RIKT – Isothermal Turbocompressors
With integrated coolers

MAN Diesel & Turbo’s isothermal compressors have been built since 1915 and more than 1,400 units have been sold. This unique design has proven its reliability in various industries where large amounts of air need to be compressed.

The RIKT is available in eight frame sizes from 71 to 160 seamlessly covering an actual inlet volume range between 100,000 and 750,000 m³/h. Depending on the discharge pressure and the energy evaluation, the RIKT will be designed with 2 to 4 intercoolers and 3 to 6 impellers, thus adapting the compressor to deliver gas at a pressure ratio ranging between 4.5 and 20 in a single, compact casing. The integrated coolers not only reduce the overall dimensions to the smallest possible footprint, but also avoid interconnecting process piping. Noise emanating from high velocity gas in the impellers is also significantly reduced by the plate fin coolers and casing.

Applications
- Air separation industry
- Iron and steel industry
- Fertilizer industry
- Nitric acid
- Enhanced Oil Recovery (EOR)
- Compressed Air Energy Storage (CAES)
- Any industry where a large amount of compressed air is required

Standardized configuration
The RIKT frame sizes are based on geometrical scaling of most components, leading to a high degree of standardization and reliable performance. If necessary, major components such as impellers and diffusers may be tailored to fit process requirements.

Characteristics
- In accordance with API 617
- Inlet flow range from 100,000 to 750,000 m³/h
- Selection of rotors for a given frame size
- Integrated intercoolers with water separators
- Up to 6 impellers and 2 to 4 intercoolers
- Axial inlet with 1st stage open impeller
- Subsequent impellers closed type
- Casing welded in carbon steel plate

Inlet Guide Vanes (IGV)
Inlet guide vanes ensure for best efficiency over a wide range and allow a precise control of the process by:
- Pressure or flow control
- Power limitation

Intercoolers
The intercoolers are integrated in the casing. The gas is guided through an optimized flow path thus leading to very low interstage pressure losses.

Bearings
- Tilting pad journal and Kingsbury type axial bearings
- Accessible without removing the upper casing half

Couplings
- Maintenance-free, flexible disc-type couplings for the low- and high-speed shafts.

Gear
- Double helical gear
- Axial bearing on low-speed shaft
- Shaft-driven main oil pump

Driver
- Direct-driven by steam or gas turbine
- Electric motor with gear (set)

Control system
- Anti-surge control system
- Reverse flow protection

Reliability & availability / Service
- The RIKT series has a track record with over 3 Mio. operating hours
- Designed for highest reliability
- After sales services are available worldwide by MAN PrimeServ and cover the entire product life cycle: spare parts, overhauls, repairs, re-vamps/modernization and training.
### Features

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Widely referenced isothermal compressors with more than 1,400 units built since 1915</td>
<td>Highest reliability</td>
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<tr>
<td>Standardized core units and modularly built trains</td>
<td>Referenced, many identical machines in operation</td>
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<td>Standardized rotors built with referenced impellers</td>
<td>Performance predictability</td>
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<td>Pressure ratio up to 20</td>
<td>Rotor exchangeability</td>
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<td>Abradable seals with negative clearance</td>
<td>For all air separation processes and other applications where large amounts of air have to be compressed</td>
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<tr>
<td>Adjustable Inlet Guide Vanes (IGV)</td>
<td>Minimum seal losses</td>
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<td>No external piping and intercoolers</td>
<td>Wide operating range</td>
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<td>Integrated intercoolers (IC) (2 to 4 IC’s per casing)</td>
<td>High efficiency at part load operation</td>
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<td>Intercoolers with various material combinations</td>
<td>Constant speed operation</td>
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<td>Proven 2-stage water separator with coalescing mesh and fin collector firmly attached to the IC’s</td>
<td>Short installation time, low interstage pressure losses leading to higher efficiency, significantly lower noise emission</td>
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<td>Vertical removal of intercooler bundles with an overhead crane</td>
<td>Low pressure losses between the stages</td>
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<td>Direct drive by steam or gas turbine</td>
<td>High efficiency → lower energy consumption</td>
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<td>Electric motor drive</td>
<td>Compact design → smallest footprint → reduced building costs</td>
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<td>Flexible disc type couplings for the low and high-speed shaft</td>
<td>Wide range of cooling water qualities, incl. seawater cooling</td>
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<td>Lube oil system and gear</td>
<td>High degree of condensate removal</td>
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<td>RIKT 71 to 90: oil system integrated into base frame</td>
<td>No separate cooler bundle extraction device required</td>
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<td>RIKT 100 and larger: separate oil system</td>
<td>Simple train arrangement with a minimum number of rotating parts</td>
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<td>Gearing-up with standardized double helical gear, use of the most economical 4-pole standard electric motors</td>
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<td>Maintenance free</td>
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<tr>
<td></td>
<td>Shorter erection time, smaller footprint</td>
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<td>To reduce dimensions for transportation</td>
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RIKT – Isothermal turbocompressors with integrated coolers

Integrated compressor coolers

Compressor outer casing - lower half

Impellers

Discharge volute

1st stage overhung impeller

Inlet guide vanes

Inlet suction nozzle axial direction
Technical Data

Driver: Electric motor, steam or gas turbine
Suction pressure: Ambient pressure
Discharge pressure [bara]: Up to 20 bara
Flow rate [m$^3$/h]: Max. 750,000 m$^3$/h
Power range [MW]: Approx. 60 MW
Number of impeller stages: 3-6
Number of intercoolers: 2-4

RIKT Compressor
Frame Size Selection Diagram
All data provided in this document is non-binding. This data serves informational purposes only and is especially not guaranteed in any way. Depending on the subsequent specific individual projects, the relevant data may be subject to changes and will be assessed and determined individually for each project. This will depend on the particular characteristics of each individual project, especially specific site and operational conditions.

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