DNV·GL

Certificate No:
TAM00000WV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Turbocharger

with type designation(s)
MXP300, MXP400, MXP500

Issued to
ABB Turbo Systems AG
Baden, AG, Switzerland

is found to comply with
DNV GL rules for classification – Ships
DNV GL rules for classification – High speed and light craft

Application :

The turbochargers are approved for use on internal combustion engines with application data as given in the certificate. Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Issued at **Hamburg** on **2018-05-30**
This Certificate is valid until **2023-05-29**.
DNV GL local station: **Augsburg**

Approval Engineer: **Sven Neddenien**

for **DNV GL**

Burkhard Lilienthal
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Job Id: **262.1-027030-1**
Certificate No: **TAM00000WV**

Product description
Exhaust driven turbochargers served by cylinder groups with combined power up to 2300 kW.

Alternative place of production
ABB Jiangjin Turbo Systems Co ., Ltd.
No. 23 Dong Jiang Lu, Degan Jie Dao
Degan Industrial Zone, Jiangjin
Chongqing 402284
P.R. China

IHI Rotating Machinery Engineering Co., Ltd.
3934 Inatomi, Tatsuno-machi, Kamilina-gun
Nagano-pref. 399-0492
Japan

Application/Limitation
Maximum operational speed and exhaust gas temperature for turbochargers:

Turbocharger type	Compressor wheel diameter (mm) CV26/CV28	n_{max} (1/s)	T_{max} (°C)	Max. pressure ratio
MXP300	156	1200	620	6.1
MXP400	196	955	620	6.2
MXP500	232	807	620	6.3

The stated speeds and temperatures are the highest allowed values and should not be exceeded at any time, nor at engine overload (110%).

Alarm levels:

Parameter	Value
Overspeed	0.98 · n_{max}
Max. temperature before turbine	605 °C
Min. lubrication oil pressure, inlet ($n \geq 0.5\ n_{max}$)	1.25 bar
Max. lubrication oil temperature, inlet	> 90 until 95 °C
Max. lubrication oil temperature, outlet	> 145 until 165 °C

The overspeed alarm value shall be specified in the individual turbocharger DNVGL Product Certificate.

Type Approval documentation

Tests carried out
Test run of turbocharger MXP400 for type approval, 2017-11-02, Tatsuno, Japan

Marking of product
The product is to be marked with manufacturer's name or trademark and type number identification.

Periodical assessment
Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not

altered since the Type Approval certificate was issued.

In cases where the type approved product is manufactured at other companies, periodical assessments shall be carried out randomly at these companies. All companies shall be assessed at least once in the period of validity of the TA certificate.

This will be according to Class Guideline DNVGL-CG-0338, Section 4.

Other conditions

Turbochargers are categorized in three categories depending on power served by each turbocharger: Category A = ≤ 1000 kW, Category B = > 1000 kW and ≤ 2500 kW, Category C = >2500 kW.

Turbochargers shall be delivered with a product certificate issued by the manufacturer (category B) or by the class society (category C). For turbochargers of category A a certificate is not mandatory.

END OF CERTIFICATE