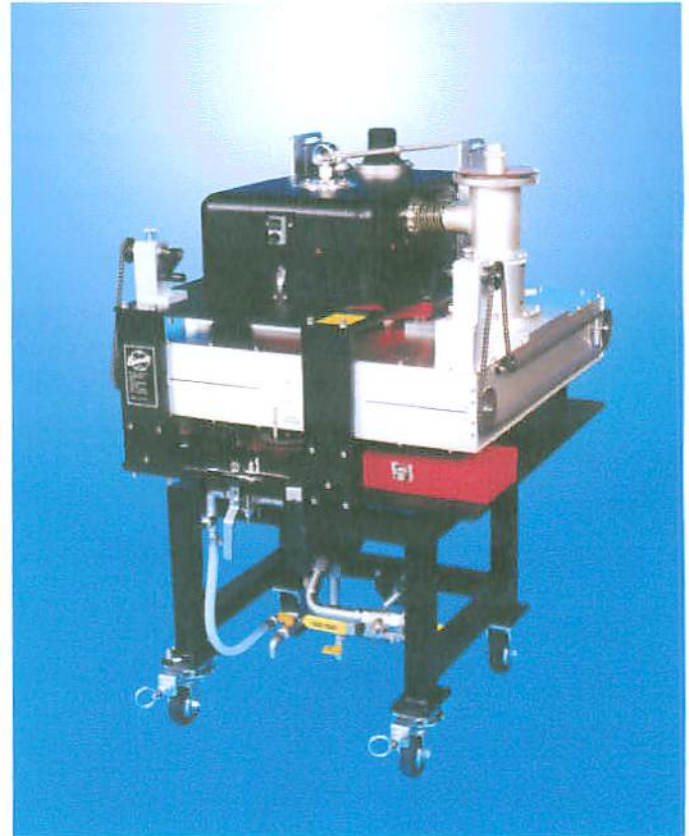




## K2D110W (K2)<sup>2</sup> Klystrode<sup>®</sup> Digital IOT Amplifier

(K2)<sup>2</sup> UHF-TV Cavity Amplifier

- Designed for 8VSB operation
- Peak power capabilities of 110 kW with average power of 26 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, cavities and anode - air cooled electron gun
- Made in the USA - ISO 9001 facility



Made in USA

The EIMAC K2D110W Klystrode<sup>®</sup> 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)<sup>2</sup> series is suitable for use with 8VSB, COFDM and similar modulation schemes.

The (K2)<sup>2</sup> cavity amplifier, is comprised of a single tube, K2D110W, and associated hardware assembly, HA2000. The cavity amplifier covers the entire UHF TV band from 470—815 MHz (bands IV and V).

The (K2)<sup>2</sup> 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 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.

Electron gun and cavity air-cooling is improved with the new (K2)<sup>2</sup> air plenum design. Tube replacement and maintenance is a simple matter for one person without requiring winches 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<sup>®</sup> IOT can be used at up to 110 kW peak power with average power levels of 26 kW for 8 VSB operation (for details please contact Eimac Division, CPI Inc., Klystrode<sup>®</sup> IOT Applications Engineering).



## 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

#### K2D110W 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, type N  
 Output RF connector: Standard 3 1/8 inch, 50 Ohm coaxial line  
 (Alternate 41/16 inch, 50 Ohm coaxial line available - user to specify).  
 Net weight of total hardware assembly ..... 460 lbs [209 kg]



## Operational Characteristics

### DTV Service (8VSB):

Peak output power: ..... 110 kW  
 Average output power: ..... 26 kW  
 VSWR: ..... 1.1 : 1  
 Beam Voltage ..... 34 kV  
 Beam Current (ave): ..... 2.1 A  
 Grid Current (max) ..... ± 0.2 A  
 Bias Voltage (typical) ..... -73 V  
 Beam idle current ..... 0.5 A  
 Peak input power ..... 875 W  
 Average input power ..... 210 W  
 Collector Dissipation (max) ..... 60 kW

### Cooling<sup>1</sup>

Airflow to cavities and cathode ..... 50 - 70 cfm (2.0m<sup>3</sup>/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 l/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.

\* Current must be limited by the supply

**For More Detailed Information:** Contact Eimac Division, CPI Inc., Klystrode IOT Applications Engineering  
 301 Industrial Road, San Carlos, CA 94070 Phone: 650 592-1221, Fax: 650 592-9988  
<http://www.eimac.com> or e-mail to: [klystrode@eimac.cpii.com](mailto:klystrode@eimac.cpii.com)

Characteristics and typical operating conditions are tentative. These figures may change without notice as a result of additional information. CPI, Eimac Division should be consulted before using this information for final equipment design. Klystrode<sup>®</sup> and Eimac<sup>®</sup> are registered trademarks of CPI. Vacion<sup>®</sup> is a registered trademark of Varian Associates, Inc.

<sup>1</sup> Contact factory for recommendations when using Glycol coolant.