FURMAN®

Power Conditioning

TEC AWARD NOMINEE
IT-1220: "BEST ANCILLARY EQUIPMENT"

BALANCED ISOLATION TRANSFORMERS, 10/20/30 A

MODELS IT-1210, IT-1220, IT-1230

IT-1220 shown (IT-1210 and IT-1230 front panels are similar).

FEATURES

- Available in 10 Amp, 20 Amp and 30 Amp models
- Provides precisely balanced AC power for ultra-low-noise installations
- Typically gives a 16 dB improvement in background noise floor
- Toroidal transformer with center-tapped secondary is the most efficient and compact design, with minimal magnetic field leakage
- Exclusive "Soft Start" circuit prevents turn-on transients and high inrush currents
- Faraday shield reduces electrostatic coupling between primary and secondary
- Extreme Voltage Shutdown circuit protects against dangerously high or low input voltages
- Microprocessor-controlled "smart" AC voltmeter monitors line voltage, flashes alerts for marginal and extreme conditions
- Provides basic power conditioning (spike suppression, RFI filtering) plus gas discharge tube to dissipate spikes
- Ground fault circuit interrupter (GFCI) protection
- Models IT-1210 and IT-1220 UL/CUL listed

DESCRIPTION

Designed for the most critical, ultra-low-noise installations, the **IT-1210, IT-1220** and **IT-1230** can supply 10, 20 or 30 Amps of balanced AC power to recording studios, video or film production facilities, broadcast stations, etc. These models drastically reduce hum and buzz caused both by ground currents from power supply filtering and by radiation from supply cables into sensitive lines, particularly low level and unbalanced sources.

The IT-1210, IT-1220 and IT-1230 not only dramatically reduce the noise floor but also have been reported to noticeably improve dynamic range and sonic clarity.

At the heart of these units is a specially wound and shielded toroidal isolation transformer with a center-tapped secondary. These precision transformers, in conjunction with wideband EMI/RFI filters and output spike protection, make these units excellent power conditioning solutions for any situation.

An IT-1210 or IT-1220 can be installed in minutes without the need for an electrician; the IT-1230 may require some help in choosing and wiring an appropriate supply cable. All three models provide clean and completely safe power – there is no need to "lift grounds" or compromise the integrity of safety ground wires to achieve hum reduction.

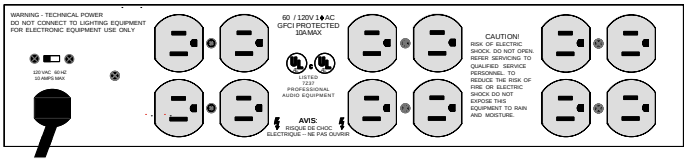
Special features include an accurate, self-checking AC voltmeter that not only measures normal voltages, but also flashes eye-catching special pattern alerts for off-scale but not extreme conditions (80-90 or 130-140 Volts); an Extreme Voltage Shutdown circuit to cause a protective shutdown if the unit is exposed to dangerous voltages (like accidental connection to 220 Volts); and Furman's exclusive "Soft Start" circuit to prevent the large inrush surge currents and spikes that would otherwise occur at turn-on and turn-off with such large transformers.

The IT-1210 occupies two rack spaces (3.5" high); the IT-1220 and IT-1230 occupy three rack spaces (5.25" high).

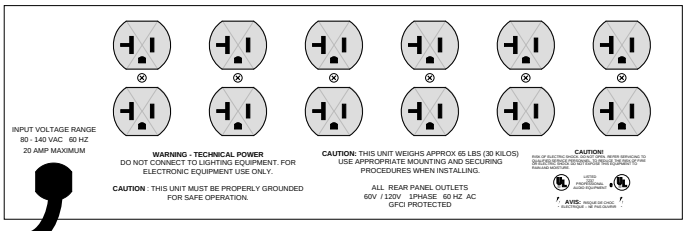
The IT-1210 and IT-1220 rear panels provide 12 outlets, the front panel provides two. The IT-1230 rear provides ten 20 Amp outlets, one 30 Amp twistlock outlet and one 30 Amp twistlock inlet. The front provides two 15 Amp outlets. All outlets are balanced and Ground Fault Circuit Interrupter protected.

Furman Sound, Inc.● 1997 South McDowell Blvd.● Petaluma, CA 94954 USA
Phone: (707) 763-1010● Fax: (707) 763-1310● http://www.furmansound.com

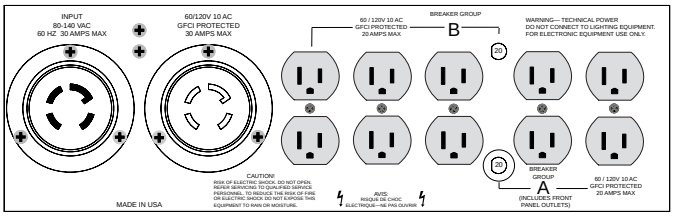
IT-1210 Rear View



IT-1220 Rear View



IT-1230 Rear View



BACKGROUND

In much the same way that balanced audio lines can reduce the pickup of hum and other types of electromagnetic interference (EMI), the use of balanced AC power lines in sensitive audio, video, or computer installations can make an enormous difference in system noise. But power distribution in North America, unfortunately, is not balanced. The distribution standards currently in use were derived from practices established over a century ago, when electric power use was limited to lighting and motors—long before any EMI-sensitive applications existed. The emphasis then was on convenience (from the power utilities' standpoint) and safety, but not noise cancellation. The result was a three-wire distribution scheme in which 120 Volt branch circuits have a hot wire and a neutral wire, with the neutral tied to a third wire connected for safety to an earth ground. The third wire does not carry any current unless there is a fault. This unbalanced scheme causes hum in audio circuits for two main reasons. First, the current flowing in the hot wire induces hum in any other nearby wires, which may carry vulnerable low-level audio signals. Second, because the impedance of chassis and cable shielding to ground is greater than zero, ground current flowing from power supply capacitors and from EMI pickup causes a voltage drop at 60 Hz and its harmonics. This low level noise becomes part of the audio signals.

With a center-tapped isolation transformer, the AC power feeding a studio can be balanced at its source. The current-carrying wires then are no longer "hot" (120 Volts) and "neutral" (0 Volts), but two 60 Volt lines of opposite polarity (referenced to the safety ground connected to the center tap), whose difference is 120 Volts. This type of power, when run around a room, does not induce hum into nearby audio wiring, because the two conductors induce equal and opposite voltages that cancel each other out. Similarly, ground currents are all but eliminated by the same common-mode cancellation effect. No longer is it necessary to adopt cumbersome and expensive star-ground systems or use massive bus bars or heavy ground rods. Most such systems are far more trouble than the less than ideal results they produce, because the ground impedance cannot be reduced to zero. The common-mode rejection of a truly balanced AC supply is simpler, cheaper, and more effective.

Balanced power is recognized by the National Electrical Code (Article 530) for technical power applications. Its use is restricted to electronic equipment only. Balanced power may not be used for lighting equipment, and access must be restricted to use by qualified personnel only.

OPTION

- **RRM-2 Rear Rack Mount Ears:** Adjustable depth rear rack ears for the IT-1210, IT-1220 or IT-1230. Adjustment depth is 17" to 18.25" from inside front panel.

Three Year Warranty

The IT-1210, IT-1220 and IT-1230 are protected by a three year limited warranty covering defects in materials and workmanship.

IT-1210/1220/1230 SPECIFICATIONS

Output current:	IT-1210: 10 Amps (1200 Watts at 60/120 Volts 1Ø AC, 60 Hz) IT-1220: 20 Amps (2400 Watts at 60/120 Volts 1Ø AC, 60 Hz) IT-1230: 30 Amps (3600 Watts at 60/120 Volts 1Ø AC, 60 Hz)
Voltage Ranges:	Normal, 90-130; Marginal (flashes alert), 80-90 or 130-140; Extreme (causes shutdown), below 80 or above 140
Inlets:	IT-1210: Heavy duty power cord with 15 Amp three-prong plug IT-1220: Heavy duty power cord with 20 Amp three-prong plug IT-1230: One 30 Amp NEMA L14-30P twistlock connector
Outlets:	IT-1210: 12 rear, 2 front, each rated at 10 Amp IT-1220: 12 rear, 2 front, each rated at 20 Amp IT-1230: Ten 20 Amp outlets and one 30 Amp NEMA L14-30R twistlock outlet in rear, plus two 20 Amp outlets on front. Front outlets are Ground Fault Interrupter (GFCI) type.
Isolation, Input to Output:	Breakdown Voltage: 1500 Volts minimum. Leakage current: 40 mA maximum. Capacitance: 300 pf maximum
Turns Ratio:	1:1; windings separated with Faraday shield
Transformer Regulation:	(Full load/no load) 3% at full load
Spike Protection Modes:	Line to neutral, neutral to ground, line to ground
Spike Clamping Voltage:	TVSS rating of 400 Volts peak, L-N, N-G, L-G (tested to UL-1449)
Spike Response time:	1 nanosecond
Maximum surge current:	6,500 Amps (8 x 20 mS pulse)
Maximum spike energy:	80 Joules per mode, 240 Joules total
Noise attenuation:	Transverse mode: Greater than 60 dB Common mode: Greater than 80 dB at 1 to 200 MHz
Mechanical:	Dimensions: IT-1210: 3.5" H x 19" W x 17" D. IT-1220/30: 5.25" H x 19" W x 17" D. Weight: IT-1210: 40 lbs (18 kg) Weight: IT-1220: 60.5 lbs (27.5 kg) Weight: IT-1230: 66 lbs (30 kg) Construction: Steel chassis, powder coated; glass epoxy printed circuit boards
Power Consumption:	8.5 Watts for display and control circuits, independent of actual load
Safety information:	IT-1210, IT-1220 UL/CUL Listed