



## 9100 Series

### Wide-Bandwidth, High-Power Switch-Mode Amplifiers

**AE Techron's 9100 Series** amplifiers are 200Vp, DC-to-250 kHz capable amplifiers that offer a unique combination of high-power density, wide-bandwidth, high efficiency, and linear amplifier-like fidelity in a single, compact package. They can drive virtually any type of load without a reduction in rated power, with low distortion and low DC drift.

The 9100 series is power-efficient, with a typical efficiency over 90% at full power. It is a powerful and flexible partner when the environment is difficult or existing AC Mains options are limited.

The single-unit models can be powered from any normal single-phase AC mains voltage (100V AC – 250V AC). The cabinet-based Power Systems can be powered from a variety of three-phase voltages from 200VAC to 415VAC\*.

This combination of features makes the 9100 series an ideal solution for a wide range of high-current, low-voltage applications that require both wide bandwidth and the ability to drive reactive or widely varying load impedances.

*\* Three-phase voltages above 240VAC will require a 5-wire service.*

### Features:

- **Stable when driving highly capacitive loads.**
- **Four-quadrant operation.**
- **User-selectable gain.**
- **User-selectable current limit to protect fragile DUTs or where specified in the Standard.**
- **DC enabled or DC blocked and DC Servo (for driving transformer-coupled loads or coils).**
- **Balanced and/or unbalanced input.**
- **Operate as a voltage-controlled voltage source or voltage-controlled current source.**
- **Variable output impedance from 0 to 1 ohm (Voltage mode).**

### Performance Overview:

<b>Bandwidth:</b>	<b>DC to 250 kHz</b>
<b>Min. Drop/Rise Time:</b>	<b>7μs</b>
<b>Slew Rate:</b>	<b>Up to 150 V/μs</b>
<b>Maximum Voltage:</b>	<b>200Vp</b>
<b>Current:</b>	<b>35A<sub>RMS</sub> to 540A<sub>RMS</sub></b>
<b>Distortion:</b>	<b>&lt;0.1% at 1 kHz, below clip</b>
<b>Long-Term Power:</b>	<b>5 kW to 30 kW*</b>

*\*9105 output is 4.2 kW from 230V or 240V sources; output for models 9110 and 9115 is 5 kW.*

## Specifications

### SINGLE UNIT MODELS



#### 9105

**Maximum Continuous Output Current:** 35A<sub>RMS</sub> AC or DC  
**Power:** 2 kW from 20A, 120VAC; 4.2 kW from 30A, 230/240VAC  
**Supply Voltage:** Universal power supply with PFC, single-phase, 100V to 240V AC  $\pm$ 10%, 30A, 50/60 Hz  
**Quiescent Power, Standby:** 55W  
Run: 125W  
**Dimensions (HxWxD):** 3.47 x 17.3 x 22.8 in. (8.81 x 43.94 x 57.91 cm)  
**Weight:** Approx 40 lbs. (18.14 kg)

#### 9110

**Maximum Continuous Output Current:** 70A<sub>RMS</sub> AC or DC  
**Power:** 5 kW  
**Supply Voltage:** Universal power supply with PFC, single-phase, 100V to 240V AC  $\pm$ 10%, 30A, 50/60 Hz  
**Quiescent Power, Standby:** 55W  
Run: 184W  
**Dimensions (HxWxD):** 3.47 x 17.3 x 22.8 in. (8.81 x 43.94 x 57.91 cm)  
**Weight:** Approx 45 lbs. (20.41 kg)

#### 9115

**Maximum Continuous Output Current:** 90A<sub>RMS</sub> AC or DC  
**Power:** 5 kW  
**Supply Voltage:** Universal power supply with PFC, single-phase, 100V to 240V AC  $\pm$ 10%, 30A, 50/60 Hz  
**Quiescent Power, Standby:** 55W  
Run: 255W  
**Dimensions (HxWxD):** 3.47 x 17.3 x 22.8 in. (8.81 x 43.94 x 57.91 cm)  
**Weight:** Approx 50 lbs. (22.68 kg)

### POWER SYSTEM MODELS

#### 9130

**Maximum Continuous Output Current:** 180A<sub>RMS</sub> AC  
**Power:** 10 kW  
**Supply Voltage:** 3-phase, 208V  $\pm$ 10%, 30A, 50/60 Hz; 400V  $\pm$ 10%, 30A version available  
**Quiescent Power, Standby:** 110W  
Run: 510W  
**Dimensions (HxWxD):** 35.05 x 22.56 x 31.56 in. (89.03 x 57.3 x 80.16 cm)  
**Weight:** Approx 222 lbs. (100.7 kg)

#### 9145

**Maximum Continuous Output Current:** 270A<sub>RMS</sub> AC  
**Power:** 15 kW  
**Supply Voltage:** 3-phase, 208V  $\pm$ 10%, 30A, 50/60 Hz; 400V  $\pm$ 10%, 30A version available  
**Quiescent Power, Standby:** 165W  
Run: 765W  
**Dimensions (HxWxD):** 35.05 x 22.56 x 31.56 in. (89.03 x 57.3 x 80.16 cm)  
**Weight:** Approx 272 lbs. (123.4 kg)

#### 9160

**Maximum Continuous Output Current:** 360A<sub>RMS</sub> AC  
**Power:** 20 kW  
**Supply Voltage:** 3-phase, 208V  $\pm$ 10%, 60A, 50/60 Hz; 400V  $\pm$ 10%, 60A version available  
**Quiescent Power, Standby:** 220W  
Run: 1,020W  
**Dimensions (HxWxD):** 35.05 x 22.56 x 31.56 in. (89.03 x 57.3 x 80.16 cm)  
**Weight:** Approx 322 lbs. (146 kg)

#### 9175

**Maximum Continuous Output Current:** 450A<sub>RMS</sub> AC  
**Power:** 25 kW  
**Supply Voltage:** 3-phase, 208V  $\pm$ 10%, 60A, 50/60 Hz; 400V  $\pm$ 10%, 60A version available  
**Quiescent Power, Standby:** 275W  
Run: 1,275W  
**Dimensions (HxWxD):** 35.05 x 22.56 x 31.56 in. (89.03 x 57.3 x 80.16 cm)  
**Weight:** Approx 435 lbs. (197.3 kg)

#### 9190

**Maximum Continuous Output Current:** 540A<sub>RMS</sub> AC  
**Power:** 30 kW  
**Supply Voltage:** 3-phase, 208V  $\pm$ 10%, 60A, 50/60 Hz; 400V  $\pm$ 10%, 60A version available  
**Quiescent Power, Standby:** 330W  
Run: 1,530W  
**Dimensions (HxWxD):** 45.80 x 22.56 x 31.56 in. (116.33 x 57.3 x 80.16 cm)  
**Weight:** Approx 485 lbs. (220 kg)



*NOTE: The Power System Models (9130, 9145, 9160, 9175, and 9190) are comprised of 9115 units.*

## Common Data (all models)

**Operating Modes:** AC, DC, and AC + DC  
**Frequency, AC Mode Output (-3 dB):** DC - 250 kHz  
**Max Voltage Ranges (no load),**  
 AC: 0 - 140 V<sub>RMS</sub>  
 AC + DC: 0 - ±200 V<sub>P</sub>  
**Load Regulation (ref to full scale):** <0.05%, DC to 100 Hz;  
 <0.1%, 10 Hz to 10 kHz  
**Line Regulation (full scale):** 100V to 250V AC<sub>RMS</sub>  
**Harmonic Distortion (80 kHz, low-passed):** Less than  
 0.3% from 10 Hz to 30 kHz; 0.5% up to 50 kHz  
**Harmonic Distortion (30 kHz, low-passed):** Less than  
 0.1% from 10 Hz to 50 kHz  
**DC Offset:** <2mV  
**Distortion:** <1.0%  
**THD:** .02% at 1kHz  
**Ripple Voltage:** 250mV @ 250kHz  
**Voltage Slew Rate, 8Ω:** 150 V/μs  
**Efficiency:** 85%, typical

**Power Factor:** .98, typical  
**Source Impedance:** 5 mΩ + 6 μH  
**Cooling:** Internal forced-air fans  
**Protection:** Over/under voltage, over current,  
 over temperature  
**Input, Signal In:** BNC connector (unbalanced)  
**Output:** High-current barrier strip  
**Operating Environment,**  
**Temperature:** 5 °C to 50 °C (41 °F to 122 °F);  
 Maximum output power de-rated above 30 °C (86 °F)  
**Humidity:** Maximum relative humidity 80% for  
 temperatures up to 31 °C decreasing linearly to 50%  
 relative humidity at 40 °C  
**Altitude:** 3000 m Maximum  
**Environment:** Indoor Use Only, Pollution degree 2  
**Equipment Class:** Group 1 Class A  
**Transient Overvoltage:** Overvoltage Category II

### Continuous Output Current

	9105	9110	9115	9130	9145	9160	9175	9190
13.5 VDC	35A	60A	90A	180A	270A	360A	450A	540A
24 VDC	35A	60A	90A	180A	270A	360A	450A	540A
48 VDC	34A	60A	90A	180A	270A	360A	450A	540A
30 VAC	35A	70A	90A	180A	270A	360A	450A	540A
60 VAC	35A	70A	80A	160A	240A	320A	400A	480A
120 VAC	35A	37A	37A	74A	100A	137A	174A	200A

Performance data is for a purely resistive load; performance will be improved into loads that are partially or completely reactive.

### 9100 Series Default DIP Switch Settings

Red = Default

OFF ON				
1	<input type="checkbox"/>	1 DC SERVO	OFF	ON
2	<input type="checkbox"/>	2 OPERATION MODE	CC	CV
3	<input type="checkbox"/>	3 COMPENSATION NETWORK 2	OFF	ON
4	<input type="checkbox"/>	4 COMPENSATION NETWORK 1	OFF	ON
1	<input type="checkbox"/>	5 <b>CONTROL CONFIGURATION</b>	FOLLOWER	LEADER
2	<input type="checkbox"/>	6 COUPLING	AC	DC
3	<input type="checkbox"/>	7 GAIN BIT 3 (MSB)	OFF	10
4	<input type="checkbox"/>	8 GAIN BIT 2	OFF	5
5	<input type="checkbox"/>	9 GAIN BIT 1 (LSB)	OFF	2.5
6	<input type="checkbox"/>	10 <b>ELECTRONIC GAIN MATCHING</b>	OFF	ON
7	<input type="checkbox"/>	11 CURRENT LIMIT BIT 1	OFF	BIT 1 VALUE*
8	<input type="checkbox"/>	12 CURRENT LIMIT BIT 2	OFF	BIT 2 VALUE*

ALL OFF = 2.5  
 ALL UP = 20  
 BOTH OFF = MIN\*  
 BOTH ON = MAX\*

NOTE: *GRAY TEXT INDICATES SWITCH USED FOR FACTORY CONFIGURATION ONLY.*

ALL BIT SWITCHES ARE ADDITIVE. RIGHT = ON.

\*CURRENT LIMIT VALUES:

BIT 1 = + 25Ap (9105), + 50Ap (9110), + 75Ap (9115)  
 BIT 2 = + 12.5Ap (9105), + 25Ap (9110), + 37.5Ap (9115)  
 MIN = 12.5Ap (9105), 25Ap (9110), 37.5Ap (9115)  
 MAX = 50Ap (9105), 100Ap (9110), 150Ap (9115)

### SIM-91 Default DIP Switch Settings

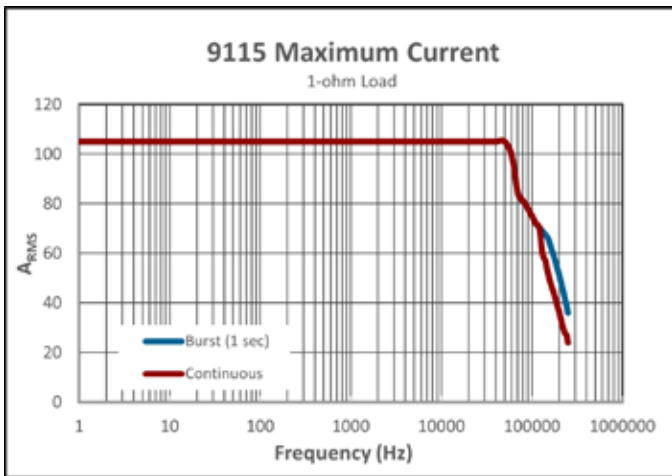
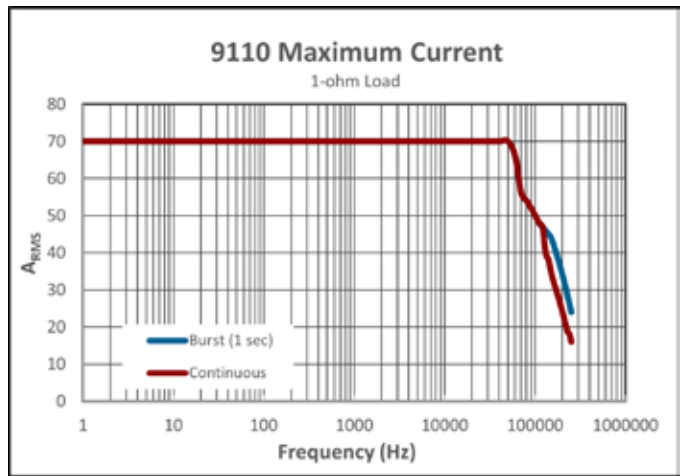
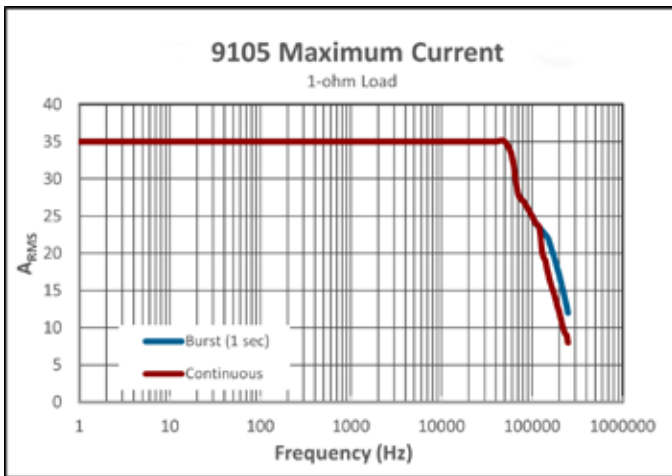
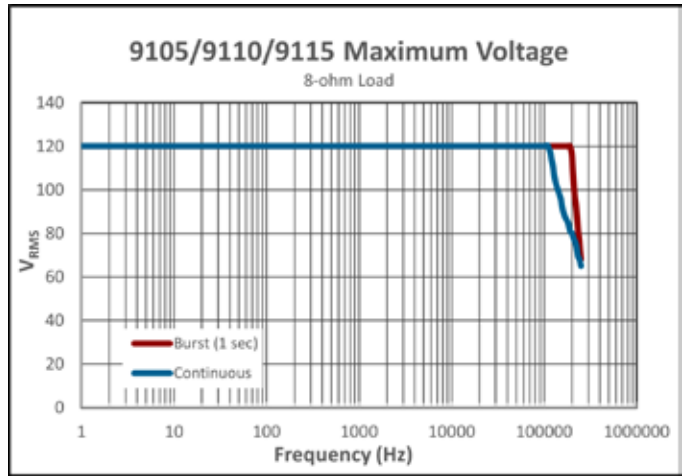
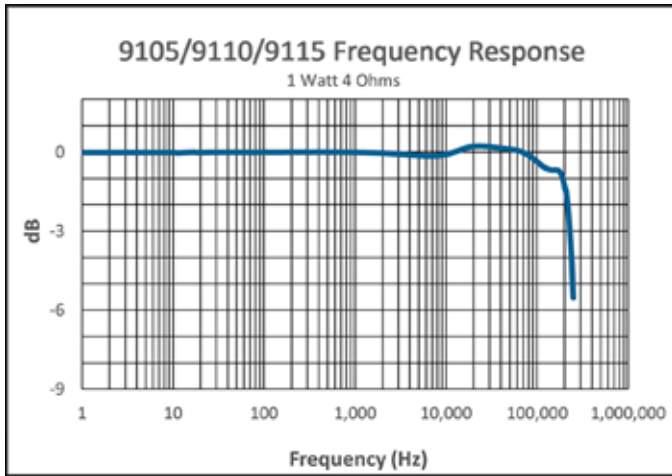
Red = Default

OFF ON				
1	<input type="checkbox"/>	1 SYNTHETIC IMPEDANCE BIT 3 (MSB)	OFF	BIT 3 VALUE**
2	<input type="checkbox"/>	2 SYNTHETIC IMPEDANCE BIT 2	OFF	BIT 2 VALUE**
3	<input type="checkbox"/>	3 SYNTHETIC IMPEDANCE BIT 1 (LSB)	OFF	BIT 1 VALUE**
4	<input type="checkbox"/>	4 UNUSED	OFF	NULL

NOTE: ALL BIT SWITCHES ARE ADDITIVE. RIGHT = ON.

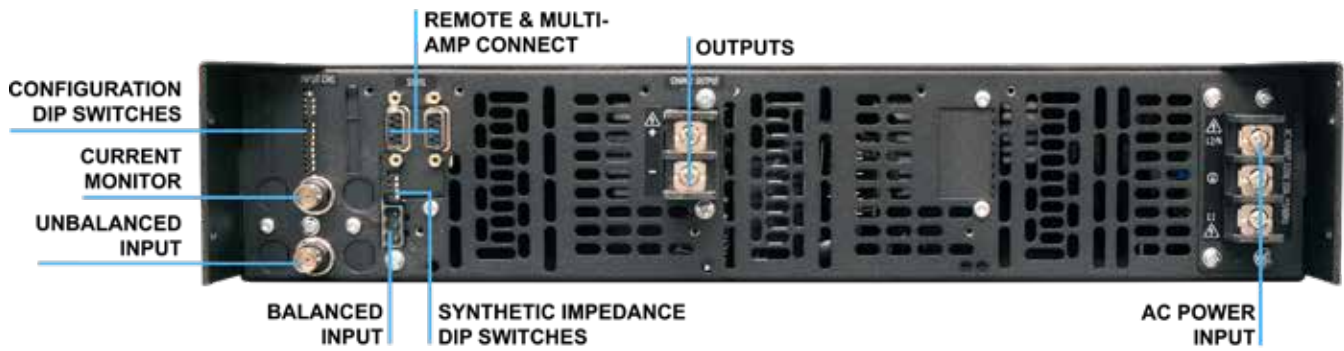
\*\*SYNTHETIC IMPEDANCE VALUES:

BIT 3 = +0.5Ω (9105), +0.25Ω (9110), +0.166Ω (9115)  
 BIT 2 = +0.25Ω (9105), +0.125Ω (9110), +0.0833Ω (9115)  
 BIT 1 = +0.125Ω (9105), +0.0625Ω (9110), +0.0416Ω (9115)



THD + Noise*	
Below	mV
500 kHz	25
80 kHz	2

\*THD + Noise with 1V input, 8-ohm load



CURRENT MONITOR: 1V = 10A<sub>RMS</sub> (9105), 1V = 20A<sub>RMS</sub> (9110), and 1V = 30A<sub>RMS</sub> (9115)



Please note that the handles are not to be used for carrying the amplifier and only lift the device using a two-person technique.

AE Techron Sales Representative