

Hospital Grade Isolation Transformers



ISO-PUCK

***Your solution for hazardous leakage current
in OR and Patient Care Rooms from***

- Computers, Laptops • Printers, Monitors
- Entertainment Electronics • Aging Medical Devices

With ISO-PUCK You Comply with NFPA 99 2012 Code

Where existing cord connected equipment exceeds 500 uA (Microamps) with the ground wire disconnected, methods to reduce leakage current such as the addition of small isolation transformer to that equipment are permissible. (NFPA 99 Chapter 10.3.5.1)

ISO-PUCK isolation transformers with maximum 100uA leakage current is your best solution when your commercial or medical devices exceed 500 uA leakage current in OR's and patient care rooms.

Available from 200VA to 3000VA for 60Hz and 200VA to 2500VA/50-60Hz operation.

ISO-PUCK

Electrical Safety Standards to prevent Electric Shock

Over the past several years we have seen an increased national and international awareness of the potential hazard to humans of electrical shock from patient care equipment. This concern produced the third edition of the safety standard IEC60601-1:2005. In the US the equivalent safety standard is ANSI/AAMI ES60601-1:2005(R) 2012

ISO-PUCK medical grade isolation transformers prevent hazardous and possibly life threatening levels of leakage (touch) current in medical devices and commercial grade electronics including computers, monitors, printers and other non-battery operated electrical equipment used in OR and patient care areas.

In the United States, the 2012 edition of NFPA 99 went through a major overhaul as it was changed from a standard to a code to reflect how the document is used and adopted. It is now a risk based document. Maximum allowed level of leakage (touch) current is 100 microamps in fixed equipment and 500 microamps in portable equipment.

The back page of this brochure contains further details.

ISO-PUCK Models for 120V input and 120V output Voltage at 60Hz Frequency

Power Rating	Model	Housing Material*(Finish)	Diameter		Depth		Approx. Weight	
			In.	mm	In.	mm	Lbs	Kg
200 VA	IP-200/60	Polycarbonate (White)	4 7/8	125	2 1/8	54	5.1	2.3
300 VA	IP-300/60	Polycarbonate (White)	5 3/4	145	2 3/4	70	8.9	4.0
400 VA	IP-400/60	Polycarbonate (White)	5 3/4	145	2 3/4	70	13	5.9
600 VA	IP-600/60	Polycarbonate (White)	6 5/8	168	2 3/4	70	14.1	6.4
800 VA	IP-800/60	Polycarbonate (White)	6 5/8	168	2 3/4	70	19.2	8.7
1000 VA	IP-1000/60	Polycarbonate (White)	7 7/8	200	3 1/8	80	19.7	8.9
1200 VA	IP-1200/60	Polycarbonate (White)	7 7/8	200	3 1/8	80	20	9.1
1500 VA	IP-1500/60	Polycarbonate (White)	8 1/2	218	3 3/4	100	28	12.7
1800 VA	IP-1800/60	Polycarbonate (White)	8 1/2	218	3 3/4	100	30	13.6
2200 VA	IP-2200/60	Polycarbonate (White)	8 1/2	218	3 3/4	100	33	15.0
2400 VA	IP-2400/60	Enamel Coated Steel (Off-White)	9	230	4 1/4	108	35	15.9
3000 VA	IP-3000/60	Enamel Coated Steel (Off-White)	9	230	4 1/4	108	38	17.2

*Some smaller models are available in off-white baked enamel Steel Housing. Contact factory for details.

ISO-PUCK Models for 100V or 120V or 230/240V Input or Output Voltages at 50-60Hz Frequency

Power Rating	Model	Housing Material*(Finish)	Diameter		Depth		Approx. Weight	
			In.	mm	In.	mm	Lbs	Kg
200 VA	IP-200/50	Polycarbonate (White)	4 7/8	125	2 1/8	54	6.2	2.8
350 VA	IP-350/50	Polycarbonate (White)	5 3/4	145	2 3/4	70	13.3	6.0
650 VA	IP-650/50	Polycarbonate (White)	6 5/8	168	2 3/4	70	17.4	7.9
1000 VA	IP-1000/50	Polycarbonate (White)	7 7/8	200	3 1/8	80	20	9.1
1200 VA	IP-1200/50	Polycarbonate (White)	7 7/8	200	3 1/8	80	26	11.8
1800 VA	IP-1800/50	Polycarbonate (White)	7 7/8	200	3 1/8	80	33	15.0
2500 VA	IP-2500/50	Enamel Coated Steel (Off-White)	9	230	4 1/4	108	38	17.2

*Some smaller models are available in off-white baked enamel Steel Housing. Contact factory for details.



Plugs and Receptacles

USA/Canada:

For 120V/15A line voltage NEMA 5-15 Hospital Grade

For 120V/20 A line voltage NEMA 5-20 Hospital Grade

For higher amperage please consult factory In addition to NEMA 5 receptacle, a triple outlet and a four or six outlet hospital grade power strip permanently attached are available

Europe: Schuko, UK or as specified

Rest of the World: As specified

IEC60320 connectors are available for all models

Cord Lengths and Color

Standard length is 2 feet (60 cm). Custom lengths available at nominal cost. White color is standard

Mounting

The steel enclosure models include a mounting bracket with a single key-hole for mounting on walls, carts, etc. The polycarbonate housing is designed with one key hole on top and one through hole on the bottom for mounting on walls, carts etc. See www.iso-puck.com for details.

ISO-PUCK Offers Benefits to Hospital Purchasing Managers

- Instead of paying for more expensive medical grade computers, monitors and printers and other electronics as required when used in OR and patient care areas, substantial savings can be achieved by using commercial grade electronics connected to the ISO-PUCK.
- Buying regular less costly industrial carts equipped with the ISO-PUCK to meet the required medical safety standards.

ISO-PUCK may Eliminate Nuisance Alarms

If your hospital has installed line isolation monitors in OR, the ISO-PUCK can reduce the cumulative leakage current which may cause unwanted alarms.

GFI (Ground Fault Interrupt) Outlets do not Provide Adequate Leakage Current Protection in OR's

The GFI outlet provides a limited degree of safety but requires 4-6 milliamps to trip and therefore do not meet regulatory safety requirements for OR and patient care areas.

Wet Locations

Whenever an operating room is designated as a wet location, installing an isolation transformer like the ISO-PUCK rather than a ground fault circuit interrupter (GFCI) avoids interruption of power during surgery.

No Hazardous Ground Leakage Current with the ISO-PUCK

The ISO-PUCK provides a floating system (IT earthing system) for maximum protection against excessive ground leakage current. The secondary (output) neutral is not bonded to ground.

Decentralized Protection

Installing the ISO-PUCK provides decentralized protection where it is needed. Even Certified Medical Devices can cause harmful leakage (touch) current. Reasons may include degradation of components and power supplies due to aging or the use of defective power strips, power cords and spillage of fluids on electrical connections.

Power Strips (RPT's Relocatable Power Taps)

Our ISO-PUCK models are available with single or triple outlet receptacles or Medical Grade Power Strips with four or six outlets. The cord is permanently attached to the transformer housing.

Please note that although the Medical Grade Power Strip must meet higher safety standards than the common commercial type, it will not by itself reduce excessive and harmful leakage current. When the power strip is part of the ISO-PUCK assembly, the leakage current of products connected to its power strip will not be excessive and harmful to staff and patients.

NFPA 99 does not specify the safety standard to which a power strip (RPT) must be listed. There are two standards applicable to power strips in healthcare facilities. UL1363A for use in patient care areas and UL1363 for non patient care areas.

Unless otherwise instructed by our customer we will always provide our ISO-PUCK with a power strip listed to UL1363A.

Benefits to Medical Industry OEM's

- The ISO-PUCK is a quick and inexpensive solution to comply with current medical safety standards worldwide. Besides saving money when testing your medical device, using our ISO-PUCK may speed up market introduction of your medical device due to shorter time at the testing laboratory.
- The ISO-PUCK transformers are easily installed in racks and carts or inside medical devices or other equipment that must comply with medical safety standards in the US, Canada, Europe and the rest of the world.

Medical Safety Standard Certifications

Our ISO-PUCK series of enclosed, corded Hospital Grade Isolation Transformers are certified to applicable safety standards in the following markets;

- USA - ANSI/AAMI (formerly UL) ES80801-1
- CANADA - CSA std c22, No.801.1
- EUROPE - EN61558-2,
- International - IEC60801-1 Third Edition

As of June 1, 2013 the third edition is mandatory for all new installations of medical devices to be used in the healthcare industry in North America, Europe and countries requiring compliance with IEC60601-1.

INTERTEK
File No. 3051384

Our transformers carry CE Marking and comply with current RoHS requirements



THE 2012 EDITION OF NFPA 99 HIGHLIGHTS

The 2012 edition went through a major overhaul. NFPA 99 was changed to a "code" instead of a "standard" to reflect how the document is used and adopted. The premise of an occupancy-based document was modified to become a risk-based document. The risk to a patient does not change for a given procedure. If the procedure is performed in a doctor's office versus a hospital, the risk remains the same.

ELECTRICAL HAZARDS

The major reasons for electrical accidents in hospitals and healthcare facilities are faulty equipment and wiring. It is not the line voltage, but the leakage current between electrical line and the ground that generates electric shock. The intensity of the shock depends on how much current is transmitted through the person's body. The threshold of perception for an average built adult is 1 mA (milliampere) of current, which would generate a slight tingling feeling through the fingertips. See below for maximum allowed level of leakage current in electrical equipment plugged into an outlet in OR's and patient care rooms.

DEFINITIONS OF TERMINOLOGY (NFPA 99 2012 Edition)

Leakage Current (now also called Touch Current). The leakage current flowing from the enclosure or from parts thereof, excluding patient connections, accessible to any operator or patient in normal use, through an external path other than protective grounding (earth) conductor to earth or to another part of the enclosure. (Chapter 3.3.175)

Basic Patient Care Room. Room in which the failure of equipment or a system is not likely to cause injury to the patients or caregivers but can cause patient discomfort. (Chapter 3.3.138.1)

Critical Patient Care Room. Room in which failure of equipment or a system is likely to cause major injury or death to patients or caregivers. (Chapter 3.3.138.2)

General Patient Care Room. Room in which failure of equipment or a system is likely to cause minor injury to patients or caregivers. (Chapter 3.3.138.3)

Patient Care Vicinity is the space within a location intended for the examination and treatment of patients, extending 1.8 meter (6 feet) beyond the normal location of the bed, chair, table, treadmill, or other device that supports the patient during examination and treatment and extending vertically to 2.3 meter (7 feet, 6 inches) above the floor. (Chapter 3.3.139)

Leakage Current – Fixed Equipment

The leakage current flowing through the ground conductor of the power supply connection to ground of permanently wired appliances installed in general or critical care areas shall not exceed 100 uA (Microamps) AC or DC with all grounds lifted. (Chapter 10.3.5.1)

Leakage Current – Portable Equipment

Leakage Current also called Touch Current for cord connected equipment shall not exceed 100 uA (Microamps) with the ground wire intact (if ground wire provided) with normal polarity and shall not exceed 500 uA with the ground wire disconnected. (Chapter 10.3.4.2)

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If multiple devices are connected together and one power cord supplies power, the leakage current shall be measured as an assembly. (Chapter 10.3.5.2)

Where existing cord connected equipment exceeds 500 uA with the ground wire disconnected, methods to reduce leakage current such as the addition of small isolation transformer to that equipment is permissible. (Chapter 10.3.5.1)

IMPORT AND EXPORT MARKETS

The ISO-PUCK is a quick and inexpensive way to access international markets as it is available for 50Hz line frequency and 100V or 120V or 230/240V input and output voltages. The bare version of the transformers without enclosure is also available for OEM manufacturers.

SAFETY STANDARDS

ISO-PUCK series of medical grade enclosed isolation transformers are certified to IEC 60601-1, third edition and equivalent ANSI/AAMI (UL), EN and CSA safety standards.

NFPA is the acronym of National Fire Protection Association who has acted as sponsor of the National Electrical Code (NEC) since 1911. The code is purely advisory as far as NFPA is concerned.

BRIDGEPORT MAGNETICS

Tortran Division of Bridgeport Magnetics Group, Inc.
6 Waterview Drive, Shelton, CT 06484, USA
800-836-5920 • 203-954-0050 • Fax: 203-954-0051
www.iso-puck.com • www.bridgeportmagnetics.com

Distributor: