

CPI Ku-band GEN IV klystron power amplifier for satellite uplink communications

This HPA is equipped with an MSDC klystron for high power and high efficiency.

Highly Efficient

Provides up to 3.0 kW of output power. Multi-stage depressed collector klystron allows the amplifier to use less power and produce less heat than other K-HPAs. Employs a power saver feature to optimize K-HPA efficiency to meet your operating condition.

Easy to Use

Scopescreen provides a graphical log display. Ethernet option provides higher speed connections, can update and coordinate all clock settings, and enables a snapshot feature where user can create a file containing all settings, alarms and faults at a single point in time.

Greater Reliability

Low temperatures are the key to longer lifetimes for klystrons and electronic parts. The CPI power supply design and high efficiency, multi-stage depressed collector klystron make these lower temperatures possible. K-HPA MTBF is nearly 90,000 hours.

Easy Maintenance, Easy Handling

All areas of the amplifier are easily accessible and there are no large harnesses to get in the way. Separate RF and Power Supply drawers slide out from a standard rack.

Worldwide Support

Backed by over 40 years of satellite communications experience, and CPI's worldwide 24-hour customer support network that includes more than 20 regional factory service centers.



CPI GEN IV Ku-band KPA

FEATURES:

- Motorized channel selector
- Remote control panel
- Extended frequency range
- Redundant and combined systems
- Meets international safety standard EN-60215, EMC compatibility 2014/30/EU and harmonic standard EN-61000-3-2
- Power Saver for added efficiency
- External receive band reject filter
- L-band block upconverter (BUC) - specifications for when the BUC is included are not contained in this document. Contact CPI for details.
- Ethernet interface

Quality Management
System - ISO 9001:2015



Specification	CPI GEN IV Klystron HPA K4U series			Ku-band
Frequency Ranges ¹	13.75 to 14.50 GHz		12.75 to 13.25 GHz	14.0 to 14.8 GHz
Klystron Power Output (min.)	3.0 kW (64.77 dBm)	2.45 kW (63.89 dBm)	2.35 kW (63.71 dBm)	2.45 kW (63.89 dBm)
Amplifier Output ² (min.)	2.5 kW (63.97 dBm)	2.0 kW (63.01 dBm)	2.00 kW (63.01 dBm)	1.95 kW (62.91 dBm)
Instantaneous Bandwidth, min.	85 MHz		80 MHz	85 MHz
Preset Channels	Up to 24 (Up to 99 with Digital Fast Tuner System (DFTS))			
Output Power Adjustability	0 to 30 dB of output typ, in 1 dB steps			
Gain (at rated power)	77 dB min.			
Gain Stability vs. Time	±0.25 dB/24 hr. max. at constant drive and temperature			
Gain Stability vs. Temp.	1 dB max. from 20° to 40°C; ±2.5 dB max from 0° to 50° C (at constant drive)			
Gain Slope (at rated power)	0.04 dB/MHz pk-pk max. over Fo ±30 MHz at rated power			
Gain Variation (at rated power)	0.4 dB pk-pk max. over Fo ±30 MHz			
VSWR	Input: 1.25:1 max; Output: 1.30:1 max; Load: 2.0:1 for full spec. compliance - any value for operation without damage			
AM/PM Conversion	4°/dB max. at rated power			
Harmonic Output ²	-80 dBc with filter; -35 dBc without filter			
Noise and Spurious	-135 dBW/4 kHz, 11.70 to 12.75 GHz; 65 dBW/4 kHz, passband; -110 dBW/4 kHz, 12.75 to 40 GHz, excluding passband	-135 dBW/4 kHz, 10.70 to 11.70 GHz; 65 dBW/4 kHz, passband; -110 dBW/4 kHz, 11.75 to 40 GHz, excluding passband	-135 dBW/4 kHz, 11.70 to 12.75 GHz; -65 dBW/4 kHz, passband (-60 dBW/4 kHz, passband with linearizer); -110 dBW/MHz, 12.75 to 40 GHz, excluding passband	
Phase Noise ^{3,4}	Exceeds requirements of INTELSAT Standard IESS-308-309 at -10 dB backoff			
Intermodulation	-28 dBc with regard to each of two equal carriers at 7 dB backoff from rated output power		-27 dBc wrt each of two equal carriers at 7 dB backoff from rated output power	
Group Delay	In any 72 MHz band: 0.1 ns/MHz linear max.; 0.02 ns/MHz ² parabolic max; 2.0 ns pk-pk ripple max.			
Primary Power ³	All ratings are ± 10%, 47-63 Hz 3-phase with neutral and ground: 208 VAC or 380 to 415 VAC			
Power Consumption ⁵	9 kW max.	8.0 kW max; typical values for the following RF output backoffs with respect to rated (power saver OFF): 7.7 kW at 0 dB (rated); 5.6 kW at -4 dB; 4.9 kW at -7 dB; -4.6 kW at -10 dB; -4.5 kW at -13 dB		
Power Factor	0.9 min.			
Inrush Current, peak	180% of normal line current peak max. (first half-cycle only)			
RF Connection	Input: Type N Female; Output: WR75 waveguide flange, grooved; RF Power Monitors: Type N Female			
Dimension (W x H x D)	RF Drawer 19 x 17.5 x 28 in. (483 x 445 x 711 mm); PS Drawer 19 x 8.75 x 24 in. (483 x 223 x 610 mm), without fans and handles			
Weight	RF Drawer 220 lbs w/ klystron (100 kg); PS Drawer 100 lbs (45.4 kg)			
Cooling	Forced air with integral blower and fans; separate klystron collector cooling path			
Air Flow Rate, Klystron	175 cfm min., at sea level			
External Ducts Backpressure	0.5 inch water gauge total, maximum.			
Klystron Heat Loss	5000 W max.	4400 W max.		
Heat Loss in Room	1700 W max. (cabinet less Klystron)			
Acoustic Noise	63 dBA nominal, measured 3ft. from front of equipment			
Ambient Temperature	-10° to 50° operating; -54° to +71° non-operating			
Relative Humidity	95%, non-condensing			
Altitude	10,000 ft. (3000 m) with standard adiabatic temp derating of 2°C/1000 ft. of 6.5°C/km, operating; 40,000 ft (12,000 m) non-ope			
Shock and Vibration	As normally encountered in satellite earth stations and shipping			

- Other frequencies and power levels also available as options. Contact CPI for details.
- External harmonic filter may be removed as an option. Add 0.25 dB to amplifier output for units ordered without harmonic filter, and raise harmonic output to -30 dBc.
- Prime power AC line imbalance not to exceed 3%. Excess imbalance may cause an increase in residual RF noise (AM, FM and PM). Phase noise increase is typically 2.5 dB / % imbalance.

- AC current harmonic content: less than 20%, primarily fifth and seventh harmonics. Harmonics must be considered when choosing UPS sources.
- Lower power consumption can be achieved if power saver (included as standard) is employed when operating below rated output power.



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For more detailed information, please refer to the corresponding CPI technical description if one has been published, or contact CPI. 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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