Hazardous classified location

FM ID US: FM22US0061X
FM ID CA: FM22CA0043X

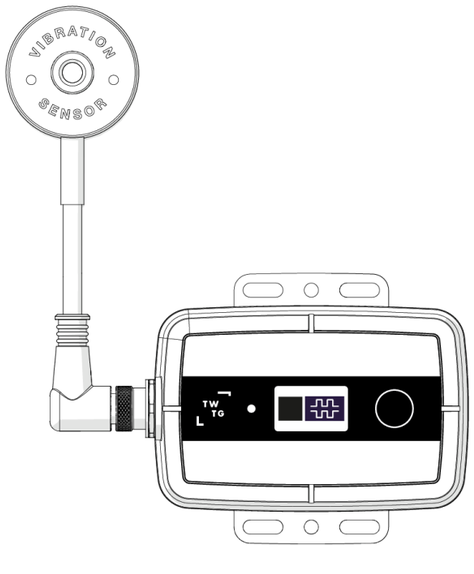
DEKRA 22ATEX0004X
IECEx DEK 22.0004X

For DS-VB-02-XX:
Class I, Div. 1, Group A, B, C, D, T4
Class I, Zone 0 AEx/Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 80°C

For DS-VB-02-XX:
II 1G Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 80°C

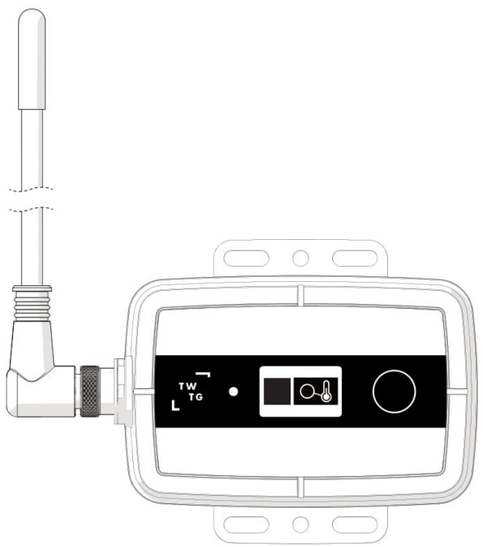
For DS-LD-02-XX:
Class I, Div. 1, Group A, B, C, D, T4
Class I, Zone 0 AEx/Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 70°C

For DS-LD-02-XX:
II 1G Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 70°C



For DS-TT-02-XX:
Class I, Div. 1, Group A, B, C, D, T4
Class I, Zone 0 AEx/Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 70°C

For DS-TT-02-XX:
II 1G Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 70°C



Note:
There are no connections between the hazardous location and non-hazardous location as this equipment is battery powered and transmits data over a wireless communication functionality (LoRa-WAN)

Installation notes:

DS-XX-02-XX (Applicable to all models):

1) Do not connect the M12 connector when an explosive atmosphere is present

2) The only battery allowed to be used is the Tadiran 1410780323
   Description: S1P1/SL-2780/323/TWT

DS-LD-02-XX:

3) For normal operation, the DS-LD-02-XX must always be paired with the DS-VB-02-XX
   DS-LD-02-XX M12 connector output circuit (terminals 1-4)
   Uo = 3.98, Io = 1328 mA, Po = 367 mW, Co = 24 µF, Lo = 10 uH

4) The ambient temperature range for the DS-LD-02-XX is -40 °C to +70 °C

5) The DS-LD-02-XX and DS-VB-02-XX must be individually connected to earth

DS-VB-02-XX:

6) For normal operation, the DS-VB-02-XX must always be paired with the DS-LD-02-XX
   DS-VB-02-XX M12 connector input circuit (terminals 1-4)
   Ui = 3.98, Ii = 1328 mA, Pi = 367 mW, Ci = 20 µF, Li = 3.9 uH

7) The ambient temperature range for the DS-VB-02-XX is -40 °C to +80 °C

8) The DS-LD-02-XX and DS-VB-02-XX must be individually connected to earth

DS-TT-02-XX:

9) For normal operation, the DS-TT-02-XX shall be coupled with a simple apparatus with the following specifications:
   Uo <= Ui, Io <= Ii, Po <= Pi, Co >= Ci, Lo >= Li
   Where Uo = 3.98V; Io = 44mA; Po = 44 mW; Co = 80uF and Lo = 10 mH

10) The ambient temperature range for the DS-TT-02-XX is -40 °C to +70 °C

11) The DS-TT-02-XX must be connected to earth, the simple apparatus connected to the DS-TT-02-XX may be connected to earth

12) For the DS-TT-02-XX, the simple apparatus must be connected to the transmitter using an M12 connector with the following specifications:
   - M12 type A
   - 4 pins
   - Socket / Female
   - Non-shielded

   The following part numbers have been pre-approved for use without further assessment:
   - Phoenix Contact SACC-M12FS-4PL M
   - Phoenix Contact SACC-M12FS-4PL
   - TE Connectivity T4110001041-000

This drawing is part of the FM Certification Documentation and must not be modified without reference to FM approvals

Specific Conditions of Use:

Potential Electrostatic charging hazard. The product shall be installed in such a way that the risk for electrostatic discharges is minimized.

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
A2	Added temperature range to classification	02/09/2023	WK
A3	Added DS-LD-02-XX and DS-VB-02-XX Output parameters	29/09/2022	WK
A4	Added specifications and pre-approved parts for M12 connector to attach to DS-TT-02-XX	20/01/2023	WK
A5	Added a new page for DS-RT-02-XX and DS-PG-02-00	20/02/2023	WK
A6	Installation note 9 (DS-TT-02-XX) changed to 'shall'. Power for DS-LD-02-XX and DS-VB-02-XX has changed	25/07/2023	WK

TW TG L

FM C US Scale: 1:1 Units: Millimeters THIRD ANGLE PROJECTION

Drawn By: DM | Drawn date: 16/08/2023 | Checked by: WK | Check date: 16/08/2023 | SHEET: 1 OF 2

Item No: 4004_N02-09 | Description: Control-Drawing | REV: A6

Document Name: 4004_N02-09_Control-Drawing_A6

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Hazardous classified location

FM ID US: FM22US0061X
FM ID CA: FM22CA0043X

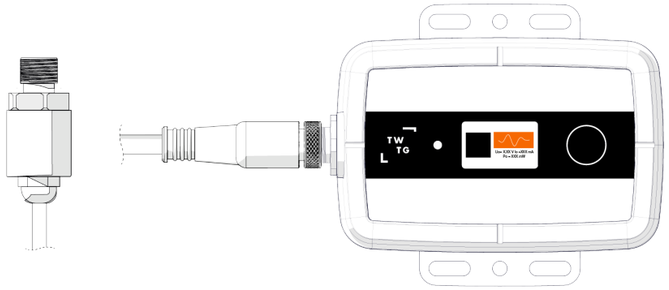
DEKRA 22ATEX0004X
IECEx DEK 22.0004X

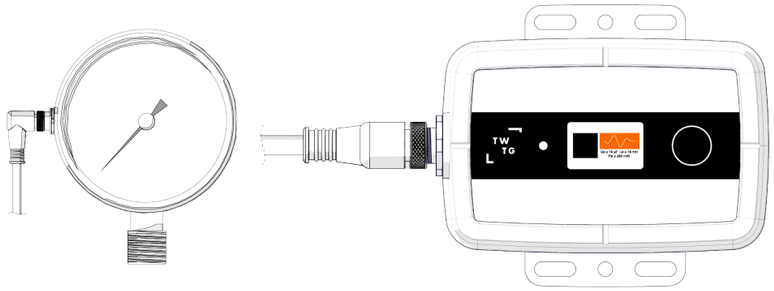
For DS-PG-02-XX:
Class I, Div. 1, Group A, B, C, D, T4
Class I, Zone 0 AEx/Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 80°C

For DS-PG-02-XX:
II 1G Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 80°C

For DS-RT-02-XX:
Class I, Div. 1, Group A, B, C, D, T4
Class I, Zone 0 AEx/Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 70°C

For DS-RT-02-XX:
II 1G Ex ia IIC T4 Ga
-40°C ≤ Ta ≤ 70°C





Note:
There are no connections between the hazardous location and non-hazardous location as this equipment is battery powered and transmits data over a wireless communication functionality (LoRa-WAN)

Installation notes:

DS-XX-02-XX (Applicable to all models):

1) Do not connect the M12 connector when an explosive atmosphere is present

2) The only battery allowed to be used is the Tadiran 1410780323
   Description: S1P1/SL-2780/323/TWT

DS-RT-02-XX:

3) For normal operation, the DS-RT-02-XX must either be paired with the DS-PG-02-XX or with a ratiometric sensor
   DS-RT-02-XX M12 connector output circuit (terminals 1-4) when connected to simple intrinsically safe sensors with distributed capacitance / inductance:
   Uo = 5.73, Io = 93 mA, Po = 51 mW, Co = 27 µF, Lo = 4 mH

4) DS-RT-02-XX M12 connector output circuit (terminals 1-4) when connected to a configuration with mixed intrinsically safe circuits
   When Ci-sensor (excluding cable) < 1% of Co or, Li-sensor (excluding cable) < 1% of Lo
   Uo = 5.73, Io = 93 mA, Po = 51 mW, Co = 27 µF, Lo = 4 mH
   When Ci-sensor (excluding cable) > 1% of Co and, Li-sensor (excluding cable) > 1% of Lo
   Uo = 5.73, Io = 93 mA, Po = 51 mW, Co = 0.1 µF, Lo = 2 mH

5) The ambient temperature range for the DS-RT-02-XX is -40 °C to +70 °C

6) The DS-RT-02-XX and DS-PG-02-XX, or connected ratiometric sensor, must be individually connected to earth

Extension cable:

7) The cable used to connect the DS-RT-02-XX with either the DS-PG-02-XX or the ratiometric sensor must adhere to the following specifications:
   - 2x M12 type A 4 pin connector
     1x Socket / Female
     1x Plug / Male
   - Jacket material requirements: (for example PUR or TPU)
     Oil resistant
     Tear and notch resistant
     Flame retardant according to IEC 60332-1-2
   - Shielded (only connected to one of the connectors)
   - Internal cables must be either 4 wires or 2 twisted pairs
   - Internal wires must be minimum 26 AWG and maximum 18 AWG
   - Dielectric strength (isolation) must be a minimum of 0.5kV / 1 min (Conductor to conductor and conductor to shield)
   - The ambient temperature range for the extension cable must be at least -40 °C to +80 °C
   - Capacitance and inductance per cable length must be evaluated to make sure that the cable and ratiometrice sensor, or cable and DS-PG-02-XX, combined have a lower capacitance and inductance than Co and Lo of the DS-RT-02-XX

DS-PG-02-XX:

8) For normal operation, the DS-PG-02-XX must always be paired with the DS-RT-02-XX
   DS-PG-02-XX M12 connector input circuit (terminals 1-4)
   Ui = 5.73, Ii = 93 mA, Pi = 51 mW, Ci = 60 nF, Li = 0 µH

9) The ambient temperature range for the DS-PG-02-XX is -40 °C to +80 °C

10) The DS-RT-02-XX and DS-PG-02-XX must be individually connected to earth

Ratiometric sensor:

11) The Ratiometric sensor paired with the DS-RT-02-XX must adhere to the following requirements
    Ui <= Uo-RT, Ii <= Io-RT, Pi <= Po-RT, Co-RT >=(Ci + Cextension-cable), Lo-RT >= (Li + Lextension-cable)

This drawing is part of the FM Certification Documentation and must not be modified without reference to FM approvals

Specific Conditions of Use:

Potential Electrostatic charging hazard. The product shall be installed in such a way that the risk for electrostatic discharges is minimized.

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
A2	Added temperature range to classification	02/09/2023	WK
A3	Added DS-LD-02-XX and DS-VB-02-XX Output parameters	29/09/2022	WK
A4	Added specifications and pre-approved parts for M12 connector to attach to DS-TT-02-XX	20/01/2023	WK
A5	Added a new page for DS-RT-02-XX and DS-PG-02-00	20/02/2023	WK
A6	Installation note 9 (DS-TT-02-XX) changed to 'shall'. Power for DS-LD-02-XX and DS-VB-02-XX has changed	25/07/2023	WK

TWTG

FM C US Scale: 1:1 Units: Millimeters THIRD ANGLE PROJECTION

Drawn By:	Drawn date:	Checked by:	Check date:	SHEET:	OF
DM	16/08/2023	WK	16/08/2023	2	2

Item No: 4004_N02-09
Description: Control-Drawing
REV: A6
Document Name: 4004_N02-09_Control-Drawing_A6

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