INSTALLATION AND OPERATING INSTRUCTIONS
OF THE INTERNATIONAL ISOBOX SERIES ISOLATION TRANSFORMERS.

Before installing and/or using this product, please check for any visual damage of the enclosure, power cord and plug. If any damage is observed, do not use this product. Contact Toroid Corporation or its authorized agent for instructions to return the product for repair or replacement.

The **ISOBOX** Series Isolation transformers are intended for applications where medical devices require improved electrical isolation and/or reduced leakage current to comply with existing safety standards. With the ISOBOX connected between the device and the wall outlet where the device is installed, the leakage current and the electrical isolation of the installed device will have the data of the ISOBOX. (See data on following pages).

DANGER: Risk for explosion exists if used in the presence of flammable anesthetics, or other flammable gases or liquids.

CAUTION: Grounding continuity should be checked periodically

CAUTION: To reduce the risk of electrical shock, do not open enclosure. There are no serviceable parts inside. Refer service to Toroid Corporation or its authorized agent only. Do not expose this equipment to rain or moisture.

WARNING: To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth

NOTE: **USA and Canada,** Grounding reliability can only be achieved when this equipment is connected to a matching receptacle marked "Hospital Only", or, "Hospital Grade".

CAUTION: This product requires convection cooling. Adequate ventilation is therefore required. When installing this product, a minimum clearance of 2" should be provided to all sides, except mounting surface.

WARNING: No modification of this equipment is allowed.

WARNING: To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth

CAUTION: Caution should be taken to use in life supporting equipment as this unit may shut down for safety reasons due to overload or short circuit, and render medical equipment without power.

CAUTION: An Auto reset thermal switch may open at an overload condition and will, without warning, turn power back on automatically when device cools down.

EXPLANATION OF GRAPHICS SYMBOLS

The exclamation point with an equilateral triangle is intended to alert the users to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

The open book with an " i " is intended to alert users of the importance to read the operating instructions prior to installation and use.

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TRANSPORT AND STORING CONDITIONS:
Temperature range; -30 Degr.C (-22F) to 70 Degr.C (158F).
Humidity; up to 95% RH (non-condensing).
Altitude Range; up to 15,300m (50,000ft)

OPERATING CONDITIONS:
Temperature range; -10Degr.C (14F) to 40 Degr.C (104F).
Humidity: up to 95% RH (non-condensing).
Altitude Range; Up to 4,600m (15,000ft)

CLEANING INSTRUCTIONS:
This is an electrical device. Do not clean this device with power on or the power cord attached to an outlet. Only use a dry rag or cloth.

PERIODIC MAINTENANCE AND INSPECTION.
No regular maintenance is required for this device though a regular inspection is recommended. Grounding continuity should be checked periodically by a qualified technician. Inspection should also consist of checking that plugs are engaged and not damaged. Any cords should not be damaged or knotted. Damage to the enclosure or any parts of the device should be evaluated by the manufacturer or qualified technician. Frequency of inspection and cleaning is dependent on location and type of use and should be determined by an engineer, the equipment maintenance department or personnel. Inspect the devices at a minimum of once per year.

MOUNTING INSTRUCTIONS:
The ISOBOX isolation transformer may be placed horizontally on any flat stable surface such as a floor or table top. For high traffic areas, carts and unstable surfaces, use of the mounting brackets for all mounting locations is recommended to ensure the stability of the ISOBOX. The ISOBOX may also be vertically mounted to a wall by removing the four rubber feet on the bottom of the enclosure and replacing the rubber feet with the two mounting brackets supplied. The same Phillips head screws should be used for this. For wall mounting, please use appropriate wall anchors unless fastened into wall stud(s) or other forms of enforcement available to support the weight of the enclosure. Appropriate air clearance for ventilation of ISOBOX is required (see CAUTION paragraph on previous page).

OPERATING INSTRUCTIONS:

The M series IsoBox offers flexibility with selectable input and output voltage. Therefore you must ensure correct input voltage and output voltage settings or you may put people in danger or create hazardous conditions and, you may severely damage equipment and parts connected to it.

This isolation transformer has eight (8) voltage combinations. To achieve the desired voltage in and out, please refer to this table;

Input voltage provided (VAC 50/60Hz)	Power entry module setting	Output desired (VAC)	Output voltage selector setting
100	100	115-125	115
115-120	120	115-125	115
220	220	115-125	115
230-240	240	115-125	115
100	100	230-240	230
115-120	120	230-240	230
220	220	230-240	230
230-240	240	230-240	230

Correct value must be used with the selected input voltage or danger, hazard or damage may occur as a result.

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Recommended initial installation procedure:

1. Adjust and verify IsoBox input voltage setting to intended and available supply.
2. Adjust and verify IsoBox output voltage setting to match attached equipment.
3. Verify correct fuse rating in power entry module. See page 4 for correct fuses for your IsoBox and settings.
4. Mount IsoBox per above recommendations, note required spacing and air clearance.
5. Verify power switch on the ISOBOX is in the OFF (0) position.
6. In Canada and USA, when connecting the ISOBOX to the wall outlet, plug only into a Hospital Grade Wall Outlet to ensure reliable grounding.
7. Connect ISOBOX to Wall outlet.
8. Verify equipment to be connected to the ISOBOX is turned OFF (0).
9. Connect the devices to the receptacles of the ISOBOX.
10. Turn ON (1) the power switch of the ISOBOX.
11. The devices connected to the ISOBOX are now ready to be turned ON (1) and operated**.**

Note detachable power cord requirements on next page.

The total power consumption equals the sum of all devices connected to the ISOBOX. The total power consumption must not exceed the maximum power rating of the ISOBOX, as shown on the product rating label or table below.

To reduce inrush currents, the M series employs a NTC thermistor. After turning off the IsoBox unit it is recommended to let the ISOBOX "cool down" for approximately 1 minute. There may otherwise be a risk of blowing a fuse in the power entry module or possibly tripping the wall outlet circuit breaker.

For power cord retention clip and clamp installation, please refer to separate instruction sheet.

ELECTROMAGNETIC COMPATIBILITY

This equipment has NOT been tested to comply with the limits for medical devices to the IEC 601-1-2:1994. The limits in this standard are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates, uses and can radiate radio frequency energy and, may cause harmful interference to other devices in the vicinity. There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device.
- Increase the separation between the equipment.
- Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected.
- Consult the manufacturer or field service technician for help.

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ISOBOX SPECIFICATIONS.

All ISOBOX models listed in this document are intended for 100 or 115-120 or 220 or 230-240 VAC and 50/60Hz input frequency. DO NOT USE OTHER VOLTAGES OR FREQUENCIES. See previous paragraph for voltage selector settings on the ISOBOX and Datasheets for mechanical data.

Model No.	Rated Input Current at 100/120/220/240 Vac – 50/60Hz	Output voltage (Vac, 50/60 Hz)	Max Output current (Amps)	Output Power * (VA)	Leakage current 132V Nom/1 fault **	Leakage current 264V Nom/1 fault **	Regul. %
ISB-030M	3.2/2.7/1.5/1.3A	115-120/230-240	2.50/1.25	300	30/60	60/115	6.8
ISB-060M	6.3/5.3/2.9/2.75A	115-120/230-240	5.00/2.50	600	35/65	65/125	5.0
ISB-100M	10.4/8.8/4.8/4.4A	115-120/230-240	8.33/4.17	1000	35/65	70/130	3.2

* Maximum total output power of the ISOBOX, whether one or more outlets are used. Rated at 120/240V.

** Nominal leakage current is measured at normal use and in no fault condition. 1 fault (single) leakage current is measured as Non-Patient connected, with reversed polarity and under single fault condition.

This is a Class 1 transformer.

MECHANICAL DATA:

See Individual Data Sheets.

POWER CORD REQUIREMENTS:

Input: All power cords must be appropriately approved by testing agency for the country where the ISOBOX is installed, such as UL/CSA/VDE/SEMKO/<HAR> etc. For the US and Canadian Market, a HOSPITAL GRADE Plug is required.

The cord must have one end suitable for the wall receptacle and the other end must be of appliance type, IEC-320 female plug. All power cords must have grounding contacts.

	Minimum wire Diameter	Length Recommended
ISB-030M	AWG 18 (0.75mm^2)	12 ft or less
ISB-060M	AWG 18 (0.75mm^2)	12 ft or less
ISB-100M	AWG 16 (1.00mm^2)	12 ft or less

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FUSE REQUIREMENTS:

These ISOBOX transformers have been tested, approved and deemed to be safe under certain conditions. The fuse in the power entry module is protecting the ISOBOX from overloads and short circuits. If the incorrect fuse is used, there may be danger to operator(s) or patient(s), or damage to equipment. Fuses must be UL and CSA approved and marked for North American use and VDE/EN approved and marked for European use. Use only SLOW BLOW type (T-type) fuse rated 250V.

IEC 60601.1 3rd edition requires Hi Breaking Capacity fuses), also known as Interrupting Current, (1500A) if the prospective short circuit current is 35A or 10x current rating of the fuse, whichever is higher.

UL 246 (for UL installations) requires breaking capacity 1.1-3.5A =100A, 3.6-10A =200A, 10.1-15 =750A

This table describes the recommended fuses (approved in Critical Component List), manufacturer and series description for each input setting;

ISB-030M

100V		**120V**		**220V and 240V**	
4.0AT	**Part No.**	**3.15AT**	**Part No.**	**1.6AT**	**Part No.**
Littelfuse	0215004.	Littelfuse	02153.15	Littlefuse	021501.6
Schurter (SPT)	0001.2510	Schurter (SPT)	0001.2509	Schurter (SPT)	0001.2506
Bussman	S505-4-R	Bussman	S505-3.15-R	Bussman	S505-1.6-R
		Littelfuse	02393.15P**	Littelfuse	021301.6*
				Littelfuse	021801.6*
				Littelfuse	023901.6*
				Schurter (FST)	0034.3119*

ISB-060M

100V		**120V**		**220V and 240V**	
8AT		**6.3AT**		**3.15AT**	
Littelfuse	0215008.	Littelfuse	021506.3	Littlefuse	02153.15
Schurter (SPT)	0001.2513	Schurter (SPT)	0001.2512	Schurter (SPT)	0001.2509
Bussman	S505-8-R	Bussman	S505-6.3-R	Bussman	S505-3.15-R
		Littelfuse	023906.3**		

ISB-100M

100V		**120V**		**220V and 240V**	
12.5AT		**10AT**		**5.0AT**	
Schurter (SPT)	0001.2515	Littelfuse	0215010.	Littlefuse	0215005.
		Schurter (SPT)	0001.2514	Schurter (SPT)	0001.2511
		Bussman	S505-10-R	Bussman	S505-5-R

*These are approved fuses for installation outside of North America as the projectable short circuit current is less than 35A

**This is a UL Listed product and is approved for use in USA only

DO NOT USE FUSES WITH HIGHER AMP RATING THAN THOSE LISTED ABOVE.

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TROUBLE SHOOTING:

DO NOT ATTEMPT TO REPAIR. WARRANTY WILL BE VOID IF UN-AUTHORIZED REPAIR WORK HAS BEEN CARRIED OUT.

No output power:
1. Verify that the ISOBOX is connected and that the power switch is ON (1).
2. Verify fuses in power entry module (disconnect ISOBOX from Power first)
3. Use another wall outlet.
4. Check wall outlet circuit breaker.
5. If you have any other problems with the ISOBOX, please call Toroid Corporation of Maryland, from US/CAN; 800-274-5793 other; 410-860-0300.

If you need to return the ISOBOX for any reason, call the factory for return instructions.

If you notice **any** Mechanical Damage: Call Toroid Corporation of Maryland for instructions.

LIMITED WARRANTY:

The ISOBOX series enclosed isolation transformers are backed by Toroid Corporation of Maryland's 36 month warranty. For complete information, please refer to the warranty card enclosed with this package.

SAFETY AGENCY LISTINGS:

The M series IsoBox' are compliant to both IEC60601-1 2nd edition and IEC60601-1 3rd edition. Listing by UL to UL60601-1 1st edition and CSA C22.2 No. 601.1.

Listee	Cert./Rep.No's/UL Category	Standards	Markings
CB Cert. No:	US/920/ITS	EN60601-1 (2nd ed)	-
CB Cert. No:	E482313-D1000-1/A0/C0-ULCB	IEC 60601-1 (3rd Ed, Am1)	-
CE mark	CE012 (self declared)	Low Voltage Directive	CE
UL List/Cert	E183813 KFCG	UL60601-1 (1st ed)	UL
	E183813 KFCG7	CSA C22.2 No. 601.1	cUL
UL Recogn.	E482313 QQMH2	ANSI/AAMI ES60601-1:2005/(R)2012	RU
	E482313 QQMH8	CSA CAN/CSA-C22.2 NO. 60601-1 (2008)	cRU

RECYCLING:
Much of this product can be recycled. Please do not dispose in general waste. Turn into a recycling center that is equipped to handle electrical equipment. This part is ROHS II compliant.

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