



Application line up

Upstream	Gas gathering, Gas lift ,Gas production and processing, Gas injection (Enhanced oil / Gas recovery), Refinery, LNG, Natural Gas Liquids (NGL), Gas To Liquid (GTL)
Midstream	Gas pipeline, Gas storage, Fuel gas
Downstream	Ethylene & Derivatives, Ammonia / Urea, Methanol, Air separation, Propane dehydrogenation (PDH), Nitric acid and other plants including off-shore services (FPSO, Floating LNG), CCS.



Offshore gas treatment plant



Pipeline station



Fertilizer plant



Gas injection compressor for FPSO



Main refrigerant compressor for LNG plant



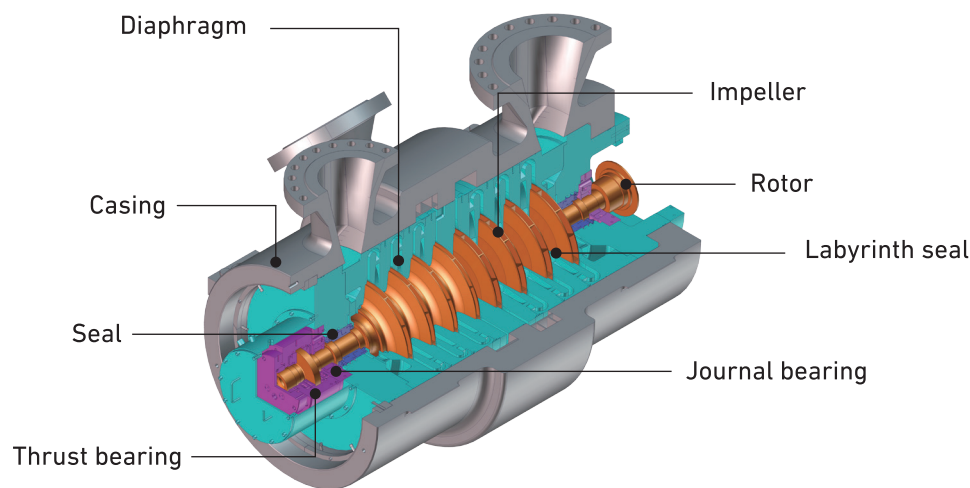
Cracked gas compressor train for mega ethylene plant



Product gas compressor for PDH plant

Vertically split (V-type) compressor

Vertically split compressors are applied for medium and high pressure services. This type of compressor consists of diaphragm bundle and casing. The diaphragm bundle forms a single unit with the head, bearing and seal, and the assembled bundle is fixed to casing by shear rings. The nozzle can be attached to the top, bottom, or side in accordance with customer's requirements.



MITSUBISHI HEAVY INDUSTRIES COMPRESSOR CORPORATION
4-6-22, Kan-on-shin-machi, Nishi-ku,
Hiroshima, 733-8553 Japan
TEL +81-82-291-2200



www.mhicompressor.com | spectra.mhi.com

MOVE THE WORLD FORWARD MITSUBISHI HEAVY INDUSTRIES GROUP



MITSUBISHI CENTRIFUGAL COMPRESSOR

Technical evolutions of compressor

Mitsubishi Advanced Compressor (MAC)

Mitsubishi Heavy Industries Compressor Corporation (MCO) has manufactured well over a thousand compressor units for application in a wide range of industries since building Japan's first centrifugal compressor in 1917. Our original compressor brand called MAC (Mitsubishi Advanced Compressor) developed from 1980's, now play a vital role in oil & gas production, gas transportation, oil refining, petrochemicals and other processes. Utilizing our R&D institutes we are continuously developing innovative technologies.

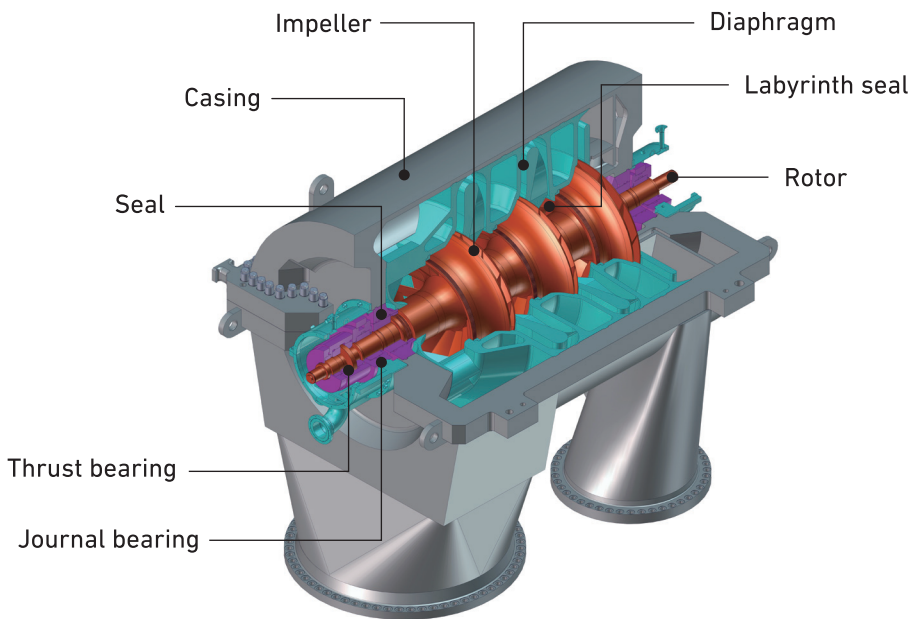
Advantage of MAC

- Stable superior performance
- High speed and compact design
- Easy maintenance
- Reliable long term operation
- Quick and excellent after-sales service

Type and characteristic

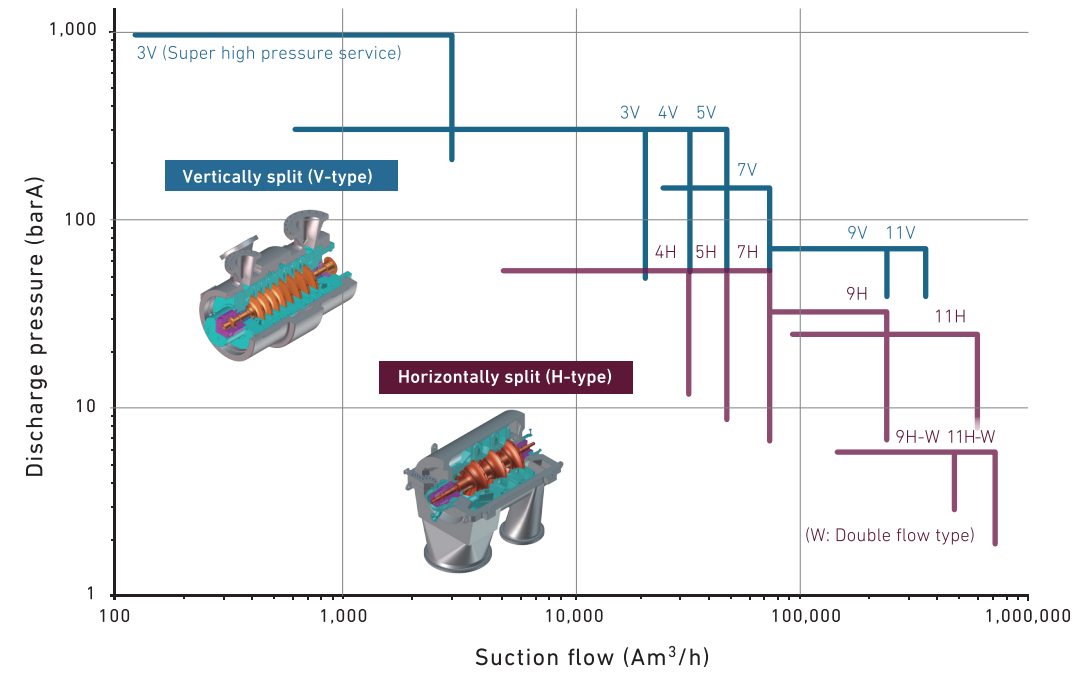
Horizontally split (H-type) compressor

Horizontally split type compressor are applied for large flow and low / medium pressure service. This type of casing is split along the rotor shaft and bolted at the split line. The bearing and seal sections allow easy disassembly and assembly without removing the upper casing.



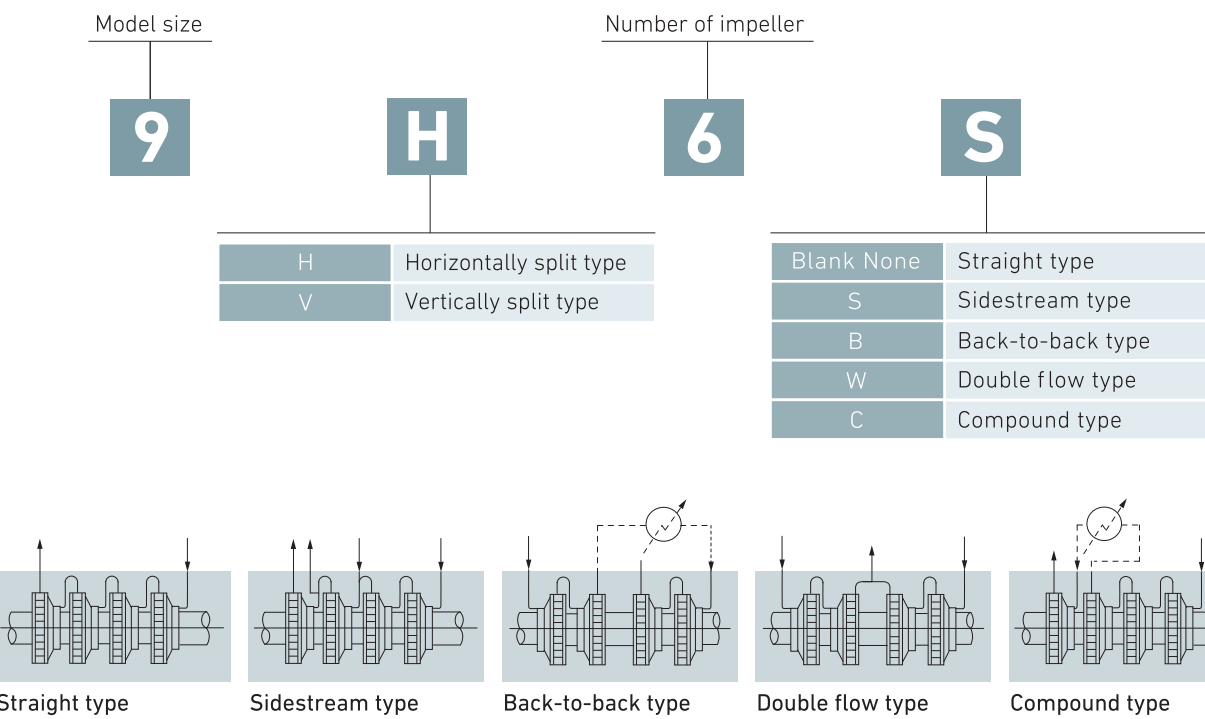
Type of Mitsubishi Advanced Compressor

Application range



Model code

MAC models are generally indicated by a four-digit code.

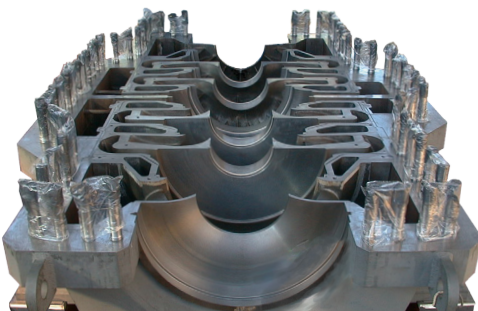


Design features

Casing

Three type of casing can be applied.

1. Cast steel casing
2. Fabricated casing
3. Forged steel casing



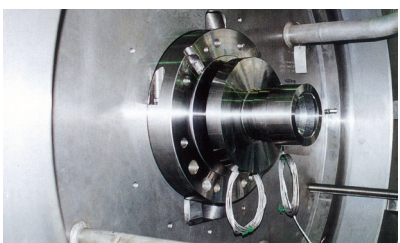
Fabricated casing for horizontally split type

Overhang damper

Overhang damper can be applied to increase damping force for more stable operation.



Overhang damper

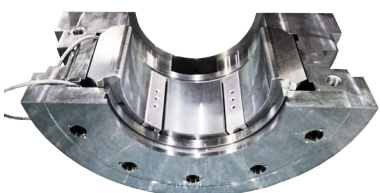


Bearing

Oil lubricant bearing

• Journal bearing

Direct lubrication type tilting pad bearings are applied to increase the load capacity and to reduce mechanical losses.



Journal bearing - Direct lubrication type

• Thrust bearing

Direct lubrication type self leveling multi pad bearing with load equalizing system is applied to increase the load capacity and to reduce mechanical losses.



Thrust bearing - Direct lubrication type

• Active Magnetic Bearing (AMB)

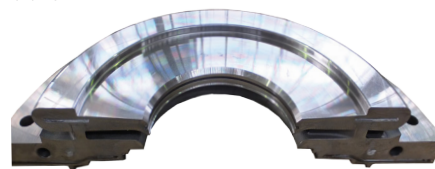
For oil free operation, AMB can be applied in several application such as gas pipeline compressor.

Diaphragm

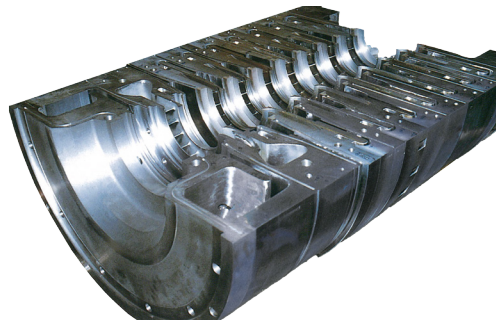
The diaphragms form the flow passage: diffuser, return channel, sidestream. They are designed to minimize fluid losses as less as possible.

• Movable Inlet Guide Vane

For wide range operation, MCO can apply Movable Inlet Guide Vane (MIGV).



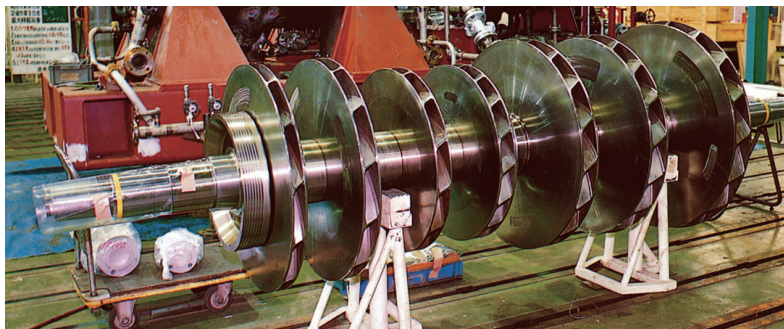
Diaphragm



Diaphragm assembly for vertically split type

Rotor

The rotor consists of impellers, shaft, sleeves, balance piston and thrust disc.



Rotor assembly

Seal

Shaft seals prevent / reduce gas leakage from casing. Interstage seals reduce the leakage between stages. Following seal types are applicable.

• Shaft seal

Dry gas seal / Labyrinth seal / Oil film seal / Mechanical seal.

• Interstage seal/ Balance piston seal

Labyrinth seal / Abradable seal / Swirl canceller labyrinth seal / Hole pattern seal.

For improving rotordynamic stability, a swirl canceller labyrinth seal which generates counter gas flow to cancel swirl flow or a hole pattern seal can be applied.

Impeller

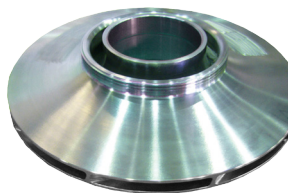
MCO's full 3D impeller line up provides high efficiency and satisfies the design needs of wide range application from small to large volume flow. The performance of each impeller is tested and verified by our R&D laboratory.

• One piece impeller

For the low-weldability or narrow path type impellers, MCO has been developed weld less manufacturing.



3D impeller

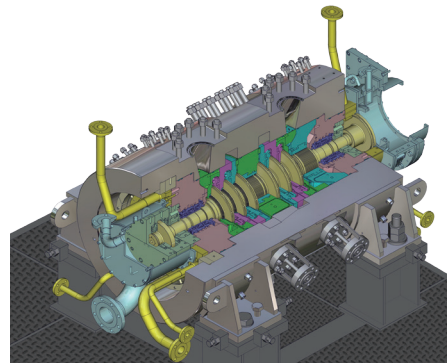
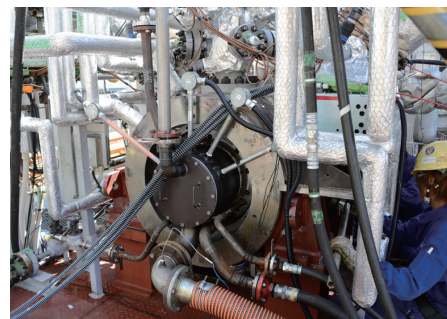


One piece impeller

Cutting Edge Technology

Super high pressure compressor

The MCO's design concept for the application of super high pressure compressor is to realize high performance with minimum compact body attaining light weight for easy installation and maintenance. MCO's super high pressure compressor has realized the wide operating range maintaining the high efficiency and stable operation. It can be applicable for high pressure and high density services such as CO2 injection of EOR, CCS, Gas processing plant, offshore equipment (FPSO).



MCO super high pressure compressor

Available gas condition

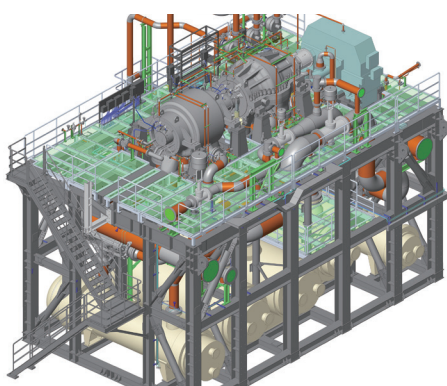
Pressure Up to 1,000 bar
Service Heavy to light molecular weight (CO2 100 % ~ Natural gas)

Module design

For Gas injection, FPSO, ASU and other plants, modularized packages can be provided.

• Modularized packages offer :

- Single lift transportation
- Streamlined field installation
- Shortened project schedule
- Total construction cost reduction



3D model

• Ergonomics design

Ergonomics design by using 3D simulations can realize the optimum arrangement of overall compressor train system, for each aspect of assembling, installation, operating and maintenance.



Nitrogen injection compressor module for ASU Plant