K2D130W
K2 Series
Digital IOT

K2 UHF-TV Cavity Amplifier

- Designed for 8VSB operation
- Peak power capabilities of 130 kW with average power of 31 kW
- High gain amplifier: 22 dB minimum
- Long life, high reliability with dispenser type cathode and pyrolytic graphite grid
- Single tube and circuit: 470 to 815 MHz
- User-friendly tuning
- Tube replacement does not require disconnection of power supply or cooling water
- Compact size with "collector (water) down"
- Water-cooled collector and output cavity. Air-cooled electron gun and anode.
- Made in the USA - ISO 9001 facility

Made in USA

The EIMAC K2D130W Klystrode® Inductive Output Tube (IOT) is a high efficiency amplifier tube for use in digital UHF television service as the output stage of DTV transmitters. The K2 series is suitable for use with 8VSB, COFDM and similar modulation schemes.

The K2 cavity amplifier, is comprised of a single tube, K2D130W, and associated hardware assembly, HA2000. The cavity amplifier covers the entire UHF TV band from 470—815 MHz (bands IV and V).

The K2 amplifier series has an advanced Electro-Magnetic-Compatibility (EMC) designed input circuit, which isolates the RF input from the transmitter DC high voltage. The input filter circuit is optimized for the sharp rise-time, short duration pulses of DTV, simplifying transmitter pre-correction. The input circuit has a stable, out-of-the-way storage position and utilizes a cam-guided insertion mechanism to ensure positive connection to the IOT.

The input cavity, the output cavity, focus magnet assembly, arc detector, water-jacket and load coupler are mounted on a rugged wheeled support stand which is compatible with transmitters from all manufacturers.

Electron gun and cavity air-cooling is improved with the new K2 air plenum design. Tube replacement and maintenance is a simple matter for one person without requiring hoists or removing the cavity assembly from the transmitter cabinet. Coolant lines or power supplies do not have to be disconnected.

In DTV digital transmission, the K2D130W Klystrode® IOT can be used at up to 130 kW peak power with average power levels of 30 kW for 8 VSB operation (for details please contact Eimac Division, CPI Inc., Klystrode® IOT Applications Engineering).

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Summary Data

Frequency Range ..... 470 to 815 MHz
Power Gain ..... 22 dB typical at average power levels
Beam Voltage ..... 27 to 38 kV*

ELECTRICAL
Cathode ..... Dispenser type
DC Heater Voltage ..... -8 to -10 V
DC Heater Current ..... 8.5 A (typical)
DC Heater Power ..... 80 W (nominal)
Maximum cold start DC Heater Current 15A*
Heater warm-up time ..... 5 minutes (nominal)
Focus Magnet (current regulated):
DC Voltage ..... 3.5 ±1.5V
DC Current ..... 15—25A

MECHANICAL
K2D130W Klystrode IOT
Length ..... (overall) 22.5 in (57.2 cm) nominal
Diameter ..... (overall) 5.1 in (12.9 cm) nominal
Mounting position ..... vertical, collector end down
Net weight (with lift handle) ..... 25.0 lbs (11.4 kg) approx.

HA2000 Hardware Assembly
Input ..... RF connector, 7/16" type N
Output RF connector: Standard 3-1/8 inch, 50 Ohm coaxial line (Alternate 4-1/16 inch, 50 Ohm coaxial line available - user to specify).
Net weight of total hardware assembly ..... 460 lbs [209 kg]

* Current must be limited by the supply

Operational Characteristics

DTV Service (8VSB):

Peak output power ..... 130 kW
Average output power ..... 30 kW
VSWR ..... 1.1 : 1
Beam Voltage ..... 36 kV
Beam Current (avg) ..... 2.3 A
Grid Current (max) ..... ± 0.2 A
Bias Voltage (typical) ..... -73 V
Beam idle current ..... 0.5 A
Peak input power ..... 1000 W
Average input power ..... 240 W
Collector Dissipation (max) ..... 60 kW

Cooling[1]
Airflow to cavities and cathode ..... 50 - 70 cfm (2.0m^3/min)
Static pressure head ..... 5.0 inches water (1.30 kPa)
Inlet air temperature ..... 15—50°C
Water flow for collector ..... 10–20 US g/min (38 -75 1/min)
Collector pressure drop at 15 US gal/min ..... 15 psi (104 kPa)
Maximum Inlet pressure ..... 60 psi (414 kPa)
Water Outlet temperature ..... 70°Cmax
Water Inlet temperature ..... 15°—55°C

Arc Detector
Two (2) photo resistors and test lamps are located in the output cavities which must be used for protection of the tube from cavity arc damage.

ION Pump
A getter ion pump requiring 3-4 kV with respect to the heater is provided.

NOTE 1:
The recommended coolant flow rate for pure demineralized water is 10 GPM. When using a 50/50 glycol/water mix, Eimac recommends the flow rate be set at 20 GPM. Regardless of the coolant mixture, should audible evidence of boiling be heard, which sounds like rattling, the coolant flow rate must be immediately increased or the equipment shut down. Annual replacement of the coolant, such as Dowtherm 4000 or Dowtherm SR-1, is recommended to avoid glycol breakdown.

For More Detailed Information: Contact CPI MPP / Eimac Operation, IOT Applications Engineering
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