

# *Power Requirements – TraceGC*

It is your responsibility to provide an acceptable source of power. You should provide a dedicated power line with a circuit breaker capable of withstanding the power ratings listed in the following sections.

## **120 V ac Power Requirements**

For TRACE GC systems installed in the US and other countries using 120 V ac power, the *minimum* power requirements are as follows:

- 120 V ac +6, -10%
- frequency of 50/60 Hz  $\pm$  2 Hz
- three duplex outlets (single-phase power) with a minimum power rating of 20 A at each duplex outlet
- earth ground hard-wired to the main panel

## **230 V ac Power Requirements**

For TRACE GC systems installed in countries using 230 V ac power, the *minimum* power requirements are as follows:

- 230 V ac  $\pm$  10%
- frequency of 50/60 Hz  $\pm$  2 Hz
- three duplex outlets, with a minimum power rating of 16 A at each duplex outlet
- earth ground hardwired to the main panel

## **Power Quality**

The quality of power supplied to your TRACE GC system must be stable and within the specifications listed in this guide. The line voltage must be free of fluctuation due to slow changes in the average voltage, surges, sags, transients, and harmonics.

The TRACE GC system operates in an Overvoltage Category II environment, as defined in International Standard EN 61010-1: 1993.

Below are definitions for the most common voltage disturbances:

*Slow average* is a gradual, long-term change in average root mean square (RMS) voltage level, with typical durations greater than 2 s.

*Sags* and *surges* are sudden changes in average RMS voltage level, with typical durations between 50  $\mu$ s and 2 s.

*Transients* (or *impulses*) are brief voltage surges of up to several thousand volts, with durations of less than 50  $\mu$ s.

*Harmonic distortion* is a high-frequency disturbance that appears as distortion of the fundamental sine wave. Total harmonic distortion should be less than 3%.

## Effects of Voltage Disturbances

Constant high line voltage or surges in voltage can cause overheating and component failures. Constant low line voltage or sags in voltage can cause the system to function erratically. Transients, even of a few microseconds duration, can cause electronic devices to fail catastrophically or to degrade, shortening their lives significantly. Harmonic distortion can cause noise in power supply lines and degrade the performance of the instrument. Therefore, it is important to establish the quality of the line power in your laboratory prior to the installation of your TRACE system.

The interconnected power outlets for the TRACE system require a common point to one ground connector. If there are two such points, with each connected to separate external grounds, noise current will flow through the ground system via the ground loop that is formed.

The power cable from the TRACE GC is approximately 3 m (9 ft) long.

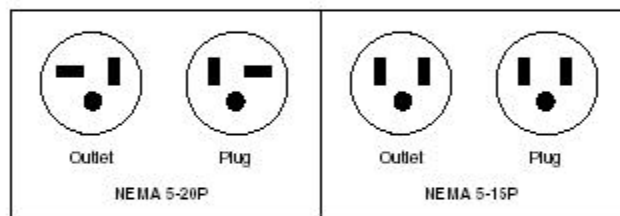
Use an Uninterruptible Power Source (UPS) to protect your data system against possible loss due to power outages. At this time, we do not recommend using a UPS with the GC.

Most UPS systems are not designed to provide high-quality distortion-free power for scientific equipment.

The 120 V ac systems are fitted with U.S. standard National Electronics Manufacturers Association (NEMA) 5-20P power plugs. A NEMA 5-20P power plug and its corresponding outlet are rated at 20 A and 125 V ac.

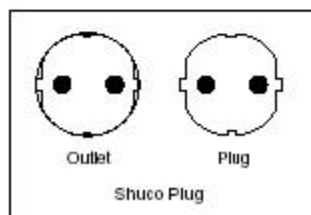
The power cables from the personal computer, monitor, and printer are approximately 2 m (6 ft) long. The 120 V ac systems are fitted with NEMA 5-15P plugs. For optional instruments, the plug requirements may vary. Refer to your product's user manual for specifications.

Figure 1-1 shows the NEMA power plugs and outlets.



**Figure 1-1.** NEMA 5-20P and 5-15P Power Plugs and Outlets: 120 V ac

The 230 V ac systems are fitted with Shuco German-type power plugs. Plug requirements are dictated by country. Figure 1-2 shows the Shuco power plug and outlet.



**Figure 1-2.** Shuco 230 V ac Power Plugs and Outlets

You should never connect the TRACE GC and its peripheral devices to the same electrical wall outlet. You will run the risk of overloading the circuit.

Tables 1-3 and 1-4 show maximum current requirements for the TRACE GC system and optional instruments.

**Table 1-3.** Maximum Current Requirements for the TRACE Standard System

<b>Instrument</b>	<b>120 V Current Requirement (in amperes)</b>	<b>230 V Current Requirement (in amperes)</b>
TRACE GC	20	10
computer	4	2
monitor	2	1
Total	26	13

**Table 1-4.** Maximum Current Requirements for TRACE Optional Instruments

<b>Instrument</b>	<b>120 V Current Requirement (in amperes)</b>	<b>230 V Current Requirement (in amperes)</b>
<b>GC Autosamplers</b>		
AS 2000	0.8	0.4
HS 2000	1.6	0.8
<b>Printers</b>		
ink jet printer/plotter	1.8	0.9
laser printer	7	3.5

Other peripheral devices, such as purge and trap units, may be connected to the TRACE GC. These peripheral devices may have additional power requirements. Consult your local service engineer for assistance.