

## DC-DC Converter (Isolated) for Hybrid Electric and Fuel Cell Systems

### PRODUCT OVERVIEW:

The DC12 Series of converters has been designed for medium and heavy duty electric, hybrid and fuel cell commercial vehicles. It uses advanced digital control with J1939 communications and diagnostics with secondary analog controller and high frequency magnetics with advanced ZVS/ZCS switching to achieve high power density and efficiency. MIL-STD-1275 option available.

### FEATURES:

- DC Input Voltage Range: 250-900V<sub>DC</sub>
- DC output range: 12-30V<sub>DC</sub>
- Efficiency: 95% rated, > 94% from 40% to 100% load.
- Output Current: 100A at 27.8V<sub>DC</sub>, 3 kW, or 200A at 13.6V<sub>DC</sub>. Can be paralleled externally.
- Short Circuit, Over Current, Over/Under Voltage and Over Temp protection.
- Output voltage 12 to 30 V<sub>DC</sub>, (42-57 V<sub>DC</sub> optional) programmable via CAN.
- Input and output voltages, currents, power and temperature reporting.
- CAN command, control and diagnostics. Output voltage can be regulated via CAN.
- High Efficiency ZVS/ZCS architecture.
- MIL-STD-1275 optional
- IP65 Rated, (IP67 optional)



### PART NUMBERING:

DC12□□□□□□

Input Voltages  
MV: 250-450V<sub>DC</sub>  
HV: 500-800V<sub>DC</sub>  
UV: 650-900V<sub>DC</sub>

V-output  
12: 12V<sub>DC</sub>  
24: 24V<sub>DC</sub>  
48: 48V<sub>DC</sub>

Control  
C: CAN  
0: Fixed

Rsvd

### APPLICATIONS:

Electric, Hybrid and Fuel Cell Vehicles, Light Rail, Off-road equipment and Battery charging systems. DC12 can be customized to meet your most stringent applications requirements.

Signal Connector DEUTSCH DT15-12PA	
1	GND
2	BIAS_ENABLE
3	CAN_H
4	CAN_L
5	RS232_TX
6	RS232_RX
7	GND
8	#CDC_FAULT
9	EXT_BIAS
10	#BOOT_SCI
11	RESERVED
12	RESERVED
<b>HV Connector: Tyco</b> <b>LV Output: 3/8" stud</b>	

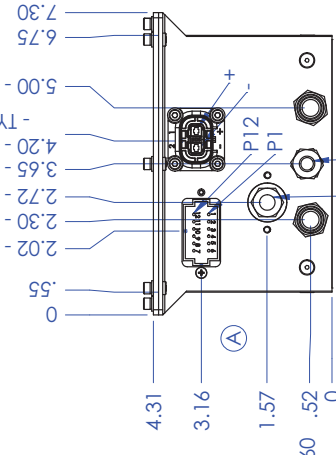
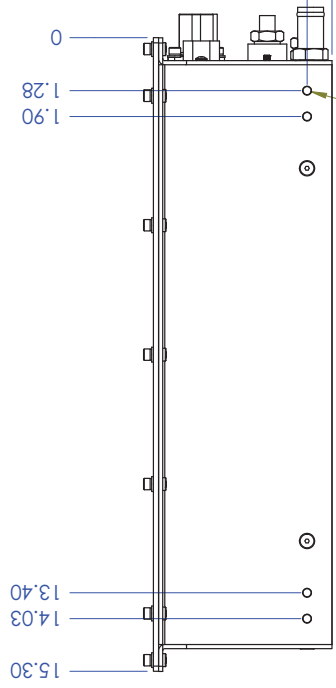
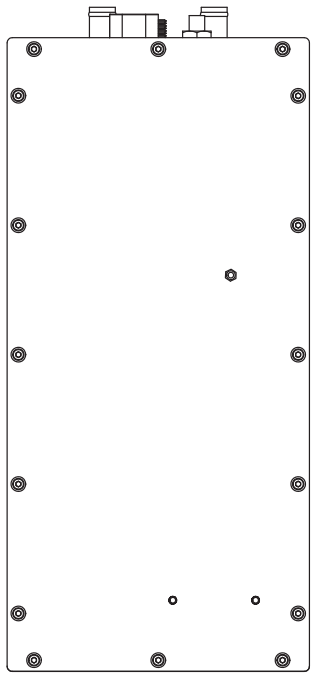
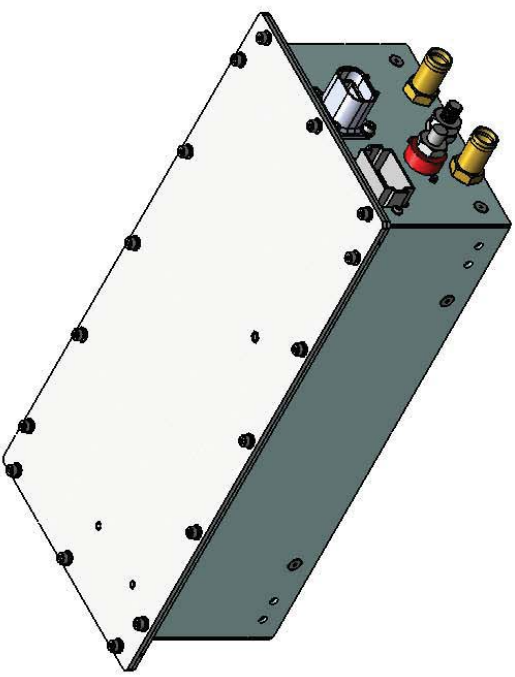
Line regulation (±10%)	±1%
Load regulation	±2%
Ripple	< ±1% + 100 mVp-p
Load transient (10-90%)	< 5% typical
Response time	50 ms typical
Turn-on rise time	Soft-start, 450 ms typical
Output protection	Overload and short circuit
Cooling	Liquid cooled < 60°C, 12 Lpm
Operating temperature	-20°C to +70°C
Load de-rating	2.5% /°C from 60°C liquid
Storage temperature	-40°C to +105°C
Efficiency	95%
Isolation resistance	> 1 MΩ at 700Vdc
Weight	8 kg.
Environmental Rating	IP65 (IP67 Optional)



US Hybrid



ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE	3/18/2010	DON KANG



- 2.02 - J2 - SIGNAL DEUTSCH DT15-12PA
- 2.30 - 5/8" HOSE FITTING (3/8 NPT)
- 2.72 - 3/8-16 - DC OUTPUT POSITIVE
- 3.65 - 3/8-16 - DC OUTPUT - CHASSIS GROUND
- 4.20 - J1 - HIGH VOLTAGE - DC INPUT
- TYCO HVA280- P/N# 1587831-1
- 5.00 - 5/8" HOSE FITTING (3/8 NPT)
- 6.75
- 7.30

8X M5X0.8  $\nabla$  0.45" - MOUNTING LOCATIONS

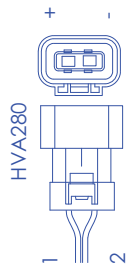
TORQUE: 150 LB/IN  
TORQUE: 236 LB/IN

UNIT NUMBER	OUTPUT VOLTAGE	INPUT VOLTAGE
DC12A000AA	30V	500-712 Vdc
DC12B000AA	14.5V	500-712 Vdc
DC12C000AA	13.8V	300-425Vdc

NOTES: UNLESS OTHERWISE SPECIFIED

1. DC/DC CONVERTER WEIGHT: 7.2 kg (15.9 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 3/8 NPT HOSE FITTINGS: 3/4", 3/8" OR 90 DEG. FITTINGS.
8. TORQUE 3/8-16 FASTENERS TO 150 LB/IN.
9. INPUT MATING CONNECTOR: TYCO HVA280 (P/N# 1587902-9).
10. SIGNAL MATING CONNECTOR: DEUTSCH P/N# DT06-12SA.

J2 - PIN Table	1	2	3	4	5	6	7	8	9	10	11	12
SIGNAL GND												
BIAS ENABLE												
CAN H												
CAN L												
RS232 TX												
RS232 RX												
SIGNAL GND												
# CDC FLT												
EXT BIAS												
# BOOT												
RESERVED												
RESERVED												



US HYBRID

DC-DC CONVERTER OUTLINE & MOUNTING

DC120000DA

SCALE: 1:3

SHEET 1 OF 1

DATE: 3-14-11

REV: A

DWG: DC120000DA

PROPRIETARY AND CONFIDENTIAL

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