

LIEBERT ACTIVE TRACKING[®] FILTER SYSTEM INSTALLATION, OPERATION AND MAINTENANCE MANUAL

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INSTALLATION INSTRUCTIONS FOR THE LIEBERT ACTIVE TRACKING[®] FILTER SYSTEM

The Liebert Active Tracking[®] Filter System is a series connected, high quality, high-energy surge current diversion system designed to protect sensitive equipment from disruptive low-energy noise and damaging high-energy voltage transients. Proper installation is required for maximum system performance.

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 Active Tracking Filter System should only be performed by qualified personnel.

UNPACKING AND INSTALLATION

Unpacking and Preliminary Inspection

1. Inspect the shipping crate(s) for damage or signs of mishandling before unpacking the unit.
2. Remove any securing bands and cardboard packing and inspect the unit for any obvious shipping damages.
3. If any damage as a result of shipping is observed, immediately file a claim with the shipping agency and forward a copy to your local Liebert Sales Representative.

Handling Considerations

Larger units are bolted to a 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 referred to in Figure 1.

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 unit should be cleaned and carefully inspected before placing into service.

Location Considerations

Environment – The unit is designed for operation indoors in ambient temperatures of -40°C (-40°F) to +60°C (+140°F) with a relative humidity of 0% to 95% (non-condensing).

The unit is provided in a NEMA 12 industrial use enclosure, which is dust-tight and drip-tight and should not be installed in areas with excessive dust, corrosive vapors, flammable materials or explosive atmospheres.

Audible Noise – The audible noise of the unit is less than 40 dBA at 5 feet, which allows its placement within almost any room if desired.

Service Clearances – Service clearance is needed only at the front of the unit, thirty-six inches (36 in / 914 mm) minimum is recommended.

EQUIPMENT PERFORMANCE!!

For maximum system performance, the unit must be located as close to the protected circuit as practical to minimize interconnecting wiring length.

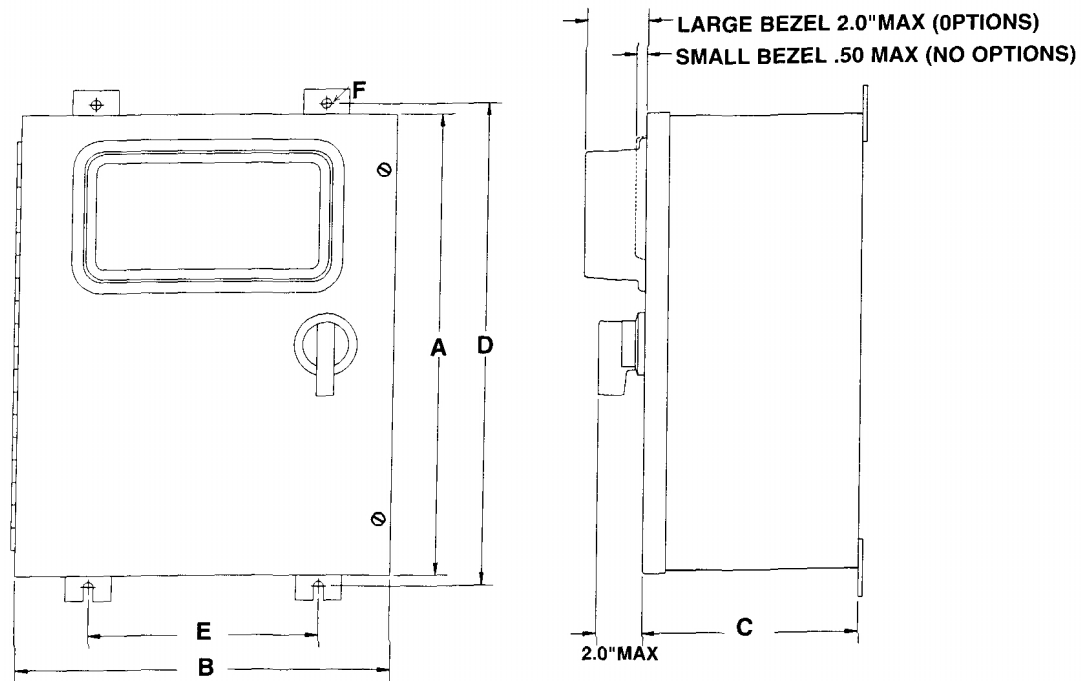
For optimum transient surge protection, coordinated surge suppression should be applied at the service entrance and all other electrical connections to the building (telephone, CATV, etc.), at known surge generating loads within the building (large motors, arc welders, switched capacitors, etc.), as well as at sensitive electronic loads (such as computers, electronic appliances, solid state motor drives, etc.). For interconnected electronic loads (such as by way of data cabling), transient surge suppression should also be applied to the interconnecting wiring (data cables).

Mounting – Units up to 400 amps are intended to be wall mounted. Larger units are intended to be floor mounted. Units may be furnished without enclosure to be incorporated into custom switchgear. Refer to Figures 1 and 2 or unity submittal drawings for typical mounting dimensions and weight.

Door Closing Adjustments

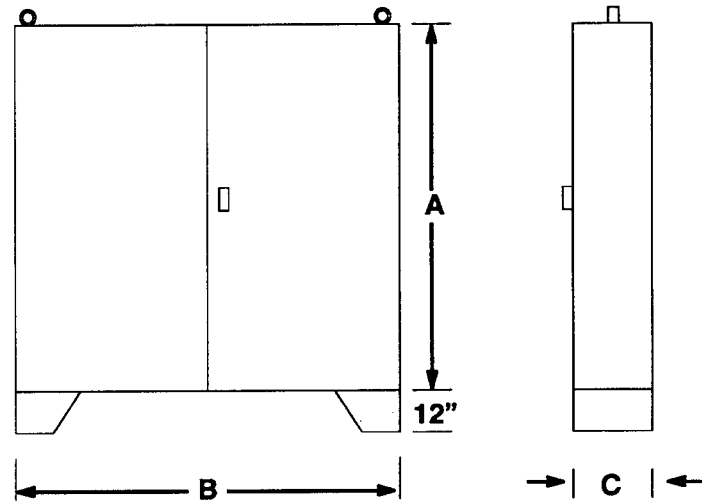
Single Door (Wall Mounted) – If the surface on which the enclosure is mounted is not flat, the door may not open and close properly. Also, if heavy equipment is mounted on a large door, the door may sag slightly. If the top of the door strikes the lip which extends around the body opening, place metal shims behind the mounting foot which is located at the bottom of the enclosure and closest to the door hinge. Place the shims between the mounting foot and the wall or mounting surface. Be sure all mounting screws are tightened securely.

Two-Door (Floor Mounted) – The overlapping doors are factory fitted to meet evenly at the top and bottom. If the floor under the enclosure is not level, the doors will not close evenly. In this case, place metal shims under the corners of the enclosure. The enclosure should be bolted in place with the doors closed to prevent tipping when installing shims. Shims under the right front corner will raise the right door. Shims under the left front corner will raise the left door. It is important that the doors meet evenly to insure a proper seal against liquids and dust. Be sure all mounting bolts are tightened securely.



Current Rating	Model XXX = VOLTAGE	Application	Dimensions (Inches)						Weight	
			A	B	C	D	E	F	Lbs	Kg
30A	FxxxN/L30	Single Phase	24.0	20.0	9.0	21.25	10.0	.44	35	15.9
	FxxxS300	Split Phase	24.0	20.0	9.0	25.25	14.0	.44	45	20.4
	FxxxD30	Three Phase Delta	24.0	20.0	9.0	25.25	14.0	.44	50	22.7
	FxxxY30	Three Phase Wye	24.0	20.0	9.0	25.25	14.0	.44	60	27.2
60 A	FxxxN/L60	Single Phase	24.0	20.0	9.0	21.25	10.0	.44	35	15.9
	FxxxS60	Split Phase	24.0	20.0	9.0	25.25	14.0	.44	45	20.4
	FxxxD60	Three Phase Delta	24.0	20.0	9.0	25.25	14.0	.44	50	22.7
	FxxxY60	Three Phase Wye	24.0	20.0	9.0	25.25	14.0	.44	60	27.2
100A	FxxxN/L100	Single Phase	30.0	24.0	9.0	25.25	14.0	.44	60	27.2
	FxxxS100	Split Phase	30.0	24.0	9.0	31.25	18.0	.44	70	31.8
	FxxxD100	Three Phase Delta	30.0	24.0	9.0	31.25	18.0	.44	70	31.8
	FxxxY100	Three Phase Wye	30.0	24.0	9.0	31.25	18.0	.44	80	36.3
225A	FxxxN/L225	Single Phase L - N	30.0	24.0	9.0	25.25	14.0	.44	60	27.2
	FxxxS225	Split Phase	30.0	24.0	9.0	31.25	18.0	.44	70	31.8
	FxxxD225	Three Phase Delta	30.0	24.0	9.0	31.25	18.0	.44	70	31.8
	FxxxY225	Three Phase Wye	30.0	24.0	9.0	31.25	18.0	.44	80	36.3
400A	FxxxD400	Three Phase Delta	48.0	36.0	12.0	49.25	30.0	.44	275	125
	FxxxY400	Three Phase Wye	48.0	36.0	12.0	49.25	30.0	.44	300	136

Figure 1. Typical Cabinet Data (30 to 400Amps)



CURRENT RATING	MODEL (xxx = Voltage Code)	APPLICATION	DIMENSIONS			WEIGHT	
			A	B	C	Lbs	Kg
800 A	FxxxD800	Three Phase Delta	60.0	48.0	12.0	500	227
	FxxxY800	Three Phase Wye	60.0	48.0	12.0	530	241
1200 A	FxxxD1200	Three Phase Delta	60.0	48.0	20.0	700	318
	FxxxY1200	Three Phase Wye	60.0	48.0	20.0	750	340
2000 A	FxxxD2000	Three Phase Delta	60.0	48.0	20.0	875	397
	FxxxY2000	Three Phase Wye	60.0	48.0	20.0	950	431
4000 A	FxxxD4000	Three Phase Delta	60.0	48.0	20.0	1175	533
	FxxxY4000	Three Phase Wye	60.0	48.0	20.0	1300	590

NOTE: Consult factory for special instructions on caseless and switchgear models.

Figure 2. Typical Cabinet Data (800 to 4000 amps)

ELECTRICAL CONNECTIONS

All electrical connections should be installed by a qualified (licensed) electrician only. All wiring must comply with the National Electrical Code (NEC) and applicable local codes.



VERIFY THAT ALL POWER CIRCUITS ARE DE-ENERGIZED AND LOCKED OUT BEFORE MAKING ELECTRICAL CONNECTIONS.

The Liebert Active Tracking Filter System is wired in-line (in series) with the protected load(s). See Figures 3a and 3b.

Ampacity

The filter's maximum continuous current rating must be greater than or equal to the protected load's full load amps or overcurrent protection rating.

Terminals are provided inside the Liebert Active Tracking Filter System for the line (phase), neutral (if used), transient ground, and equipment safety ground connections. See Table 1 for terminal wire size ranges.

For best performance, keep input and output wiring separated as much as practical to eliminate input-to-output coupling of noise and transients. Do not route input and output wiring in the same raceway. If practical, terminate input and output raceways (conduits) at opposite ends of the active tracking filter enclosure (input near the top and output near the bottom).

Short Circuit Rating

Units up to 225 amps are suitable for available symmetrical short circuit currents up to 25,000 amps. For short circuit currents up to 50,000 amps, Class RK5 fuses sized up to 125% of the filter's continuous current rating are required.

Units rated at 400 to 800 amps are suitable for available symmetrical short circuit currents up to 50,000 amps. For short circuit currents up to 100,000 amps, Class L Fuses sized up to 125% of the filter's continuous current rating are required.

Units 1200 amps and above are suitable for available symmetrical short circuit currents up to 200,000 amps.

Voltage Rating



BEFORE MAKING CONNECTIONS TO THE UNIT, VERIFY THAT THE UNITY MODEL NUMBER AND NAMEPLATE VOLTAGE RATING ARE APPROPRIATE FOR CONNECTION TO THE INTENDED POWER SOURCE (SEE FIGURE 4). IF POWER SOURCE IS DIFFERENT THAN SHOWN, CALL 1-800-288-6169 BEFORE INSTALLING UNIT.

FAILURE TO OPERATE THE UNIT FROM A SOLIDLY – GROUNDED POWER SOURCE OF THE PROPER VOLTAGE LEVEL AND CONFIGURATION MAY RESULT IN UNIT FAILURE. IF MULTIPLE POWER SOURCES ARE USED (SUCH AS WITH UPS OR ENGINE GENERATORS), VERIFY THAT ALL SOURCES ARE SOLIDLY GROUNDED AND OF THE PROPER VOLTAGE LEVEL AND CONFIGURATION.

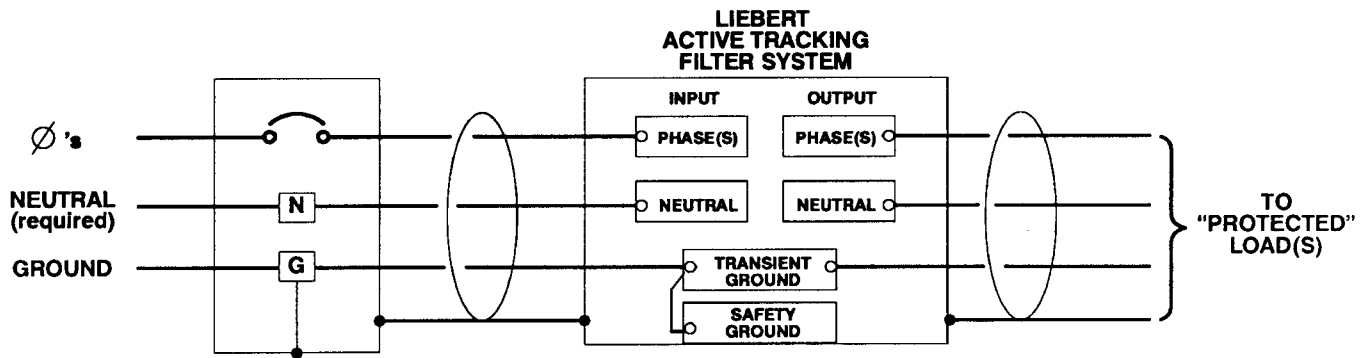


Figure 3a. Typical Active Tracking Filter Connections for Wye (4 Wire + Ground) or Split Single Phase (3 Wire + Ground) System

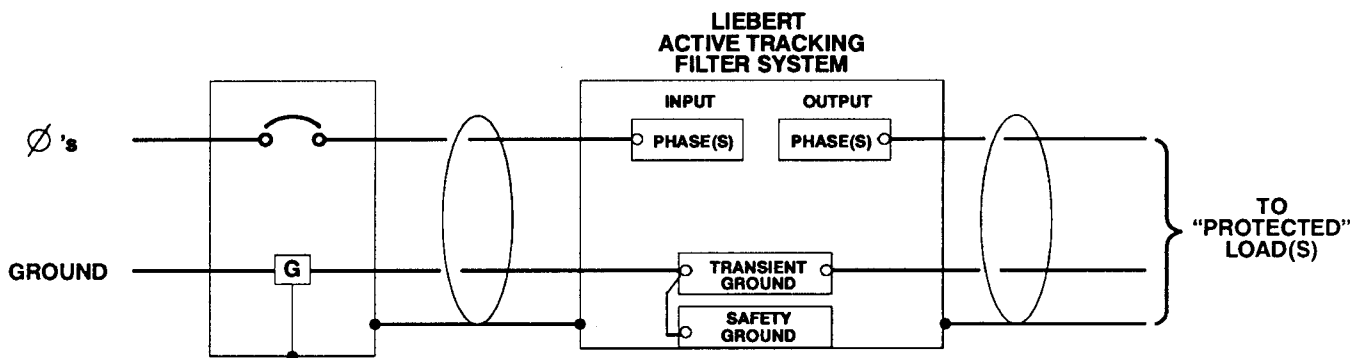
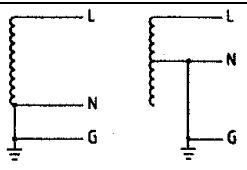
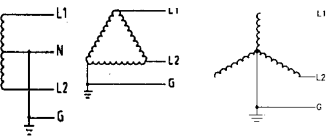
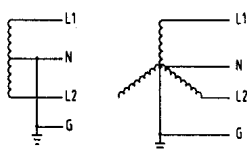
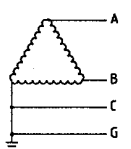

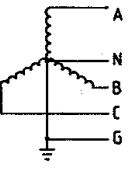
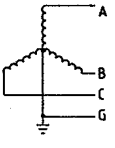


Figure 3b. Typical Active Tracking Filter Connections for Delta (3 Wire + Ground) System

SOURCE CONFIGURATIONS	NOMINAL OPERATING VOLTAGE			MODEL VOLTAGE CODE	REPLACEABLE MODULE P/N			
	L-N	L-L	L-G		L-N	L-L	L-G	N-G
 <p>Single Phase L-N, 2 W + G</p>	100	N/A	100	100N	M100130LN	N/A	M100130LG	M100130LG
	110	N/A	110	110N	M110130LN	N/A	M110130LG	M110130LG
	120	N/A	120	120N	M120150LN	N/A	M120150LG	M120150LG
	230	N/A	230	230N	M230275LN	N/A	M230275LG	M230275LG
	277	N/A	277	277N	M277320LN	N/A	M277320LG	M277320LG
	346	N/A	346	346N	M346420LN	N/A	M346420LG	M346420LG
 <p>Single Phase L-L, 2 W + G</p>	N/A	208	208	208L	N/A	M208130LN	M208250LG	N/A
	N/A	240	240	240L	N/A	M240150LN	M240275LG	N/A
	N/A	400	400	400L	N/A	M400275LN	M400575LG	N/A
	N/A	380	480	480L	N/A	M480275LN	M480575LG	N/A
	N/A	600	600	600L	N/A	M600420LN	M600680LG	N/A
 <p>Split Single Phase, 3 W + G</p>	100	173	100	100S	M100130LN	N/A	M100130LG	M100130LG
	110	190	110	110S	M110130LN	N/A	M110130LG	M110130LG
	120	208	120	120S	M120150LN	N/A	M120150LG	M120150LG
	230	400	230	230S	M230275LN	N/A	M230275LG	M230275LG
	277	480	277	277S	M277320LN	N/A	M277320LG	M277320LG
	346	600	346	346S	M346420LN	N/A	M346420LG	M346420LG
 <p>Three Phase Delta, 3 W + G</p>	N/A	208	208	208D	N/A	M208150LN	M208250LG	N/A
	N/A	240	240	240D	N/A	M240150LN	M240275LG	N/A
	N/A	400	400	400D	N/A	M400275LN	M400575LG	N/A
	N/A	480	480	480D	N/A	M480275LN	M480575LG	N/A
	N/A	600	600	600D	N/A	M600420LN	M600680LG	N/A
 <p>Three Phase Delta Hi Leg, 4 W + G</p>	120	240	120	240H	M120150LN	N/A	M120150LG	M120150LG
	208	240	208	240H	M208250LN	N/A	M208250LG	M120150LG
 <p>Three Phase Wye 4 W + G</p>	100	173	100	100Y	M110130LN	N/A	M100130LG	M100130LG
	110	190	110	110Y	M100130LN	N/A	M110130LG	M110130LG
	120	208	120	120Y	M120150LN	N/A	M120150LG	M120150LG
	230	400	230	230Y	M230275LN	N/A	M230275LG	M230275LG
	277	480	277	277Y	M277320LN	N/A	M277320LG	M277320LG
	346	600	346	346Y	M346420LN	N/A	M346420LG	M346420LG
 <p>Three Phase Wye, 3 W + G</p>	N/A	208	120	120Y	N/A	M208150LN	M208150LG	N/A
	N/A	400	230	230Y	N/A	M400275LN	M400275LG	N/A
	N/A	480	277	277Y	N/A	M480275LN	M480275LG	N/A
	N/A	600	346	346Y	N/A	M600420LN	M600420LG	N/A

Note: For other voltages or source configurations, consult factory.

Figure 4 . Voltage Codes and Power Source Configurations

TABLE 1
TERMINAL WIRE SIZE RANGE

FILTER CONTINUOUS CURRENT RATING	PHASE AND NEUTRAL TERMINALS	TRANSIENT GROUND TERMINAL	SAFETY GROUND TERMINAL
30 – 100 A	# 14 – 2/0 (1)	# 14 – 2/0 (1)	# 14 - # 4 (5)
225 A	# 6 – 250 kcmil (1)	# 14 – 2/0 (1)	# 10 – 1/0 (5)
400 A	# 6 – 250 kcmil (2)	# 6 – 250 kcmil (2)	# 6 – 250 kcmil (5)
800 A	2.75 x .50 Cu Busbar (4)	# 6 – 250 kcmil (2)	# 6 – 250 kcmil (5)
1200 A	(2x) 6.0 x .25 Cu Busbar (4)	# 6 – 250 kcmil (2)	# 6 – 250 kcmil (5)
2000 A	(3x) 6.0 x .25 Cu Busbar (4)	# 6 – 250 kcmil (2)	# 6 – 250 kcmil (5)
4000 A	(5x) 6.0 x .25 Cu Busbar (4)	# 6 – 250 kcmil (2)	# 6 – 250 kcmil (5)

NOTES:

1. Double lug with single connection for Input and Output.
2. Double lug with dual connection for Input and Output.
3. Lug (s) may be used if customer prefers wiring; must specify wire gauge and # of conductors when ordering.
4. Units must be installed with Busbar(s) only! Wire lugs are not U.L. approved.
5. Single lug connection
6. Double lug connection

System Grounding

The performance and safety of any transient voltage surge suppression system is dependent on proper grounding. Grounding is required primarily for safety. Correct implementation also enhances equipment performance. Incorrect grounding can reduce or impede the unit's operation.

All electrical circuits to and from the Active Tracking Filter System must include an equipment grounding conductor as required by the NEC and local codes.

An insulated grounding conductor is recommended in addition to any metallic raceway which may be used as a grounding conductor. The grounding conductor should be at least the code minimum per NEC Table 250 – 95 based on the load circuit capacity. Grounding conductors must be routed with the associated power conductors in the same raceway (conduit).

When metallic raceways are used, adequate electrical continuity must be maintained at all raceway connections, particularly raceway terminations to the electrical enclosures.



THE USE OF ISOLATING BUSHINGS OR OTHER MEANS TO INTERRUPT A METALLIC CONDUIT RUN IS A POTENTIAL SAFETY HAZARD AND IS NOT RECOMMENDED.

Units are provided with a “transient ground” terminal which is intentionally isolated from the metal enclosure. A “safety ground” terminal is provided in each unit to ground the metal enclosure. As shipped, the “transient ground” terminal is wired to the “safety ground” terminal. Standard recommended practice is to leave the two ground terminals connected together and treat them as one unity grounding connection. When an “isolated ground” scheme is used, the jumper between the two ground terminals can be removed as long as two grounding conductors are included in the raceway (one for connection to “transient ground” terminal and one done for connection to the “safety ground” terminal) and they are ultimately connected together at the power source ground.

Power Source Grounding – The Active Tracking Filter is designed to be operated from a solidly grounded power source. For applications with impedance – grounded or ungrounded power sources, contact the factory at 1-800-288-6169 for application assistance. If multiple power sources are used (such as with UPS, automatic transfer switches, or standby generators), verify that all power sources are solidly grounded. For further information on UPS grounding, see Liebert Power Line PLT – 41 . For further information on ATS and generator grounding, see Liebert Power Line PLT – 48.

Grounding Electrode – Contrary to popular belief, transient voltage surge suppressors do not discharge all surges to ground (earth). Transient voltage surge suppressors divert the surge current back to its source to complete the electrical circuit. In the case of lightning whose potential is developed with respect to the earth, the transient voltage surge suppressor diverts the surge current to the grounding electrode (earth connection). However, for most surges which are developed by switching loads, the transient voltage surge suppressor diverts the surge current back to its source without involving the grounding electrode.

For proper transient voltage surge suppression performance, the service entrance grounding electrode system must comply with the NEC by having all available electrodes (building steel, metal water pipe, driven rods, concrete encased electrodes, etc.) properly bonded together and connected to the power system grounding.



THE USE OF A SEPARATE GROUNDING ELECTRODE TO GROUND THE TRANSIENT VOLTAGE SURGE SUPPRESSOR DEFEATS THE EFFECTIVENESS OF THE TRANSIENT VOLTAGE SURGE SUPPRESSOR, IS A POTENTIAL SAFETY HAZARD, MAY CAUSE EQUIPMENT DAMAGE, IS AN NEC VIOLATION (REFERENCE NEC 250 – 51 AND 250 – 54), AND IS NOT RECOMMENDED.

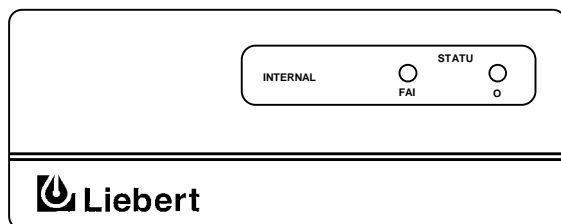
OPERATION

Liebert Active Tracking Filter Systems require little or no operator intervention after installation.

The units are provided with diagnostic indicators and alarms which assist in determining when the unit has failed and requires repair.

Each active surge current diverter module is equipped with a green LED which indicates it is energized and functional. If unit is energized and green LED is off, the surge current diverter module is not fully functional and requires replacement. See the maintenance section of this manual for additional information.

System Monitor Panel – The front door of the unit may be equipped with one or more of the following status indicators or alarms:



Standard Monitor Panel

Module Status Indicators (Standard) – These indicators provide a summary of the status of all surge current diverter modules. For normal conditions, the green “OK” LED is illuminated. If one or more of the surge current diverter modules require replacement, the green “OK” LED is turned off and the red “FAIL” LED is illuminated.

Audible Alarm (Standard) – If one or more of the surge current diverter modules requires replacement, an audible alarm is activated to draw attention to the fact that repair service is required to restore the system to normal operation. An audible alarm disable is provided to silence the alarm. The system will automatically reset itself after repair. The audible alarm switch and “Fail” LED can be tested by depressing the “Test” switch.

Dual Counters (Optional) – are provided for transient voltage surge monitoring. The counters totalize surges monitored since the last counter reset.

Normal Mode Swell Counter (Standard) – monitors all line to line and line to neutral voltages. It is factory set to record whenever the peak voltage on any normal mode exceeds the MCOV of the TVSS for more than 100 μ s. This allows the counter to record temporary line overvoltages that many result from utility switching, line regulation problems, etc.

Common Mode Surge Counter (Optional) – monitors line to ground transient voltages. This circuit totalizes all surges that deviate from the line sine wave envelope by more than 125 volts. The counter is AC coupled and rejects transient voltages longer than 100 μ s.

Front Panel Counter Reset Disable/Enable Switch – The counter is resettable from the counter reset switch on the front bezel. The front reset may be disabled internally to provide protection against tampering. To disable the front reset, follow the procedure below:

1. Remove power from the unit, lock out and tag the disconnect or circuit breaker.
2. Open door and verify power is off with a voltmeter.
3. Throw SWXI on the power supply board to the disable position.

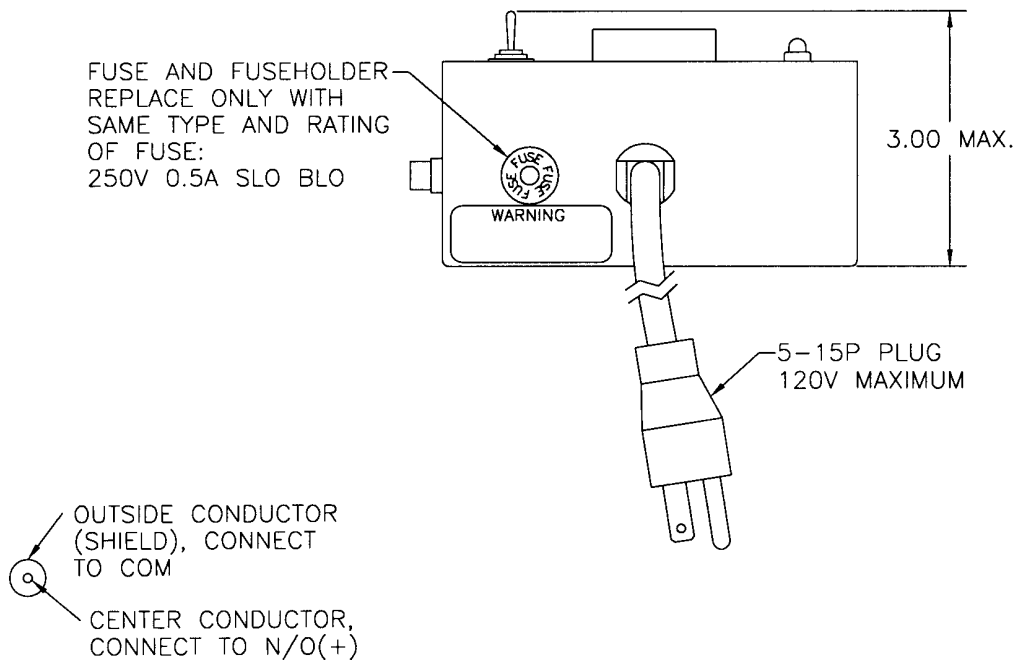
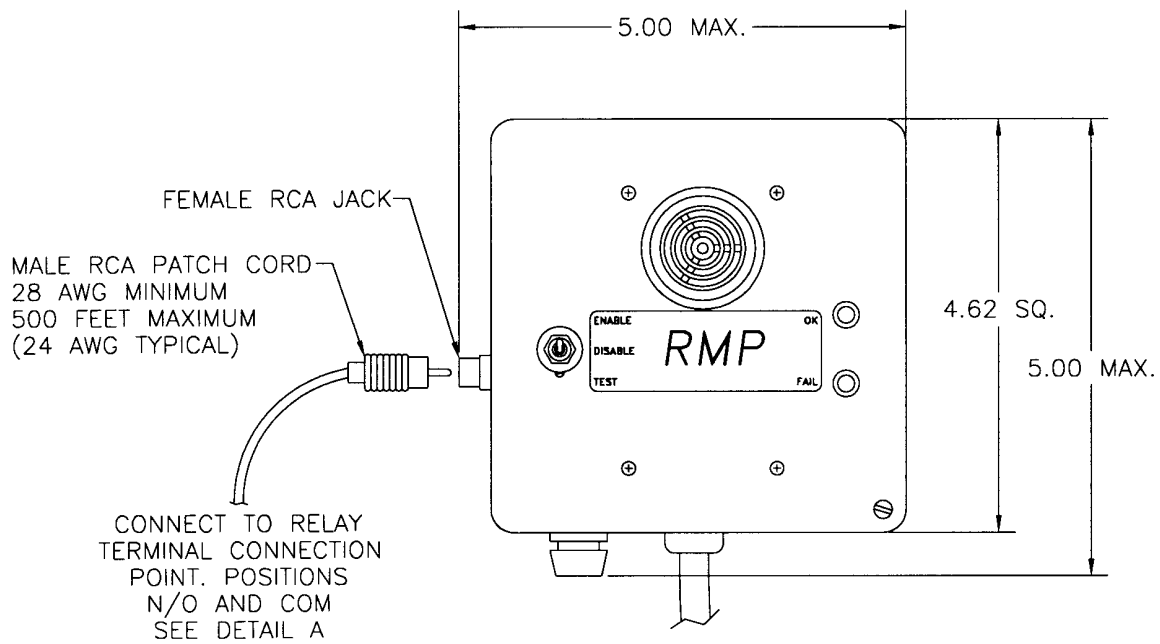
Enable the front counter reset switch by repeating the procedure and return SWXI to the enable position.

Totalizer Battery Replacement – The totalizers each have a ten-year life lithium battery. The batteries are located inside the totalizers. To change the batteries, requires removing the front bezel to access the counters. Be sure to follow the lockout and tag power down procedure to assure power has been removed from the unit before attempting battery replacement.

Summary Alarm Contact (Standard) – A summary alarm Form C (1 N.O. and 1 N.C.) relay contact is provided for remote indication of one or more failed surge current diverter modules. The summary alarm contact terminals are located on the PC board inside the unit. Contacts are rated for 5 amps at 277 VAC maximum.

Remote Monitor Panel (Optional) – A remote monitor panel is available to provide unit status and alarm information at a location up to 500 feet away from the Active Tracking Filter System. (See Figure 5.) Operation of the Remote Monitor Panel is similar to the unit system monitor panel. The “Enable” position of the switch is the normal position, which allows audible alarm operation. The “Disable” switch position silences the audible alarm. The “Test” position tests the audible alarm and indicator lights.

The remote monitor panel requires an external source of power. Standard units are furnished with a six-foot power cord with a NEMA 515 plug for connection to a 120 VAC source. Control connections are required from the remote monitor panel to the power supply board in the Active Tracking Filter System. Connections are made by way of two-conductor control cable fitted with “RCA” plug on one end (see Figure 5), which is not furnished with the remote monitor panel.



DETAIL A

Figure 5. Remote Monitor Panel

MAINTENANCE



ONLY QUALIFIED PERSONNEL SHOULD PERFORM MAINTENANCE ON THE SYSTEM.

HAZARDOUS VOLTAGES ARE PRESENT INSIDE THE UNIT DURING NORMAL OPERATIONS.

ELECTRICAL SAFETY PRE-CAUTIONS MUST BE FOLLOWED WHEN SERVICING THIS EQUIPMENT.

TO PREVENT RISK OF ELECTRICAL SHOCK, TURN OFF AND LOCK OUT ALL POWER SOURCES TO THE UNIT BEFORE SERVICING UNIT.

Corrective Maintenance (Repair)

The Liebert Interceptor Active Tracking System is designed for years of trouble-free operation. However, even the most reliable equipment may fail.

Diagnostic indicators are provided to indicate when a surge current diverter module needs replacement. (See operation section of this manual for details). To ensure continuity of transient surge protection, failed modules should be replaced at the earliest convenient service opportunity. Parallel modules provide redundant transient surge protection such that any single module failure does not completely eliminate the transient surge protection.

When replacing surge current diverter modules, other components should be inspected for damage and replaced if necessary. Standard electrical troubleshooting procedures should be used to isolate problems other than failed surge current diverter modules.

When replacing components, for continued proper operation and safety, replace only with identically rated components. Please contact factory for information on replacement parts.

For servicing assistance, contact your local Liebert sales representative or the Control Concepts Division of Liebert at 607-724-2484 or 800-288-6169.

Preventative Maintenance (Inspection and Cleaning)

Periodic system inspections, cleaning, and connection checks are recommended to ensure reliable system performance and continued surge transient protection.

It is difficult to establish a schedule for preventative maintenance since conditions vary from site to site. Inspections for failed surge current diverter modules using available diagnostics should be done routinely (weekly or monthly).

LIMITED WARRANTY

This Warranty is given ONLY to purchasers who buy for commercial or industrial use in the ordinary course of each purchaser's business.

General:

Control Concepts' products are in our opinion the finest available. We take pride in our products and are pleased that you have chosen them. Under certain circumstances, we offer with our products the following Five-Year Warranty Against Defects in Material and Workmanship. Please read your Warranty carefully. This Warranty sets forth our responsibilities in the unlikely event of defect and tells you how to obtain performance under this Warranty.

FIVE YEAR LIMITED WARRANTY AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP

CONTROL CONCEPTS PRODUCTS COVERED: Interceptor Series Active Tracking[®] Filter TVSS.

Terms of Warranty:

As provided herein, the Control Concepts product is warranted to be free of defects in material and workmanship for a period of five (5) years from the date of delivery of the product to User. The delivery date will be determined only from the Control Concepts bill of lading. If any of the Control Concepts products fail to conform to the warranty within the warranty period, Control Concepts, at its option, will furnish new or factory remanufactured parts for repair or replacement of that part.

Warranty Extends to First Purchaser for Use, Non-transferable:

This Warranty is extended to the first person, firm, association or corporation for whom the Control Concepts product specified herein is originally installed for use in the United States (the "User"). This Warranty is not transferable or assignable without the prior written permission of Control Concepts.

Assignment of Warranties:

Control Concepts assigns to User any warranties which are made by manufacturers and suppliers of components of the Control Concepts product and which are assignable, but Control Concepts makes NO REPRESENTATIONS as to the effectiveness or extent of such warranties, assumes NO RESPONSIBILITY for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this warranty to such components.

Descriptions:

Control Concepts warrants for the period and on the terms of the Warranty set forth herein that the Control Concepts product will conform to the descriptions contained in Control Concepts' final invoices, orders and Control Concepts' product brochures. Control Concepts does not control the installation and use of any Control Concepts product. Accordingly, it is understood that the Descriptions are NOT WARRANTIES OF PERFORMANCE and NOT WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE.

Obtaining Performance Under This Warranty:

Within a reasonable time, but in no case to exceed thirty (30) days, after User's discovery of a defect, User shall contact Control Concepts and request a return authorization number. User shall ship the product, with proof of purchase, to Control Concepts freight prepaid. Control Concepts products shipped to Control Concepts without a return authorization number will be refused and returned freight collect to User at User's expense. Control Concepts products shipped by User to Control Concepts which have incurred freight damage due to User's improper packaging of the product will not be covered by this Warranty and any repairs or replacement parts, components or products needed will be invoiced in the full current price amount and returned freight collect to User.

Subject to the limitations specified herein, Control Concepts will repair or replace, at its option, without charge for Control Concepts labor or materials, subsequent to its inspection and F.O.B. Control Concepts' facility, the Control Concepts product shipped to Control Concepts with a return authorization number and warranted hereunder which does not conform to the Warranty. Replacement parts, components or products shipped to User prior to Control Concepts' receipt and inspection of the product claimed to be defective, shall be invoiced in the full current price amount and shipped freight collect F.O.B. Control Concepts' facility. Warranty coverage will be extended only after Control Concepts' receipt of the claimed defective product within thirty (30) days of shipment of any replacement parts, components or products, if applicable, Control Concepts' inspection discloses the claimed defect and the returned product shows no signs of treatment or use which would void the coverage of this Warranty.

Items Not Covered By Warranty:

THIS WARRANTY DOES NOT COVER DAMAGE OR DEFECT CAUSED BY misuse, improper application, wrong or inadequate electrical current or connection, inadequate water or drain services, negligence, inappropriate on site operating conditions, corrosive atmosphere, repair by non-Control Concepts designated personnel, accident in transit, tampering, alterations, a change in location or operating use, exposure to the elements, Acts of God, theft or installation contrary to Control Concepts' recommendations or specifications, or in any event if the Control Concepts serial number has been altered, defaced or removed.

THIS WARRANTY DOES NOT COVER shipping costs, installation costs, circuit breaker resetting or maintenance or service items and further, except as provided herein, does NOT include labor costs or transportation charges arising from the replacement of the Control Concepts product or any part thereof or charges to remove same from any premises of the User.

THIS WARRANTY DOES NOT COVER DAMAGE OR DEFECT CAUSED BY use of the Control Concepts product in combination with any electrical or electronic components, circuits, systems, assemblies, or other materials not furnished by Control Concepts. Control Concepts does NOT warrant the suitability for use or the results of the Control Concepts product in combination with the products of others.

REPAIR OR REPLACEMENT OF A DEFECTIVE PRODUCT OR PART THEREOF DOES NOT EXTEND THE ORIGINAL WARRANTY PERIOD.

Limitations:

- THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- USER'S SOLE AND EXCLUSIVE REMEDY IS REPAIR OR REPLACEMENT OF THE CONTROL CONCEPTS PRODUCT AS SET FORTH HEREIN.
- IF USER'S REMEDY IS DEEMED TO FAIL OF ITS ESSENTIAL PURPOSE BY A COURT OF COMPETENT JURISDICTION, CONTROL CONCEPTS' RESPONSIBILITY FOR PROPERTY LOSS OR DAMAGE SHALL NOT EXCEED ONE TIMES THE NET PRODUCT PURCHASE PRICE.
- IN NO EVENT SHALL CONTROL CONCEPTS ASSUME ANY LIABILITY FOR INDIRECT, SPECIAL, INCIDENTAL, OR ECONOMIC CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER, INCLUDING WITHOUT LIMITATION, LOST PROFITS, BUSINESS INTERRUPTION OR LOSS OF DATA, WHETHER ANY CLAIM IS BASED UPON THEORIES OF CONTRACT, NEGLIGENCE, STRICT LIABILITY, TORT OR OTHERWISE.

Miscellaneous:

- NO SALESPERSON, EMPLOYEE OR AGENT OF CONTROL CONCEPTS IS AUTHORIZED TO ADD TO OR VARY THE TERMS OF THIS WARRANTY. Warranty terms may be modified, if at all, only in a writing signed by a Control Concepts' officer.
- This Warranty is effective as of the date of Control Concepts receipt of payment and supersedes all previous warranties. Control Concepts reserves the right to supplement or change the terms of this Warranty in any subsequent warranty offering to User or others.
- In the event that any provision of this Warranty should be or becomes invalid and/or unenforceable during the warranty period, the remaining terms and provisions shall continue in full force and effect.
- This Warranty is given in and is intended to be construed under the laws of the State of New York.
- This Warranty represents the entire agreement between Control Concepts and User with respect to the subject matter herein and supersedes all prior or contemporaneous oral or written communications, representations, understandings or agreements relating to this subject.