Certificate Number: 14-HS1291647-PDA
23/SEP/2015

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/DEC/2018. 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 29/DEC/2019 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: Thruster, Tunnel Thruster
Model Name(s): 42TT400ML

Presented to:
THRUSTMASTER OF TEXAS, INC.
6900 THRUSTMASTER DR.
United States

Intended Service:	Marine & Offshore Applications - Bow and Stern Tunnel Thrusters to assist in Maneuvering and Dynamic Positioning of Vessels with APS, PAS or DPS notations.
Description:	Continuous Duty Tunnel Thruster, Reversible, 40.5 inch dia. Fixed-pitch Propeller, Electric Motor Driven, 42 inch O.D. Steel Tunnel.
Tier:	5
Ratings:	Propeller: 390 sHP (291 skW) at 579.5 RPM, Nominal Thrust: 43 kN; Electric Motor: 4 Pole, 3 Phase, 380V, 400 HP (300 kW) at 1780 RPM, Class F insulation, IP55, Space Heater.
Service Restrictions:	Unit Certification of the thruster is required if Optional Notation APS, PAS or DPS is requested as per 4-3-5/1.3 of the Steel Vessels Rules, 4-3-5/1.3 of the Offshore Support Vessels Rules, 4-1-2/5 of the Mobile Offshore Drilling Units Rules or 4-1-1/29 of the Steel Vessels Under 90 Meters Rules. 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. 1) Certificates of pinion, gear, coupling, propeller, propeller shaft and electrical motor are to be made available to the attending Surveyor. Materials including the pinion, gear, coupling and propeller shaft may be

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	accepted on the basis of the manufacturer's certified mill test reports and satisfactory surface inspection and hardness check witnessed by a Surveyor as per 4-3-5/3.3.2 of the Steel Vessels Rules or 4-3-5/3.3.2 of the Offshore Support Vessels Rules, as applicable. The following are to be approved by an ABS Technical Office on a case-by-case basis: 1) Description of operation of the tunnel thruster comprised of controller locations (i.e. main controller, thruster controllers, etc.), signal path and control transfer procedures. 2) Thruster controls and instrumentation details and drawings as per 4-3-5/7 of the Steel Vessels Rules, 4-3-5/7 of the Offshore Support Vessels Rules or 4/9 and 4/11 of the Guide for Dynamic Positioning Systems, as applicable. 3) Variable Frequency Drive (VFD) controller details and installation drawings as per 4-8-3/5 of the Steel Vessels Rules or 4-8-3/5 of the Offshore Support Vessels Rules, as applicable. 4) Thruster tunnel thickness calculations as per 3-2-2/5.11 of the Steel Vessels Rules, 3-2-2/5.11 of the Offshore Support Vessels Rules or 3-2-2/7 of the Steel Vessels Under 90 Meters Rules, as applicable. (Note: tunnel design thickness = 0.5 inches).
Notes / Documentation:	Drawing No. B122755, Hub, Propeller, Revision: -, Pages: 1 Drawing No. B122820, Key, 1 X .625 X 9.625 L, Revision: 00, Pages: - Drawing No. B122974, Key, .625 X .625 X 4.063 LG, Revision: 00, Pages: - Drawing No. Correspondence, Asbestos form, Revision: -, Pages: 1 Drawing No. Correspondence, Abs ta application form, Revision: -, Pages: 1 Drawing No. Correspondence, Emails, Revision: -, Pages: 1 Drawing No. Correspondence, Letter dated Dec 01 14, Revision: -, Pages: 1 Drawing No. Correspondence, Purchase order, Revision: -, Pages: 1 Drawing No. D122737, GA, 42TT400ML, Revision: -, Pages: 1 Drawing No. D122758, Pinion, Shaft, Revision: -, Pages: 1 Drawing No. D122761, Gear, Lower, Revision: -, Pages: 1 Drawing No. D122785, Shaft, Propeller, Revision: -, Pages: 1 Drawing No. D122785, Shaft, Propeller, Revision: A, Pages: 1 Drawing No. D122926, Tunnel, 42 OD X 54 LG Weldment, Revision: -, Pages: 1 Drawing No. D122927, Tunnel, 42 OD X 54 LG Machining, Revision: -, Pages: 1 Drawing No. E122754, Propeller, RH, 40.5x30.0, Revision: -, Pages: 1 Drawing No. E122754, Propeller, RH, 40.5x30.0, Revision: A, Pages: 1 Drawing No. P041245-ABS, Y2E2-355M, L-4, 6, 8P-B5, Revision: 2, Pages: 1 Drawing No. P05413, GA of 100 Mod 107.95 Type EK Seal - Special Seat, Revision: A, Pages: 1 Drawing No. P08960, Rotex 90 AFN, Revision: -, Pages: 1 Drawing No. Strength Calculations, Strength Calcs, Revision: -, Pages: 1
Term of Validity:	This Product Design Assessment (PDA) Certificate 14-HS1291647-PDA, dated 27/Dec/2014 remains valid until 29/Dec/2019 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:	Rules for Conditions of Classification, Part 1 - 2014 Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following: Steel Vessels 4-3-5 Steel Vessels Under 90 Meters (295 Feet) in Length 4-1-1/7.23, 4-1-1/29 Offshore Support Vessels 4-3-5; 2014 Mobile Offshore Drilling Units Rules 1-1-4/9.7, 1-1-A2, 1-1-A3, 4-1-2/5.
National Standards:	
International Standards:	
Government Authority:	
EUMED:	
Others:	Manufacturer's Standard.

Model Certificate	Model Certificate No	Issue Date	Expiry Date
PDA	14-HS1291647-PDA	30/DEC/2014	29/DEC/2019

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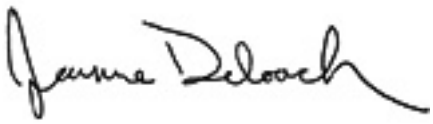

ABS Programs

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.

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