EU-TYPE EXAMINATION
CERTIFICATE

Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

1. **EU-Type Examination Certificate Number:** ITS18ATEX203161X R.0

2. **Product:** Models MS4500E, MS4500E-HC, MS4500L and MS4500L-HC Corrosion Monitors

3. **Manufacturer:** Metal Samples Company
(a Division of Alabama Specialty Products, inc.)

4. **Address:** 152 Metal Samples Rd, Munford, AL 36268, USA

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

6. Intertek Testing Services NA Ltd., Notified Body number 2903 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council dated 26 February 2014, certifies that the 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 of the Directive.

7. Compliance with the Essential Health and Safety Requirements has been assured by compliance with BS EN 60079-0: 2018 and EN 60079-11: 2012 except in respect of those requirements referred to within item 14 of the Schedule.

8. If the sign "X" is placed after the certificate number, it indicates that the product is subject to the special conditions of use specified in the Schedule to this certificate.

9. 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.

10. The marking of the product shall include the following:

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-25°C ≤ Tamb ≤ +60°C (for use with Duracell PC1300)
-40°C ≤ Tamb ≤ +70°C (for use with Xeno Energy XL-145F or Tadiran TL4920)

Certification Officer: Kevin J. Wolf **Date:** 6 December 2022

Kevin J. Wolf

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11. Description of Equipment or Protective System

The model MS4500E and MS4500E-HC is a portable monitoring equipment which measures the corrosion rate of metallic pipe through a resistive probe. The equipment utilizes a rectangular cuboidal non-metallic enclosure with approximate dimensions 30cm x 20cm x 14cm which is housed within a rubber boot to provide additional impact resistance. The equipment fascia incorporates an LCD display and a pushbutton keypad. Batteries may be interchanged in the equipment in the non-hazardous area via a screw secured compartment located on the rear of the enclosure.

The ambient temperature range in which the equipment may be installed is dependent upon the cells used.

Ambient Temperature Range	Model	Cells
-25°C ≤ Tamb ≤ +60°C	MS4500E	Duracell PC1300
-40°C ≤ Tamb ≤ +70°C	MS4500E-HC	Xeno Energy XL-145F or Tadiran TL4920

The equipment must be removed from the hazardous area, or the area confirmed to be non-hazardous prior to changing cells.

Connection to the equipment is made through connectors on the side wall of the enclosure. The equipment has the facilities for connection to an external corrosion measurement probe, a USB stick for data storage and transfer and a USB port for connection to a USB isolator for communications in the non-hazardous area. Further detail on each connection is given below.

Measurement probe – EXCDB-000015 – ER Measurement Board

The equipment has been assessed for use with one of two measurement boards. The first of which is the ER measurement board, designed to connect to a simple resistive probe through the 6 pin connector external to the equipment. This probe shall be a simple resistive device with no discrete sources of resistance, inductance or capacitance. The probe connection has the following associated entity parameters.

Uo: 4.94V
Io: 0.332A
Po: 0.410W
Ci: 0µF
Li: 0µH
Co: 1µF
Lo: 100µH

Measurement probe – EXCDB-000037 – LPR Measurement Board

The equipment has been assessed for use with one of two measurement boards. The second of which is the LPR measurement board, designed to connect to a simple resistive probe through the 6 pin connector external to the equipment. This probe shall be a simple resistive device with no discrete sources of resistance, inductance or capacitance. The probe connection has the following associated entity parameters.

Uo: 8.61V
Io: 0.202A
Po: 0.044W
Co: 1µF
Lo: 18µH

Model ET1650 USB Stick

A USB port is provided for downloading data in the hazardous area. This port has been assessed for connection to the ET1650 USB stick manufactured by Alabama Specialty Products. The USB stick has been assessed for connection to a maximum Um of 6V. Connection of an unassessed USB stick to this port is not permitted.

USB Barrier

The equipment has been assessed for connection to the model ET1867 USB barrier manufactured whilst both the barrier and the MS4500E or MS4500E-HC are located in the non-hazardous area. This USB barrier has been assessed for a maximum input voltage of 6V.

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12. Report Number

Intertek Report: 104849497DAL-005-CR Issue: October 10 2022

13. Special Conditions of Certification

(a). Special Conditions of Use

- Connection of the equipment to the ET1867 USB barrier may only be made whilst both the barrier and the equipment are located in the non-hazardous area.
- External non-metallic materials utilize a conductive coating to prevent the risk of electrostatic charging. The equipment shall be removed from service if damage to this coating is observed. Refer to the manufacturer's instruction manual for further information on the durability and any chemical vulnerability of this coating.

(b). Conditions of Manufacture - Routine Tests

- N/A, no routine tests applicable.

14. Essential Health and Safety Requirements (EHSRs)

The relevant Essential Health and Safety Requirements (EHSRs) have been identified and assessed in Intertek Report: 104849497DAL-005-CR Issue: October 10 2022.

15. Drawings and Documents

The following drawing list entirely replaces that listed on the previous Certificate.

Title:	Drawing No.:	Rev. Level:	Date:
Circuit Diagram - MS4500 Data Logger Host Board Type III with USB A	EXCDB-000032	A	07/21/2022
Circuit Diagram - MS4500 Data Logger Host Board Type III with USB A	EXCDB-000032	B	08/11/2022
Circuit Diagram - MS4500 Data Logger Host Board Type III with USB C	EXCDB-000063	0	07/21/2022
Circuit Diagram - MS4500 Data Logger ER Measurement Board	EXCDB-000015	0	10/16/2014
Circuit Diagram - MS4500 Data Logger LPR Measurement Board	EXCDB-000037	A	07/21/2022
Circuit Diagram - MS4500 Data Logger Diode Shunt and LCD Board	EXCDB-000016	B	07/21/2022
Circuit Diagram - MS4500 Data Logger Power Supply Board TPS63000	EXCDB-000061	0	07/21/2022
Circuit Diagram - MS4500 Data Logger Power Supply Board TPS63060	EXCDB-000062	0	07/21/2022
Bill of Materials - MS4500 Data Logger Host Board Type III with USB A	EXBOM-000032	A	07/21/2022
Bill of Materials - MS4500 Data Logger Host Board Type III with USB A	EXBOM-000032	B	08/11/2022
Bill of Materials - MS4500 Data Logger Host Board Type III with USB C	EXBOM-000063	0	07/21/2022

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Title:	Drawing No.:	Rev. Level:	Date:
Bill of Materials - MS4500 Data Logger ER Measurement Board	EXBOM-000015	A	07/21/2022
Bill of Materials - MS4500 Data Logger LPR Measurement Board	EXBOM-000037	A	07/21/2022
Bill of Materials - MS4500 Data Logger Diode Shunt and LCD Board	EXBOM-000016	B	07/21/2022
Bill of Materials - MS4500 Data Logger Power Supply Board TPS63000	EXBOM-000061	0	07/21/2022
Bill of Materials - MS4500 Data Logger Power Supply Board TPS63060	EXBOM-000062	0	07/21/2022
PCB Fabrication Drawing - MS4500 Data Logger Host Board Type III with USB A	EXPCB-000032	A	07/21/2022
PCB Fabrication Drawing - MS4500 Data Logger Host Board Type III with USB A	EXPCB-000032	B	08/11/2022
PCB Fabrication Drawing - MS4500 Data Logger Host Board Type III with USB C	EXPCB-000063	0	07/21/2022
PCB Fabrication Drawing - MS4500 Data Logger ER Measurement Board	EXPCB-000015	0	07/21/2022
PCB Fabrication Drawing - MS4500 Data Logger LPR Measurement Board	EXPCB-000037	A	07/21/2022
PCB Fabrication Drawing - MS4500 Data Logger Diode Shunt and LCD Board	EXPCB-000016	B	07/21/2022
PCB Fabrication Drawing - MS4500 Data Logger Power Supply Board TPS63000	EXPCB-000061	0	07/21/2022
PCB Fabrication Drawing - MS4500 Data Logger Power Supply Board TPS63060	EXPCB-000062	0	07/21/2022
Assembly Drawing - MS4500 Data Logger Host Board Type III with USB A	EXET1890	A	07/21/2022
Assembly Drawing - MS4500 Data Logger Host Board Type III with USB A	EXET1890	B	08/11/2022
Assembly Drawing - MS4500 Data Logger Host Board Type III with USB C	EXET2648	0	07/21/2022
Assembly Drawing - MS4500 Data Logger ER Measurement Board	EXET1477	E	07/21/2022
Assembly Drawing - MS4500 Data Logger LPR Measurement Board	EXET1970	A	07/21/2022
Assembly Drawing - MS4500 Data Logger Diode Shunt and LCD Board	EXET1478	B	07/21/2022
Assembly Drawing - MS4500 Data Logger Power Supply Board TPS63000	EXET2646	0	07/21/2022
Assembly Drawing - MS4500 Data Logger Power Supply Board TPS63060	EXET2647	0	07/21/2022
MS4500X-XX Handheld Data Logger	EXMDB-010966	A	2022-06-24
Instrument Assembly Drawing MS4500E / MS4500E-HC Type III	EXMDB-010894	A	2022-06-24

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Title:	Drawing No.:	Rev. Level:	Date:
Instrument Assembly Drawing MS4500L / MS4500L-HC Type III	EXMDB-011200	0	2022-06-24
Protective Boot assembly MS4500X-XX Enclosure Type III	EXET2719	0	2022-07-22
LCD and Diode Boards Assembly MS4500X-XX Instrument Type III	EXET1510	A	2022-06-24
MS4500E Data Logger Battery Cable assembly	EXET1528	A	04/04/18
Hazardous Area Label - MS4500E & MS4500E-HC	EXMDB-011185	0	07/21/2022
Hazardous Area Label - MS4500L & MS4500L-HC	EXMDB-011210	0	07/21/2022
Control Drawing MS4500E/L Hand Held Data Logger USB A	EXWDB-000085	F	07/25/2022
Control Drawing MS4500E/L HC Hand Held Data Logger USB A	EXWDB-000123	B	07/25/2022
Control Drawing MS4500E/L Hand Held Data Logger with USB C	EXWDB-000166	0	07/25/2022
Control Drawing MS4500E/L HC Hand Held Data Logger with USB C	EXWDB-000167	0	07/25/2022
MS4500E - XX High Resolution ER Data Logger Operator's Manual	EXDOC-000014	E	07/25/2022
MS4500L - XX High Resolution ER Data Logger Operator's Manual	EXDOC-000029	0	07/25/2022
Bill OF Material - USB Flash Drive	EXBOM-000028	0	6/26/2017
Circuit Diagram - USB Drive	EXCDB-000028	0	04/03/17
Assembly Drawing - USB Drive	EXET-1649	0	04/25/17
PCB Fabrication Drawing - USB Drive	EXPCB-000028	0	4/25/2017
Hazardous Area Label USB Memory Storage Unit	EXMDB-011186	0	02/28/2022
Label - USB Storage Device	EXET1861	A	04/04/2018
Bill OF Material - USB Barrier	EXBOM-000022	0	2/8/2018
Circuit Diagram - USB Barrier	EXCDB-000022	0	12/01/2016
Assembly Drawing - USB Barrier	EXET-1669	0	11/29/16
PCB Fabrication Drawing - USB Barrier	EXPCB-000022	0	11/29/16
Hazardous Label - USB Barrier	EXMDB-011187	0	02/28/2022
Manufacture's Label - USB Barrier	EXET1871	0	02/08/2018
USB Barrier Assembly intrinsically safe certified	EXET1867	0	05/10/2017

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16. Details of Certificate changes R.0

Free Reference for Original Assessment - G103168505 Issued April 2018
Free Reference for this Assessment – G104849497 Issued October 2022

This assessment considers the following changes to the assessment:

- Update of EN 60079-0 to latest iteration of standard.
- Revision to equipment to include variable mainboards in, EXCDB-000032 Rev A and B and EXCDB-000063 depending upon construction.
- Inclusion of alternative measurement board EXCDB-000037 to be fitted optionally with EXCDB 000015.
- Modifications to display board EXCDB-000016 to permit the use of an alternative LCD module.
- Modifications and reassessment of enclosure to degree of protection IP54.
- General modifications to BoMs to account for supply chain.