



CERTIFICATE NUMBER	23-2435216-PDA
EFFECTIVE DATE	29-Sep-2023
EXPIRY DATE	28-Sep-2028
ABS TECHNICAL OFFICE	Houston ESD - Electrical

CERTIFICATE OF

Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

MSA INNOVATION, LLC

located at

**1000 CRANBERRY WOODS DR., , CRANBERRY TOWNSHIP, PA,
United States, 16066**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: **Gas Monitor**

Model: **ULTIMA X5000 Transmitter, ULTIMA X5000 Junction Box, JB5000 Junction Box, ULTIMA XIR Plus Sensor, Digital Sensor (with FRIT)**

Endorsements:

Tier: **2 - PDA Issued**

This Product Design Assessment (PDA) Certificate remains valid until 28/Sep/2028 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Soheni Haque

Soheni Haque, Sr. Managing Principal Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

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Tier: 2 - PDA Issued

Product: Gas Monitor
Model: ULTIMA X5000 Transmitter, ULTIMA X5000 Junction Box, JB5000 Junction Box,
ULTIMA XIR Plus Sensor, Digital Sensor (with FRIT)

Endorsements:

Intended Service:

Marine & Offshore Applications - Fixed gas detection devices for measuring combustible and toxic gases as well as oxygen

Description:

The ULTIMA X5000 Gas Monitor consists of an ULTIMA X5000 Transmitter and an optional ULTIMA X5000 Junction Box or JB5000 Junction Box. The ULTIMA X5000 supports up to two Digital Sensors, up to two ULTIMA XIR Plus Sensors or one ULTIMA XIR Plus Sensor and one Digital Sensor simultaneously.

The ULTIMA X5000 Transmitter (Model Code A-X5000-abcdeffggh) provides an Organic LED (OLED) display, power, alarm and fault indicators, two 4-20 mA measurement signal outputs as well as Bluetooth, Modbus (via a Bus Communication Module), wireless or wired HART communication capabilities and an optional 3 alarm Single Pole Double Throw (SPDT) relay output.

The ULTIMA X5000 Junction Box (Model Code 10179509, 10179511, 10179513) and the JB5000 Junction Box (Model Code 10213892, 10213896) are the remote mounting units for use as a remotely mounted pass-through when connected to an approved fixed gas detection transmitter.

The ULTIMA XIR Plus Sensor (Model Code A-5K-SENS-a-b-c-d-e) is the infra-red sensor to monitor combustible gas in air atmospheres.

The Digital Sensor (Model Code A-5K-SENS-a-b-c-d-e, with FRIT) utilizes either a catalytic sensing element for combustible gas detection or an electrochemical sensing element for toxic or oxygen detection. The FRIT (sinter element) is located in the lower sensor element housing assembly.

Rating:

Input Power: 11 to 30 Vdc, 15 W max.

Signal Output: 4 to 20 mA

Output Relay Contact: 220 Vac/30 Vdc, 5.0 A max.

Operating Ambient Temperature: -40°C to +60°C

-40°C to +50°C (Digital Sensor - Toxic (H2S 500 ppm))

Relative Humidity: 5 to 95% RH non-condensing

10 to 95% RH, non-condensing (Digital Sensor -Oxygen)

Degree of Ingress Protection: NEMA Type 4X, IP66

NEMA Type 3X, IP65 (Digital Sensor)

* Measuring Gas Types and Ranges (gas-in-air atmospheres)

Combustible Gas: 0-100% LEL

Hydrogen Sulfide (H2S): 0-10, 0-20, 0-50, 0-100 or 0-500 ppm

Carbon Monoxide (CO): 0-100, 0-500 or 0-1000 ppm

Oxygen (O2): 0-25% v/v

* Certified for use in hazardous areas

ULTIMA X5000 Transmitter:

CL I, Div 1 Group A, B, C, D; T6

CL I, Div 2 Group A, B, C, D; T4 (without optional relays)

CL II, Div 1, 2 Group E, F, G; CL III; T6

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CL I, Zone 1 AEx db IIC T6 Gb
CL I, Zone 2 AEx nA IIC T4 Gc (without optional relays)
Zone 21, AEx tb IIIC T85C Db

ULTIMA X5000 Junction Box & JB5000 Junction Box:

CL I, Div 1 Group A, B, C, D; T6
CL I, Div 2 Group A, B, C, D; T6
CL II, Div 1, 2 Group E, F, G; CL III; T6
CL I, Zone 1 AEx db IIC T6 Gb
CL I, Zone 2 AEx nA IIC T6 Gc
Zone 21, AEx tb IIIC T85C Db

ULTIMA XIR Plus Sensor:

CL I, Div 1 Group A, B, C, D; T6
CL I, Div 2 Group A, B, C, D; T6
CL II, Div 1, 2 Group E, F, G; CL III; T6
CL I, Zone 1 AEx db IIC T6 Gb
CL I, Zone 2 AEx nA IIC T6 Gc

Digital Sensor (with FRIT):

CL I, Div 1 Group A, B, C, D; T5
CL I, Div 2 Group A, B, C, D; T5
CL II, Div 1, 2 Group E, F, G; CL III; T5
CL I, Zone 1 AEx db IIC T5 Gb
Zone 21 AEx tb IIIC T85°C Db
CL I, Zone 2 AEx nA IIC T5 Gc

* Measuring gas types and ranges and devices certified for use in hazardous areas are as per FM Approval Certificate FM20US0060X, Date: 6 February 2023. Refer to the FM Approval Certificate for the details of gas types and ranges based on the Model Codes of the devices.

Service Restriction:

- 1) Unit Certification is not required for this product.
- 2) If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.
- 3) The products are limited to use of gas detection for combustible and toxic gases as well as oxygen with the gas types and ranges as specified per FM Approval Certificate FM20US0060X, Date: 6 February 2023.

Comments:

- 1) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
- 2) Installation in hazardous area is to be verified in accordance with Marine Vessels Rules 4-8-3/13, 4-8-4/27 and Mobile Offshore Units Rules 4-3-3/9.1, 4-3-3/9.3 as well as Equipment Marking/Special Condition of Use listed in the valid Ex-certification issued by a competent, independent testing laboratory.
- 3) The subject PDA certificate does not cover Modbus, wireless or wired HART or Bluetooth used for combustible gas, toxic gas and oxygen performance. The Modbus, wireless or wired HART or Bluetooth may only be used for data collection or record keeping with regard to combustible gas, toxic gas or oxygen detection.
- 4) The electrical cables are not included.

Notes/Drawing/Documentation:

Drawing No. 10177157, SMTA, ULTIMA X5000 OPTION, Revision: 2
Drawing No. 10177160, SMTA, ULTIMA XIR, Revision: 2
Drawing No. 10177161, SMTA, ULTIMA XIR, Revision: 2
Drawing No. 10177166, SMTA, REMOTE INTERFACE, X5000, Revision: 0
Drawing No. 10215096, SMTA, X5000, REMOTE OPTION, Revision: 0

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Drawing No. 324170, SCHEMATIC DIAGRAM, GM CATALYTIC CELL PRE-AMP, Revision: 2
Drawing No. 324171-1, Display BOM Level by Level - CCA, Combustible Pre-amp board, Revision: -
Drawing No. 324180, Schematic Diagram, Xcell Puck, Revision: 0
Drawing No. 324181-1, Display BOM Level by Level - CCA, XCELL Sensor Puck board, Revision: -
Drawing No. 324230, Schematic Diagram, Xcell Life & Health Puck Board, Revision: 3
Drawing No. 324231-1, Display BOM Level by Level - CCA, XCell, Life & Health puck bd, Revision: -
Drawing No. 324250, SCHEMATIC DIAGRAM, DIFFUSION SUPERVISION PREAMP, Revision: 1
Drawing No. 324251-1, Display BOM Level by Level - CCA, Diffusion Supervision Preamp, Revision: -
Drawing No. 5-5088-1, SMTA, X5000, USER INTERFACE, Revision: 2
Drawing No. 7-7296-1, SMTA, ULTIMA X5000, MAIN, Revision: 3
Drawing No. SK3073-1134, WIRING SCHEMATIC, P.C. BOARD ASSEMBLY, ULTIMA X5000, OPTION, Rev. 0
Drawing No. SK3073-1143, WIRING SCHEMATIC, P.C. BOARD ASSEMBLY, ULTIMA XIR PLUS, MAIN, Revision: 2
Drawing No. SK3073-1145, WIRING SCHEMATIC, P.C. BOARD ASSEMBLY, ULTIMA X5000, USER INTERFACE, Revision: 1
Drawing No. SK3073-1146, WIRING SCHEMATIC, PC BOARD ASSEMBLY, ULTIMA X5000, MAIN, Rev. 3
Drawing No. SK3073-1149, WIRING SCHEMATIC, PCBA, ULTIMA X5000, REMOTE INTERFACE, Revision: 1
Drawing No. SK3073-1168, WIRING SCHEMATIC, PCBA, REMOTE OPTION, Revision: 0
Drawing No. sk3073-1144, WIRING SCHEMATIC, P.C. BOARD ASSEMBLY, ULTIMA XIR PLUS, POWER, Revision: 2
Drawing No. 10177361/08, Operating Manual - ULTIMA X5000 Gas Monitor
Drawing No. 10182779/09, Addendum to ULTIMA X5000 Gas Monitor System Operating Manual 10177361
Drawing No. 0720-185-MC, ULTIMA X5000 Gas Monitor Specifications (02.2022)
FM Approval CERTIFICATE OF CONFORMITY, FM20US0060X, ULTIMA X5000 Gas Monitor fixed gas detection system (ULTIMA X5000 transmitter & ULTIMA X5000 or JB5000 Junction Box) and ULTIMA XIR Plus sensor, Date: 6 February 2023
IECEX Certificate of Conformity, IECEX FMG 21.0019X, S5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT), Issue No: 1
IECEX Certificate of Conformity, IECEX FMG 21.0021X, ULTIMA X5000 Gas Monitor fixed gas detection system (ULTIMA X5000 transmitter & ULTIMA X5000 or JB5000 Junction Box) and ULTIMA XIR Plus sensor, Issue: 1
IECEX TEST REPORT REFERENCE, US/FMG/ExTR22.0014/01, Date of Issue: 6 February 2023
CSA Certificate of Compliance 70116284, Date Issued: 2022-09-28

Terms of Validity:

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STANDARDS

ABS Rules:

2023 Rules for Conditions of Classification, Part 1, 1-1-4/7.7, 1-1-A3, 1-1-A4, which cover the following:
2023 Marine Vessel Rules 4-8-3/1.3, 4-8-3/1.7, 4-8-3/1.9, 4-8-3/1.11, 4-8-3/1.17, 4-8-3/Table 2, 4-8-3/13, 4-8-4/1.3, 4-8-4/27

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2023 Rules for Conditions of Classification, Part 1 - Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which cover the following:
2023 Mobile Offshore Units Rules 4-3-1/9, 4-3-1/11, 4-3-1/15, 4-3-1/17, 4-3-3/3.1, 4-3-3/Table 1, 4-3-3/9.1, 4-3-3/9.3
2023 Facilities On Offshore Installations Rules 3-3/13.3.3, 3-8/7.7, 3-8/7.9

National:
NA

International:
NA

Government:
NA

EUMED:
NA

OTHERS:
NA