

X-Band Gen IV Klystron High Power Amplifier

Unmatched Efficiency

Uses less power and produces less heat than any other K-HPA. Features Power Saver and Power Tracker, optimizing K-HPA efficiency to meet your operating condition.

User-Friendly Features and Options

Scopescreen provides a graphical log display. The 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.

Integrated Protection Switching

Redundant switch controller eliminates the cost of external controllers. System status is shown on the display and switch controls are implemented locally on the front panel touchpad, or remotely via the digital serial interface.

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.

Global Applications

Meets International Safety Standard EN-60215, Electromagnetic Compatibility 2014/30/EU and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements.

Worldwide Support

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



Model X-Band Gen IV
Klystron high power amplifier for
satellite communications

OPTIONS

- Motorized Channel Selector: (<1 second)
- Remote Control Panel
- Linearizer
- L-Band Block Upconverter (BUC)
(Contact factory for typical performance specifications with integrated BUC)
- Ethernet Interface



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X-Band Gen IV Klystron High Power Amplifier

Specification	Model X-Band Gen IV
Frequency Ranges	7.9 - 8.4 GHz
Klystron Power Output	2.5, 3.0 or 3.3 kW min. (64.0, 64.8 or 65.1 dBm)
Amplifier Output ¹	2.0, 2.4 or 2.7 kW min. (63.0, 63.8 or 64.3 dBm), at flange with harmonic filter
Bandwidth	60 MHz (with 2.5 kW klystron) or 45 MHz (with 3.0 kW klystron)
Power Adjustability	0 to -20 dB of output with ± 0.1 dB typical resolution
Gain	77 dB min. at rated power
Gain Stability	± 0.25 dB/24hr max. at constant drive and 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 max. over Fo ± 30 MHz
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 max. for full spec. compliance; any value for operation without damage
AM/PM Conversion	4°/dB max. at rated power
Harmonic Output	-80 dBc with filter; -35 dBc without filter
Noise and Spurious (at rated gain)	-135 dBW/4 kHz, 3.7 - 4.2 GHz; -65 dBW/4 kHz, 4.2 - 12.0 GHz; -110 dBW/MHz, 4.2 - 40, excluding passband
Phase Noise ²	Exceeds requirements of INTELSAT Standard IESS-308/309 by -10 dB at -10 dB backoff
Intermodulation	-28 dBc max. with two equal carriers at total output power 7 dB below rated single-carrier output
Group Delay	In any 40 MHz band: 0.10 ns/MHz linear max; 0.02 ns/MHz ² parabolic max; 2.0 ns pk-pk ripple max.
Primary Power ³	All ratings are $\pm 10\%$, 47-63 Hz 3-phase with neutral and ground: 200 VAC (without neutral), 208 VAC, 380 to 415 VAC
Power Factor	0.95 min.
Power Consumption ⁴	9.5 kW max for 3 kW operation; Typical values for the following RF output backoffs with respect to rated (power saver off): 8.9 kW @ 0 dB (rated), 6.6 kW @ -4 dB, 5.6 kW @ -7 dB, 5.2 kW @ -10 dB, 4.8 kW @ -13 dB; 8.0 kW max for 2.5 kW operation
Inrush Current, peak	180% of normal line current peak max. (first half-cycle only)
RF Connection	Input: Type N female; Output: WR-112 with grooved flange
RF Power Monitors	Type N female
Dimensions	(W x H x D without fans and handles) RF Drawer PS Drawer 19 x 17.5 x 28 in. (483 x 445 x 711 mm) 19 x 8.75 x 24 in. (483 x 223 x 610 mm)
Weight	RF Drawer PS Drawer 220 lbs with klystron (100 kg) 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, max.
Klystron Heat Loss	5300 W max.
Heat Loss in Room	2000 W max. (cabinet less Klystron)
Acoustic Noise	63 dBA nominal, measured 3 ft. 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. or 6.5°C/km 40,000 ft. (12,000 m)
Shock and Vibration	As normally encountered in satellite earth stations and shipping.

¹Harmonic filter can be removed as an option. Add 0.25 dB to amplifier output for units ordered without harmonic filter.

²Prime power AC line unbalance 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.

³AC current harmonic content: less than 20%, primarily fifth and seventh harmonics. Harmonics must be considered when choosing UPS sources.

⁴Lower power consumption can be achieved if power saver (included as standard) is employed when operating below rated output power.