

## CPI S-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

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 conditions.

### 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 and 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 S-Band KPA

### FEATURES:

- Motorized channel selector (<10 seconds)
- Remote control panel
- Linearizer
- Ethernet interface
- Power combined option
- L-Band Block Upconverter (contact CPI for specifications)
- Acoustically quiet
- Scopescreen provides a graphical log display
- Functions are displayed in a large, high-quality, color display with a wide viewing angle. Event log is included.
- Meets international safety standards EN-60215, EMC 2014/30/EU and harmonic standard EN-61000-3-2

### APPLICATIONS:

- Satellite communications, troposcatter and terrestrial gapfiller applications

Quality Management  
System - ISO 9001:2015



Specification	CPI GEN IV Klystron HPA K4S8 series	S-band
Frequency ranges <sup>1</sup>	1.6 to 2.0 GHz, 1.7 to 1.9 GHz, 1.7 to 2.0 GHz, 2.0 to 2.2 GHz, 2.15 to 2.65 GHz or 2.6 to 2.7 GHz	
Klystron power output (min.)	2.5 kW min. (64.0 dBm); 3.0 kW min. at 2.6 GHz (64.8 dBm); 1.2 kW min. (60.8 dBm) for 25 MHz BW	
Amplifier output at flange <sup>2</sup>	2.0 kW min. (63.0 dBm); 2.66 kW min. at 2.6 GHz (64.3 dBm); 900 W (59.5 dBm) for 25 MHz BW	
Bandwidth	8 MHz (-1 dB)	
Power adjustability	0 to -20 dB of output with $\pm 0.1$ dB typical resolution	
Gain at rated power	70 dB min.; 60 dB for 900 W KPA	
Gain stability	$\pm 0.25$ dB/24 hr. max. at constant drive and temperature 1.0 dB max. from 20° to 40°C; $\pm 2.5$ dB max from 0° to 50° C (at constant drive)	
Gain slope at rated power	0.2 dB/MHz typ. over $F_0 \pm 2.0$ MHz	
Gain variation at rated power	0.5 dB pk-pk typ. over $F_0 \pm 2.0$ MHz	
VSWR	Input (200 MHz tunable): 1.30:1 max; Output (200 MHz tunable): 1.35:1 max; 2.0:1 for full spec. compliance - any value for operation without damage	
AM/PM Conversion	4°/dB max. at rated power; 10°/dB max. (>200 MHz tunable)	
Harmonic Output <sup>2</sup>	-80 dBc	
Noise power density (at rated gain)	-145 dBW/4 kHz, receive band typ. -60 dBW/4 kHz, in passband typ. (-55 dBW/4 kHz typ. with linearizer) -110 dBW/4 kHz, outside passband typ.	
Spurious at rated power	-60 dBc; -55 dBc with linearizer option	
Phase noise <sup>3</sup>	Exceeds requirements of IESS-308-309 at -10 dB backoff	
Intermodulation	-29 dBc with two equal carriers at total output 7 dB below rated single-carrier output	
Group delay <sup>4</sup>	3.0 ns/MHz linear max; 2.0 ns/MHz parabolic max.; 4.0 ns pk-pk ripple max.	
Primary power <sup>3</sup>	All ratings are $\pm 10\%$ , 47-63 Hz 3-phase with neutral and ground: 208 VAC or 380 to 415 VAC	
Power consumption <sup>5</sup>	10.0 kW max; typical values for the following RF output backoffs with respect to rated (power saver off): 9.0 kW at 0 dB (rated); 7.0 kW at -4 dB; 6.0 kW at -7 dB; 5.2 kW at -10 dB; 5.0 kW at -13 dB	
Power factor	0.95 min.	
Inrush current, peak	180% of normal line current peak max. (first half-cycle only)	
RF connections	Input: Type N Female; Output: CPR-430 grooved flange below 2.10 GHz (CPR-340G flange at 2.6 to 2.7 above 2.10 GHz)	
RF power monitors	Type N female	
Dimensions (W x H x D) (without fans and handles)	RF Drawer (Above 2.1 GHz) <sup>1</sup> 19 x 23 x 34 in. (483 x 584 x 863 mm); (Below 2.1 GHz) <sup>1</sup> 19 x 24.5 x 42 in. (483 x 623 x 1066 mm) PS Drawer 19 x 8.75 x 24 in. (483 x 223 x 610 mm)	
Weight	RF Drawer 280 lbs w/ klystron (127 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	250 cfm min., at sea level (175 cfm at 10,000 ft.)	
External ducts backpressure	0.5 in. 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 3ft. from front of equipment	
Ambient temperature	-10° to +50° operating; -40° to +80° non-operating	
Relative humidity	95%, non-condensing	
Altitude	6000 ft. (1829 m) operating with standard adiabatic temp derating of 2°C/1000 ft. of 6.5°C/km, 40000 ft (12000 m) non-operating	
Shock and vibration	As normally encountered in satellite earth stations and shipping	

1. Other frequencies and power levels also available as options. Contact CPI for details.

2. 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. The external harmonic filter extends 12 to 18 in behind the back of the RF drawer.

3. 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.

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

5. 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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