



# MASTERFLUX COOLING SOLUTIONS

DIRECT DC VARIABLE CAPACITY



[MASTERFLUX.COM](http://MASTERFLUX.COM)

# DIRECT DC

## VARIABLE-CAPACITY COOLING SOLUTIONS FOR EMERGING APPLICATIONS

Masterflux, a Tecumseh brand, designs and manufactures a wide range of direct DC, variable capacity compressors and systems for a variety of emerging applications.

Compact and lightweight, highly efficient and reliable, our Masterflux compressors are developed for mobile applications and high COP. Masterflux also develops cooling and refrigeration systems such as eBTMS (battery thermal management system), eMRU (electric mobile refrigeration unit), and eHVAC for EV/ICE vehicle applications.



## MASTERFLUX APPLICATIONS

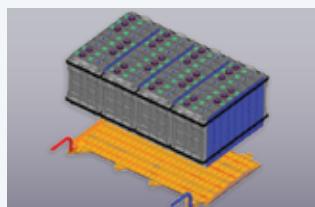
Well suited for a variety of DC applications covering the ordinary to the extraordinary:

### IDLE MITIGATION



Masterflux's line of compressors is ideally suited for battery powered no-idle applications for OEM and aftermarket systems.

### BATTERY THERMAL MANAGEMENT



Masterflux's compressors and Battery Thermal Management systems are designed for fast and efficient Air and Liquid Cooling of EV Battery Packs.

### LAST-MILE DELIVERY



Quiet, robust and highly-efficient cooling designed for frequent deliveries with rapid-pull-downs.

### MEDICAL/SCIENTIFIC



Because our compressors can be powered by low DC voltage, regulatory certification is greatly simplified.

### SOLAR/OFF-GRID POWER



Masterflux offers a solution for DC systems running on solar, battery, or other off-grid power sources.

### MILITARY



Our technology can be found in military applications from the use of chiller technology for cooling a soldier to powering thermal systems for electronic cooling.

### ELECTRONICS



With demanding requirements for electronic cooling, Masterflux is at the forefront of the development of new cooling concepts for electronic systems.

### MOBILE CONTAINERS



Compact and reliable Masterflux used by global logistic services.

# MASTERFLUX SOLUTIONS

## SYSTEMS

### eBTMS



Air-cooled and Liquid-chiller systems for EV Thermal Management

### eHVAC



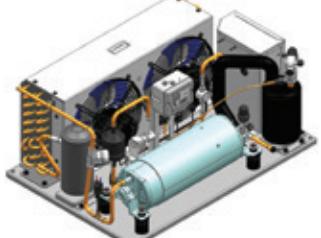
Highly energy-efficient Idle-mitigation solution optimized for commercial vehicles.

### eMRU



Electric Mobile Refrigeration Units for mobile containers and Last-Mile deliveries.

### SPECIALIZED



Custom cooling units for special applications such as electronics and medical chillers.

## COMPRESSORS

### MESA



High Temp:  
BTU: 312-1598  
Watts: 91-468

### CASCADE



Low Temp:  
BTU: 100-621  
Watts: 29-182

High Temp:  
BTU: 980-2570  
Watts: 287-753

### ATLAS



Low Temp:  
BTU: 500-970  
Watts: 147-284

High Temp:  
BTU: 1800-6000  
Watts: 527-1758

### HG / VHG



Up to 15k BTU in High Temp  
Watts: Up to 4395

### SIERRA



Up to 15k BTU in High Temp  
Watts: Up to 4395

### ALPINE



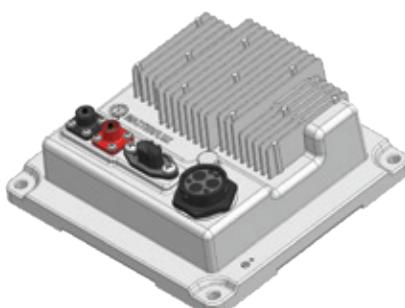
Up to 31K BTU in High Temp  
Watts: Up to 9000

## CONTROLLERS

Masterflux controllers are designed and developed in-house, optimized for specific Masterflux compressors.

For each model of compressor, there may be several versions of the controller to choose from.

Ask us about custom controller development for your specific application.

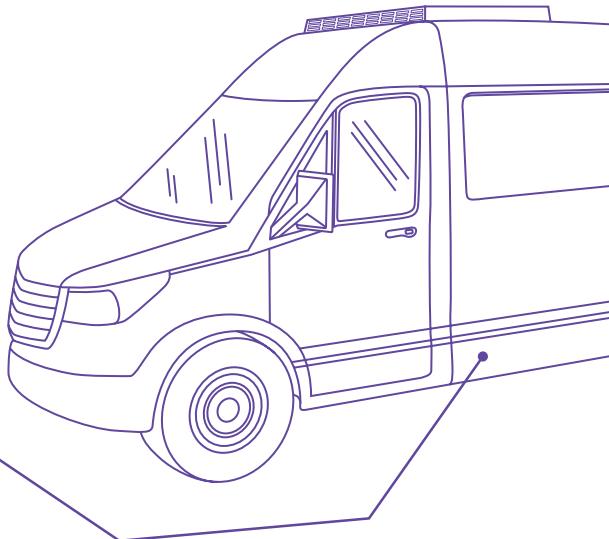
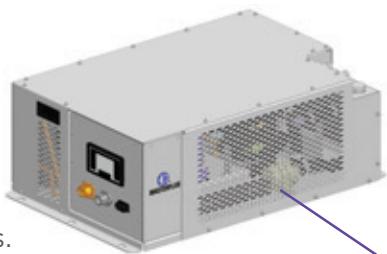


# I DIRECT DC SYSTEMS

## eBTMS

### (ELECTRIC BATTERY THERMAL MANAGEMENT SYSTEMS)

Highly efficient active-cooling systems with Direct-DC compressors ensure precise temperature control to optimize battery life of EV applications.



From micro-compressors to full-sized tandem setups, Masterflux offers a wide range of variable-cooling capacities for your applications.

#### PLATFORM A



Cooling Capacity:  
BTU: 512-1700  
Watts: 150-500  
Air cooled and liquid cooled version

#### PLATFORM B



Cooling Capacity:  
BTU: 2050-6800  
Watts: 600-2000  
Liquid cooled version

#### PLATFORM C

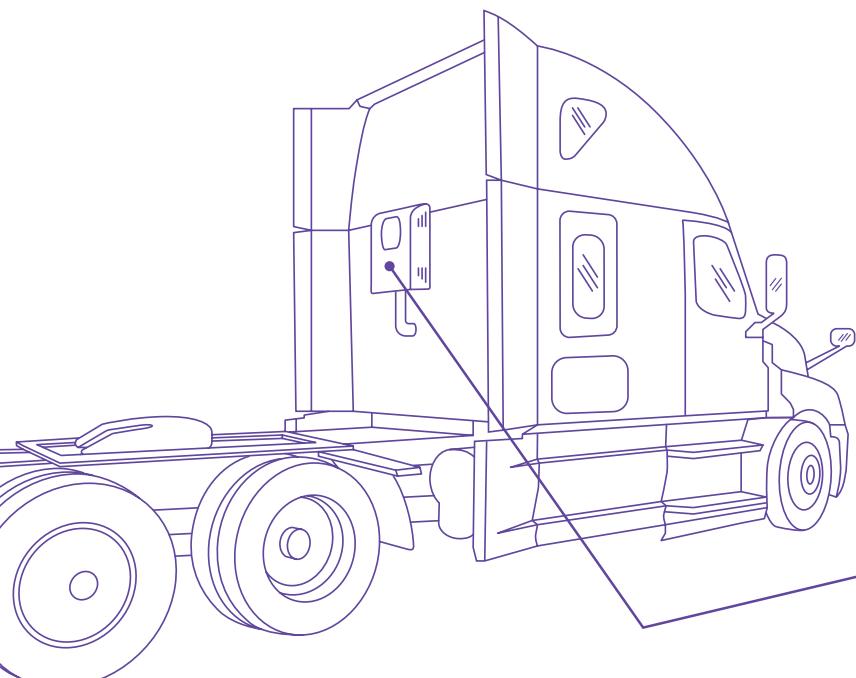


Cooling Capacity:  
BTU: 8500-15000  
Watts: 2500-4500  
Liquid cooled version

#### PLATFORM D



Cooling Capacity:  
BTU: 17000-31000  
Watts: 5000-9000  
Liquid cooled version



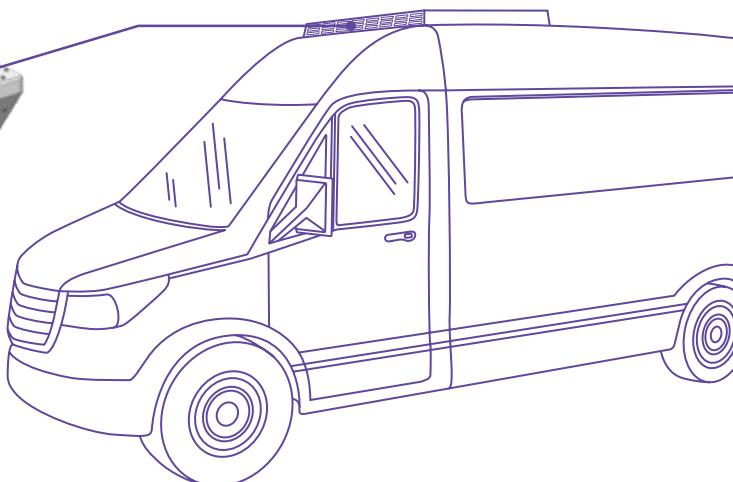
## eHVAC (ELECTRIC HVAC SYSTEMS)

There is no secret that Masterflux DC Compressors have been used for “non-idle” air conditioning for decades by major truck manufacturers. Masterflux is extending the offering by packaging idle-mitigation systems for your needs.



## eMRU (ELECTRIC MOBILE REFRIGERATION UNITS)

Fresh or frozen. Masterflux eMRU offers a variety of efficient, reliable and compact electric refrigeration systems; condensing units for food trucks, micro-systems for mobile containers, full refrigeration systems for TRU and other last-mile transports.



**MX-150**



Cooling Capacity:  
1500 Watts (@ 0°C)  
5000 BTU/h (@ 32°F)

**MX-250**



Cooling Capacity:  
2500 Watts (@ 0°C)  
8500 BTU/h (@ 32°F)

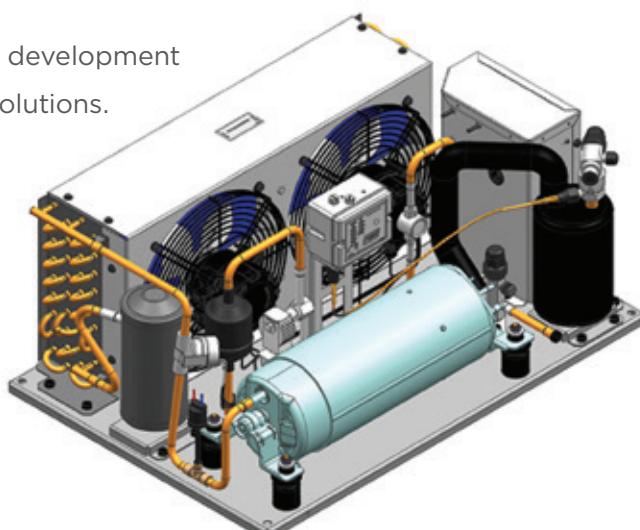
**MX-550**



Cooling Capacity:  
5500 Watts (@ 0°C)  
19000 BTU/h (@ 32°F)

## I SPECIALITY DC COOLING

Masterflux offers custom development of specialty DC cooling solutions.



Some examples of applications include:

- Electronics & semiconductors
- Food trucks & carts
- Telecom & solar
- EV DCFC stations
- Mobile chillers
- Ask us more!

# COMPRESSORS & CONTROLLERS



**MESA**

## MESA

Our Mesa family of compressors are the perfect choice for small DC-powered refrigerators used in recreational vehicles, buses, trains, trucks and boats, as well as medical and telecommunications applications. The Mesa compressor is rugged, light-weight and can fit any unique installation requirements.

### FEATURES & BENEFITS

- Micro/Mini rotary BLDC compressors one-fourth the size of conventional compressors
- High-efficiency motors with optimized pumping mechanisms results in industry leading EERs
- Stable and low vibration mechanisms coupled with reduced friction cylinder components minimize noise

### TECHNICAL INFO

Refrigerant: R134a

Application: High Temp

Cooling Capacity:

1540 BTU/hr (High Temp)  
450 Watts (High Temp)

Voltage Range:

12 VDC, 24 VDC, 48 VDC

**CASCADE**

## CASCADE

Our Cascade compressor is ideally suited for battery powered mobile and stationary applications as well as battery cooling. From medical to mobile refrigeration and from solar refrigeration to telecommunications, our Cascade family of compressors are perfect for your application. With an integrated electronic control mounted on the compressor, Cascade is the optimal combination of compressor and controller in one compact and efficient footprint.

### FEATURES & BENEFITS

- Low temperature compressor ideally suited for mobile applications
- High temperature models available for telecom applications
- Integrated electronic controller mounting

### TECHNICAL INFO

Refrigerant: R134a

Application: Low, High Temp

Cooling Capacity:

100-621 BTU/hr (Low Temp)  
980-2570 BTU/hr (High Temp)  
29-182 Watts (Low Temp)  
287-753 Watts (High Temp)

Voltage Range:

12/24V Dual Voltage Models and  
24V and 48V Models

**ATLAS**

**SIERRA**

**ALPINE**

## ATLAS

The compactness of our Atlas compressors make them suitable for a wide variety of applications. Mobile applications such as recreational vehicles, buses, trains, trucks or boats find Atlas as the compressor of choice to fit their unique installation needs. Other industries such as medical and telecommunications choose Atlas for its wide voltage range capabilities of 12, 24 and 48 VDC. Our Atlas family of compressors are setting the industry standard for durability and will meet any customer need head on.

### FEATURES & BENEFITS

- Compact, high-powered, efficient and lightweight
- Suitable for an extensive range of applications
- High-efficiency motors with optimized pumping mechanisms results in industry leading EERs

### TECHNICAL INFO

Refrigerant: R134a, R1234yf

Application: Low, High Temp

Cooling Capacity:

500-970 BTU/hr (Low Temp)  
1800-6000 BTU/hr (High Temp)  
147-284 Watts (Low Temp)  
527-1758 Watts (High Temp)

Voltage Range:

12 VDC, 24 VDC, 48 VDC

## HG / VHG

The VHG is a variable speed, rotary compressor with a direct DC drive. Our customers choose the VHG compressor because it eliminates the need to convert DC voltage to AC voltage to drive the compressors. VHG is the perfect choice for rooftop AC and rooftop refrigeration units used in recreational vehicles and last-mile delivery. With its light weight, low profile and wide capacity range, the VHG reduces overall power consumption, increases battery life and can fit a wide variety of customer applications.

### FEATURES & BENEFITS

- High efficiency BLDC motor
- Ready for mobile applications
- Smart controller (voltage, frequency, serial interface) 16cc displacement

### TECHNICAL INFO

Refrigerant:  
R404A, R452A, R134A, R1234yf, R513A, R290  
Application:  
Low Temp, Med Temp, High Temp  
Cooling Capacity:  
Up to 15k BTU in High Temp  
Up to 4395 Watts  
Voltage Range:  
12 VDC, 24 VDC, 48 VDC and 400 VDC

## SIERRA

No matter the requirement, the Sierra family of compressors is the solution. Pound for pound, Sierra has the widest operating range and the most capacity of any compressor on the market, so it is no surprise you can find it in hundreds of applications. Sierra is well suited for transport applications such as electric vehicles, trains, buses and aircrafts but is also used in the military, battery cooling and telecommunications industries. By integrating diagnostics into the variable speed drive, the Sierra family of compressors has set the standard for reliability.

### FEATURES & BENEFITS

- High-efficiency, high-capacity, BLDC compressor line
- Robust rotary design ideally suited for mobile and transport applications
- Dual compressor configurations for increased capacity range

### TECHNICAL INFO

Refrigerant:  
R134a, R404A, R-290, R1234yf, R513A  
Application:  
Low, Med, High Temp  
Cooling Capacity:  
Up to 15k BTU in High Temp  
Up to 4395 Watts  
Voltage Range:  
12 VDC, 24 VDC, 48 VDC, 400 VDC, 650 VDC and 850 VDC

## ALPINE

Alpine brings the best capacity and efficiency to the market, delivering a reliable and compact DC cooling and heat pump solution for **e-mobility, transport refrigeration and last-mile delivery**. The applications include HVAC, heat pump, battery thermal management, and power train component cooling, both for on and off-road electric vehicles. Designed to be the best in class with a brushless DC motor and a wide voltage range up to 850 VDC, offering a light-weight solution with CANBUS communication, IP67 rating and a variety of low-GWP refrigerants.

### FEATURES & BENEFITS

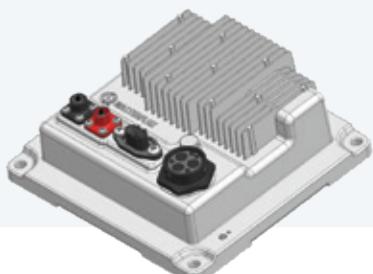
- Designed for EV and transport applications
- Light-weight solution, IP67 rating and integrated controller
- CANBUS communication

### TECHNICAL INFO

Refrigerant: Low Temp – R452A, R290  
High Temp – R134a, R513A, R1234yf  
Application:  
Low, Med, High Temp/ Heat pump  
Cooling Capacity:  
Up to 31k BTU in High Temp  
Up to 9k Watts  
Voltage Range:  
400 VDC, 650 VDC and 850 VDC

## CONTROLLERS

Each Masterflux compressor requires a Masterflux sensorless BLDC motor controller to operate. For each model of compressor, there may be several versions of the controller to choose from. These controllers are specifically tested and optimized for each compressor and ensure optimal performance.



### KEY FEATURES

- Compressor initiation and operation
- Variable speed control
- Locked-rotor protection
- Limits power and current draw
- Thermal protection and shutdown of compressor and controller
- Provides diagnostic information
- Low-voltage and high-voltage shutdown



### OPTIONAL ACCESSORIES

- Compressor harnesses
- Manual control devices
- Serial and USB diagnostic devices



**TECUMSEH COMPRESSOR COMPANY LLC**

Subsidiary of Tecumseh Products Company LLC

5683 Hines Drive | Ann Arbor, MI 48108

734.585.9500 | [tecumsehmarketing@tecumseh.com](mailto:tecumsehmarketing@tecumseh.com)

[www.tecumseh.com](http://www.tecumseh.com)