

DC-DC CONVERTER

Madhura Power Technologies Pvt. Ltd.

Index

Sr. No	DC-DC Converter	Page No.
1	500 W	3
2	1 kW	5
3	1.5 kW	7
4	2 kW	9
5	3 kW	11
6	5.6 kW	12
7	10 kW	13
8	3 + 1 kW Dual Output Converter	14
9	3 kW Bi-directional Converter	16

DC to DC Converter for Hybrid and EV

Model M-EVD-80-500-13/13F

500 W @ 13.5 Vdc



Application Overview

The 500 Watt EVD series is a ruggedized DC-DC converter suitable for electric vehicle, marine, industrial and other applications that draw power from a bank of batteries or other high DC voltages. It is used to supply power to accessories, lights, instruments, etc.

Key Features

- Fully Isolated
- Parallel Connection (up to 10X units)
- Protection from Over Voltage, Short Circuit, Over Temperature, Input Reverse Polarity
- Very Low Quiescent Current
- IP66 Enclosure
- RoHS Compliant
- Available with standard Molex or Flying Lead connectors

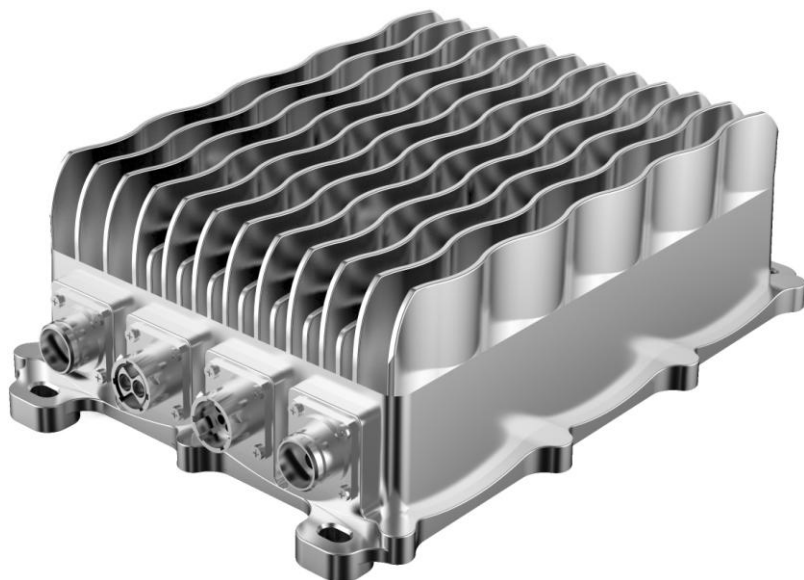
M-EVD-80-500-13/13F SPECIFICATIONS

Item	Specifications
Output	
Output Power	500W
Nominal Voltage Range	13.5Vdc
Output Current	0-38A
Input	
Operating Input Voltage Range	50-126V for 13 and 50-130V for 13F model
Maximum Input Current	11A
Efficiency	93%
Mechanical	
Cooling	Base plate temperature cannot exceed specified maximum, under all operating conditions in application
Dimension	190 x 76 x 43.5mm; 7.48 x 2.99 x 1.71"
Weight	1.25kg; 2.75lbs
Operating Temperature (Ambient)	- 40~75°C
Storage Temperature	- 40~85°C
Base plate Temperature	max 95 °C
Humidity	0-90%
Regulation	
EMI/EMC	IP 66 EMC Emission: EN12895, EN55022 EMC Immunity: EN12895 ESD: EN12895 (±4KV Contact, ±15KV Air)
Connection	
Interface	Molex or Flying Lead
Protection	
Input Protection	Short circuit protection
	Over voltage protection
	Under voltage protection
	Reverse Voltage Protection
Output Protection	Short circuit protection
	Reverse polarity protection
	Over voltage protection
	Over temperature protection
	Over Current limit protection

DC to DC Converter for Hybrid and EV

Model M-VDD102S360-14

1 kW @ 12 Vdc



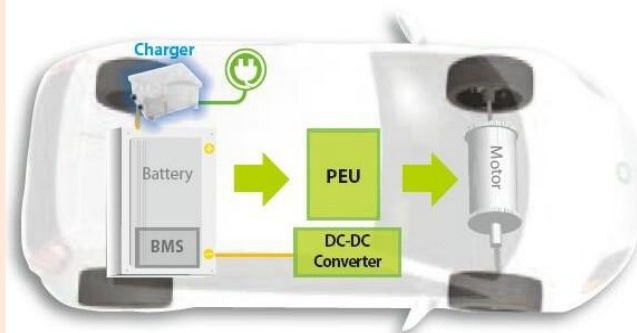
Key Features

- High Frequency: silent operation
- Output power: 1000W
- Protection from short circuit, overload and reverse polarity
- Fully isolated
- IP67 protection
- CAN-bus communication
- Integrated fuse holder
- Power status indicator

Application Overview

Electric vehicles normally use low voltage service batteries (12, 24, 48VDC) to supply the board instrumentation. The easier system to charge and aid the board battery is to connect in parallel a power supply with an appropriate output voltage. The biggest power source on the vehicles are normally the traction batteries with an higher voltage, so we have to reduce an high DC voltage to a lower DC voltage. This is the M-VDD102S360-14 DC/DC converter object.

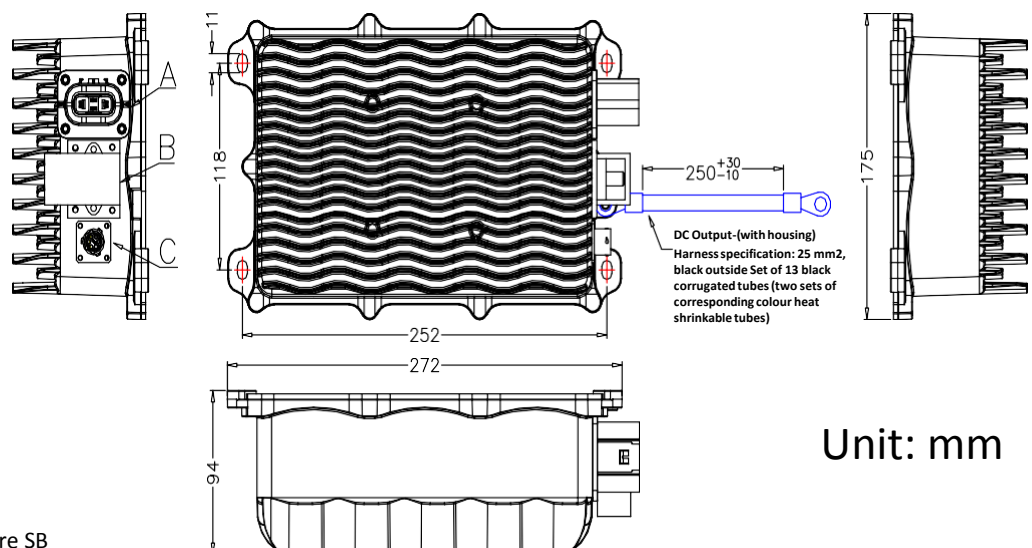
The M-VDD102S360-14 DC/DC Converter is suitable for all electric powered vehicles and is designed to be fitted on board the vehicle and connected permanently to the battery. This fully encapsulated converter deliver a stable isolated high power, low voltage DC supply for accessories such as lights, horns, and wipers. This eliminated inefficient battery taps and fragile, expensive high voltage accessories.



M-VDD102S360-14 SPECIFICATIONS

Item	Specifications
Output	
Output Power	1KW
Nominal Voltage Range	12Vdc
Output Current	0-72A
Peak Power	1.2KW
Input	
Operating Input Range	200-420Vdc
Maximum Input Current	3.5A
Frequency Range	50/60Hz
Efficiency	≥94%
Mechanical	
Cooling	Air-cooling
Dimension	272x175x94mm; 10.7x6.9x3.7"
Weight	2kg; 4.4lbs
Operating Temperature	- 40~60°C
Operating Ambient Temperature	- 40~75°C
Storage Temperature	- 40~95°C
Relative Humidity (non-condensing)	≥85%
Altitude	≤2000m
Regulation	
Environment	IP67, IEC60068, CNS15454
Emission	IEC 1000/IEC 801-2,3,4/IEC 255-4
Communication	
Interface	CAN BUS/Enable control
Protection	
Input Protection	Surge protection
	Short circuit protection
	Over voltage protection
	Under voltage protection
	Input Fuse over current protection
Output Protection	Short circuit protection
	Over load protection
	Reverse polarity protection
	Over voltage protection
	Over temperature protection
	Current limit protection
	Output fuse over current protection

Dimensions



Unit: mm

DC to DC Converter Hybrid and EV

Model M-VDD152S360-14

1.5 kW @ 12 Vdc



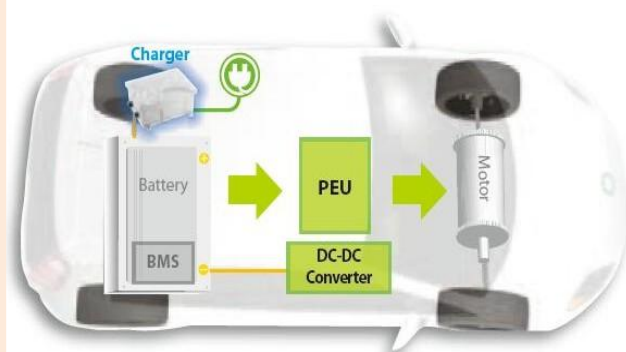
Key Features

- High Frequency: silent operation
- Output power: 1500W
- Protection from short circuit, overload and reverse polarity
- Fully isolated
- IP67 protection
- CAN-bus communication
- Integrated fuse holder
- Power status indicator

Application Overview

Electric vehicles normally use low voltage service batteries (12, 24, 48VDC) to supply the board instrumentation. The easier system to charge and aid the board battery is to connect in parallel a power supply with an appropriate output voltage. The biggest power source on the vehicles are normally the traction batteries with an higher voltage, so we have to reduce an high DC voltage to a lower DC voltage. This is the M-VDD152S360-14 DC/DC converter object.

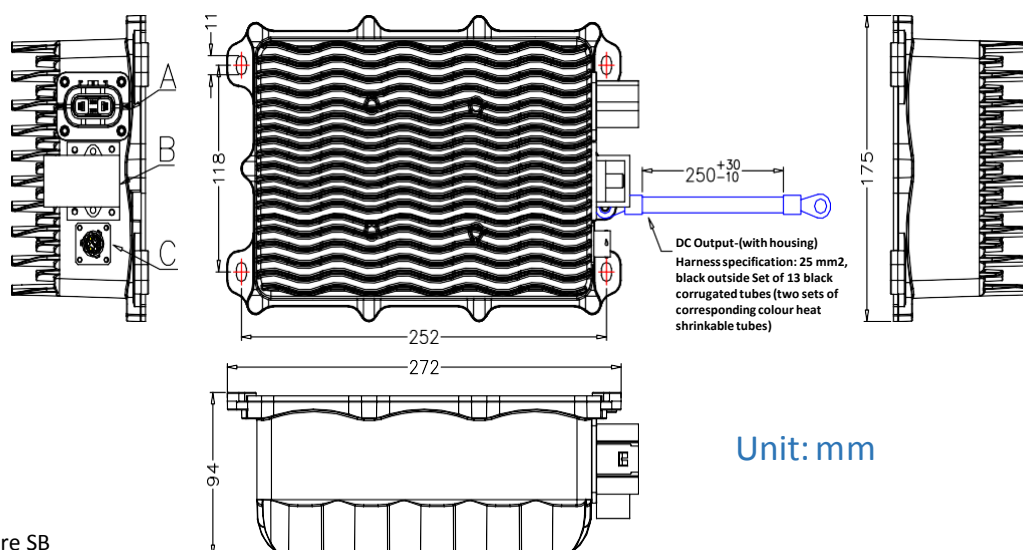
The M-VDD152S360-14 DC/DC Converter is suitable for all electric powered vehicles and is designed to be fitted on-board the vehicle and connected permanently to the battery. This fully encapsulated converter deliver a stable isolated high power, low voltage DC supply for accessories such as lights, horns, and wipers. This eliminated inefficient battery taps and fragile, expensive high voltage accessories.



M-VDD152S360-14 SPECIFICATIONS

Item	Specifications
Output	
Output Power	1.5KW
Nominal Voltage Range	12Vdc
Output Current	0-108A
Peak Power	1.8KW
Input	
Operating Input Range	200-420Vdc
Maximum Input Current	5.5A
Frequency Range	50/60Hz
Efficiency	≥94%
Mechanical	
Cooling	Air-cooling
Dimension	272x175x94mm; 10.7x6.9x3.7"
Weight	2kg; 4.4lbs
Operating Temperature	- 40~60°C
Operating Ambient Temperature	- 40~75°C
Storage Temperature	- 40~95°C
Relative Humidity (non-condensing)	≧85%
Altitude	≦2000m
Regulation	
Environment	IP67, IEC60068, CNS15454
Emission	IEC 1000/IEC 801-2,3,4/IEC 255-4
Communication	
Interface	CAN BUS/Enable control
Protection	
Input Protection	Surge protection
	Short circuit protection
	Over voltage protection
	Under voltage protection
	Input Fuse over current protection
Output Protection	Short circuit protection
	Over load protection
	Reverse polarity protection
	Over voltage protection
	Over temperature protection
	Current limit protection
	Output fuse over current protection

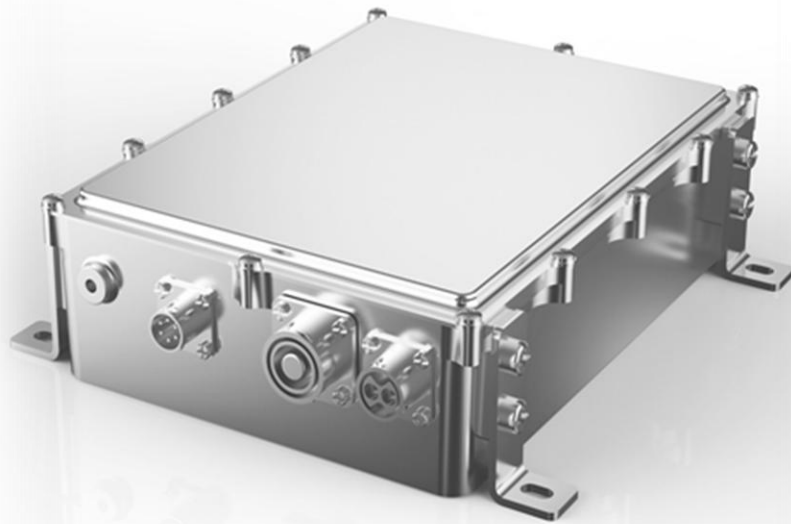
Dimensions



DC to DC Converter for Hybrid and EV

Model M-VDD202S360-14

2 kW @ 12 Vdc



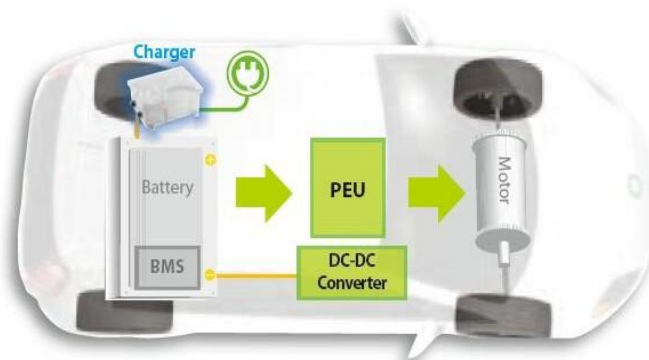
Key Features

- High Frequency: silent operation
- Output power: 2000W
- Protection from short circuit, overload and reverse polarity
- Fully isolated
- IP67 protection
- CAN-bus communication
- Integrated fuse holder
- Power status indicator

Application Overview

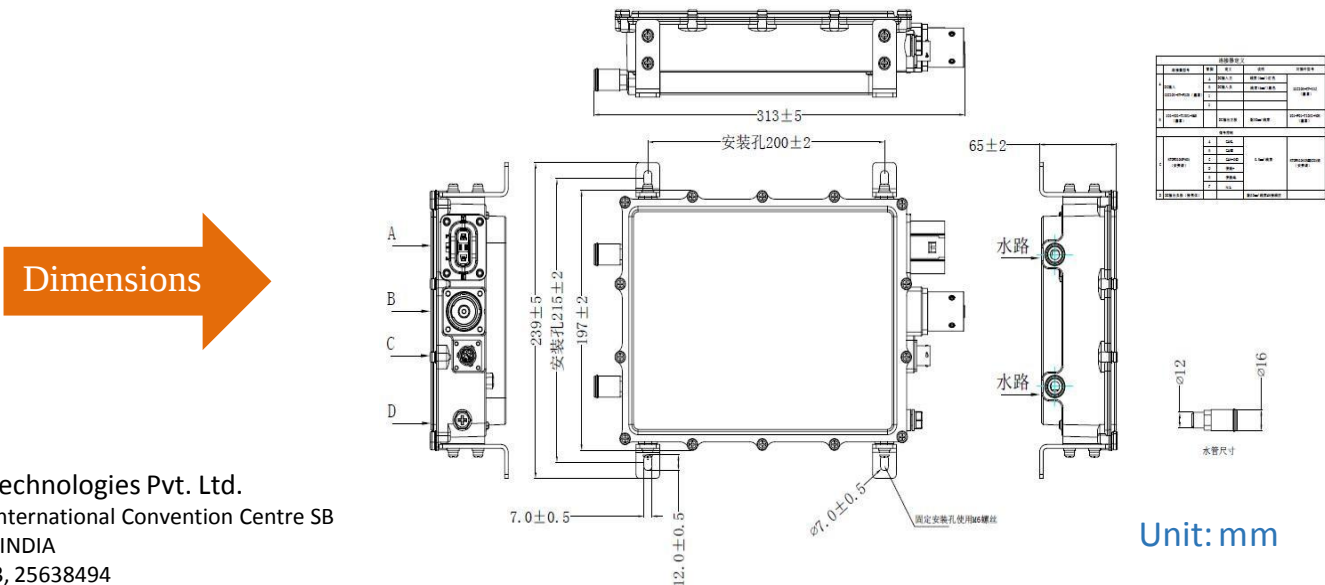
Electric vehicles normally use low voltage service batteries (12, 24, 48VDC) to supply the board instrumentation. The easier system to charge and aid the board battery is to connect in parallel a power supply with an appropriate output voltage. The biggest power source on the vehicles are normally the traction batteries with an higher voltage, so we have to reduce an high DC voltage to a lower DC voltage. This is the M-VDD202S360-14 DC/DC converter object.

The M-VDD202S360-14 DC/DC Converter is suitable for all electric powered vehicles and is designed to be fitted on-board the vehicle and connected permanently to the battery. This fully encapsulated converter deliver a stable isolated high power, low voltage DC supply for accessories such as lights, horns, and wipers. This eliminated inefficient battery taps and fragile, expensive high voltage accessories.

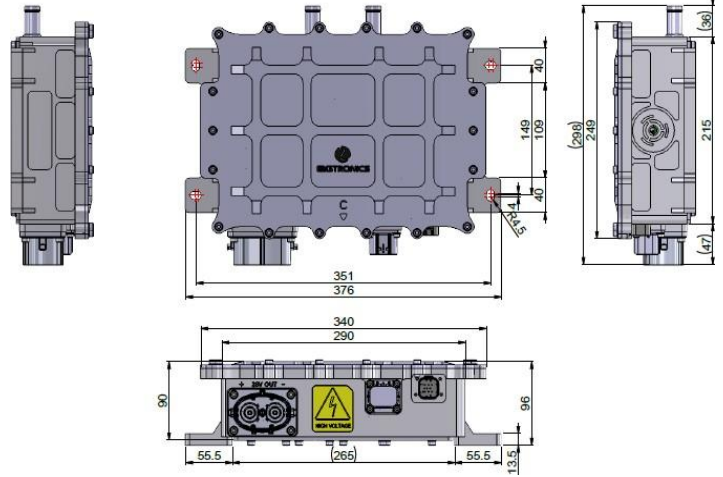


M-VDD202S360-14 SPECIFICATIONS

Item	Specifications
Output	
Output Power	2KW
Nominal Voltage Range	12Vdc
Output Current	0-143A
Peak Power	2.4KW
Input	
Operating Input Range	200-420Vdc
Maximum Input Current	7A
Fequency Range	50/60Hz
Efficiency	≥94%
Mechanical	
Cooling	Liquid-cooling
Dimension	250x196x98mm; 9.8x7.7x3.9"
Weight	2.5kg; 5.5lbs
Operating Temperature	- 40~60°C
Operating Ambient Temperature	- 40~75°C
Storage Temperature	- 40~95°C
Relative Humidity (non-condensing)	≥85%
Altitude	≤2000m
Regulation	
Environment	IP67, IEC60068, CNS15454
Emission	IEC1000/IEC 801-2,3,4/IEC 255-4
Communication	
Interface	CANBUS/Enable control
Protection	
Input Protection	Surge protection
	Short circuit protection
	Over voltage protection
	Under voltage protection
	Input Fuse over current protection
Output Protection	Short circuit protection
	Over load protection
	Reverse polarity protection
	Over voltage protection
	Over temperature protection
	Current limit protection
	Output fuse over current protection



**DC to DC Converter for Hybrid and EV
Model M-ACU14V3K
3 kW @ 14 Vdc**

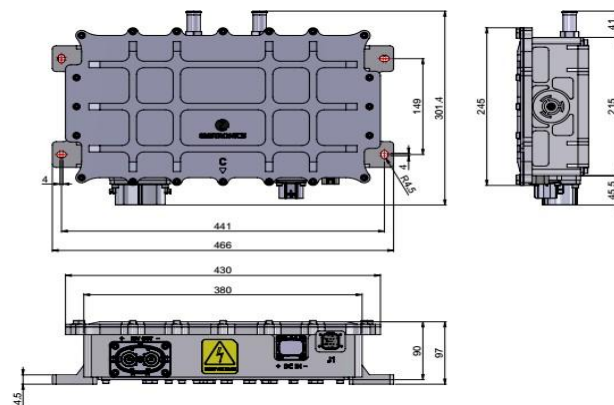
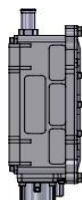


POWER	UNIT	STANDARD
Power ratings	[kW]	3
Input side voltage range	[V]	430(330~500)
Input side current ratings	[A]	7.75(6.7~10.2)
Output side Voltage range	[V]	14(8~15)
Output side current ratings	[A]	214.3
Control Power	[V]	14(8~16)
Structure(Type)	[-]	Uni-Directional
Efficiency @ 80% Load	[%]	Over 94
Efficiency @ Max Load	[%]	Over 92
OPERATING CONDITION	UNIT	STANDARD
Environ. Temp.(operating)	[°C]	-40 ~ 85
Environ. Temp(storage)	[°C]	-40 ~ 105
MECHANICAL	UNIT	STANDARD
Weight	[kg]	Under 20
Size(W*D*H) (mm*mm*mm)	[-]	290 * 215 * 90
Vibration class(G)	[g]	6
Protection Class	[-]	IP69K
Cooling	[-]	Water Cooled

DC to DC Converter for Hybrid and EV

Model M-ACU28V5.6K

5.6 kW @ 28 Vdc

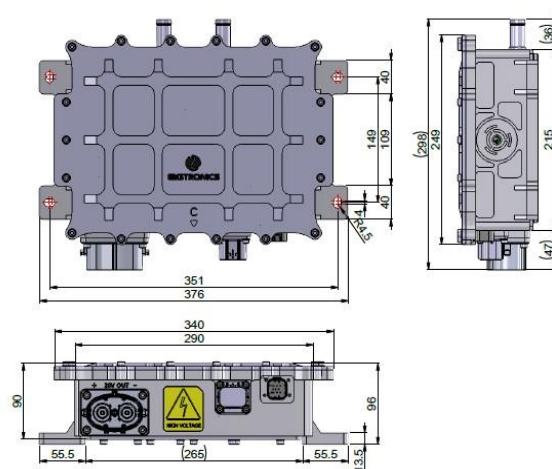
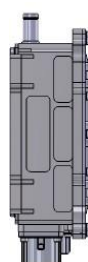
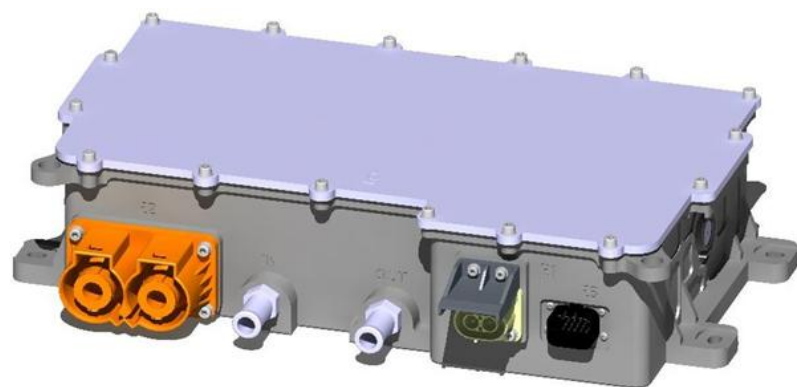


POWER	UNIT	STANDARD
Power ratings	[kW]	5.6
Input side voltage range	[V]	650(550~750)
Input side current ratings	[A]	11.11(9.2~14.2)
Output side Voltage range	[V]	28(16~29)
Output side current ratings	[A]	200
Control Power	[V]	28(16~32)
Structure(Type)	[-]	Uni-Directional
Efficiency @ 80% Load	[%]	Over 97
Efficiency @ Max Load	[%]	Over 96
OPERATING CONDITION	UNIT	STANDARD
Environ. Temp.(operating)	[°C]	-40 ~ 85
Environ. Temp(storage)	[°C]	-40 ~ 105
MECHANICAL	UNIT	STANDARD
Weight	[kg]	Under 20
Size(W*D*H) (mm*mm*mm)	[-]	380 * 215 * 97
Vibration class(G)	[g]	6
Protection Class	[-]	IP69K
Cooling	[-]	Water Cooled

DC to DC Converter for Hybrid and EV

Model M-ACU28V10K

10 kW @ 28 Vdc



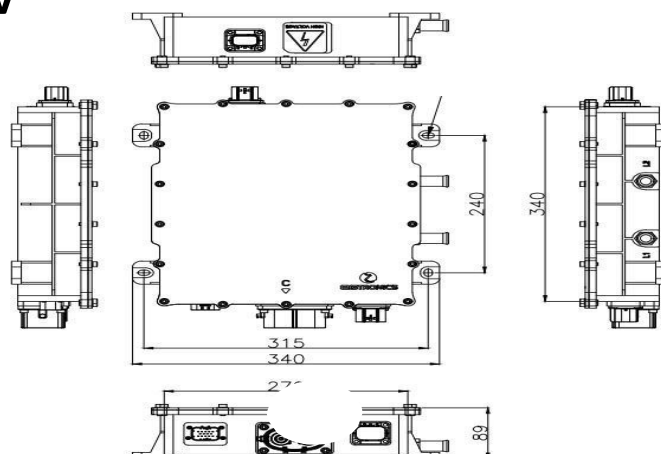
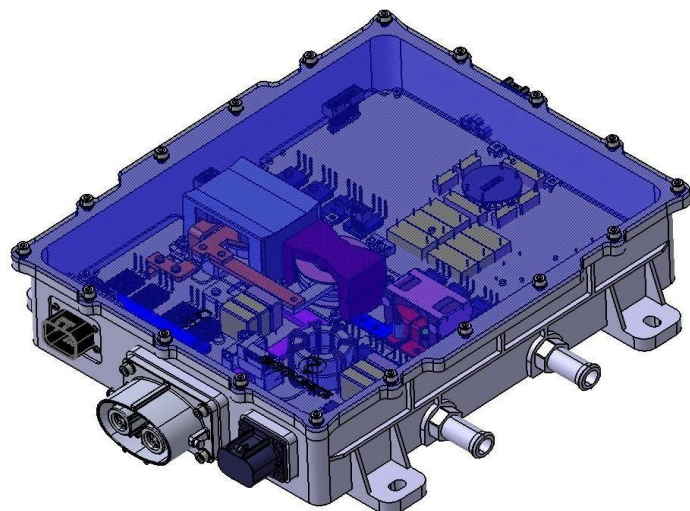
POWER	UNIT	STANDARD
Power ratings	[kW]	10
Input side voltage range	[V]	700(550~850)
Input side current ratings	[A]	15.87(13.1~20.3)
Output side Voltage range	[V]	28(16~32)
Output side current ratings	[A]	357.1
Control Power	[V]	28(16~32)
Structure(Type)	[-]	Uni-Directional
Efficiency @ 80% Load	[%]	Over 94
Efficiency @ Max Load	[%]	Over 92
OPERATING CONDITION	UNIT	STANDARD
Environ. Temp.(operating)	[°C]	-40 ~ 85
Environ. Temp(storage)	[°C]	-40 ~ 105
MECHANICAL	UNIT	STANDARD
Weight	[kg]	Under 20
Size(W*D*H) (mm*mm*mm)	[-]	380 * 215 * 97
Vibration class(G)	[g]	6
Protection Class	[-]	IP69K
Cooling	[-]	Water Cooled

DC to DC Converter for Hybrid and EV

Dual Output

3kW - 13.8V

1kW - 24V



315 X 340 X 89mm (W X D X H)

M-ACU14V3K(R2) (LDC3K) Specifications

POWER	UNIT	STANDARD
Power ratings	[kW]	3
Input side voltage range	[V]	350(250~420)
Input side current ratings	[A]	9.52(8~13.4)
Output side Voltage range	[V]	13.8(8~15)
Output side current ratings	[A]	217
Control Power	[V]	13.8(8~16)
Structure(Type)	[-]	Uni-Directional
Efficiency @ rated operating condition	[%]	Over 96
Efficiency @ max. operating condition	[%]	Over 94
Protection Grade	[-]	IP69
OPERATING CONDITION	UNIT	STANDARD
Environ. Temp.(operating)	[°C]	-40 ~ 85
Environ. Temp(storage)	[°C]	-40 ~ 105
CONTROL	UNIT	STANDARD
Type of Controller	[-]	Digital/Analog
Command source and type	[-]	Voltage command from PCU
Command recurrence time	[ms]	10
Control period	[kHz]	1
Control accuracy	[V]	±0.1V
Control Bandwidth	[Hz]	Over than 1,000

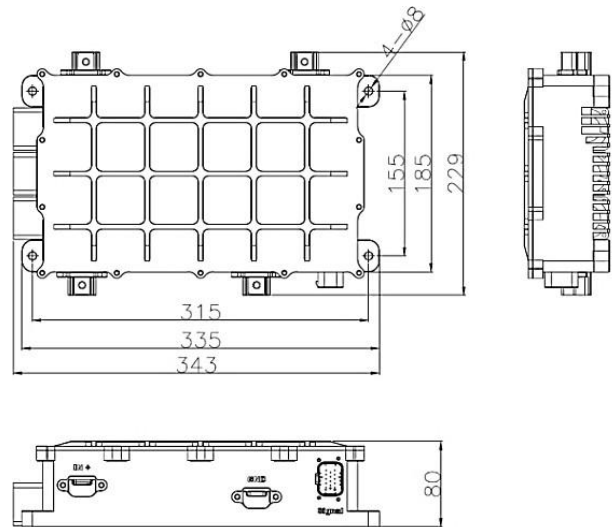
M-ACU24V1K (LDC1K) Specifications

POWER	UNIT	STANDARD
Power ratings	[kW]	1
Input side voltage range	[V]	350(250~420)
Input side current ratings	[A]	3.17(2.7~4.5)
Output side Voltage range	[V]	24(18~25)
Output side current ratings	[A]	42
Control Power	[V]	24(16~32)
Structure(Type)	[-]	Uni-Directional
Efficiency @ rated operating condition	[%]	Over 96
Efficiency @ max. operating condition	[%]	Over 94
OPERATING CONDITION	UNIT	STANDARD
Environ. Temp.(operating)	[°C]	-40 ~ 85
Environ. Temp(storage)	[°C]	-40 ~ 105
CONTROL	UNIT	STANDARD
Type of Controller	[-]	Digital/Analog
Command source and type	[-]	Voltage command from PCU
Command recurrence time	[ms]	10
Control period	[kHz]	1
Control accuracy	[V]	±0.1V
Control Bandwidth	[Hz]	Over than 1,000

DC to DC Converter for Hybrid and EV

Model M-ADL5030

Bi-directional Converter



POWER	UNIT	LDC BUCK 3KW	LDC BOOST 2.5KW
Power ratings (Con/Max)	[kW]	3 @Low side voltage=12V(±10%)	2.5 @High side voltage=48V(±10%)
Input side voltage range (Min/Nom/Max)	[V]	36 / 48V / 52	10 / 12V / 16
Output side Voltage range (Min/Nom/Max)	[V]	6.5 / 13.8V / 18 @±2%	48V @±1%
Current (Input side current ratings (Min/Max)	[A]	0 ~ 66	0 ~ 215
Current (Output side current ratings (Con)	[A]	218A @ Low side voltage = 13.8V	53A @ High side voltage = 48V
Control Power (Battery Power range (Min/Nom/Max)	[A]	6.5 / 12V / 18	<-
Weight	[kg]	4	
Efficiency	UNIT	LDC BUCK 3KW	LDC BOOST 2.5KW
Efficiency @ rated operating condition	[%]	95↑	93↑
Efficiency @ max. operating condition	[%]	96↑	94↑