

International Power Guide for Research Laboratory Test Equipment

Scientists, research lab managers and their customers continue to contact us about the optimal solution for powering research laboratory test equipment. Across the globe, laboratories are using increasingly delicate and precise test equipment. In addition, research and testing have become both global and mobile, with equipment and researchers moving worldwide.

For a laboratory's power and test challenges, KCC Scientific Converters solve the following concerns:

What if...

- ...your test equipment was developed for a different power grid?
- ...you need to test a product being developed for a different power grid?
- ...your equipment requires regulated ultra-high mains power line frequency precision?
- ...you need compact, precision converters to accommodate your mobile requirements?

KCC Scientific frequency and voltage converters are designed to power laboratories' delicate and precise devices anywhere in the world. Our products do it by reconstructing the power line or mains reconstruction.

Traditional Industrial Frequency and Voltage Converters

Many of the frequency converter units there look like they were designed in the 70's—because in many cases, they *were* designed between the 70's and the 90's. Designing new products for this space is not for the faint of heart, and many companies who originally designed these products in that era no longer have the expertise in house to update the products. As a result, they are saddled with older designs, which may or may not meet newer safety, EMI, and PFC standards. They also use 30 year-old semiconductor technologies. These older technologies suffer from lower efficiency, and bring with them larger, heavy inductors and SMPS transformers. These things in combination lead to weight issues. The result is equipment up around 80 pounds.

Up until now, frequency and voltage converters have been developed and available primarily with large industrial applications in mind. These converters are generally higher power, 1500 watts or more. Further, they may convert frequency and voltage, with only one level (output frequency and voltage not selectable). At the time of purchase, an end user is often forced to choose 230V AC 50Hz to 115V AC 60Hz or vice versa, because the option of having both in one product has not been universally available.

The difficulty of set up for many frequency and voltage converters can pose a barrier to end users. Other older converters are flexible, but to a fault. They require substantial setup time due to this flexibility. The user is forced to deal with learning a (sometimes) complex user interface just to set voltage and frequency! This hinders straight forward out-of-the-box setup, and may have to be repeated every time the unit is powered off and then back on. Older, higher power converters are mostly large, heavy and immobile. In addition, the starting price point is often well over USD \$3000. The cost is cumbersome enough that vendors offer rentals in addition to purchase. For today's research labs, these older, traditional models are simply too much cost, size, weight and power—and not enough precision. .

Newer Compact Precision Converters Are Now Available

Today, as a result of the globally collaborative research environment and a mobile work force, it is imperative that frequency and voltage converters be compact, relatively lightweight, lower power, higher precision, and economical. In addition, frequency and voltage converters today must include outputs selectable for all worldwide power grids. As a result these newer frequency and voltage converters would create a virtual, universal power grid for research labs. To learn more click here: <https://www.kccscientific.com/products/>

KCC Scientific Professional Series:

Product	Size	Weight	Price (USD)
Thor (100 watts)	8.75 x 6.25 x 3.25 in (22.2 x 15.9 x 8.26 cm)	6.6 lbs (3kg)	\$439.00
Hercules (200 watts)	8.75 x 6.25 x 3.25 in (22.2 x 15.9 x 8.26 cm)	8.6 lbs (3.9kg)	\$799.00
Mercury (500/1000 watts)	17.5 x 12.75 x 3.75 in (44.5 x 32.4 x 9.53 cm)	29 lbs (13.2kg)	\$1499/\$1895.00

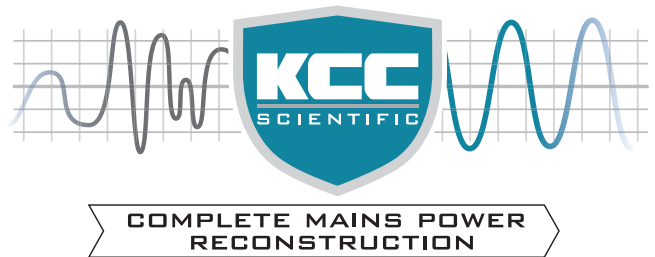
Frequently Asked Questions from Research and Device Laboratories

KCC Scientific Products Convert, Clean and Regulate Power

1) Precision Frequency

We need to power our device at 230V, at exactly 50.0000Hz to analyze performance. The device will not function optimally at small variations of frequency + - 0.1Hz. What is the precision of KCC Scientific converters frequency?

All KCC Scientific frequency and voltage converters are accurate to within .0002%. If you need absolute precision we encourage you to use the Professional Series converters. These models include Thor at 100 watts, Hercules at 200 Watts and Mercury at up to 1000 watts. The Professional Series products are of scientific grade performance and are most applicable for research and test.



2) Power Rating

Will using wattage below the converter's power rating damage it or result in output aberrations?

There is no issue with under-loading a KCC Scientific converter. They perform optimally with any load from 0 watts to full power.

3) Multiple Devices or Multiple Connections for Testing

Can I hook up multiple devices at one time?

Yes! If you have an installation requiring, for example, 1500 watts, you can “split” the power distribution for that system into two branches and use two converters, each providing one-half of the required power to each branch. However, don't connect multiple converters in parallel into the same branch to boost the power. This is both unsafe and just plain won't work.

4) Earth Connection or Grounding with Converters

I would like to use the Hercules 200 watt converter to operate a leakage current test at 60Hz. When I start it up, the leakage tester displays “no earth connection.” Is the output of the frequency converter floating?

The Hercules Converter acts as an isolation transformer. If the leakage current tester is using the line or neutral connections as the earth reference, then it will show that there is no connection.

If you have an application where you need the neutral output grounded, we would be happy to configure it that way for you at the factory. Please contact us at <https://www.kccscientific.com/contact/> at the time of purchase and we can configure the unit accordingly. If you already purchased the unit, it can be returned and re-configured for you.

5) Smaller, more Economical Frequency Converters

We travel the world with a few racks of sensitive electronic equipment and have been struggling to find a reasonably priced, universal AC AC converter. What is the size and weight of the Professional Series Converters?

The Professional Series frequency and voltage converters are compact, lightweight and economical. They are perfect for laboratory benches as well as racks traveling the globe.

6) PFC—why is it relevant?

PFC stands for Power Factor Correction. Older (and some newer) equipment use linear transformers, rectifiers and very large capacitors to create the internal DC voltages used to power the equipment. This style of power supply has been recognized for years as violating newer power standards for efficiency. The reason is that it wastes a great amount of power in contrast to the real power delivered. Many frequency and voltage converters as well as the equipment being powered by them suffer from this issue.

KCC Scientific converters are all PFC-corrected. This means high efficiency, the ability to meet newest standards, and lightweight design. A side benefit is that this helps smooth the power factor of the equipment being powered, regardless of whether the equipment is PFC compliant or not.

7) What is included with your converters?

With all KCC Scientific converters, everything you need to plug and play is included.

Let's start with the *power cord or wall plug*. We ship a power cord or wall plug to accommodate the wall mains in accordance with the customer's selection at checkout. The customer can choose from Type B (North America), Euro plug or Schuko Type E (European), BS1363 Type G (Great Britain and Asia), Type I (Australia and New Zealand), and Type M (South Africa).

With Hercules and Thor, we also include a *wall adapter*. The convenience of using a wall adapter cannot be overstated. These adapters are fully certified and rugged. Nevertheless, they are easy to replace should some event occur which causes them damage.

The output receptacle on Hercules and Thor is universal, and can likewise accommodate plug styles from nearly every country.

Above a certain power level, wall adapters are not an option. For *Mercury*, the power supply is built in. The output receptacles provided are the standard NEMA 5-15 Type A/B North American 2 or 3-prong style) for 115V AC output. In addition, a Schuko-style plug is provided for 230V AC output. Output adapter plugs for other countries are available upon request.



Worldwide
Power Grid



Universal
Frequency



Universal
Voltage

NEW! Mercury 500W and 1000W

Mercury 1000W shown



Mercury 500W 1000W Description:

Weight	30 lbs
Dimensions	17.5 x 12.75 x 3.50 in
Output Voltage	Selectable 115V/230V AC
Frequency Accuracy	.0002%
Frequencies Available	50Hz/60Hz Selectable
Voltage Accuracy	2% Regulated
Output Power	1000W, 500W
Remote Programmability	No
Output Plug	North America and EU-style output receptacles
Applications	Higher power or professional audio equipment, Production Test, Qualifying Designs
Mercury Edition	Mercury Audio, Standard 1000W, Standard 500W
Power Cord (this plugs into your wall)	Australia Type I, Israel Type H + \$6, North America Type B, South Africa Type M + \$10, Type C (Europlug) + \$6, UK Type G (BS 1363) + \$10



Mercury back panel

If you need help determining whether you can operate a valued electronic device overseas, give us a call toll free or contact us: 1.833.502.6049
<https://www.kccscientific.com/contact/>

We ship worldwide.