

S-Band Compact Klystron High Power Amplifier

for Satellite, Troposcatter, Terrestrial Gapfiller and Test Applications

The Compact High Power Amplifier

S-Band CKPA — provides up to 2.5 kW of power in a dual drawer package

Technology Reuse At its Best

Assures high reliability in a compact design based on field proven performance. Features Power Saver and Power Tracker, optimizing K-HPA efficiency to meet your operating condition.

New 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.

Useful Displays

Large, high quality, color, graphical display has a wide viewing angle and a sharp appearance. All important functions are clearly displayed, and an event log is included.

S-Band



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 touch-pad, 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-size, non-magnetic rack.

Worldwide Support

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

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Compact Klystron High Power Amplifier

SPECIFICATIONS, Model K3S S-Band CKPA Electrical

Frequency Range ¹	Various bands within the 1.7 - 3.0 GHz frequency range, including a 2.0 to 2.6 GHz wideband option ¹
Klystron Power Output ¹	Up to 2.50 kW min. (64.0 dBm), depending on klystron ¹
Amplifier Output at flange ^{1,2}	1.0 to 2.0 kW min. (63.0 dBm), depending on klystron ^{1,2}
Bandwidth	8 MHz (P1dB)
Power Adjustability	0 to -20 dB of output with ± 0.1 dB typical resolution
Gain at Rated Power	74 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)	0.2 dB/MHz max. over (Fo ± 2.5 MHz) (0.5 dB/MHz max. wide freq. range option)
Gain Variation (at rated power)	0.5 dB pk-pk max. over (Fo ± 2.5 MHz), where Fo is the center freq. of the selected channel
Input VSWR	1.25:1 max. (1.35:1 max. with wide freq. range option)
Output VSWR	1.35:1 max. (1.5:1 max. from 2.0 to 2.5 GHz and 1.65:1 from 2.5 to 2.6 GHz with wide band frequency option)
Load VSWR	2.0:1 max. for full spec. compliance; any value for operation without damage
AM/PM Conversion (at rated power)	3°/dB maximum
Harmonic Output ²	-80 dBc
Noise Density (at rated gain)	-145 dBW/4 kHz, receive band (2.2 to 2.3 GHz, except for when the klystron is tuned at CF 2.13 to 2.37 GHz) -60 dBW/4 kHz, in passband (-55 dBW/4 kHz in passband with lin) (-50 dBW/4 kHz in passband with BUC) -110 dBW/MHz, outside passband
Phase Noise ^{3,4}	Exceeds requirements of IESS-308/309 by 10 dB at 10 dB backoff.
Intermodulation	-29 dBc with two equal carriers at total output 7 dB below rated single-carrier output
Group Delay	3.0 ns/MHz linear max. 2.0 ns/MHz ² parabolic max. 5.0 ns pk-pk ripple max. (the above group delay specs are typical for the wide freq. range option)
Primary Power ⁴	All ratings are $\pm 10\%$, 47-63 Hz 3-phase with neutral and ground: 208 VAC 380 to 415 VAC 200 VAC (without neutral)
Power Consumption ⁵	10 kW max.

OPTIONS:

- *Motorized Channel Selector: (<10 seconds typ.)*
- *Remote Control Panel*
- *Linearizer*
- *Ethernet Interface*
- *Power Combined Option*

KLYSTRON MAGNET SUSCEPTIBILITY

Install RF Drawer at least 12 inches from ferromagnetic structures (i.e. power transformers, cold rolled steel racks or structural beams).

Failure to comply with this requirement may result in degraded RF performance and/or product failures.

Mechanical

RF Input Connection	Type N female
RF Output Connection	CPR-430 G flange (CPR-340 G flange for 2.6 - 2.7 GHz)
RF Power Monitors	Type N female
Dimension (W x H x D without waveguide, fans and handles)	19 x 24.5 x 33 in. (483 x 623 x 838 mm)
RF Drawer ⁶	19 x 8.75 x 24 in. (483 x 223 x 610 mm)
PS Drawer	19 x 8.75 x 24 in. (483 x 223 x 610 mm)
Weight	280 lbs w/klystron (127 kg)
RF Drawer	92 lbs (41.8 kg)
PS Drawer	92 lbs (41.8 kg)
Cooling	Forced air with integral blower and fans; separate klystron collector cooling path
Air Flow Rate, Klystron	450 cfm min., at sea level (300 cfm at 10,000 feet)
External Ducts Backpressure	0.5 inch water gauge total, maximum
Klystron Heat Loss	8000 W max.
Heat Loss in Room (cabinet less Klystron)	2000 W max.
Acoustic Noise	68 dBA nominal, measured 3 ft. from front of equipment (quieter with variable fan speed control option)

Environmental

Ambient Temperature	-10° to +50° operating; -40° to +80° non-operating
Relative Humidity	95%, non-condensing
Altitude	operating: 5,000 ft. (1525 m) with standard adiabatic temp derating of 2.5°C/1000 ft. or 8.125°C/km non-operating: 40,000 ft. (12,000 m)
Shock and Vibration	As normally encountered in satellite earth stations and shipping

¹Frequency ranges and output power levels are klystron dependent. For a complete list of the klystrons available, please refer to CPI technical description TD-143

²External 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.

³Prime 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.

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

⁵Lower power consumption can be achieved if power saver (included as standard) is employed when operating below rated output power.

⁶Wideband version (2.0 - 2.6 GHz) has a height of 28.0" (712 mm)



Please check CPI's web site to ensure most current data sheet.

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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