CERTIFICATE OF CONFORMITY

1. **HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**
2. **Certificate No:** **FM19CA0092X**
3. **Equipment:** **LevelWave LG01, LevelWave LR01**
   (Type Reference and Name)
4. **Name of Listing Company:** **Eckardt SAS**
5. **Address of Listing Company:** **20 Rue De La Marne**
   FR-68360 Soultz
   France
6. The examination and test results are recorded in confidential report number:

   PR454609 dated 16th December 2019

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   CAN/CSA C22.2 No. 0-M91:R2006,CSA-C22.2 No. 0.4-04:2004, CSA-C22.2 No. 0.4-05:R2008, CSA-C22.2 No. 0.5:R2008, CSA-C22.2 No. 25:R2009, CSA-C22.2 No. 30:R2009, CSA-C22.2 No. 94-M91:R2006,CAN/CSA-C22.2 No. 142-M1987:2009, CAN/CSA No. 213-M1987:2012, CAN.CSA C22.2 No. 157-92:R2012, CAN/CSA C22.2 No.60529:2005, CAN/CSA-C22.2 No. 60079-0:R2011, CAN/CSA-C22.2 No. 60079-1:2011, CAN/CSA C22.2 No. 60079-11:R2011, CAN/CSA C22.2 No. 60079-15:2012, CAN/CSA-C22.2 No. 1010.1:2004, ANSI/ISA 12.27.01:2003

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
VP, Manager - Electrical Systems

16 December 2019
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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

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 www.fmapprovals.com

SCHEDULE

Canadian Certificate Of Conformity No: FM19CA0092X

10. Equipment Ratings:

    Intrinsically Safe for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Explosionproof with Intrinsically Safe outputs for Class I, Division 1, Groups B, C and D, Non-Incendive for Class I, II and III, Division 2, Groups A, B, C, D, E, F and G, Dust-ignitionproof with Intrinsically Safe outputs for Class II and III, Division 1, Groups E, F and G; Intrinsically Safe for Class I, Zone 0, Ex ia IIC T* Ga, Flameproof with Intrinsically safe outputs for Class I, Zone 1, Ex db ia [ia Ga] IIC T* Gb, Non-sparking for Class I, Zone 2, Ex nA IIC T* Gc, Intrinsically safe for Class 1, Zone 2, Ex ic IIC T* Gc hazardous locations, indoors and outdoors (Type 4X/6, Type 6P, IP66 and IP67) with an ambient temperature rating of -40°C to +80°C.

11. The marking of the equipment shall include:

    IS/Ex ia Compact Version, IS/Ex ia Remote Version (probe/antenna housing) and XP-AIS/DIP-AIS/Ex db ia Remote Version (probe/antenna housing):

    Class I, Division 1, Groups A, B, C, D; T*

    Class II, Division 1, Groups E, F and G, T90°C

    Class III, Division 1, T90°C

    Class I, Zone 0, Ex ia, IIC T* Ga

    Ta = -40°C to +80°C; Type 4X/6 (Enclosure), Type 6P (Probe/Antenna), IP66, IP67, DUAL SEAL

    IS/Ex ia Remote Version (converter housing):

    Class I, Division 1, Groups A, B, C, D; T*

    Class II, Division 1, Groups E, F and G, T90°C

    Class III, Division 1, T90°C

    Class I, Zone 1, Ex ia [ia Ga], IIC T* Gb

    Ta = -40°C to +80°C; Type 4X/6 (Enclosure), IP66, IP67

    XP-AIS/DIP-AIS/Ex db ia Compact Version:

    Class I, Division 1, Groups B, C, D; T*

    Class II, Division 1, Groups E, F and G, T90°C

    Class III, Division 1, T90°C

    Class I, Zone 1, Ex db ia [ia Ga], IIC T* Gb

    Ta = -40°C to +80°C; Type 4X/6 (Enclosure), Type 6P (Probe/Antenna), IP66, IP67, DUAL SEAL

SCHEDULE

Canadian Certificate Of Conformity No: FM19CA0092X

XP-AIS/DIP-AIS/Ex db ia Remote Version (converter housing):
Class I, Division 1, Groups A, B, C, D; T*
Class II, Division 1, Groups E, F and G, T90°C
Class III, Division 1, T90°C
Class I, Zone 1, Ex db ia [ia Ga], IIC T* Gb
Ta = -40°C to +80°C; Type 4X/6 (Enclosure), IP66, IP67

Probe system (LG01) or antenna system (LR01):
Class I, Division 1, Groups A, B, C, D; T*
Class II, Division 1, Groups E, F and G, T90°C
Class III, Division 1, T90°C
Class I, Zone 0, Ex ia, IIC T* Ga
Zone 20, Ex ia, IIIC T90°C Da
Ta = -40°C to +80°C; Type 6P (Probe/Antenna), IP66, IP67, DUAL SEAL

NI/Ex nA/Ex ic Compact Version, NI/Ex nA/Ex ic Remote version (probe/antenna housing):
Class I, Division 2, Groups A, B, C, D; T*
Class II, Division 2, Groups E, F and G, T90°C
Class III, Division 2, T90°C
Class I, Zone 2, Ex nA, IIC T* Gc
Class I, Zone 2, Ex ic, IIC T* Gc
Ta = -40°C to +80°C; Type 4X/6 (Enclosure), Type 6P (Probe/Antenna), IP66, IP67, DUAL SEAL

NI/Ex nA/Ex ic Remote Version (converter housing):
Class I, Division 2, Groups A, B, C, D, T*

SCHEDULE

Canadian Certificate Of Conformity No: FM19CA0092X

Class II, Division 2, Groups E, F and G, T90°C

Class III, Division 2, T90°C

Class I, Zone 2, Ex nA, IIC T* Gc

Class I, Zone 2, Ex ic, IIC T* Gc

Ta = -40°C to +80°C; Type 4X/6 (Enclosure), IP66, IP67

LevelWave LG01: Install per Control Drawing APPR F0821010641C

LevelWave LR01: Install per Control Drawing APPR F0821010651C

12. **Description of Equipment:**

General - The LevelWave LG01 (TDR technology) and LevelWave LR01 (Radar technology) Measurements Instruments are designed for acquiring level, distance and volume in a vessel or tank. All signal outputs are either a 4-20 mA current loop with HART protocol or a digital fieldbus (PROFIBUS PA or FOUNDATION fieldbus).

Construction - The LevelWave LG01 and LevelWave LR01 electronic enclosures are made of either aluminum or stainless steel and are mounted to a process connection that interfaces with the wetted parts of the vessel.

Ratings – The 4-20 mA version of the LevelWave LG01 and LevelWave LR01 operates at either 36Vdc (XP-AIS/DIP-AIS/Ex db ia and NI/Ex nA versions) or at 30V dc (IS/Ex ia version). The Fieldbus version of the LevelWave LG01 and LevelWave LR01 operates at either 17.5Vdc for FISCO model (IS/Ex ia and XP-AIS/DIP-AIS/Ex db ia and Ex ic versions) or at 24Vdc for entity model (IS/Ex ia and XP-AIS/DIP-AIS/Ex db ia versions) or at 32Vdc with Non Incendive Field Wiring (NI/Ex nA version). The transmitters are rated for use in an ambient temperature range of -40°C to +80°C. The LevelWave LG01 probe system is rated for use in a process temperature range of -50°C to +300°C. The LevelWave LR01 antenna system is rated for use in a process temperature range of -60°C to +250°C.

LevelWave LG01
Models: LG010abcdefghijklmpqrst or LG014abcdefghijklmpqrst or LG019abcdefghijklmpqrst.

IS/Ex ia (j=1): Entity: Ui ≤ 30Vdc; I, ≤ 300mA; Pi ≤ 1W; Ci = 30nF; Li = 30µH
IS/Ex ia (j=A, B): Entity: Ui ≤ 24Vdc; Ii ≤ 300mA; Pi ≤1.2W; Ci = 1nF; Li = 4µH
IS/Ex ia (j=A, B): FISCO: Ui ≤ 17.5Vdc; Ii ≤ 380mA; Pi ≤ 5.32W; Ci = 1nF; Li = 4µH
XP-AIS/DIP-AIS/Ex db ia (j=1): Umax ≤ 36Vdc; Um = 250Vac
XP-AIS/DIP-AIS/Ex db ia (j=A, B): Entity: Ui ≤ 24Vdc; Ii ≤ 300mA; Pi ≤ 1.2W; Ci = 1nF; Li = 4µH
XP-AIS/DIP-AIS/Ex db ia (j=A, B): FISCO: Ui ≤ 17.5Vdc; Ii ≤ 380mA; Pi ≤ 5.32W; Ci = 1nF; Li = 4µH
NI/Ex nA (j=1): Umax ≤ 36Vdc; Um = 250Vac
NI/Ex nA (j=A, B); NIFW: Ui ≤ 32Vdc; Ci = 1nF; Li = 4µH

SCHEDULE

Canadian Certificate Of Conformity No: FM19CA0092X

IS/Ex ic (j=A, B): FISCO Ui ≤ 17.5Vdc; Ci = 1nF; Li = 4µH

Outputs for the remote: Uo ≤ 6.6Vdc; Io ≤ 1.36A; Po ≤ 1.02W; Co = 2.7µF; Lo = 65µH

a= Converter/Version (housing material) 0, 1, 2, 3, 4 or 5.
b= Approval A, B or C.
c= Other approval (one digit, not safety relevant).
d= Pressure/Temperature/Sealing 0, 1, 2, 3, 6, 7, 8, C, D, E, H, K or L.
e= Material/Probe 0, 1, 2, 3, 4, 6, 7, A, B, D, E, G, K or L.
f= Material/Probe end type (one digit, not safety relevant).
g= Process connection size 0, C, D, E, F, G, H, K, L, M, N, P or R
h= Process connection pressure class 0, 1, 2, 3, 4, A, B, D, E, F, G, H, K, P, U, V or W.
i= Process connection sealing face/sanitary 0, 1, 2, 3, 4, 5, 6, A, B, C, D, E, F, G, H, K, L, M or P.
j= Output 0, 1, A or B.
k= Cable entry/Cable gland 0, 1, 2, 3, 4, A or B.
l= Housing option/Display 0, 1, 2, 3, 4, A, B, C, D, E or F.
m= Display language/instruction manual (one digit, not safety relevant).
p= Module option 0, 6, 7, 8, A or B.
q= Adaptors 0.
r= Calibration certificate (one digit, not safety relevant).
s= Drawing/TAG Number (one digit, not safety relevant).
t= Other constructions (one digit, not safety relevant).

LevelWave LR01
Models: LR010abcdefghijklmpqrst or LR014abcdefghijklmpqrst or LR019abcdefghijklmpqrst

IS/Ex ia (j=1): Entity: Ui ≤ 30Vdc; Ii ≤ 300mA; Pi ≤ 1W; Ci = 30nF; Li = 30µH
IS/Ex ia (j=A, B): Entity: Ui ≤ 24Vdc; Ii ≤ 300mA; Pi ≤ 1.2W; Ci = 1nF; Li = 4µH
IS/Ex ia (j=A, B): FISCO: Ui ≤ 17.5Vdc; Ii ≤ 380mA; Pi ≤ 5.32W; Ci = 1nF; Li = 4µH
XP-AIS/DIP-AIS/Ex db ia (j=1): Umax ≤ 36Vdc; Um = 250Vac
XP-AIS/DIP-AIS/Ex db ia (j=A, B): Entity: Ui ≤ 24Vdc; Ii ≤ 300mA; Pi ≤ 1.2W; Ci = 1nF; Li = 4µH
XP-AIS/DIP-AIS/Ex db ia (j=A, B): FISCO: Ui ≤ 17.5Vdc; Ii ≤ 380mA; Pi ≤ 5.32W; Ci = 1nF; Li = 4µH
NI/Ex nA (j=1): Umax ≤ 36Vdc; Um = 250Vac
NI/Ex nA (j=A, B); NIFW: Ui ≤ 32Vdc; Ci = 1nF; Li = 4µH
IS/Ex ic (j=A, B): FISCO Ui ≤ 17.5Vdc; Ci = 1nF; Li = 4µH

Outputs for the remote: Uo ≤ 6.6Vdc; Io ≤ 1.36A; Po ≤ 1.02W; Co = 2.7µF; Lo = 65µH

a= Converter/Version (housing material) 0, 1, 2, 3, 4 or 5.
b= Approval A, B or C.
c= Other approval (one digit, not safety relevant).
d= Pressure/Temperature/Sealing 0, 1, 5, 6, A, D, K, R or T.
e= Material/Antenna 0, 1, 2, 3, 4, G, H, L, M, N, P, R, S, T, U, V, W or X.

SCHEDULE

Canadian Certificate Of Conformity No: FM19CA0092X

f= Material/Antenna extension 0, 6, 7, 8, E, F, G, H, K, R, W or X.
g= Process connection size 0, G, H, K, L, M, N, P or R.
h= Process connection pressure class 0, 1, 2, 3, 4, A, D, E, F, G, H, K, P or U.
i= Process connection sealing face/sanitary 0, 1, 2, 3, 4, 5, 6, A, B, C, D, E, F, G, H, K, L, M or P.
j= Output 0, 1, A or B.
k= Cable entry/Cable gland 0, 1, 2, 3, 4, A or B.
l= Housing option/Display 0, 1, 2, 3, 4, A, B, C, D, E or F.
m= Display language/instruction manual (one digit, not safety relevant).
p= Remote option 0, 6, 7, 8, A or B.
q= Adaptors 0.
r= Calibration certificate (one digit, not safety relevant).
s= Drawing/TAG Number (one digit, not safety relevant).
t= Special option 0, 1, 3 or 5.

13. **Specific Conditions of Use:**

None

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

This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

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
16th December 2019	Original Issue.

CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM19US0175X**
3. **Equipment:** **LevelWave LG01, LevelWave LR01**
   (Type Reference and Name)
4. **Name of Listing Company:** **Eckardt SAS**
5. **Address of Listing Company:** **20 Rue De La Marne**
   FR-68360 Soultz
   France
6. The examination and test results are recorded in confidential report number:

   PR454609 dated 16th December 2019

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 3610:2010, FM Class 3611:2004, FM Class 3615:2006, FM Class 3616:2011, FM Class 3810:2005, ANSI/ISA 61010-1 (82.02.01):2004, ANSI/NEMA 250:2008, ANSI/IEC 60529:2004, ANSI/ISA 60079-0:2009, ANSI/UL 60079-1:2009, ANSI/ISA 60079-11:2011, ANSI/ISA 60079-15:2009, ANSI/ISA 60079-31:2009, ANSI/ISA 12.27.01:2003

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

J. E. Marquedant
VP, Manager - Electrical Systems

16 December 2019
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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 www.fmapprovals.com

SCHEDULE

US Certificate Of Conformity No: FM19US0175X

10. Equipment Ratings:

Intrinsically Safe for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Explosionproof with Intrinsically Safe outputs for Class I, Division 1, Groups A, B, C and D, Non-Incendive for Class I, II and III, Division 2, Groups A, B, C, D, E, F and G, Dust-ignitionproof with Intrinsically safe outputs for Class II and III, Division 1, Groups E, F and G; Intrinsically Safe for Class I, Zone 0, AEx ia IIC T* Ga, Flameproof with Intrinsically safe outputs for Class I, Zone 1, AEx db ia [ia Ga] IIC T* Gb, Non-sparking for Class I, Zone 2, AEx nA IIC T* Gc, Intrinsically safe for Class 1, Zone 2, AEx ic IIC T* Gc, Intrinsically Safe for Zone 20, AEx ia IIIC T90°C Da, Protection by Enclosure with intrinsically safe outputs for Zone 21, AEx ia tb [ia Da] IIIC T90°C Db hazardous (classified) locations, indoors and outdoors (Type 4X/6, Type 6P, IP66 and IP67) with an ambient temperature rating of -40°C to +80°C.

11. The marking of the equipment shall include:

IS/AEx ia Compact Version, IS/AEx ia Remote Version (probe/antenna housing) and XP-AIS/DIP-AIS/AEx db ia/AEx ia tb Remote Version (probe/antenna housing):

Class I, Division 1, Groups A, B, C, D; T*

Class II, Division 1, Groups E, F and G, T90°C

Class III, Division 1, T90°C

Class I, Zone 0, AEx ia, IIC T* Ga

Zone 20, AEx ia, IIIC T90°C Da

Ta = -40°C to +80°C; Type 4X/6 (Enclosure), Type 6P (Probe/Antenna), IP66, IP67, DUAL SEAL

IS/AEx ia Remote Version (converter housing):

Class I, Division 1, Groups A, B, C, D; T*

Class II, Division 1, Groups E, F and G, T90°C

Class III, Division 1, T90°C

Class I, Zone 1, AEx ia [ia Ga], IIC T* Gb

Zone 21, AEx ia [ia Da], IIIC T90°C Db

Ta = -40°C to +80°C; Type 4X/6 (Enclosure), IP66, IP67

XP-AIS/DIP-AIS/AEx db ia/AEx ia tb Compact Version:

Class I, Division 1, Groups A, B, C, D; T*

Class II, Division 1, Groups E, F and G, T90°C

Class III, Division 1, T90°C

Class I, Zone 1, AEx db ia [ia Ga], IIC T* Gb

Zone 21, AEx ia tb [ia Da], IIIC T90°C Db

SCHEDULE

US Certificate Of Conformity No: FM19US0175X

Ta = -40°C to +80°C; Type 4X/6 (Enclosure), Type 6P (Probe/Antenna), IP66, IP67, DUAL SEAL

XP-AIS/DIP-AIS/AEx db ia/AEx ia tb Remote Version (converter housing):

Class I, Division 1, Groups A, B, C, D; T*

Class II, Division 1, Groups E, F and G, T90°C

Class III, Division 1, T90°C

Class I, Zone 1, AEx db ia [ia Ga], IIC T* Gb

Zone 21, AEx ia tb [ia Da], IIIC T90°C Db

Ta = -40°C to +80°C; Type 4X/6 (Enclosure), IP66, IP67

Probe system (LG01) or antenna system (LR01):

Class I, Division 1, Groups A, B, C, D; T*

Class II, Division 1, Groups E, F and G, T90°C

Class III, Division 1, T90°C

Class I, Zone 0, AEx ia, IIC T* Ga

Zone 20, AEx ia, IIIC T90°C Da

Ta = -40°C to +80°C; Type 6P (Probe/Antenna), IP66, IP67, DUAL SEAL

NI/AEx nA/AEx ic Compact Version, NI/AEx nA/AEx ic Remote version (probe/antenna housing):

Class I, Division 2, Groups A, B, C, D; T*

Class II, Division 2, Groups E, F and G, T90°C

Class III, Division 2, T90°C

Class I, Zone 2, AEx nA, IIC T* Gc

Class I, Zone 2, AEx ic, IIC T* Gc

Ta = -40°C to +80°C; Type 4X/6 (Enclosure), Type 6P (Probe/Antenna), IP66, IP67, DUAL SEAL

NI/AEx nA/AEx ic Remote Version (converter housing):

Class I, Division 2, Groups A, B, C, D, T*

Class II, Division 2, Groups E, F and G, T90°C

Class III, Division 2, T90°C

Class I, Zone 2, AEx nA, IIC T* Gc

Class I, Zone 2, AEx ic, IIC T* Gc

Ta = -40°C to +80°C; Type 4X/6 (Enclosure), IP66, IP67

LevelWave LG01: Install per Control Drawing APPR F0821010641C

LevelWave LR01: Install per Control Drawing APPR F0821010651C

12. **Description of Equipment:**

General - The LevelWave LG01 (TDR technology) and LevelWave LR01 (Radar technology) Measurements Instruments are designed for acquiring level, distance and volume in a vessel or tank. All signal outputs are either a 4-20 mA current loop with HART protocol or a digital fieldbus (PROFIBUS PA or FOUNDATION fieldbus).

Construction - . The LevelWave LG01 and LevelWave LR01 electronic enclosures are made of either aluminum or stainless steel and are mounted to a process connection that interfaces with the wetted parts of the vessel.

Ratings – The 4-20 mA version of the LevelWave LG01 and LevelWave LR01 operates at either 36Vdc (XP-AIS/DIP-AIS/AEx db ia/AEx ia tb and NI/AEx nA versions) or at 30V dc (IS/AEx ia version). The Fieldbus version of the LevelWave LG01 and LevelWave LR01 operates at either 17.5Vdc for FISCO model (IS/AEx ia and XP-AIS/DIP- AEx db ia/AEx ia tb and AEx ic versions) or at 24Vdc for entity model (IS/AEx ia and XP-AIS/DIP-AIS/ AEx db ia/AEx ia tb versions) or at 32Vdc with Non Incendive Field Wiring (NI/AEx nA version). The transmitters are rated for use in an ambient temperature range of -40°C to +80°C. The LevelWave LG01 probe system is rated for use in a process temperature range of -50°C to +300°C. The LevelWave LR01 antenna system is rated for use in a process temperature range of -60°C to +250°C.

LevelWave LG01
Models: LG010abcdefghijklmpqrst or LG014abcdefghijklmpqrst or LG019abcdefghijklmpqrst.

IS/AEx ia (j=1): Entity: Ui ≤ 30Vdc; Ii ≤ 300mA; Pi ≤ 1W; Ci = 30nF; Li = 30µH
IS/AEx ia (j=A, B): Entity: Ui ≤ 24Vdc; Ii ≤ 300mA; Pi ≤ 1.2W; Ci = 1nF; Li = 4µH
IS/AEx ia (j=A, B): FISCO: Ui ≤ 17.5Vdc; Ii ≤ 380mA; Pi ≤ 5.32W; Ci = 1nF; Li = 4µH
XP-AIS/DIP-AIS/ AEx db ia/AEx ia tb (j=1): Umax ≤ 36Vdc; Um = 250Vac
XP-AIS/DIP-AIS/ AEx db ia/AEx ia tb (j=A, B): Entity: Ui ≤ 24Vdc; Ii ≤ 300mA; Pi ≤ 1.2W; Ci = 1nF; Li = 4µH
XP-AIS/DIP-AIS/ AEx db ia/AEx ia tb (j=A, B): FISCO: Ui ≤ 17.5Vdc; Ii ≤ 380mA; Pi ≤ 5.32W; Ci = 1nF; Li = 4µH
NI/AEx nA (j=1): Umax ≤ 36Vdc; Um = 250Vac
NI/AEx nA (j=A, B); NIFW: Ui ≤ 32Vdc; Ci = 1nF; Li = 4µH
IS/AEx ic (j=A, B): FISCO Ui ≤ 17.5Vdc; Ci = 1nF; Li = 4µH

Outputs for the remote: Uo ≤ 6.6Vdc; Io ≤ 1.36A; Po ≤ 1.02W; Co = 2.7µF; Lo = 65µH

a= Converter/Version (housing material) 0, 1, 2, 3, 4 or 5.
b= Approval A, B or C.
c= Other approval (one digit, not safety relevant).
d= Pressure/Temperature/Sealing 0, 1, 2, 3, 6, 7, 8, C, D, E, H, K or L.
e= Material/Probe 0, 1, 2, 3, 4, 6, 7, A, B, D, E, G, K or L.
f= Material/Probe end type (one digit, not safety relevant).
g= Process connection size 0, C, D, E, F, G, H, K, L, M, N, P or R
h= Process connection pressure class 0, 1, 2, 3, 4, A, B, D, E, F, G, H, K, P, U, V or W.
i= Process connection sealing face/sanitary 0, 1, 2, 3, 4, 5, 6, A, B, C, D, E, F, G, H, K, L, M or P.
j= Output 0, 1, A or B.
k= Cable entry/Cable gland 0, 1, 2, 3, 4, A or B.

l= Housing option/Display 0, 1, 2, 3, 4, A, B, C, D, E or F.
m= Display language/instruction manual (one digit, not safety relevant).
p= Module option 0, 6, 7, 8, A or B.
q= Adaptors 0.
r= Calibration certificate (one digit, not safety relevant).
s= Drawing/TAG Number (one digit, not safety relevant).
t= Other constructions (one digit, not safety relevant).

LevelWave LR01
Models: LR010abcdefghijklmpqrst or LR014abcdefghijklmpqrst or LR019abcdefghijklmpqrst

IS/AEx ia (j=1): Entity: Ui ≤ 30Vdc; Ii ≤ 300mA; Pi ≤ 1W; Ci = 30nF; Li = 30µH
IS/AEx ia (j=A, B): Entity: Ui ≤ 24Vdc; Ii ≤ 300mA; Pi ≤ 1.2W; Ci = 1nF; Li = 4µH
IS/AEx ia (j=A, B): FISCO: Ui ≤ 17.5Vdc; Ii ≤ 380mA; Pi ≤ 5.32W; Ci = 1nF; Li = 4µH
XP-AIS/DIP-AIS/ AEx db ia/AEx ia tb (j=1): Umax ≤ 36Vdc; Um = 250Vac
XP-AIS/DIP-AIS/ AEx db ia/AEx ia tb (j=A, B): Entity: Ui ≤ 24Vdc; Ii ≤ 300mA; Pi ≤ 1.2W; Ci = 1nF; Li = 4µH
XP-AIS/DIP-AIS/ AEx db ia/AEx ia tb (j=A, B): FISCO: Ui ≤ 17.5Vdc; Ii ≤ 380mA; Pi ≤ 5.32W; Ci = 1nF; Li = 4µH
NI/AEx nA (j=1): Umax ≤ 36Vdc; Um = 250Vac
NI/AEx nA (j=A, B); NIFW: Ui ≤ 32Vdc; Ci = 1nF; Li = 4µH
IS/AEx ic (j=A, B): FISCO Ui ≤ 17.5Vdc; Ci = 1nF; Li = 4µH

Outputs for the remote: Uo ≤ 6.6Vdc; Io ≤ 1.36A; Po ≤ 1.02W; Co = 2.7µF; Lo = 65µH

a= Converter/Version (housing material) 0, 1, 2, 3, 4 or 5.
b= Approval A, B or C.
c= Other approval (one digit, not safety relevant).
d= Pressure/Temperature/Sealing 0, 1, 5, 6, A, D, K, R or T.
e= Material/Antenna 0, 1, 2, 3, 4, G, H, L, M, N, P, R, S, T, U, V, W or X.
f= Material/Antenna extension 0, 6, 7, 8, E, F, G, H, K, R, W or X.
g= Process connection size 0, G, H, K, L, M, N, P or R.
h= Process connection pressure class 0, 1, 2, 3, 4, A, D, E, F, G, H, K, P or U.
i= Process connection sealing face/sanitary 0, 1, 2, 3, 4, 5, 6, A, B, C, D, E, F, G, H, K, L, M or P.
j= Output 0, 1, A or B.
k= Cable entry/Cable gland 0, 1, 2, 3, 4, A or B.
l= Housing option/Display 0, 1, 2, 3, 4, A, B, C, D, E or F.
m= Display language/instruction manual (one digit, not safety relevant).
p= Remote option 0, 6, 7, 8, A or B.
q= Adaptors 0.
r= Calibration certificate (one digit, not safety relevant).
s= Drawing/TAG Number (one digit, not safety relevant).
t= Special option 0, 1, 3 or 5.

13. **Specific Conditions of Use:**

None

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

SCHEDULE

US Certificate Of Conformity No: FM19US0175X

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
16th December 2019	Original Issue.

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 www.fmapprovals.com

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03
Certificate nº / Certificado nº

Emissão: 30/08/2019
Issuance / Otorgamiento

Válido até: 08/04/2020
Valid until / Válido hasta

Produto: *Product/Producto*	**TRANSMISSOR DE NÍVEL RADAR DE ONDA GUIADA** **TRANSMISSOR DE NÍVEL RADAR**
Tipo / Modelo: *Type – Model/Tipo – Modelo*	**LevelWave LG01** **LevelWave LR01**
Solicitante: *Applicant/Solicitante*	**ECKARDT S.A.S.** **(Trading as Foxboro® by Schneider Electric)** **20 rue de la Marne** **F-68360 Soultz** **France**
Fabricante: *Manufacturer/Fabricante*	**KROHNE S.A.S.** **2 allée des Ors-BP98** **F-26103 Romans sur Isère** **France**
Normas Técnicas: *Standards/Normas*	**ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-1:2016** **ABNT NBR IEC 60079-11:2013, ABNT NBR IEC 60079-26:2016 e** **ABNT NBR IEC 60079-31:2014**
Laboratório de Ensaio: *Testing Laboratory/Laboratorio de Ensayo*	**DEKRA Certification B.V.**
Nº do Relatório de Ensaios: *Test Report Number/Nº del informe de Ensayo*	**DEKRA nº NL/DEK/ExTR13.0081/00 de 20/11/2013** **DEKRA nº NL/DEK/ExTR13.0081/01 de 28/06/2019**
Nº do Relatório de Auditoria: *Audit Report Number/Nº del informe de Audit*	**NL/DEK/QAR12.0030/04 de 17/01/2018**
Esquema de Certificação: *Certification Scheme/Esquema de Certificación*	**Modelo 5 com Avaliação do Sistema de Gestão da Qualidade do Fabricante e Ensaios no Produto, conforme cláusula 6.1 dos Requisitos de Avaliação da Conformidade, anexo à Portaria nº 179 do INMETRO, publicada em 2010.**
Notas: *Notes/Anotación*	**A validade deste Certificado de Conformidade está atrelada à realização das avaliações de manutenção e tratamento de possíveis não conformidades de acordo com as orientações da DNV GL previstas no RAC específico. Para verificação da condição atualizada de regularidade deste Certificado de Conformidade deve ser consultado o banco de dados de produtos e serviços certificados do INMETRO.**
Portaria: *Governmental Regulation/Regulación Oficial*	**INMETRO n° 179 de 2010.**

Adriano Marcon Duarte
Gerente de Operações
Operations Manager

Certificação de Produto
OCP 0017

Heleno dos Santos Ferreira
Especialista Atmosferas Explosivas
Specialist for Explosive Atmospheres

Nota: A falta de cumprimento das condições estabelecidas no contrato pode tornar este certificado inválido.
O documento assinado digitalmente e distribuído eletronicamente é o original do certificado e válido. Ref:. https://www.dnvgl.com/assurance/general/validating_digital_signatures.html

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03 *Certificate nº / Certificado nº*

Emissão: 30/08/2019 *Issuance / Otorgamiento*

Válido até: 08/04/2020 *Valid until / Válido hasta*

Descrição do Equipamento:

O transmissor de nível radar de onda guiada modelo LevelWave LG01 tipo LG010a...r, LG014a...r e LG019a...r e o transmissor de nível radar modelo LevelWave LR01 tipo LR010a...r, LR014a...r e LR019a...r são utilizados para medição contínua de nível de líquidos inflamáveis ou não inflamáveis ou partículas sólidas, granulados ou pó dentro tanques de armazenamento ou processamento, ou ainda poços de destiladores.

A distância entre o transmissor modelo LevelWave LG01 e a superfície do meio é medida utilizando uma sonda (por exemplo, um cabo ou uma haste) que guia os pulsos eletromagnéticos que são refletidos pela superfície do meio.

A distância entre a antena do transmissor modelo LevelWave LR01 e a superfície do meio é medida utilizando um radar de onda contínua de frequência modulada.

Os transmissores a 2 fios são alimentados pela malha. O sinal de saída é de 4 a 20 mA com comunicação digital sobreposta (protocolo HART) ou uma corrente fixa com o sinal da portadora para comunicação utilizando o protocolo Fieldbus (PROFIBUS PA ou FOUNDATION Fieldbus).

Os transmissores podem ser fornecidos com o tipo de proteção segurança intrínseca ou fornecido com uma fonte de alimentação no interior de um invólucro à prova de explosão, nesta versão uma placa de circuito com barreira Zener é integrada ao módulo da fonte de alimentação.

Opcionalmente, os transmissores podem ser fornecidos com um display para ajustes de parâmetros (IHM).

Os transmissores possuem uma versão remota. O comprimento do cabo entre o invólucro do transmissor e do sensor pode ser no máximo 100 m.

O grau de proteção do transmissor de nível é IP66 e IP67 conforme a ABNT NBR IEC 60529.

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03 *Certificate nº / Certificado nº*
Emissão: 30/08/2019 *Issuance / Otorgamiento*
Válido até: 08/04/2020 *Valid until / Válido hasta*

LevelWave LG01

LG010abcdefghijklmnopqr ou LG014abcdefghijklmnopqr ou LG019abcdefghijklmnopqr

a Conversor / Versão (material do invólucro)
1: Compacta (alumínio)
2: Compacta (aço inoxidável)
3: Sensor (alumínio) com conversor remoto (alumínio)
4: Sensor (aço inoxidável) com conversor remoto (aço inoxidável)
5: Sensor (aço inoxidável) com conversor remoto (alumínio)

b Aprovação
R: INMETRO Ex ia IIC T6…TX[1]) Ga/Gb + Ex ia IIIC T90 °C Da/Db
S: INMETRO Ex db ia IIC T6…TX[1]) Ga/Gb + Ex ia tb IIIC T90 °C Da/Db
T: INMETRO Ex ic IIC T6…TX[1]) Gc + Ex ic IIIC T90 °C Dc
1): para o valor de TX, ver dados térmicos abaixo

c Outras aprovações (um dígito, não relevante para a segurança)

d Pressão / Temperatura / Vedação
1: 40 Bar / -40 °C...+150 °C / FKM
2: 40 Bar / -20 °C...+150 °C / Kalrez 6375
3: 40 Bar / -50 °C...+150 °C / EPDM
6: 40 Bar / -40 °C...+300 °C (HT) / FKM
7: 40 Bar / -20 °C...+300 °C (HT) / Kalrez 6375
8: 40 Bar / -50 °C...+250 °C (HT) / EPDM
C: 300 Bar (HP) / -40 °C...+150 °C / FKM
D: 300 Bar (HP) / -20 °C...+150 °C / Kalrez 6375
E: 300 Bar (HP) / -50 °C...+150 °C / EPDM
H: 300 Bar (HP) / -40 °C...+300 °C (HT) / FKM
K: 300 Bar (HP) / -20 °C...+300 °C (HT) / Kalrez 6375
L: 300 Bar (HP) / -50 °C...+250 °C (HT) / EPDM
S: 40 Bar /-20 °C...+150 °C / FKM/FPM (FDA, EC 1935/2004 + EC 2023/2006 e EU 10/2011) *
T: 40 Bar /-20°C...+150°C / Kalrez 6230 (FDA, EC 1935/2004 + EC 2023/2006 e EU 10/2011) *
U: 40 Bar /-45°C...+150°C / EPDM (FDA, EC 1935/2004 + EC 2023/2006 e EU 10/2011) *
* nota: as normas listadas não estão no escopo deste certificado)

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03 *Certificate nº / Certificado nº*
Emissão: 30/08/2019 *Issuance / Otorgamiento*
Válido até: 08/04/2020 *Valid until / Válido hasta*

e Material / Sonda
1: 316L / Haste única Ø8 mm max. 4 m
2: 316L / Haste única Ø8 mm segmentado max. 6 m
3: 316L / Cabo único Ø2 mm max. 40 m (somente líquido)
4: 316L / Cabo único Ø4 mm max. 40 m (liquido) ou 20 m (sólido)
5: 316L / Cabo único Ø8 mm max. 40 m (somente sólido)
6: 316L / Haste dupla Ø8 mm max. 4 m
7: 316L / Cabo dupla Ø4 mm max. 40 m (somente líquido)
A: 316L / Coaxial Ø22 mm max. 6 m
B: 316L / Coaxial Ø22 mm segmentado max. 6 m
D: Hastelloy C22 / Cabo único Ø 2 mm max. 40 m (somente líquido)
E: Hastelloy C22 / Coaxial Ø 22 mm
G: FEP / Cabo único com revestimento total, incluindo contrapeso
K: 316L / Sem sonda (Única - haste Ø8 mm ou cabo Ø4 mm)
L: 316L / Sem sonda (Dupla - haste Ø8 mm ou cabo Ø4 mm)
P: PVDF bainha / Haste única Ø8 mm max. 4 m
T: 316 / Cabo único Ø 4 mm para BM 26 ADVANCED max. 6 m
V: 316 / Cabo único Ø 4 mm para BM 26 F max. 6 m
X: 316 / Haste única Ø 8 mm Ra < 0,76 µm

f Material / tipo de extremidade da sonda (um dígito, não relevante para a segurança)

g Tamanho da conexão de processo (um dígito, não relevante para a segurança)

h Classe de pressão da conexão de processo (um dígito, não relevante para a segurança)

i Face de vedação da conexão de processo / sanitária (um dígito, não relevante para a segurança)

j Sinal de saída
1: 2 fios - 4...20 mA passiva HART
A: Foundation Fieldbus (2 fios)
B: PROFIBUS PA (2 fios)

k Entrada de cabos / Prensa-cabos (nota: prensa-cabos não fazem parte do escopo deste certificado)
1: M20 x 1,5 / Sem
2: M20 x 1,5 / Plástico
3: M20 x 1,5 / Latão
4: M20 x 1,5 / Aço inoxidável
A: ½" NPT (latão niquelado) / Sem
B: ½" NPT (aço inoxidável) / Sem

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03 *Certificate nº / Certificado nº*
Emissão: 30/08/2019 *Issuance / Otorgamiento*
Válido até: 08/04/2020 *Valid until / Válido hasta*

l Opção de invólucro / Display
1: Invólucro Horizontal / sem display
2: Invólucro Horizontal / com display
3: Invólucro Horizontal / sem display + Proteção contra intempéries
4: Invólucro Horizontal / com display + Proteção contra intempéries
A: Invólucro Vertical / sem display
B: Invólucro Vertical / com display no topo
C: Invólucro Vertical / com display ao lado
D: Invólucro Vertical / sem display + Proteção contra intempéries
E: Invólucro Vertical / com display no topo + Proteção contra intempéries
F: Invólucro Vertical / com display ao lado + Proteção contra intempéries

m Idioma de exibição (um dígito, não relevante para a segurança)

n Opção para a versão remota
0: Sem
6: Cabo de sinal 10 m
7: Cabo de sinal 25 m
8: Cabo de sinal 50 m
A: Cabo de sinal 75 m
B: Cabo de sinal 100 m

o Adaptadores
0: Sem

p Certificado de calibração (um dígito, não relevante para a segurança)

q Número de TAG (um dígito, não relevante para a segurança)

r Outras construções (um dígito, não relevante para a segurança)

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03 *Certificate nº / Certificado nº*
Emissão: 30/08/2019 *Issuance / Otorgamiento*
Válido até: 08/04/2020 *Valid until / Válido hasta*

LevelWave LR01

LR010abcdefghijklmnopqr ou LR014abcdefghijklmnopqr ou LR019abcdefghijklmnopqr

a Conversor / Versão (material do invólucro)
1: Compacta (alumínio)
2: Compacta (aço inoxidável)
3: Sensor (alumínio) com conversor remoto (alumínio)
4: Sensor (aço inoxidável) com conversor remoto (aço inoxidável)
5: Sensor (aço inoxidável) com conversor remoto (alumínio)

b Aprovação
R: INMETRO Ex ia IIC T6…TX[1]) Ga/Gb + Ex ia IIIC T90 °C Da/Db
S: INMETRO Ex db ia IIC T6…TX[1]) Ga/Gb + Ex ia tb IIIC T90 °C Da/Db
T: INMETRO Ex ic IIC T6…TX[1]) Gc + Ex ic IIIC T90 °C Dc
1): para o valor de TX, ver dados térmicos abaixo

c Outras aprovações (um dígito, não relevante para a segurança)

d Pressão / Temperatura / Vedação
1: V96; 40 Bar / -40 °C...+150 °C / FKM, FPM
3: V96; 40 Bar / -40 °C...+130 °C / FPM FEP revestida
5: V96; 40 Bar / -50 °C...+130 °C / EPDM
6: V96; 40 Bar / -20 °C...+150 °C / Kalrez 6375
7: V96; 40 Bar / -20 °C...+130 °C / Kalrez 6230
8: V96; 40 Bar / -20 °C...+130 °C / FEP revestido de silicone
A: V96 LT; 40 Bar / -60 °C...+130 °C / PFA
D: V96 HT; 40 Bar / -40 °C...+200 °C / FKM FPM
F: V96 HT; 40 Bar / -40 °C...+200 °C / FEP revestido de FPM
K: V96 HT; 40 Bar / -20 °C...+250 °C / Kalrez 6375
L: V96 HT; 40 Bar / -20 °C...+250 °C / Kalrez 6230
M: V96 HT; 40 Bar / -20 °C...+200 °C / FEP revestido de silicone
N: V96 HT; 40 Bar / -20 °C...+150 °C / PFA
R: Corneta;16 Bar / -20 °C...+100 °C / PP
T: Corneta; 40 Bar / -50 °C...+150 °C / PTFE
V: PTFE vareta zone 0; 16 Bar / -40 °C...+150 °C / PTFE
W: PTFE vareta com placa; 16 Bar / -40 °C...+150 °C / PTFE
X: PTFE vareta sem placa; 3 Bar / -20 °C...+150 °C / Kalrez 6375
Y: PP vareta sem placa; 3 Bar / -40 °C...+100 °C / FPM

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03 *Certificate nº / Certificado nº*

Emissão: 30/08/2019 *Issuance / Otorgamiento*

Válido até: 08/04/2020 *Valid until / Válido hasta*

e Material / Antena
1: 316 L / Corneta metálica (chapa metálica) DN80 (3")
2: 316 L / Corneta metálica (chapa metálica) DN100 (4")
3: 316 L / Corneta metálica (chapa metálica) DN150 (6")
4: 316 L / Corneta metálica (chapa metálica) DN200 (8")
5: 316 L / Corneta metálica (usinada) DN65 (2.5")
B: PP sem placa / Vareta L= 270 mm
C: PTFE com placa / Vareta L = 384 mm
D: PTFE sem placa / Vareta L= 270 mm
E: PTFE com placa para poço de estabilização / L= 60 mm
G: PP / Corneta L=317 mm
H: PTFE / Corneta L=300 mm
L: 316 L / Guia de onda metálica ≤ 1 m (3.28 ft)
M: 316 L / Guia de onda metálica ≤ 1,5 m (4.92 ft)
N: 316 L / Guia de onda metálica ≤ 2 m (6.56 ft)
P: 316 L / Guia de onda metálica ≤ 2,5 m (8.2 ft)
R: 316 L / Guia de onda metálica ≤ 3 m (9.84 ft)
S: 316 L / Guia de onda metálica ≤ 3,5 m (11.48 ft)
T: 316 L / Guia de onda metálica ≤ 4 m (13.12 ft)
U: 316 L / Guia de onda metálica ≤ 4,5 m (14.76 ft)
V: 316 L / Guia de onda metálica ≤ 5 m (16.4 ft)
W: 316 L / Guia de onda metálica ≤ 5,5 m (18.04 ft)
X: 316 L / Guia de onda metálica ≤ 6 m (19.68 ft)

f Material / Extensão da Antena
1: PP / 100 mm (4") somente para Vareta
2: PP / 300 mm (8") somente para Vareta
3: PP / 500 mm (20") somente para Vareta
4: PP / 700 mm (28") somente para Vareta
6: PTFE / 100 mm (4")
7: PTFE / 200 mm (8")
8: PTFE / 300 mm (12")
A: PTFE / 400 mm (16") somente para Vareta
B: PTFE / 500 mm (20") somente para Vareta
C: PTFE / 600 mm (24") somente para Vareta
E: 316 L / 100 mm (4")
F: 316 L / 200 mm (8")
G: 316 L / 300 mm (12")
H: 316 L / 400 mm (16")
K: 316 L / 500 mm (20")
L: 316 L / 600 mm (24")
M: 316 L / 700 mm (28")
N: 316 L / 800 mm (32")
P: 316 L / 900 mm (36")

R: 316 L / 1000 mm (40")
S: 316 L / 1300 mm (52")
T: 316 L / 1600 mm (64")
U: 316 L / 2000 mm (80")
W: 316 L / extensão S-bend
X: 316 L / extensão L-bend (angulo reto)

g Tamanho da conexão de processo (um dígito, não relevante para a segurança)

h Classe de pressão da conexão de processo (um dígito, não relevante para a segurança)

i Face de vedação da conexão de processo / sanitária (um dígito, não relevante para a segurança)

j Sinal de saída
1: 2 fios - 4...20 mA passiva HART
A: Foundation Fieldbus (2 fios)
B: PROFIBUS PA (2 fios)

k Entrada de cabos / Prensa-cabos (nota: prensa-cabos não fazem parte do escopo deste certificado)
1: M20 x 1,5 / Sem
2: M20 x 1,5 / Plástico
3: M20 x 1,5 / Latão niquelado
4: M20 x 1,5 / Aço inoxidável
A: ½" NPT (latão niquelado) / Sem
B: ½" NPT (Aço inoxidável) / Sem

l Opção de invólucro / Display
1: Invólucro Horizontal / sem display
2: Invólucro Horizontal / com display
3: Invólucro Horizontal / sem display + Proteção contra intempéries
4: Invólucro Horizontal / com display + Proteção contra intempéries
A: Invólucro Vertical / sem display
B: Invólucro Vertical / com display no topo
C: Invólucro Vertical / com display ao lado
D: Invólucro Vertical / sem display + Proteção contra intempéries
E: Invólucro Vertical / com display no topo + Proteção contra intempéries
F: Invólucro Vertical / com display ao lado + Proteção contra intempéries

m Idioma de exibição (um dígito, não relevante para a segurança)

n Opção para a versão remota
6: Cabo de sinal 10 m
7: Cabo de sinal 25 m
8: Cabo de sinal 50 m
A: Cabo de sinal 75 m
B: Cabo de sinal 100 m

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03 *Certificate nº / Certificado nº*
Emissão: 30/08/2019 *Issuance / Otorgamiento*
Válido até: 08/04/2020 *Valid until / Válido hasta*

o Adaptor
0: Sem

p Certificado de calibração (um dígito, não relevante para a segurança)

q Desenho / número do TAG (um dígito, não relevante para a segurança)

r Outras construções
0: Sem
1: NACE MR 0175/MR 0103
3: Aquecimento / Resfriamento (apenas corneta metálica)
5: Purgar com líquido (apenas corneta metálica)
6: Purgar com líquido + Aquecimento / Resfriamento (apenas corneta metálica)
A: Purgar com gás (apenas corneta metálica)
B: Purgar com gás + Aquecimento / Resfriamento (apenas corneta metálica)

A relação entre a classe de temperatura, a temperatura máxima do flange e a temperatura ambiente para cada tipo de sonda/antena são listados nas tabelas a seguir:

Modelo: LevelWave LG01 versão compacta

Nível de Proteção	Temperatura Ambiente Máxima			Máxima Temperatura do Flange	Classe de Temperatura
	Com sonda de 2 mm	Com sonda de 2 mm e extensão HT	Com todas as outras sondas		
Ga/Gb	52 °C	54 °C	53 °C	60 °C	T6
	70 °C	70 °C	70 °C	60 °C	T5
	80 °C	80 °C	80 °C	60 °C	T4
Gb e Gc	52 °C	54 °C	53 °C	60 °C	T6
	42 °C	51 °C	45 °C	85 °C	
	67 °C	69 °C	68 °C	75 °C	T5
	57 °C	66 °C	60 °C	100 °C	
	77 °C	79 °C	78 °C	85 °C	T4
	67 °C	76 °C	70 °C	110 °C	
	57 °C	73 °C	62 °C	135 °C	
	51 °C	71 °C	57 °C	150 °C	T3
	Não permitido	68 °C	Não permitido	180 °C[1)]	
	Não permitido	65 °C	Não permitido	200 °C[1)]	
	Não permitido	60 °C	Não permitido	250 °C[1)]	T2
	Não permitido	54 °C	Não permitido	300 °C[1)]	

Nível de Proteção	Temperatura Ambiente Mínima			Mínima Temperatura do Flange	Classe de Temperatura
	Com sonda de 2 mm	Com sonda de 2 mm e extensão HT	Com todas as outras sondas		
Ga/Gb	-40 °C	-40 °C	-40 °C	-20 °C	T6-T2
Gb e Gc	-40 °C	-40 °C	-40 °C	-40 °C[1)]	
	-36 °C	-39 °C	-37 °C	-50 °C[1)]	

[1)] A faixa de temperatura permitida para as gaxetas devem ser observadas (ver instruções).

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03
Certificate nº / Certificado nº

Emissão: 30/08/2019
Issuance / Otorgamiento

Válido até: 08/04/2020
Valid until / Válido hasta

Modelo: LevelWave LG01 versão remota

Nível de Proteção	Temperatura Ambiente Máxima			Máxima Temperatura do Flange	Classe de Temperatura
	Com sonda de 2 mm	Com sonda de 2 mm e extensão HT	Com todas as outras sondas		
Ga/Gb	49 °C	51 °C	49 °C	60 °C	T6
	70 °C	70 °C	70 °C	60 °C	T5
	80 °C	80 °C	80 °C	60 °C	T4
Gb e Gc	49 °C	51 °C	49 °C	60 °C	T6
	39 °C	48 °C	43 °C	85 °C	
	64 °C	66 °C	64 °C	75 °C	T5
	54 °C	65 °C	58 °C	100 °C	
	77 °C	79 °C	78 °C	85 °C	T4
	64 °C	75 °C	68 °C	110 °C	
	51 °C	71 °C	59 °C	135 °C	
	43 °C	69 °C	54 °C	150 °C	T3
	Não permitido	65 °C	Não permitido	180 °C[1)]	
	Não permitido	62 °C	Não permitido	200 °C[1)]	
	Não permitido	54 °C	Não permitido	250 °C[1)]	T2
	Não permitido	47 °C	Não permitido	300 °C[1)]	

Nível de Proteção	Temperatura Ambiente Mínima			Mínima Temperatura do Flange	Classe de Temperatura
	Com sonda de 2 mm	Com sonda de 2 mm e extensão HT	Com todas as outras sondas		
Ga/Gb	-40 °C	-40 °C	-40 °C	-20 °C	T6-T2
Gb e Gc	-40 °C	-40 °C	-40 °C	-40 °C[1)]	
	-35 °C	-39 °C	-36 °C	-50 °C[1)]	

[1)] A faixa de temperatura permitida para as gaxetas devem ser observadas (ver instruções).

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03
Certificate nº / Certificado nº

Emissão: 30/08/2019
Issuance / Otorgamiento

Válido até: 08/04/2020
Valid until / Válido hasta

Modelo: LevelWave LR01 versão compacta

Nível de Proteção	Temperatura Ambiente Máxima				Máxima Temperatura do Flange	Classe de Temperatura
	Antena corneta PP	Antena tipos: Corneta PTFE & Vareta	Antena corneta metálica sem extensão HT	Antena corneta metálica com extensão HT		
Ga/Gb	46 °C	46 °C	46 °C	46 °C	45 °C	T6
	41 °C	42 °C	41 °C	44 °C	55 °C	T5
	38 °C	40 °C	39 °C	43 °C	60 °C	T4
Gb e Gc	46 °C	46 °C	46 °C	46 °C	45 °C	T6
	41 °C	42 °C	41 °C	44 °C	55 °C	
	38 °C	40 °C	39 °C	43 °C	60 °C	
	53 °C	55 °C	54 °C	58 °C	75 °C	T5
	40 °C	44 °C	43 °C	54 °C	100 °C	
	77 °C	77 °C	77 °C	79 °C	85 °C	T4
	69 °C	71 °C	70 °C	76 °C	100 °C	
	Não permitido	57 °C	54 °C	71 °C	135 °C[1)]	
	Não permitido	50 °C	48 °C	68 °C	150 °C[1)]	T3
	Não permitido	Não permitido	Não permitido	64 °C	180 °C[1)]	
	Não permitido	Não permitido	Não permitido	61 °C	200 °C[1)]	
	Não permitido	Não permitido	Não permitido	53 °C	250 °C[1)]	T2

Nível de Proteção	Temperatura Ambiente Mínima				Máxima Temperatura do Flange	Classe de Temperatura
	Antena tipos: Corneta PP & Vareta	Antena corneta PTFE	Antena corneta metálica sem extensão HT	Antena corneta metálica com extensão HT		
Ga/Gb	-40 °C	-40 °C	-40 °C	-40 °C	-20 °C	T6-T2
Gb e Gc	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C[1)]	
	Não permitido	-36 °C	-35 °C	-38 °C	-50 °C[1)]	
	Não permitido	Não permitido	Não permitido	-37 °C	-60 °C[1)]	

[1)] A faixa de temperatura permitida para as gaxetas devem ser observadas (ver instruções).

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03
Certificate nº / Certificado nº

Emissão: 30/08/2019
Issuance / Otorgamiento

Válido até: 08/04/2020
Valid until / Válido hasta

Modelo: LevelWave LR01 versão remota

Nível de Proteção	Temperatura Ambiente Máxima				Máxima Temperatura do Flange	Classe de Temperatura
	Antena corneta PP	Antena tipos: Corneta PTFE & Vareta	Antena corneta metálica sem extensão HT	Antena corneta metálica com extensão HT		
Ga/Gb	46 °C	46 °C	46 °C	46 °C	45 °C	T6
	41 °C	41 °C	41 °C	44 °C	55 °C	T5
	39 °C	39 °C	39 °C	43 °C	60 °C	T4
Gb e Gc	46 °C	46 °C	46 °C	46 °C	45 °C	T6
	41 °C	41 °C	41 °C	44 °C	55 °C	
	39 °C	39 °C	39 °C	43 °C	60 °C	
	54 °C	54 °C	54 °C	59 °C	75 °C	T5
	43 °C	43 °C	41 °C	55 °C	100 °C	
	77 °C	77 °C	77 °C	79 °C	85 °C	T4
	70 °C	71 °C	70 °C	77 °C	100 °C	
	Não permitido	55 °C	53 °C	72 °C	135 °C[1)]	
	Não permitido	48 °C	45 °C	66 °C	150 °C[1)]	T3
	Não permitido	Não permitido	Não permitido	63 °C	180 °C[1)]	
	Não permitido	Não permitido	Não permitido	57 °C	200 °C[1)]	
	Não permitido	Não permitido	Não permitido	53 °C	250 °C[1)]	T2

Nível de Proteção	Temperatura Ambiente Mínima				Máxima Temperatura do Flange	Classe de Temperatura
	Antena tipos: Corneta PP & Vareta	Antena corneta PTFE	Antena corneta metálica sem extensão HT	Antena corneta metálica com extensão HT		
Ga/Gb	-40 °C	-40 °C	-40 °C	-40 °C	-20 °C	T6-T2
Gb e Gc	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C[1)]	
	Não permitido	-36 °C	-35 °C	-39 °C	-50 °C[1)]	
	Não permitido	Não permitido	Não permitido	-37 °C	-60 °C[1)]	

[1)] A faixa de temperatura permitida para as gaxetas devem ser observadas (ver instruções).

A temperatura máxima de superficie "T" do invólucro é de 90 °C.

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03 *Certificate nº / Certificado nº*
Emissão: 30/08/2019 *Issuance / Otorgamiento*
Válido até: 08/04/2020 *Valid until / Válido hasta*

Características Elétricas:

Equipamentos intrinsecamente seguros "Ex ia" com saída 4-20 mA (protocolo HART)

Alimentação e circuito de saída:
(terminais de saída 1+ e 1-):

No tipo de proteção segurança intrínseca Ex ia IIC e Ex ia IIIC, somente para conexão a um circuito intrinsecamente seguro, observando os seguintes valores máximos:

U_i = 30 V
I_i = 300 mA
P_i = 1 W
C_i = 16 nF
L_i = 27 µH

Equipamentos intrinsecamente seguros "Ex ia" e proteção por invólucro "Ex d" e "Ex t" com cabeamento intrinsecamente seguro "Ex ia" utilizando protocolo PROFIBUS PA ou FIELDBUS FOUNDATION

Circuito Fieldbus:
(terminais de saída 1+ e 1-):

No tipo de proteção segurança intrínseca Ex ia IIC e Ex ia IIIC, somente para conexão a um circuito intrinsecamente seguro, observando os seguintes valores máximos:

U_i = 24 V
I_i = 300 mA
P_i = 1,2 W
C_i = 1 nF
L_i = 2 µH

Circuito Fieldbus:
(terminais de saída 1+ e 1-):

No tipo de proteção segurança intrínseca Ex ia IIC e Ex ia IIIC, somente para conexão a um circuito intrinsecamente seguro ou um circuito FISCO, observando os seguintes valores máximos:

U_i = 17,5 V
I_i = 380 mA
P_i = 5,32 W
C_i = 1 nF
L_i = 2 µH

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03
Certificate nº / Certificado nº

Emissão: 30/08/2019
Issuance / Otorgamiento

Válido até: 08/04/2020
Valid until / Válido hasta

Equipamentos intrinsecamente seguros "Ex ic" com saída 4-20 mA (protocolo HART)

Alimentação e circuito de saída:
(terminais de saída 1+ e 1-):

No tipo de proteção segurança intrínseca Ex ic IIC e Ex ic IIIC, somente para conexão a um circuito intrinsecamente seguro, observando os seguintes valores máximos:

U_i = 30 V
I_i = 300 mA
P_i = 1 W
C_i = 16 nF
L_i = 27 µH

Equipamentos intrinsecamente seguros "Ex ic" utilizando protocolo PROFIBUS PA ou FIELDBUS FOUNDATION

Circuito Fieldbus:
(terminais de saída 1+ e 1-):

No tipo de proteção segurança intrínseca Ex ic IIC e Ex ic IIIC, somente para conexão a um circuito intrinsecamente seguro, observando os seguintes valores máximos:

U_i = 32 V
C_i = 1 nF
L_i = 2 µH

Circuito Fieldbus:
(terminais de saída 1+ e 1-):

No tipo de proteção segurança intrínseca Ex ic IIC e Ex ic IIIC, somente para conexão a um circuito intrinsecamente seguro ou um circuito FISCO, observando os seguintes valores máximos:

U_i = 17,5 V
C_i = 1 nF
L_i = 2 µH

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03
Certificate nº / Certificado nº

Emissão: 30/08/2019
Issuance / Otorgamiento

Válido até: 08/04/2020
Valid until / Válido hasta

Equipamentos com proteção por invólucro "Ex d" e "Ex t" com sinal de saída de 4 a 20 mA (protocolo HART)

Fonte de alimentação = 36 Vcc (max)
Sinal de Saída = 4-20 mA
Tensão máxima de proteção = U_m = 250 V

Análises e ensaios realizados:

As análises e os ensaios realizados encontram-se no arquivo nº 14.0058.

Documentação descritiva:

Documento	Páginas	Descrição	Rev.	Data
IECEx DEK 13.0077X	10	Certificado de Conformidade	0	19/11/2013
IECEx DEK 13.0077X	15	Certificado de Conformidade	1	28/06/2019
NL/DEK/ExTR13.0081/00	5	Relatório de ensaios	0	20/11/2013
NL/DEK/ExTR13.0081/01	5	Relatório de ensaios	1	28/06/2019

Marcação:

Os transmissores de nível foram aprovados nos ensaios e análises, nos termos das normas adotadas, devendo receber a marcação, levando-se em consideração o item observações.

Versão Compacta
Ex ia IIC T6...T2 Ga/Gb
Ex ia IIC T6...T2 Gb
Ex ic IIC T6...T2 Gc
Ex ia IIIC T90 °C Da/Db
Ex ia IIIC T90 °C Db
Ex ic IIIC T90 °C Dc
Ex db ia IIC T6...T2 Ga/Gb
Ex db ia IIC T6...T2 Gb
Ex ia tb IIIC T90 °C Da/Db
Ex ia tb IIIC T90 °C Db

Versão Remota (Transmissor)
Ex ia [ia Ga] IIC T6...T4 Gb
Ex ic [ic] IIC T6...T4 Gc
Ex ia [ia Da] IIIC T90 °C Db
Ex ic [ic] IIIC T90 °C Dc
Ex db ia [ia Ga] IIC T6...T4 Gb
Ex ia tb [ia Da] IIIC T90 °C Db

Versão Remota (Sensor)
Ex ia IIC T6...T2 Ga/Gb
Ex ia IIC T6...T2 Gb
Ex ic IIC T6...T2 Gc
Ex ia IIIC T90 °C Da/Db
Ex ia IIIC T90 °C Db
Ex ic IIIC T90 °C Dc

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03
Certificate nº / Certificado nº

Emissão: 30/08/2019
Issuance / Otorgamiento

Válido até: 08/04/2020
Valid until / Válido hasta

Observações:

1. O número do certificado é finalizado pela letra X para indicar que o produto está sujeito às condições específicas de uso seguro especificadas abaixo:
   Quando utilizado em uma atmosfera explosiva requerendo o uso de equipamento EPL Ga, o equipamento deverá necessariamente ser instalado de tal forma que exclua a mais remota possibilidade do surgimento de uma ignição através de cargas eletrostáticas que venham a surgir a partir das partes plásticas.
   Quando utilizado em uma atmosfera explosiva com a presença de poeiras combustíveis o equipamento deve ser instalado de modo a excluir o surgimento de cargas eletrostáticas.
   As dimensões da junta da bucha são menores do que os requeridos pela ABNT NBR IEC 60079-1 (o comprimento mínimo é 13,9 mm e o interstício é 0,118 mm).

2. Este Certificado de Conformidade é válido para os produtos de modelo e tipo idêntico ao protótipo ensaiado. Qualquer modificação de projeto ou utilização de componentes e materiais diferentes daqueles descritos na documentação deste processo, sem autorização prévia da DNV GL, invalidará o certificado.

3. É responsabilidade do fabricante assegurar que os produtos estejam de acordo com as especificações do protótipo ensaiado, através de inspeções visuais e dimensionais.

4. Os produtos devem ostentar, na sua superfície externa e em local visível, a Marca de Conformidade e as características técnicas da mesma de acordo com as especificações da ABNT NBR IEC 60079-0 / ABNT NBR IEC 60079-1 / ABNT NBR IEC 60079-11 / ABNT NBR IEC 60079-26 / ABNT NBR IEC 60079-31 e Requisitos de Avaliação da Conformidade, anexo à Portaria nº 179 do INMETRO, publicada em 18 de Maio de 2010. Esta marcação deve ser legível e durável, levando-se em conta possível corrosão química.

5. O produto deve ostentar, em lugar visível e de forma indelével, a seguinte advertência:

ATENÇÃO
NÃO ABRA QUANDO ENERGIZADO
APÓS DESENERGIZAÇÃO AGUARDE 10 MINUTOS ANTES DA ABERTURA – Classe T6
APÓS DESENERGIZAÇÃO AGUARDE 10 MINUTOS ANTES DA ABERTURA – Classe T5

6. Os bujões para fechar as aberturas não utilizadas e os dispositivos de entrada de cabos (prensa-cabos, unidade seladora, adaptadores de rosca) devem ser certificados como à prova de explosão, adequados para as condições de uso e corretamente instalados.

7. Os produtos devem ser instalados em atendimento às Normas pertinentes em Instalações Elétricas em Atmosferas Explosivas.

8. As atividades de instalação, inspeção, manutenção, reparo, revisão e recuperação dos produtos são de responsabilidade do usuário e devem ser executadas de acordo com os requisitos das normas técnicas vigentes e com as recomendações do fabricante.

9. Para fins de comercialização no Brasil, as responsabilidades da alínea “e” do item 10.1 da Portaria 179 de 18 de maio de 2010, é do representante legal, do importador ou do usuário.

DNV GL – BUSINESS ASSURANCE

CERTIFICADO DE CONFORMIDADE

Certificate of Conformity / Certificado de Conformidad

Certificado nº: DNV 14.0058 X – Revisão 03
Certificate nº / Certificado nº

Emissão: 30/08/2019
Issuance / Otorgamiento

Válido até: 08/04/2020
Valid until / Válido hasta

Projeto nº: PRJC-586067-2018-PRC-BRA

Histórico:

Revisão	Descrição	Data
0	Certificação inicial – Efetivação	08/04/2014
1	Revalidação	10/01/2017
2	Atualização do numero do projeto	07/08/2018
3	Atualização do certificado em conformidade com o certificado IECEx	30/08/2019

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx DEK 13.0077X

Issue No: 1

Certificate history:
Issue No. 1 (2019-06-28)
Issue No. 0 (2014-04-16)

Status: **Current**

Date of Issue: **2019-06-28**

Applicant: **Eckardt S.A.S.**
Rue de la Marne 20,
68360 Soultz
France

Equipment: **Guided Wave Radar Level Meter - LevelWave LG01 and Free Space Radar Level Meter - LevelWave LR01**

Optional accessory:

Type of Protection: **ia, ic, db, tb**

Marking:
For marking refer to Annex 1 to this certificate.

Approved for issue on behalf of the IECEx Certification Body: R. Schuller

Position: Certification Manager

Signature:
(for printed version)

Date: 2019-06-28

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

DEKRA Certification B.V.
Meander 1051,
6825 MJ Arnhem
The Netherlands

IECEx Certificate of Conformity

Certificate No:	IECEx DEK 13.0077X	Issue No: 1
Date of Issue:	**2019-06-28**	Page 2 of 4
Manufacturer:	**Eckardt S.A.S.** Rue de la Marne 20, 68360 Soultz **France**	

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2014-10 Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

NL/DEK/ExTR13.0081/01

Quality Assessment Report:

DE/PTB/QAR16.0001/01

IECEx Certificate of Conformity

Certificate No:	IECEx DEK 13.0077X	Issue No: 1
Date of Issue:	**2019-06-28**	Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The Guided Wave Radar Level Meter – LevelWave LG01 type LG010a...r, LG014a...r and LG019a...r and Free Space Radar Level Meter - LevelWave LR01 type LR010a...r, LR014a...r and LR019a are used for continuous level measurement of flammable or non-flammable liquids or solid particles, granulates or powders within storage or process tanks or in a stilling well.

The distance between transmitter LevelWave LG01 and the surface of the process medium is measured using a probe system (e.g. cable or rod) that guides electromagnetic pulses that are reflected by the surface of the process medium.

The distance between the antenna of transmitter LevelWave LR01 and the surface of the process medium is measured using frequency modulated continuous wave radar.

The 2-wire transmitter is loop powered. The output is either a 4 - 20 mA current signal with an overlaid digital communication protocol (HART) or a fixed current with a carrier signal for the fieldbus protocol (PROFIBUS PA or FOUNDATION fieldbus FF).

Either the 4 - 20 mA HART Transmitter is completely in type of protection intrinsic safety “i” or the transmitter is provided with the power supply compartment in type of protection flameproof enclosures "d". In the latter version a zener barrier circuit board is located in the terminal compartment.

Optionally, the transmitter may be provided with display and adjustment capabilities (HMI option).

Transmitters LevelWave LG01 and LevelWave LR01 are also available as remote versions. The length of the cable between transmitter housing and sensor is maximum 100 m.

The enclosure provides a degree of protection of at least IP66/IP67 as per IEC 60529.

For type designation, marking and technical data refer to Annex 1 to this certificate.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- When used in a potentially explosive atmosphere requiring the use of a probe of equipment protection level Ga the probe must be installed so, that even in the event of rare incidents an ignition source due to electrostatic charging of the plastic parts of the apparatus is excluded.

- When used in an explosive dust atmosphere the apparatus must be installed so that electrostatic discharging is excluded.

- The flamepath at the bushing has a width of min. 13.9 mm and a gap of max. 0.118 mm.

- For ambient temperature range see temperature tables in Annex to this certificate.

IECEx Certificate of Conformity

Certificate No: IECEx DEK 13.0077X Issue No: 1

Date of Issue: **2019-06-28**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

- Name and address change of the manufacturer;
- Assessment to newer editions of the standards;
- minor constructional changes.

Annex:

223841200-Annex1 to IECEx DEK 13.0077X.pdf

Annex 1 to Certificate of Conformity IECEx DEK 13.0077 X
Annex 1 to NL/DEK/ExTR13.0081/01
Annex 1 to EU-Type Examination Certificate DEKRA 13ATEX0180 X, issue 2

Type designation

LevelWave LG01

LG010abcdefghijklmnopqr or LG014abcdefghijklmnopqr or LG019abcdefghijklmnopqr

a Converter/Version (housing material)
- 1: Compact (aluminium)
- 2: Compact (stainless steel)
- 3: Sensor (aluminium) with remote Converter (aluminium)
- 4: Sensor (stainless steel) with remote Converter (aluminium)
- 5: Sensor (stainless steel) with remote Converter (aluminium)

b Approval
- 1: ATEX II 1/2 G Ex ia IIC T6…TX[1)] Ga/Gb + II 1/2 D Ex ia IIIC T90 ℃ Da/Db
- 2: ATEX II 1/2 G Ex ia/db IIC T6…TX[1)] Ga/Gb + II 1/2 D Ex ia/tb IIIC T90 ℃ Da/Db
- 4: ATEX II 3 G Ex ic IIC T6…TX[1)] Gc + II 3 D Ex ic IIIC T90 ℃ Dc
- 6: IECEx Ex ia IIC T6…TX[1)] Ga/Gb + Ex ia IIIC T90 ℃ Da/Db
- 7: IECEx Ex ia/db IIC T6…TX[1)] Ga/Gb + Ex ia/tb IIIC T90 ℃ Da/Db
- 8: IECEx Ex ic IIC T6…TX[1)] Gc + Ex ic IIIC T90 ℃ Dc

[1)]: for the value of TX see thermal data below

c Other approval (one digit, not safety relevant)

d Pressure / Temperature / Sealing
- 1: 40 Bar / -40 ℃...+150 ℃ / FKM
- 2: 40 Bar / -20 ℃...+150 ℃ / Kalrez 6375
- 3: 40 Bar / -50 ℃...+150 ℃ / EPDM
- 6: 40 Bar / -40 ℃...+300 ℃ (HT) / FKM
- 7: 40 Bar / -20 ℃...+300 ℃ (HT) / Kalrez 6375
- 8: 40 Bar / -50 ℃...+250 ℃ (HT) / EPDM
- C: 300 Bar (HP) / -40 ℃...+150 ℃ / FKM
- D: 300 Bar (HP) / -20 ℃...+150 ℃ / Kalrez 637 5
- E: 300 Bar (HP) / -50 ℃...+150 ℃ / EPDM
- H: 300 Bar (HP) / -40 ℃...+300 ℃ (HT) / FKM
- K: 300 Bar (HP) / -20 ℃...+300 ℃ (HT) / Kalr ez 6375
- L: 300 Bar (HP) / -50 ℃...+250 ℃ (HT) / EPDM
- S: 40 Bar/-20℃...+150℃/FKM/FPM (FDA, EC 1935 /2004 + EC 2023/2006 and EU 10/2011) *
- T: 40 Bar/-20℃...+150℃/Kalrez 6230 (FDA, EC 1935/2004 + EC 2023/2006 and EU 10/2011) *
- U: 40 Bar/-45℃...+150℃/EPDM (FDA, EC 1935/20 04 + EC 2023/2006 and EU 10/2011) *

* note: the listed standards are not in the scope of this certificate)

e Material / Probe
- 1: 316L / Single rod Ø 8 mm max. 4m
- 2: 316L / Single rod Ø 8 mm segmented max. 6m
- 3: 316L / Single cable Ø 2 mm max. 40m (liquid only)
- 4: 316L / Single cable Ø 4 mm max. 40m (liquid) or 20m (solid)
- 5: 316L / Single cable Ø 8 mm max. 40m (solid only)
- 6: 316L / Double rod Ø 8 mm max. 4m
- 7: 316L / Double cable Ø 4 mm max. 40m (liquid only)
- A: 316L / Coax Ø22 mm max. 6m
- B: 316L / Coax Ø22 mm segmented max. 6m
- D: Hastelloy C22 / Single cable Ø 2 mm max. 40m (liquid only)
- E: Hastelloy C22 / Coax Ø 22 mm
- G: FEP / Single cable full coated including counterweight
- K: 316L / No probe (Single - rod Ø 8 mm or cable Ø4mm)

L: 316L / No probe (Double - rod Ø 8 mm or cable Ø4mm)
P: PVDF sheath / Single rod Ø 8 mm max. 4m
T: 316 / Single cable Ø 4 mm for BM 26 ADVANCED max. 6m
V: 316 / Single cable Ø 4 mm for BM 26 F max. 6m
X: 316 / Single rod Ø 8 mm Ra < 0.76µm

f Material / Probe end type (one digit, not safety relevant)

g Process connection size (one digit, not safety relevant)

h Process connection pressure class (one digit, not safety relevant)

i Process connection sealing face / sanitary (one digit, not safety relevant)

j Output
1: 2 wires - 4...20mA passive HART
A: Foundation Fieldbus (2 wire)
B: PROFIBUS PA (2 wire)

k Cable entry / Cable gland (note: cable glands are not in the scope of this certificate)
1: M20x1.5 / Without
2: M20x1.5 / Plastic
3: M20x1.5 / Brass
4: M20x1.5 / Stainless Steel
A: 1/2 NPT (Nickel-plated brass) / Without
B: 1/2 NPT (Stainless Steel) / Without

l Housing option / Display
1: Horizontal housing / No Display
2: Horizontal housing / Display
3: Horizontal housing / No display + Weather protection
4: Horizontal housing / Display + Weather protection
A: Vertical housing / No display
B: Vertical housing / Display top
C: Vertical housing / Display side
D: Vertical housing / No display + Weather protection
E: Vertical housing / Display top + Weather protection
F: Vertical housing / Display side + Weather protection

m Display language (one digit, not safety relevant)

n Option for remote version
0: Without
6: Signal cable 10m
7: Signal cable 25m
8: Signal cable 50m
A: Signal cable 75m
B: Signal cable 100m

o Adaptors
0: Without

p Calibration certificate (one digit, not safety relevant)

q TAG Number (one digit, not safety relevant)

r Other constructions (one digit, not safety relevant)

LevelWave LR01

LR010abcdefghijklmnopqr or LR014abcdefghijklmnopqr or LR019abcdefghijklmnopqr

a Converter / Version (housing material)
- 1: Compact (aluminium)
- 2: Compact (stainless steel)
- 3: Sensor (aluminium) with remote Converter (aluminium)
- 4: Sensor (stainless steel) with remote Converter (aluminium)
- 5: Sensor (stainless steel) with remote Converter (aluminium)

b Approval
- 1: ATEX II 1/2 G Ex ia IIC T6…TX1) Ga/Gb + II 1/2 D Ex ia IIIC T90 ℃ Da/Db
- 2: ATEX II 1/2 G Ex db ia IIC T6…TX1) Ga/Gb + II 1/2 D Ex ia tb IIIC T90 ℃ Da/Db
- 4: ATEX II 3 G Ex ic IIC T6…TX1) Gc + II 3 D Ex ic IIIC T90 ℃ Dc
- 6: IECEx Ex ia IIC T6…TX1) Ga/Gb + Ex ia IIIC T90 ℃ Da/Db
- 7: IECEx Ex db ia IIC T6…TX1) Ga/Gb + Ex ia tb IIIC T90 ℃ Da/Db
- 8: IECEx Ex ic IIC T6…TX1) Gc + Ex ic IIIC T90 ℃ Dc
  - 1) for the value of TX see thermal data below

c Other approval (one digit, not safety relevant)

d Pressure / Temperature / Sealing
- 1: V96; 40 Bar / -40 ℃...+150 ℃ / FKM, FP M
- 3: V96; 40 Bar / -40 ℃...+130 ℃ / FPM FEP coated
- 5: V96; 40 Bar / -50 ℃...+130 ℃ / EPDM
- 6: V96; 40 Bar / -20 ℃...+150 ℃ / Kalrez 6375
- 7: V96; 40 Bar / -20 ℃...+130 ℃ / Kalrez 6 230
- 8: V96; 40 Bar / -20 ℃...+130 ℃ / Silicone FEP coated
- A: V96 LT; 40 Bar / -60 ℃...+130 ℃ / PFA
- B: LP; 2 Bar / -20℃...+130 ℃ / Kalrez 6375 (non Ex)
- D: V96 HT; 40 Bar / -40 ℃...+200 ℃ / FKM FPM
- F: V96 HT; 40 Bar / -40 ℃...+200 ℃ / FPM FEP coated
- K: V96 HT; 40 Bar / -20 ℃...+250 ℃ / Kalr ez 6375
- L: V96 HT; 40 Bar / -20 ℃...+250 ℃ / Kalr ez 6230
- M: V96 HT; 40 Bar / -20 ℃...+200 ℃ / Sili cone FEP coated
- N: V96 HT; 40 Bar / -20 ℃...+150 ℃ / PFA
- R: Wave Horn;16 Bar / -20 ℃...+100 ℃ / PP
- T: Wave horn; 40 Bar / -50 ℃...+150 ℃ / PTFE
- V: PTFE WS zone 0; 16 Bar / -40 ℃...+150 ℃ / PTFE
- W: PTFE WS with plate; 16 Bar / -40 ℃...+150 ℃ / PTFE
- X: PTFE WS without plate; 3 Bar / -20 ℃...+ 150 ℃ / Kalrez 6375
- Y: PP WS without plate; 3 Bar / -40 ℃...+10 0 ℃ / FPM

e Material/Antenna
- 1: 316 L / Metallic horn (sheet metal) DN80 (3")
- 2: 316 L / Metallic horn (sheet metal) DN100 (4")
- 3: 316 L / Metallic horn (sheet metal) DN150 (6")
- 4: 316 L / Metallic horn (sheet metal) DN200 (8")
- 5: 316 L / Metallic horn (machined) DN65 (2.5")
- B: PP without plate / Wave-Stick L=270 mm
- C: PTFE with plate / Wave-Stick L = 384 mm
- D: PTFE without plate / Wave-Stick L=270 mm
- E: PTFE SW with plate for Stilling well / L=60 mm

G: PP / Wave Horn L=317mm
H: PTFE / Wave Horn L=300mm
L: 316 L / Metallic wave guide ≤ 1 m (3.28 ft)
M: 316 L / Metallic wave guide ≤ 1.5 m (4.92 ft)
N: 316 L / Metallic wave guide ≤ 2 m (6.56 ft)
P: 316 L / Metallic wave guide ≤ 2.5 m (8.2 ft)
R: 316 L / Metallic wave guide ≤ 3 m (9.84 ft)
S: 316 L / Metallic wave guide ≤ 3.5 m (11.48 ft)
T: 316 L / Metallic wave guide ≤ 4 m (13.12 ft)
U: 316 L / Metallic wave guide ≤ 4.5 m (14.76 ft)
V: 316 L / Metallic wave guide ≤ 5 m (16.4 ft)
W: 316 L / Metallic wave guide ≤ 5.5 m (18.04 ft)
X: 316 L / Metallic wave guide ≤ 6 m (19.68 ft)

f Material / Antenna extension
1: PP / 100 mm (4") for Wave-Stick only
2: PP / 300 mm (8") for Wave-Stick only
3: PP / 500 mm (20") for Wave-Stick only
4: PP / 700 mm (28") for Wave-Stick only
6: PTFE / 100 mm (4")
7: PTFE / 200 mm (8")
8: PTFE / 300 mm (12")
A: PTFE / 400 mm (16") for Wave-Stick only
B: PTFE / 500 mm (20") for Wave-Stick only
C: PTFE / 600 mm (24") for Wave-Stick only
E: 316 L / 100 mm (4")
F: 316 L / 200 mm (8")
G: 316 L / 300 mm (12")
H: 316 L / 400 mm (16")
K: 316 L / 500 mm (20")
L: 316 L / 600 mm (24")
M: 316 L / 700 mm (28")
N: 316 L / 800 mm (32")
P: 316 L / 900 mm (36")
R: 316 L / 1000 mm (40")
S: 316 L / 1300 mm (52")
T: 316 L / 1600 mm (64")
U: 316 L / 2000 mm (80")
W: 316 L / S-bend extension
X: 316 L / L-bend extension (right angle)

g Process connection size (one digit, not safety relevant)

h Process connection pressure class (one digit, not safety relevant)

i Process connection sealing face / sanitary (one digit, not safety relevant)

j Output
1: 2 wires - 4...20mA passive HART
A: Foundation Fieldbus (2 wire)
B: PROFIBUS PA (2 wire)

k Cable entry/Cable gland
1: M20x1.5 / Without
2: M20x1.5 / Plastic
3: M20x1.5 / Nickel-plated brass

4: M20x1.5 / Stainless Steel
A: 1/2 NPT (Nickel-plated brass) / Without
B: 1/2 NPT (Stainless Steel) / Without

l Housing option / Display
1: Horizontal housing / No Display
2: Horizontal housing / Display
3: Horizontal housing / No display + Weather protection
4: Horizontal housing / Display + Weather protection
A: Vertical housing / No display
B: Vertical housing / Display top
C: Vertical housing / Display side
D: Vertical housing / No display + Weather protection
E: Vertical housing / Display top + Weather protection
F: Vertical housing / Display side + Weather protection

m Display language (one digit, not safety relevant)

n Option for remote version
6: Signal cable 10m
7: Signal cable 25m
8: Signal cable 50m
A: Signal cable 75m
B: Signal cable 100m

o Adaptor
0: Without

p Calibration certificate (one digit, not safety relevant)

q Drawing / TAG Number (one digit, not safety relevant)

r Other constructions
0: Without
1: NACE MR 0175/MR 0103
3: Heating / Cooling (metallic Horn only)
5: Purging with liquid (metallic Horn only)
6: Purging with liquid + Heating / Cooling (metallic Horn only)
A: Purging with gas (metallic Horn only)
B: Purging with gas + Heating / Cooling (metallic Horn only)

Annex 1 to Certificate of Conformity IECEx DEK 13.0077 X
Annex 1 to NL/DEK/ExTR13.0081/01
Annex 1 to EU-Type Examination Certificate DEKRA 13ATEX0180 X, issue 2

Marking codes

Compact version LR01					
II 1/2 G II 2 G II 3 G	Ex ia IIC T6…T2 Ga/Gb or Ex ia IIC T6…T2 Gb or Ex ic IIC T6…T2 Gc	and	II 1/2 D II 2 D II 3 D	Ex ia IIIC T90 ºC Da/Db or Ex ia IIIC T90 ºC Db or Ex ic IIIC T90 ºC Dc	or
II 1/2 G II 2 G	Ex db ia IIC T6…T2 Ga/Gb or Ex db ia IIC T6…T2 Gb	and	II 1/2 D II 2 D	Ex ia tb IIIC T90 ºC Da/Db or Ex ia tb IIIC T90 ºC Db	
Compact version LG01					
II 1/2 G II 2 G II 3 G	Ex ia IIC T6…T2 Ga/Gb or Ex ia IIC T6…T2 Gb or Ex ic IIC T6…T2 Gc	and	II 1/2 D II 2 D II 3 D	Ex ia IIIC T90 ºC Da/Db or Ex ia IIIC T90 ºC Db or Ex ic IIIC T90 ºC Dc	or
II 1/2 G II 2 G	Ex ia/db IIC T6…T2 Ga/Gb or Ex db ia IIC T6…T2 Gb	and	II 1/2 D II 2 D	Ex ia/tb IIIC T90 ℃ Da/Db or Ex ia tb IIIC T90 ºC Db	
Remote version transmitter					
II 2 (1) G II 3 G	Ex ia [ia Ga] IIC T6...T4 Gb or Ex ic [ic] IIC T6...T4 Gc	and	II 2 (1) D II 3 D	Ex ia [ia Da] IIIC T90 ºC Db or Ex ic [ic] IIIC T90 ºC Dc	or
II 2 (1) G	Ex db ia [ia Ga] IIC T6...T4 Gb	and	II 2 (1) D	Ex ia tb [ia Da] IIIC T90 ºC Db	
Remote version sensor					
II 1/2 G II 2 G II 3 G	Ex ia IIC T6…T2 Ga/Gb or Ex ia IIC T6…T2 Gb or Ex ic IIC T6…T2 Gc	and	II 1/2 D II 2 D II 3 D	Ex ia IIIC T90 ºC Da/Db or Ex ia IIIC T90 ºC Db or Ex ic IIIC T90 ºC Dc	

Annex 1 to Certificate of Conformity IECEx DEK 13.0077 X
Annex 1 to NL/DEK/ExTR13.0081/01
Annex 1 to EU-Type Examination Certificate DEKRA 13ATEX0180 X, issue 2

The temperature class depending on the ambient temperature, the flange temperature and the type of probe / antenna used, is listed in the following tables:

Compact version of the LevelWave LG01

Equipment Protection Level	Max. ambient temperature			Max. flange temp.	Temp. class
	2 mm probe	2 mm probe and HT extension	All other probes		
Ga/Gb	52 ℃	54 ℃	53 ℃	60 ℃	T6
	70 ℃	70 ℃	70 ℃	60 ℃	T5
	80 ℃	80 ℃	80 ℃	60 ℃	T4
Gb and Gc	52 ℃	54 ℃	53 ℃	60 ℃	T6
	42 ℃	51 ℃	45 ℃	85 ℃	
	67 ℃	69 ℃	68 ℃	75 ℃	T5
	57 ℃	66 ℃	60 ℃	100 ℃	
	77 ℃	79 ℃	78 ℃	85 ℃	T4
	67 ℃	76 ℃	70 ℃	110 ℃	
	57 ℃	73 ℃	62 ℃	135 ℃	
	51 ℃	71 ℃	57 ℃	150 ℃	T3
	Not allowed	68 ℃	Not allowed	180 ℃ [1)]	
	Not allowed	65 ℃	Not allowed	200 ℃ [1)]	
	Not allowed	60 ℃	Not allowed	250 ℃ [1)]	T2
	Not allowed	54 ℃	Not allowed	300 ℃ [1)]	

Equipment Protection Level	Min. ambient temperature			Min. flange temp.	Temp. class
	2 mm probe	2 mm probe and HT extension	All other probes		
Ga/Gb	-40 ℃	-40 ℃	-40 ℃	-20 ℃	T6-T2
Gb and Gc	-40 ℃	-40 ℃	-40 ℃	-40 ℃ [1)]	T6-T2
	-36 ℃	-39 ℃	-37 ℃	-50 ℃ [1)]	

[1)] Permitted gasket temperature ranges must be observed (see instructions)

Annex 1 to Certificate of Conformity IECEx DEK 13.0077 X
Annex 1 to NL/DEK/ExTR13.0081/01
Annex 1 to EU-Type Examination Certificate DEKRA 13ATEX0180 X, issue 2

Remote version of the LevelWave LG01

Equipment Protection Level	Max. ambient temperature			Max. flange temp.	Temp. class
	2 mm probe	2 mm probe and HT extension	All other probes		
Ga/Gb	49 ℃	51 ℃	49 ℃	60 ℃	T6
	70 ℃	70 ℃	70 ℃	60 ℃	T5
	80 ℃	80 ℃	80 ℃	60 ℃	T4
Gb and Gc	49 ℃	51 ℃	49 ℃	60 ℃	T6
	39 ℃	48 ℃	43 ℃	85 ℃	
	64 ℃	66 ℃	64 ℃	75 ℃	T5
	54 ℃	65 ℃	58 ℃	100 ℃	
	77 ℃	79 ℃	78 ℃	85 ℃	T4
	64 ℃	75 ℃	68 ℃	110 ℃	
	51 ℃	71 ℃	59 ℃	135 ℃	
	43 ℃	69 ℃	54 ℃	150 ℃	T3
	Not allowed	65 ℃	Not allowed	180 ℃ [1)]	
	Not allowed	62 ℃	Not allowed	200 ℃ [1)]	
	Not allowed	54 ℃	Not allowed	250 ℃ [1)]	T2
	Not allowed	47 ℃	Not allowed	300 ℃ [1)]	

Equipment Protection Level	Min. ambient temperature			Min. flange temp.	Temp. class
	2 mm probe	2 mm probe and HT extension	All other probes		
Ga/Gb	-40 ℃	-40 ℃	-40 ℃	-20 ℃	T6-T2
Gb and Gc	-40 ℃	-40 ℃	-40 ℃	-40 ℃ [1)]	T6-T2
	-35 ℃	-39 ℃	-36 ℃	-50 ℃ [1)]	

[1)] Permitted gasket temperature ranges must be observed (see instructions)

Annex 1 to Certificate of Conformity IECEx DEK 13.0077 X
Annex 1 to NL/DEK/ExTR13.0081/01
Annex 1 to EU-Type Examination Certificate DEKRA 13ATEX0180 X, issue 2

Compact version of the LevelWave LR01

Equipment Protection Level	Max. ambient temperature				Max. flange temp.	Temp. class
	Wave horn PP	Wave horn PTFE & Wavestick	Metalic horn without HT extension	Metalic horn with HT extension		
Ga/Gb	46 ℃	46 ℃	46 ℃	46 ℃	45 ℃	T6
	41 ℃	42 ℃	41 ℃	44 ℃	55 ℃	T5
	38 ℃	40 ℃	39 ℃	43 ℃	60 ℃	T4
Gb and Gc	46 ℃	46 ℃	46 ℃	46 ℃	45 ℃	T6
	41 ℃	42 ℃	41 ℃	44 ℃	55 ℃	
	38 ℃	40 ℃	39 ℃	43 ℃	60 ℃	
	53 ℃	55 ℃	54 ℃	58 ℃	75 ℃	T5
	40 ℃	44 ℃	43 ℃	54 ℃	100 ℃	
	77 ℃	77 ℃	77 ℃	79 ℃	85 ℃	T4
	69 ℃	71 ℃	70 ℃	76 ℃	100 ℃	
	Not allowed	57 ℃	54 ℃	71 ℃	135 ℃ [1)]	
	Not allowed	50 ℃	48 ℃	68 ℃	150 ℃ [1)]	T3
	Not allowed	Not allowed	Not allowed	64 ℃	180 ℃ [1)]	
	Not allowed	Not allowed	Not allowed	61 ℃	200 ℃ [1)]	
	Not allowed	Not allowed	Not allowed	53 ℃	250 ℃ [1)]	T2

Equipment Protection Level	Min. ambient temperature				Min. flange temp.	Temp. class
	Wave horn PP & Wavestick	Wave horn PTFE	Metalic horn without HT extension	Metalic horn with HT extension		
Ga/Gb	-40 ℃	-40 ℃	-40 ℃	-40 ℃	-20 ℃	T6-T2
Gb and Gc	-40 ℃	-40 ℃	-40 ℃	-40 ℃	-40 ℃ [1)]	T6-T2
	Not allowed	-36 ℃	-35 ℃	-38 ℃	-50 ℃ [1)]	
	Not allowed	Not allowed	Not allowed	-37 ℃	-60 ℃ [1)]	

[1)] Permitted gasket temperature ranges must be observed (see instructions)

Annex 1 to Certificate of Conformity IECEx DEK 13.0077 X
Annex 1 to NL/DEK/ExTR13.0081/01
Annex 1 to EU-Type Examination Certificate DEKRA 13ATEX0180 X, issue 2

Remote version of the LevelWave LR01

Equipment Protection Level	Max. ambient temperature				Max. flange temp.	Temp. class
	Wave horn PP	Wave horn PTFE & Wavestick	Metalic horn without HT extension	Metalic horn with HT extension		
Ga/Gb	46 ℃	46 ℃	46 ℃	46 ℃	45 ℃	T6
	41 ℃	41 ℃	41 ℃	44 ℃	55 ℃	T5
	39 ℃	39 ℃	39 ℃	43 ℃	60 ℃	T4
Gb and Gc	46 ℃	46 ℃	46 ℃	46 ℃	45 ℃	T6
	41 ℃	41 ℃	41 ℃	44 ℃	55 ℃	
	39 ℃	39 ℃	39 ℃	43 ℃	60 ℃	
	54 ℃	54 ℃	54 ℃	59 ℃	75 ℃	T5
	43 ℃	43 ℃	41 ℃	55 ℃	100 ℃	
	77 ℃	77 ℃	77 ℃	79 ℃	85 ℃	T4
	70 ℃	71 ℃	70 ℃	77 ℃	100 ℃	
	Not allowed	55 ℃	53 ℃	72 ℃	135 ℃ [1)]	
	Not allowed	48 ℃	45 ℃	66 ℃	150 ℃ [1)]	T3
	Not allowed	Not allowed	Not allowed	63 ℃	180 ℃ [1)]	
	Not allowed	Not allowed	Not allowed	57 ℃	200 ℃ [1)]	
	Not allowed	Not allowed	Not allowed	53 ℃	250 ℃ [1)]	T2

Equipment Protection Level	Min. ambient temperature				Min. flange temp.	Temp. class
	Wave horn PP & Wavestick	Wave horn PTFE	Metalic horn without HT extension	Metalic horn with HT extension		
Ga/Gb	-40 ℃	-40 ℃	-40 ℃	-40 ℃	-20 ℃	T6-T2
Gb and Gc	-40 ℃	-40 ℃	-40 ℃	-40 ℃	-40 ℃ [1)]	T6-T2
	Not allowed	-36 ℃	-35 ℃	-39 ℃	-50 ℃ [1)]	
	Not allowed	Not allowed	Not allowed	-37 ℃	-60 ℃ [1)]	

[1)] Permitted gasket temperature ranges must be observed (see instructions)

The maximum surface temperature “T” of the electronics enclosure is 90 ℃. For detailed temperature data refer to the instruction manual.

Annex 1 to Certificate of Conformity IECEx DEK 13.0077 X
Annex 1 to NL/DEK/ExTR13.0081/01
Annex 1 to EU-Type Examination Certificate DEKRA 13ATEX0180 X, issue 2

Electrical data

Apparatus in type of protection intrinsic safety “ia” with 4-20 mA-HART output

Supply and output circuit (terminals output 1, + and -):
in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 16 nF; L_i = 27 µH.

Apparatus in type of protection intrinsic safety “ia” and flameproof enclosure "d" or dust ignition protection by enclosure "t" with field wiring in type of protection "ia", with PROFIBUS PA or FIELDBUS foundation FF interface

Fieldbus circuit (terminals output 1, + and -):
in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
U_i = 24 V; I_i = 300 mA; P_i = 1.2 W; C_i = 1 nF; L_i = 2 µH.

Fieldbus circuit (terminals output 1, + and -):
in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit or a circuit in accordance with FISCO, with the following maximum values:
U_i = 17.5 V; I_i = 380 mA; P_i = 5.32 W; C_i = 1 nF; L_i = 2 µH.

Apparatus in type of protection intrinsic safety “ic” with 4-20 mA-HART output

Supply and output circuit (terminals output 1, + and -):
in type of protection intrinsic safety Ex ic IIC and Ex ic IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 16 nF; L_i = 27 µH.

Apparatus in type of protection intrinsic safety “ic” with PROFIBUS PA or FIELDBUS foundation FF interface

Fieldbus circuit (terminals output 1, + and -):
in type of protection intrinsic safety Ex ic IIC and Ex ic IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
U_i = 32 V; C_i = 1 nF; L_i = 2 µH.

Fieldbus circuit (terminals output 1, + and -):
in type of protection intrinsic safety Ex ic IIC and Ex ic IIIC, only for connection to a certified intrinsically safe circuit or a circuit in accordance with FISCO, with the following maximum values:
U_i = 17.5 V; C_i = 1 nF; L_i = 2 µH.

Apparatus with terminal compartment in type of protection flameproof enclosures “d” and dust ignition protection by enclosure “t” with 4-20 mA-HART output

Power supply ……. max. 36 Vdc
Output ……. 4 - 20 mA
Intrinsically safe circuits …… U_m = 250 V

CERTIFICATE

(1) EU-Type Examination

(2) **Equipment or protective systems intended for use in potentially explosive atmospheres - Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number: **DEKRA 13ATEX0180 X** Issue Number: **2**

(4) Product: **Guided Wave Radar Level Meter - LevelWave LG01**
Type: LG010a...r, LG014a...r, LG019a...r

Free Space Radar Level Meter - Level Wave LR01
Type: LR010a...r, LR014a...r, LR019a...r

(5) Manufacturer: **ECKARDT S.A.S.**

(6) Address: **Rue de la Marne 20, 68360 Soultz, France**

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., Notified Body number 0344 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential test report number NL/DEK/ExTR13.0081/01.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2012 + A11 : 2013 **EN 60079-1 : 2014** **EN 60079-11 : 2012**
EN 60079-26 : 2015 **EN 60079-31 : 2014**

except in respect of those requirements listed at item 18 of the Schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:

For marking see section 15.

Date of certification: 28 June 2019

DEKRA Certification B.V.

R. Schuller
Certification Manager

DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands
T +31 88 96 83000 F +31 88 96 83100 www.dekra-product-safety.com Registered Arnhem 09085396

(13) # SCHEDULE

(14) **to EU-Type Examination Certificate DEKRA 13ATEX0180 X** Issue No. **2**

(15) **Description**

The Guided Wave Radar Level Meter – LevelWave LG01 type LG010a...r, LG014a...r and LG019a...r and Free Space Radar Level Meter - LevelWave LR01 type LR010a...r, LR014a...r and LR019a are used for continuous level measurement of flammable or non-flammable liquids or solid particles, granulates or powders within storage or process tanks or in a stilling well.

The distance between transmitter LevelWave LG01 and the surface of the process medium is measured using a probe system (e.g. cable or rod) that guides electromagnetic pulses that are reflected by the surface of the process medium.

The distance between the antenna of transmitter LevelWave LR01 and the surface of the process medium is measured using frequency modulated continuous wave radar.

The 2-wire transmitter is loop powered. The output is either a 4 - 20 mA current signal with an overlaid digital communication protocol (HART) or a fixed current with a carrier signal for the fieldbus protocol (PROFIBUS PA or FOUNDATION fieldbus FF).

Either the 4 - 20 mA HART Transmitter is completely in type of protection intrinsic safety “i” or the transmitter is provided with the power supply compartment in type of protection flameproof enclosures "d". In the latter version a zener barrier circuit board is located in the terminal compartment.

Optionally, the transmitter may be provided with display and adjustment capabilities (HMI option).

Transmitters LevelWave LG01 and LevelWave LR01 are also available as remote versions. The length of the cable between transmitter housing and sensor is maximum 100 m.

The enclosure provides a degree of protection of at least IP66/IP67 as per EN 60529.

For type designation, marking and technical data refer to Annex 1 to this certificate.

Installation instructions

The instructions provided with the product shall be followed in detail to assure safe operation.

(16) **Report Number**

No. NL/DEK/ExTR13.0081/01

(17) **Specific conditions of use**

- When used in a explosive atmosphere requiring the use of a probe of equipment category 1 G the probe must be installed so, that even in the event of rare incidents an ignition source due to electrostatic discharging of the plastic parts of the apparatus is excluded.
- When used in an explosive dust atmosphere the apparatus must be installed so that electrostatic discharging is excluded.
- The flame path at the bushing has a width of min. 13,9 mm and a gap of max. 0,118 mm.
- For ambient temperature range refer to Annex 1 to this certificate.

(13) # SCHEDULE

(14) **to EU-Type Examination Certificate DEKRA 13ATEX0180 X** Issue No. **2**

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at item (9).

(19) **Test documentation**

As listed in Report No. NL/DEK/ExTR13.0081/01

(20) **Certificate history**

Issue 0 -	216595600	initial certificate
Issue 1 -	223841200	manufacturer name and address changed Minor constructional changes assessed per newer editions of the standards