Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

4413

Accredited to ISO/IEC 17025:2017

MS Testing – a trading division of Mariner Systems (UK) Ltd

Issue No: 026 **Issue date:** 30 June 2022

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DL5 6BF	**Website: www.mstesting.co.uk**

Testing performed at the above address only

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address: 5 Maple Way Aycliffe Industrial Park Newton Aycliffe Co Durham DL5 6BF	**Local contact:** Mr S Thompson Tel: +44 (0)1325 321366 Fax: +44 (0)1325 319369 E-Mail: info@mstesting.co.uk	Testing: EMC Testing Environmental Testing	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
Any location suitable for the activity listed. The site must be suitable for the nature of the testing undertaken and will be the subject of contract review arrangements between the laboratory and the customer,	**Local contact:** Mr S Thompson	Environmental (IPX5) Testing	S

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
Electrical installations in ships - Control and instrumentation Maritime navigation and Radio communication equipment and systems	**ENVIRONMENTAL TESTS** (non-explosive items) **1. CLIMATIC** 1.1 HIGH TEMPERATURE Constant/Cyclic Max temp: + 70 °C Max chamber size: 1.6 m x 1.9 m x 1.6 m Max temp: + 100 °C Max chamber size: 0.8 m x 0.8 m x 0.8 m Max temp: + 180 °C Max chamber size: 1.2 m x 1.0 m x 1.2 m 1.2 LOW TEMPERATURE Constant/Cyclic Min temp: - 25 °C Max chamber size: 1.6 m x 1.9 m x 1.6 m Min temp: - 40 °C Max chamber size: 0.8 m x 0.8 m x 0.8 m Min temp: - 60 °C Max chamber size: 1.2 m x 1.0 m x 1.2 m	BS EN 60068-2-2:2007 IEC 60068-2-2:2007 BS EN 60945, section 8.2. IACS E10: 2022 BS EN 60068-2-1:2007 IEC 60068-2-1:2007 BS EN 60945, section 8.4. IACS E10: 2022	A A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
As listed on Page 1	**ENVIRONMENTAL TESTS** (cont'd) **1. CLIMATIC** (cont'd) 1.3 HIGH HUMIDITY - Constant/Cyclic Humidity range: 10 % rh to 98 % rh (at temps > + 10 °C) Max temperature: + 70 °C Max chamber size: 1.6 m x 1.9 m x 1.6 m	IEC 60068-2-30:2005 IEC 60068-2-78:2001 BS EN 60068-2-30:2005 Test Db BS EN 60068-2-78:2002 BS EN 60068-2-78:2013 BS EN 60945, section 8.3 IACS E10: 2022	A
	1.4 SALT MIST Temp range: ambient to + 55 °C	IEC 68-2-52:Kb EN 60068-2-52:Kb:1996 EN 60068-2-52:Kb:2017 BS EN 60945:2002, section 8.12 Lloyds Spec No 1:2002, Cl 16 Lloyds Spec No 1:2019, Cl 16 IACS E10: 2022	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
As listed on Page 1	**ENVIRONMENTAL TESTS** (cont'd)		
	2. INGRESS PROTECTION	BS EN 60529:1992 A1 & A2 BS EN 60529:2013	
	Protected against solid objects greater than 50 mm dia	IP1X	A
	Protected against solid objects greater than 12.5 mm dia	IP2X	A
	Protected against solid objects greater than 2.5 mm dia	IP3X	A
	Protected against solid objects greater than 1.0 mm dia	IP4X	A
	Dust Protected	IP5X	A
	Dust Tight	IP6X	A
	Protected against splashing water	IPX4	A
	Protected against water jets	IPX5	A, S
	Protected against powerful water jets	IPX6	A
	Protected against the effects of immersion	IPX7	A
	Protection against the effects of continuous immersion	IPX8	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
As listed on Page 1	**ENVIRONMENTAL TESTS** (cont'd) **3. DYNAMIC**		
	3.1 VIBRATION - Sinusoidal (ambient temperature) Freq range: 2 to 3000 Hz Max pk/pk displacement: ± 25 mm	BS EN 60068-2-6:1996 BS EN 60068-2-6:2008 IEC 60068-2-6:2007 BS EN 60945, section 8.7 IACS E10: 2022	A
	3.2 VIBRATION – Random (ambient temperature) Freq range: 2 to 3000 Hz Max pk/pk displacement: ± 25 mm	BS EN 60068-2-64:2008 IEC 60068-2-64:2008 BS EN 60068-2-64:2019 IEC 60068-2-64:2019	A
	3.3 SHOCK - Half sine (ambient temperature) Max severity: 15 gn Pulse width: 11 ms	BS EN 60068-2-27:1993 BS EN 60068-2-27:2009	A
	3.4 STATIC INCLINATION Max angle: 45° Max item size: 3 m x 3 m x 3 m Max mass: 500 kg	IEC 60092-504:2001 IEC 60092-504:2016 IACS E10: 2022	A
	3.5 DYNAMIC INCLINATION Max angle: 45° Max item size: 3 m x 3 m x 3 m Max mass: 500 kg	IEC 60092-504:2001 IEC 60092-504:2016 IACS E10: 2022	A
	3.6 ACOUSTIC NOISE Sound pressure level at 1 m 30 to 135 dBA	BS EN 60945, section 11.1	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
As listed on Page 1	**4. VOLTAGE TESTS**		
	High Voltage Tests 1500V ac	IACS Req:1991/issue 5 E10 IACS Req:1991/issue 7 E10 IACS E10: 2022 IEC 60947-2	A
	Insulation Breakdown 500 V dc 100 M Ohms	IEC60092-504 prior to and following Damp heat and low temperature tests in IEC 60945:2002 8.3 and 8.4 IACS E10: 2022	A
	Power supply Variation	IEC 60945:2002 + Corr 1:2008 section 10.7 IACS E10: 2022	A
	Power Supply Failure	IEC 60945:2002 + Corr 1:2008 section 10.8 IACS E10: 2022	A
	5. EMC TESTS		
	5.1 Electrostatic Discharge 8 kV Air Discharge 6 kV Contact Discharge	IEC 60945:2002 + Corr 1:2008 section 10.9 IEC 61000-4-2:2001 IEC 61000-4-2:2008 EN 61000-4-2:2009	A
	5.2 Electrical Fast Transient Bursts 4 kV	IEC 60945:2002 + Corr 1:2008 section 10.5 IEC 61000-4-4:2004 EN 61000-4-4:2004 EN 61000-4-4:2004 + A1:2010 EN 61000-4-4:2012	A
	5.3 Surge 4 kV	IEC 60945:2002 + Corr 1:2008 section 10.6 IEC 61000-4-5:2005 EN 61000-4-5:2006 EN 61000-4-5:2014 + A1: 2017	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
As listed on Page 1	**EMC TESTS (cont'd)** 5.4 Compass Safe Distance	IEC 60945:2002 + Corr 1:2008 section 11.2	A
	5.5 Radiated Immunity 80 to 6000 MHz, ≤ 10 V/m 80 to 1000 MHz 20 V/m (uniform field size 1.5m x 0.5m)	IEC 60945:2002 + Corr 1:2008 section 10.4 EN 61000-4-3:2006 + A1:2008 EN 61000-4-3:2006 + A1:2008 + A2:2010 EN IEC 61000-4-3:2020	A
	5.6 Conducted Emissions 9 kHz to 30 MHz	IEC 60945:2002 + Corr 1:2008 Section 9.2 EN 55016-2-1:2009 EN 55016-2-1:2009 + A2: 2013 EN 55016-2-1:2014 EN 55016-2-1: 2014 + A1: 2017 EN 55022:2006 + A1:2007 (excluding telecommunication ports) EN 55022:2010 EN 55032:2015 +A11:2020 Excluding antenna port EN 55014-1:2006 EN 55014-1:2006 + A1:2009 EN 55014-1:2017 EN 55014-1: 2021 EN 55011:2009 +A1:2010 EN 55011:2016 + A1:2017 +A11:2020 (excluding Group 2 apparatus & grid connected power converters)	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
As listed on Page 1	**EMC TESTS** (cont'd)		
	5.7 Radiated Emissions 150 kHz to 6000 MHz	IEC 60945:2002 + Corr 1:2008 Section 9.3 EN 55016-2-3:2006 EN 55016-2-3:2006 + A1:2007 + A2:2014 EN 55016-2-3:2017 +A1:2019 EN 55022:2006 + A1:2007 EN 55022:2010 EN 55032:2015 +A11:2020 EN 55014-1:2006 EN 55014-1: 2006 + A1:2009 EN 55014-1: 2017 EN 55014-1: 2021 EN 55011:2009 + A1:2010 (excluding Group 2 apparatus) EN 55011:2016 (excluding Group 2 apparatus) EN 55011: 2016 + A1: 2017 +A11:2020 (excluding Group 2 apparatus)	A
	5.8 Discontinuous Emissions (Clicks): 10 kHz to 30 MHz	EN 55014-1:2006 + A1:2009 EN 55014-1:2017 EN 55014-1: 2021	A
	5.9 Conducted Current Harmonics (Emissions) Measurements up to 40th Harmonic Equipment Input Current ≤ 16A per phase	EN 61000-3-2:2006 +A2:2009 EN 61000-3-2:2014 EN IEC 61000-3-2:2019	A
	5.10 Conducted AC Mains Flicker (Emissions)	EN 61000-3-3:2008 EN 61000-3-3:2013 +A1:2019 EN 61000-3-3: 2013 + A2: 2021	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
As listed on Page 1	**EMC TESTS** (cont'd) 5.11 Voltage Dips and Interruptions	EN 61000-4-11:2004 EN 61000-4-11:2004 + A1: 2017 EN IEC 61000-4-11: 2020	A
	5.12 Power Absorbing Emissions Measurements (Power Clamp) 30 to 300 MHz	EN 55014-1:2006 EN 55014-1: 2006 + A1:2009 EN 55014-1: 2017 EN 55016-2-2:2004 +A1:2005 + A2:2005	A
	5.13 Conducted Low Frequency Immunity 50 Hz - 10 kHz	IACS E10: 2006 IACS E10: 2014 IACS E10: 2018 IACS E10: 2022	A
	5.14 Conducted Radio Frequency Immunity 150 kHz to 230 MHz RF Voltage up to 10 V rms	EN 61000-4-6:2009 EN 61000-4-6:2014 IEC 60945:2002 + Corr 1:2008 section 10.3	A
	5.15 Power Frequency Magnetic Fields (Immunity) Frequency: DC to 1 kHz Field Strength: Up to 30 A/m	EN 61000-4-8:1993 + A1:2001 EN 61000-4-8: 2010	A
	5.16 Power-Frequency Magnetic Fields (Immunity) (Pulsed) Field Strength: Up to 1000 A/m	EN 61000-4-9:1993 +A1:2001 EN 61000-4-9:2016	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
As listed on Page 1	**EMC TESTS** (cont'd) 5.17 Product Standards The EMC standards listed are accredited to the extent that they call up the basic standards as accredited within this schedule.	EN 50130-4:1994 + A1:1998 + A2:2003 EN 50130-4: 2011 + A1:2014 EN 50270:2006 EN 50270: 2015 EN 55014-2:1997 + A2:2008 EN 55014-2: 2015 EN 55024:1998 + A1:2001 + A2:2003 EN 55024:2010 + A1:2015 EN 55035: 2017 + A11: 2020 EN 61000-6-1:2007 EN IEC 61000-6-1:2019 EN 61000-6-2:2005 EN IEC 61000-6-2:2019 EN 61000-6-3:2007 EN 61000-6-3:2007 + A1:2011 EN IEC 61000-6-3:2020 EN 61000-6-3: 2021 EN 61000-6-4:2007 EN 61000-6-4:2007 + A1:2011 EN IEC 61000-6-4:2019 EN 61326-1:2006 EN 61326-1:2013 EN IEC 61326-1: 2021 EN 61326-2-6:2013 EN IEC 61326-2-6: 2021 EN 50121-3-2: 2016 + A1: 2019 EN 50121-4:2006 IACS E10:2022	A
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