Turbochargers

Boost Your Power. Boost Your Efficiency.
Seven decades of coping with every challenge – The KBB history:

1950 The history of exhaust gas turbochargers from Bannewitz begins in the Dresden turbo research and test centre “Forschungs- und Versuchsanstalt für Strömungsmaschinen”. At the beginning of the nineteen-fifties, well-trained, innovative technicians and engineers develop East German exhaust gas turbochargers which go into serial production in Bannewitz as of 1953.

1960 At the end of the nineteen-fifties, “VEB Kompressorenbau Bannewitz” sets up its own research and development division in close cooperation with engine manufacturers and research organisations to develop the coming generations of turbochargers.
1985  The licensed production of MAN turbochargers allows KBB to expand its manu-
facturing and test rig capacities. It also attests to the high quality of production at Bannewitz. In the middle of the nineteen-eighties, KBB has over 700 employees who manufac-
ture and sell more than 1,800 exhaust gas turbochargers every year.

1989  KBB looses 80 % of its established market through the political changes that lead
to the reunification of Germany. A difficult but in the end successful adjustment to the world
market begins with the conversion from a state-owned company into a limited company.

1993  Further investments in more effective manufacturing equipment become possible
through the takeover by CTT (Cummins Turbo Technology former Holset).

1995  KBB quality management is certified according to ISO 9001. Parallel to serial pro-
duction of Holset turbochargers, the HPR series of radial turbines, the 6th generation of
genuine KBB turbochargers, is developed for high compressor pressure ratios.

1999  The economic situation can be further consolidated following the takeover by the
Ogepar S.A. group (Luxembourg). This allows investments in sophisticated CNC manu-
factoring plants and in developing new markets for the successful HPR series in Asia and
Europe.

2008  KBB has established itself as a reliable and sound supplier for the diesel and gas
engine industry. More than 150 highly qualified and motivated employees manufacture
over 1,500 turbochargers and provide worldwide after-sales service.

2010  KBB has launched its new series of ST 27 turbochargers with radial-flow design
and has started the development of 2-stage-turbocharging for IMO/TIER3 requirements.

2012  KBB has invested in a new storage and assembly hall. The hall was finished in
spring and production started on time. The new building allows KBB to continue meeting
the increased demand for turbochargers and spare parts.

2013  60 years of turbocharger production at KBB. Over this period more than 60,000
exhaust-gas turbochargers from different generations of technological development re-
presenting an overall engine output of around 45 GW have left the factory in Bannewitz.

2014  First applications of K2B Two Stage Turbocharging
KBB can rely on highly-motivated, well-trained technicians and engineers in the fields of:

**Design:**
- Many years of experience in the design of turbochargers with radial and axial turbines
- Use of state-of-the-art 3D CAD software
- Documentation management
- Manufacturing support
- Management of German and international standards
- Management of change/update procedures

**Development:**
- Use of sophisticated CFD codes in turbine and compressor aero design
- Application of commercial FEM software for strength and vibration calculations
- Many years of experience in high-speed sliding bearing design
- Close cooperation with German and international research organisations in basic research such as the development of materials
- Presentation of in-house development results at international trade conferences

**Test rigs:**
- Turbocharger test centre with 5 gas fired test rigs incl. two stage turbocharging test capacity
- Performance mapping and special measurements within the scope of turbocharger development

**Application Engineering:**
- Turbocharger matching to engine applications
- Service support
- 1D simulation to support the matching for single and two stage supercharging
Almost all turbocharger components undergo in-house machining using advanced, multi-axis CNC turning, milling and grinding machines as well as sophisticated balancing, part cleaning and quality assurance equipment.

KBB has machining centres for the one-stop processing of housings and 5-axis milling machines to manufacture impellers, for example.

All turbine shafts and impellers are subjected to overspeed tests on a separate cold test rig during processing.

The manufacturing processes of identical components from different turbocharger types are standardised, thus ensuring a uniform quality.

State-of-the-art 3D coordinate measuring technology guarantees a precise manufacturing process.

All facilities and tools are upgraded consistently and systematically.
KBB Turbochargers for Turbine Wheel Axial

Air Connection Casing

HPA7000

K2B - Know
- Concept for a low pressure (LP) and a high pressure (HP) turbocharger range

- Two pairs of LP and HP turbochargers are tested and released for serial applications:
  
  HPA7000 + HSR6 for engine power 4 – 5 MW

  LPR5 + HSR4 for engine power 1.5 – 2.5 MW

- Customized design solutions for compressors, turbines and oil sealings
Design Features of the ST Range

- Interchangeable with the HPR-generation
- Single stage boreless radial compressor and turbine
- Inboard plain bearings lubricated by the engine oil system
- Oil inlet and outlet arranged through the turbo support
- Maintenance friendly fixation of the compressor wheel
- Suitable for heavy fuel operation
- Accessories like compressor and turbine washing devices, speed sensor, air filter silencer and insulation available
- Water cooled bearing housing on request for high temperature applications
- Reduction of engine emissions (to support IMO II requirements)

Power Upgrade
- More efficiency
- Increased pressure ratio
- High power with the same lifetime
Wide compressor maps with extended area of top efficiency

<table>
<thead>
<tr>
<th>Model</th>
<th>Air flow rate V [m$^3$/s]</th>
<th>Engine output P [kW]</th>
<th>Maximum pressure ratio $\Pi_v$ max</th>
<th>Efficiency factor $\eta$ [%]</th>
<th>Maximum pressure ratio $\Pi_v$ max</th>
<th>Efficiency factor $\eta$ [%]</th>
<th>Weight m [kg]</th>
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<tbody>
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<td>500-1,000</td>
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<td>64</td>
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</table>

* Weight = basic turbo + air filter silencer + gas outlet casing
Exhaust gas turbochargers are expected to meet the highest demands in terms of performance and reliability. KBB thus places great store in consistent quality management.

The company has been certified to DIN EN ISO 9001 since 1995.

A QM officer is responsible for the QM system's continued development. Engineers and qualified inspectors ensure quality in the manufacturing processes.

The QM system is subject to ongoing review. Both management reviews and internal audits of all divisions form part of an annual audit program.

Type approval certificates from various classification societies exist for all turbochargers that are manufactured in series. Detailed quality documentation on overspeed tests, balance quality, trial runs and crack tests, for example, are kept for each individual turbocharger in a separate construction record.

KBB turbochargers undergo a trial run on the in-house test rig before delivery.

KBB offers worldwide service for its turbochargers, either directly via the headquarter or via a closely linked network of service stations.

The service team is available 24 hours a day, 7 days a week all year round. Just call +49 (0) 172 351 6045.

Fully trained and experienced specialists can advise customers on fault localisation and elimination. A repair service is provided wherever necessary in the workshops or directly on site. Original spare parts are always available at KBB and can be dispatched from the central warehouse within 24 hours.
Welcome to Saxony! Visit our company in Bannewitz at the gates of Dresden, the capital of the Free State of Saxony, with its more than 800 year history.

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