

## dB-3903 TWT Amplifier



**9kW Pulsed**  
**8 – 12 GHz**



The dB-3903 power-combined TWT Amplifier (TWTA) uses two wideband, periodic permanent magnet (PPM)-focused TWTs to amplify CW, AM, FM or pulse-modulated signals. Compared to a single TWT approach, the dB-3903 provides higher saturated output power and improved harmonic performance. In addition, dB Control minimizes losses from power combining by carefully matching the TWTs and other RF components for amplitude and phase over the entire frequency range.

Designed and manufactured in-house, the dB-3903 uses dB Control's proprietary transformer fabrication, encapsulation and high-voltage potting techniques developed specifically for demanding military applications.

The power supply section of the dB-3903 employs a modular architecture and low-noise power supply topology using high-efficiency solid state power-conversion circuits. An embedded microcontroller provides the interface, control and protection functions, as well as extensive fault diagnostics and status indication.

With only one RF input and one RF output (similar to single TWT configurations), the dB-3903 is extremely easy to operate; no RF switches are required.

### Features

- 8 to 12 GHz, 9kW peak typical, 6% duty
- Excellent amplitude and phase stability
- Very low phase noise
- Low harmonics and spurious
- Complete protection for the TWT and power supply against excessive currents, high VSWR, over temperature, and over/under voltages
- Extensive BIT and status monitoring
- Local or remote operation
- Fault isolation
- Optional remote protocol

### Applications

- Test and measurement
- RFI/EMI/EMC testing
- Antenna pattern and radar cross-section measurements
- Electronic countermeasures (ECM)
- Electronic warfare (EW) simulation

# dB-3903 TWT Amplifier Specifications

**Reliability by Design®**

## Electrical

|                                 |   |
|---------------------------------|---|
| Frequency Range                 | 8.0 GHz to 12.0 GHz, instantaneous bandwidth  |
| Power Output                    | 9kW peak typical  |
| Duty                            | 6% max. P.W. 50 $\mu$ s max. PRF 100kHz max.  |
| RF Input for Rated Output Power | 0 dBm (1 milliwatt)   |
| Gain at Rated Power             | 69.6 dB min.  |
| RF Gain Adjustment Range        | 30 dB min.  |
| Harmonics                       | -20 dBc typical   |
| Spurious                        | -50 dBc within 1 MHz of carrier   |
| Input/Output VSWR               | 2.0:1 max.  |
| Load VSWR                       | 1.5:1 max. for full specification compliance<br>2.5:1 max. no damage  |
| Prime Power                     | 208 VAC, 3-Phase, 50/60 Hz  |
| Power Consumption               | 5 kVA max.  |
| Amplifier Protection            | TWT Over-Temperature, Helix Over-Current,<br>Arc Protection, Cathode Over-Voltage,<br>High Reflected RF Power,<br>Power Supply Over-Temperature |
| Front Panel Digital Display     | Equipment Status, Faults  |
| RF Sample                       | Forward/Reflected Power, -60 dBc  |
| Instrument Control              | Local or remote   |
| Front Panel Controls            | Power On  |
| Optional Protocols              | RS232, RS422, RS485, Ethernet (TCP/IP)<br>or custom protocols   |

## Mechanical

|                       |                                  |
|-----------------------|----------------------------------|
| RF Input              | Type N (F)                       |
| RF Output             | WR-90 Flange                     |
| RF Sample             | SMA/Type N (F)                   |
| Remote Control        | DB-15                            |
| Input Power Connector | MS Type (optional)               |
| Interlock             | DB-9                             |
| Size                  | 18" (W) x 28" (H) x 36" (D) max. |
| Weight                | 300 lbs max.                     |
| Cooling               | Built-In forced air              |

## Environmental

|                       |  |
|-----------------------|--|
| Operating Temperature | -10° C to +50° C, ambient              |
| Operating Altitude    | Up to 10,000 feet above mean sea level |
| Humidity              | Up to 95% RH non-condensing            |

*Specifications subject to change without notice.*



## About dB Control

Established in 1990, dB Control Corp., a subsidiary of the Electronic Technologies Group (ETG) of HEICO Corp., supplies mission-critical, often sole-source, products worldwide to military organizations, as well as to major defense contractors and commercial manufacturers. dB Control designs and manufactures reliable high-power TWT Amplifiers (TWTAs), microwave power modules (MPMs), transmitters and power supplies with modulators for radar, electronic countermeasures (ECM) and data link applications. The company's high-power amplifiers use solid state, as well as vacuum electron devices and cover the 1 to 50 GHz frequency range. The modularity of dB Control's designs enables rapid configuration of custom products for a variety of platforms, including ground-based and high-altitude military manned and unmanned aircraft. dB Control has an outstanding record of successfully repairing, refurbishing and replacing tightly packaged high-voltage transformers, assemblies and power supplies. The company offers specialized contract manufacturing, transformer winding and testing, full vacuum encapsulation, pressure cure, conformal coating and repair depot services from its modern 52,100-square-foot facilities in Fremont, California. [www.dBControl.com](http://www.dBControl.com)

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