

**T&C**  
Power Conversion

# AG 2413 RF POWER SOURCE



T&C POWER CONVERSION

**2400 Watts of RF Power at 13.56 MHz for Industrial and Laboratory Applications.**

**FEATURING:**

- **13.56 MHz up to 2400 Watts in peak power**
- **Low harmonic level @ 2000 W Better than -40 dBc**
- **Measuring Forward, Reflected and Load Power simultaneously**
- **Front Panel Control & Monitoring of all Generators functions. Data acquisition: Status Monitoring & Power Measurement via Analog Port**
- **AGC Power Leveling: Output Power Control within ±1.5% SP typical**
- **Pulse operation in MGC/Burst mode**



RF Power Source Model AG 2413 is a robust source of RF power for general laboratory and industrial applications.

Featuring leading edge solid state design for all generator stages and a built-in crystal oscillator signal source, it provides everything for a complete and reliable, controlled RF power delivery system. It reflects the **T&C** ongoing commitment to provide RF power products of the highest quality, incorporating current requirements for complete remote control and data acquisition.

**OPERATION**

The AG 2413 is capable of up to 2400 watts of total RF power at a frequency of 13.56 MHz, with low harmonic distortion. Front Panel power meters are calibrated into a 50 Ohm load and are accurate when unit operates into a matched load. Outside matched condition, the model AG 2413 power measurement system provides an accurate reading of VSWR. High level VSWR is also monitored for protection of RF output stage. When used as an amplifier, the AG 2413 is compatible with most signal and function generators,

computer synthesizer cards and amplifies signals within its control loop bandwidth limits. The AG 2413 features a combination of forced-air and water cooling systems. The internal power supply designed to permit operation over a wide temperature range and AC line conditions.

The AG 2413 is built to withstand a +3 dBm Input signal. The unit amplifies the inputs of AM, narrow band FM and pulse modulations.

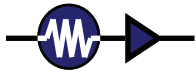
**OUTPUT PROTECTION**

AG 2413 is protected by its internal monitoring system for 2400 Watts of Forward Power and 480 W of total Reverse Power (20% of total FWD). REV automatic fold back reduces output power depending on the level of the actual VSWR.

**GENERAL**

**T&C** generators are designed to be reliable. The use of conservatively rated components ensures high reliability and eliminates the need for periodic retuning.

110 Halstead Street  
Rochester, New York 14610  
USA  
Tel: 585 482-5551  
Fax: 585 482-8487  
www.tcpowerconversion.com  
sales@tcpowerconversion.com



## Class Of Operation

Class C

## Frequency Of Operation

13.56 MHz

## RF Power Output

2400 Watts nominal  
Calibration into 50 Ohm standard

## Dynamic Power Range

~ 1 to 2400 Watts,  
2400 Watts max FWD power limit.

## Operation with external signal: Output as amplifier in MGC/Burst

0 dBm IN, 10V scale at CTL IN pin 5  
NOTE! Scale for MGC is not as linear .

## RF Input Drive for AGC Mode

Recommended +0 to +3 dBm for best operation.

## Input Drive Source (amplifier)

Signal or function generator, analog input capable of drive 0 to 3 dBm @ 50 Ohm

## Internal RF Source

Crystal oscillator at 13.56 MHz  
Stability: 0.005% or better

## Input and Output Impedance

50 Ohm

## IN / OUT VSWR

1.2:1 max - input  
3:1 max - output

## Output VSWR Protection

480 Watts max reflected power limit (20% of max FWD). Automatic fold back limit with [W] level of protection depending on actual VSWR of the load connected.

## Harmonic Level @ 2000W

Better than -40 dBc any harmonic

## Spurious Output

-50 dBc noise level generated by internal circuits

## Output Blanking

T&C amplifiers and generators offer blanking of the output signal.  
Function available via DB25 connector.

## RF Output Settings & Control

- Front Panel EDITOR and function switches for manual control,

- Front Panel ports:  
SubD 25 Analog and Digital I/O .  
User selectable levels down to 1 watt.  
Scales:  
5V (default) = full power  
10V = full power, selected from the front panel

USB 2.0 (RS232) "Digital Communication" for GUI or user own communication schemes.

## Power Settings Accuracy

>240W: within +/-1.5 % of a SP,  
< 240W: within +/- 6W.  
Unit-to-unit repeatability within 1%, subject to all effective limits.

## BURST Specifications

Pulse Width from 3  $\mu$ s to continuous, user defined.

## Front Panel Connectors

INPUT BNC Female  
OUTPUT Type N Female  
Digital I/O: RS232, USB2.0.

## AC Power Connection

Non-detachable power cord anchored with compression bushing. Back Panel.

## AC Power Connection

Three Prong International connector (2P +SG for L1, N/L2, SG),  
INTERPOWER p/n 84132201 (blue),  
VDE rating 32A/200/250V,  
UL/CSA rating 30A/250V

## AC Circuit Protection

Internally fused on each PFC module of the AC/DC Power Supply,  
3 x15A

## AC Input Current (RMS)

21A max. 200 to 240 VAC, +/-10%,  
50-60 Hz, @ 2.4 kW RF set point.

Power Consumption  $\leq$ 4.4 kVA

AC Front End with Power Factor Correction!

## Cooling

Forced air, with air flow left-to-right, sideways. 6" space on each side recommended, 1.5" (30 mm) min required for proper operation with minimum static pressure. 80 CFM.

Water at 15C-25C with flow  $\geq$  1.5 GPM (6LPM). Heatsink temperature monitored for equipment safety, 70C limit.

## Water Inlet and Outlet

The connection provided accepts a 3/8-inch NPT male pipe thread.

## Dimensions

H132.5mm x W482mm x L320mm  
( 5.25" x 19" x 12.6" )

## Weight

15 kg, 33 lbs.

## Mounting

19" Rack, 3U high.  
Front Panel with extended ears for rack mounting.

## Environmental conditions

Temp.: 0° to 40° C ambient  
Humidity: 80%

Equipment intended for ISM applications in laboratory and light industrial environment.

CE self certified for EN/UL 61010-1

RoHS compliance.