

# A WORLD OF COMPRESSORS FOR A WORLD OF DIFFERENCE



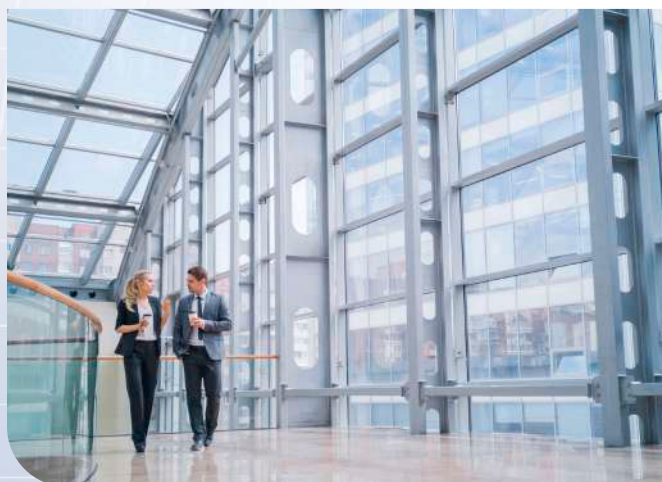
# A WORLD OF COMPRESSORS FOR A WORLD OF DIFFERENCE

For over 100 years, Carlyle has lead the development of compressors for all sizes and types of refrigeration applications. Our current product lines include **open drive** and **semi-hermetic reciprocating** and **screw compressors**.

Today, with worldwide concern about the global warming potential (GWP) of common hydroflouorocarbon (HFC) refrigerants, we are applying our technological capabilities to the development of compressors that use alternative refrigerants, including natural, carbon-neutral refrigerants while still meeting the need for reliable, efficient operation and low life-cycle costs. Carlyle compressors are capable of retrofitting to the latest low GWP solutions.

In addition to product innovation, Carlyle means worldwide reach. With sales and facilities around the globe, we are truly a global supplier, and fully prepared to address your needs wherever you and your customers are in the world.

COMPRESSOR TYPE	FAMILY	NOMINAL HP	CAPACITY RANGE (CFM)
Semi-Hermetic Reciprocating	06D	2 - 15	8 - 41
Semi-Hermetic Reciprocating	06E	15 - 40	50 - 99
Compound Cooling 2 stage	06CC	5 - 30	17 - 99
Semi-Hermetic Reciprocating	06M	9 - 15	15 - 24
Semi-Hermetic Twin Screw	06T	15 - 50	33 - 108
Semi-Hermetic Twin Screw	PARAGON 06TS, 06TT, 06TU, 06TV	60 - 340	137 - 819
Semi-Hermetic Twin Screw	06Z	130 - 325	170 - 787
Open Drive Reciprocating	05K	5 - 7.5	12 - 24
Open Drive Reciprocating	05G	7.5 - 15	37 - 41
Open Drive Reciprocating	5H	40 - 150	92 - 346



# PARAGON TWIN SCREW COMPRESSORS

## 06TS, 06TT, 06TU, 06TV

### Innovative Design

Carlyle's **Paragon** Twin Screw compressor combines our vast refrigeration and cooling experience with sophisticated technology. Paragon's patented rotor profile and optimized housing geometry design, result in exceptional efficiency and reliability.

### Superior Serviceability

The Semi-Hermetic, Paragon Twin Screw compressors are designed with fewer parts which results in higher reliability and ease of serviceability.

### Efficient Oil Management

Carlyle offers multiple oil separator options to fit the most challenging applications, as well as external, easy-to-service oil filters, level sensors and heaters to reduce installation labor and eliminate the need for an accessory oil pump.

### Perfect Load Matching

All Paragon models utilize a continuous slide valve unloading system for capacity modulation from 25% to 100%, which allows for perfect load matching and superior seasonal efficiency. AC and Low/Medium duty models can also be applied with variable speed drive (VFD).

### Air-Cooled AC Duty

137 - 819 CFM		
R-134a	R-513A	R-1234ze
✓	✓	✓

### Water Cooled AC Duty

266 - 819 CFM		
R-134a	R-513A	R-1234ze
✓	✓	✓

### Refrigeration Duty

137 - 356 CFM			
R-404A	R-448A	R449A	R-507
✓	✓	✓	✓



06TS



06TT



06TU



06TV

# VARIABLE SPEED TWIN SCREW COMPRESSORS - 06Z

## Unequaled Performance

The latest in Carlyle's long heritage of **06Z** screw compressors is available now. With patented rotor profile geometry, optimized casting design, and a built-in Vi valve the Variable Speed Screw is the quietest and most efficient in the Carlyle line.

## Rolling Element Bearings

The robust thrust bearing design exceeds 2 million hours of life at AHRI IPLV conditions.

There is no in-service inspection required, nor is an oil pump is required.

## Three frame sizes

Tonnage for tonnage, chassis are smaller than conventional twin screw models.

## High Strength Motor

The high efficiency motor is suction cooled, with screen, for improved reliability. An integrated NTC winding sensor provides further thermal protection. And the motor is a slip fit for improved serviceability.

## Perfect Load Matching

The Variable Speed Screw compressor is effective down to 20% load. Loads are matched with a VFD range from 25 Hz to 105 Hz (varies by frame size), and a built in Vi valve provides optimal performance at both full and part-load conditions.

## Air & Water Cooled AC Duty

170 - 787 CFM		
R-134a	R-513A	R-1234ze
✓	✓	✓



06Z



# SEMI-HERMETIC SCREW - 06T

## Unique Design – Efficient and Durable

Carlyle's small-space **06T** screw compressor provides better performance and reliability than reciprocating compressors without sacrificing energy. The twin-screw design is tolerant to liquid flood-back and is able to utilize liquid heat exchangers on all temperature applications, providing increased capacity and stabilized system performance.

## Compact Size and Weight

They are 15% smaller and lighter than comparable reciprocating compressors, yet have up to 50% higher capacities reducing space required for mechanical rooms and reducing applied cost. Careful engineering minimizes vibration and sound levels while maximizing reliability.

## Application Flexibility

Built new from the ground up, this product meets the needs of both commercial and industrial applications ranging from high to low temperatures in single, parallel, and externally compounded system designs. Our step up gear design is ideal for variable speed capacity control systems.

## Refrigerant Friendly

Carlyle 06T twin-screw compressors are proven reliable in a wide variety of refrigerant applications. Careful design considerations lead to improved performance when applied with R-134a, R-404A, R448A, R-449A, R-507, and with POE oils.

### AC Duty

33 - 88 CFM	
R-134a	R-407C
✓	✓

### Refrigeration Duty

33 - 88 CFM			
R-404A	R-507	R-448A	R-449A
✓	✓	✓	✓



# SEMI-HERMETIC RECIPROCATING COMPRESSORS

## 06D & 06E

### Efficient Performance by Design

The **06D** design begins with a 2-cylinder model from 2 to 3HP and quickly increases to a 4-cylinder V configuration from 3 to 6.5 HP and then a 6-cylinder W configuration from 6.5 to 15HP. The **06E** design begins with a 4-cylinder V configuration from 15 to 20 HP and then a 6-cylinder W configuration from 20 to 40HP. The piston movement in these V and W configurations are designed to improve balance and lower sound & vibration as well as internal operating temperatures.

### Efficient Capacity Control

The optional suction cut-off system prevents refrigerant from entering the cylinder to control the compressor capacity. This design eliminates the recompression of refrigerant, as used by competitors, reducing operating costs and assuring consistent capacity reduction in all ambient conditions. Add a Variable Frequency Drive (VFD) for precise load matching.

### Reliability by Design

Our crankcase venting system, combined with an oversized oil sump, results in equalized internal start-up pressures to eliminate nuisance oil trips and assures oil return to the compressor. The positive displacement oil lubrication system extends across the full range down to the 2HP model and combines high flow oil pump with an oil pressure regulator. This assures reliable lubrication with minimum oil circulation in the system.

### Refrigerant Friendly

Carlyle reciprocating compressors are proven reliable in a wide variety of refrigerant applications. Careful design considerations in the valve plate, venting, and lubrication areas lead to improved performance when applied with R-134a, R-513A, R-404A, R-407C, R448A, R-449A, R-507 and with POE oils.

### AC Duty

8 - 99 CFM		
R-134a	R-513A	R-407C
✓	✓	✓

### Refrigeration Duty

8 - 99 CFM			
R-404A	R-448A	R-449A	R-507
✓	✓	✓	✓



06D



06E

# COMPOUND COOLING 2 STAGE COMPRESSORS 06CC

## Innovative Technology

Carlyle's innovative design **06CC** makes it literally two compressors in one, with both high and low stages built into one compressor. Our new narrow-seat valve design makes it the most efficient low temperature compressor in the market for HFC applications from the 5HP to 30HP range.

## Higher Efficiency

Compound Cooling, Two-Stage compressors are dedicated to low temperature applications, operating as low as -60°F (-51°C). The Two-Stage design allows for lower compression ratios which results in increased capacity, the application of smaller HP motors and lower applied costs.

## Optimized System Operation

Compatible with HFC refrigerants and POE oil in single, multiplexed, and parallel system design configurations. Utilizing liquid sub-cooling minimizes liquid temperature fluctuation to expansion devices in systems incorporating floating condensing temperatures.

## Refrigerant Friendly

Carlyle reciprocating compressors are proven reliable in a wide variety of refrigerant applications. Careful design considerations in the valve plate, venting, and lubrication areas lead to improved performance when applied with R-404A, R448A, R-449A, R-507 and with POE oils.

## Low Temp Refrigeration Duty

17 - 99 CFM			
R-404A	R-448A	R-449A	R-507
✓	✓	✓	✓



06CC

# SEMI-HERMETIC RECIPROCATING COMPRESSORS

## 06M

### Optimized Models For All Applications

The **06M** models are available for high and medium temperature HVAC applications.

### Multiple Unloading Options

Apply the control that's right for the job. Options include: Variable Frequency Drive (VFD), Step (with capacity control solenoid), Pulse Width Modulation (PWM) valve and control module.

### Space Saving Footprint

In many cases, the narrow 06M footprint will fit to replace scroll compressors.

### Flexible And Simple Application

Application is made easy with dual sight glasses, terminal box rotation, optional suction locations, and a standard mounting pattern across all models.

### AC Duty

15 - 24 CFM

R-410A



06M

# SEMI-HERMETIC RECIPROCATING COMPRESSORS FOR CO<sub>2</sub> 06V FOR TRANSCRITICAL DUTY

## Non-Ozone Depleting, Sustainable Refrigerant for the future

CO<sub>2</sub> (R-744) is a carbon neutral, non-ozone depleting refrigerant and addresses today's concerns about the global warming potential (GWP) of common hydrofluorocarbon (HFC) refrigerants. CO<sub>2</sub> is part of a small family of natural refrigerants found in the natural environment.

## 06V for CO<sub>2</sub>

New **06V** models optimized for CO<sub>2</sub> employ the proven two-cylinder, two-stage design which allows for intercooling and mechanical subcooling between stages. Add a Variable Frequency Drive (VFD) for precise load matching. With a wide operating envelope and a small footprint, 06V for CO<sub>2</sub> are ideal for transcritical applications.

## Refrigeration Duty

3.4 CFM

R-744 CO<sub>2</sub>



06V

# OPEN DRIVE COMPRESSORS FOR TRANSPORT AIR CONDITIONING

## 05G, 05K

### Money Saving Flexibility

The automatic unloaded start capability makes expensive high-torque motors unnecessary, reducing initial expense.

### Dependable Performance

Positive pressure lubrication extends the life of the compressor. Compressors can be operated as a direct drive or belt drive with the ability to use a variety of motors – electrical, natural gas, and diesel to name a few. Multi-step unloading is available in both internal hydraulic and external electronic control configurations.

### Energy Efficient Operation

The design of the crankcase casting, cylinder heads and valve plates allow for a smooth, unrestricted flow of refrigerant through the compressor, resulting in greater operating efficiencies.

### Simple to Maintain

Some models are designed to be completely rebuilt on-site, including cylinder wall replacement.

### Refrigerant Friendly

Carlyle reciprocating compressors are proven reliable in a wide variety of refrigerant applications. Careful design considerations in the valve plate, venting, and lubrication areas lead to improved performance when applied with R-134a, R-1234yf, R-452A, and with POE oils.

### AC Duty

12 - 41 CFM		
R-134a	R-1234yf	R-452A
✓	✓	✓



05K



05G

# OPEN DRIVE COMPRESSORS FOR REFRIGERATION

## 5H

### Money Saving Flexibility

The automatic unloaded start capability makes expensive high-torque motors unnecessary, reducing initial expense.

### Dependable Performance

Positive pressure lubrication extends the life of the compressor. Compressors can be operated as a direct drive or belt drive with the ability to use a variety of motors – electrical, natural gas, and diesel to name a few. Multi-step unloading is available in both internal hydraulic and external electronic control configurations.

### Energy Efficient Operation

The design of the crankcase casting, cylinder heads and valve plates allow for a smooth, unrestricted flow of refrigerant through the compressor, resulting in greater operating efficiencies.

### 5H for Ammonia

Ammonia (R-717) is a carbon neutral, non-ozone depleting refrigerant and addresses today's concerns about the global warming potential (GWP) of common hydrofluorocarbon (HFC) refrigerants. Ammonia is part of a small family of natural refrigerants found in the natural environment.

All components qualified for Ammonia operation.

Factory Installed Features:

- Electric Solenoid Unloading
- Oil Pressure Safety Switch
- Suction & Discharge Service Valves

Optional Accessories:

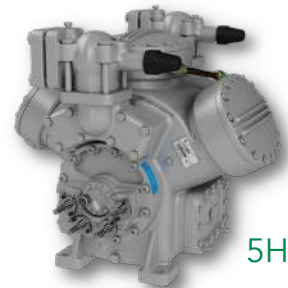
- Mufflers
- Oil Cooler Kit

### AC Duty

20 - 346 CFM		
R-134a	R-513A	R-407C
✓	✓	✓

### Refrigeration Duty

20 - 346 CFM				
R-404A	R-507	R-448A	R-449A	R-717 Ammonia
✓	✓	✓	✓	✓



# COMPRESSOR CONTROL ACCESSORIES

## VARIABLE FREQUENCY DRIVE (VFD)

**Optimal Capacity Control Range** Optimize the application operation modulating the compressor's low and high speed using a Variable Frequency Drive (VFD) reducing or increasing the capacity for precise load matching.

An impactful solution improving partial load efficiency by offering Variable Frequency Drive (VFD)

Enables improved speed control for ramping up the compressor for a smooth startup and prevents a heavy load extending the life of the equipment.

**Compressor Application** All Carlyle compressors are VFD capable.



## PWM VALVE & CONTROL MODULE

**Saves Energy with Precise System Control** Load matching with tighter suction pressure control allows you to float the suction pressure while improving compressor efficiency.

**Carlyle Reliability** The PWM valve underwent extensive high cycle qualification testing and use of the PWM valve reduces compressor cycling of the fixed compressors for the extended compressor life and reliability.

**Even More Efficient Two Stage Compressors** The Carlyle compound cooling compressor provides superior efficiencies for low temperature applications. With the PWM valve, your low temperature system will have the best of both worlds – precise capacity control and even greater energy efficiency, making Carlyle a clear choice for all your low temperature applications.

**Compressor Application** The PWM control module is designed to operate with 06D, 06E, 06CC and 06M compressor models for all low, medium and high temperature applications.



## 06T & PARAGON CONTROL MODULE (CCM)

**User Configurable** The Carlyle Control Module (CCM) is user configurable for both slide valve & compressor protection, slide valve control only, or compressor protection only. The control set-point can be specified for either pressure or temperature.

**CCM Inputs** The CCM has multiple sensors to control the controller set-point, the motor temperature, discharge temperature, and oil flow and level.

**CCM Outputs** The CCM monitors the slide valve unloader coils #1 and #2, the motor cooling valve, and the compressor start/stop circuit.

**LED Fault Code Outputs** Multiple fault code outputs alert to potential issues such as high motor temperature, high discharge temperature, loss of oil flow to the compressor, low oil level in the oil separator, or of a faulty sensor. The PCM is network capable with ModBus®, BacNet®, LonWorks®, N2 Open, and RS485 communications port.

**Compressor Application** The CCM is designed to operate with all 06T & Paragon screw compressor models.



Carlyle Compressor | P.O. Box 4808 |  
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ModBus is a registered trademark of Schneider Electric. BacNet is a registered trademark of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.). LonWorks is a registered trademark of Echelon Corporation.

