



Product information

# ABB Turbocharging TPL...-A

# Power, performance and reliability

## Highest engine power and efficiency rely on one vital component – the turbocharger.

The ultimate goals of turbocharged-engine development are higher power and efficiency – two areas in which ABB's TPL turbochargers make a vital contribution. The TPL...-A series was developed for modern 4-stroke diesel engines and gas engines for marine (propulsion and auxiliary) applications as well as for land-based power plants.

The TPL design concept provides a robust and reliable platform for engine applications with outputs ranging from 2,500 kW to the highest in the industry. In addition to offering high efficiency and long times between overhauls, these turbochargers have features designed to satisfy strict environmental requirements.

A simple, modular design with small number of parts makes the TPL...-A easy to maintain and service. Customers benefit from low life-cycle costs.

### Optimized for today's market

The TPL...-A unites the simplicity and compactness of a modular design with turbine and compressor stages that ensure high turbocharger efficiency while reducing fuel consumption and thermal loading. High volume flow ranges allow optimized matching to different engine applications. A variety of uncooled gas inlet casings and optional waste gate connections are available.

In addition to having a smaller number of parts than its predecessor, the TPL...-A has several new features designed to make installation and maintenance easier. A major contributor to the turbocharger's high reliability and long service life is the new bearing assembly, which is designed for exchange intervals of 36,000 hours.

### Tested to the limit

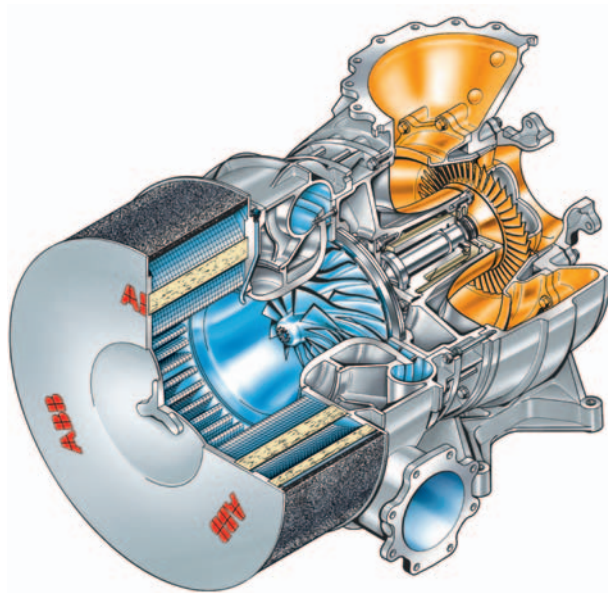
A comprehensive series of qualification tests is carried out to confirm the total reliability of ABB turbochargers.





## Benefits that count

The TPL...-A has a whole range of features designed to keep your running costs down.



Features	Benefits
Radial compressor with backswept blades; different trims available	Wide compressor map for optimized matching in all applications
High-performance axial turbine with different stagger angles and trims; with lacing wire	Suitable for different turbocharging systems; optimized matching
Free-floating axial bearing disc; radial bearing bushes with squeeze oil damper	High reliability and longer times between overhauls
Bearing assembly lubricated by engine lube oil system	No additional lubrication system needed
Oil inlet and outlet at bottom	Easy to service
Turbine and compressor cleaning possible	Improved operation in harsh conditions (incl. HFO)
Bearings, rotor, turbine diffuser and nozzle ring dismantled from compressor side	Simplified maintenance; no need to disconnect hot gas pipes
No water cooling	No corrosion; no additional piping
Variable positioning of casings and flanges	More options for installation
Variable turbine geometry as option	Increased operational flexibility
Comprehensive qualification test program, including containment test	Highest operational safety

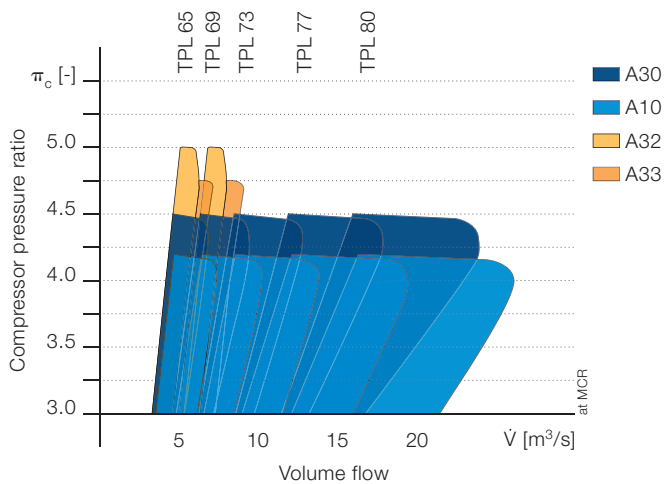
# Design features

## Turbine and compressor

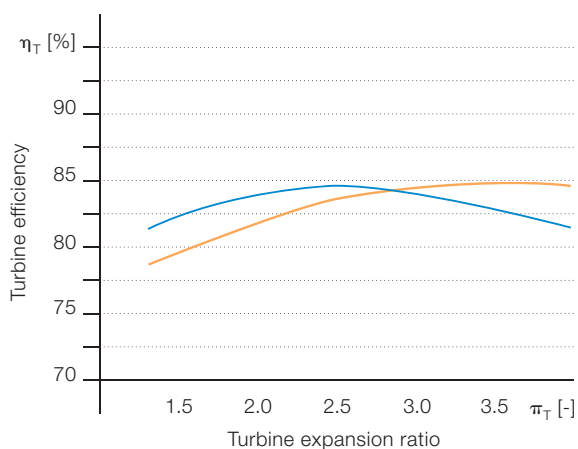
### Turbine

The TPL...-A turbocharger's axial turbine is designed for high efficiencies and high volume flow rates. Different stagger angles and the use of lacing wire to damp vibration in the larger units make the TPL...-A turbine suitable for pulse as well as constant pressure turbocharging systems. Variable turbine geometry is available as an option for applications with changing operating or ambient conditions.

Volume flow range of TPL...-A turbochargers



Range of turbine efficiency (2 different flow capacities)

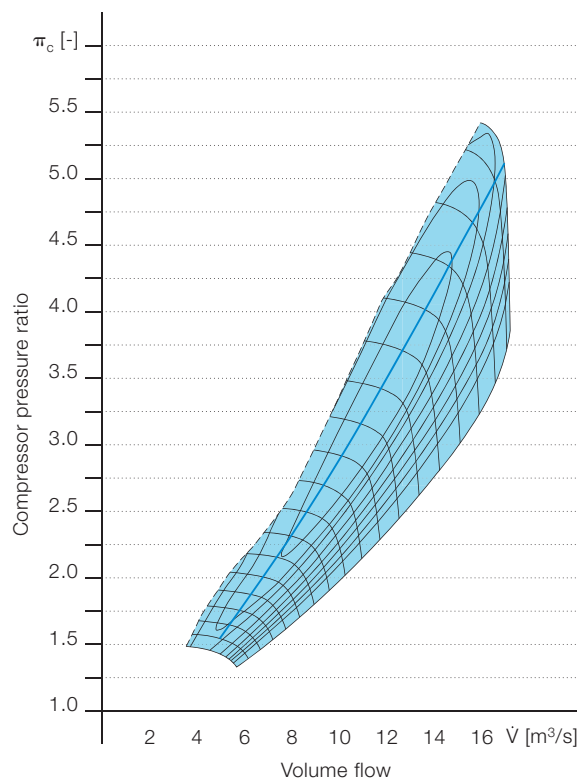


### Compressor

The high volume flow rates achieved with the TPL...-A compressor allow optimized matching to different engine applications. High efficiencies and wide compressor maps are ensured by single-piece, splitter-bladed aluminium alloy wheels with backswept blades. Peak efficiencies of more than 85 % are achievable.

Market requirements are covered by two compressor stages. The TPL...-A10 compressor achieves a pressure ratio of 4.2, high specific flow capacities and high efficiencies. For compressor pressure ratios up to 4.5, ABB offers the TPL...-A30. Titanium compressor wheels are available as an option for special applications.

Example of compressor map



# Design features

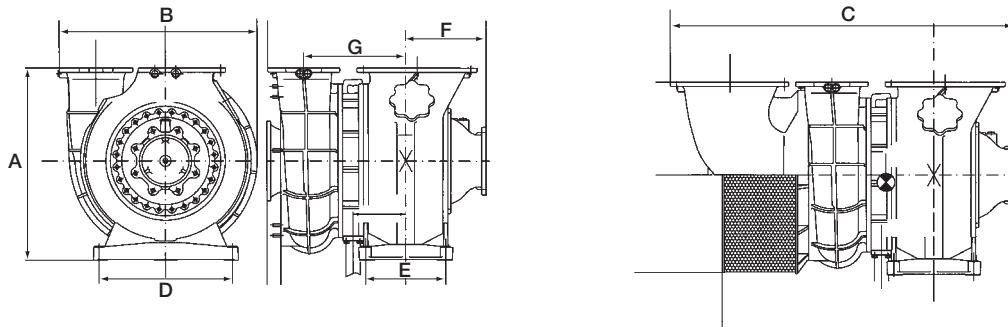
## Bearings and casings



### Bearing lifetime

Benefiting from experience gained with over 50,000 ABB turbochargers with plain bearings in service worldwide, TPL plain bearings are designed to run for 36,000 hours before being exchanged.

ABB developed the new bearing assembly for direct lubrication by the engine lube oil system. The main axial bearing consists of a free-floating thrust disc with profiles on both sides, rotating at about half the rotor speed for minimized losses. An extremely hard special coating ensures extra-high resistance to wear caused by contaminated oil. The non-rotating radial bearing bushes are centered in a squeeze oil film damper.



Type	A	B	C	D	E	F	G	Weight kg*
TPL65	870	889	1545	600	360	362	458	885
TPL69	1025	1043	1852	708	424	427	540	1558
TPL73	1192	1217	2154	822	494	497	627	2310
TPL77	1416	1446	2539	978	586	589	746	3511
TPL80	1644	1667	2933	1134	680	684	865	5352

\* includes filter silencer

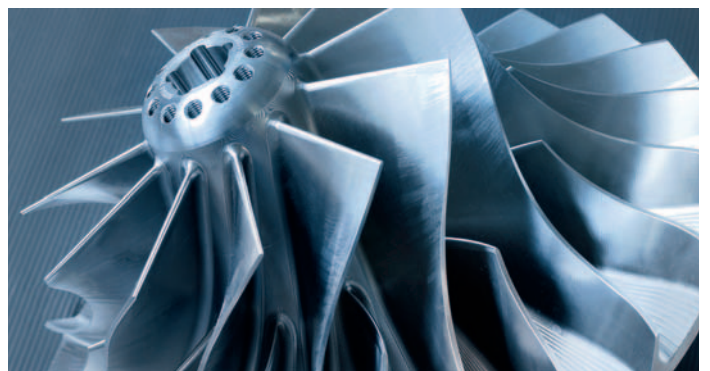
### Optimized casing design

TPL..-A casings have been optimized for applications on 4-stroke engines. Excellent fluid dynamics and minimized thermal stress are ensured. Features include integrated waste gate flanges, temperature and pressure measurement connections. All-round insulation minimizes the turbocharger noise level and casing surface temperature.

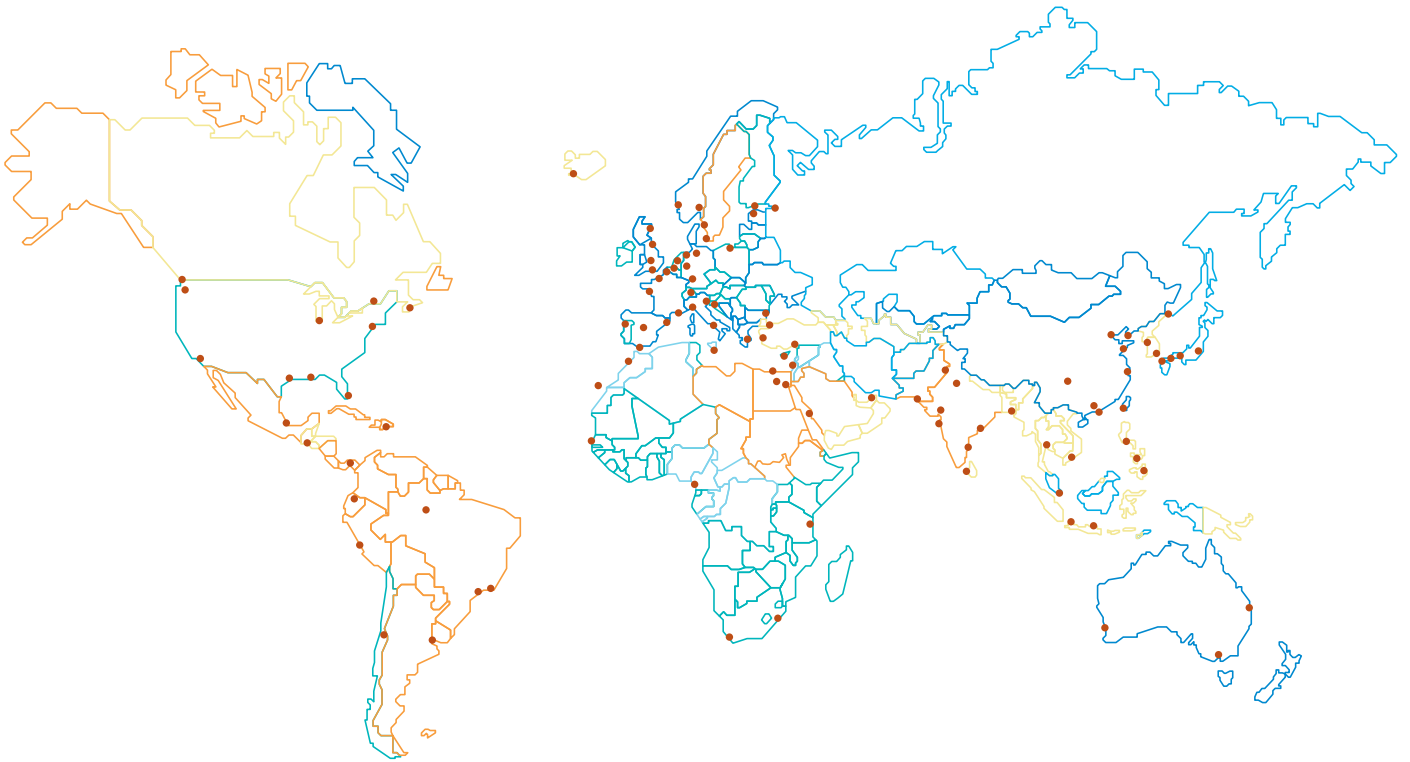
### ABB turbocharger qualification tests

Tests include:

- Resonance endurance
- Low cycle fatigue
- Temperature cycle
- Hot shutdown
- Oil tightness
- Compressor containment
- Turbine containment
- Blade vibration
- Thrust bearing
- Noise



# ABB Turbocharging Service network



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