



US Hybrid



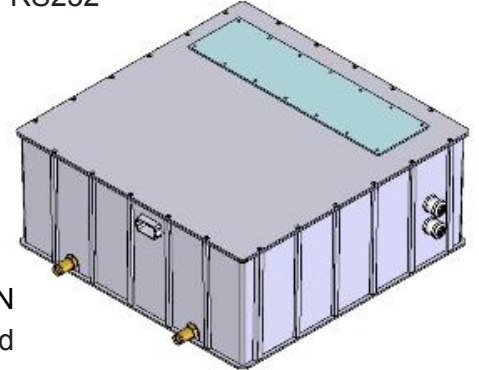
## Bi-directional DC-DC Converter for Hybrid Electric and Fuel Cell Systems

### PRODUCT OVERVIEW:

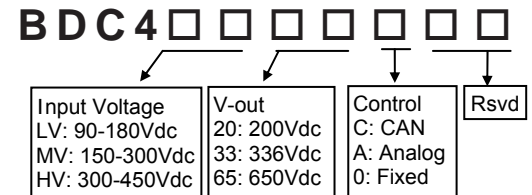
DC-DC converters utilizes advanced Digital Power Processing with high frequency magnetic design to provide efficient and high bandwidth dynamic response for voltage and current regulations with input and output voltage and current and power limits protections. The cost effective high frequency proven magnetic design with robust redundant control provides fast response, flexibility, reliability, light weight and volume product for Fuel Cell and alternative energy industry. Extensive diagnostics via CAN-J1939 and RS232

### FEATURES:

- Input and output Voltage Range: 150-300Vdc or 300-500VDC
- Input Current: 400A continuous.
- CAN command, control and diagnostics. Input/Output voltages and currents can be regulated or limited via CAN command. Input and output voltages, currents, power and temperature reporting.
- Efficiency: 96% rated, > 94% from 40% to 100% load
- CAN communication parameters reconfigurable by user through RS232 interface.
- Ground voltage isolation detection and protection.
- Short Circuit, OC, O/U V and OT protection.
- Parallelable with fault tolerant operation.



### PART NUMBERING:



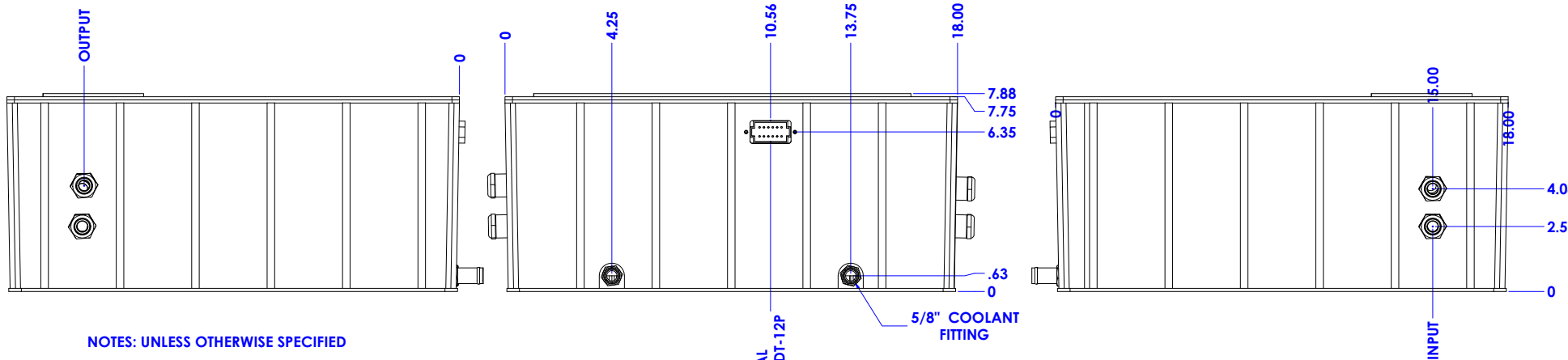
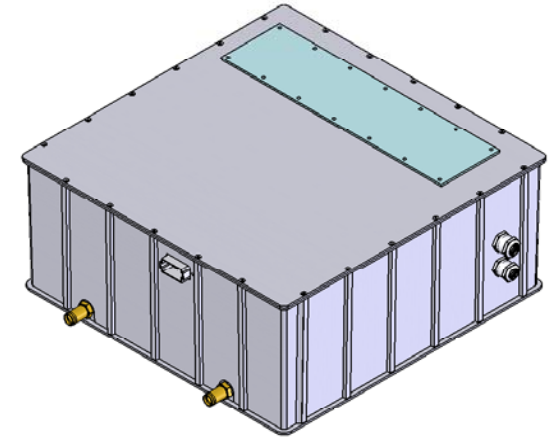
### APPLICATIONS:

Hybrid Electric and Fuel Cell Vehicles and Renewable Energy Systems.

| Signal Connector:<br>DEUTSCH DT15-12PA |                          |
|--|--------------------------|
| 1                                      | GND                      |
| 2                                      | PWR_ON<br>(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                         | $< \pm 2\% + 500 \text{ mVp-p}$             |
| 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 $< 60\text{C}$ , 12 Lpm       |
| Operating temperature          | $-20\text{C}$ to $+70\text{C}$              |
| Load de-rating                 | $2.5\% / \text{C}$ from $60\text{C}$ liquid |
| Storage temperature            | $-40\text{C}$ to $+85\text{C}$              |
| Efficiency                     | $> 94\%$ (40%-100% load)                    |
| Isolation resistance           | $> 1 \text{ M}\Omega$ at 700Vdc             |
| Weight (kg)                    | 36 kg.                                      |

POWER CONNECTION  
ACCESS PANEL



**NOTES: UNLESS OTHERWISE SPECIFIED**

1. BDC400 WEIGHT: XX kg (XX.X LBS.).
2. VOLUME: 1863 CU/IN
3. COOLANT: 50/50 ETHYLENE GLYCOL / WATER.
4. MIN FLOW: XX L / MIN (X.0 GPM).
5. PRESSURE DROP: 1405 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.

|                            |                   |           |             |                    |
|----------------------------|-------------------|-----------|-------------|--------------------|
| UNLESS OTHERWISE SPECIFIED |                   | NAME      | DATE        | US HYBRID          |
| DIMENSIONS ARE IN INCHES   |                   | DESIGN    | F. ERICSSON |                    |
| TO DIMENSIONS              | ANGULAR TOLERANCE | CHECKED   |             | TITLE              |
| TWO PLACE DECIMAL          | 1:30              | TRIP APPR |             | BDC - 400          |
| THREE PLACE DECIMAL        | 1:500             | WIG APPR  |             | OUTLINE & MOUNTING |
|                            |                   | D.A.      |             | SIZE DWG. NO.      |
| INVENTOR                   | GEOMETRIC         | COMMENTS  |             | D CV050000D-       |
| DATE                       |                   |           |             | SCALE: 1:2         |
| ISSUE                      |                   |           |             | REV                |
|                            |                   |           |             | -                  |
|                            |                   |           |             | SHEET 1 OF 1       |

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12-21-07  
DATE