DISCONTINUED PRODUCT

Liebert®

POWER PROTECTION

Computer Isolation Transformer System

Installation, Operation & Maintenance Manual

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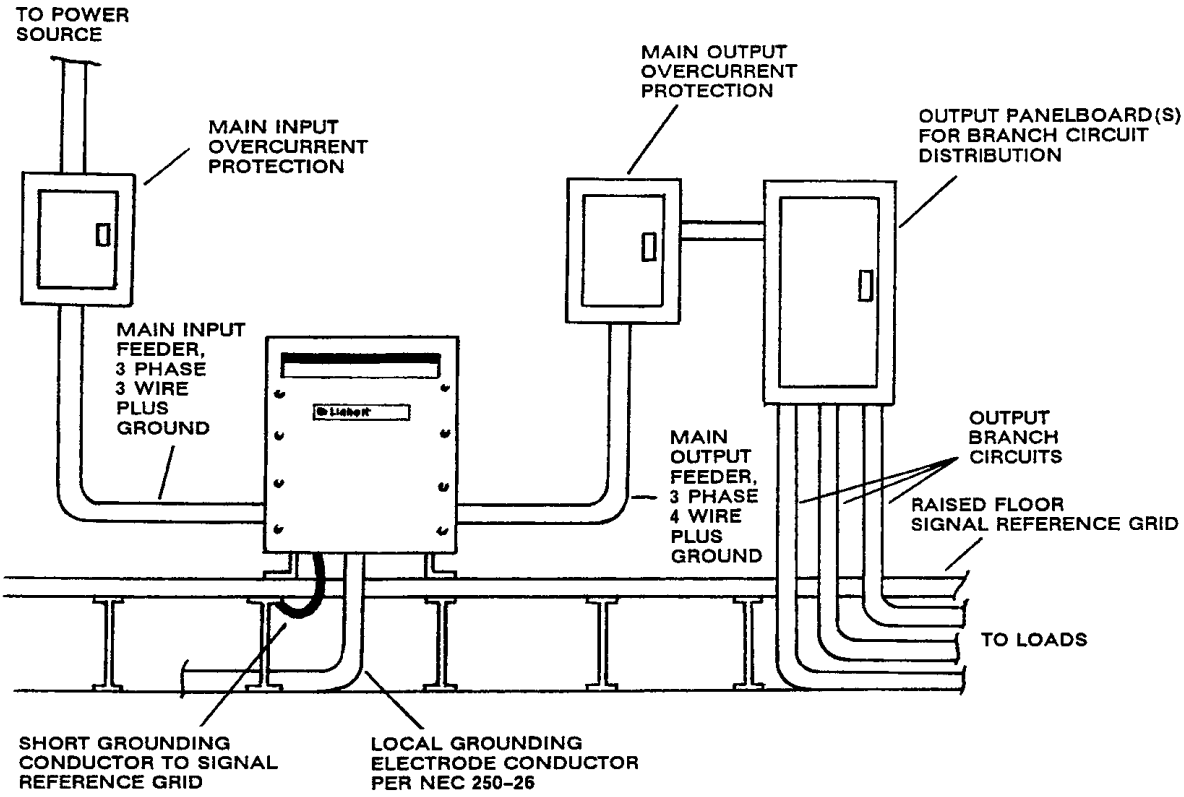
FIGURES

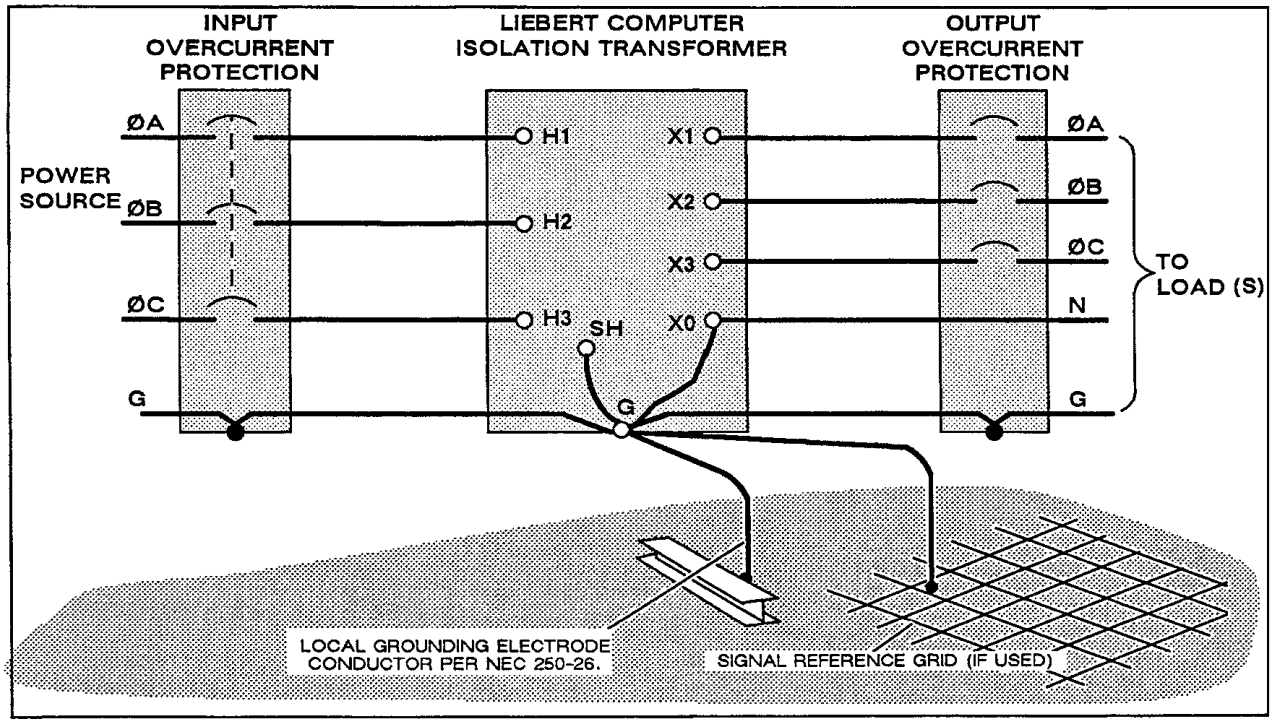
TABLES

1.0 INSTALLATION INSTRUCTIONS FOR THE LIEBERT ISOLATION TRANSFORMER

The Liebert Computer Isolation Transformer is a high quality, multiple electrostatically shielded, isolation transformer and spike suppression network designed for the protection of sensitive electronic systems from common and normal mode noise and transients. Proper installation is required for maximum system performance.

Figure 1 Typical Installation





The installer should perform the following steps to assure a quality installation. The entire installation manual should be read before starting installation. These instructions do not replace national or local electrical codes. Check applicable electrical codes to ensure compliance. Installation of the Liebert Computer Isolation Transformer should only be performed by qualified personnel.

1.1 Unpacking and Installation

1.1.1 Unpacking and Preliminary Inspection

A quality installation begins on the receiving dock.

1. **Inspect the shipping crate** for damage or signs of mishandling before unpacking the unit.
1. **Remove the securing bands** and cardboard packing and inspect the unit for any obvious shipping damages.
2. **If any damage as a result of shipping is observed,** immediately file a claim with the shipping agency and call Liebert Customer Service and Support at **1-800-543-2378.**

1.1.2 Handling Considerations

The transformer is bolted to the shipping pallet to facilitate handling by forklift or pallet jack. Check the size and weight. Refer to the cabinet data furnished with the unit. Typical size and weights are given in **Figure 2.**

CAUTION
The transformer has a high center of gravity and is top-heavy. Use caution when lifting or moving the unit.

The unit should be kept upright at all times. The unit can be handled by forklift after removal from the shipping pallet. Be sure forks extend completely under unit base before lifting.

1.1.3 Storage

The unit should be stored in a clean, dry environment. Storage temperature range is -55°C (-67°F) to +85°C (+185°F). Care should be taken to avoid condensation. All packing and shipping materials should be left intact until the unit is ready for final installation. If the unit has been stored for an extended period of time, the transformer should be cleaned and dried before placing into service. For further information, see ANSI/IEEE C57.94-1983 Recommended Practice for Installation, Application, Operation and Maintenance of Dry-Type General Purpose Distribution and Power Transformers.

1.1.4 Location Considerations

Environment - The unit is designed for operation indoors in ambient temperatures of 0°C (+32°F) to 40°C (+104°F) with a relative humidity of 0% to 95% (noncondensing). When considering room ambient temperature, be sure to include the heat output (BTU/Hr) of the transformer (see **Figure 2).**

The unit is provided in a NEMA 1 enclosure and should not be installed in areas with excessive dust, corrosive vapors, flammable or explosive materials. Unit location should comply with the National Electrical Code (NEC) 450-21.

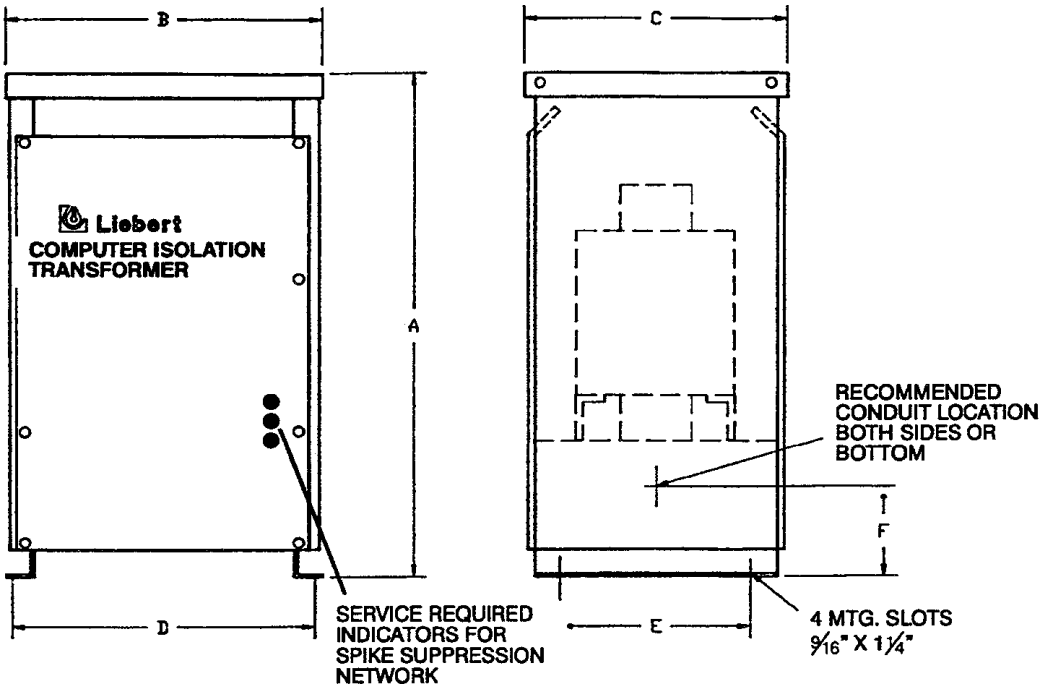
CAUTION
Do not store any materials on top of the enclosure. Proper heat dissipation is important for safe operation.

Audible Noise - The audible noise of the unit is less than 45 dBA at 5 feet which allows its placement within a computer room, if desired. Care should be taken in the installation to prevent unintentional noise amplification due to the location in a corner or the room acoustics.

Service and Ventilation Clearances - Service clearance is needed only at the front of the unit, 36 inches (914 mm) minimum is recommended. At least 12 inches (305 mm) of clearance is required at the rear of the unit for cooling air flow.

Equipment Performance - For maximum system performance, the computer isolation transformer should be located within the computer room and/or as close to the loads served as practical. Unit location should be chosen so that the output distribution wiring runs are as short as practical.

Figure 2 Typical Cabinet Data



kVA	Max. Heat Output		Transformer Type	Weight		Dimensions Inches (mm)					
	60 Hz BTU/hr	50 Hz kCal/hr		60 Hz lbs	50 Hz kg	A	B	C	D	E	F
15	2130	720	STD	290	150	36.5 (927)	24.75 (629)	18.75 (477)	21.75 (553)	13.5 (343)	6.5 (165)
			K-20	310	160						
20	2840	930	STD	320	165						
			K-20	340	175						
30	3740	1240	STD	370	190						
			K-20	390	200						
50	5450	1580	STD	500	255						
			K-20	650	330	48.5 (1232)	29.5 (750)	22.75 (578)	26.5 (673)	17.5 (445)	8.5 (216)
75	7750	2120	STD	835	425						
			K-20	875	445						
100	8800	2680	STD	950	485						
			K-20	1125	575						
125	10650	3280	STD	1075	550						
			K-20	1475	750						
150	10480	3650	STD	1185	605						
			K-20	1800	915	52.5 (1334)	37.0 (940)	26.75 (680)	34.0 (864)	21.5 (546)	8.5 (216)
200	12930	4825	STD	1565	795						
			K-20	2400	1220						
225	13720	5555	STD	1690	860						
300	19830	6615	STD	2030	1035						

2.0 INPUT AND OUTPUT WIRING

Input and output wiring should be installed by licensed electricians. All wiring must comply with the National Electrical Code (NEC) and applicable local codes. A typical installation is shown in **Figure 1.** See **Figure 2** for typical recommended conduit locations. Input and output wiring is recommended to be separated as far as possible to minimize the capacitive coupling of high frequency noise within the unit. Do not run Input and output wiring in the same raceway.

2.1 Input Power Connections

The input power feeder is connected to the input terminals (H1, H2, H3) located inside the unit.

WARNING
VERIFY THAT ALL POWER CIRCUITS ARE DE-ENERGIZED AND LOCKED OUT BEFORE INSTALLING CABLES OR MAKING CONNECTIONS.

To minimize disturbances caused by other loads in the building, the 3-phase power input to the unit should be supplied directly from the service entrance (a dedicated power feeder).

Verify that the supply voltage matches the unit's input voltage rating shown on the nameplate.

Full capacity voltage compensation taps are provided on each of the three primary (input) windings to allow matching the power source voltage within +5% and -10% of the nominal nameplate input voltage rating in 2-1/2% increments. **Table 1** shows the tap connections for the various input voltages. Be sure input power circuits are de-energized and locked off before changing tap settings. To select a different tap setting, move the jumper to the desired tap per **Table 1.** The same tap setting should be selected for all three phases.

The input feeder circuit should be sized in accordance with the NEC and any local building codes to assure the feeder's ability to safely carry the system's full load current, including losses.

Input overcurrent protection that meets the NEC or applicable local codes must be provided. Reference NEC 450-3(b).

Typical full load amps, overcurrent protection and conductor size data are shown in **Table 2.**

Input feeder conductors should be sized for no more than 2% voltage drop. If operation at undervoltage conditions for extended periods of time is desired, the input feeders must be oversized.

The input feeder should consist of three phase conductors and one (safety) ground conductor (3W + G).

Table 1 Transformer Input Voltage Tap Connections

Tap	%	For 208V Nominal	For 240V Nominal	For 380V Nominal	For 415V Nominal	For 480V Nominal	For 480V Nominal
4 - 5	+5.0%	218V	252V	399V	436V	504V	630V
4 - 6	+2.5%	213V	246V	390V	425V	492V	615V
3 - 5	Nominal	208V	240V	380V	415V	480V	600V
3 - 6	-2.5%	203V	234V	371V	405V	468V	585V
2 - 6	-5.0%	198V	228V	361V	394V	456V	570V
3 - 7	-7.5%	192V	222V	352V	384V	444V	555V
2 - 7	-10.0%	187V	216V	342V	374V	432V	540V

Table 2 Wire Sizing Data

Voltage	kVA	Input			Output		
		FLA	Suggested OPD (AMPS)	Suggested Wire (AWG)	FLA	Suggested OPD (AMPS)	Suggested Wire (AWG)
208V	15	44	60	6	42	60	6
	20	58	80	4	56	70	4
	30	87	110	2	83	110	2
	50	144	200	000	139	175	00
	75	215	300	350kcmil	208	300	350kcmil
	100	285	400	2-000*	277	350	2-00*
	125	356	450	2-0000*	347	450	2-0000*
	150	427	600	2-350kcmil*	416	600	2-350kcmil*
	200	572	800	3-300kcmil*	555	700	2-500kcmil*
	225	644	800	3-300kcmil*	625	800	3-300kcmil*
	300	858	1200	4-350kcmil*	833	1200	4-350kcmil*
240V	15	38	50	8			
	20	50	70	4			
	30	75	100	2			
	50	125	175	00			
	75	186	250	250kcmil			
	100	247	350	2-00*			
	125	309	400	2-000*			
	150	370	500	2-250kcmil*			
	200	496	700	2-500kcmil*			
	225	558	700	2-500kcmil*			
	300	722	1000	3-400kcmil*			
380V	15	24	30	10	23	30	10
	20	32	40	8	30	40	8
	30	48	60	6	46	60	6
	50	79	100	2	76	100	2
	75	118	150	0	114	150	0
	100	157	200	000	152	200	000
	125	196	250	250kcmil	190	250	250kcmil
	150	234	300	350kcmil	228	300	350kcmil
	200	312	400	2-000*	304	400	2-000*
	225	352	450	2-0000*	342	450	2-0000*
	300	469	600	2-350kcmil*	456	600	2-350kcmil*
415V	15	22	30	10	21	30	10
	20	29	40	8	28	40	8
	30	44	60	6	42	60	6
	50	72	90	2	70	90	2
	75	108	150	0	104	150	0
	100	143	200	000	139	175	00
	125	180	225	0000	174	225	0000
	150	216	300	350kcmil	209	300	350kcmil
	200	286	400	2-000*	278	350	2-00*
	225	322	450	2-0000*	313	400	2-000*
	300	429	600	2-350kcmil*	417	600	2-350kcmil*

FLA = Full Load Amps of Isolation Transformer.

OPD = Suggested Overcurrent Protection Device for Isolation Transformer by others in accordance with NEC 450-3(b).

Wire Sizes based on NEC Table 310-16, using 75°C copper conductor.

*Parallel feeders per NEC 300-20 and 310-4.

NOTES:

1. Input power feeder should be a dedicated feeder direct from service entrance if possible. Ground conductors recommended to be parity sized with power conductors for increased system performance. Ground conductor minimum size per NEC Table 250-95. Input power feeder conduit may be used as the safety ground conductor. When conduit is used, adequate electrical continuity must be maintained at conduit connections to enclosures and throughout conduit run.
2. Input feeder wire size listed in **Table 2** is the minimum feeder size recommended. Larger wire size may be required because of voltage drop or supply overcurrent protection device.
3. Output feeder wire size listed in **Table 2** is the minimum feeder size recommended. Larger wire size may be required because of overcurrent protection device, voltage drop, or excessive neutral current (see NEC Table 310-16 notes 8 and 10). For best performance, transformer should be located as close to the load as practical.

Table 2 Wire Sizing Data

Voltage	kVA	Input			Output		
		FLA	Suggested OPD (AMPS)	Suggested Wire (AWG)	FLA	Suggested OPD (AMPS)	Suggested Wire (AWG)
480V	15	19	25	10	18	25	10
	20	25	35	8	24	30	10
	30	38	50	8	36	45	8
	50	62	80	4	60	80	4
	75	93	125	1	90	125	1
	100	124	175	00	120	150	0
	125	154	200	000	150	200	000
	150	185	250	250kcmil	180	225	0000
	200	248	350	2-00*	241	300	350kcmil
	225	279	350	2-00*	271	350	2-00*
	300	372	500	2-250kcmil*	360	450	2-0000*
600V	15	15	20	12			
	20	20	30	10			
	30	30	40	8			
	50	50	70	4			
	75	75	100	2			
	100	99	125	1			
	125	124	175	00			
	150	148	200	000			
	200	198	250	250kcmil			
	225	223	300	350kcmil			
	300	297	400	2-000*			

FLA = Full Load Amps of Isolation Transformer.

OPD = Suggested Overcurrent Protection Device for Isolation Transformer by others in accordance with NEC 450-3(b).

Wire Sizes based on NEC Table 310-16, using 75°C copper conductor.

*Parallel feeders per NEC 300-20 and 310-4.

NOTES:

1. Input power feeder should be a dedicated feeder direct from service entrance if possible. Ground conductors recommended to be parity sized with power conductors for increased system performance. Ground conductor minimum size per NEC Table 250-95. Input power feeder conduit may be used as the safety ground conductor. When conduit is used, adequate electrical continuity must be maintained at conduit connections to enclosures and throughout conduit run.
2. Input feeder wire size listed in **Table 2** is the minimum feeder size recommended. Larger wire size may be required because of voltage drop or supply overcurrent protection device.
3. Output feeder wire size listed in **Table 2** is the minimum feeder size recommended. Larger wire size may be required because of overcurrent protection device, voltage drop, or excessive neutral current (see NEC Table 310-16 notes 8 and 10). For best performance, transformer should be located as close to the load as practical.

2.2 Output Power Connections

The Output Power Feeder is connected to the output terminals (X0, X1, X2, X3) located inside the unit.

WARNING
VERIFY THAT INCOMING POWER CIRCUITS ARE DE-ENERGIZED AND LOCKED-OUT BEFORE INSTALLING CABLES OR MAKING CONNECTIONS IN THE UNIT.

Code compliance - All output wiring must comply with the NEC and all other applicable codes.

Main output overcurrent protection and/or panelboards with ground and neutral provisions are recommended for connecting load(s) as required. (See **Figure 1.)**

The output wiring should be sized per the NEC or applicable local codes to ensure the wining's ability to safely handle the load current. Typical full load amps, overcurrent protection and conductor-size data are shown in **Table 2.** However, larger wire size may be required because of voltage drop or excessive harmonic neutral currents. (See the NEC, Table 310-16, notes 8 and 10.) For best performance, the unit should be located as close to the loads as practical. Individual branch circuits are recommended for each load to minimize disturbances caused by other loads.

Output distribution cables for use in data processing areas under a raised floor should be well-planned:

- **Cable access** - Cable routes should follow aisles between equipment. This will facilitate access to cables for installation, routine inspection, and future changes.
- **Cable length** - Measure the distance to the load equipment following right-angle paths, rather than diagonally or directly. Always measure to the extreme far side of the equipment to ensure adequate cable length.
- **Air circulation** - Prevent restriction of airflow under the raised floor by running the conduits flat on the sub-floor, in parallel paths.

Initial system output loading should be between 50% and 75% of rated capacity. This allows the addition of future loads without immediately investing in another power conditioner. The high partial-load efficiency of the unit permits such sizing without imposing an energy-use penalty during initial operation.

For additional information on calculating the required system capacity, see Liebert Powerline PLT-09, Power Calculations (System Sizing).

Keep the load balanced. Balancing of loads is good design practice on any 3-phase system. All additions to the system should be arranged so as to preserve this balance.

2.3 System Grounding

The performance and safety of any power conditioning system depends on proper grounding. **Figure 1** shows a typical grounding arrangement for the Liebert Computer Isolation Transformer.

Equipment grounding - Grounding is primarily for safety. Correct implementation of grounding also enhances equipment performance. All power feeders must include equipment grounding means as required by the NEC and local codes.

An insulated ground conductor is recommended to be run in each feeder conduit. Although ground conductors can be the minimum size per NEC Table 250-95, they are recommended to be parity-sized with power conductors for increased system performance.

If the power feeder conduit is used as a grounding conductor, adequate electrical continuity must be maintained at all conduit connections.

Using isolating bushings in a metal conduit run is a potential safety hazard and is not recommended.

Signal reference grid - If the unit is used to supply power to a computer room or area which is equipped with a signal reference grid or a grounded raised-floor stringer system, a grounding conductor should be connected from the unit's ground bus to the grid or floor system. This conductor should be stranded or braided #8 AWG or larger, and as short as practical. Less than 3 feet (1 meter) is recommended.

2.4 Grounding Electrode Conductor

Required by code - The Isolation transformer is considered to be a "separately derived system." Therefore, according to the safety practices of NEC 250-26, a local grounding electrode conductor is required in addition to the equipment safety ground which is normally run with the power conductors.

Unit connection - A grounding terminal is furnished inside the unit for field-connection of the grounding electrode conductor.

Electrode connection - As shown in **Figure 1,** the grounding electrode conductor is required to be run from the unit to the nearest effectively grounded (in order of preference):

1. Building steel,
2. Metal water pipe, or
3. Other made grounding electrode.

Sizing of the grounding electrode conductor is based on the secondary circuit conductors according to the NEC Table 250-94. Typical minimum grounding electrode conductor sizes are shown in **Table 3.**

Recommended methods for running the grounding electrode conductor (arranged in order of preference for system performance; as acceptable by local and other applicable codes):

1. Outside of conduit (where not susceptible to damage).
2. Inside nonmetallic conduit.
3. Inside nonferrous conduit.
4. Inside ferrous conduit, bonded to the ferrous conduit at both ends, as acceptable by local and other applicable codes.

Table 3 Minimum Suggested Grounding Electrode Conductor Sizes (AWG)

kVA	Output Voltage		
	208V	380V, 415V	480V
15	8	8	8
20	8	8	8
30	8	8	8
50	4	8	8
75	2	6	6
100	2	4	6
125	2	2	4
150	0	2	2
200	00	2	2
225	00	0	0
300	000	00	0

Sizes based on NEC Table 250-94 using copper conductors and the suggested minimum output conductor sizes shown in **Table 1.**

3.0 INSPECTION AND START-UP CHECKLIST FOR THE LIEBERT COMPUTER ISOLATION TRANSFORMER

Unit Serial Number: _____

Unit Model Number: _____

Date: _____

A detailed internal inspection should be performed after the unit is in place and before it is energized, to ensure trouble free startup. The same internal inspection should be carried out when performing preventive maintenance.

Initial system start-up - A qualified electrician should be employed to perform the equipment inspection and start-up. Liebert system startup may be arranged by calling your local Liebert sales representative, or Liebert Customer Service and Support at **1-800-543-2378** (inside the United States).

WARNING
EQUIPMENT INSPECTION AND START-UP SHOULD BE PERFORMED ONLY BY TRAINED PERSONNEL.

HAZARDOUS VOLTAGES ARE PRESENT DURING START-UP PROCEDURES.

ELECTRICAL SAFETY PRECAUTIONS MUST BE FOLLOWED THROUGHOUT INSPECTION AND START-UP.

3.1 Inspection

WARNING
ALL EQUIPMENT INSPECTION PROCEDURES ARE TO BE PERFORMED WITH POWER TO THE UNIT TURNED OFF AND LOCKED OUT.

3.1.1 Exterior Inspection

___ 1. Confirm that the exterior of unit is undamaged (including cables and receptacles, if furnished).

___ 2. Confirm that service and ventilation clearances are adequate.

3.1.2 Interior Inspection

___ 3. Remove front panel.

___ 4. Inspect all wire and conductor insulation for damage.

___ 5. Inspect all wiring connections to the spike suppression network. Re-secure the connections if necessary.

___ 6. Check all transformer terminal connections for tightness. Retorque if necessary.

___ 7. Check transformer mounting bolts for tightness. Retorque if necessary.

___ 8. Remove any foreign objects from the interior area of the unit. **Make sure air passages on transformers are dear and free of debris!!**

___ 9. Check that the intake and exhaust air openings are clean and free of obstructions.

___ 10. Verify proper input and output power connections to unit, including equipment grounding conductor and local grounding electrode conductor.

3.2 Start-Up

WARNING
START-UP PROCEDURES SHOULD BE PERFORMED ONLY BY QUALIFIED PERSONNEL HAZARDOUS VOLTAGES ARE PRESENT IN THE EQUIPMENT THROUGHOUT THE MAJORITY OF THE START-UP PROCEDURE. PROCEED WITH CAUTION.

CAUTION
All loads should be disconnected or turned off before proceeding with the following steps.

___ 11. Turn ON the building power to the unit.

___ 12. Check the phase rotation at Terminals H1, H2, H3. Phase rotation should be A, B, C, left-to-right.

___ 13. Check and record the input voltages at Terminals H1, H2, H3. Measured voltages should correspond to the unit's nameplate input voltage.

Volts, phase A to phase B = _____
Volts, phase B to phase C = _____
Volts, phase C to phase A = _____

NOTE
*The input voltages measured in **Step 13** should not differ significantly from the nameplate input voltage rating. If there is more than a 3% difference, turn off and lock—out building power to the unit and select proper input voltage tap setting (see **2.1 - Input Power Connections** for voltage compensation tap information).*

Verify and record proper tap setting: _____

___ 14. Check the phase rotation at the output terminals X1, X2, X3. The rotation should be A, B, C, left-to-right.

___ 15. Check and record the voltages at the output terminals X0, X1, X2, X3.

Volts, phase A to phase B = _____
Volts, phase B to phase C = _____
Volts, phase C to phase A = _____
Volts, phase A to neutral = _____
Volts, phase B to neutral = _____
Volts, phase C to neutral = _____

NOTE
*The output voltages measured in **Step 15** should not differ significantly from the nameplate output voltage rating. If there is more than a 3% difference, repeat **Steps 13** to **15,** then contact Liebert Customer Service and Support or the local factory representative for assistance.*

___ 16. Check that the spike suppression service required indicators on the front panel are not illuminated. If illuminated, refer to **4.0 - Maintenance** for corrective action.

___ 17. Turn OFF building power. Replace front panel.

3.3 Equipment Connection Check Out

___ 18. Turn ON building power to unit. Turn ON main output breaker.

___ 19. Individually turn on each branch circuit breaker and check the output voltage (also phase rotation, if a 3-phase circuit) at the receptacle or cable end.

___ 20. Turn OFF all branch circuit breakers and the main output circuit breaker (if used).

___ 21. Connect the load equipment per equipment manufacturer's specifications and recommendations.

___ 22. Turn on the main output breaker(s) (if used). Turn on branch circuit breakers to the load equipment. **Observe the power-up sequence recommended by the equipment manufacturer.**

___ 23. Measure output voltage and total load currents. If required, use the voltage compensation taps to correct voltage levels (see **2.1 - Input Power Connections).** Make sure load currents (including neutral current for standard transformers) are less than unit's rated full load output current (see **Table 2).**

Output Currents:

Phase A _____

Phase B _____

Phase C _____

Neutral _____

___ 24. Verify that all load equipment operates properly.

4.0 MAINTENANCE

4.1 Corrective Maintenance (Repair)

Even the most reliable equipment may fail. Liebert Customer Service and Support (CS&S) is at your service to assure fast repair of your Computer Isolation Transformer and minimum down-time of your installation

WARNING
ONLY QUALIFIED PERSONNEL SHOULD PERFORM MAINTENANCE ON THE SYSTEM.

Standard electrical troubleshooting procedures should be used to isolate problems with the Isolation ration Transformer system. If there are questions don't hesitate to contact your local Liebert sales representative or Liebert CS&S.

To contact Liebert CS&S for information or repair service, call **1-800-543-2378** (inside the United States).

When a Spike Suppression Service Required indicator on the front panel is illuminated, at the earliest convenient service opportunity, the spike suppression assembly should be replaced and the filter capacitors should be inspected for damage and replaced, if required. Be sure all power to the transformer is turned off and locked out before servicing.

Table 4 Typical Spike Suppression Replacement Parts

	Output Voltage (Phase-to-Phase)			
	208V	380V	415V	480V
MOV Assembly	115193 - 05	115193 - 06	115193 - 07	115193 - 08
Output Filter Capacitor Assy.	115192 - 01	115192 - 02	115192 - 02	115192 - 02

	Input Voltage (Phase-to-Phase)		
	208, 240V	380, 415, 480V	600V
Input Filter Capacitor Assy.	115194 - 01	1151934 - 02	115194 - 03

4.2 Preventive Maintenance (Inspection & Cleaning)

Air circulation through the cabinet may cause duet to accumulate on internal components. Cleaning should be done as necessary during electrical inspections.

Annual general system inspections, cleaning, and connection checks are recommended to ensure system performance and long service life.

WARNING
ONLY QUALIFIED PERSONNEL SHOULD PERFORM MAINTENANCE ON THE SYSTEM. ALL VOLTAGE SOURCES TO THE UNIT MUST BE DISCONNECTED BEFORE INSPECTING OR CLEANING WITHIN THE CABINET.

Inspection Schedule - It is difficult to establish a schedule for periodic inspections since conditions vary from site to site. Inspections after the first 24 hours, 30 days, and 6 months of operation should help determine a pattern for the inspection schedule. Inspections should be conducted at least annually thereafter.

At Each Periodic Inspection:

- Electrical connections and component mountings should be inspected for tightness.
- Ventilation openings and grilles should be inspected and cleaned.
- Verify that the spike suppression service required indicators are not illuminated and that there is no damage to the spike suppression components.
- Input voltage, output voltage, and load currents should be measured and compared to nameplate ratings. Use voltage compensation taps (see **2.1 - Input Power Connections** for tap changing information) to correct voltage levels. Make sure load currents (including neutral current for standard transformers) are less than rated full load current (see unit nameplate or wire sizing data for full load amps).
- Liebert Customer Service and Support offers a complete range of preventive maintenance services. Contact Liebert Customer Service and Support for details, call **1-800-543-2378** (inside the United States).

Computer Isolation Transformer System

Technical Support

U.S.A.	1-800-222-5877
Outside the U.S.A.	614-841-6755
U.K.	+44 (0) 1793 553355
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Netherlands	+00 31 475 503333
E-mail	upstech@liebert.com
Web site	http://www.liebert.com
Worldwide FAX tech support	614-841-5471

The Company Behind The Products

With more than 500,000 installations around the globe, Liebert is the world leader in computer protection systems. Since its founding in 1965, Liebert has developed a complete range of support and protection systems for sensitive electronics:

- Environmental systems: close-control air conditioning from 1.5 to 60 tons.
- Power conditioning and UPS with power ranges from 250 VA to more than 1000 kVA.
- Integrated systems that provide both environmental and power protection in a single, flexible package.
- Monitoring and control — on-site or remote — from systems of any size or location

Service and support, through more than 100 service centers around the world, and a 24-hour Customer Response Center.

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