

## Bi-directional 11KW On-board Charger + 3KW DC-DC Converter



### Features

- Bi-directional, 500-850VDC to 220VAC 16A
- Universal AC input range 304-456VAC
- Input/output protections
- Intelligent charging modes
- Customized CAN communication optional
- 250/500kbs communication rate optional
- UDS bootloader and diagnostic optional
- IP67 enclosure, liquid cooled
- Weight: 12kg

### Main Specifications

| Part Number        |                 | Input Voltage                            | Output Voltage | Output Current |
|--------------------|-----------------|------------------------------------------|----------------|----------------|
| CAD112DF800-14302B | OBC             | 304-456Vac 3 phase<br>176-264Vac 1 phase | 500-850Vdc     | 0-19A          |
|                    | DC-DC Converter | 500-850Vdc                               | 14Vdc          | 0-215A         |

### Electrical Specifications

These specifications are valid over the converter's full ranges of input voltage output voltage and current, and operating temperature unless noted otherwise.

### Input Specifications

| Parameter              | Notes & Conditions | Min   | Typical | Max  | Unit |
|------------------------|--------------------|-------|---------|------|------|
| <b>OBC</b>             |                    |       |         |      |      |
| Input Voltage 3 phase  |                    | 304   | 380     | 456  | Vac  |
| Input Voltage 1 phase  |                    | 176   | 220     | 264  | Vac  |
| Input Frequency        |                    | 45    | 50      | 65   | Hz   |
| Input Current          |                    | -     | -       | 32   | A    |
| Inrush Current         |                    | -     | -       | 50   | A    |
| Power Factor           |                    | 0.92- | 0.95-   | 0.98 | %    |
| <b>DC-DC Converter</b> |                    |       |         |      |      |
| Input Voltage          |                    | 500   | 640-    | 480  | Vdc  |
| Input Current          |                    | -     | -       | 12   | A    |
| Quiescent Current      |                    | -     | -       | 20   | mA   |

### DC-AC Inverter

|               |          |     |      |     |     |
|---------------|----------|-----|------|-----|-----|
| Input Voltage | DC input | 500 | 6400 | 850 | Vdc |
| Rated Power   |          |     | 3.3  |     | KW  |

### Output Specifications

| Parameter              | Notes & Conditions                | Min | Typical | Max | Unit |
|------------------------|-----------------------------------|-----|---------|-----|------|
| <b>OBC</b>             |                                   |     |         |     |      |
| Output Voltage         |                                   | 500 | 640-    | 850 | Vdc  |
| Output Current         |                                   |     | -       | 19  | A    |
| Output Power           |                                   | -   | -       | 11  | KW   |
| Output Wakeup Voltage  |                                   | -   | 12      | -   | Vdc  |
| Efficiency             | Typical Vin, full load, Ta = 25°C | 90  | 95      | 98  | %    |
| <b>DC-DC Converter</b> |                                   |     |         |     |      |
| Output Voltage         |                                   | 9   | 14      | 16  | Vdc  |
| Output Current         |                                   |     |         | 215 | A    |
| Output Power           |                                   |     | 3       | -   | KW   |
| Maximum Output Power   | Less than 6 min.                  | -   | -       | 3.5 | KW   |
| Efficiency             | Typical Vin, full load, Ta = 25°C | 93  | 96-     | 99  | %    |
| Quiescent Current      |                                   | -   | -       | 0.3 | mA   |
| Dynamic Response       | Typical Vin, full load, Ta = 25°C | -   | -       | 200 | ms   |
|                        |                                   |     |         |     |      |
| <b>DC-AC Inverter</b>  |                                   |     |         |     |      |
| Output Voltage         |                                   |     | 220     |     | Vac  |
| Output Current         |                                   |     | 16      |     | A    |
| Efficiency             |                                   |     | 93      |     | %    |

### Protection Specifications

| Parameter                       | Notes & Conditions       | Min | Typical | Max | Unit |
|---------------------------------|--------------------------|-----|---------|-----|------|
| <b>OBC</b>                      |                          |     |         |     |      |
| Input Under-voltage Protection  |                          | 170 |         | 350 | Vac  |
| Input Under-voltage Recovery    | Auto-recovery            | 200 |         | 360 | Vac  |
| Input Over-voltage Protection   |                          | 270 |         | 470 | Vac  |
| Input Over-voltage Recovery     | Auto-recovery            | 260 |         | 440 | Vac  |
| Output Under-voltage Protection |                          | 200 |         |     | Vdc  |
| Output Under-voltage Recovery   | Auto-recovery            | 210 |         |     | Vdc  |
| Output Over-voltage Protection  |                          | 460 |         |     | Vdc  |
| Output Over-voltage Recovery    | Auto-recovery            | 450 |         |     | Vdc  |
| Over Temperature Protection     | Shut down                |     | -       | 80  | °C   |
|                                 | Recovery                 | 75  | -       | -   | °C   |
| Output Short Circuit Protection | Shut down, auto-recovery |     |         |     |      |
| <b>DC-DC</b>                    |                          |     |         |     |      |
| Input Under-voltage Protection  |                          | 495 |         | 505 | Vdc  |
| Input Under-voltage Recovery    | Auto-recovery            | 505 |         | 515 | Vdc  |

|                                                      |                         |       |   |       |     |
|------------------------------------------------------|-------------------------|-------|---|-------|-----|
| Input Over-voltage Protection                        |                         | 855   |   | 865   | Vdc |
| Input Over-voltage Recovery                          | Auto-recovery           | 500   |   | 515   | Vdc |
| Output Under-voltage Protection                      |                         | 8.5   |   | 9.5   | Vdc |
| Output Under-voltage Recovery                        | Auto-recovery           | 9     |   | 10    | Vdc |
| Output Over-voltage Protection                       |                         | 16    |   | 18    | Vdc |
| Output Over-voltage Recovery                         | Auto-recovery           | 12.75 |   | 15.25 | Vdc |
| Over Temperature Protection<br>(coolant temperature) | Shut down               |       | - | 80    | °C  |
|                                                      | Recovery                | 75    | - | -     | °C  |
| Output Short Circuit Protection                      | Shut down auto-recovery |       |   |       |     |

## Environmental Specifications

| Parameter             | Notes & Conditions                                                                  | Min | Typical | Max  | Unit |
|-----------------------|-------------------------------------------------------------------------------------|-----|---------|------|------|
| Operating Temperature | Automatically reduces the output power when the coolant temperature goes over 65°C. | -40 | -       | +70  | °C   |
| Storage Temperature   |                                                                                     | -40 | -       | +85  | °C   |
| Relative Humidity     | No condensation                                                                     | 5   | -       | 95   | %    |
| Altitude              |                                                                                     | -   | -       | 5000 | m    |
| Cooling               | Liquid cooled, flow rate >=10L/min                                                  |     |         |      |      |
| Ingress Protection    | IP67                                                                                |     |         |      |      |
| Weight                |                                                                                     |     | 12      |      | kg   |
| Acoustic Noise        | QC/T 895-2011                                                                       | -   | -       | 60   | dB   |

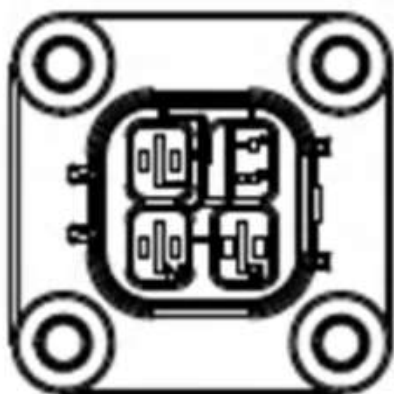
## Safety Specifications

| Parameter             | Notes & Conditions                                                                        | Min  | Typical | Max | Unit |
|-----------------------|-------------------------------------------------------------------------------------------|------|---------|-----|------|
| Isolation Voltage     | Input-Output, 1 min.                                                                      | 2000 | -       | -   | Vac  |
|                       |                                                                                           | 2800 | -       | -   | Vdc  |
| Insulation Resistance |                                                                                           | 20   | -       | -   | MΩ   |
| Grounding Resistance  | Case-Ground                                                                               | -    | -       | 0.1 | Ω    |
| Input Discharge       | The input terminal voltage will drop below 60V within 1s after the input power is cut off |      |         |     |      |
| Electric Clearance    | GB/T 18488.1-2001                                                                         |      |         |     |      |

## Reliability Specifications

| Parameter        | Standard                                   |
|------------------|--------------------------------------------|
| Durability       | QC/T 895-2011                              |
|                  | QC/T 24347-2009                            |
| EMC              | GB/T 18487.1-2001                          |
| Harmonic Current | GB17625.0-2003, CLASS A                    |
| Vibration        | QC/T 413 – 2002 3.12 (ISO 16750-3 4.2.2.2) |
| Shock            | ISO 16750-3 4.2.2.2                        |
| Salt Fog         | QC/T 413 – 2002 3.13                       |

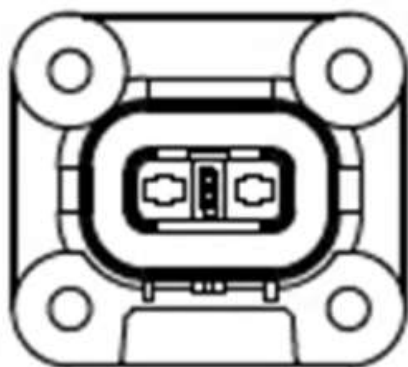
## Input Connector Description



Amphenol  
HVSL364024A

| Pin | Function     | Mating connector            |
|-----|--------------|-----------------------------|
| 1   | L1 (1 phase) | Amphenol<br>HVSL364064A106I |
| 2   | L2           |                             |
| 3   | L3           |                             |
| 4   | N            |                             |
| A   | HVIL in      |                             |
| B   | HVIL out     |                             |

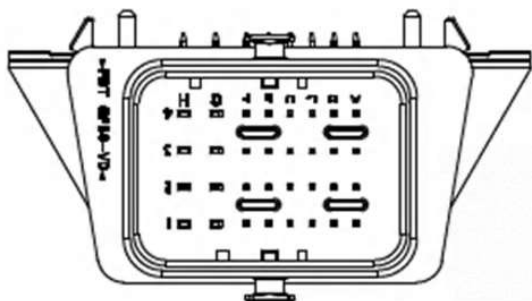
## High Voltage Output Connector Description



Amphenol  
HVC2P63MV406

| Pin | Function | Mating connector         |
|-----|----------|--------------------------|
| 1   | Out +    | Amphenol<br>HVC2P63FS406 |
| 2   | Out -    |                          |
| A   | HVIL in  |                          |
| B   | HVIL out |                          |

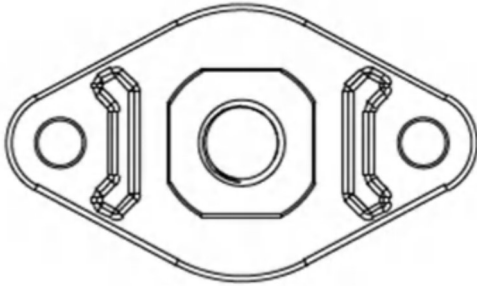
## Signal Connector Description



TE  
2334366-2

| Pin    | Function    | Pin | Function        | Mating connector |
|--------|-------------|-----|-----------------|------------------|
| 1A     | CAN 1-H     | 3A  | NTC 1+          | TE<br>2137299-8  |
| 1B     | CAN 1-L     | 3B  | NTC 2+          |                  |
| 1C     | EN_OBC      | 3C  | NTC 3+          |                  |
| 1D     | EN_DC DC    | 3D  | NTC -           |                  |
| 1E     | CC          | 3E  | Lock feedback 1 |                  |
| 1F     | CP          | 3F  | Lock feedback 2 |                  |
| 1G     | VCC+        | 3G  | Lock +          |                  |
| 1H     | GND         | 3H  | Lock -          |                  |
| 2A     | wake up     | 4A  | HVIL In         |                  |
| 2B     | CC_Out      | 4B  | HVIL out        |                  |
| 2C     | EN_inverter | 4C  | CAN2 H reserve  |                  |
| Others | NC          | 4D  | CAN2 L reserve  |                  |

## DC-DC LV Output + Connector Description



M8 screw

## Mechanical Parameters (unit: mm)

Dimension: LxWxH=417x270x98mm (include connector and mounting kit)

