



## *Confirmation of Product Type Approval*

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product. This certificate reflects the information on the product in the ABS Records as of the date and time the certificate is printed.

Pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 17/JAN/2017. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until 04/MAY/2020 subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

**Product Name:** Power Monitoring Unit  
**Model Name(s):** T2000/T3000/T3100/T4800/T4500

**Presented to:**  
LITTELFUSE SELCO A/S  
BETONVEJ 10  
Denmark

**Intended Service:** ABS Classed Vessels and Offshore Facilities in accordance with the listed ABS Rules and International Standards

**Description:** Reverse power relays T2000 protects generators prime mover from physical damage and overload protection for parallel generator configuration. Frequency relays T3000 monitors frequency for generators, bus bars and other systems. Voltage relay T3100 provides voltage monitoring on generators, bus bars or any other distribution system. Auto synchronizer T4500 provides generator synchronization to bus bars by controlling the generator speed. Load sharer T4800 provides load sharing and frequency control for parallel running generators.

**Tier:** 3

**Ratings:** T3100: Max. Voltage: 660 Volt, operating temperature: -20 to +70 C degrees; overvoltage level 100-120%; undervoltage level: 80-100%. T2000 series: Max. Voltage 660V; operating temperature: -20 to +70 C degrees; frequency range: 45-400 Hz; Trip level 2-20% In T4500 series: Max. Voltage 660V; operating temperature: -20 to +70 C degrees; Frequency range: 35 to 70 Hz T3000 series: Max. Voltage 660V; operating temperature: -20 to +70 C degrees; frequency range: 40 to 70 Hz; underfrequency/overfrequency level: 45 to 65 Hz; Contact rating: AC: 250 V, 2 A, 250 VA; DC: 60 V, 2 A, 100 W. T4800 series: 60V; operating temperature: -20 to +70 C degrees; frequency range; frequency range: 35 to 70 Hz; Frequency adjustment: 48 to 62 Hz; Proportional band: ±50 - 250% load; ±5 - 25% frequency; Dead band zone: ±2 - 10% load; ±0.2 - 1.0% frequency.

**Service Restrictions:** Unit Certification is not required for this product. 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.

**Comments:** The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product. Environmental test performed by Delta: Test report No. DANAK-1911045 EMC test performed by Delta: Test report No. Danak-1911045 The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

**Notes / Documentation:** Drawing No. 016, T2000\_Datasheet, Revision: -, Pages: 1 Drawing No. 017, T3000\_Datasheet, Revision: -, Pages: 1 Drawing No. 018, T3100\_Datasheet, Revision: -, Pages: 1 Drawing No. 019, T4500\_Datasheet, Revision: -, Pages: 1 Drawing No. 020, T4800\_Datasheet, Revision: -, Pages: 1 Drawing No. Danak-198611 Drawing No. 026, Delta-K251196-3, Rev. 2, Revision: -, Pages: 1 Drawing No. R860729-03E Drawing No. K24-0393A Drawing No. Danak-1911045 Drawing No. Danak-19/13483

**Term of Validity:** This Product Design Assessment (PDA) Certificate 15-LD1360735-PDA, dated 05/May/2015 remains valid until 04/May/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first). This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product. Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA. Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

**ABS Rules:** The Rules applicable to this assessment are: - Steel Vessel Rules (2015) 1-1-4/7.7, 1-1-A 3 and 4; 4-9-8/13 - Steel Vessels Under 90 Meters (295 Feet) in Length (2015) 1-14/7.7, 1-1-A 3 and 4 - Facilities on Offshore Installations (2015) 1-1-4/9.7, 1-1-A 2 and 3 - Offshore Support Vessels (2015) 1-1-4/7.7, 1-1-A 3 and 4; 4-9-8/13 - Mobile Offshore Drilling Units Rules (2015) 1-1-4/9.7, 1-1-A 2 and 3 - Steel Vessels for Service on Rivers and Intracoastal Waterways (2015) 1-1-4/7.7, 1-1-A 3 and 4

**National Standards:**

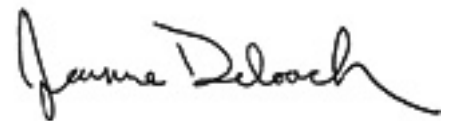
**International Standards:** IACS E10:Rev.5: 2006

**Government Authority:**

**EUMED:**

**Others:**

Model Certificate	Model Certificate No	Issue Date	Expiry Date
PDA	15-LD1360735-PDA	05/MAY/2015	04/MAY/2020



ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.