



RUGGED & EFFICIENT ATRU/TRU CONVERTERS

HIGH RELIABILITY CONVERTERS FOR AIRBORNE APPLICATIONS

TT Electronics provides auto-transformer rectifier units (non-isolated) and transformer/rectifier units (isolated) optimised for minimum size and weight, and maximum reliability, solving many of the challenges inherent in airborne rectification.

- **Wide range of sizes** – 250W to 40kW+
- **Application specific output voltages** – 28/270/400/540 VDC are standard, voltages to 800 VDC can be accommodated
- **Ultra-reliability** – minimum component count provides extremely high MTBF for mission critical application and flight safety
- **Defense and commercial aerospace applications**– for internal and external power on commercial aircraft, radar and communications power on defence platforms
- **Compliance to various power quality standards**– DO-160G, MIL-STD-1399, MIL-STD-704
- **Rugged design** – for use with a wide range of temperatures and acceleration profiles. DO-160G, MIL-S-901, MIL-STD-167, MIL-STD-810
- **Optimised size, weight and cooling**– from time of initial design all performance characteristics are analysed for their impact on size, weight, temperature rise, efficiency. Convection, conduction and forced-air cooling



- Available in wide side range

- Ultra Reliable - minimal component count

- Aerospace & Defence applications

- Compliance to various power quality standards

- Rugged design

- Optimised size, weight and cooling

15 kW ATRU for new commercial aircraft applications

This newly designed ATRU has been optimised for use aboard commercial aircraft and utilised to drive a powerful DC motor. Several design innovations are employed – a newly designed phase-shifting autotransformer topology, enhanced forced air cooling and DC filtering for improved motor performance. Fully DO-160 compliant, this package provides flexibility in ATRU design for other applications and power levels.

- **Motor drive application** – 400 VDC output, 15kW continuous. Filtered DC output for very low ripple (<0.1 V P-P with balanced line input). Diode switching profile selected for EMI emissions and lighting susceptibility compliance to DO-160
- **Utilises newly designed transformer topology** – along with efficient, low-weight heat-transfer approach previously designed and employed by TT Electronics
- **Short development cycle** – less than 16 weeks from time of order until delivery of qualification units
- **COTS enclosure** – ARINC 600 5-MCU standard dimensions
- **Optimised weight** – 32 lbs. for 15kW continuous
- **Manufacturable** – Transformer/diodes/filter inductor fully assembled prior to installation in enclosure



- Utilises newly designed transformer topology
- Short development cycle
- Optimised weight
- Fully assembled

Performance Summary:

Key Characteristics

Input Voltage	200/115 V, 3 phase, 400 Hz per DO-160G Section 16 Cat A(CF)
Output Voltage	400 VDC nominal unregulated
Power	15kW continuous, 30 kW for 30 seconds, 45kW for 5 seconds
Ripple	<3 V peak – peak with unbalanced lines
Efficiency	> 97%, 50-100% load
Power Quality	DO-160G Section 16 Designation H
Thermal	Forced air cooling, 180 deg. C insulation system, thermal monitoring
Environmental	Per DO-160G
EMI Emissions	DO-160G Section 21 Cat L
Lightening Susceptibility	DO-160G Section 22 Level 3