



XTRD-400K Ku-Band High Power Rack Mount Amplifiers



- **400 Watts**
- **Power Factor Correction**

- **Digital Display & Control Interface**
- **High Efficiency**

The XTRD-400K is a highly efficient rack mountable traveling wave tube amplifier (TWTA) designed for fixed and mobile uplink applications.

The unit includes RF gain control, a solid state pre-amplifier, RF filters, cooling, and monitoring and control (M&C) systems.

Rack space is conserved because the amplifier occupies only 3 rack units (5¼ inches) of a standard 19-inch rack cabinet. Nominal weight is 56 pounds.

The unit features a menu driven front panel display and RS-232/422/485 serial port interfaces for complete computer control. RF, traveling wave tube, and default parameters are easily monitored on the four line front panel display.

Gain control is provided via the front panel or through the serial interface.

The XTRD-400K incorporates high efficiency, dual stage collector TWTs. Reliability is enhanced because both prime power consumption and internal operating temperatures are reduced for both the linear and saturated modes of operation.

Power factor correction circuitry is also included which minimizes line current distortion and reduces the required Volt-Amps input.

The automatic features of the high frequency resonant conversion power supply include quick recovery from prime power outages and multiple helix fault resets (three fault cycles.)

Depending upon user requirements these amplifiers can be configured for either single thread or redundant system operation.

PERFORMANCE SPECIFICATIONS

Parameter	XTRD-400K Ku-Band
FREQUENCY RANGE (extended frequency coverage) available	13.75 to 14.5 GHz (12.75 to 14.5 GHz)
OUTPUT POWER Traveling Wave Tube Rated Power @ Amplifier Flange	400 W 350 W
GAIN Large Signal, minimum Small Signal, minimum Attenuator range (continuous) Maximum SSG Variation Over: Any Narrow Band Full Band Slope, maximum Stability, 24 Hr maximum Stability, Temperature	70 dB 75 dB 25 dB 1.0 dB per 80 MHz 2.5 dB ± 0.04 dB/MHz ± 0.25 dB ± 1.0 dB maximum over temperature range at any frequency
INTERMODULATION with two equal signals	-18 dBc maximum with two equal carriers @ 4 dB total output backoff
HARMONIC OUTPUT, maximum	-60 dBc
AM/PM CONVERSION, maximum	2.5°/dB 6 dB below rated power
NOISE POWER, maximum Transmit Band Receive Band	-70 dBw/4 kHz -150 dBw/4 kHz 10.95 to 12.75 GHz
GROUP DELAY, maximum Bandwidth Linear Parabolic Ripple	Any 80 MHz 0.01 nsec/MHz 0.005 nsec/MHz ² 0.5 nsec/P _K -P _K
RESIDUAL AM NOISE, maximum	-50 dBc to 10 kHz -20 (1.5 + logf) dBc to 500 kHz -85 dBc above 500 kHz
PHASE NOISE, maximum	12 dB below IESS phase-noise profile AC fundamental -50 dBc Sum of all spurs -47 dBc
VSWR Input, maximum Output, maximum	1.3:1 1.3:1

PRIME POWER

90 MIN - 264 MAX VAC
47 to 63 Hz, single phase
0.95 Minimum Prime Power Factor
Maximum Input VA: 1400

OPTIONS

Extended Frequency Coverage
1:1, 1:2, 1:N Redundancy
Variable Phased Combined
Integrated Linearizers



ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50° C to +70° C
OPERATING TEMPERATURE RANGE	-10° C to +50° C
HUMIDITY	Up to 95% Noncondensing
ALTITUDE	10,000 feet MSL maximum
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air

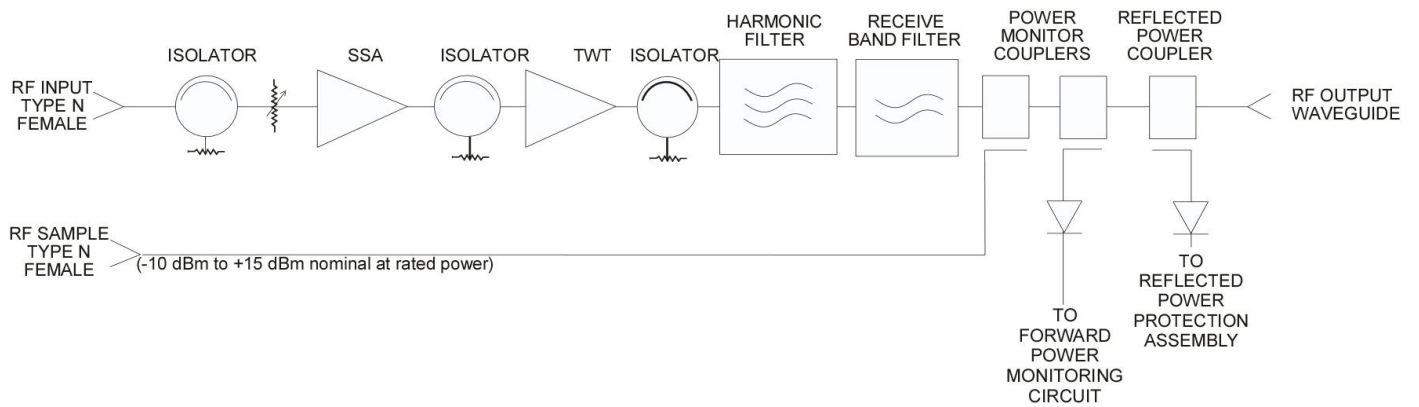
INTERFACE

TYPE	FUNCTION			
CONTROLS	Local	Local/remote	AC Power ON/OFF	
	Local and Remote	Gain	High Voltage ON/OFF	Fault Reset
		Min/Max Power Alarm/Fault	Audio Alarm ON/OFF	Lamp Test
		Reflected Power Alarm/Fault	Units (Watts, dBm, dBW)	Heater Standby ON/OFF
STATUS	Front Panel LEDs	Standby	Power	Heater Time Out (FTD)
		Local	Remote	Heater Standby
		Summary Fault	High Voltage	
	Front Panel Digital Display	Power Out	Beam Hours	Faults:
		Reflected Power	Helix Current	High VSWR
		TWT Temperature	Helix Voltage	High Voltage
Heater Hours			Helix Current	TWT Temperature
Dry Form-C Relay Contacts (Two)		Summary Fault		
COMPUTER	Hardware Interface	Two Ports: RS-232 & RS-422/RS-485		
SERIAL PORT	Xicom Command Set	ASCII Commands		
RF SAMPLE PORT COUPLING				-37 dB Nominal

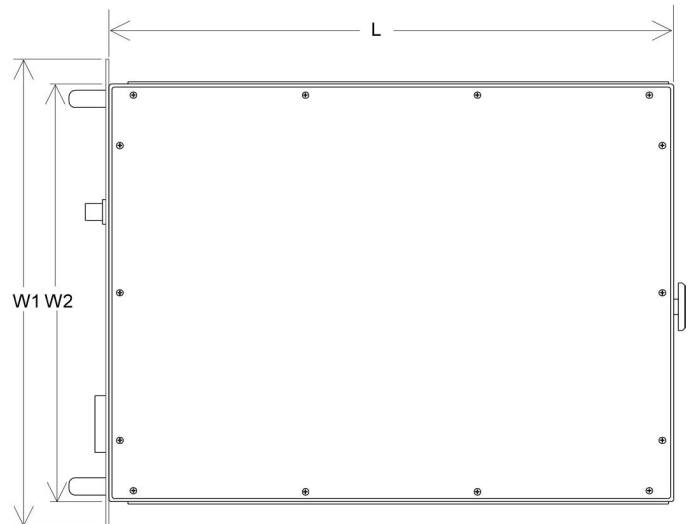
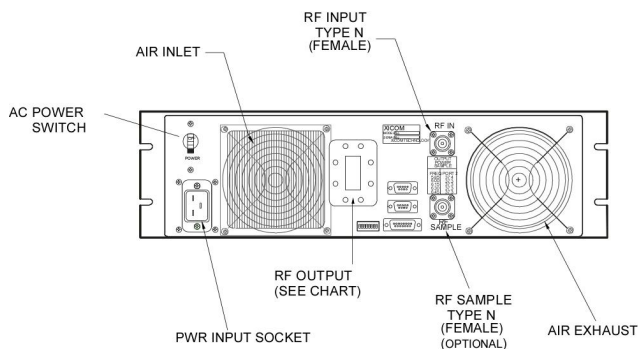
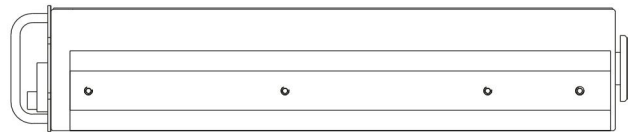
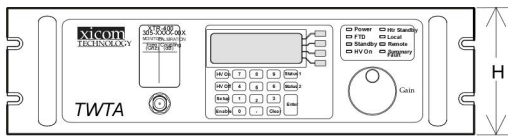
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Block Diagram



Outline Drawing



RF OUTPUT (WAVEGUIDE FLANGE)
Ku-BAND-WR-75

DIMENSIONS		
	inches	centimeters
W1	17.00	43.18
W2	19.00	48.26
L	23.00	58.42
H	5.22	13.26

Nominal Weight = 56 lbs (25.4 kg)