



US Hybrid



## 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.

Its weight and volume density are the best in the industry. It comes with extensive diagnostics via CAN-J1939 or RS232.

### FEATURES:

- Input and output Voltage Range: 100-650Vdc
- Input Current: 200A continuous.
- Efficiency: 96% rated, > 94% from 40% to 100% load
- Ground voltage isolation detection and fault protection.
- 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
- Can be used in parallel



### APPLICATIONS:

Hybrid Electric and Fuel Cell Vehicles and Renewable Energy Systems.

### PART NUMBERING:

**BDC2** □ □ □ □ □ □ □

Input Voltage LV: 90-180Vdc MV: 150-300Vdc HV: 300-450Vdc	V-out 20: 200Vdc 33: 336Vdc 65: 650Vdc	Control C: CAN A: Analog 0: Fixed	Rsvd
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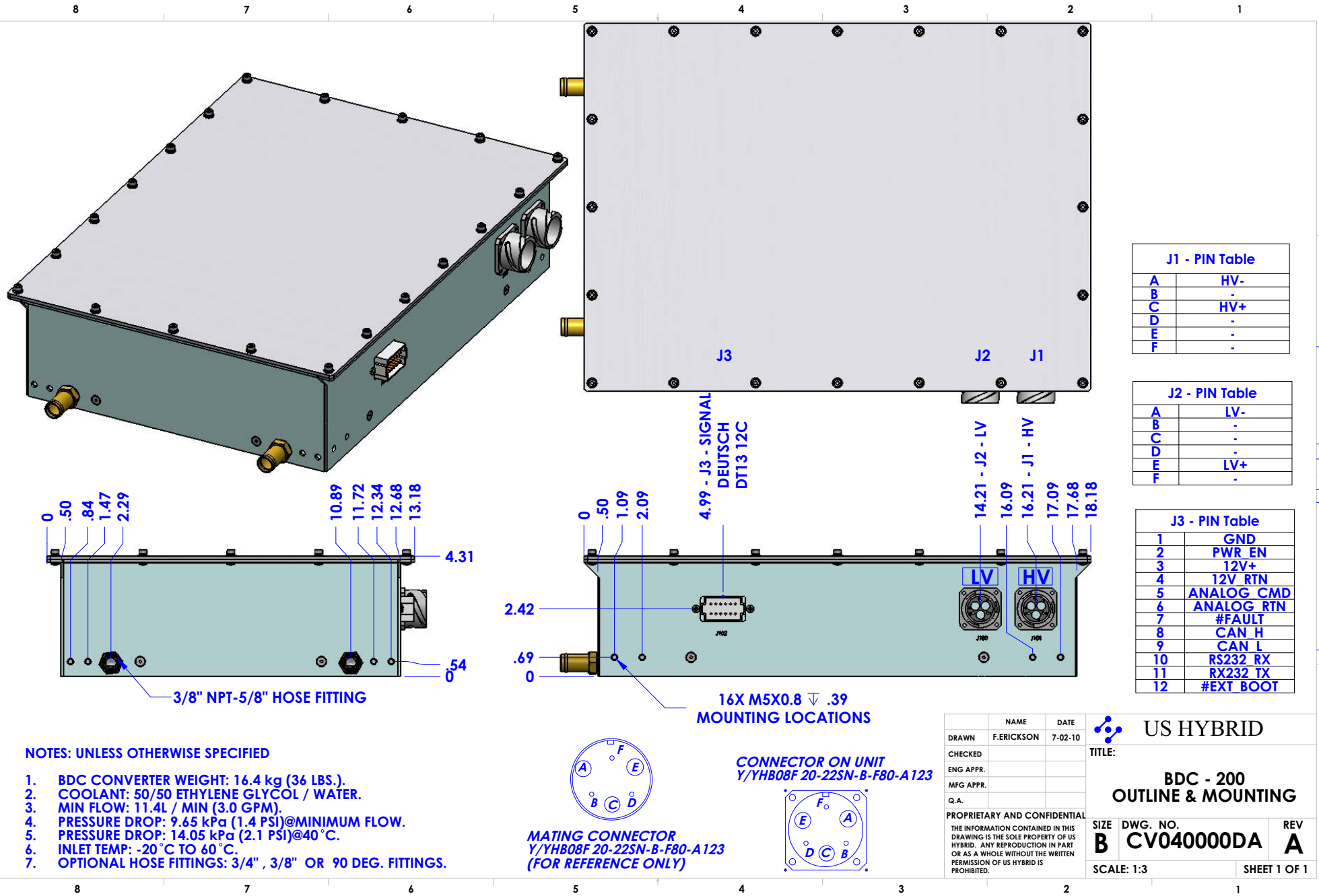
Signal Connector: DEUTSCH DT15-12PA	
1	GND
2	PWR_ON (Opto, 10-30V)
3	12V_POS
4	12V_NEG
5	VOUT_ANALOG_CMD
6	ANALOG_RTN
7	#FAULT (active low OC)
8	CAN_H
9	CAN_L
10	RS232_RX
11	RS232_TX
12	#PROGRAM
Power Connector: ITT	

Line regulation ( $\pm 10\%$ )	$\pm 2\%$
Load regulation	$\pm 2\%$
Ripple	$< \pm 1\% + 500 \text{ mVp-p}$
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 $< 60^\circ\text{C}$ , 12 Lpm
Operating temperature	$-20^\circ\text{C}$ to $+70^\circ\text{C}$
Load de-rating	2.5% / $^\circ\text{C}$ from $60^\circ\text{C}$ liquid
Storage temperature	$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Efficiency	$> 94\%$ (40%-100% load)
Isolation resistance	$> 1 \text{ M}\Omega$ at 700Vdc
Weight (kg)	21 kg.

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

DATA SHEET REV: 1001, Specifications subject to change.

Integrated Solutions for Clean Mobility & Energy Conservation



**J1 - PIN Table**

A	HV-
B	.
C	HV+
D	.
E	.
F	.

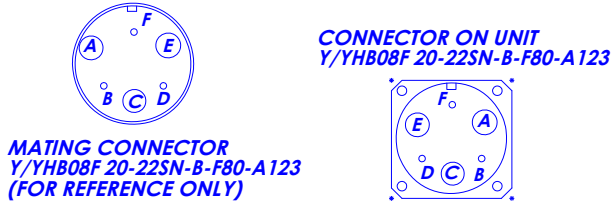
**J2 - PIN Table**

A	LV-
B	.
C	.
D	.
E	LV+
F	.

**J3 - PIN Table**

1	GND
2	PWR_EN
3	12V+
4	12V RTN
5	ANALOG_CMD
6	ANALOG_RTN
7	#FAULT
8	CAN_H
9	CAN_L
10	RS232_RX
11	RX232_TX
12	#EXT_BOOT

- NOTES: UNLESS OTHERWISE SPECIFIED**
1. BDC CONVERTER WEIGHT: 16.4 kg (36 LBS.).
  2. COOLANT: 50/50 ETHYLENE GLYCOL / WATER.
  3. MIN FLOW: 11.4L / MIN (3.0 GPM).
  4. PRESSURE DROP: 9.65 kPa (1.4 PSI)@MINIMUM FLOW.
  5. PRESSURE DROP: 14.05 kPa (2.1 PSI)@40°C.
  6. INLET TEMP: -20°C TO 60°C.
  7. OPTIONAL HOSE FITTINGS: 3/4", 3/8" OR 90 DEG. FITTINGS.



	NAME	DATE
DRAWN	F.ERICKSON	7-02-10
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

**US HYBRID**

TITLE: **BDC - 200 OUTLINE & MOUNTING**

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SIZE **B** DWG. NO. **CV040000DA** REV **A**

SCALE: 1:3 SHEET 1 OF 1

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