MITSUBISHI
Integrally Geared Compressor

MCO Web site:
http://www.mhicompressor.com/

© 2016 MITSUBISHI HEAVY INDUSTRIES COMPRESSOR CORPORATION All Right Reserved
Mitsubishi Integrally Geared Compressor has found widespread application principally as air compressor, booster compressor, nitrogen-gas compressor, CO₂ compressor, natural gas compressor and vacuum pump. Mitsubishi Integrally Geared Compressor has been designed to offer high efficiency and high reliability. Utilizing our R&D institutes we are continually developing innovative technologies.

Application Line up

Air and N₂ compressor
Air compressor and Nitrogen compressor are used in several applications, such as Air Separation, PTA, Ammonia and other chemical plants. Application range is as follows:
- Flow volume 20,000 to 75,000Am³/h with pressure up to 100barA
- Flow volume 75,000 to 450,000Am³/h with pressure up to 50barA
- Flow volume up to 1,000,000Am³/h with pressure up to 8barA

Fuel gas compressor
Integrally geared fuel gas compressor is fully standardized to be suitable for low/middle pressure fuel gas condition. Compressor core unit, motor driver, lube oil system, dry gas seal control unit and process gas piping are completely packaged on common base skid to minimize site installation work. Flow volume is up to 200,000Am³/h with discharge pressure up to 60barA.

Carbon dioxide (CO₂) compressor
Fields of application are CCS, EOR and CO₂ separation in IGCC, oxy-fuel, pre combustion and post combustion processes. Flow volume is up to 200,000Am³/h with discharge pressure up to 200barA.

Expander
Expander, Integrally geared radial type, is designed based on proven integrally geared compressor concept as power recovery system. Fields of application are PTA, Nitric Acid and others. Gas inlet temperature is up to 550°C, Exhaust volume flow is up to 550,000Am³/h.

Typical 6-stage integrally geared compressor
Design Features

**Gear casing**
Gear casing is designed and constructed for easy checking the gear and bearings without removing the scroll casing by disassembling the upper side gear casing.

**Pinion shaft**
Each high speed pinion shaft has the impellers fitted on the end. The rotation speed is set at the optimized speed for the impeller performance. Pinion shaft assembly with impeller is removable design, for easy maintenance.

**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 in-house R&D laboratory.

**Shaft seal**
Standard seal type is labyrinth seal. Between labyrinth seal and oil baffle, atmosphere open space is located for preventing the lubricating oil from entering into the process side.

**Speed increasing gear**
Single helical gears are applied to raise the driver speed to impeller speed. The gear is made with heat-treating, precision polishing for stable operation. Speed increasing gear, key component of integrally geared compressor, is designed by Mitsubishi own criteria based on R&D. Minimum gear quality corresponds to AGMA standard.

**Inlet Guide Vane (IGV)**
Movable inlet guide vanes enable a wide operating range. The inlet guide vanes are installed ahead of first stage or each stage as option.
Type of Mitsubishi Integrally Geared Compressor

Application Range

Compressor

<table>
<thead>
<tr>
<th>Discharge Pressure (barA)</th>
<th>Suction Flow (Am³/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>16C</td>
</tr>
<tr>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td>1,000,000</td>
<td></td>
</tr>
</tbody>
</table>

Expander

<table>
<thead>
<tr>
<th>Exhaust Volume Flow (Am³/h)</th>
<th>Discharge Pressure (barA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16C</td>
<td>1,000</td>
</tr>
<tr>
<td></td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td>100,000</td>
</tr>
<tr>
<td></td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

Design Features

Idle gear arrangement for Double Flow Integrally Geared Compressor

Double Flow Integrally Geared Compressor (DF-IGC) is designed with idle gear arrangement and double identical suction:

- Compactness (by small size for 1st stage impellers)
- Eliminated large bull gear
- Lower GD & Starting torque
- Driven by 4 (2)-pole EM or ST

Idle gear arrangement avoids large bull gear and multi-pole EM.

Auxiliary System Design

MCO designs the integrated auxiliary system such as LO system, Dry gas seal system, Control system etc., which provide the suitable operation of our compressors and drivers.

Ergonomics Design

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