COREPOWER® Systems

Brushless Power Generation

1332-X

Power Conversion Unit (PCU)

Size
15.60 In W x 14.00 In D x 6.80 In H
(396.2 mm W x 355.6 mm D x 172.7 mm H)

Weight
25 lbs
(11.34 kg) nominal

POWER

- Bi-directional converter
- Output: 28VDC, 300 amps (≈9,000W)

SAFETY

- Detects ground faults within the SGU, the PCU and the PCU/SGU interconnecting harnesses as well as ground faults on the 28VDC output bus
- Feeder fault protection without added contactors or remote circuit breakers
- Dual mode temperature protection (Caution & Fault)
- High reliability 28VDC over-voltage protection (<1E-10 probability of over-voltage fault)
- Provides output current sense signal proportional to PCU 28.5VDC output current

CERTIFICATION

- DO-160E
- DO-178B, Level B
- FAA TSO *Pending*

FEATURES

- High efficiency, soft switching converters
- Fault tolerant
- Eliminates separate high current start contactors
- Eliminates separate bus current monitors
- Contains a processor-based controller and can communicate over an ARINC 429 data bus
- Able to respond intelligently to various commands and stimuli, and can monitor and report a variety of operating parameters including bus voltage and currents
- Software configurable for key operating characteristics
- High reliability and low maintenance
  - MTBF >13,000 hours
- 28VDC output voltage: programmable set-point = 27.5, 28.0, 28.5 and 29.0VDC
- Static regulation: ±0.3VDC
- Overload operation:
  - 450 amps for five minutes
  - 600 amps for 20 seconds
- Programmable generator speed transition:
  - Cut-in (5,000 to 7,000 rpm)
  - Cut-off (4,500 to 6,500 rpm)
- Incorporates current sharing capability

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Technology Comparison

Performance Parameter	Traditional Brushed Starter-Generator	SGU 300 amp
Weight (starter only)	32 pounds (300 amps) 38 pounds (400 amps)	26 pounds
Reliability: MTTR MTBF	500 hours 4,000 hours	4,000 hours (bearings only) 20,000 hours
Efficiency	<70%	>75% (SGU + PCU)
Performance at Idle	Significantly derated at idle or oversized generator needed to compensate	Rated power available at idle speed
In-Service Cost	1X	≈ 0.4X
Initial System Cost	1X (S-G + GCU + contactor + GF transformer + current monitor + cable)	1.6X (SGU + PCU + cable)
Start Stresses	Very high initial torque and limited ability to tailor torque curve	Soft start and tailored torque curve
Thermal Management	Much higher power loss in machine—requires high capacity blower	Relatively low power loss in machine—low capacity blower is sufficient
Battery & Electrical System Impact	High peak inrush current, requires over-sized battery and causes severe bus under-voltage transient	Controlled inrush current, allows use of lighter battery and significantly reduces bus under-voltage transient

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