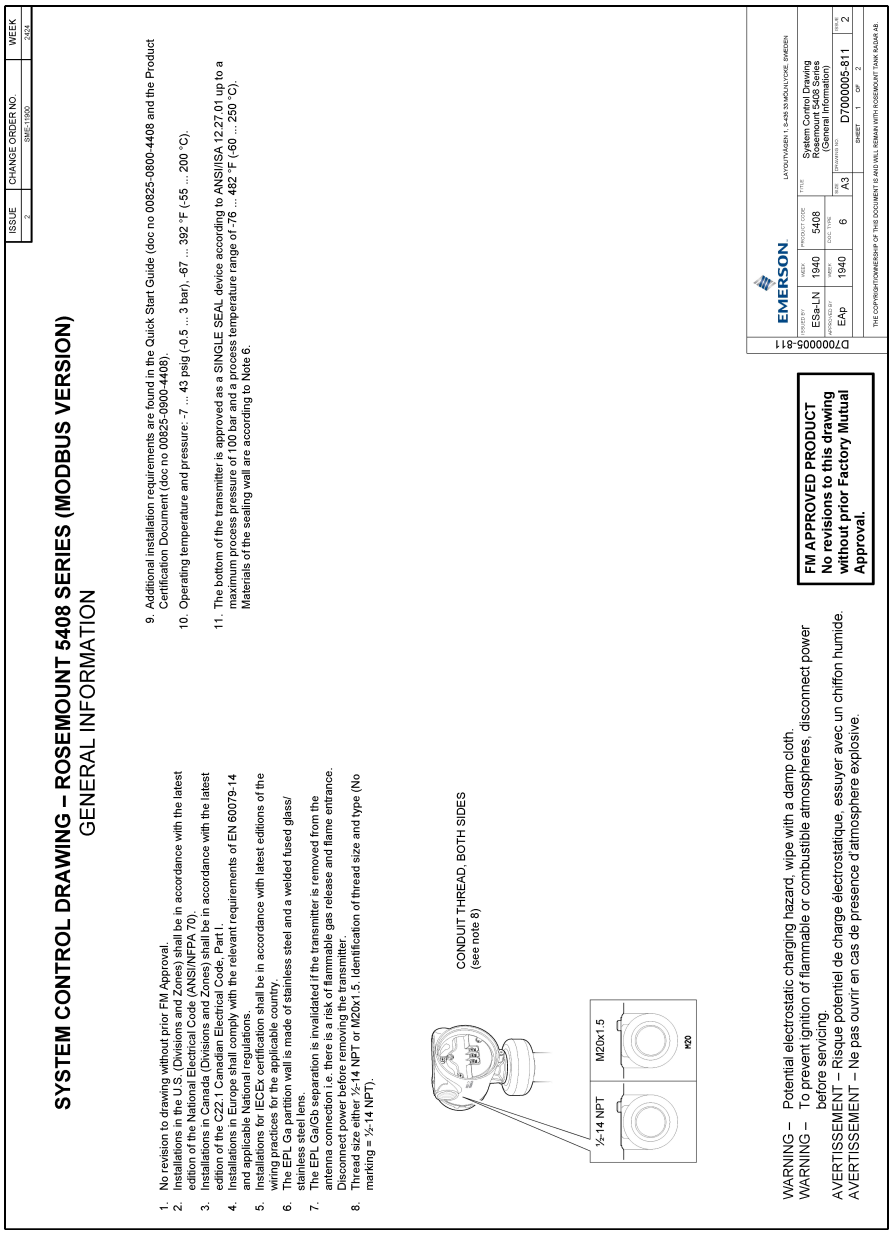
1. Flamepath joints are not for repair. Contact the manufacturer.
2. Plastic wire-on tag, Plastic part of Process Seal Antenna and Non-standard paint options (paint options other than Rosemount Blue) may cause risk from Electrostatic discharge. Avoid installation that could cause electrostatic build-up, and only clean with a damp cloth.
3. Appropriate cable, glands, and plugs need to be suitable for a temperature of 5 °C greater than the maximum specified ambient temperature for location where installed.
4. The Transmitter can be installed in the boundary wall between EPL Ga and EPL Gb. In this configuration, the process connection is EPL Ga, while the transmitter housing is EPL Gb. Refer to Control Drawing D7000005-811.
5. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP6X. To maintain the ingress protection ratings, Covers and Sensor Module to be fully tightened and PTFE tape or pipe dope is required for cable entries and blanking plugs. See Instruction Manual on application requirements.
6. Install per Control Drawing D7000005-811.

7. 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.
8. Display glass shall be positioned in such a way as to minimize the risk of mechanical impact.
9. The applicable temperature class, ambient temperature range and process temperature range of the equipment is as follows;

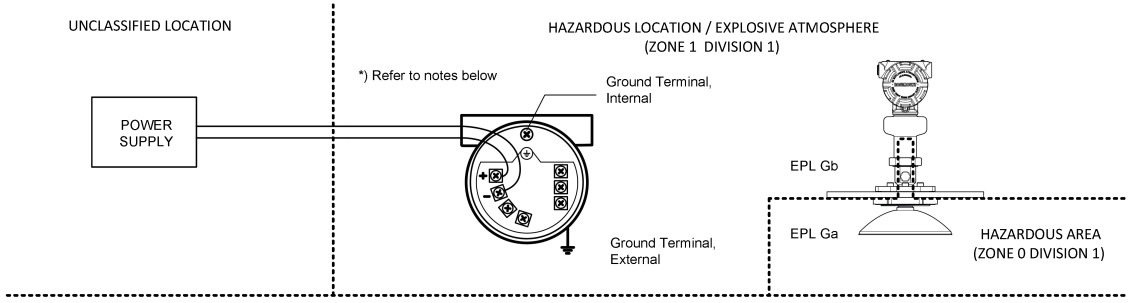
Temperature class	Ambient temperature range	Process temperature range
T2	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 250 °C
T3	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 195 °C
T4	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 130 °C
T5	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 95 °C
T6	-60 °C ≤ Ta ≤ 70 °C	-60 °C to 80 °C

1.13 Installation drawings

Figure 1-1: D7000005-811 - System Control Drawing



ISSUE	CHANGE ORDER NO.	WEEK
2	SME-11900	2424



Notes

1. No revision to drawing without prior FM Approval.
2. Installations in the U.S. (Divisions and Zones) shall be in accordance with the latest edition of the National Electrical Code (ANSI/NFPA 70).
3. Installations in Canada (Divisions and Zones) shall be in accordance with the latest edition of the C22.1 Canadian Electrical Code, Part I.
4. Installations in Europe shall comply with the relevant requirements of EN 60079-14 and applicable National regulations.
5. Installations for IECEx certification shall be in accordance with latest editions of the wiring practices for the applicable country.
6. See Quick Start Guide (doc no 00825-0800-4408) and the Product Certification Document (doc no 00825-0900-4408) for additional installation details.

Flameproof/XP installation

	Safe Apparatus for use in:	Ambient Temperature Limits
FM_{US}	XP Class I, DIV 1, GP A-D T6…T2 CL I Zone 0/1 AEx db IIC T6..T2 Ga/Gb	-50°C≤Ta≤+70°C
FMc	XP Class I, DIV 1, GP A-D T6…T2 Ex db IIC T6..T2 Ga/Gb	-50°C≤Ta≤+70°C
ATEX	II 1/2G Ex db IIC T6..T2 Ga/Gb	-60°C≤Ta≤+70°C
IECEx	Ex db IIC T6..T2 Ga/Gb	-60°C≤Ta≤+70°C

Model	Normal Operating Parameters
Modbus (RS-485)	U ≤ 36V, P ≤ 1W

WARNING – Potential electrostatic charging hazard, wipe with a damp cloth.
WARNING – To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.
WARNING – In explosive atmosphere keep tight when circuit is alive.
WARNING – Seal to be installed within 50 mm of the enclosure (Canada).
WARNING – Conduit seal to be installed within 18 inches of the enclosure (USA).

AVERTISSEMENT – Risque potentiel de charge électrostatique, essuyer avec un chiffon humide.
AVERTISSEMENT – Ne pas ouvrir en cas de presence d'atmosphere explosive.
AVERTISSEMENT – Ouvrir le circuit avant d'enlever le couvercle.
AVERTISSEMENT – Un dispositif d'étanchéité doit être installé à 50 mm du boiter (Canada).

FM APPROVED PRODUCT
No revisions to this drawing without prior Factory Mutual Approval.

D7000005-811

EMERSON. LAYOUTVÄGEN 1, S-435 33 MÖLNLYCKE, SWEDEN

ISSUED BY	WEEK	PRODUCT CODE
ESa-LN	1940	5408
APPROVED BY	WEEK	DOC. TYPE
EAp	1940	6

TITLE: System Control Drawing Rosemount 5408 Series (Flameproof/XP installation)

SIZE A3 | DRAWING NO. D7000005-811 | SCALE 2

SHEET 2 OF 2

1.14 EU Declaration of Conformity

Figure 1-2: EU Declaration of Conformity

Rev. #4

EMERSON

Declaration of Conformity CE

We,

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

declare under our sole responsibility that the product,

Rosemount™ 5408 Level Transmitter (Modbus)

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.

(signature)	Sr. Manager Product Approvals (function)
Dajana Prastalo (name)	23-Aug-24; Mölnlycke (date of issue & place)

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Rev. #4

EMERSON

Declaration of Conformity CE

EMC Directive (2014/30/EU)

Harmonized Standards: EN 61326-1:2013
Other Standards Used: IEC 61326-1:2020

ATEX Directive (2014/34/EU)

FM15ATEX0055X

Flameproof (Hart@4-20mA, Foundation ® Fieldbus):

Equipment Group II, Category 1/2G, Ex db IIC T6…T2 Ga/Gb
Equipment Group II, Category 2D, Ex tb IIIC T85°C…T250°C Db

Harmonized Standards:
EN IEC 60079-0:2018
EN 60079-1:2014
EN 60079-26:2015
EN 60079-31:2014
Other Standards Used: EN 60529:1991/A1:2000/A2:2013

RED Directive (2014/53/EU)

Harmonized Standards:
EN 302 372:2016
EN 302 729:2016
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

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1.15 China RoHS

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

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

This table is proposed in accordance with the provision of SJ/T11364
本表格系依据SJ/T11364的规定而制作.
O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.
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.
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.
X: 意为在该部件所使用的所有均质材料里，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.

Product Certifications
00825-0900-4408, Rev. AE
September 2024

For more information: **Emerson.com/global**

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