

# 400W Outdoor TWT Amplifier

## for Satellite Communications

**Ku-Band**

### The T04UO Series

400 Watt TWT Amplifier  
— high efficiency in an  
environmentally sealed  
compact package  
designed for outdoor  
operation



### Plays in the Rain

Provides 400 watts of power in a rugged and compact weatherproof package, digital ready, for wideband, single- and multi-carrier satellite service in the 13.75-14.50 GHz frequency band. Ideal for transportable and fixed earth station applications.

### Cost Effective and Efficient

Mounting at the antenna improves performance through minimized cable losses and saves cost in system design. Employs a high efficiency, dual-depressed collector helix traveling wave tube, reducing operating costs.

### Reliable

Designed and built to survive in extremely adverse environmental conditions and features increased cooling margin for longer life.

### Simple to Operate

User-friendly microprocessor-controlled logic with integrated RS422/485 computer interface. Digital metering, pin diode attenuation and optional integrated linearizer for improved intermodulation performance.

### Easy to Maintain

Modular design and built-in fault diagnostic capability via remote monitor and control.

### Global Applications

Meets International Safety Standard EN-60215, Electromagnetic Compatibility 2004/108/EC and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements.

### Worldwide Support

Backed by over two decades of satellite communications experience, and CPI's worldwide 24-hour customer support network that includes twenty regional factory service centers.



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## OPTIONS:

- *1 RU Remote Control Panel*
- *Extended Frequency (12.75-14.5 GHz)*
- *Redundant and Power Combined Subsystems*
- *Additional External Receive Band Reject Filter (increases loss by a minimum 70 dB up to 12.7 GHz)*
- *SSIPA with Variable Attenuator (provides RF Level Adjust Range of 0 to 30 dB)*
- *Integral Linearizer (requires SSIPA with attenuator option)*
- *Integrated 1:1 switch control and drive*
- *Ethernet Interface*
- *Higher Operating Temperature Limit (+60°C)*
- *L-Band Block Upconverter (BUC --- requires SSIPA option)*  
***This data sheet does not provide amplifier specifications for when the BUC is included. Consult CPI for details.***

## SPECIFICATIONS, T04UO

### Electrical

Frequency	13.75 to 14.50 GHz
Output Power	
TWT	400 W min. (56.02 dBm)
Flange	350 W min. (55.44 dBm)
Bandwidth	750 MHz (1750 MHz with ext. band option)
Gain	46 dB min. at rated power output (70 dB with SSIPA); 52 dB min. at small signal (75 dB with SSIPA)
Gain Stability	
At constant drive and temp.	±0.25 dB/24hr max. (after 30 min. warmup)
Over temp. constant drive	±1.0 dB over operating temp. range (any freq.); ±0.75 dB over ±10°C
Small Signal Gain Slope	±0.02 dB/MHz max.
Small Signal Gain Variation	1.0 dB pk-pk across any 80 MHz band; 2.5 dB pk-pk across any 750 MHz band (4.0 dB with linearizer); 4.5 dB pk-pk across 1750 MHz band (6.0 dB with linearizer);
RF Level Adjust Range	0 to 30 dB typ. (SSIPA option required)
Attenuator Step Size	0.1 dB (SSIPA option required)
Input VSWR	1.3:1 max.
Output VSWR	1.3:1 max.
Load VSWR	2.0 max. continuous operation; any value for operation without damage
Phase Noise	10 dB below IESS-308 continuous mask (3 dB below with BUC option)
AC fundamental	-42 dBc
Sum of all spurs	-47 dBc
AM/PM Conversion	2.5°/dB max. for a single carrier up to 7 dB below rated power (2.5°/dB max. at 3 dB below rated with linearizer)
Harmonic Output	-60 dBc at rated power
Noise and Spurious (at rated gain)	<-150 dBW/4 kHz from 10.9 to 12.7 GHz (to 11.7 GHz with ext. freq. option); <-100 dBW/4 kHz, 11.7 to 12.2 GHz (ext. freq. option only) <-70 dBW/4 kHz transmit band to 18.0 GHz <-65 dBW/4 kHz transmit band to 18.0 GHz (with optional linearizer) <-105 dBW/4 kHz from 18.0 to 26.0 GHz <-125 dBW/4 kHz from 26.0 to 40.0 GHz

### Electrical (continued)

Intermodulation	-24 dBc max. with two equal carriers at total output power 7 dB (4 dB with optional integral linearizer) below rated single-carrier output
Group Delay (in any 80 MHz band)	0.01 ns/MHz linear max. 0.002 ns/MHz <sup>2</sup> parabolic max. 0.5 ns pk-pk ripple max.
Primary Power	90-264 VAC, single phase; 47-63 Hz
Power Consumption	1.35 kW, typ. 1.5 kW, max.
Power Factor	0.95 min.

### Environmental (Operating)

Ambient Temperature	-40°C to +55°C operating, including solar loading; -40°C to +75°C non-operating
Relative Humidity	100% condensing
Altitude	10,000 ft. (3,048 m) with standard adiabatic derating of 2°C/1000 ft. (305 m), operating; 50,000 ft. (15,240 m), non-operating
Shock and Vibration	20 g pk, 11 msec, 1/2 sine
Acoustic Noise	65 dBA @ 3 ft. from amplifier

### Mechanical

Cooling (TWT)	Forced air with integral blower
RF Input Connection	Type N female
RF Output Connection	WR-75 waveguide flange, grooved with UNC 2B 6-32 threaded holes
RF Output Monitor	Type N female
Dimensions (W x H x D)	10.25 x 10.5 x 20.5 in. (260 x 267 x 521 mm)
Weight	55 lbs (25.0 kg) max., with no options



For more detailed information, please refer to the corresponding CPI Technical Description.

Note: Specifications may change without notice as a result of additional data or product refinement.

Please contact CPI before using this information for system design.

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