



# HITACHI MEDIUM VOLTAGE DRIVES FOR NET GAS COMPRESSOR APPLICATION IN OIL & GAS INDUSTRY

## ABOUT NET GAS COMPRESSOR APPLICATION

**Net Gas Compressors** are essential devices in the oil and gas industry, designed to increase the pressure of natural gas (Hydrogen) by reducing its volume. This process is crucial for the efficient transportation of natural gas through pipelines and other infrastructure. These compressors come in various types, including reciprocating, rotary screw, centrifugal, and axial compressors, each suited for different applications based on pressure and flow requirements.

In upstream production, net gas compressors boost the pressure of natural gas exhausted by upstream recycle gas compressor, facilitating its movement to processing facilities. During midstream operations, they play a vital role in processing plants where natural gas is processed. In downstream transmission, compressors ensure that natural gas maintains the necessary pressure for required process parameters.

The working principle of net gas compressors involves drawing in low-pressure gas, compressing it by reducing its volume, and then discharging the high-pressure gas. Key components include the compressor element, motor, valves, cooling system, and control system. These components work together to ensure efficient and reliable compression of natural gas, with modern compressors equipped with advanced control systems for optimal performance and safety.

Net gas compressors offer several advantages, including efficiency, reliability, versatility, and safety. However, they also require regular maintenance and can have significant initial costs. Despite these challenges, their role in ensuring a steady supply of natural gas to meet growing energy demands makes them indispensable in the industry.



[Symbolic Picture for reference]

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#### CHALLENGES / ISSUES

In the refinery process, which involves handling hazardous chemicals and gases, the MVD (Medium Voltage Drive) application is very critical. Any lapses in MVD operation can lead to serious hazards, such as environmental contamination due to the release of excessive media into the atmosphere, fires within the refinery, and prolonged process interruptions. These disruptions ultimately impact overall plant productivity. Additionally, the restoration time for these processes is lengthy.

Previously, these critical applications were operated using a single MVD from different manufacturers. In the event of MVD tripping, plant reliability was at stake. If a fault occurs in a single VFD, it can lead to a complete plant shutdown, ultimately resulting in significant financial losses. Also, due to the continuous operations of the MVD, timely maintenance is not feasible.

#### NEED FOR THE SOLUTION

- To prevent any unwanted disturbances or interruptions in the process due to MVD.
- To enable regular maintenance of MVDs on an alternate basis.
- To ensure long-term trouble-free operations and reliability.

#### HITACHI'S OFFERED PRODUCT / SOLUTION

- Hitachi offers a unique solution with redundant MVDs, along with an auto-changeover facility.
- The offered solution consists of two MVDs, along with PLC and VCBs. One MVD will be in operation, while the other remains on standby.
- In case of any abnormalities in the running MVD, it will automatically switch over to the standby MVD. This changeover is quick and smooth, ensuring that process parameters remain unaffected.
- If there are doubts about a particular MVD, the customer can isolate the suspected MVD and restore it after rectifications. Meanwhile, the process continues with the other operational MVD.
- Since one MVD is always in standby mode, maintenance can be carried out without stopping the process, ultimately improving system reliability.
- Hitachi team successfully commissioned both MVDs and executed the changeover smoothly, without process interruption.
- The system architecture is as follows:

#### BENEFITS OF USING HITACHI MV DRIVE IN NET GAS COMPRESSOR APPLICATION

- **Wide Range of Ratings:** Hitachi's products are available in a diverse range of ratings to meet customer's specific requirements.
- **24/7 Service Support and Nationwide Network:** Hitachi offers round-the-clock service support through its extensive PAN India service network.
- **Experienced Technical Team:** Hitachi's highly skilled technical team is equipped to handle any challenges that may arise.
- **In-House R&D Centre:** Located at its Gujarat (India) plant, its in-house research and development centre ensures continuous innovation.
- **Proven Expertise in Critical Applications:** With vast experience in handling critical applications, Hitachi delivers reliable solutions.

#### RESULT / NEXT DREAM

- For reliable and smooth operations over, extended durations
- Tailored - customized solutions

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- Timely maintenance of MVDs to enhance product reliability
- Reduced frequency of unwanted plant stoppages

### HITACHI MVD PRODUCT INSTALLATION



### ABOUT HITACHI MEDIUM VOLTAGE DRIVE FOR NET GAS COMPRESSOR APPLICATION

#### HIVECTOL-HVI-E Series Medium Voltage Multi-Level Drives

Range: Up to 14,700 kVA (3.3 kV to 11 kV)

URL: <https://www.hitachi-hirel.com/products/drives/medium-voltage-drive>

- Patented Design - Increases Reliability
  - Pre-Charging (Reduces charging inrush current of the transformer to less than its rated current)
  - Cyclic Switching of the Cells (Achieves equal utilization of each cell at any operating speed)
- State-of-the-Art Technology
- Tailored to customer's Specific Application Requirements
- Long Term Technical Services and Spares Support
- Suitable for Indian Ambient Condition
- Input Harmonics Meets IEEE - 519 - 1992
- Output Waveform - Motor Friendly
- Best for High Starting Torque
- High Efficiency (Typical 97% efficiency including input Dry type transformer)
- Auto Restart
- User Friendly
- Easy to Maintain



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#### ABOUT HITACHI HI-REL POWER ELECTRONICS PRIVATE LIMITED

Founded & established in 1983 as Hi-Rel Electronics Private Limited, which later on in year 2015 had become the 100% subsidiary company of Hitachi, Japan which is one of the Global fortune 500 companies with a new name as Hitachi Hi-Rel Power Electronics Private Limited, which is being recognized as one of the pioneers in power electronics domain. Hitachi Hi-Rel, today, is a leading manufacturer of Industrial UPS, IT & Infra UPS, Medium & Low Voltage Variable Frequency Drives, Grid Tied Solar Inverters, Air Compressors and Railway Inverters.

Hitachi Hi-Rel has state-of-the art manufacturing facility at Sanand near Ahmedabad in Gujarat-India. Hitachi Hi-Rel is helping a wide array of industries and organizations to meet the mission critical demands through technologically superior, low polluting and innovative products Solutions and continue to offer world class power electronics products, value added services & customized solutions.

With a vision of “To be recognized as the most trusted Power Electronics Company by supplying superior products and services”, Hitachi Hi-Rel has garnered a significant level of trust in Indian power electronics market segment wherein it serves the entire gamut of Industries, particularly in mission critical applications for Refineries, Petro-Chemicals, Power Generation, Steel & Metals, and Process Industries as well as Critical Data Processing Applications. Besides offering greater energy efficiency & lower carbon footprint, each of the company product streams bears the hallmark of excellence with company accreditations. Hitachi Hi-Rel is an ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 certified company having export house status. Hitachi Hi-Rel sales network & service infrastructure expands out to the world & with this network, we have made strong inroad in Global markets like South East Asia, Middle East, Africa and Brazil. Also, with a presence of strategically located skilled service engineers in India helps us to score high in terms of customer expectations on service deliverables & uptime of the product.

With expertise, experience and an efficient product line, Hitachi Hi-Rel will always try to be your power electronics partner. When you choose to do business with Hitachi Hi-Rel, you are partnering with a company who cares.

#### FOR MORE INFORMATION

To know more about Hitachi Hi-Rel Power Electronics Private Limited and its offered products and solutions, please visit [www.hitachi-hirel.com](http://www.hitachi-hirel.com). You may also share your requirements at <https://www.hitachi-hirel.com/inquiry> to receive the phone call or Hitachi product information email from our authorized sales representative of your region.

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