

4.11 Operating Limitations

4.11.1 Maximum Amplifier Input Levels

The frequency of the input signal shall be between 30 Hz and 300 kHz.
Operation of the amplifier with input frequency(ies) greater than 300 kHz may damage the amplifier.

In order to avoid damaging the amplifier, the amplitude any signal(s) delivered to the input of this amplifier SHALL not exceed the **LESSER** of:

- a) any value that causes the current value displayed on the front panel display to exceed the levels in the following table:

Frequency Range	Maximum [displayed] Current
30 Hz to 150 kHz	16 Amperes
150 kHz to 200 kHz	11 Amperes
200 kHz to 300 kHz	9 Amperes

- b) any value that causes the internal amplifier temperature (also displayed on the front panel display) to exceed 60 degrees Celsius.
- c) **560 mVrms**, corresponding to an amplitude setting of **280 mVrms**, or **+2 dBm** on a 50 ohm signal source. Please refer to section 4.11.1.1.

The maximum input signal amplitude for the amplifier will change depending on the following variables:

- Frequency of the input signal from the source equipment.
- Resistance/impedance of the load connected to the amplifier output terminals.

4.11.1.1 Signal Source Amplitude Settings

The nominal input impedance of the ARI-300K is 10k-ohms; therefore, when being driven by a 50 ohm signal source, the actual input voltage delivered to the amplifier will be double the value indicated on the signal source.

The nominal output impedance of most signal sources is 50 ohms. Due to the fact that typically, a 50 ohm source will be connected to a 50 ohm load, the output amplitude is actually double the indicated value. This is done so that the measured value will agree with the indicated value after half of the voltage drops across 50 ohm impedance of measuring instrument's input port.

For example, let's say that the amplitude of a typical 50 ohm signal source is set to **[+13 dBm / 120 dBμV / 1 Vrms]**. If you were to measure the signal source output using an oscilloscope probe, or directly with its termination impedance set to 1MΩ, you would measure an amplitude of **[+19 dBm / 126 dBμV / 2 Vrms]**. If you were to change the oscilloscope's termination impedance to 50Ω, the measured amplitude would now agree with the signal source amplitude setting. Refer to Figure 4 below:

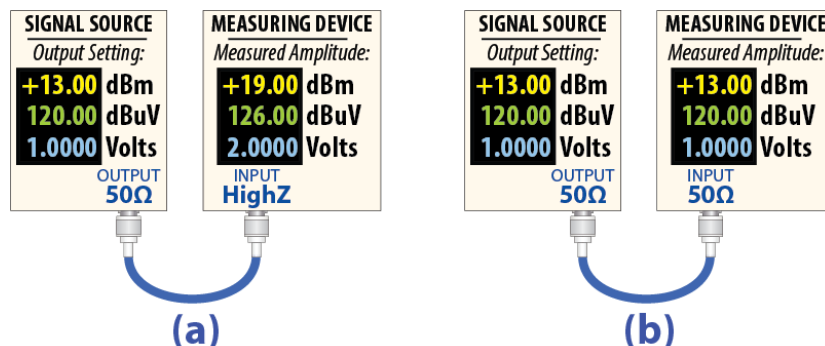


FIGURE 4 - Output Levels of 50 ohm Signal Sources

Some contemporary source instruments allow the user to select the load impedance to which the output will connect (i.e.: HighZ, 50Ω, etc.). If such a selection is available, the 'HighZ' output setting should be chosen, so that its indicated output will correctly reflect the actual output voltage when connected to a high impedance load.

4.11.2 Automatic Amplifier Shut Down

If the displayed current exceeds 16 amperes, the amplifier will automatically disable its output. In order to avoid the occurrence of this condition:

- ✓ Monitor the displayed current value on the front panel display, especially when increasing the amplitude of the input signal.
- ✓ Monitor the internal temperature of the amplifier, which is also displayed on the front panel display of the amplifier. Shut-down will occur if the temperature reaches 60 degrees Celsius.
- ✓ Reduce the amplitude of the input signal before changing the frequency of the input signal.
- ✓ When increasing the amplitude of the input signal, do so slowly, and in small increments.

If automatic shut-down does occur, normal amplifier operation can be restored by following the procedure below. If the shut-down condition was caused due to an over-temperature fault, allow the amplifier sufficient time to cool.

RESTORING AMPLIFIER OPERATION AFTER AUTOMATIC SHUT-DOWN

- 1) Disable the output of the source equipment without disconnection from the amplifier input.
- 2) Reset the amplifier by pressing the front panel power switch button twice. Once to turn off, and then once to turn back on.
- 3) Slowly increase the amplitude of the source equipment output, exercising caution to remain below the level which caused the amplifier to shut down previously.