

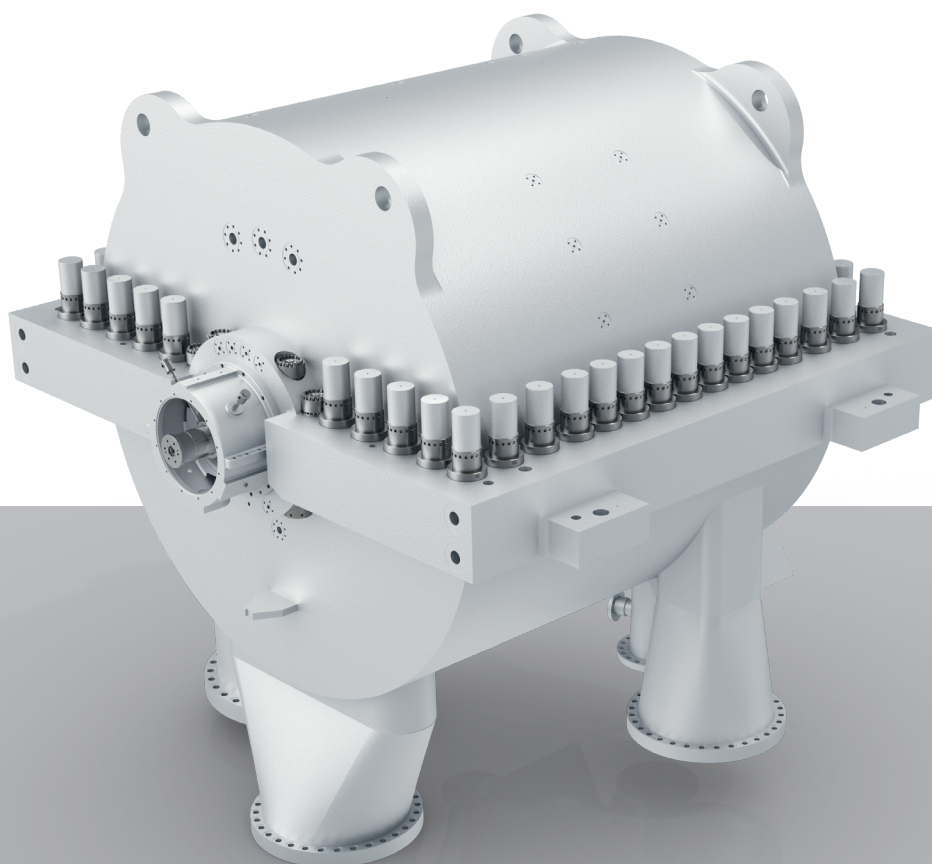
RH

Horizontal split centrifugal compressors

MAN horizontal split centrifugal compressors (Type RH) are at the heart of many processes in a wide range of applications – the downstream market, the refinery and petrochemical industry, as well as industrial gases.

Benefits at a glance

- Reliability: highest customer satisfaction marks
- Maintainability: it's built in
- Availability: robust efficiency
- Operability: extended MTBM



RH centrifugal compressor

Typical data (depending on application and train configuration)

Driver	Electric motor, steam turbine, gas turbine or expander
Suction pressure	1 bara up to 20 bara
Discharge pressure	up to 60 bara
Flow rate	Max. 900,000 m ³ /h
Power range	up to 100 MW
Efficiency	up to 90% overall efficiency possible
Min. suction temperature	-105°C
Max. discharge temperature	300°C
Variable side stream and/or extraction	up to 570%
Typical impeller diameter	280 mm up to 1,800 mm
No of impeller stages	from 1 up to 9
Number of stage groups	max. 4 (8 nozzles)

General description

MAN Energy Solutions supplies a modular RH type compressor system that consists of highly standardized compressor variants for specific applications and flexibly configurable designs. The modular concept allows for easy adaption to specific requirements, while the smart and robust design features excellent reliability and an outstanding efficiency footprint in an easy-to-maintain layout.

Our first RH type compressor was commissioned in 1912. It was followed by more than 2,700 units, over half of which are still in operation – a testament to the outstanding sustainability of these machines.

Our ongoing emphasis on rigorous R&D has been the foundation for the current iteration of our highly efficient modular compressor system and the continuously evolved product portfolio. The system's robust and flexible design, responsive order execution, our state-of-the-art manufacturing and test facility, and our MAN PrimeServ services ensure ever-growing customer satisfaction.

Modular package and compressor concept

The modular configurations range from pre-designed RH type compressor packages for downstream sectors like refinery and industrial gases or nitric acid, to completely customized RH type compressor packages for applications such as ammonia and chlorine. Using pre-designed components and established design rules has the advantage of employing proven designs, lowering lead times and results in significant cost advantages. We also offer special materials and adapted designs for customized solutions.

Typical markets, applications and compressor variants

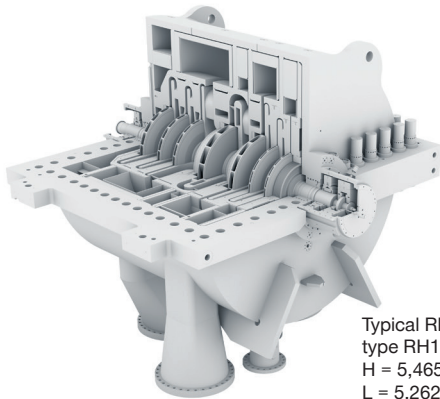
Oil & Gas

- Refinery
 - Main Air Blower
 - Wet Gas Compressor
 - Recycle Gas Compressor
 - Refrigerant Compressor
- Propane Dehydrogenation (PDH)
 - Product Gas Compressor
 - Propylene Refrigerant Compressor
 - Ethylene Refrigerant Compressor
 - Heat Pump Compressor

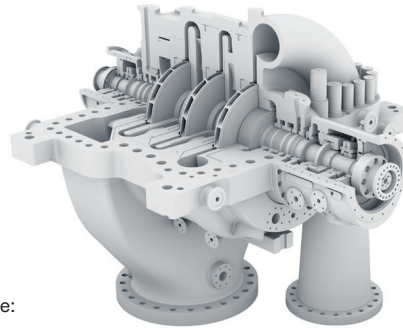
- Ethylene
 - Cracked Gas Compressor
 - Propylene Refrigerant Compressor
 - Ethylene Refrigerant Compressor

Industries

- Ammonia (also synthetic green ammonia)
 - Process Air Compressor
 - Ammonia Compressor
- Nitric Acid
 - NO_x Gas Compressor
- Chlorine
 - Chlorine Compressor
 - HCl Compressor



Typical RH with welded casing,
type RH125; dimensions example:
H = 5,465mm, W = 5,464mm,
L = 5,262mm



Typical RH with cast casing,
type RH071; dimensions example:
H = 2,475mm, W = 2,520mm,
L = 3,035mm

Evaluation matrix*

Integrity	Safety	Operability	Maintanability	Efficiency	Reliability	Availability
+	++	++	+++	++	+++	++

Integrity

At MAN Energy Solutions, integrity has always been a core principle – as individual members of society, as a business partner, and in the workplace. With its outstanding sustainability record, the RH represents our corporate values and goals perfectly.

Safety

MAN PrimeServ's longstanding experience with RH type compressors and the depth of their service portfolio guarantees maximum safety on-site and during downtimes.

Operability

The opportunity of washing fluid injection enables long mean times between maintenance and extended operation within the optimum efficiency range.

Maintanability

Its outstanding efficiency footprint and smart compressor design produce the excellent maintainability of our RH compressor. MAN PrimeServ offers worldwide 24/7-support for the entire product life cycle: spare parts, overhauls, repairs, revamps/modernization, and training.

Efficiency

Our unique, state-of-the-art impeller portfolio and the flexible modular concept result in a highly efficient design. Continuous optimization of the control and sealing concepts guarantee efficient operation at all times.

Reliability

Of all the RH type compressors we have commissioned in over 100 years, almost half are still operated by their satisfied owners. We're proud of our reliability record.

Availability

Its robustness and efficient operability in combination with short and predictable downtimes, produce the peerless availability of the RH type compressor. OPEX can be further improved with our forward-thinking digital solutions.

* The evaluation matrix is an indicator of the unique selling points of the RH compressor. The evaluation is based on the ISOMERA factor and the ranking in the categories + (good), ++ (very good) and +++ (outstanding).

Features

Benefits

Horizontal split casing

- Short downtime during overhauls due to easy maintainability
- Cost- and space-efficient footprint

Modular welded or cast casing design

- High degree of flexibility in applications with high efficiency
- optimized delivery times
- Optimized CAPEX

Single or multiple casings in line

- Optimal adaptation to customer process requirements
- Efficiency
- Optimized CAPEX

Flexible arrangement of side stream or extractions

- High degree of flexibility in applications
- Optimal adaptation to customer process requirements

In-line, back-to-back, and double-flooded compressor design

- Unique, state-of-the-art impeller portfolio
- Highly efficient compressor design
- Optimal adaptation to customer process requirements

Modular bearing and sealing concept

- Safety
- Reliability
- Optimized OPEX
- Optimized delivery times

Injection of washing fluids

- Long mean time between maintenance (MTBM)
- Extended operation within optimum efficiency range
- Optimized OPEX

Impeller in 2D or 3D design, optimized for specific flow requirements of each stage

- Unique, state-of-the-art impeller portfolio
- Highly efficient compressor design

Electric motor, steam turbine, expander and gas turbine as driver

- Maximum driver and train flexibility

Special materials for casings and impellers

- Exceptional material selections available for special media like NO_x gases
- Extensive experience in such applications

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