

Technical Data

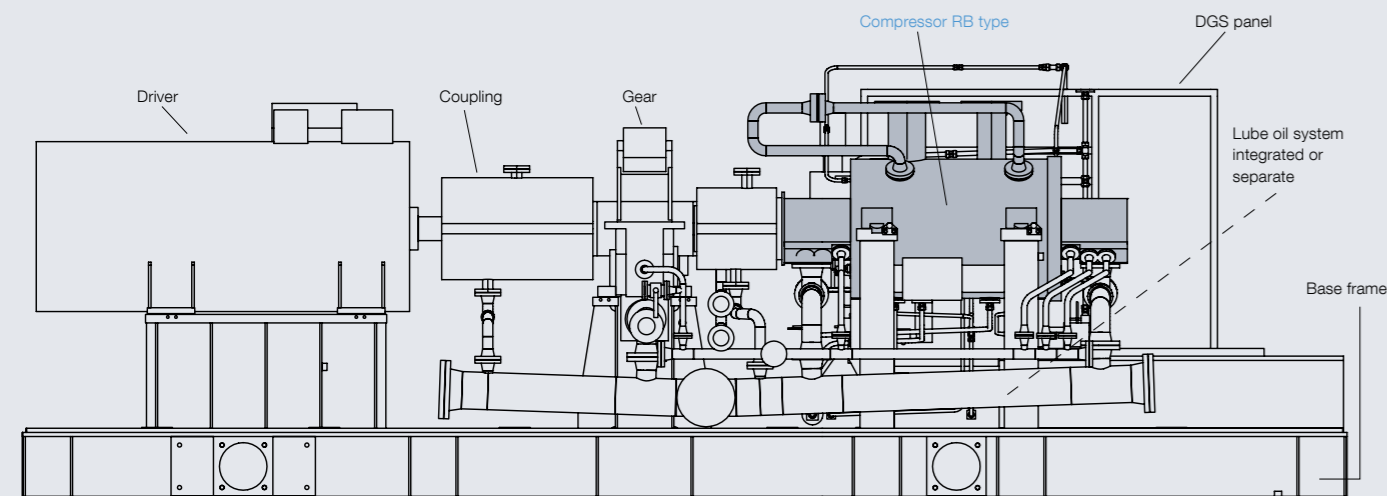
Driver	Electric motor, gas turbine or steam turbine
Min. suction pressure [bara]	≤ 1
Discharge pressure [bara]	Max. 800 bara (calculated & designed) Tested and referenced up to 650 bara
Flow rate [m³/h]	Max. 230,000 m³/h
Power range [MW]	Up to 60 MW
Efficiency [%]	approx. > 80% overall efficiency possible
No of impeller stages	Max. 10

Table of modular, pre-engineered design

RB sizes	Modular, pre-engineered design				Customized	
	Casing (C28)	Casing (C35)	Casing (C45)	Casing (C56)	Casing (Cxx - C112)	VHP* applications
Design pressure bar absolute	500	160	180	130	-	e.g. 800 for RB 28
Average inlet volume flow Am³/h	2,000	6,000	14,000	22,000	< 230,000	-
Length [mm]	1,350	1,600	1,880	2,500	4,500	adapted
Outer casing inner diameter [mm]	670	900	1,250	1,500	-	-
Max. power MW	20	30	40	60	-	-

*Very High Pressure

RB Skid



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RB

Barrel type centrifugal compressors

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RB – Barrel Type Centrifugal Compressors

The MAN Diesel & Turbo barrel type compressor is a single-shaft centrifugal compressor for applications in Oil & Gas, HPI/CPI, petrochemical processes and gas transport. Its cost effective design comes in various frame sizes. Inlet flow rates range from 200 to 230,000 Am³/h and discharge pressures go up to 800 bar.

MAN's RB centrifugal compressor allows for different numbers of impellers – up to 10 stages for a single-shaft rotor. Every shaft is equipped with tilting pad bearings. The RB compressor outer casing is forged and covers a complete cartridge. The inner cartridge is cast, steel plate material is available as an option. Compact cartridge design allows easy dis-/assembly.

For most applications, MAN offers a package design, which significantly reduces on-site installation time. This includes the RB compressor as core unit, as well as driver, gearbox (if applicable), lube oil system, seal gas rack, on skid process piping and auxiliaries.

Usually, stationary and rotating labyrinth strips are mounted at the impellers and the balance piston for sealing purposes. Only for very high pressure (VHP) applications, hole pattern seals will be mounted at the balance piston.

Sealing to atmosphere is done with dry gas seals (DGS), which can be either a tandem DGS (suction pressure ≥ 3.5 bar/g) or double – also called back-to-back – (suction pressure < 3.5 bar/g).

The entire seal gas and bearing separation (buffer) gas distribution and control system is arranged on the dry gas seal

rack. Depending on gas composition, a seal gas conditioning unit (booster and heater) or an external seal gas source may be required for start-up and settle-out conditions.

The lube oil system (if applicable) can be integrated into the compressor base frame or stand alone on a skid. The position of this unit depends on the application (onshore or offshore) and on pitch and roll rates (if applicable).

Modular configuration

The modular configuration ranges from pre-designed RB compressor packages for the upstream, midstream, downstream and industrial gases market segments up to completely customized barrel compressors e.g. for VHP and CO₂ applications. Using pre-designed components has the advantage of employing proven designs, lowering lead times and results in cost advantages.

Applications

- Upstream: oil & gas i.e. gas lift, gas export, gas injection, gas gathering, gas treatment, gas processing, CO₂ injection, LNG, boil off, gas transport, liquefied petroleum gas
- Midstream: gas transport, gas storage, fuel gas, CAES
- Downstream: refineries, fertilizers, chemical & petrochemical, i.e. hydrogen production, hydrogen recovery, hydro cracking, Desulfurization, FCC, propane dehydration, methanol, olefins, IGCC, Coal-to-Liquids, GTL-Syngas, ammonia, urea, nitric acid
- Industrial gases: air separation, nitrogen, oxygen, paper, coke oven, GTL, CTL
- Power generation: fuel gas, CCS

Base characteristics

Multistage compressor design

- Design according to API and NACE
- Up to 3 compressor sections for side stream, or intercooling between stage groups
- Direct drive or speed in-/decreasing gear
- Maximum of 10 impeller stages
- Closed impellers which can be manufactured by (integral) milling, welding, brazing or spark eroding
- Impeller sizes: from 250 to 1,350 mm
- Nozzles: studded or flanged

Base frame skid (if applicable)

- Single lift or separate
- Pitch 'n' Roll – anti-vibration-mounts (AVM) for FPSO's and platforms, multi-point or 3-point mount for damping

Unit control system

- Anti surge control system
- Performance and load share control system
- Machinery protection systems (e.g. vibration monitoring) combined with SIL capable ESD systems
- Start up and stop sequencing
- Human machine interface with visualization
- Control systems based on Siemens PCS7

Service (reliability and availability)

- The barrel type compressor was first implemented in 1968
- Proven track record of more than 38 Mio operating hours
- Designed for reliability ≥ 98.5%
- World wide PrimeServ support services for the entire product life cycle: spare parts, overhauls, repairs, revamps/modernization and training

Features

Referenced impeller family (low and high pressure applications)

Modular train design

Referenced modular components

Cartridge design

Modularly designed sealing systems (for different pressure levels)

Direct drive or speed in-/decreasing gear

Suitable for a wide range of gases

Materials

Benefits

Compact and high efficiency impeller technology which can be used to compress hydro carbon gases, carbon dioxide, dry air and nitrogen up to 800 bara.

Energy and cost savings.

Several design options for each frame size. Intercooling between stage groups possible.

Proven, powerful and reliable design concept.

The RB cartridge contains all components (inner casing, casing covers, DGS, bearing) – easy and fast dis-/assembly and storage.

Several sealing options, e.g. dry gas seals (tandem and double (back-to-back) and labyrinth seals, hole pattern.

Compatible for electric motor, gas turbine or steam turbine drivers.

To be used for:

- Hydro carbons (natural/fuel gas/sour gas)
- Dry and atmospheric air
- Carbon dioxide
- Oxygen (requires modifications), chlorine, refrigerants

Depending on the specific application: extensive experience with special materials for sour/wet gas applications (according to NACE).

