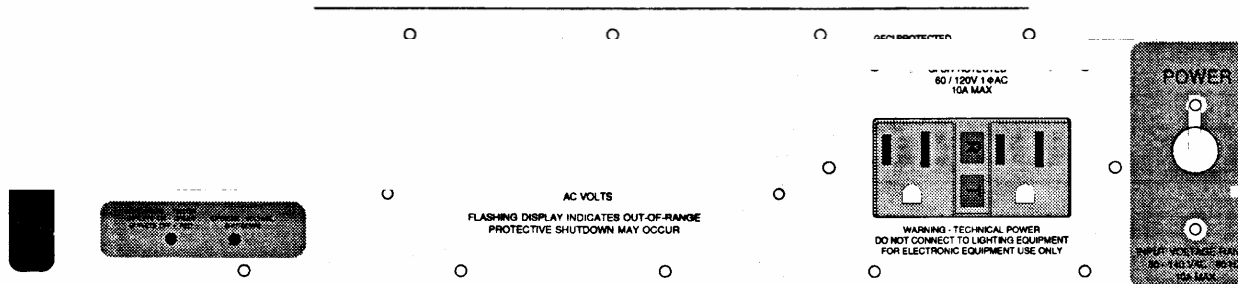


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Balanced Power Isolation Transformer, 10 Amp

MODEL IT-1210

Instruction Sheet



Introduction

Thank you for your purchase of a Furman IT-1210 10 Amp Balanced Power Isolation Transformer, and congratulations on your choice. This specially wound and shielded toroidal isolation transformer is designed specifically to reduce hum pickup by sensitive equipment when ultra-low-noise is a must.

Features

- Provides precisely balanced AC power for ultra-low-noise installations
- Typically gives a 16 dB improvement in background noise floor in system-wide installations
- Toroidal transformer with center-tapped secondary is the most efficient, compact design, with least magnetic field leakage
- 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-control led "smart" AC voltmeter monitors line voltage, flashes alerts for marginal and extreme conditions
- Provides basic power conditioning functions (spike suppression, RFI filtering)
- Ground fault interrupter (GFCI) protection

Description

Designed for the most critical, ultra-low-noise installations, the IT- 1210 can supply 10 amps of *balanced* AC power to a home theatre system, recording studio, video or film production facility, broadcast station, etc. Its purpose is to drastically reduce hum and buzz caused both by ground currents from power supply filtering and by radiation from supply cables into sensitive signal sources like guitar pickups, tape heads, and microphones. Its effect is startling! It not only dramatically reduces the noise floor but also noticeably improves dynamic range and sonic clarity.

The IT- 1210's heart is a specially wound and shielded toroidal isolation transformer with a center-tapped secondary. It is housed in a 2-unit (3.5" high) rack mount chassis. The back panel provides 12 balanced outlets, widely spaced with plenty of clearance for "wall warts"; the front panel provides two more. An IT-1210 can be installed in minutes without need for an electrician. It provides 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 220V)¹- and a special "Soft Start" circuit to prevent the large inrush surge currents and spikes that would otherwise occur at turn-on and turn-off with such a large transformer.

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 120V 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 short circuit. 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 not zero, ground current flowing, from power supply capacitors and from EMI pickup causes a voltage drop at 60 Hz and its harmonics which is added to 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" (120V) and "neutral" (0V), but two equal and opposite lines of 60V each (referenced to the safety ground connected to the center tap), whose difference is 120V. This type of power, when run around a room, does not induce hum into nearby audio wiring, because the two power 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. All such systems are doomed to yield only mediocre results because of the impossibility of reducing the ground impedance to zero. The common-mode rejection of a truly balanced AC supply is far simpler, cheaper, and more effective.

Balanced power is a technology whose time has come. Balanced, or "technical" power, is now recognized by the US National Electrical Code (Article 530) for critical, low noise applications.

Installation -

The power source to which the IT-1 210 is connected must be adequate for use at 10 amps, and a dedicated 15 amp circuit is recommended. Consult a qualified electrician if in doubt. The IT-1210 is designed for mounting in a standard 19-inch equipment rack. Because of its weight, the best position for it is the bottom slot of the rack. Its toroidal transformer minimizes magnetic leakage, but nevertheless, due to its high capacity, it will radiate an appreciable magnetic field. Therefore, we recommend that it not be positioned adjacent to sensitive, low level signal processors, especially mic preamps, mixers, tape recorders, etc. Power amps may be more suitable "rack neighbors."

The maximum benefit is derived from balanced power when ALL equipment in an installation is powered with it. Therefore, try to position the IT-1210 in a central location so its power can be easily distributed everywhere it's needed. If the total power consumption of all equipment exceeds 10 amps at 120 volts, delete high level or mechanical devices first (such as power amps, motors). If possible, physically isolate any such equipment that has to be powered with conventional power through a different circuit, and route their AC cords away from all other cabling.

The balanced power produced by the IT-1210 is restricted to use with electronic equipment only. Balanced power may not be used for lighting equipment, and access must be limited to use by qualified personnel only.

If you are installing the IT- 1210 in a rack that has rear as well as front mounting rails, you may wish to order adjustable rear rack ears from Furman. They allow the IT-1210 to be securely attached both in front and in back. Order model RRM-2.

Operation

Circuit Breaker/Switch: The IT-1210 has just one control: the large blue switch on the front panel that is both a precision magnetic circuit breaker and an on-off switch. This breaker will trip (snap to the "off" position) if the current drawn through the IT-1210 exceeds 10 amps. If this occurs, reduce the load by unplugging some equipment, then flip the switch back to the "on" position.

Soft Start/Outlets On/Off Indicator: When power is first applied to the IT-1210, the Soft Start feature is activated, indicated by a steady yellow color. Soft Start limits the inrush current to the IT-1210's transformer, which would otherwise be excessive. The result is that the IT-1210's output voltage does not reach its full level until several seconds have elapsed. When it has reached its maximum level, the LED color turns to green, indicating that all outlets are fully powered.

Should the power at the IT-1210's outlets go off for any reason-either because the power switch is in the "off" position or because an Extreme Voltage Shutdown has occurred, the LED will light up red.

Extreme Voltage Shutdown: This LED status indicator is normally off. It monitors a hazard particularly common in the entertainment industry: wiring faults-for example, accidental connection to 220V. The IT-1210 senses voltages that are so high or low that operation would be impossible (under 80V or over 140V) and shuts the power down before damage can occur. Upon initially applying power to the IT-1210, this indicator will be lit if the input is receiving less than 80 volts or

more than 140 volts, and power will not be applied to the IT-1210's outlets. If the unit has been operating with an acceptable input voltage and then that voltage goes out of the acceptable range, the IT-1210 will shut off power to the outlet and this LED will begin flashing.

NOTE. If the mains power is below 80 volts and has caused the IT- 1210 to remove power from its outlets, the IT- 12 10 will not restore power to the outlets until the mains voltage is more than 90 volts. If the mains power is above 140 volts and has caused the IT- 12 10 to remove power from its outlets, the /T- 12 10 will not restore power to the outlets until the mains voltage is less than 130 volts. The reason for this is to prevent the power oscillating on and off in marginal conditions.

LED Voltmeter: This three-color, 20-LED bar graph is an accurate, self-checking AC voltmeter that continually measures the IT-1210's input voltage. The meter reads from 90 to 128 volts in two-volt steps. The normal range voltages are indicated in green, too with moderate and extremely high or low voltages in yellow and red respectively (see chart on the previous page). The voltmeter provides three special flashing patterns to indicate abnormal power conditions:

1. If only the single LED located beneath the number 90 on the voltmeter flashes, voltage at the IT-1210 input is below 90 volts. Power to the IT-1210 outlets will remain on unless the incoming voltage falls below 80.
2. If all of the LEDs on the voltmeter flash, voltage at the input is between 130 and 140 volts. Power to the IT-1210's outlets will remain on unless the incoming voltage exceeds 140.
3. If none of the LEDs on the voltmeter are lit, and the Extreme Voltage LED indicator is flashing continuously, then the IT-1210 has shut down power to its switched outlets due to input voltage below 80 volts or above 140 volts. The IT-1210's voltmeter has a basic accuracy of plus or minus two volts, and extreme cold or heat may cause an additional one volt of error. Please note that the voltage reading is advisory only. The IT-1210 does not compensate for high or low line voltage. If you frequently move your rack to different locations, derive power from generators, use long extension cords, travel internationally, or are in an area prone to brownouts, you may benefit from the use of one of Furman's AC Line Voltage Regulators.

NOTE: Because the voltmeter reads the input voltage BEFORE the circuit breaker on/off switch, its LEDs stay on whenever the IT- 1210 is plugged in, even when the power switch UAW s off this feature allows you to check voltage before powering up your equipment. The LEDs are designed for continuous, ongoing use. They consume little power, just a few cents worth a month, like a clock.

Ground Fault Interrupter (GFCI): The GFCI on the IT-1210's front panel is a special kind of circuit breaker that detects an imbalance in the current flowing in the two hot legs. The "missing" current is presumed to be flowing through the ground conductor (the round pin on an AC outlet). Ground current often indicates a dangerous partial or full short circuit. If an imbalance is detected, the GFCI trips and cuts off power not only to itself, but to all the IT-1210's outlets. If this occurs, the button on the GFCI marked "R" (Reset) will pop out. To restore operation, correct the fault and push the button in.

You may test the proper operation of the GFCI at any time by simulating a ground fault by pushing the button marked "T" (Test). If the GFCI is working properly, this will cause the "R" button to pop out and cut off power. You can restore operation after a test by pushing the "R" button in.

Three Year Warranty

The Furman IT-1210 is warranted against failures due to defective parts or faulty workmanship for a period of three years after delivery to the original owner. During this period, Furman will make any necessary repairs without charge for parts or labor. Shipping charges to the factory or repair station must be prepaid by the owner; return shipping charges (via UPS Ground) will be paid by Furman.

This warranty applies only to the original owner and is not transferable. Also, it does not apply to repairs done other than by the Furman factory or Authorized Repair Stations.

This warranty may be cancelled by Furman at its sole discretion if the IT-1210 unit has been subjected to physical abuse or has been modified in any way without written authorization from Furman. Furman's liability under this warranty is limited to repair or replacement of the defective unit.

Furman will not be responsible for incidental or consequential damages resulting from the use or misuse of its products. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date (if a Warranty Registration Card was mailed in at the time of purchase, this is not necessary). Before returning any equipment for repair, please read the important information on service, which follows.

Also Available: Furman IT-11 220

Balanced Power Isolation Transformer, 20A

For larger installations and applications requiring ultra-low-noise performance, consider the Furman IT-1220.

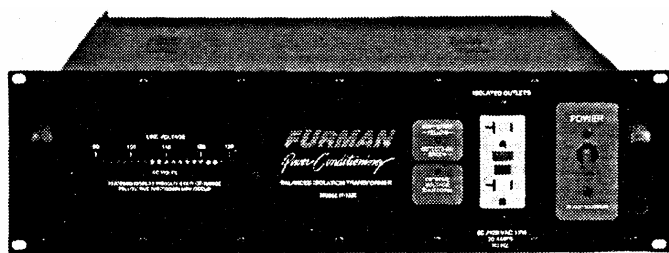
It provides 20 amps of balanced AG power, and includes all of the features and performance of the *IT-1210*, in a three rack space chassis.

For more information on the *IT-1220*, contact us by phone, fax or e-mail for a free data sheet. You can also discover the *IT-1 220* at, the Furman website: www.furmansound.com

Service

Before returning any equipment for repair, please be sure that it is adequately packed and cushioned against damage in shipment, and that it is insured. We suggest that you save the original packaging and use it to ship the product for servicing. Also, please enclose a note giving your name, address, phone number and a description of the problem.

NOTE: All equipment being returned for repair must have a Return Authorization (R/A) Number. To get an R/A Number, please call the Furman Service Department, (707) 763-1010, between 8 am and 5 pm U.S. Pacific Time. Please display your R/A Number prominently on the front of all packages.



The /T- 1220, Furman's 20-amp version of the IT- 12 10

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Other Furman Products:

*Please contact us by phone, fax or e-mail
for a copy of our latest catalog.*

IT-1210 SPECIFICATIONS

Output current:

Outlets:

Isolation, Input to Output:

Turns Ratio:

Transformer Regulation:

Spike Protection Modes:

Spike Clamping Voltage:

Spike Response time:

Maximum surge current:

Maximum spike energy: Noise attenuation:

Mechanical:

Power Consumption:

10 amps (1200 watts at 60/120 V 10 AC, 60 Hz) Technical power, for electronic equipment (not lighting) only, per NEC Article 530.

Normal, 90-130; Marginal (flashes alert), 80-90 or 130-140; Extreme (causes shutdown), below 80 or above 140

12 rear, 2 front, each rated at 20A; total of 14 outlets. Front outlets are Ground Fault Interrupter (GFCI) type.

Breakdown Voltage: 1500V minimum

Leakage current: 40 gA maximum

Capacitance: 300 pf maximum

1:11; windings separated with Faraday shield

(Full load/no load) 3% at full load

Line to neutral, neutral to ground, line to ground

TVSS rating of 400 volts peak, L-N, N-G, L-G

(tested to UL-1449)

1 nanosecond

6,500 amps (8 x 20 μ s pulse)

80 joules per mode, 240 joules total

Differential mode: Greater than 40 dB

Transverse mode: Greater than 60 dB

Common mode: Greater than 80 dB, 1 to 200 MHz

Dimensions: 3.5" H x 19" W x 17" D. Weight: 40 lbs (88 kg). Construction: Steel chassis, powder coated; glass epoxy printed circuit boards

8.5 watts for display and control circuits, independent of actual load

LISTED

The Furman IT-1210 is manufactured in the U.S.A.

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