



GE Gemini Compressor



Micro-Design, Inc. (MDi) offers a complete line of standard CNG packages ready for use in any of your applications. We have small packages that will serve small CNG fleets ranging from 2 to 20 vehicles and larger packages that will serve 10 to 150 vehicles including transit buses, airport shuttle buses, garbage trucks, road sweepers, transports, etc. The heart of all medium to large packages is the high quality, industry proven GE Gemini compressor. It is a horizontal, balanced, opposed design that has been working out in the Oil and Gas industry for over 20 years, and has been employed in hundreds of CNG stations. MDi offers complete CNG station solutions using these versatile packages along with storage, valve panels, dispensers and state-of-the-art controls.

Standard Packages

1) MDi-CNG767	MDI 767 with Motor drive	10-17 SCFM	17 – 29 CMH
2) MDi-GE100M	GE M302 with Motor drive	100-200 SCFM	170 – 340 CMH
3) MDi-GE150M	GE M302 with Motor drive	200-250 SCFM	340 – 425 CMH
4) MDi-GE200M	GE H302 with motor drive	280-400 SCFM	476 – 680 CMH
5) MDi-GE250M	GE H304 with motor drive	300-600 SCFM	510 – 1019 CMH

MDi's packages include Standard electric motors rated for C1D2 with soft start units shipped separately. Standard controls include 1 year of LevelCon web based service and ScadaPoint graphical interface. Sensors are provided for all pressure and temperature parameters including oil pressure, oil level, vibration, gas detection, etc.

CNG767 Small Compressor Package

- Ideal for small fleets 2 to 10 vehicles
- Ideal backup for large CNG systems
- Ideal for factory utility equipment
- Motor or Engine Drive
- Trailer mount option
- Controls include LevelCon & ScadaPoint
- Small footprint – 6' x 3' x 4'
- Inlet pressure 0 – 5 PSI, 0 – 0.4 Bar
- Discharge Pressure 4200 PSI, 290 Bar
- 240 VAC, 1 PH power





Compressed Natural Gas is one of the cleanest burning motor fuels available to the world market. MDi fueling systems offer the most advanced technology and highest efficiency for vehicle fleet fueling available in the market.

The MDi fueling systems are custom designed to meet the needs of the client. Systems are available in various configurations, pressures and flow rates. Small to large systems are available utilizing inlet pressures as low as 5 psig/ 34.6 kPa with discharge pressures to 5000 psig/ 344 bars. These CNG packages are designed to operate in the 100 SCFM (200 m3)/hr to 1500 SCFM (2411 m3)/hr capacity ranges.

MDi also offers High Flow Valve Panels and Controls for Bank Fill Priority and Banks/compressors Gas Flow Sequencing for Fast-Fill and Timed-Fill systems. Controllers incorporate Industry Standard "Accufil" type Fast-Fill algorithms for temperature compensated fills.

- **NGV Total Station Solutions**

CNG Compressor packages 50 SCFM – 1500 SCFM
 Priority/Sequential Fill Systems
 Valve Panels
 Dispensers
 Controls

- **Electronic Controls**

Compressor Controls Motor/Engine Drive
 Sequential/Priority Controls
 Dispensing Systems – Fast Fill/Timed Fill
 Card Access Systems
 SCADA Systems
 Remote Monitoring
 GSM/GPRS/SMS connectivity
 Internet access

- **Engineering & Mechanical**

NGV Fueling Stations
 Station Additions
 Station Upgrades
 Analytical Services and Solutions

CNG Systems Components Available

Compressors	Gemini
Motors TEFC XP	GE, Reliance, Toshiba (50/60Hz)
Engines	Caterpillar, Waukesha, GM (454v8)
Gas coolers	AirX changer FinXchanger, BAC, Evapco
Controllers	MDi microprocessor controllers, GE Fanuc
Dispensers	MDi, Kraus, Accel
Vessels	Pressure Products Inc.





MDi CNG Compressors THE HEART OF THE CNG FUELING SYSTEM

Special care is taken with both motor and engine alignment on MDi skid packages. A slight deviation from the true alignment can quickly cause seal and bearing problems on these high-pressure units. Each component is carefully selected to assure proper fit and all piping and tubing meets ASA B31.3 specification for high pressure applications.

Pipe flow rates are calculated based on the mass flow at operating conditions. Piping is normally Schedule 80 or 160 or is stainless steel tubing with extra heavy construction. All components are protected with relief valves, which are vented away from the package. Fire protection "Failsafe" valves are included on gas inlets and engine fuel lines. Each system includes an automatic blow-down of the high-pressure system. All lubrication systems include replaceable filters and all gas lines include either replaceable or "y" type strainers. The units are designed such that all parts are easily accessible for maintenance and replacement.

Electrical components are selected based on customer specifications and are available for compliance with Class 1, Div. 1 or Class 1, Div. 2 Rated Hazardous locations. The units comply with all requirements of NFPA52. Each skid is fitted with gas detection as standard and fire detection optionally. Standard MDi controls are CSA/Factory Mutual approved for operation in the specified areas.

Each skid is thoroughly tested at the factory for full performance and all cylinders are monitored and adjusted during test for proper balance and load sharing.

The Compressed Natural Gas (CNG) fueling industry utilizes a variety of sizes and compressor configurations to keep the fleets fueled and running. Mdi offers a wide range of compression systems to the CNG market.

The standard Mdi compressor-charger assembly includes all of the components necessary for the compressor unit to operate 24 hours a day 365 days a year in most cases unattended. Sizing from 100 SCFM to 1800 SFM are in our normal range.

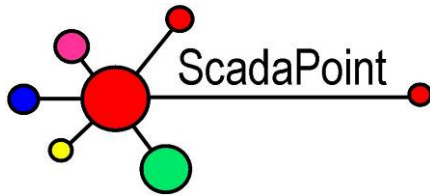
All of the packages start with a structural steel base designed for the weight and torque of the particular application. All systems are designed on CAD 2000 systems so that all tolerances are predetermined before any assembly begins.

The main components of the Mdi compressor package include high pressure multi stage reciprocating compressors. Most units are either three or four stage depending on the inlet and outlet pressures. The prime mover for the compressor is selected to meet both the speed requirements and horsepower of the compressor at its most severe condition. Our policy on driver selection is to be conservative. The next size up will normally alleviate many operational problems and allow for future increase in capacity.

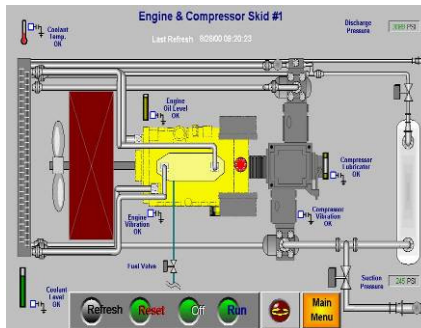
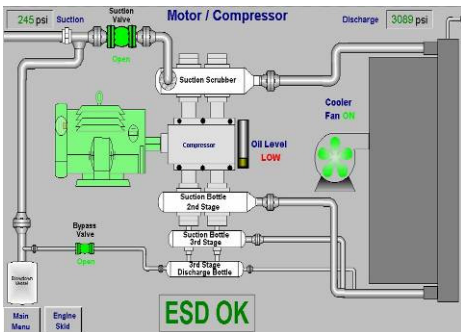
The interstage gas coolers and engine oil coolers are all computer selected based on the engine and compressor manufacturer data sheets. All coolers are sized to meet the local conditions plus some.

Enclosures are selected per Sound Suppression requirements and coolers are louvered to meet the requirements.



THE MAGIC THAT TURNS ALL OF THE COMPONENTS INTO A FUNCTIONAL FUELING FACILITY


True Virtual SCADA on the web. Complete station design is available on the web via secured access. MDi's LevelCon system provides excellent web monitoring of all system parameters including alarms that can be set to trigger emails, text messages, etc. Notifications can be sent based on events such as compressor start/stop, active fill hoses, etc.



System monitoring can be direct connected, via **MODBUS** or can be wireless via broad-spectrum radio or via cellular communication.

SCADA overview systems with graphic screens as shown are all available. Data can be accumulated and displayed in several styles of trending charts. All Data is stored and can be accessed at any time in form of trends, graphs, spread sheets or customized reports.

The MDi Controls also interface with Card Access Systems and billing activities can be incorporated.

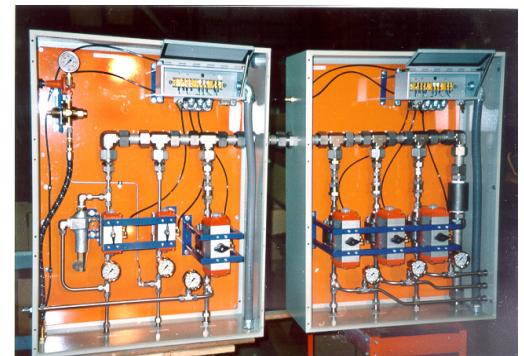
The MDi Systems Integration, engineering, equipment, control, and system KNOW-HOW give you the best CNG Fueling System available.

The controls required to make a CNG fueling system operate as specified by the owner can include graphic displays as shown above or be as simple as the transducer gauge panel shown below. Standard Screens already developed for most MMI programs cover many CNG Station and compressor skid configurations.

MDi has been involved in microprocessor based controls for the Gas Compression Industry and especially CNG applications for many years. A listing of some of the CNG controllers installed is available on the MDi CNG client List.

The single-board microprocessor developed and built by MDi, plus the MDi compressor control software and the MDi sequential priority control software make a complete integrated package ready to run any style CNG facility.

This control package gives the MDi CNG Fueling Systems a distinct advantage over other "BUILT UP" and customized PLC systems. The software for compressor control and the sequential priority control easily communicate with each other. The system also has simple communications capabilities for remote monitoring and control. For Instance, no special software is needed to communicate with any MDi controllers. Any standard communications package such as "**Microsoft HyperTerminal**" will allow full access to all parameters in the controllers.


MDi Microprocessor controllers for industrial locations

- Reciprocating and Screw compressor controllers
- Remote Terminal Units –Wireless communication
- Sequential Priority Controllers for CNG Fueling
- Water Treatment System Controllers
- Refrigeration Compressor Controllers
- Tank Monitoring with GPS and Wireless Communications
- Humidity and Temperature Control for Food Processing

MDi CNG Systems Picture Gallery

