

# Bi-directional DC-DC Converter for Hybrid Electric and Fuel Cell Systems



## PRODUCT OVERVIEW:

The Bi-Directional DC-DC series of converters utilizes advanced Digital Power Processing with a high frequency magnetic design. It has a broad band dynamic response that provides an efficient regulation of voltage and current. Both inputs and outputs have limit protections for voltage, current and power. The high frequency magnetic design is a proven technology that has superior performance, response, flexibility and reliability. High efficiency and power density. It comes with extensive diagnostics via CAN-J1939 or RS232. The unique proprietary technology allows Bi-directional power transfer at full input and output voltage ranges (100% overlap voltage).

## FEATURES:

- Input and output Voltage Range: 100-650V<sub>DC</sub>
- Extended dynamic Voltage overlap operation.
- Input Current: 200A continuous.
- Efficiency: 96% rated
- Can sink or source power at full voltage range at each terminal.
- Short Circuit, Over Current, Over/Under Voltage and Over Temperature protection.
- CAN command, control and diagnostics. Output voltage can be regulated via CAN/Analog command.
- Input and output voltages, currents, power and temperature reporting
- Ground voltage isolation detection.
- Can be used in parallel and fault redundant.
- Cascaded multi-phases Converter.



## APPLICATIONS:

Hybrid Electric and Fuel Cell Vehicles and Renewable Energy Systems.

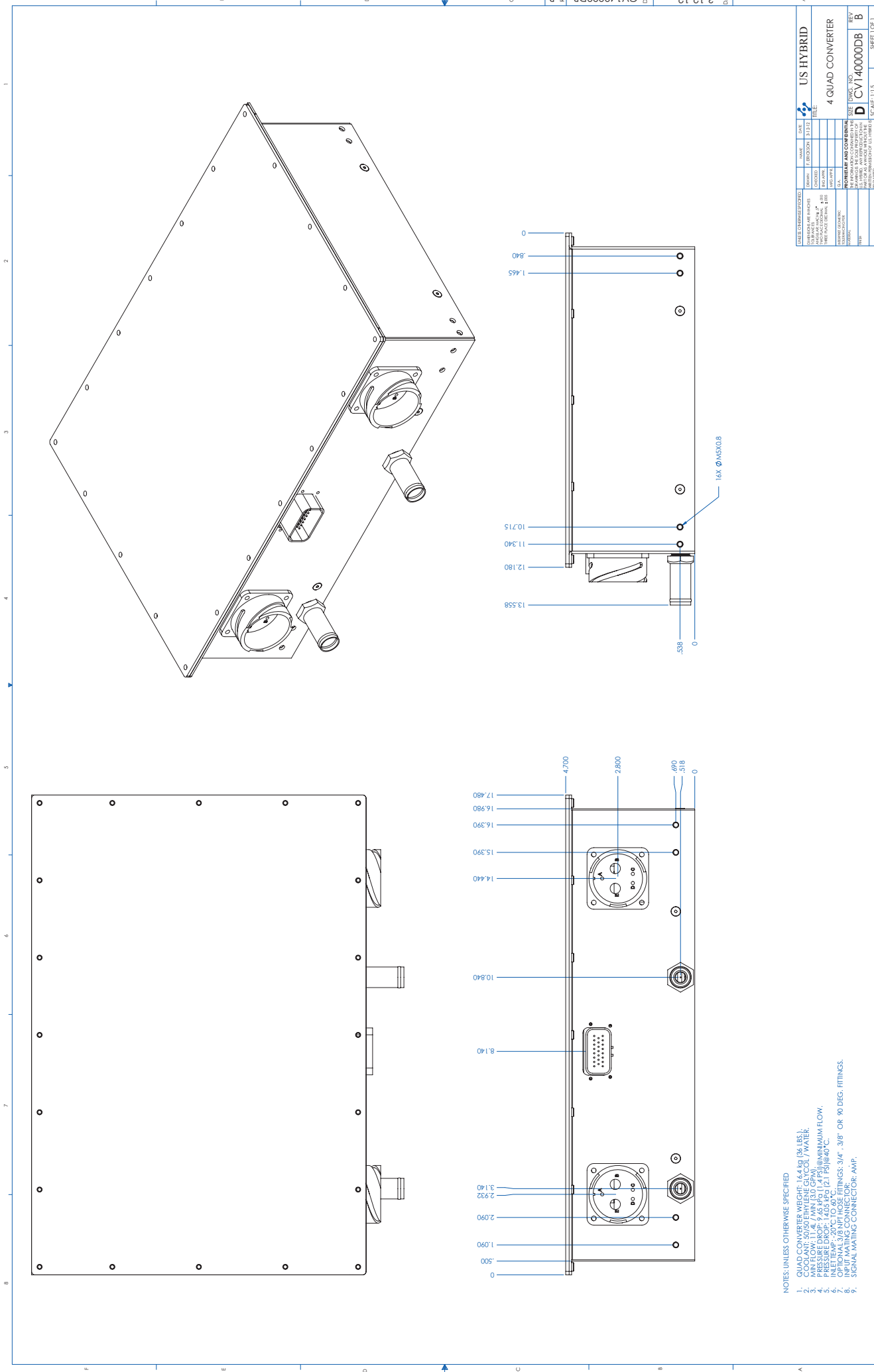
### MODEL NUMBER:

**BDX2** □ □ □ □ □ □

Input Voltage M: 150-450V <sub>DC</sub> H: 300-750V <sub>DC</sub>	V-out 30: 300V <sub>DC</sub> 45: 450V <sub>DC</sub> 65: 650V <sub>DC</sub>	Control C: CAN A: Analog 0: Fixed	Rsvd
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Signal Connector DEUTSCH DT15-12PA	
1	GND
2	PWR_ON (Opto, 10-30V)
3	12V_POS
4	12V_NEG
5	VOUT_ANALOG_CMD
6	ANALOG_RTN
7	#FAULT (active low OC)
8	CAN_H
9	CAN_L
10	RS232_RX
11	RS232_TX
12	#PROGRAM
<b>Power Connector: ITT , Tyco (Option)</b>	

Line regulation (±10%)	±2 %
Load regulation	±2%
Ripple	< ±1% + 500 mVp-p
Load transient (10-90%)	< 5% typical
Response time	250 ms typical
Turn-on rise time	Soft-start, 450 ms typical
Output protection	Overload and short circuit
Cooling	Liquid cooled < 60°C, 12 Lpm
Operating temperature	-20°C to +70°C
Load de-rating	2.5% /°C from 60°C liquid
Storage temperature	-40°C to +105°C
Efficiency	> 96%
Isolation resistance	> 1 MΩ at 700Vdc
Weight (kg)	21 kg.



NOTES: UNLESS OTHERWISE SPECIFIED  
 1. QUAD CONVERTER WEIGHT: 1.64 KG (3.6 LBS.)  
 2. COOLANT: 50/50 ETHYLENE GLYCOL / WATER.  
 3. PRESSURE DROP: 1.405 KPa (0.1 PSI) @ MINIMUM FLOW.  
 4. PRESSURE DROP: 9.45 KPa (0.7 PSI) @ MINIMUM FLOW.  
 5. PRESSURE DROP: 1.405 KPa (0.1 PSI) @ 40°C.  
 6. OPTIONAL 3/8 NPT HOSE FITTINGS: 3/4", 3/8" OR 90 DEG. FITTINGS.  
 7. INPUT MATING CONNECTOR: AMP.  
 8. SIGNAL MATING CONNECTOR: AMP.

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US HYBRID  
 4 QUAD CONVERTER  
 DWG. NO. CV14000DB  
 SCALE: 1:1.5  
 SHEET 1 OF 1