

# *Your EMC System Solutions Expert Designs Tailored To Meet Your Exact Requirements*





## We Have The Solution To Your System Needs

Fully Integrated Test Systems For Any Application  
from DC to 50 GHz

Whether you choose one of our standard test systems – or have AR build a system to your specs – you'll be amazed at how easy, accurate, efficient, and affordable testing can be. Everything you need is right at your fingertips. It all works together perfectly, because everything has been carefully selected and assembled by AR engineers, using the most dependable and most innovative equipment on the market today.

### Why An AR System Is The Smart Choice

- No company has more experience and expertise in EMC test equipment than AR
- Reduced Test Time – get products to market faster
- Increased Accuracy / Lower Risk
- Performance Guarantee – AR manufactures the majority of the critical system components allowing us to match and guarantee them to meet your requirements
- Everything is fully tested before being shipped
- Single source for support & service
- More Compact & Portable – numerous systems can be on one platform
- Free Automated Test Software

AR can deliver a solution that integrates all your testing needs: radiated and conducted immunity, radiated and conducted emissions, electrostatic discharge, lightning simulation...whatever you need.

We have the expertise and experience to supply fully automated systems needed to test various standards including IEC 61000, MIL-STD 461 and 464, DO-160, wireless, automotive, HIRF and HERO.



# Critical Steps in Designing EMC Test Systems

## New Webinar Available On Demand!

In this presentation AR discusses the most critical aspects of designing an EMC test system to meet your specific needs and requirements. Focus will be on selecting and sizing the appropriate equipment and learning the appropriate questions to ask in order to achieve these goals.

AR has the experience to develop full-turnkey solutions for a multitude of requirements – not only RI and CI, but RE and CE as well.

### What Will You Learn from this Webinar?

- EMC Test System Basics
- Common EMC Test Standards
- Defining Test System Requirements
- Sizing Components
- Sourcing Components and Systems
- Future Considerations / Expansion
- Basic Radiated Immunity Test System Example
- AR System Examples



### Defining Test System Requirements (cont.)

#### Rack-mount system vs. separate components

- Separate components
- Better organization

#### Software control

- Many tests achieved through software automation



EMCLIVE <sup>EM</sup> 17

### Watch the Webinar

Visit [www.arworld.us/design2](http://www.arworld.us/design2) or scan this page with the Layar app to watch on your mobile device.



# For Speed, Accuracy And Efficiency, You Can't Beat AR Systems



SP1053 1-18 GHz, 200V/m, Radiated Immunity System on an electric scissor lift with a 1-6m adjustable antenna height.



## *We Have a “System” To Take You As Far As You Want To Go.*

AR Systems Make Testing Easy and Virtually Foolproof.

We have complete test systems that perform entire tests up to 50 GHz with just the press of a few buttons. Everything you need – amplifiers, antennas, couplers, signal generators, system controllers, receivers, and more, along with the software to control it – all in one comprehensive test system.

*Choose an AR Radiated Immunity Test System... or Let Us Customize to Your Specs*

## *New Video: AR Applications Engineer Discusses AR Turnkey Systems*

Watch this new video on AR's Turnkey Systems and how we can meet your specific requirements.

AR RF/Microwave Instrumentation is proud to offer a wide range of turnkey system solutions for testing various standards including IEC, MIL-STD-461, MIL-STD-464, DO-160, Automotive and HIRF. AR currently offers standard and custom system solutions, tailored to fit your exact requirements. In this video, Applications Engineer Flynn Lawrence discusses an example of AR's turnkey system design and development.

<http://bit.ly/ARSystemsDemo>

Or scan this page with the Layar app to watch on your mobile device.

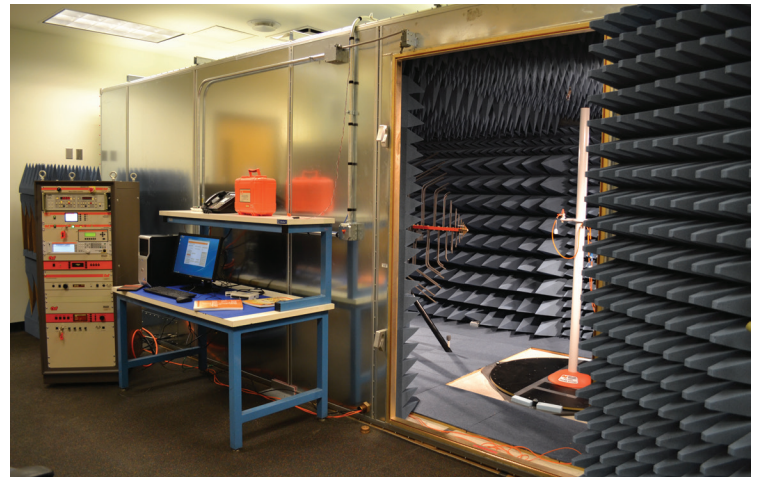




**AS06007**  
AR MultiStar RF test system reduces radiated immunity test time by generating up to 10 frequencies simultaneously.

AR can deliver a solution that integrates all your testing needs: radiated immunity, conducted immunity, conducted emissions, radiated emissions, electrostatic discharge, electromagnetic simulation... whatever you need.

We have the expertise and experience to supply turn-key and fully automated systems needed to test various standards including IEC 61000, MIL-STD 461 and 464, DO-160, wireless, automotive, HIRF and HERO.



**AS04210M2** 800 MHz -4.2 GHz, IEC 61000-4-3  
Photo Courtesy Kidde Safety



**AS18069**  
Racked Equipment  
80 MHz -18 GHz

Equipment list:

- Model 500W1000BM3, Amplifier, 80-1000 MHz, 500 Watts CW
- Model 100S1G6M3, Amplifier, 0.7-6 GHz, 100 Watts CW
- Model 20S6G18A, Amplifier, 6.0-18.0 GHz, 20 Watts CW
- Model DC6180A, Dual Directional Coupler, 80-1000 MHz, 600W
- Model DC7205A, Dual Directional Coupler, 0.7-6 GHz, 250W
- Model DC7435A, Dual Directional Coupler, 4 GHz-18 MHz, 200 W
- Model SC1000M3, System Controller, DC-18 GHz
- Model PM2003, Power Meter, 3 Channel
- Model PH2004A, Power Head, 100kHz-18 GHz
- Model PH2000A, Power Head, 10kHz-8 GHz
- 35U Control rack, to house rack-mounted equipment, internal AC power distribution, emergency power off (EPO) switch, and all internal interconnect cables
- All internal interconnect cables between system components included
- Model emcware®, Radiated Susceptibility, Conducted Immunity, and Emissions Test Software included

Visit [www.arworld.us](http://www.arworld.us) for full specification details.

Size (H x W x D)	172.8 x 56.03 x 82.3 cm (68.01 x 22.06 x 32.4 in)
Weight	159.1 kg (350 lb)
Power Input	240VAC, 1-phase, 30 Amps



# Radiated Immunity Systems

AR can supply the systems needed to test to various standards including IEC, MIL-STD461 and 464, DO-160, wireless, automotive, and HIRF. We can even build your ultimate turn-key system to include an anechoic chamber.

By fully understanding your specifications and requirements in the development of a system, we are able to propose a system that will meet all of your requirements. During the system development process, we will:

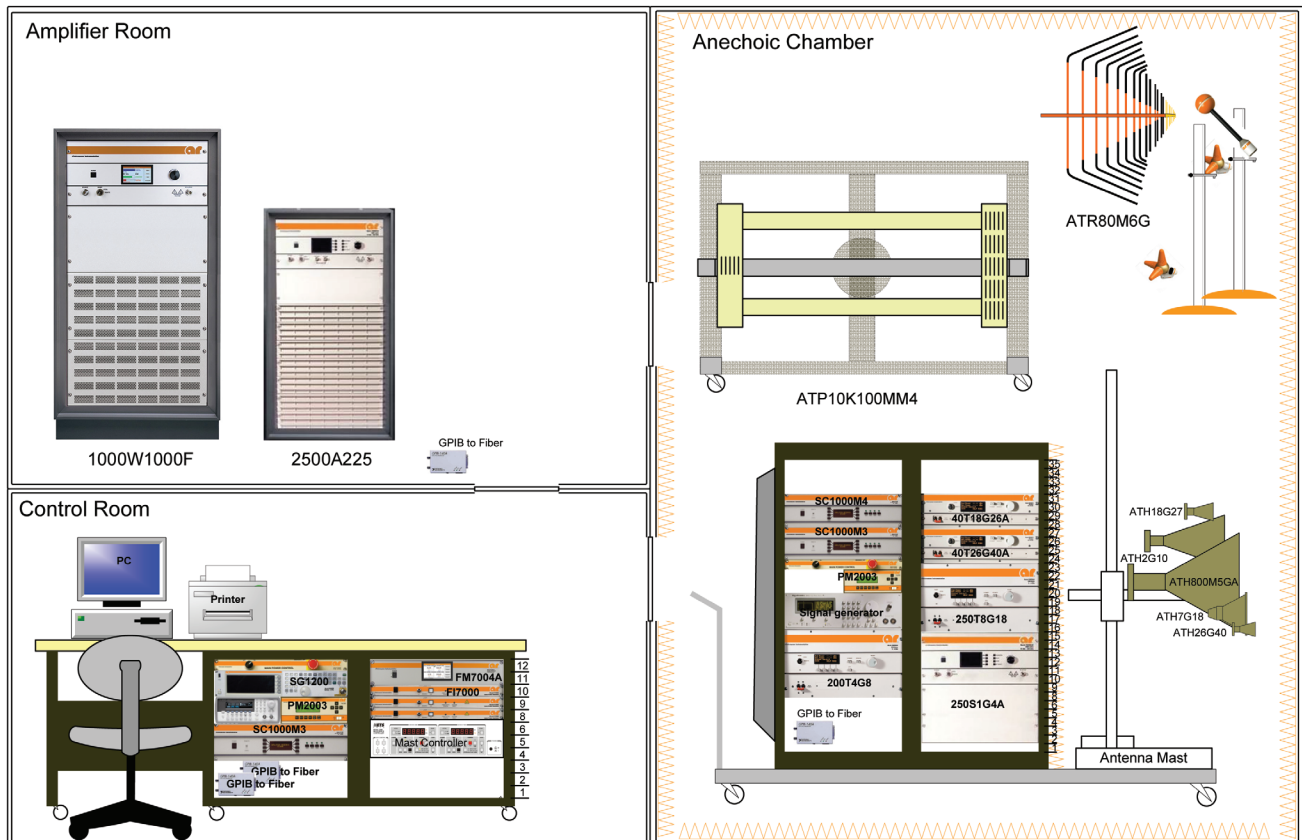
- Match equipment with appropriate components and guarantee performance
- Evaluate all packaging options including proper rack sizing, cooling options (air conditioning, blowers or liquid), AC power distribution, control and shielding
- Select the appropriate cabling, coax or waveguide, to match the amplifiers and accessories within the system
- Determine the best method of automation including signal routing (RF switching) and the integration of emware EMC test software

After your system has been designed and developed, we provide onsite installation and training when necessary. Our team of experienced system integrators will go step-by-step and explain how your system operates and provide support through your testing procedures.

We have several standard systems that can be modified to your requirements. If you have existing equipment, we can integrate them into a system or leave space for future expansion to higher frequencies and power levels..

With our AS systems, we do have the capabilities to provide turn-key and fully automated systems. We also offer SP (special package) systems which are racked equipment that has been designed to work together but is not fully integrated. AR has the experience and ability to take the integration as far as you are willing to go; from a simple racking of equipment (SP) to a fully integrated state of the art facility including installation with guaranteed performance or anything in between.

**Block Diagram of a 200V/m System**  
10 kHz - 40 GHz



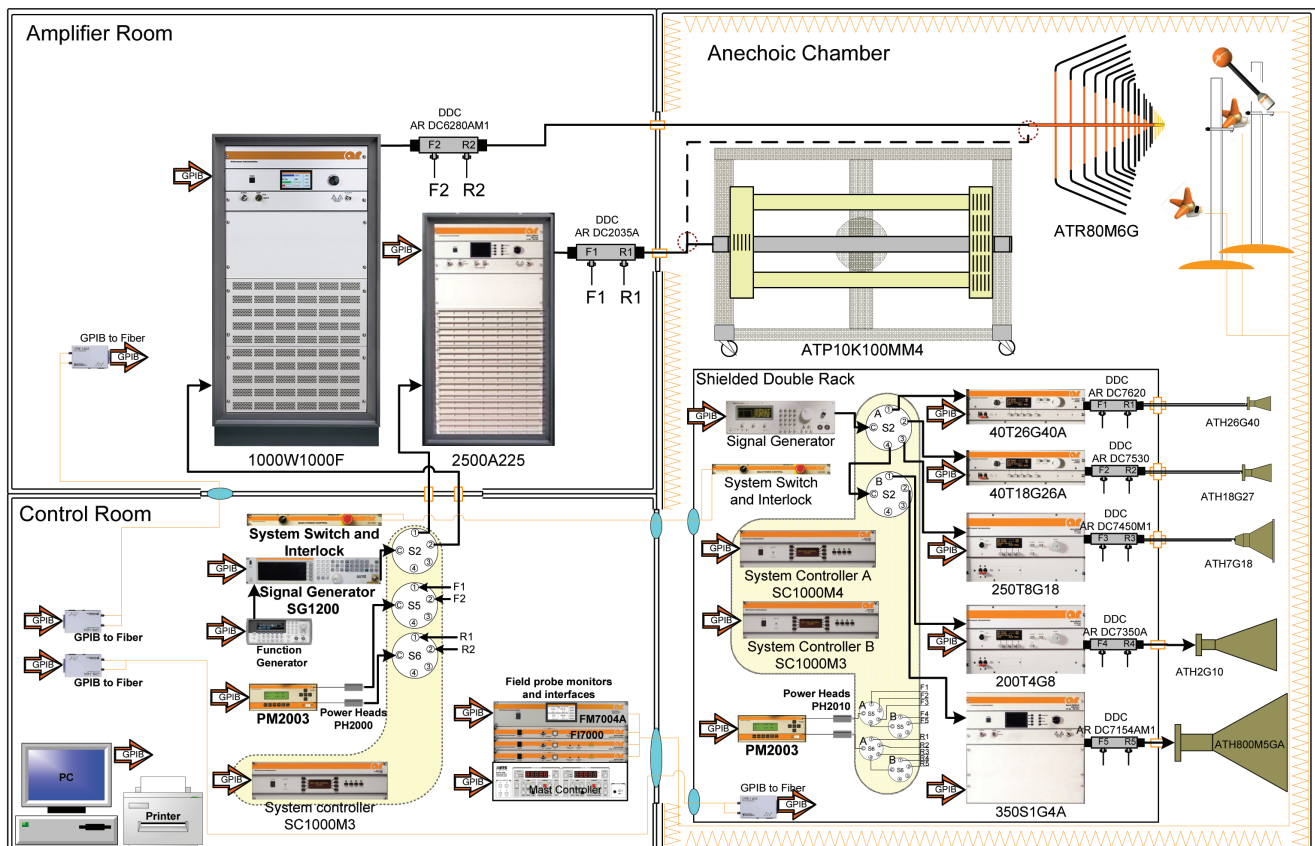


### AR Systems (partial list)

- **AS00403:** 10 kHz – 400 MHz, Automotive ISO 11452-4 conductive susceptibility test system, capable of developing 300 mA
- **AS04226:** Automotive radiated immunity test system, 10 kHz – 4.2 GHz
- **AS06029:** 10 kHz – 6 GHz, radiated immunity test system capable of developing 30 V/m CW, at a 3 m test distance
- **AS06032:** 10 kHz – 6 GHz, IEC 61000-4-3 level 3, at 3 m test distance, and IEC 61000-4-6 level 3 test capability
- **AS08010:** 10 kHz – 8 GHz, radiated immunity test system for automotive component testing, capable of producing 100 V/m, at 1 m test distance, from 10 kHz – 100 MHz, 200 V/m from 100 MHz – 8 GHz, and 600 V/m from 1.2 – 1.4 GHz and 2.7 – 3.1 GHz
- **AS50001:** M1, 10 kHz – 50 GHz, designed to produce the highest AVG field strengths required by MIL-STD461C, tables 2, 4, 5 and 6
- **AS06028:** 26 MHz – 6 GHz, radiated immunity test system capable of developing 18 V/m CW, at a 3 m test distance
- **AS06026:** 80 MHz – 6 GHz, designed to develop fields up to 10 V/m w/ 80% AM (18 V/m CW) at a 3 m distance
- **AS40029:** M1, 100 MHz – 40 GHz, designed to generate field levels of up to 300V/m CW/SW and 3000V/m PM with 6dB loading for RTCA/DO-160G Cat G testing
- **AS18056:** 800 MHz – 18 GHz, radiated immunity test system capable of generating 60 V/m, at 1 m test distance, test equipment is configured on a rolling platform
- **AS06044:** M1, 1 – 6 GHz, designed to develop fields of up to 10 V/m w/ 80% AM (18V/m CW) from 1 – 6 GHz at a 3 m distance
- **AS18055:** 1 – 18 GHz, DO-160 radiated immunity test system designed to produce 150 V/m, from 1 – 8 GHz, at 1 m test distance, and 100 V/m, from 8 – 18 GHz, at 1 m test distance

For more information on a system to meet your requirements, contact your **local sales associate** or visit our website: [www.arworld.us](http://www.arworld.us)

Schematic of a 200V/m System  
10 kHz - 40 GHz





# *AR... The Force Behind The Field*



## *AR's High Intensity Radiated Fields (HIRF) Equipment Designed To Meet Tomorrow's Needs*

Inherent danger associated with High Intensity Radiated Fields (HIRF) is becoming increasingly evident with the growing complexity of military and aircraft systems. Sources of HIRF include high power radars, weapons, and naturally occurring environmental conditions. Unprotected equipment can fail with potentially devastating results. So to prevent possible catastrophes, you must qualify them for harsh HIRF environments by testing the equipment with AR amplifiers and power-matched antennas.

AR's ability to provide test systems with the highest power wide band amplifiers and power matched antennas to produce these HIRF and other high field environments has become AR's claim to fame.

With the recent acquisition of Sunol Sciences, now SunAR RF Motion, AR can offer a broad range of complementary positioning equipment and reverberation tuners for EMC and HIRF testing; all from one company.

Whether you're generating HIRF per MIL-STD-464 testing, DO-160, or recreating RF/microwave environments for intelligence/counterintelligence/jamming measures, and infrastructure susceptibility testing, AR has the range of solutions to make you feel at ease. And don't forget AR's limitless service and support network is second to none.

# Available HIRF System Components

## RF Power Amplifiers For CW Tests

- Model 16000A225, RF Amplifier, 10 kHz-225 MHz, 16000 Watts
- Model 50000A100, RF Amplifier, 30 MHz-100 MHz, 50000 Watts
- Model 10000W1000A, RF Amplifier, 80 MHz-1000 MHz, 10000 Watts
- Model 3000S1G2z5, RF Amplifier, 1-2.5 GHz, 3000 Watts
- Model 1500T2G8B, RF Amplifier, 2.5-7.5 GHz, 1500 Watts
- Model 1500T8G18, RF Amplifier, 7.5-18 GHz, 1500W
- Model 200T18G2z5A, RF Amplifier, 18-26.5 GHz, 200W
- Model 200T2z5G40A, RF Amplifier, 26.5-40 GHz, 200W

## RF Power Amplifiers for Pulse Tests

- Model 10000W1000A, RF Amplifier, 80 MHz-1000 MHz, 10000 Watts
- Model 8000SP0z8G2z5, RF Amplifier, 0.8-2.5 GHz, 8000 Watts
- Model 6900TP2G4, RF Amplifier, 2-4 GHz, 6900 Watts
- Model 7400TP4G8, RF Amplifier, 4-8 GHz, 7400 Watts
- Model 8300TP8G12, RF Amplifier, 8-12 GHz, 8300 Watts
- Model 5700TP12G18, RF Amplifier, 12-18 GHz, 5700 Watts

## Antennas CW Tests

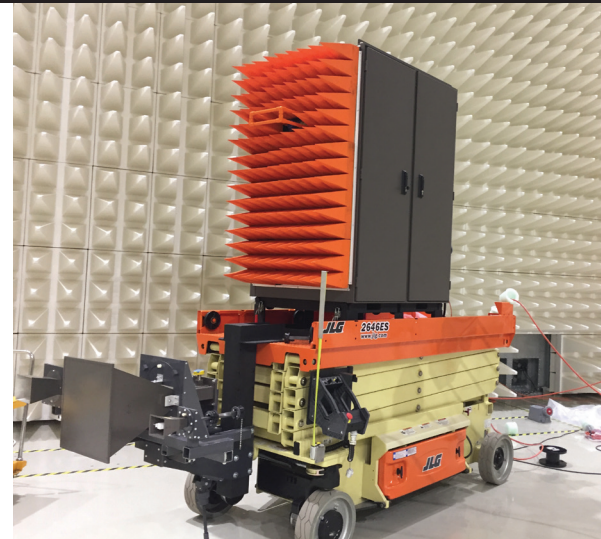
- Stripline Antenna, 10 kHz – 30 MHz
- Model ATP10K100M, Broadband Transmission Line, 10 kHz-100 MHz, 3000W
- Model ATR26M1G, Log Periodic Antenna, 26-1000 MHz, 20000W
- Model ATH800M5GA, High Gain Horn Antenna, 800 MHz-5 GHz, 1500W
- Model ATH2G8A-1, Horn Antenna, 2.5-7.5 GHz, 12000W
- Model ATH7G18, High Gain Horn Antenna, 7.5-18 GHz, 2800W
- High Gain Horn Antenna, 8-12 GHz, 10000W
- High Gain Horn Antenna, 18-26.5 GHz, 300W
- High Gain Horn Antenna, 26.5-40 GHz, 200W

## Antennas for Pulse Tests

- Stripline Antenna, 10 kHz – 30 MHz
- Model ATP10K100M, Broadband Transmission Line, 10 kHz-100 MHz, 3000W
- Model ATR26M1G, Log Periodic Antenna, 26-1000 MHz, 20000W
- Horn Antenna, Quad Array, 400-1000 MHz, 13000W
- Horn Antenna, Quad Array, 1-1.6 GHz, 2kW CW, 13kW Peak
- Horn Antenna, Quad Array, 1.5-2.6 GHz, 1.4kW CW, 13kW Peak
- High Gain Horn Antenna, 2.6-4 GHz, 700W CW, 10kW Peak
- High Gain Horn Antenna, 4-6 GHz, 150W CW, 5kW Peak
- High Gain Horn Antenna, 6-8 GHz, 150W CW, 5kW Peak
- High Gain Horn Antenna, 8-12 GHz, 10kW CW
- High Gain Horn Antenna, 12-18 GHz, 2.2kW CW, 80kW Peak

## Other Equipment

- |                      |                       |
|----------------------|-----------------------|
| Field Probes         | Signal Generators     |
| Power Meters         | System Software       |
| System Interlock     | Positioning Equipment |
| RF Switches          | Shielded Racks        |
| Directional Couplers | Equipment Lifts       |



Customized system designed to address EUT height test requirement.



Shielded radiated system allows operation inside chamber during radiated immunity testing.



Years of design experience is evident in every system – little things matter.



# We're In The Business Of Making Your Life Easier



AS00202  
4 kHz – 200 MHz System



AS03007  
10 kHz – 3 GHz System



## RF Conducted Immunity Testing to IEC, Military & Automotive Standards

If you are tired of mixing and matching various components, try AR's complete line of RF Conducted Immunity Test Systems. We now make five fully configured and stand alone CI Systems from 4 kHz to 3 GHz with output powers designed to meet the latest commercial, custom and military standards.

Each CI System has the built-in flexibility to conduct standard and customized tests using our included user friendly software that can generate reports directly into Microsoft® Word or Excel.

*Our job is to make your job easier.*

## CI00250A

### 75 Watts, 10 kHz–250 MHz

Complete Testing Solutions to the following standards: EN/IEC 61000-4-6, IEC 60601-1-2, EN 50130-4, EN 61000-6-1/2, EN 55024

#### Internal Test Specifications\*

IEC/EN 60601-1-2, IEC/EN 50130-4,  
IEC/EN 61326, IEC/EN 61000-6-1,  
IEC/EN 61000-6-2, CISPR 24/EN 55024  
IEC 61000-4-6 procedure and levels, IEC 61496-1

#### Signal Generator Specifications

Frequency range 9 kHz to 1.2 GHz  
resolution 1Hz  
Power range -140 to +13 dBm  
resolution 0.1dB  
Modulation AM, FSK, Pulse, FM, Phase, External Pulse

#### Power Meter Specifications

Channels 3  
Power heads 1  
Type diode  
Frequency 10 kHz to 8 GHz  
Range -60 to +20 dBm

#### RF Solid State Amplifier Specifications

Frequency range 10 kHz to 250 MHz  
Power rating 75 Watts minimum  
1dB compression 50 Watts minimum  
Harmonic Distortion -20dBc at 50 Watts  
Mismatch tolerance  
100% of rated power without fold back. Will operate without damage or oscillation with any magnitude of source and load impedance.  
Gain 49dB minimum

#### Connections

RF Out Type N Male (front)  
Monitor Port In Type N Male (front)  
Signal Generator Out Type N Male (rear)  
Amplifier In Type N Male (rear)  
Pulse In BNC Male (rear)  
Communication GPIB (IEEE 488) (rear)  
Monitor Port Out/In Type SMA (rear)  
Power Meter Calibration Type SMA (rear)

#### General

Power 115/230 VAC  
50/60 Hz, single phase 16A  
Breaker 2 pole, 20A  
Cooling active cooling, air ventilation  
Environmental conditions 10°C - 40°C  
Dimensions, 50.3 x 42.2 x 52.1 cm  
19.8 x 16.6 x 21.7 in  
Weight 20.5 kg (45 lb)

#### PC Requirements

Computer Pentium IV, 1 GHz Recommended  
Operating system Windows 7, Windows 8, Windows 10  
RAM 2 GB Minimum  
Screen Resolution 1024 x 768  
Ports 2 available USB ports

## CI00400A

### 100 Watts, 10 kHz–400 MHz

Complete Testing Solutions to the following standards: MIL-STD-461D & E CS114, DO160D & E, EN/IEC 61000-4-6, IEC 60601-1-2, EN 50130-4, EN 61000-6-1/2, EN 55024

#### Internal Test Specifications\*

MIL-STD-461D, CS114, MIL-STD-461E, CS114, DO160D  
Section 20 BCI testing, DO160E, Section 20 BCI testing  
IEC/EN 60601-1-2, IEC 61000-4-6 procedure and levels  
IEC/EN 50130-4, IEC/EN 61326, IEC/EN 61000-6-1  
IEC/EN 61000-6-2, CISPR 24/EN 55024

#### Signal Generator Specifications

Frequency range 9 kHz to 1.2 GHz  
resolution 1Hz  
Power range -140 to +13 dBm  
resolution 0.1dB  
Modulation AM, FSK, Pulse, FM, Phase, External Pulse

#### Power Meter Specifications\*\*

Channels 3  
Power heads 2  
Type diode  
Frequency 10 kHz to 8 GHz  
Range -60 to +20 dBm

#### RF Solid State Amplifier Specifications

Frequency range 10 kHz to 400 MHz  
Power rating 100 Watts nominal  
1dB compression 75 Watts nominal  
Harmonic distortion -20dBc at 50 Watts  
Mismatch tolerance  
100% of rated power without fold back. Will operate without damage or oscillation with any magnitude of source and load impedance.  
Gain 51dB minimum

#### Connections

RF Out Type N Male (front)  
Monitor Port In Type N Male (front)  
Signal Generator Out Type N Male (rear)  
Amplifier In/Out Type N Male (rear)  
Pulse In BNC Male (rear)  
Communication GPIB (IEEE 488) (rear)  
Directional Coupler Fwd Out/In Type SMA (rear)  
Monitor Port Out/In Type SMA (rear)  
Power Meter Calibration Type SMA (rear)

#### General

Power 115/230 VAC  
50/60 Hz, single phase 16A  
Breaker 2 pole, 20A  
Cooling active cooling, air ventilation  
Environmental conditions 10°C - 40°C  
Dimensions, 50.3 x 42.2 x 52.1 cm  
19.8 x 16.6 x 21.7 in  
Weight 22.7 kg (50 lb)

#### PC Requirements

Computer Pentium IV, 1 GHz Recommended  
Operating system Windows XP, Vista & 7  
RAM 1 GB Minimum  
Screen resolution 1024 x 768  
Ports 2 available USB ports  
GPIB adaptor

USB to GPIB adaptor included (NI GPIB-USB-HS)

## CI00401A

### 150 Watts, 100 kHz–400 MHz

Complete Testing Solutions to the following standards: ISO 11452-4, GMW 3097, ES-XW7T-1A278-AC, DC-11224, BMW GS95002, and other automotive standards.

#### Internal Test Specifications\*

ISO 11452-4, GMW 3097, ES-XW7T-1A278-AC, DC-11224,  
BMW GS95002, Peugeot B217110, Renault 36-00-8081-G,  
IEC 61000-4-6, Other automotive standards

#### Signal Generator Specifications

Frequency range 9 kHz to 1.2 GHz  
resolution 1Hz  
Power range -140 to +13 dBm  
resolution 0.1dB  
Modulation AM, FSK, Pulse, FM, Phase, External Pulse

#### Power Meter Specifications\*\*

Channels 3  
Power heads 2  
Type diode  
Frequency 10 kHz to 8 GHz  
Range -60 to +20 dBm

#### RF Solid State Amplifier Specifications

Frequency range 100 kHz to 400 MHz  
Power rating 150 Watts nominal  
1dB compression 120 Watts nominal  
Harmonic distortion -20dBc at 120 Watts  
Mismatch tolerance  
100% of rated power without fold back. Will operate without damage or oscillation with any magnitude of source and load impedance.  
Gain 52dB minimum

#### Connections

RF Out Type N Male (front)  
Monitor Port In Type N Male (front)  
Signal Generator Out Type N Male (rear)  
Amplifier In/Out Type N Male (rear)  
Pulse In BNC Male (rear)  
Communication GPIB (IEEE 488) (rear)  
Directional Coupler Fwd Out/In Type SMA (rear)  
Directional Coupler Rev Out/In Type SMA (rear)  
Monitor Port Out/In Type SMA (rear)  
Power Meter Calibration Type SMA (rear)

#### General

Power 115/230 VAC  
50/60 Hz, single phase 16A  
Breaker 2 pole, 20A  
Cooling active cooling, air ventilation  
Environmental conditions 10°C - 40°C  
Dimensions, 50.3 x 42.2 x 52.1 cm  
19.8 x 16.6 x 21.7 in  
Weight 22.7 kg (50 lb)

#### PC Requirements

Computer Pentium IV, 1 GHz Recommended  
Operating system Windows XP, Vista & 7  
RAM 1 GB Minimum  
Screen resolution 1024 x 768  
Ports 2 available USB ports  
GPIB adaptor

USB to GPIB adaptor included (NI GPIB-USB-HS)

\* Specifications can be met using AR-specified external accessories (injection probes, monitor probes, cal fixtures, CDN's, attenuators, etc.).

Options are available on all systems. See specification sheet for detailed information. Note that Option 1 is required to satisfy these test specifications.

\*\*The use of a spectrum analyzer may be necessary on some of the low level bulk current injection tests. This is especially true on power and I/O lines with a great amount of ambient noise.

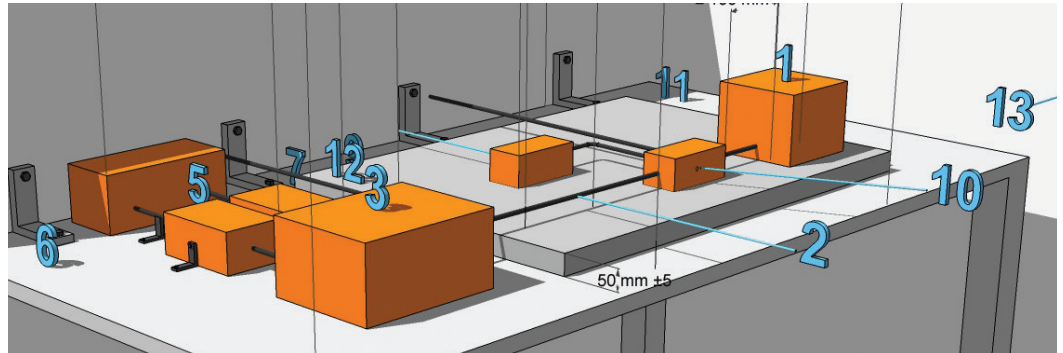


## AR CI00250A, CI00400A, CI00401A

Conducted Immunity Systems contain all components necessary to perform conducted immunity testing to the most widely used standards, with the AR CI00401A specifically designed to perform test in accordance with most auto manufacturers. In addition, AR offers amplifiers and test equipment necessary to perform 11452-4 Component Test Methods for electrical disturbance from narrowband radiated electromagnetic energy - harness excitation methods (1 MHz - 3 GHz).

### Tubular Wave Coupler Test Set-Up

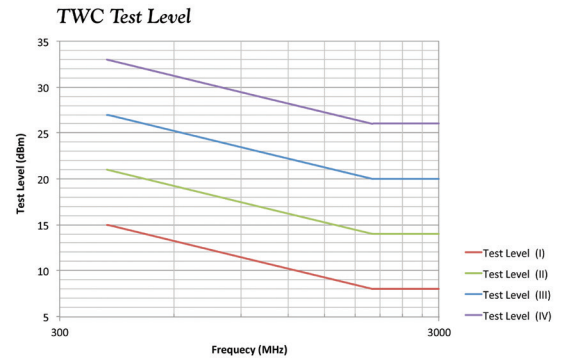
1. DUT (connected to ground if specified in the test plan)
2. wiring harness or harnesses
3. load simulator (placement and ground connection according to section 7.5 of ISO 11452-4)
4. stimulation and monitoring system\*
5. power supply
6. Artificial Network (AN)
7. optical fibers
8. high-frequency equipment\*
9. 50 Ω load\*
10. tubular wave coupler
11. ground plane (connected to the shielded room)



12. low relative permittivity support ( $\epsilon_r \leq 1,4$ )
13. shielded room

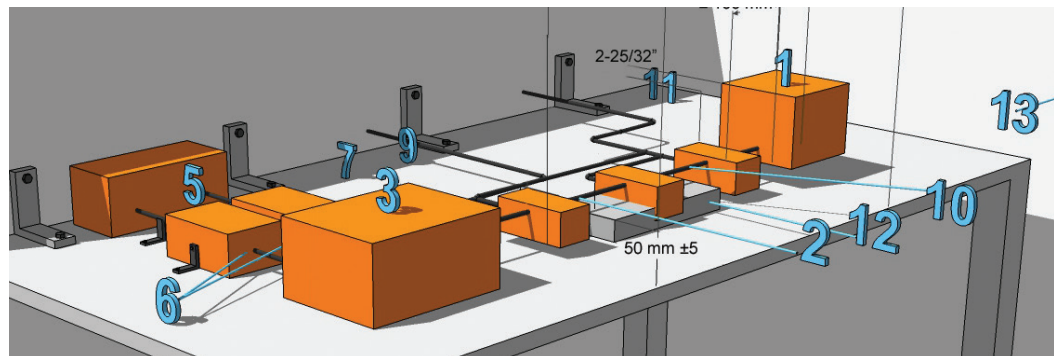
\*Required equipment not shown in diagram

Examples of test severity levels for TWC are shown on the right. Specific values may differ depending on the manufacturer's requirements.



### BCI Test Set-Up

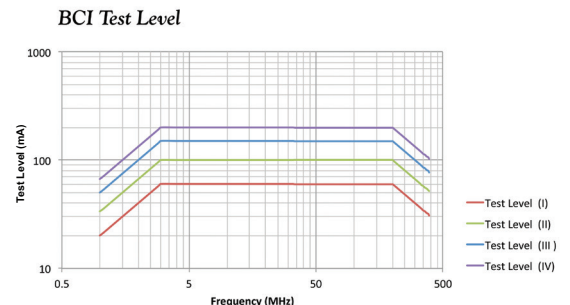
1. DUT (connected to ground if specified in the test plan)
2. wiring harness or harnesses
3. load simulator (placement and ground connection according to section 7.5 of ISO 11452-4)
4. stimulation and monitoring system\*
5. power supply
6. Artificial Network (AN)
7. optical fibers
8. high-frequency equipment\*
9. optional current measurement probe\*
10. injection probe (represented at 3 positions)
11. ground plane (connected to the shielded room)



12. low relative permittivity support ( $\epsilon_r \leq 1,4$ )
13. shielded room

\*Required equipment not shown in diagram

Examples of test severity levels for BCI are shown on the right. Specific values may differ depending on the manufacturer's requirements.



# New 3 GHz RF Conducted Immunity Test System



AS03007M

Test Levels up to 500 mA  
Testing from 10 kHz to 3 GHz for:

- IEC
- MIL-STD
- DO-160
- ISO
- Automotive Manufacturer's Standards



Testing up to 3 GHz?  
The components below are the new standard.

Main Components Of A BCI & TWC System\*

AR 150A400M3, RF Amplifier, 100kHz-400MHz, 150 Watts CW

AR 30W1000CM3, RF Amplifier, 1-1000MHz, 30 Watts CW

AR 20S1G4M3, RF Amplifier, 700MHz-4.2GHz, 20 Watts CW

Signal Generator, 9kHz-3GHz

AR PM2003, 3 Channel Power Meter

Spectrum Analyzer, 9kHz-3GHz

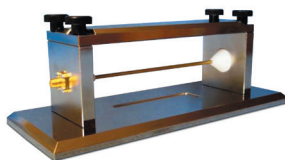
Network Analyzer, 100kHz-3GHz

AR SC1000M1, System Controller

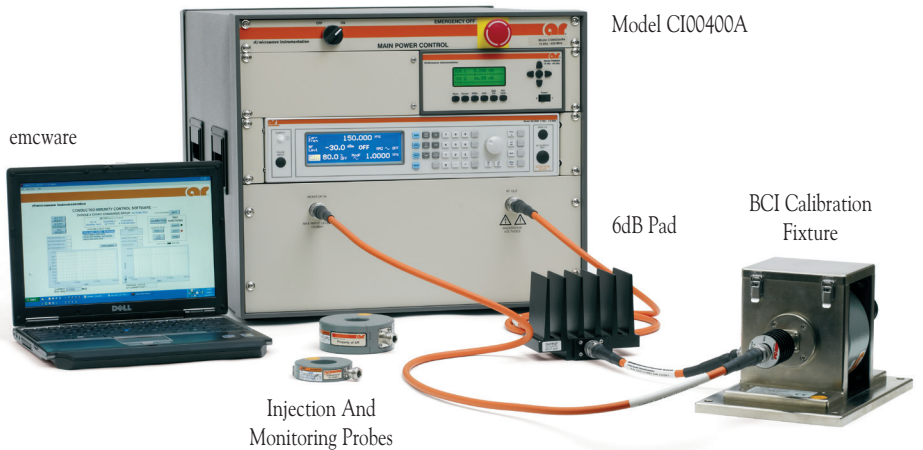
AR Control PC with EMCWare software

\* Miscellaneous components such as directional couplers, clamps, attenuators, etc are also necessary for this set up.

## Testing up to 400 MHz



Model CF30000  
Tubular Wave Coupler



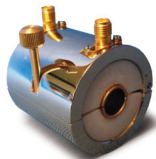
emcware

Model CI00400A

6dB Pad

BCI Calibration  
Fixture

Injection And  
Monitoring Probes



Model BI30000 Series Tubular  
Wave Couplers

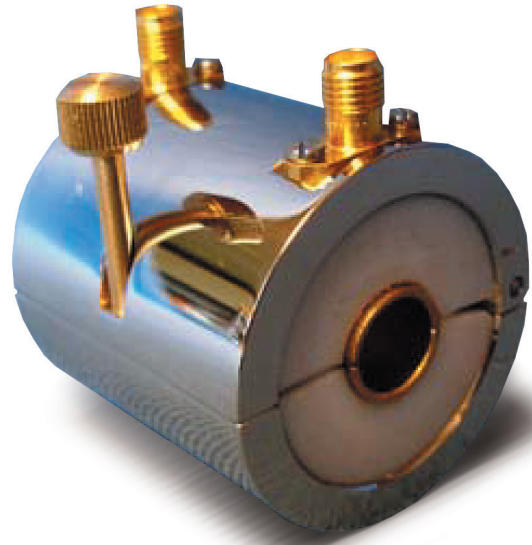
Freq. (MHz)	BCI Probe	Required Calibration Accessories	
		Calibration Fixture	Termination
1 - 400	BI00401	CF00400	TL50050
400 - 3000	BI30000	CF30000	TL50050



## Conducted Immunity and Emissions Tubular Wave Couplers

Our series of compact, versatile, affordable Tubular Wave Couplers is suitable for immunity testing and emissions measurement of power leads or other connection lines. The **BI30000 Series** features a bandwidth from 400 MHz to 3 GHz for immunity testing and 150 kHz to 3 GHz for emissions testing.

Immunity testing, using the **BI30000 Series**, is similar to a BCI probe as used in ISO 11451-2, ISO 11452-4, or IEC 61000-4-6, and emission measurements can be taken as a current probe according to EN 55025 (CISPR 25). With the proposed standards coming up in the automotive industry, the **BI30000 Series** will provide a low cost alternative to perform conductive testing up to 3 GHz.

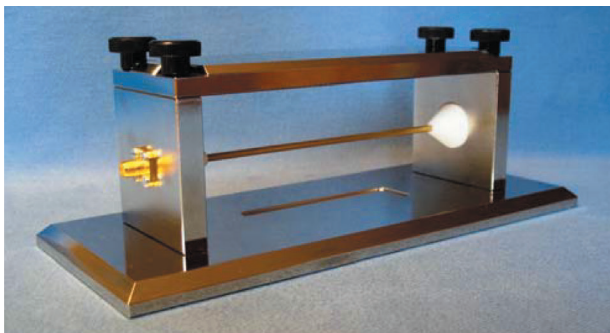


	BI30410	BI30413	BI30416	BI30520	BI30526
ISL Value <10 dB	0.50-2.80 GHz	0.60-2.80 GHz	0.80-2.50 GHz	0.60-1.40 GHz	
ISL Value < 20 dB	0.15-3.00 GHz	0.15-3.00 GHz	0.20-3.00 GHz	0.15-2.50 GHz	0.20-2.50 GHz
Size (LxW)	40 x 40 mm (1.575 x 1.575 in.)	40 x 40 mm (1.575 x 1.575 in.)	40 x 40 mm (1.575 x 1.575 in.)	50 x 50 mm (1.97 x 1.97 in.)	50 x 50mm (1.97 x 1.97 in.)
Internal Diameter	10 mm (0.394 in.)	13 mm (0.512 in.)	16 mm (0.630 in.)	20 mm (0.787 in.)	26 mm (1.02 in.)

M1 versions of the above models are available with 17025-compliant calibration.

## Tubular Wave Coupler Calibration Kit

AR offers the **CF30000** calibration fixture. This fixture is designed to work with the **BI30000 Series** Tubular Wave Couplers for the purpose of level setting prior to conducted immunity testing.



	Model CF30000
Frequency Range	150 MHz-3 GHz
Calibration Power (max. watts)	4 CW
Input Impedance	50Ω
Connectors	SMA(F)
Max. Diameter of TWC	50 mm (1.97 in.)
Length of coupling line	120 mm (4.72 in.)
Weight	1.1 kg 2.42 lb
Size (approx.) L x W x H	230 x 95 x 90 mm (9.05 x 3.74 x 3.54 in.)

# RF Conducted Probes and Clamps

The following accessories are for use with our RF Conducted Immunity CI systems, models CI00250A, CI00400A and CI00401A.

## Coupling/Decoupling Networks

AR offers a full line of coupling/decoupling networks to couple mode signals onto power supply lines. Designed to meet IEC 61000-4-6 specification requirements. All models are available in 16, 25, 32, 50, 100, 200 or 300 amps and available in 1 to 5 conductor cables.

CD10000 Series – 1 conductor

CD20000 Series – 2 conductors

CD30000 Series – 3 conductors (L-N-PE)

CD40000 Series – 4 conductors (3 phase with neutral)

CD50000 Series – 5 conductors (3 phase with neutral and PE)

Also available are coupling/decoupling networks (CDN's) for:

- Non-balanced lines – available for 2, 3, 4 or 8 lines
- Screened cables – available for 2, 3, 4, 9, 15 or 25 cables
- Unscreened balanced pair – available in 1, 2 or 4 pair

Matching calibration adapters for our CD and CDN's and 1 or 50 watt, 50 ohm termination resistors are available.

## Bulk Current Injection Probes

AR offers several models of bulk current injection probes for coupling disturbances onto unshielded cables in their specified frequency range.

- BI00250: 10 kHz – 250 MHz, 40mm ID, used for testing IEC 61000-4-6 RF Conducted Immunity
- BI00251: 10 kHz – 250 MHz, 66mm ID, used for testing IEC 61000-4-6 RF Conducted Immunity
- BI00400: 10 kHz – 400 MHz, 40mm ID, used for testing MIL-STD 461, CS114 and DO160 RF Conducted Immunity
- BI00401: 1 – 400 MHz, 40mm ID, used for testing to ISO 11452-4 and SAE J1113-4 Automotive RF Conducted Immunity
- BI01000: 100 kHz – 1000 MHz, 40mm ID, used for testing Automotive RF Conducted Immunity

## Current Monitor Probes

AR offers a line of clamp-on monitoring probes that are used to measure RF currents flowing through the conductor onto which the probe is placed. The following models are available:

- BP00100: 100Hz – 100MHz
- BP00100A: 10 Hz – 100MHz
- BP00400: 10 kHz – 400 MHz
- BP00251: 10 kHz – 500 MHz
- BP00250: 1kHz – 250MHz
- BP01000: 100 kHz – 1000 MHz

## Electromagnetic Clamps

AR's highly efficient electromagnetic clamps are for testing to IEC 61000-4-6 RF Conducted Immunity specifications. They operate in the 10 kHz – 1000 MHz range and due to their aperture size, are ideal for testing multiple conductors at once. 2 models are available, along with calibration fixtures for all current injection clamps we carry.

- EM10123A (23 mm aperture)
- EM10132A (32 mm aperture)

## Coaxial Cables

Available in 50  $\Omega$



Model CI00400A

For more information about selecting accessories for our Conducted Immunity Systems, please see [Application Note #46](#).



# AR's Competitive Edge

At AR, there's no substitute for quality. It's the foundation of our business and the AR value that's recognized around the globe. It's one of the key reasons AR has become the worldwide leader in EMC, Wireless and beyond.

AR products do more, last longer, work harder and make your job easier. And that gives you a fierce competitive edge. Only AR delivers innovative technology, advanced design, quality build & workmanship, mismatch capability, durability & longevity, less cost watt for watt, and a worldwide support network that's here for you today and tomorrow.

With the combined resources of all the AR companies, we simply have more of the best people making the best products to overcome your toughest challenges.

## AR RF/Microwave Instrumentation

- RF Solid State Amplifiers 1 to 50,000 watts, dc to 1 GHz
- Microwave Amplifiers 1 to 10,000 watts, 0.8 to 50 GHz
- Antennas Up to 15,000 watts input power, 10 kHz to 50 GHz
- RF Conducted Immunity Test Systems
- EMC/RF Test Systems
- Hybrid Power Modules
- Power Measuring Equipment
- Accessories and Software
- Electromagnetic Safety Products

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 [AR RF/Microwave Instrumentation](https://www.linkedin.com/company/AR-RF-Microwave-Instrumentation)

## AR Modular RF

- RF Amplifiers and Modules
- Broadband and Sub-band Solid State RF Amplifiers
- Booster Amplifiers for Tactical Military Radios

## SunAR RF Motion

- Positioning equipment, turntables and towers
- Distributed antenna systems
- Reverberation chamber stirrers

## AR Receiver Systems

A line of products & services for EMC Testing including:

- EMI Receivers
- Leak Detectors

## AR Europe

- Offering a complete line of RF Products and testing solutions for the European Market

Want to know more about AR? Need help with any RF solutions or testing procedures?

Here's how to reach AR and get all the help you need:

[www.arworld.us](http://www.arworld.us)

## AR RF/Microwave Instrumentation

160 School House Road  
Souderton, PA 18964-9990 USA  
Tel 215-723-8181

For RF Amplifier modules, contact:

## AR Modular RF

21222 30th Dr. SE, Building C, Suite 200  
Bothell, WA 98021, USA  
Tel 425-485-9000 • Fax 425-486-9657

## SunAR RF Motion

6780 Sierra Court, Suite R  
Dublin, CA 94568  
Tel 925- 833-9936 • Fax 925-833-9059

For receiver systems, contact:

## AR Receiver Systems

Tel 800-933-8181

## AR Europe

National Technology Park, Ashling Building  
Limerick, Ireland  
+353 61 504300 • Fax +353 61 504301  
AR Benelux +31 172 423000  
AR France +33147917530  
AR Deutschland GmbH +49 6101 80270 0  
AR United Kingdom +44 1908 282766

AR RF/Microwave Instrumentation  
is ISO Certified.

ISO 9001:2008  
Certified



## AR Global Promise

The AR warranty is more than just a warranty, it's a promise, backed by a knowledgeable support team that's always there for you to help solve any problems and answer any questions, today and tomorrow. AR warrants its amplifiers, antennas, test systems, power meters, field monitoring equipment, conducted immunity generators, couplers and tripods to be free of defects in materials and workmanship for a period of three years from date of shipment. Traveling Wave Tubes on amplifier model 250T8G18 carry a two year warranty. Vacuum and other traveling wave tubes as well as powerheads carry a one year warranty.

