CERTIFICATE OF COMPLIANCE

IEC61508

NAUTITECH™

SHUTDOWN SYSTEM

This document is issued as a summary of the hardware failure data affecting the application of the equipment as a sub-system being part of a Safety Function intended to conform with the requirements of IEC61508 - Functional Safety of Electrical/Electronic/ Programmable Logic Safety Systems. The hardware has been subjected to a Failure Modes Effects and Diagnostics Analysis (FMEDA) to determine the specific failure modes and failure rates with the relevant results presented herein.

Temperature Sensor Shutdown Safety Function - Electronic Engines

The temperature sensor shutdown safety function utilises the standard hardware platform from Nautitech consisting of the following items/products:

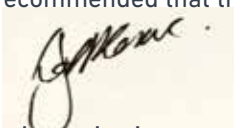| Item	Product Code	Character Display	Graphics Display
Temperature Sensor	PL500103	✔	✔
ECU Logic	PL500120	✔	✔
Character Display (*)	PL118503	✔	
Graphics Display (*)	ME5350-1-99-260		✔
PMU	PL500102	✔	✔

Notes (*) Display units are interchangeable

Product Failure Rates

Temperature Sensor Shutdown Function	Character Display	Graphics Display
SIL Capability	1	1
Sub-System Type	B	B
Hardware Fault Tolerance (HFT)	0	0
Safe Failure Fractions (SFF)	85.5%	84.9%
PFH1oo1	4.98×10^{-6}	5.89×10^{-6}
PFD1oo1 (2 year proof-test interval)	4.36×10^{-2}	5.16×10^{-2}
MTBF	29205 hrs	25685 hrs

Notes

• Reliability data for this analysis is taken from MIL-HDBK217F Notice 2 and Siemens SN29500 Reliability Data Handbook.
• Proof testing must be carried out according to the application requirements, however it is recommended that this be carried out atleast once every two years.

Signed on behalf of Nautitech

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Date: 1st Nov 2016

Verification: Marcus Punch Pty. Ltd.
Date: 1st Nov 2016