P.O. Box 429, 805 Greenlawn Road, Murphy, NC 28906-0429 TEL: (828) 837-4029 www.aegispower.com

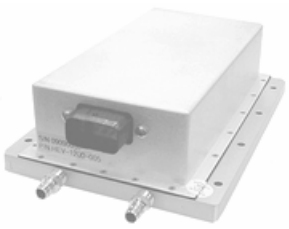
Aegis Power Solution

HEV / MEV

Hybrid Vehicle Power Converter

Input Range 250VDC – 425VDC

Rev A07, 12/01/2010



Input Connector
Discrete Monitor

Output Connector
All Models

Input Connector
CAN Bus Monitor

HEV/MEV General Information and Part Numbering App Note

The HEV/MEV series of unidirectional DC-DC Power Converters offer many configurations of power capabilities, monitoring needs, and additional options. The converter is the link between the 300VDC high voltage battery power bus and the low voltage 12V power bus of the vehicle's electrical system. Cooling is accomplished using the vehicles liquid cooling system which the HEV power converter can be tapped into using the ¼" hose barbs which are threaded to the HEV cooling base plate.

Model, Watts, Output Voltage, Monitoring Method, additional Options must be specified when ordering. Call AEGIS Power, 828-837-4029, for assistance in determing a part number for your application.

Refer to the specification sheet for a particular model for greater details and mechanical drawing.

Standard Configuration:

Models: HEV (Industrial, FCC Class A EMI Compliant)
MEV (Military, MIL-STD-461D/E/F EMI Compliant).

Wattages: 585, 1170, 1755, 2340, 2925, or 3510W for 13.8Vdc output only.
600, 1200, 1800, 2400, 3000, or 3600W for all voltages except 13.8Vdc.

Output Voltages: +12.8Vdc, +13.8Vdc, +24Vdc, +28Vdc, or +48Vdc.

Input Connector: 6 Pin IP67 Environmental Rated Molex Snap-On Rectangular Connnector.

Output Connector: Two 3/8" IP67 Environmental Rated Threaded Studs (Pos and Neg).

Cooling: Liquid cooled base plate with ¼" hose barb fittings at the inlet and outlet.

Environmental: Shock, Mil-Std-810F, Method 516.5, Procedure I.
Vibration, Mil-Std-810F, Method 514.5, Procedure I.
Water Tightness, IP67.
Operating Temperature, -40ºC to +65ºC.

Options:

CanBus communications or discrete scaled voltages available to provide monitoring of the internal sensors.
Temp Alarm, Power O.K., input cable disconnect, parallel converter sharing, and remote on/off of output available.
Output voltage trimming within a 3.5V range in 6 steps, high temp shutdown over-ride, and conformal coating available.
Custom options may be available for connector types, input voltages, output voltages, dual outputs, wattages, and others.

Note: Custom configurations require development time, possible change in price, and a custom part number.
Call Aegis Power Systems for part numbers, configuration help, or with your custom needs. 828-837-4029

Standard HEV/MEV Part Numbering & Ordering Information

A **Part Number** consists of **14 Characters** (including 2 dashes) which identify the Power Converter's standard parameters and may include an additional optional letter (15th Character) to identify a custom feature.

When ordering a converter or creating a part number, the six parameters must be identified as detailed below. **The** Custom feature (15th character) will be added by Aegis Power Systems as required by any custom specifications.

Format: **M M M W W W W – V V – M A O C**
Model ***W***attage - ***V***oltage - ***M***onitor ***A***larms ***O***ptions ***C***ustom)

M M M **HEV** (Nominal 336VDC Input, FCC Class A EMI Compliant)
MEV (Nominal 336VDC Input, MIL-STD-461D/E/F EMI Compliant).

W W W W **Wattage: 0600, 1200, 1800, 2400, 3000, 3600**

– **Dash**

V V **Voltage Out: 01 (13.8 Vdc), 02 (12.8 Vdc), 03 (28.0 Vdc), 04 (24.0 Vdc), or 05 (48.0 Vdc).**

– **Dash**

M **Monitoring Selections (In all cases a Monitor selection must be specified, even if None (0).**

0 – **No Monitoring** (No Discrete Monitoring, No CAN Bus Monitoring, No Output Trimming.)
1 – Can Bus Monitoring at 125Khz.
2 – Can Bus Monitoring at 250Khz.
3 – Can Bus Monitoring at 500Khz.
5 – Can Bus Monitoring at 125Khz with Output Voltage Trimming.
6 – Can Bus Monitoring at 250Khz with Output Voltage Trimming.
7 – Can Bus Monitoring at 500Khz with Output Voltage Trimming.
9 – **Discrete Monitor** (Vin, Vout, Iin, Iout, other options provided at the input connector.)

A **Alarm Output Selections (In all cases an Alarm selection must be specified, even if None (0).**
0 – No Alarm Options Installed.
1 – Hi Temp Alarm (85ºC), (Provides pre-warning of Hi-Temp Shutdown.)
2 – **Power O.K.** (Verification that the Output is within voltage specification.)
3 – Hi Temp Alarm and Power O.K.

O **Option Selections (In all cases an Option selection must be specified, even if None (0).**
0 – No Options Installed.
1 – **Cable Connected Signal** (+5V Signal indicating Power Input Cable is connected.)
2 – **Current Sharing** (Allows parallel connected supplies to share current.)
3 – Cable Connected and Current Sharing.
4 – **Output Inhibit** (Disables the power supply output remotely by user.)
5 – Cable Connected and Output Inhibit.
6 – Current Sharing and Output Inhibit.
7 – Cable Connected, Current Sharing, and Output Inhibit.

C **Custom Selections** (Only required if a custom feature has been added.)
Blank - No option, A - Circular Style Input Connector**, C** - Conformal Coating

Consult AEGIS Power Systems for correct part number for your application needs.

Refer to the following page for examples of Part Numbers.

Standard HEV/MEV Part Number Examples

PART NUMBER: M M M W W W W – V V – M A O C
Model Wattage - Volts Out – Monitoring, Alarms, Options, Custom Feature

NOTE: CanBus & Discrete Monitoring CANNOT be provided together.
Choose between CAN Bus, Analog, or None.

No Monitoring:

HEV**1200**-**01**-**000** Industrial Grade, **1170W**, **13.8 Vdc Output**, No Monitoring, No Additional Options.

HEV**1800**-**02**-**000** Industrial Grade, **1800W**, **12.8 Vdc Output**, No Monitoring, No Additional Options.

MEV**2400**-**03**-**000** Military Grade, **2400W**, **28.0 Vdc Output**, No Monitoring, No Additional Options.

No Monitoring with added Options:

MEV1200-**04**-**031** **M**ilitary, 1200W, **24.0V**
(-0xx) None (No CAN Bus nor Discrete Monitoring).
(-x3x) Hi Temp Alarm (85ºC) and Power O.K.
(-xx1) Cable Connected Signal.

HEV1800-**02**-013 **I**ndustrial Grade, 1800W, **12.8Vdc Output**
(-0xx) None (No CAN Bus nor Discrete Monitoring).
(-x1x) Hi Temp Alarm (85ºC)
(-xx3) Cable Connected Signal and Current Sharing

CAN Bus Monitoring:

HEV1200-01-**1**00 Industrial Grade, 1200W, 13.8V, **125Khz CAN Bus,** NO Output Trimming, and NO additional Options.

HEV1800-02-**6**00 Industrial Grade, 1800W, 12.8V, **250Khz CAN Bus with Output Trimming,** No additional Options.

CAN Bus Monitoring with added Options:

MEV3000-03-**313C** **Military** Grade, 3000W, 28.0V, **500Khz CAN Bus, NO Output Trimming, with additional options.**
(-3xxx**) 500Khz CAN Bus**
(-x1xx) Hi Temp Alarm (85ºC)
(-xx3x) Current Sharing with another HEV Power Converter in Parallel.
(-xxxC) PCB is conformal coated.

Discrete Monitoring: (All Discrete Monitored Units will have a 12 pin input connector.)

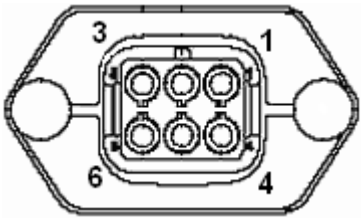
MEV2400-**01**-**924A** Military, 2340W, **13.8V,** **Discrete Monitoring with added options.**
(-9xxx**) Discrete Analog Monitoring.**
(-x2xx) Power O.K. (Output signal to customer.)
(-xx4x) Output Inhibit. (Input signal from customer.)
(-xxxA) Military style circular input connector.

HEV/MEV Power Converter Connector Information:

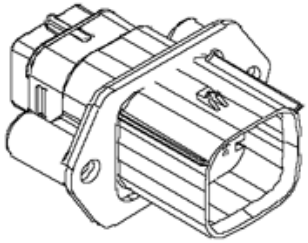
Rev A05 12/01/2010

Standard Connector
(Allows for CAN Bus & One Option or No Can Bus & Two Options)

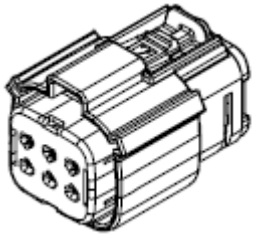
6 Pin Molex Input Connector
(IP67) (Glass Filled PBT Housing)



Wiring Side (Internal)



Pin Side (External)



Customer Mate

Installed Molex Panel Mount Plug: P/N 019429-0036
Customer Mating Receptacle Connector, Molex P/N19418-0010

Input Connector Pin Out

1. **POS VDC IN**
2. **(CANBus_Low)**
3. **RTN VDC IN**
4. **Option_High**
5. **(CANBus_High)**
6. **Option_Low**

Pin 4 is POSVDC IN & Pin 6 is RTNVDC in for units above 2400W. Pins 2 & 5 used for CanBus or a 2nd Option.

Single Blue Sea 3/8"-16 Threaded Stud
(IP67) (Reinforced Thermoplastic Housing)
(Tin-Plated Copper Alloy Studs)

Black P/N 2203

Red P/N 2204

Viewed from External Side of Cover

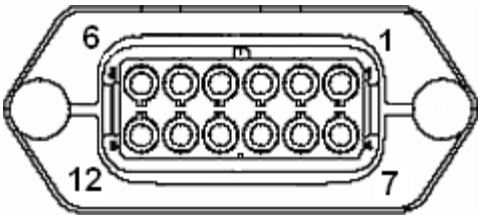
Output Stud Pin Out

Black Stud:
Negative (RTN)

Red Stud:
Positive (POS)

CAN Bus with additional Options or Discrete Monitored Units

12 Pin Molex Input Connector
(IP67) (Glass Filled PBT Housing)



Viewed from Wiring Side (Internal)

Installed Molex Panel Mount Plug: P/N 019429-0039
Customer Mating Receptacle: P/N19418-0027

Input Connector Pin Out

1. **POS VDC IN**
2. Analog Monitor Vout or **CANBus_L**
3. Analog Monitor Vin
4. Analog Monitor Iout
5. Analog Monitor Iin or **CANBus_H**
6. **RTN VDC IN**
7. Option or **POS VDC IN** units >2.5KW
8. Option
9. Option
10. Option
11. Option

Option or **RTN VDC IN** units >2.5KW

STANDARD HEV/MEV PRODUCT SUMMARY:

1. Baseplate: Liquid Cooled with ¼" threaded connections. (¼" Hose Barb Fittings installed).
2. Model: **HEV** (Industrial, meets FCC-A EMI).
   MEV (Military, meets MIL-STD-461 EMI).
3. Input Range: 250-425Vdc.
4. Wattages: 585, 1170, 1755, 2340, or 2925W for 13.8Vdc output only.
   600, 1200, 1800, 2400, 3000, 3600W for all voltages except 13.8Vdc.
5. Output Voltages: 12.8Vdc, 13.8Vdc, 24.0Vdc, 28.0Vdc, and 48Vdc.
6. Efficiency: 82% Typical.
7. Temperature: -40ºC to +65ºC with base plate operating at 60ºC coolant temp @ 2.5 LPM flow.
8. Parallel: Share option allows converters to operate in parallel for greater current availability.
9. Safety: Over Current Limit, Over Temp Shutdown (90ºC), and Output Overvoltage Shutdown.
10. Input Connector: 6 or 12 Pin IP67 snap-on rectangular input connector standard depending on options.
11. Output Connector: Two 3/8" threaded studs (Pos and Neg).
12. **Monitoring:** Available thru CanBus or as Discrete Analog Signals.
    Standard: Vin, Vout, Iin, Iout
    Other options available, see below.

13. **Standard Options Available:**
    a. High Temp Alarm (85 ºC)
       - Available as a discrete signal at the input connector.
       - Available as a CanBus signal.
    b. Power O.K. Signal
       - This is provided as a diagnostic or health bit to indicate that the output voltage is within tolerance and that the unit is properly functioning.
       - Available as a discrete signal at the input connector.
       - Available as a CanBus signal.
    c. Input Cable Detect – End user can detect if the input connector has been removed from the supply.
       - Available as a discrete signal at the input connector.
    d. Power Supply Output Inhibit – Allows end user to disable the converter's output remotely.
       - Available as a discrete signal at the input connector.
       - Available as a CanBus signal.
    e. Current Sharing – Allows separate converters to work in parallel for greater total wattage capability.
       - Available as a discrete signal at the input connector.
    f. Conformal Coating of PCB.
    g. Circular style input connector.
    h. Over Temp Shutdown (90 ºC) Over-ride
       - Available as a discrete signal at the input connector.
       - Available as a CanBus signal.

14. Other model converters that can been used in the HEV environment.
    a. AG Series, Air cooled 300-900W.
    b. FCS Series, 550-750VDC input, 1200, 2400, & 3600W.