

**POTVRDA O TIPNOM ODOBRENJU**  
**TYPE APPROVAL CERTIFICATE****Br /No**      **02-002545/024550**

Potvrđuje se da je ovaj proizvod, u skladu s Pravilima za klasifikaciju brodova, Dio 1. - Opći propisi, Odjeljak 3. - Tipno odobrenje proizvoda, odobren za ugradnju na brodove i postrojenja pod nadzorom Hrvatskog registra brodova.

*This is to certify that this product, on the basis of the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products, is approved for use on board ships and installations under supervision of the Croatian Register of Shipping.*

**TIP I OPIS PROIZVODA:***TYPE AND DESCRIPTION OF PRODUCT:***TURBOPUHALO**  
**EXHAUST GAS TURBOCHARGER****SERIJA TCR**  
**TCR SERIES****PROIZVOĐAČ:***MANUFACTURER:***MAN Energy Solutions SE**  
Stadtbachstrasse 1  
86224 AUGSBURG  
GERMANY**Licencije:***Licensees:*

- **PBS Turbo s.r.o.**, Vlkovska 279, 595 01 Velka Bites, Czech Republic
- **STX Heavy Industries Co., Ltd.**, 357-75 Hosan-dong, Dalseo-gu, DAE-GU 704-946, Republic of Korea
- **Kawasaki Heavy Industries, Ltd.**, Kobe Works, Kobe Crystal Tower, 1-1 Higashikawasaki-cho, 3-chome, Chuo-ku, Kobe 650-8670, Japan

**PROIZVOD UDOVOLJAVA SLJEDEĆIM PRAVILIMA/PROPISIMA:***THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:***HRB: Pravila za klasifikaciju brodova, Dio 9. – Strojevi****CRS: Rules for the classification of ships, Part 9. – Machines****DETALJI O PROIZVODU I UVJETIMA CERTIFIKACIJE DANI SU NA POLEĐINI.***FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.***ODOBRENJE VRIJEDI DO:***APPROVAL IS VALID UNTIL:***2023-01-28****Mjesto i datum:***Place and date:*

Split, 2019-01-17

**M.P.***(Seal)*

Marinko Popović, dipl.ing.

**NAPOMENA: Ova potvrda nije valjana ako se proizvod ili način njegove proizvodnje promijenio u odnosu na tipno ispitani proizvod. Proizvođač treba obavijestiti Hrvatski registar brodova o bilo kojoj izmjeni na proizvodu kako bi ishodio valjanu potvrdu.**

*NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.*

**PODROBNJI OPIS PROIZVODA:**  
*DETAILED PRODUCT DESCRIPTION:***Radijalno turbopuhalo**  
*Radial flow turbocharger***PODRUČJE PRIMJENE / POSEBNI GRANIČNI UVJETI:**  
*APPLICATION / LIMITATIONS:***Područje primjene/ posebni granični uvjeti**  
*Field of application/ special operational limits*

**Turbopuhala su odobrena za upotrebu na dizel motorima s prednabijanjem stalnim tlakom i impulsnim prednabijanjem i za najveću snagu motora od 7500 kW.**

*The turbochargers are approved for use on diesel engines with constant and pulse pressure turbocharging and maximum engine output of 7500 kW.*

<b>Turbopuhalo tip</b> <i>Turbocharger type</i>	<b>Najveća brzina vrtnje u trajnom radu</b> <i>Maximum rotational speed for continuous operation</i> [min <sup>-1</sup> ]	<b>Najveća brzina vrtnje u kratkotrajnom radu</b> <i>Maximum rotational speed for short time operation</i> [min <sup>-1</sup> ]	<b>Najviša temperatura ispred turbine</b> <i>Maximum temperature before turbine</i> [°C]	<b>Najveća snaga motora</b> <i>Maximum engine output</i> [kW]
<b>TCR 10</b>	<b>85000</b>	<b>86500</b>	<b>700</b>	<b>1100</b>
<b>TCR 12</b>	<b>70900</b>	<b>72100</b>	<b>650</b>	<b>1600</b>
<b>TCR12/175D</b>	<b>70000</b>	<b>70000</b>	<b>720</b>	<b>1600</b>
<b>TCR 14</b>	<b>59100</b>	<b>59700</b>	<b>650</b>	<b>2200</b>
<b>TCR 16</b>	<b>49100</b>	<b>49600</b>	<b>650</b>	<b>2700</b>
<b>TCR 18</b>	<b>40500</b>	<b>40900</b>	<b>650</b>	<b>4000</b>
<b>TCR 20</b>	<b>33600</b>	<b>34000</b>	<b>650</b>	<b>4500</b>
<b>TCR 22</b>	<b>25800</b>	<b>26000</b>	<b>650</b>	<b>7500</b>

**DOKUMENTACIJA ZA TIPNO ODOBRENJE:**  
*TYPE APPROVAL DOCUMENTATION:*

**Dokumentacija odobrena od HRB dopisom od:**  
*The documentation approved by CRS with letter dated:*

130/TS/VB/023055/JB, 2011-01-27  
504/TS/VB/023731/JB, 2015-03-23  
102/TSEv/KF/024550, 2019-01-17

**OZNAČAVANJE PROIZVODA:**  
*MARKING OF PRODUCT:*

<b>Oznaka proizvođača</b>	<i>Manufacturer's mark</i>
<b>Tip</b>	<i>Type</i>
<b>Tvornički broj</b>	<i>Work number</i>
<b>Brzina vrtnje</b>	<i>Rotational speed</i>
<b>Najviša temperatura</b>	<i>Maximum temperature</i>
<b>Godina proizvodnje</b>	<i>Year of manufacturing</i>

**UVJETI ZA CERTIFIKACIJU:**  
*CONDITIONS FOR CERTIFICATION:*

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