TRYSTAR

UltraLITE Series Model ELU

OWNERS MANUAL

1.5KW - 14KW SINGLE PHASE CENTRALIZED EMERGENCY LIGHTING INVERTER

IMPORTANT - SAVE THESE INSTRUCTIONS - PLEASE READ THIS MANUAL BEFORE USING EQUIPMENT

⚠ CAUTION

The following symbol indicates that caution should be taken when performing the process required in this manual. Damage to the unit or personal harm could happen if proper precautions are not taken.

⚠ SHOCK HAZARD

The following symbol indicates that there is a risk of electrical shock if proper precautions are not followed. Only qualified personnel should perform the actions required in this manual.

ABOUT THIS MANUAL

When viewing electronically, click on the subject to jump to that page. Clicking the header on the front page will launch the Trystar web site. Clicking anywhere else on the front page will also jump to the Table of Contents. Clicking any blue text will take you to that section of our website.

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INTRODUCTION

Trystar engineers and manufactures the industry's highest quality centralized emergency lighting inverters, capitalizing on 4 decades of expertise. We have an enviable reputation for quality, which is reflected in the design, workmanship, and performance of our products.

Providing a seamless transfer to back-up power for your emergency lighting system, the UltraLITE is compatible with all fixtures including HID, metal halide, high-pressure sodium, quartz / mercury vapor, halogen, fluorescent, and incandescent lighting applications. The voltage regulation and performance characteristics of the UltraLITE offer a significant advantage over competing products.

Features & Benefits

- Uninterrupted, regulated, continuous sinewave output for use with "normally on" lighting fixtures and exit lamps. LED and HID compatible.
- Standby output for use with "normally off" emergency lighting fixtures.
- Pulse width modulation and IGBT technology provide tight output voltage regulation.
- Delivers highly-filtered, regulated, and spike-free power to emergency lighting fixtures and "Life Safety" devices.
- True, online double-conversion topology provides conditioned, regulated power and 100% reliability to emergency lighting loads.
- Auxiliary input command.
- High-speed static bypass, and also a maintenance bypass.
- System approved for 65k AIC rated source.
- Variable-range logic provides added security during deep brownout conditions, without battery consumption — thus assuring that the batteries will be at full capacity for a power outage.
- Field-modifiable distribution.
- Short-circuit protected.
- NEMA 1 enclosure.
- Generator-compatible.
- 4-stage, temperature compensating smart charge.
- Optional control device override (wall switch, occupancy sensor, dimmer, etc).
- Optional zone sensing.
- Optional remote status panel and automatic phone dialer.
- Optional network connectivity.

Safety

- UL 924 listed Emergency Lighting Equipment
- UL 924 listed Auxiliary Lighting and Power Equipment
- UL 1778 listed Uninterruptible Power Supplies
- C-UL listed to CSA C22.2 No. 141-15 Emergency Lighting Equipment
- C-UL listed to CSA standard C22.2 No. 107.1-01 General Use Power Supplies
- NFPA 101, NFPA 111, NEC, and local codes

Product Specifications

- Input Operating Voltage Range: +12%, -30% typical, load-dependent without battery usage
- Input Frequency: 60 Hz, ± 2.5%
- Input Current Harmonic Distortion: <5% THD
- Input Power Factor Correction: > .99 PF
- Output Regulation: Typically better than ± 1.5%
- Overload Rating: Up to 125% for 30 cycles, 150% for 4 cycles when fed from the AC power source, or on battery (without use of static bypass).
- LED Inrush Rating: Peak overload capability up to 1400% to accommodate inrush current from LED fixtures/drivers (without use of static bypass).
- Standard Unit Operating Temperature:
  - UL 1778 and UL 924 Aux. listed at 0° C to 40° C.
  - UL 924 Emergency Lighting Equipment listed at 20° C to 30° C.
  - C-UL listed to CSA C22.2 No. 141-15 at 20° C to 30° C.
- Noise Attenuation: Common Mode: 120 dB, Transverse Mode: 70 dB (Models supplied with isolation transformer).

Standards

- ANSI / IEEE C62.41 Category B3
- NFPA 101 7.9.3.1.3
- NFPA 111 Stored Electrical Energy Emergency and Standby Power Systems. Meets SEPSS / ECE / Level 1 and Level 2 criteria for types O, U, A, B, and 10; and Classes up to and including Class 1.5
- NFPA 70 National Electric Code
- FCC Article 15, Subpart J, Class A
- IEC 519
- UL 924 Listed as “Emergency Lighting Equipment” with 90 minutes at full output kW rating. This 90 minute Emergency Lighting Inverter system meets NFPA 101 and 111 standards, and is NFPA compliant as “Life Safety Equipment in accordance with ANSI/NFPA 70 (NEC),

Article 700.

Display Monitor & Diagnostics

The UltraLITE's full-featured monitoring system includes:

- Self-test diagnostics.
- Automatic battery test.
- Audible alarms.
- Protected ON / OFF switch.
- Push-to-test.

The UltraLITE also has a full complement of indicators:

- Percent load.
- High / low / normal input voltage.
- On battery
- Percent of battery.
- Check battery.
- Bypass status.
- Alarm status.

Communications & Diagnostics

- Integral status and alarm panel.
- Remote communications via alarm signals or RS232.

Batteries

- Integral 90 minute, maintenance-free batteries. (Optional runtimes available including 30, 60, and 120 minutes.)
- Automatic, pre-programmed battery testing, including self-diagnostics.
- Small footprint and self-contained batteries maximize floor space.
- Rapid recharge, per UL 924 requirements.
- UL 924 Listed as "Emergency Lighting Equipment" with 90 minutes at full output kW rating. This 90 minute Emergency Lighting Inverter system meets NFPA 101 and 111 standards, and is NFPA compliant as "Life Safety Equipment in accordance with ANSI/NFPA 70 (NEC), Article 700.

Advanced Digital Monitoring — The Intellistat TS™

Available for all models.

The user-friendly Intellistat TS™ monitor provides quick, full-access to all of the inverter's features, allows all programming to be done directly from the touchscreen display, and provides complete system diagnostics and testing. A color, TFT, high resolution touch-screen display indicates all the electrical parameters, as well as the functional status of the inverter. The touch-screen display allows the entry of the date / time values, system setpoints, and password information into the monitor, without the need

for an external computer and cable.

Advanced Digital Monitoring — The Intellistat TS™

The Intellistat TS's features include:

- LCD display of all electrical parameters.
- NFPA-compliant automatic battery testing / logging
- User-programmable automatic system testing.
- System alarm annunciation.
- Audible alarm with alarm silence.
- Alarm status display.
- Programmable alarm set-points.
- Date and time display.
- Auto-logging of test results and abnormal events.
- Multi-layer password protection.
- Programmable local interfaces.
- Logs up to 50 events.
- Non-volatile clock and memory.
- Remote monitoring capabilities.
- Optional reporting of test results via fax / e-mail / voice / webpage.
- Optional status notification via e-mail / cell-phone.

Egress Lighting Integrity Test

This feature provides the industry's most advanced life safety system test available. The Intellistat TSautomatically energizes all life safety circuits, regardless of egress lighting design ("always on" or "normally off") during the required monthly and annual tests. The Intellistat TS then compares power consumption during the test period with userdefined load capacity, analyzes the data, and advises if service is required.

Automatic System Tests

The Intellistat TS automatically performs a userdefined (date and time) 5-minute system test every 30 or 90 days. It also performs user-defined (date and time) 30-, 60-, or 90-minute, or 2- or 4-hour annual system tests. For all of these tests, the Intellistat TS logs the test results with date and time, as well as a "pass" or "fail" indication.

Manual System Tests

The Intellistat TS also allows the user to manually invoke a user-defined system test for 30-, 60-, or 90-minutes, as well as 2- or 4-hours. A 1-minute or 5-minute manual test is also available for "spot inspections".

RECEIVING THE INVERTER

INSPECTION, PLACEMENT, INSTALLATION, SETUP AND START-UP SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY

INSPECTION

Upon receipt of the lighting inverter, visually inspect the unit(s) for shipping damage. If shipping damage has occurred, the purchaser should promptly notify the carrier and file a claim with the carrier. The factory should be notified if the damages may impair the operation of the unit. Reference front cover or accompanying paper work for factory contact information. **DO NOT REMOVE THE DEBRIS SHIELD FROM THE TOP OF THE UNIT UNTIL READY FOR START UP.**

Note: Open the front door of the enclosure(s) and inspect inside the unit for shipping damage.

Note: Open the front door of the enclosure(s) and inspect inside the unit for shipping damage.

IMPORTANT NOTICE

This shipment has been carefully inspected, checked and properly packaged at our company.

When it was delivered to the carrier it was in good condition and technically it became your property at that time. Thus, any damage, whether obvious or hidden, must be reported to the transportation company within FIVE days of receipt of the shipment at your premises to avoid forfeiting claims for damages.

FOR ALL SHIPMENTS DAMAGED IN TRANSIT

Leave the items, packing material and carton “AS IS”. Notify your carrier’s local office and ask for immediate inspection of the carton and contents. After inspection has been made by the carrier, and you have received acknowledgment in writing as to the damage, notify our Customer Service Department to make any required repair arrangements.

It is your responsibility to follow the above instructions or the carrier will not honor any claims for damage. Also, if there are any shortages or questions regarding this shipment, please notify us within FIVE days.

Please note that we cannot be responsible for any service work or backcharges unless authorized by us in writing, before the work is performed.

WHILE IN STORAGE BATTERIES MUST BE CHARGEDFOR 24 HOURS EVERY 6 MONTHS. WHILE IN STORAGE DISCONNECT THE BATTERY CONNECTOR FROM THE INVERTER

STORAGE

If it is necessary to store the unit, be sure to place it in a clean dry area. **For extended storage, the batteries must be charged for 24 hours every 6 months. Failure to do so will result in weak or bad batteries which WILL**

NOT be covered under the warranty. Charging is accomplished by installing the batteries, turning the inverter on and allowing it to run. See “Installation - Battery Installation” and “Battery Wiring” for details on installing batteries and the “Start-up Procedure” for turning the inverter on. While storing disconnect the battery connector from the inverter. Make sure proper ventilation is available any time the inverter is on.

REMOVING THE LIGHTING INVERTER FROM THE PALLET

CAUTION

CABINETS AND BATTERIES ARE EXTREMELY HEAVY USE PROPER EQUIPMENT WHEN REMOVING THE CABINETS FROM THE SKID

SHOCK HAZARD

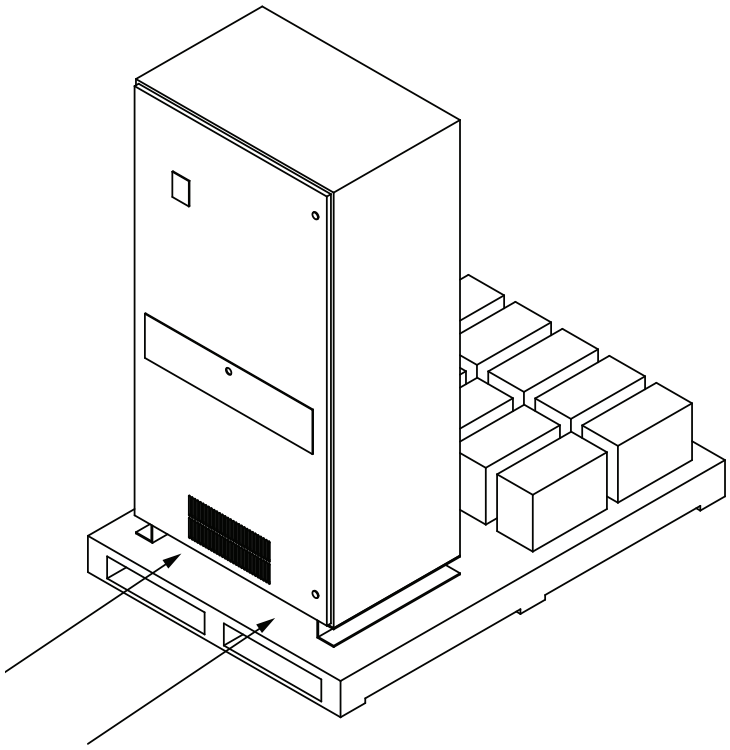
DO NOT SHORT BATTERY TERMINALS

TOOLS REQUIRED:

1/2” Socket, Forklift, dolly.

Batteries on same pallet as the lighting inverter

1. Remove the plastic wrapping and banding and discard.
2. Remove batteries from pallet with the use of a dolly or other lifting device be sure to place them in a safe location.
3. To remove the lighting inverter from the pallet, first remove the four 1/2” bolts that are securing the lighting inverter cabinet to the pallet.
4. Using a forklift, place the forks securely under the lighting inverter from the front or back side.
5. Carefully lift the lighting inverter from the skid.
6. Set the lighting inverter cabinet down until you are ready for installation. **Do not remove the debris shield from the top of the unit until ready for start up.**



Batteries on different pallet as the lighting inverter or batteries installed internally:

1. Remove plastic wrapping.
2. To remove the lighting inverter from the pallet, first remove the four 1/2” bolts that are securing the lighting inverter cabinet to the pallet.
3. Using a forklift, place the forks securely under the lighting inverter from the front or back side.
4. Carefully lift the lighting inverter from the skid.
5. Set the lighting inverter cabinet down until you are ready for installation.

INSTALLATION AND SAFETY PRECAUTIONS

IMPORTANT SAFEGUARDS, READ AND FOLLOW ALL SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS.

⚠ CAUTION

A BATTERY CAN PRESENT A RISK OF ELECTRICAL SHOCK AND HIGH SHORT CIRCUIT CURRENT. THE FOLLOWING PRECAUTIONS SHOULD BE OBSERVED WHEN WORKING ON BATTERIES:

- REMOVE WATCHES, RINGS, OR OTHER METAL OBJECTS.
- USE TOOLS WITH INSULATED HANDLES.
- WEAR RUBBER GLOVES AND BOOTS.
- DO NOT LAY TOOLS OR METAL PARTS ON TOP OF BATTERIES.
- DISCONNECT CHARGING SOURCE PRIOR TO CONNECTING OR DISCONNECTING BATTERY TERMINALS.

⚠ CAUTION

USE CAUTION WHEN HANDLING OR SERVICING BATTERIES. BATTERY ACID CAN CAUSE BURNS TO SKIN AND EYES. IF ACID IS SPILLED ON SKIN OR IN THE EYES, FLUSH WITH FRESH WATER AND CONTACT A PHYSICIAN IMMEDIATELY. BATTERIES ARE VERY HEAVY. USE CAUTION WHEN LIFTING AND MOVING THEM. INSTALLATION SHOULD ONLY BE PERFORMED BY AUTHORIZED PERSONNEL. DIAGRAMS FOR WIRING BATTERIES ARE LOCATED ON THE BATTERY CABINET DOOR. BE SURE TO WIRE BATTERIES PROPERLY. IMPROPER WIRING CAN CAUSE DAMAGE TO THE BATTERIES. WIRING SHOULD ONLY BE PERFORMED BY AUTHORIZED PERSONNEL.

- FOLLOW ALL STANDARD AND LOCAL ELECTRICAL CODES.
- BE SURE INPUT POWER TO UPS IS PROPERLY GROUNDED.
- DO NOT ALLOW WATER OR FOREIGN OBJECTS TO GET INSIDE UPS.
- DO NOT PLACE OBJECTS OR LIQUIDS ON TOP OF THE UPS.
- DO NOT LOCATE UPS NEAR RUNNING WATER OR WHERE THERE IS EXCESSIVE HUMIDITY.
- DO NOT USE OUTDOORS.
- DO NOT MOUNT NEAR GAS OR ELECTRIC HEATERS.
- EQUIPMENT SHOULD BE MOUNTED IN LOCATIONS AND AT HEIGHTS WHERE IT WILL NOT READILY BE SUBJECTED TO

TAMPERING BY UNAUTHORIZED PERSONNEL.

- THE USE OF ACCESSORY EQUIPMENT NOT RECOMMENDED BY THE MANUFACTURER MAY CAUSE AN UNSAFE CONDITION.
- DO NOT USE THIS EQUIPMENT FOR OTHER THAN INTENDED USE.
- SERVICING OF BATTERIES SHOULD BE PERFORMED OR SUPERVISED BY PERSONNEL KNOWLEDGEABLE OF BATTERIES AND THE REQUIRED PRECAUTIONS.
- KEEP UNAUTHORIZED PERSONNEL AWAY FROM BATTERIES.
- DO NOT SHORT BATTERY TERMINALS.
- DO NOT DISPOSE OF BATTERY OR BATTERIES IN A FIRE. THE BATTERY MAY EXPLODE.
- ONLY REPLACE BATTERIES WITH IDENTICAL SPECIFICATION OF ORIGINAL BATTERIES SUPPLIED WITH THE SYSTEM.
- DO NOT OPEN OR MUTILATE THE BATTERY OR BATTERIES. RELEASED ELECTROLYTE IS HARMFUL TO THE SKIN AND EYES. IT MAY BE TOXIC.
- READ AND FOLLOW ALL SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS.

This unit is intended for installation in a temperature controlled, indoor area free of conductive contaminants.

INSTALLATION

TOOLS REQUIRED AND INSTALLATION CHECKLIST

This unit is intended for installation in a temperature controlled, indoor area free of conductive contaminants.

_ Phillips Head Screw Driver, 3/16” Allen wrench (for input/output terminal blocks).

_ For field wiring size, based on amperage and breaker sizes in table below. Units are rated for operation up to 40 deg. C. Amb. Refer only to the matrix below for the service panel AC breaker size. The unit comes standard with terminals for hard wire installation.

_ Lighting Inverters require a ground wire. The grounded supply conductor (Neutral) wire should be the same size as the input feed wires. The ground wire should be installed in accordance to NEC code. The ground that feeds the Lighting Inverter should be of good integrity and dedicated to the Lighting Inverter. The run should be as short as possible. Conduit cannot be used for the grounding of the circuit.

_ When wiring batteries be sure to use insulated tools for safety.

Note: LLX AND GGX MODELS - REQUIRE AN INPUT NEUTRAL

Reference: NEC ARTICLE 250
AC INPUT BREAKER, WIRING AND CURRENT MATRIX

NOTE: LLX AND GGX MODELS - REQUIRE AN INPUT NEUTRAL

INPUT MATRIX (KVA=KW)

	1.5KVA/KW		2.2KVA/KW		3KVA/KW		3.5KVA/KW	
INPUT VOLTAGE	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER
120V	21.1	25	28.2	35	37.1	50	42.3	50
277V	9.6	15	12.9	15	15.7	25	19.5	25
120/208V	----	----	----	----	21	30	23.9	30
120/240V	----	----	----	----	18.2	30	20.7	30

INPUT MATRIX (KVA=KW)

	4.2KVA/KW		5KVA/KW		6KVA/KW		7KVA/KW		7.5KVA/KW	
INPUT VOLTAGE	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER
120V	48.5	70	56.6	80	----	----	----	----	----	----
277V	21	30	25.1	35	31.5	50	36.6	50	38.9	50
120/208V	28	40	32.7	50	41.9	60	47.8	70	50.7	70
220V	27	35	30.9	50	40.5	60	46.1	70	49	70
120/240V	24.3	40	28.3	50	36.3	60	414.4	70	43.9	70
347V	17.1	25	19.6	30	25.6	35	29.3	40	31.1	40
480V	12.4	20	14.2	20	18.5	25	21.1	30	22.4	30
600V	9.9	15	11.3	15	14.8	20	16.9	25	18	25

INPUT MATRIX (KVA=KW)

	8.5KVA/KW		10KVA/KW		12.5KVA/KW		13.5KVA/KW		14KVA/KW	
INPUT VOLTAGE	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER
120V	----	----	----	----	----	----	----	----	----	----
277V	43.4	60	50.2	70	61.5	80	66	90	68.2	90
120/208V	56.6	80	65.4	90	80	100	85.9	125	88.8	125
220V	54.7	80	63.2	90	77.4	100	83.1	125	85.9	125
120/240V	49	80	56.6	90	69.3	100	74.4	125	77	125
347V	34.7	50	40.1	60	49.1	60	52.7	70	54.5	70
480V	25.2	35	29	40	35.5	45	38.1	50	39.4	50
600V	20	30	23.2	30	28.4	35	30.5	40	31.5	40

Note: Input currents alone are maximum at full load, and when batteries are in recharge mode.

Note: Input currents alone are maximum at full load, and when batteries are in recharge mode.

AC OUTPUT BREAKER, WIRING AND CURRENT MATRIX

OUTPUT MATRIX (KVA=KW)

	1.5KVA/KW	2.2KVA/KW	3KVA/KW	3.5KVA/KW	4.2KVA/KW	5KVA/KW	6KVA/KW
OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT
120V	12.5	18.3	25	29.2	35	41.7	-------
277V	5.4	8	10.8	12.6	15.16	18.1	21.7
120/277V *	12.5 / 5.4	18.3 / 7.8	25 / 10.8	29.2 / 12.6	35 / 15.6	41.7 / 18.1	50 / 21.7
120/208V	-------	-------	14.4	16.8	20.19	24	28.8
120/240V	-------	-------	12.5	14.6	17.5	20.8	25
120/347V*	-------	-------	-------	-------	35 / 12.1	41.7 / 14.4	50 / 17.3
127/220V*	-------	-------	-------	-------	33.1 / 19.1	39.4 / 22.7	47.2 / 27.3

OUTPUT MATRIX (KVA=KW)

	7KVA/KW	7.5KVA/KW	8.5KVA/KW	10KVA/KW	12.5KVA/KW	13.5KVA/KW	14KVA/KW
OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT
120V	-----	-----	-----	-----	-----	-----	-----
277V	25.3	27.1	30.7	36.1	45.1	48.7	50.4
120/277V *	58.3 / 25.3	62.5 / 27.1	70.8 / 30.7	83.3 / 36.1	104.2 / 45.1	112.5 / 48.7	116.7 / 50.4
120/208V	33.7	36.1	40.9	48.1	60.1	64.9	67.3
120/240V	29.2	31.3	35.4	41.7	52.1	56.3	58.3
120/347V*	58.3 / 20.2	62.5 / 21.6	70.8 / 24.5	83.3 / 28.8	104.2 / 36	112.5 / 38.9	116.7 / 40.3
127/220V*	55.1 / 31.8	59.1 / 34.1	66.9 / 38.6	78.7 / 45.5	98.4 / 56.8	106.3 / 61.4	110.2 / 63.6

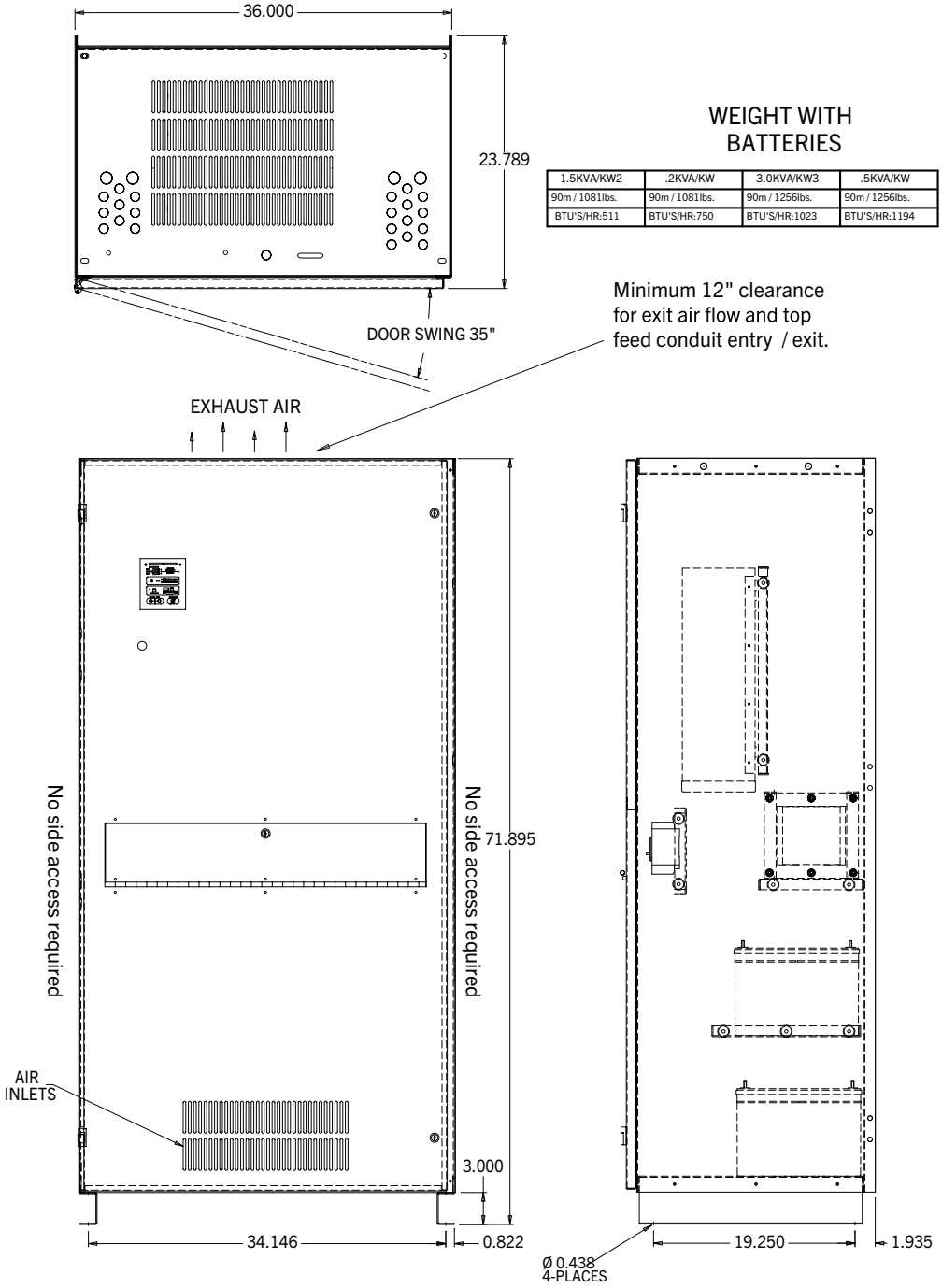
The ILS AC inverter systems must be located and installed conforming to CAN/CSA-C282-05 Emergency Electrical Power Supply for Buildings and CSA standard C22.1.
This unit is intended for installation in a temperature controlled, indoor area free of conductive contaminants.
MINIMUM CHARGE TIME FOR FULL BATTERY CAPACITY = 24 HOURS

CABINET DIMENSIONS, ACCESSES AND CLEARANCES 1.5KW - 3.5KW

This unit is intended for installation in a temperature controlled, indoor area free of conductive contaminants.

LIGHTING INVERTER PLACEMENT

Refer to the drawing below for installation clearances and ventilation requirements. The lighting inverter should be placed in a dry, well ventilated or temperature controlled area. Be sure not to block any fan or air inlet areas of the lighting inverter. Doing so will cause damage to the unit.



WEIGHT WITH BATTERIES

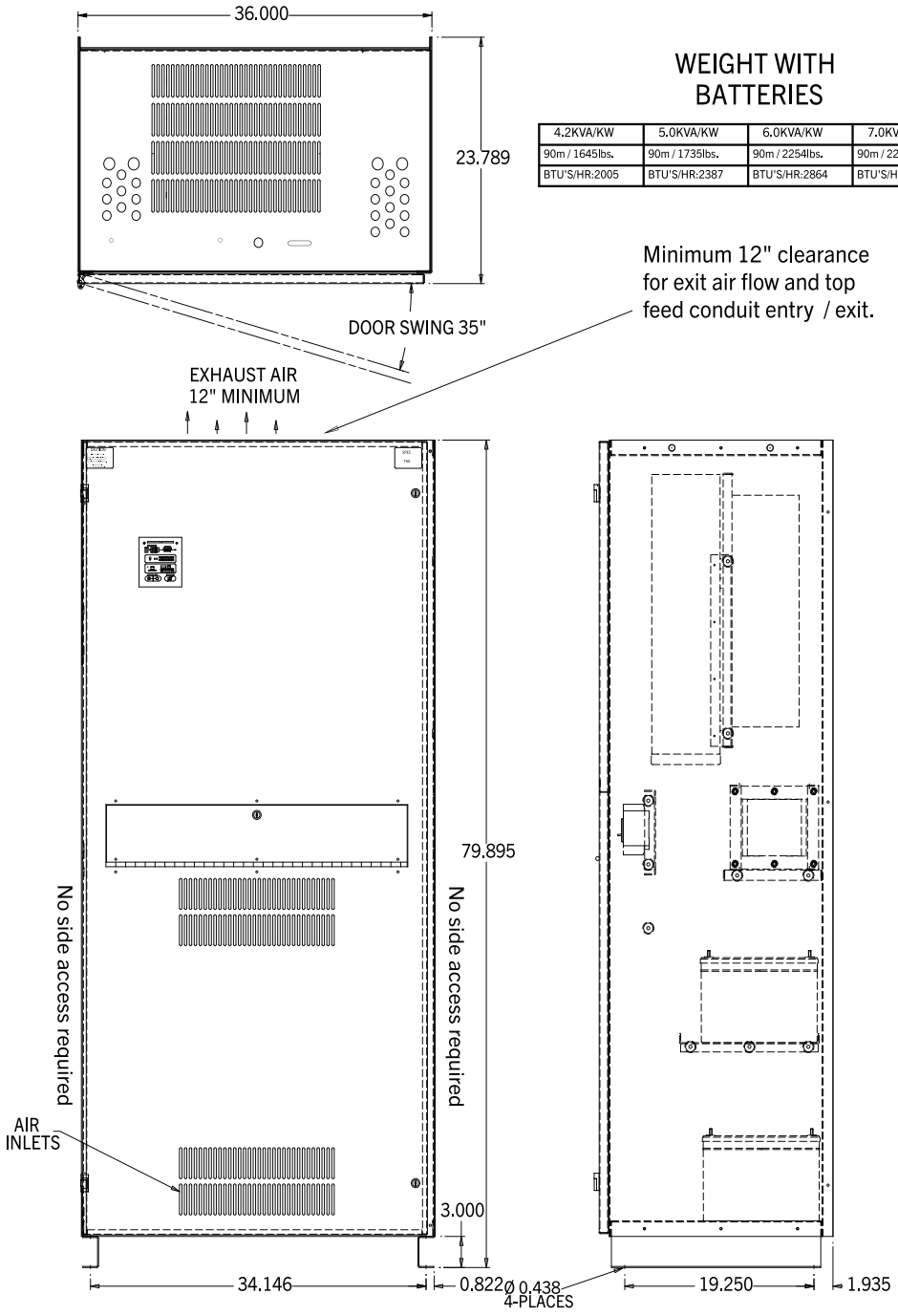
1.5KVA/KW2	.2KVA/KW	3.0KVA/KW3	.5KVA/KW
90m / 1081lbs.	90m / 1081lbs.	90m / 1256lbs.	90m / 1256lbs.
BTU'S/HR:511	BTU'S/HR:750	BTU'S/HR:1023	BTU'S/HR:1194

CABINET DIMENSIONS, ACCESSES AND CLEARANCES 4.2KW - 7KW

This unit is intended for installation in a temperature controlled, indoor area free of conductive contaminants.

LIGHTING INVERTER PLACEMENT

Refer to the drawing below for installation clearances and ventilation requirements. The lighting inverter should be placed in a dry, well ventilated or temperature controlled area. Be sure not to block any fan or air inlet areas of the lighting inverter. Doing so will cause damage to the unit.



WEIGHT WITH BATTERIES

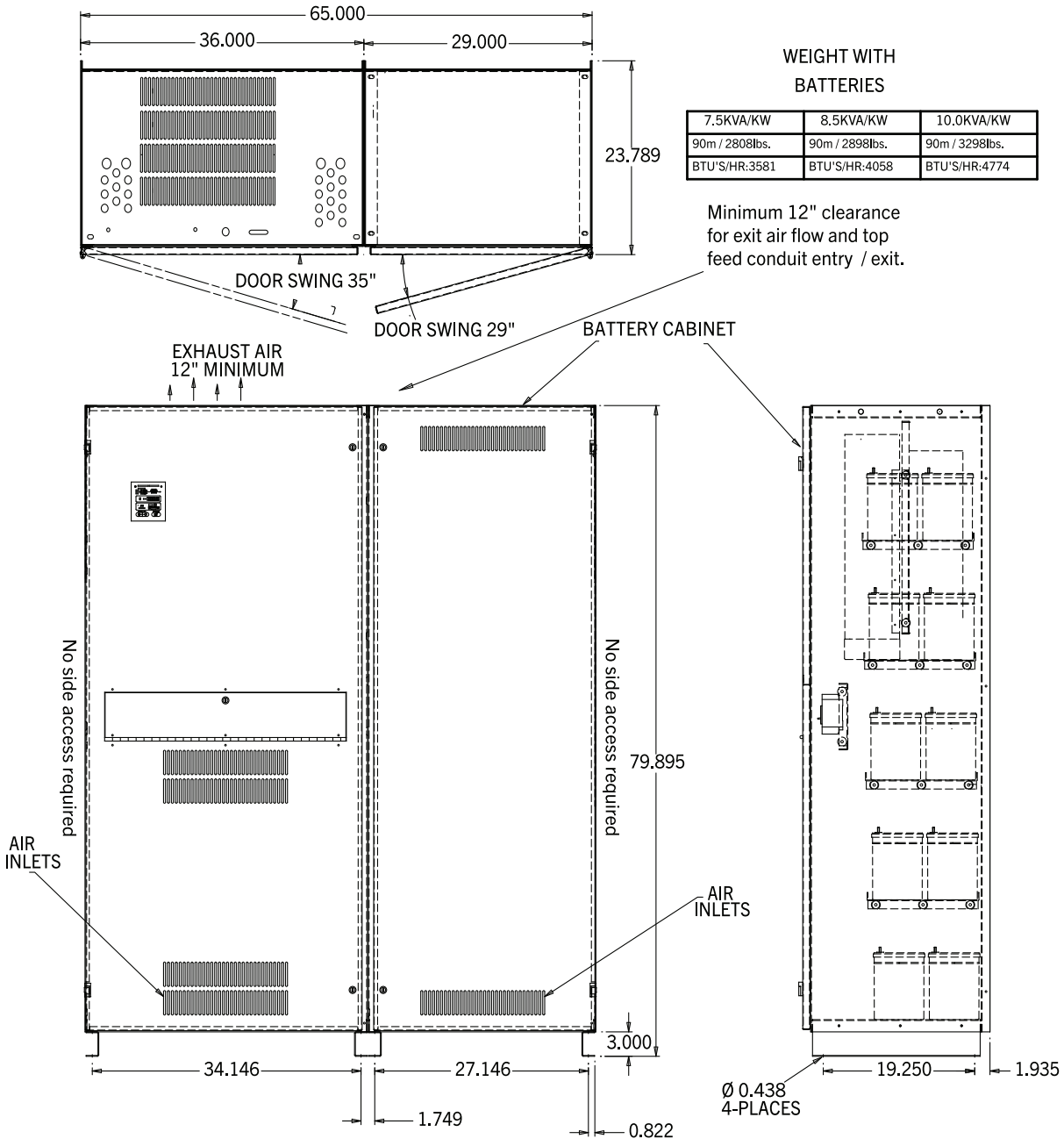
4.2KVA/KW	5.0KVA/KW	6.0KVA/KW	7.0KVA/KW
90m / 1645lbs.	90m / 1735lbs.	90m / 2254lbs.	90m / 2254lbs.
BTU'S/HR:2005	BTU'S/HR:2387	BTU'S/HR:2864	BTU'S/HR:3342

CABINET DIMENSIONS, ACCESSES AND CLEARANCES 7.5KW-10KW - W/ EXT. BATTERY CABINET

This unit is intended for installation in a temperature controlled, indoor area free of conductive contaminants.

LIGHTING INVERTER PLACEMENT

Refer to the drawing below for installation clearances and ventilation requirements. The cabinets should be placed in a dry, well ventilated or temperature controlled area. Be sure not to block any fan or air inlet areas of the lighting inverter. Doing so will cause damage to the batteries.



CABINET DIMENSIONS, ACCESSES AND CLEARANCES 12.5KW-14KW - W/ EXT. BATTERY CABINET

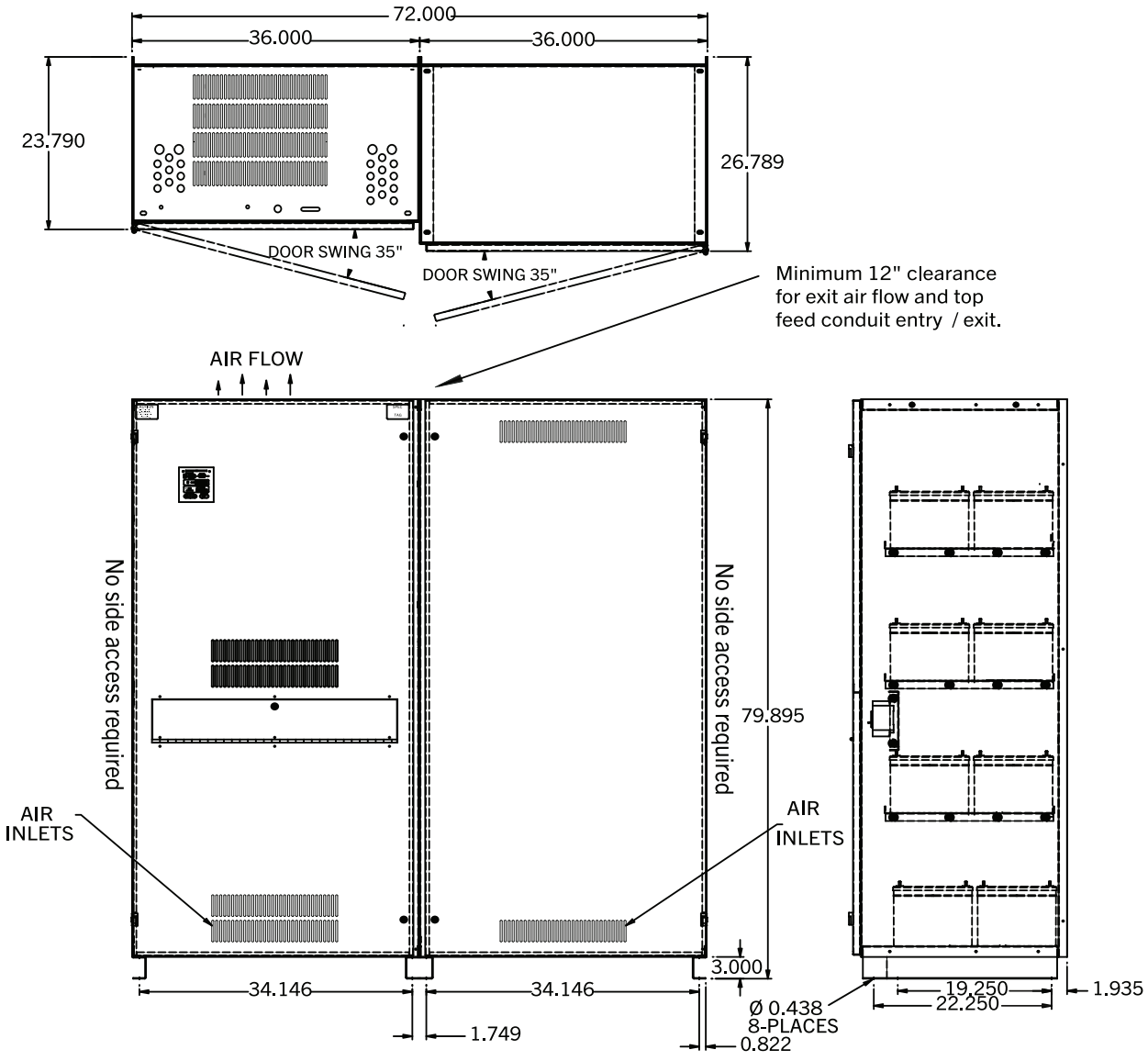
This unit is intended for installation in a temperature controlled, indoor area free of conductive contaminants.

LIGHTING INVERTER PLACEMENT

Refer to the drawing below for installation clearances and ventilation requirements. The cabinets should be placed in a dry, well ventilated or temperature controlled area. Be sure not to block any fan or air inlet areas of the lighting inverter. Doing so will cause damage to the batteries.

WEIGHT WITH BATTERIES

12.5KVA/KW	13.5KVA/KW	14.0KVA/KW
90m / 4124lbs.	90m / 4134lbs.	90m / 4576lbs.
BTU'S/HR:5967	BTU'S/HR:6445	BTU'S/HR:6684



BATTERY REQUIREMENTS

MINIMUM CHARGE TIME FOR FULL BATTERY CAPACITY = 24 HOURS

Batteries of a specific manufacturer and model are required to maintain the system's UL 924 listing. Use of batteries not recognized in the product's UL report will void its listing.

BATTERIES FOR ELU'S RATED FOR 90 MINUTES			
MANUFACTURER	**A/H**	**BATTERY MODEL NUMBER**	**FOR USE WITH MODELS RATED (QTY)**
CSB	40	GP12400	1.5kW (10)
Power Battery		PRC/TC-1255	
DEKA		45HR2000	1.5kW (10); 2.2kW (10)
CSB	55	HRL12200	
Leoch		XP12210FR	
Power Battery		PRC/TC-1290	
DEKA		24HR3000	
DEKA	90	HR3000	3.0kW (10); 3.5kW (10); 6kW (20);
GNB		S12V285/S12V285F	7.0kW (20); 10kW (30); 12.5kW (40)
CSB		HRL-12280	
Leoch		XP12300FR	
Power Battery		PRC/TC-12100	
DEKA		27HR3500	1.5kW (10); 2.2kW (10); 3.0kW (10);
DEKA	100	HR3500	3.5kW (10); 4.2kW (10); 6.0kW (20);
Northstar		NSB12-400	7.0kW (20); 7.5kW (20); 8.5kW (20);
CSB		HRL12330	10kW (30); 14kW (40)
Leoch		XP12350FR	
Power Battery		PRC/TC-12120	1.5kW (10); 2.2kW (10); 3.0kW (10);
DEKA		31HR4000	3.5kW (10); 4.2kW (10); 5kW (10);
DEKA	120	HR4000	6.0kW (20); 7.0kW (20); 7.5kW (20);
CSB		HRL12390	8.5kW (20); 10kW (20); 13.5kW (30)
Leoch		XP12400FR	
Power Battery		PRC/TC-12150	1.5kW (10); 2.2kW (10); 3.0kW (10);
DEKA	150	31HR5000	3.5kW (10); 6.0kW (20); 7.0kW (20);
CSB		HRL12540	7.5kW (20); 8.5kW (20); 10kW (20);
Leoch		XP12540FR	

BATTERIES FOR ELU'S RATED FOR 90 MINUTES			
MANUFACTURER	**A/H**	**BATTERY MODEL NUMBER**	**FOR USE WITH MODELS RATED (QTY)**
CSB Leoch	26	GP12400 LP1226	1.5kW (10)
CSB	40	GP12400	2.2kW (10); 3.0kW (10); 3.5kW (10); 6.0kW (20); 7.0kW (20); 7.5kW (20); 8.5kW (30)
DEKA CSB Leoch	35	U1HR1500 HRL12150 XP12150FR	1.5kkW (10); 2.2kW (10); 3.0kW (10)
Power Battery DEKA CSB Leoch	55	PRC/TC-1255 45HR2000 HRL12200 XP12210FR	3.5kW (10); 4.2kW (10); 5.0kW (10)
Power Battery DEKA DEKA GNB CSB Leoch	90	PRC/TC-1290 24HR3000 HR3000 S12V285/S12V285F HRL12280 XP12300FR	5.0kW (10) 6.0kW (10); 7.0kW (10); 7.5 kW (10); 8.5kW (10); 13.5kW (20); 14kW (20)
Power Battery DEKA DEKA Northstar CSB Leoch	100	PRC/TC-12100 27HR3500 HR3500 NSB12-400 FRL12330 XP12350FR	10kW(10); 12.5kW(10); 13.5kW(10), 14kW (10)
GNB	35	S12V120/S12V120F	2.2kW (10); 3.0kW (10)
GNB	35	S12V170/S12V120F	3.5kW (10); 4.2kW (10)
GNB CSB DEKA Leoch	150	S12V500/S12V500F HRL12540 HR5000 XP12540FR	7.0kW (10); 7.5kW (10); 8.5kW (10); 10.0kW (10); 12.5kW (10); 13.5kW (10); 14.0kW (10)

BATTERY INSTALLATION AND WIRING

REFER TO THE BATTERY WIRING DIAGRAM ON THE INNER DOOR OF THE INVERTER OR BATTERY CABINET

BATTERY INSTALLATION

Batteries must be installed with the proper orientation. Note the orientation shown on the battery wiring diagrams attached to the inner door of the inverter or battery cabinet. Battery hold down brackets are not standard equipment. If the battery bracket option was purchased, there will be a bracket installation diagram included with the brackets supplied. See ***"Installation and Safety Precautions".***

TEMPERATURE COMPENSATED CHARGING SYSTEM

The unit is equipped with an ambient compensated charging system the automatically adjusts the charging voltage dependent and the ambient temperature detected by probe located next to the battery. For units where the battery is in the inverter cabinet, the probe is already mounted. If not, the probe should be mounted on the top most battery shelve on top of a battery. Ty-wrap the probe to a battery cable. For units with a separate battery cabinet, the probe needs to be positioned as shown on the battery wiring drawings on the inner door of the inverter or battery cabinet as part of the battery installation. The probe is coiled up in the inverter cabinet ready be fished through to the battery cabinet. The probe should be mounted on the top most battery shelve on top of a battery. Ty-wrap the probe to a battery cable.

BATTERY WIRING 1.5KW - 14KW

The DC voltage for the system is 120V. Batteries are wired as shown in the diagram on the inner door of the inverter or battery cabinet. Included with the lighting inverter is a kit for the wiring. Follow the steps and the corresponding diagram on the inner door of the inverter or battery cabinet, noting the different lengths and labels of wire.

1. Place batteries in the lower section of the lighting inverter or into the external battery cabinet as shown in the wiring diagram. Battery orientation is important. Install only as shown.
2. Locate the proper sections of wire that correspond to the wiring diagram.
3. Wire the batteries as shown, taking note of the polarity.
4. Once the batteries are wired, use a volt meter to measure the positive and negative leads, verify the polarity.The voltmeter should read approximately +120VDC. If it is different recheck the wiring and test again.
5. **DO NOT PLUG IN DC CONNECTOR UNTIL READY TO APPLY AC POWER**. Insert the DC male connector into the DC female connector on the lighting inverter.

REFER TO THE BATTERY WIRING DIAGRAM ON THE INNER DOOR OF THE INVERTER OR BATTERY CABINET

The minimum DC bus voltage to turn the unit on is 105VDC.

MINIMUM CHARGE TIME FOR FULL BATTERY CAPACITY = 24 HOURS

Batteries of a specific manufacturer and model are required to maintain the system's UL 924 listing. Use of batteries not recognized in the product's UL report will void its listing.

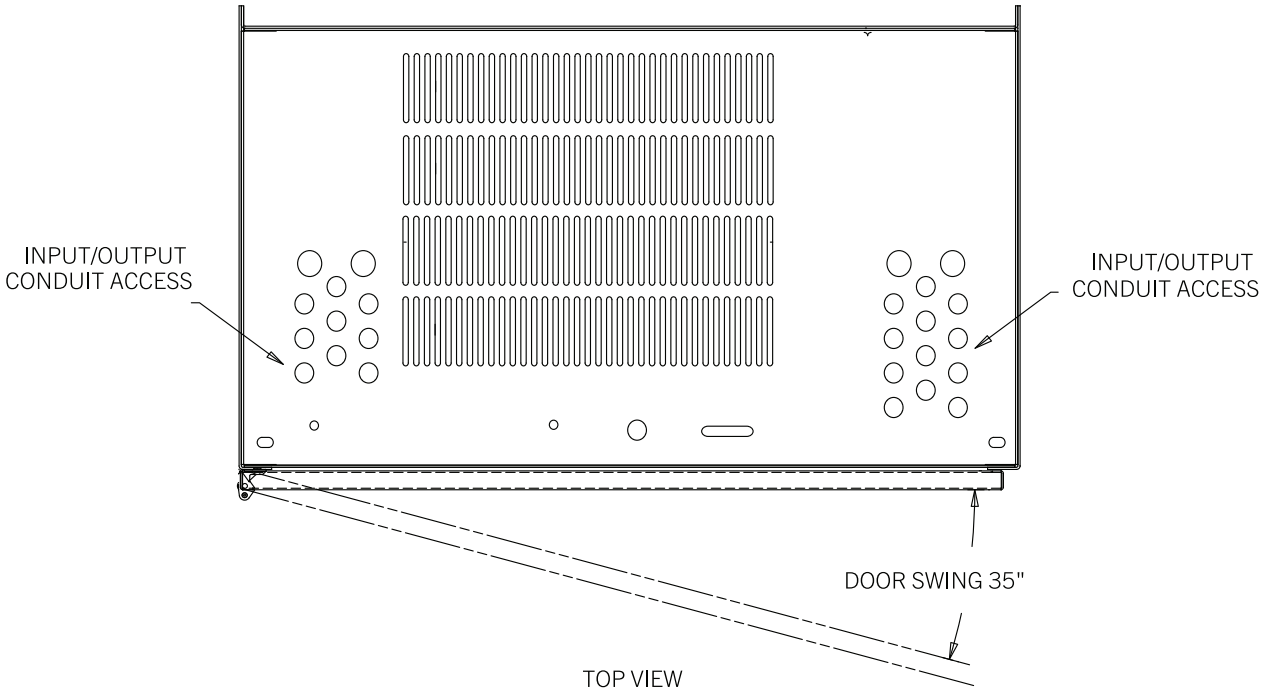
INPUT AND OUTPUT CONDUIT ENTRY POINTS

WARNING

RISK OF ELECTRICAL SHOCK

THE LIGHTING INVERTER RECEIVES POWER FROM MORE THAN ONE SOURCE. BE SURE ALL UTILITY CIRCUIT BREAKERS ARE IN THE OFF POSITION AND THE BATTERY CONNECTOR IS UNPLUGGED BEFORE SERVICING.

Do not remove the debris shield from the top of the unit until ready for start up.



INPUT AND OUTPUT WIRING

⚠ WARNING

RISK OF ELECTRICAL SHOCK

THE LIGHTING INVERTER RECEIVES POWER FROM MORE THAN ONE SOURCE. BE SURE ALL UTILITY CIRCUIT BREAKERS ARE IN THE OFF POSITION AND THE BATTERY CONNECTOR IS UNPLUGGED BEFORE SERVICING.

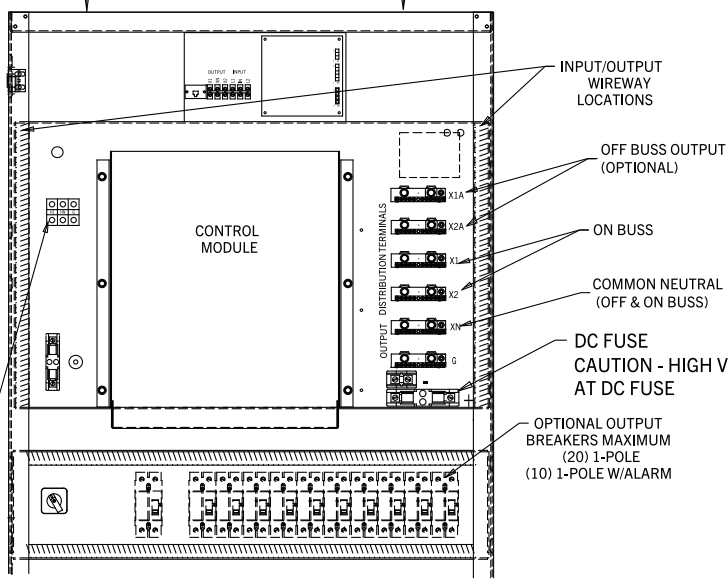
Lighting Inverter Wiring With Distribution

Input wiring is performed at the input terminal strip. Output wiring is performed at the output terminal strip and terminated at the distribution breakers on the front panel. It is recommended that all wiring is performed according to NEC standards and local codes. **NOTE: On units with 120/208V or 120/240V outputs the loads must be split evenly between X1 - XN and X2 - XN. This also applies to X1A - XN and X2A - XN where applicable.**

Note: On units with 120/208V or 120/240V outputs the loads must be split evenly between X1 - XN and X2 - XN. This also applies to X1A - XN and X2A - XN where applicable.

INPUT AND OUTPUT LOCATIONS TYPICAL ALL SIZES

Pre-punched conduit knockout.



NOTE: LLX AND GGX MODELS - REQUIRE AN INPUT NEUTRAL

OUTPUT DISTRIBUTION TERMINALS

PK9 WIRE RANGE
#10-14 AWG, TORQUE=20 IN. LB.
#8, TORQUE=25 IN. LB.
#4-6 AWG, TORQUE=35 IN. LB.

CU BAR WITH TA-2/0
WIRE RANGE #14-2/0
TORQUE=120 IN LB.
(300A MAX.)

KW	INPUT VOLTAGE	WIRE RANGE	TORQUE
1.5-2.2	ALL	18AWG - 6AWG	17.7 IN. LBS.
3-3.5	208, 240	18AWG - 6AWG	17.7 IN. LBS.
3.0-3.5	120, 277, 347, 480, 600	8AWG - 2/0	110 IN. LBS.
4.2-14	ALL	8AWG - 2/0	110 IN. LBS.

INPUT WIRE MUST BE COPPER

OUTPUT

120/208V	X1-XN=120V	X2-XN=120V	X1-X2=208V
120/240V	X1-XN=120V	X2-XN=120V	X1-X2=240V
120/277V	X1-XN=120V	X2-XN=277V	
120/347V	X1-XN=120V	X2-XN=347V	

OFF BUS OUTPUT

120/208V	X1A-XN=120V	X2A-XN=120V	X1A-X2A=208V
120/240V	X1A-XN=120V	X2A-XN=120V	X1A-X2A=240V
120/277V	X1A-XN=120V	X2A-XN=277V	
120/347V	X1A-XN=120V	X2A-XN=347V	

OUTPUT DISTRIBUTION

Termination for hardwired connection is standard. Distribution has 20 available spaces for circuit breakers. Optional output circuit breakers -

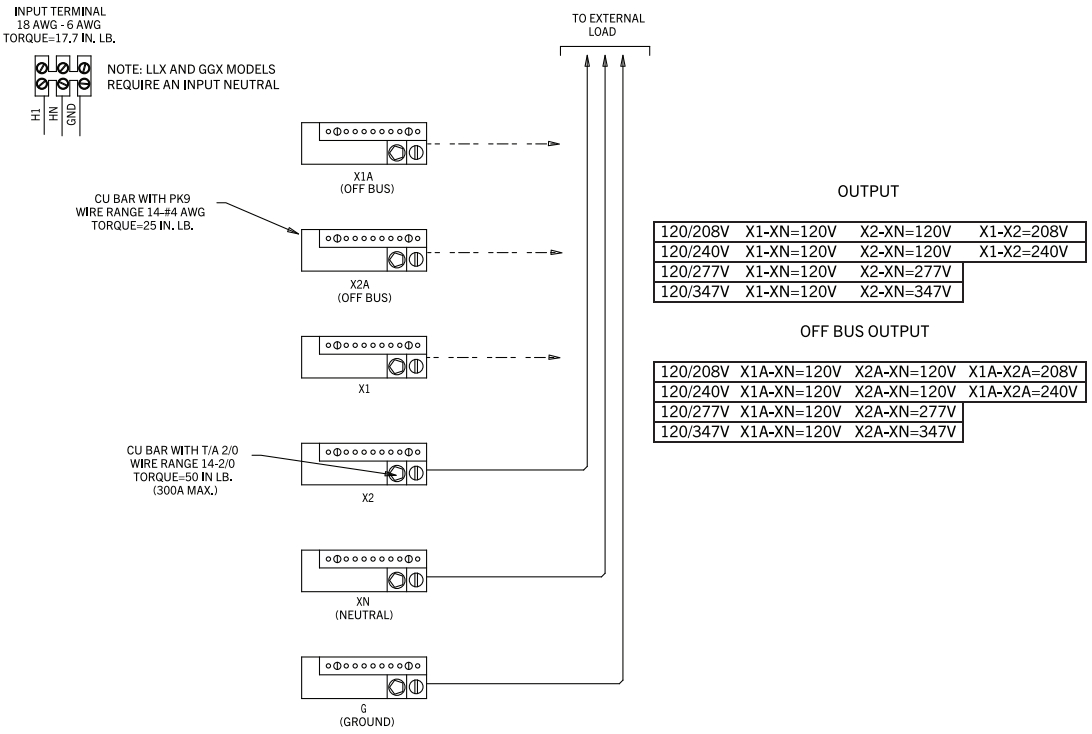
- without trip indicator alarm (un-monitored) = 20 spaces available.
- with trip indicator alarm (monitored) = 13 spaces available if 120V or 277V. 10 spaces available if 347V.

Single pole breakers take up one space, two pole and monitored single pole breakers take up to two spaces. Do not exceed 20 spaces.

OUTPUT WIRING

Note: On units with 120/208V or 120/240V outputs the loads must be split evenly between X1 - XN and X2 - XN. This also applies to X1A - XN and X2A - XN where applicable.

NOTE: On units with 120/208V or 120/240V outputs the loads must be split evenly between X1 - XN and X2 - XN. This also applies to X1A - XN and X2A - XN where applicable

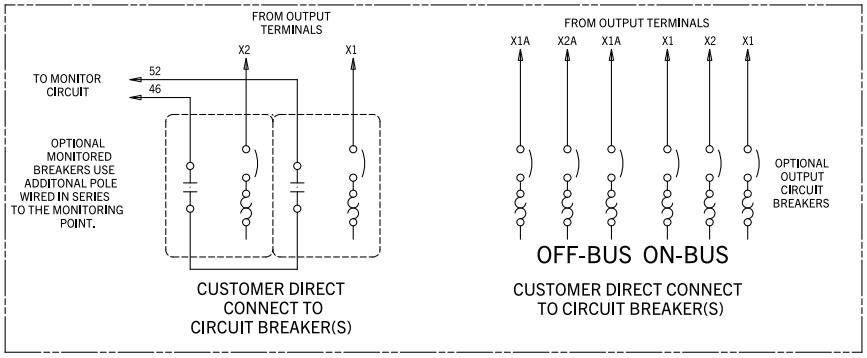


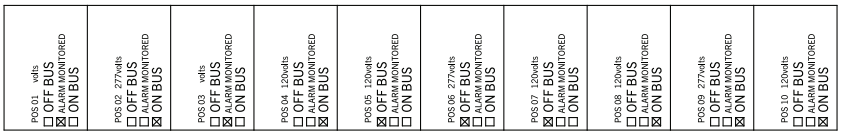
OUTPUT

120/208V	X1-XN=120V	X2-XN=120V	X1-X2=208V
120/240V	X1-XN=120V	X2-XN=120V	X1-X2=240V
120/277V	X1-XN=120V	X2-XN=277V	
120/347V	X1-XN=120V	X2-XN=347V	

OFF BUS OUTPUT

120/208V	X1A-XN=120V	X2A-XN=120V	X1A-X2A=208V
120/240V	X1A-XN=120V	X2A-XN=120V	X1A-X2A=240V
120/277V	X1A-XN=120V	X2A-XN=277V	
120/347V	X1A-XN=120V	X2A-XN=347V	





A LEGEND MARKER IS PROVIDED TO SHOW THE VOLTAGE AND ARRANGEMENT. FIELD WIRE TO LOAD.

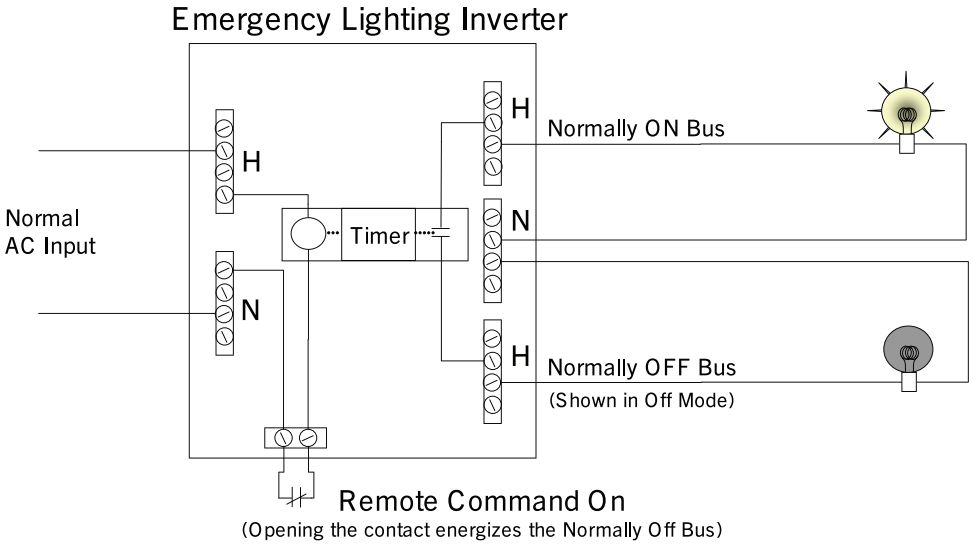
OPTIONAL TIMED OFF BUS SET UP

OPTIONAL TIMED OFF BUS SET UP

DESCRIPTION

In many lighting system applications, there are designated lights that remain off until a power outage occurs. Available on the model ELU is a Timed Normally Off Bus option. This option incorporates a programmable timer which controls an internal contactor located between the output of the inverter's "Normally On" uninterrupted output and the Normally Off emergency lighting. When utility power is lost, voltage is inadequate or a remote input "command on" signal is received, emergency power is applied to these lights after a user programmable time period has expired. This is especially useful in applications where there may be only a short duration of power loss (a few seconds), in which it may not be desirable for the Normally Off lighting to illuminate. With an additional timer, a "delay return" or "timed off" feature is provided. In this case, the timer can be configured so that there is a delay in the shut off of the emergency lighting when utility power is restored. This option is critical in applications where there is HID Sodium lighting used for normal lighting. Once utility power is restored to HID Sodium lighting, they require 10 or 15 minutes to reach full illumination. The Timed Normally Off bus compensates for that delay by keeping the Normally Off emergency lighting turned on until the HID lighting is fully illuminated. In certain applications, the voltage required to illuminate the emergency lighting is different than the utility voltage available at the lighting panel and at the input of the inverter. In this case, the inverter's isolation transformer is used to supply the normally off bus with the appropriate voltage. In addition, many inverter models provide more than one uninterrupted output voltage; for example 120V & 277V. This flexibility allows the inverter to supply Normally On and Normally Off emergency lighting fixtures with a different voltage if required. Example: Normally On emergency lighting may require 277V, while Normally Off emergency fixtures may require 120V. There is no need for external transformers.

The Normally Off bus is rated at 100% of full load capacity. The diagram below represents how the Normally Off Bus works:



For location of Remote Command On terminals see *"Appendix A - Component Location Diagram"*

Under all conditions, uninterrupted power is being fed to the Normally On lighting. When utility power is present (as depicted above), the contactor between output of the inverter and the Normally Off lighting is open; thus the Normally Off lighting is not illuminated. When utility power is lost, the timer senses it and in turn delays the energizing of the contactor. Once the contactor is energized, emergency power is applied to the Normally Off lighting. If an additional timer is implemented, when utility power returns, the timer senses it and delays the de-energizing of the contactor, according to the user programmed time period ("delay return" or "timed off" function). Once the contactor is deenergized, the Normally Off lighting is turned off. See "Optional Timed Off Bus Setup" .

OPTIONAL TIMED OFF BUS SET UP

TIMED OFF BUS LOGIC AND CIRCUIT BOARD

SETTING UP THE DIP SWITCHES AND OFF BUS TIMING CIRCUITS ONLY APPLICABLE WITH STANDARD MONITOR SEE “APPENDIX A - COMPONENT LOCATION DIAGRAMS” FOR BOARD LOCATION.

I/O FUNCTION AND CAPABILITIES

LL1, LL2 (NP1):	FUSED 120-240VAC FROM INPUT OF CONTROL MODULE
XX1, XN:	FUSED 120VAC FROM OUPUT OF CONTROL MODULE
L1-2:	FUSED 120VAC OUTPUT TO RUN OUTBOARD CIRCUITRY
CONTACTOR L, N:	FUSED OUTPUT TO CONTACTOR(S) 120V-5A
GENERAL ALARM:	UNPROTECTED OUTPUT SIGNAL CONTACTS
REMOTE PANELS:	5V OUT TO N/O CONTACTS ON REMOTE POWER PANELS

* SW1 - Alarm and Off Bus Positions - Disable position typically used when the inverter is having service or maintenance done. If you do not want the off bus lights or the alarm contacts to engage during this time, place these positions "off" while doing service. Be sure to place them back to the "on " position when service or maintenance is completed.

NOTE:

ALL TIME DELAY RANGES ARE DETERMINED BY ASSOCIATED JUMPER AND ADJUSTED WITHIN THAT RANGE BY ASSOCIATED POT.

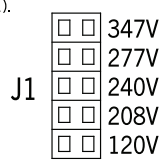
CLOCKWISE=INCREASE TIME,
COUNTER CLOCKWISE=DECREASE TIME.

FOR 1-9 SEC, PLACE JUMPER IN POSITION 3
FOR 10-90 SEC PLACE JUMPER IN POSITION 2
FOR 100-900 SEC PLACE JUMPER IN POSITION 1

OPERATION OF CONTROLS

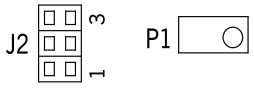
(SEE BOARD LAYOUT ON NEXT PAGE)

1 J1 VOLTAGE SELECT JUMPER: USED TO SELECT THE PROPER SCALING FOR THE INPUT LINE VOLTAGE PRESENT AT LL1-LL2 (NP1).

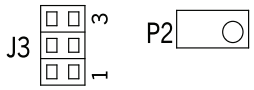


2. SW1: ENABLES AND DISABLES THE OFF BUSS AND GENERAL ALARM CONTACTS, AND ALSO CONTROLS WHEN THE OFF BUSS WILL ENGAGE (-20% OR -50% LINE VOLTAGE).

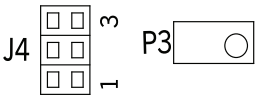
3. OFF BUSS ENGAGE DELAY: 1SEC-15MIN. DELAY IS DETERMINED BY J2 AND P1(0-100K POT).



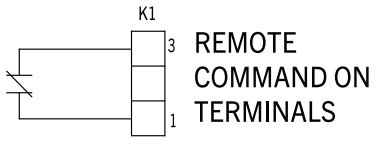
4. OFF BUSS DISENGAGE DELAY: 1SEC-15MIN. DELAY IS DETERMINED BY J3 AND P2(0-100K POT).



5. GENERAL ALARM DELAY: 1SEC-15MIN. DELAY IS DETERMINED BY J4 AND P3(0-100K POT).



6. REMOTE POWER PANEL INPUT: CONNECTED TO N/O CONTACTS. WHEN POWER IS PRESENT AT PANEL, CONTACT IS CLOSED. WHEN POWER IS LOST FROM ANY PANEL THE OFF BUSS WILL ENGAGE AFTER DELAY. JUMPER PINS 1 AND 3 IF NOT BEING USED.

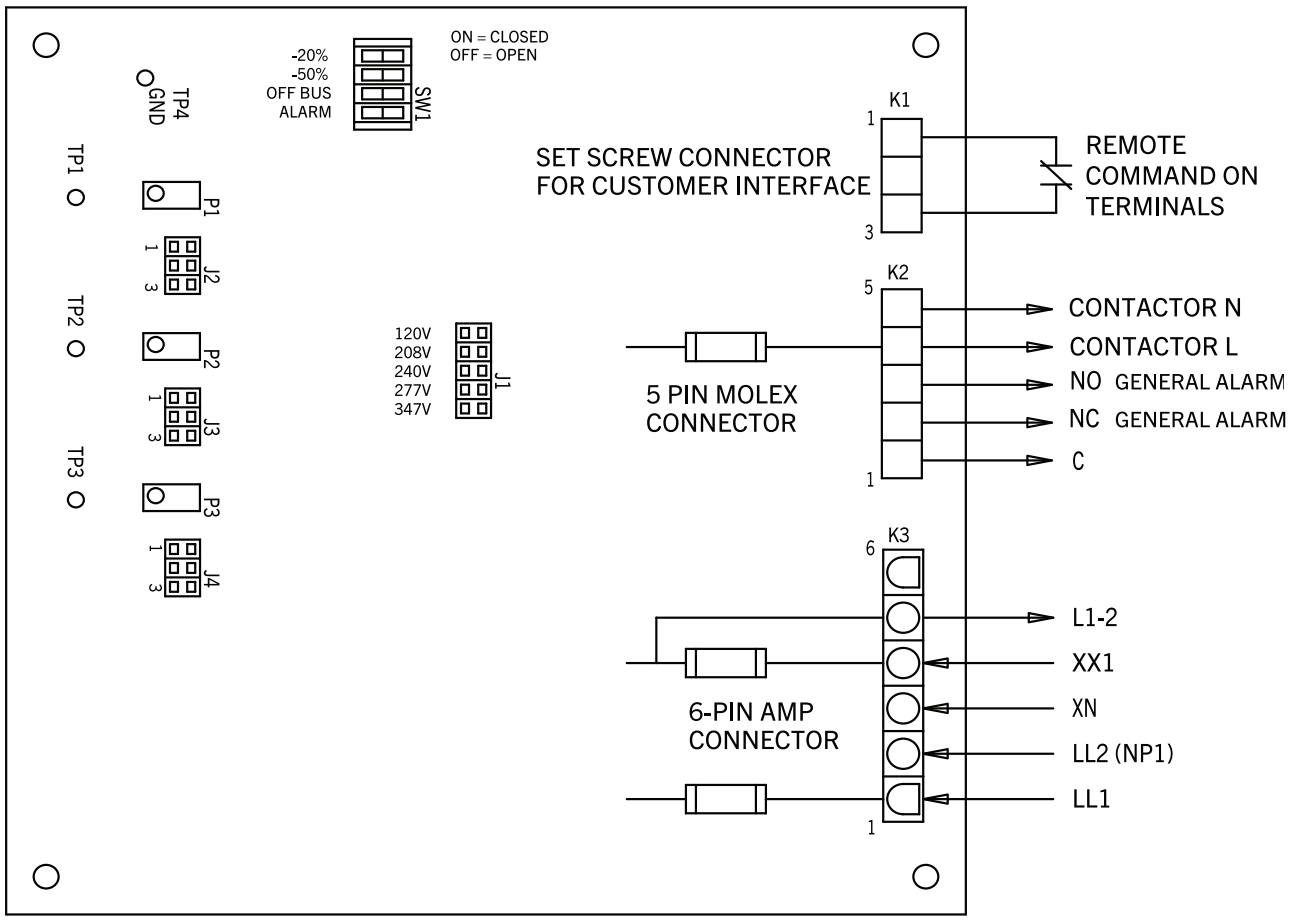


OPTIONAL TIMED OFF BUS SETUP CONTINUED

TIMED OFF BUS CONTROL BOARD LAYOUT

ONLY APPLICABLE WITH STANDARD MONITOR SEE "APPENDIX A - COMPONENT LOCATION DIAGRAMS" FOR BOARD LOCATION.

OFF BUSS ON DELAY FACTORY PRESET AT 1 SECONDS
OFF BUSS RETURN DELAY FACTORY PRESET AT 15 MINUTES



Note: ALL TIME DELAY RANGES ARE DETERMINED BY ASSOCIATED JUMPER AND ADJUSTED WITHIN THAT RANGE BY ASSOCIATED POT.

*NOTE:

ALL TIME DELAY RANGES ARE DETERMINED

BY ASSOCIATED JUMPER AND ADJUSTED WITHIN

THAT RANGE BY ASSOCIATED POT.

CLOCKWISE=INCREASE TIME,

COUNTER CLOCKWISE=DECREASE TIME.

FOR 1-9 SEC, PLACE JUMPER IN POSITION 3

FOR 10-90 SEC PLACE JUMPER IN POSITION 2

FOR 100-900 SEC PLACE JUMPER IN POSITION 1

OPTIONAL EXTERNAL BYPASS INSTALLATION

The Model ELU is available with an external, make-before-break (MBB) or break-before-make (BBM), wrap-around maintenance bypass switch option. Either bypass option is available on inverter systems where the nominal input and output voltages are the same and output distribution breakers are external from the Inverter enclosure. When in bypass mode, the switch will bypass the Inverter system and feed the load power directly from the AC input power source. The Inverter system's main input breaker may then be opened, allowing the Inverter to be fully serviced, including the complete maintenance and replacement of circuit cards or components. Each bypass switch includes an auxiliary contact to indicate the position of the switch (normal or bypass) for remote monitoring purposes. The MBB switch includes a second auxiliary contact that must be wired to the inverter and will invoke the system's static bypass before the switch is turned to the bypass position.

Both switches are designed to be wall-mounted, and are provided with a padlock attachment to accommodate lock out / tag-out (LOTO) procedures during maintenance. Use of the padlock attachment is optional for the BBM switch, but mandatory for the MBB switch. See WARNING instructions provided.

Optional Break-Before-Make External Maintenance Bypass: On Inverter systems where the nominal input and output voltages are the same and output distribution breakers are external from the Inverter enclosure, an external, wall mounted, break before make, wrap around maintenance bypass switch is available for field installation. When in bypass mode, the switch will bypass the Inverter system and feed the load power directly from the AC input power source. The Inverter system's main input breaker may then be opened, allowing the Inverter to be fully serviced, including the complete maintenance and replacement of circuit cards or components. The bypass switch includes an auxiliary contact to indicate the position of the switch (normal or bypass) for remote monitoring purposes. The bypass switch is provided with a padlock attachment for lockout purposes during maintenance.

Optional Make-Before-Break External Maintenance Bypass: On Inverter systems where the nominal input and output voltages are the same and output distribution breakers are external from the Inverter enclosure, an external, wall mounted, push to turn, make before break, wrap around maintenance bypass switch is available for field installation. When in bypass mode, the switch will bypass the Inverter system and feed the load power directly from the AC input power source. The Inverter system's main input breaker may then be opened, allowing the Inverter to be fully serviced, including the complete maintenance and replacement of circuit cards or components. The bypass switch includes an auxiliary contact to indicate the position of the switch (normal or bypass) for remote monitoring purposes. A second auxiliary contact must be wired to the inverter and will invoke the system's static bypass before the switch is turned to the bypass position. The bypass switch is provided with a padlock attachment for lockout purposes during maintenance. **POTENTIAL FOR BACK FEED**

EXISTS WHILE OPERATING THIS MAKE BEFORE BREAK SWITCH. KEEP SWITCH LOCKED-OUT AT ALL TIMES TO PREVENT UNAUTHORIZED ACCESS / OPERATION. USE PROPER LOCK-OUT / TAG-OUT PROCEDURE BEFORE OPERATING THIS SWITCH. DO NOT OPERATE THIS SWITCH WHEN THE INVERTER IS ON BATTERY POWER.

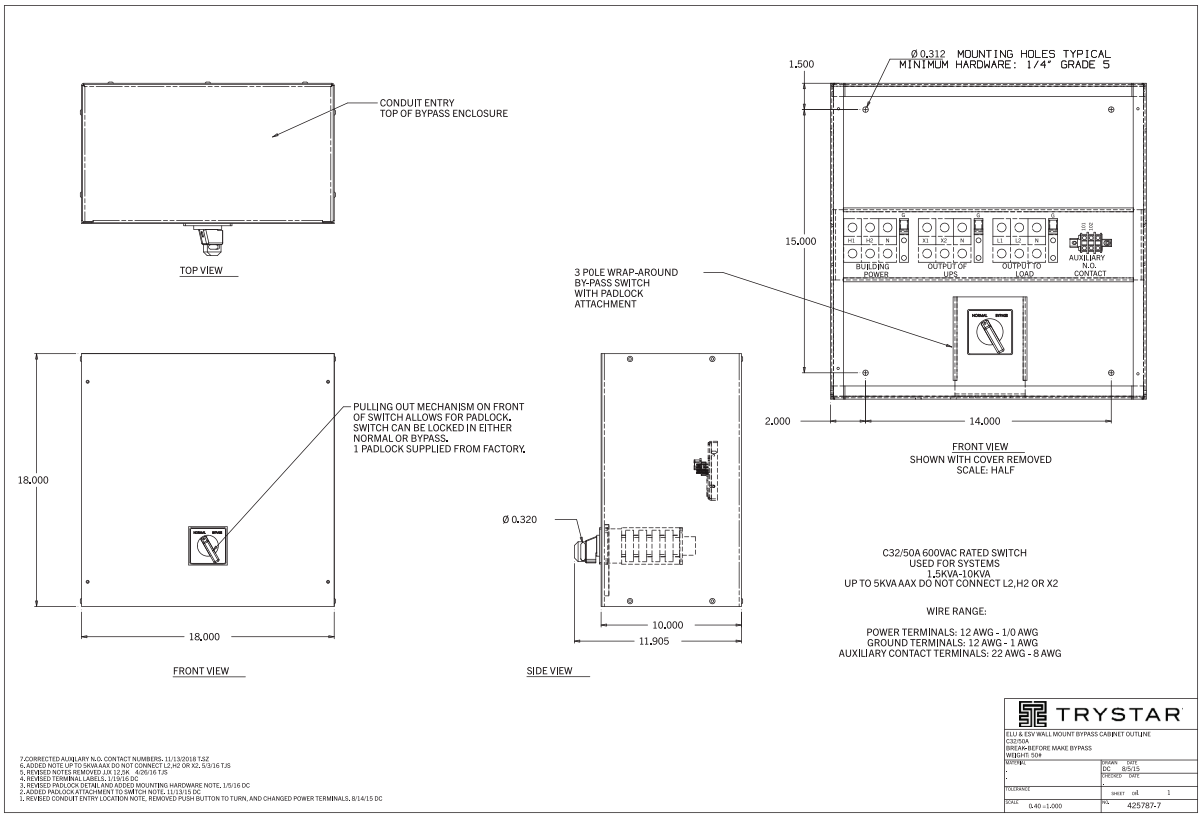
⚠ CAUTION ⚠

TO REDUCE THE RISK OF FIRE, CONNECT ONLY TO A CIRCUIT PROVIDED WITH (+) AMPERES MAXIMUM BRANCH CIRCUIT OVERCURRENT PROTECTION IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, ANSI/NFPA 70."

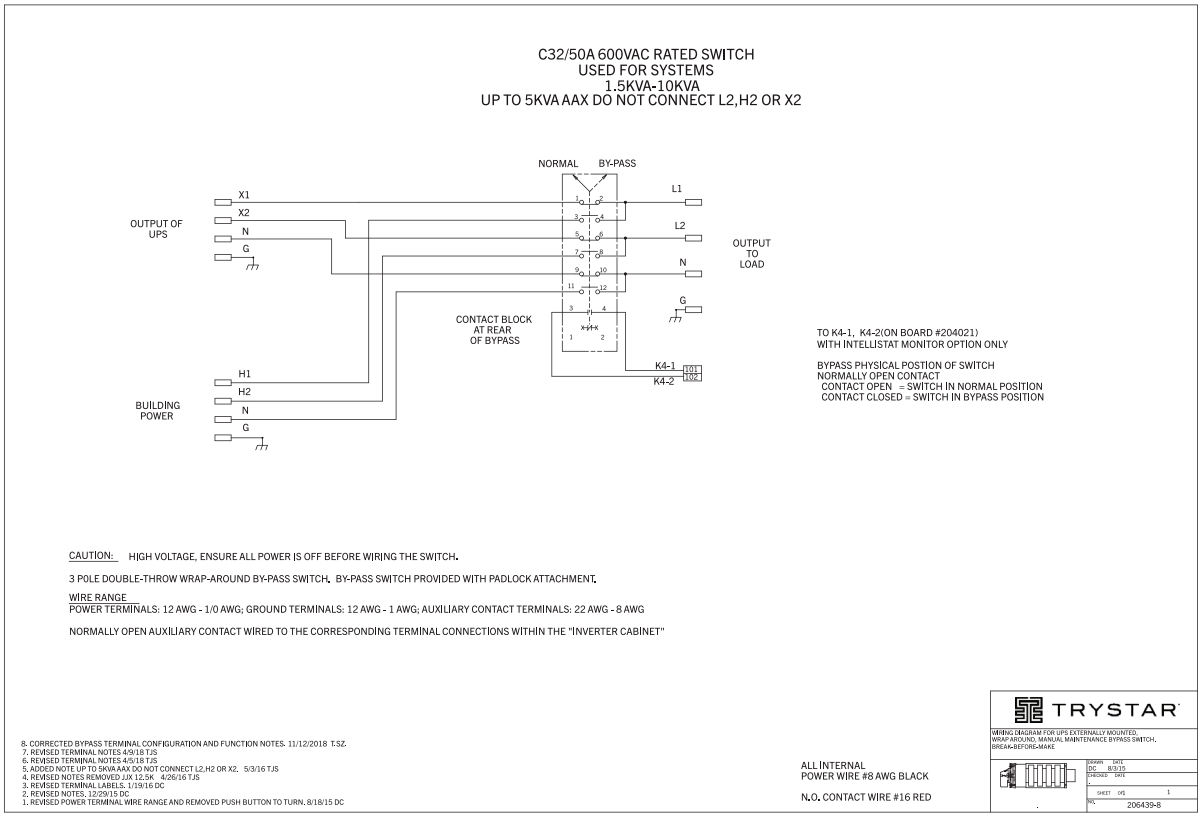
KVA	AAX		LLX		GGX		JJX	
	BREAKER SIZE (AMPS)	MINIMUM WIRE SIZE	BREAKER SIZE (AMPS)	MINIMUM WIRE SIZE	BREAKER SIZE (AMPS)	MINIMUM WIRE SIZE	BREAKER SIZE (AMPS)	MINIMUM WIRE SIZE
1.5	20	12	N/A	N/A	N/A	N/A	10	14
2.2	25	10	N/A	N/A	N/A	N/A	10	14
3	35	8	20	12	20	12	15	14
3.5	40	8	25	10	20	12	20	12
4.2	45	6	30	8	25	10	20	12
5	55	6	30	8	30	8	25	10
6	N/A	N/A	40	8	35	8	30	8
7	N/A	N/A	45	6	40	8	35	8
7.5	N/A	N/A	50	6	40	8	35	8
8.5	N/A	N/A	55	6	45	6	40	8
10	N/A	N/A	65	4	55	6	50	6
12.5	N/A	N/A	80	2	70	4	60	4
14	N/A	N/A	85	2	75	2	65	4

Wire sizes are based on a the temperature derating factor of .88 for 75°C rated wire in a 40°C environment per NEC Table 310.15(B)(2)(a).

BREAK BEFORE MAKE, 1.5-10KVA

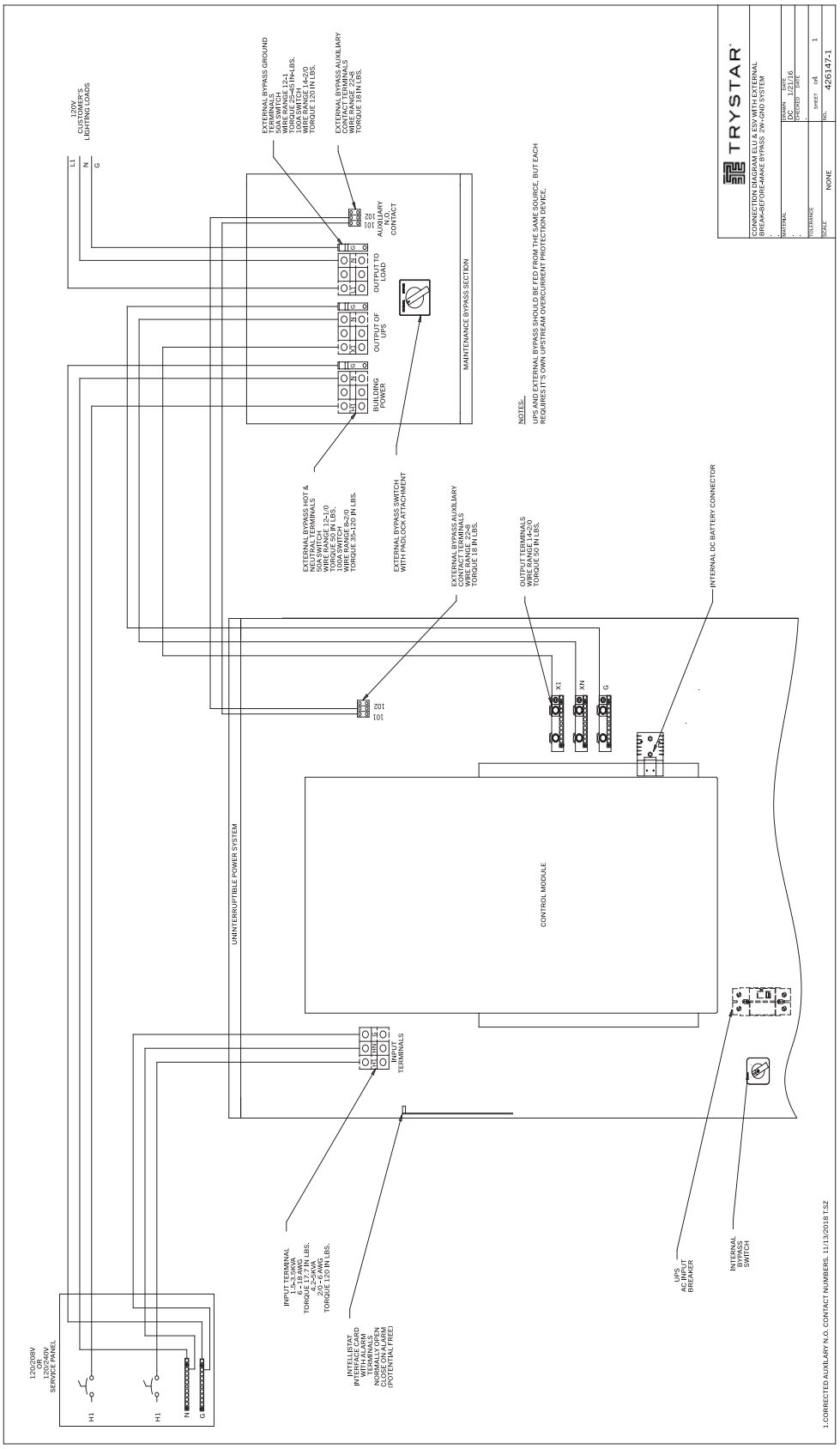


7.CORRECTED AUXILIARY N.O. CONTACT NUMBERS, 11/13/2018 T.SZ
6. ADDED NOTE UP TO 5KVA AAX DO NOT CONNECT L2,H2 OR X2, 5/3/16 TJS
5. REVISED NOTES, 4/26/16 TJS
4. REVISED TERMINAL LABELS, 1/12/16 DC
3. REVISED PADLOCK DETAIL AND ADDED MOUNTING HARDWARE NOTE, 1/5/16 DC
2. ADDED PADLOCK ATTACHMENT TO SWITCH NOTE, 11/13/15 DC
1. REVISED CONDUIT ENTRY LOCATION NOTE. REMOVED PUSH BUTTON TO TURN, AND CHANGED POWER TERMINALS, 8/14/15 DC

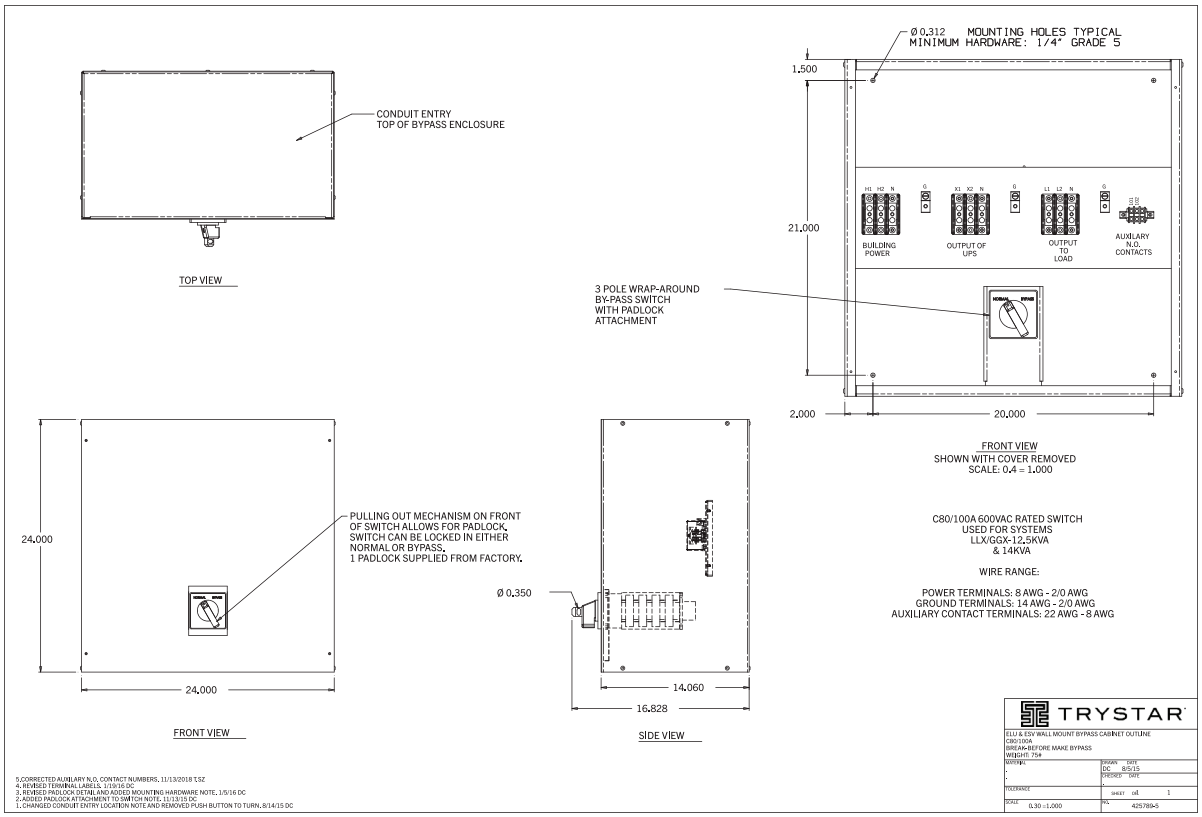


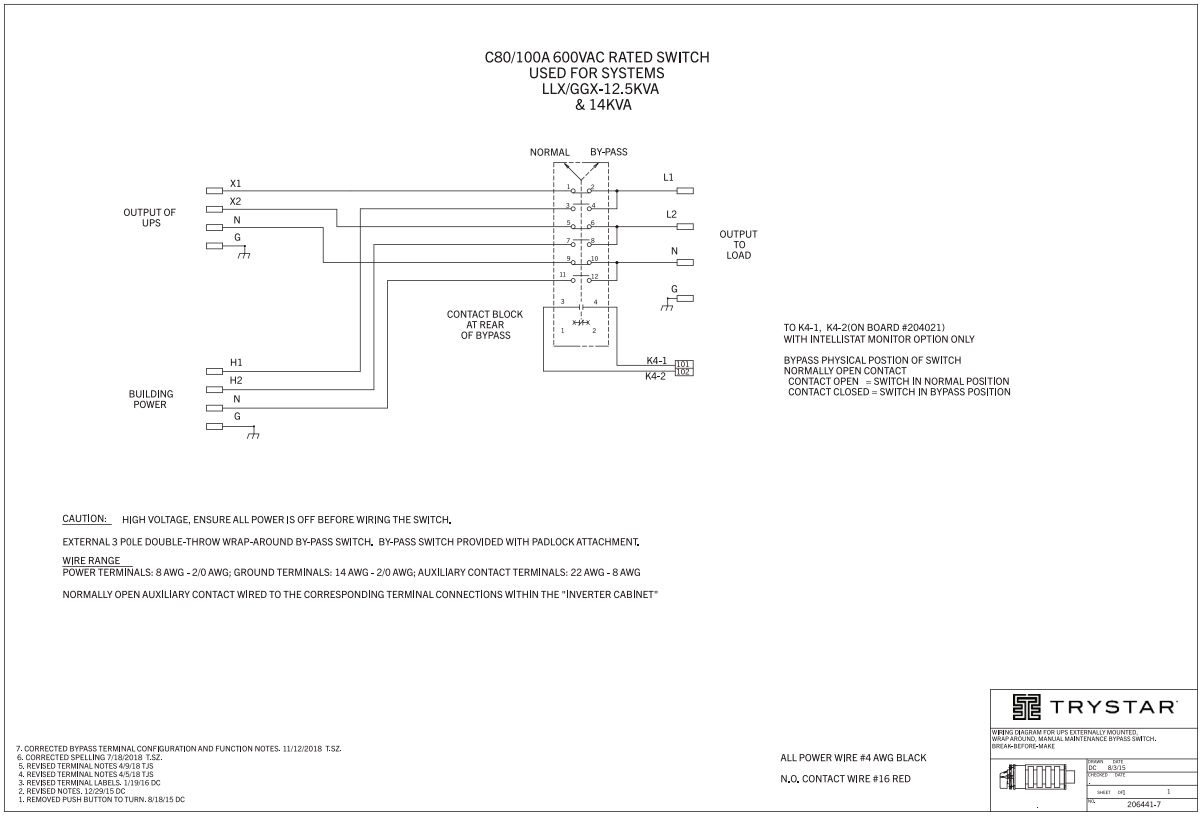
8. CORRECTED BYPASS TERMINAL CONFIGURATION AND FUNCTION NOTES. 11/12/2018 T.SZ.
7. REVISED TERMINAL NOTES 4/9/18 TJS
6. REVISED TERMINAL NOTES 4/5/18 TJS
5. ADDED NOTE UP TO 5KVA AAX DO NOT CONNECT L2,H2 OR X2. 5/3/16 TJS
4. REVISED NOTES REMOVED JJX 12.5K 4/26/16 TJS
3. REVISED TERMINAL LABELS. 1/19/16 DC
2. REVISED NOTES, 12/29/15 DC
1. REVISED POWER TERMINAL WIRE RANGE AND REMOVED PUSH BUTTON TO TURN. 8/18/15 DC

BREAK BEFORE MAKE, 1.5-10KVA - SYSTEM WIRING

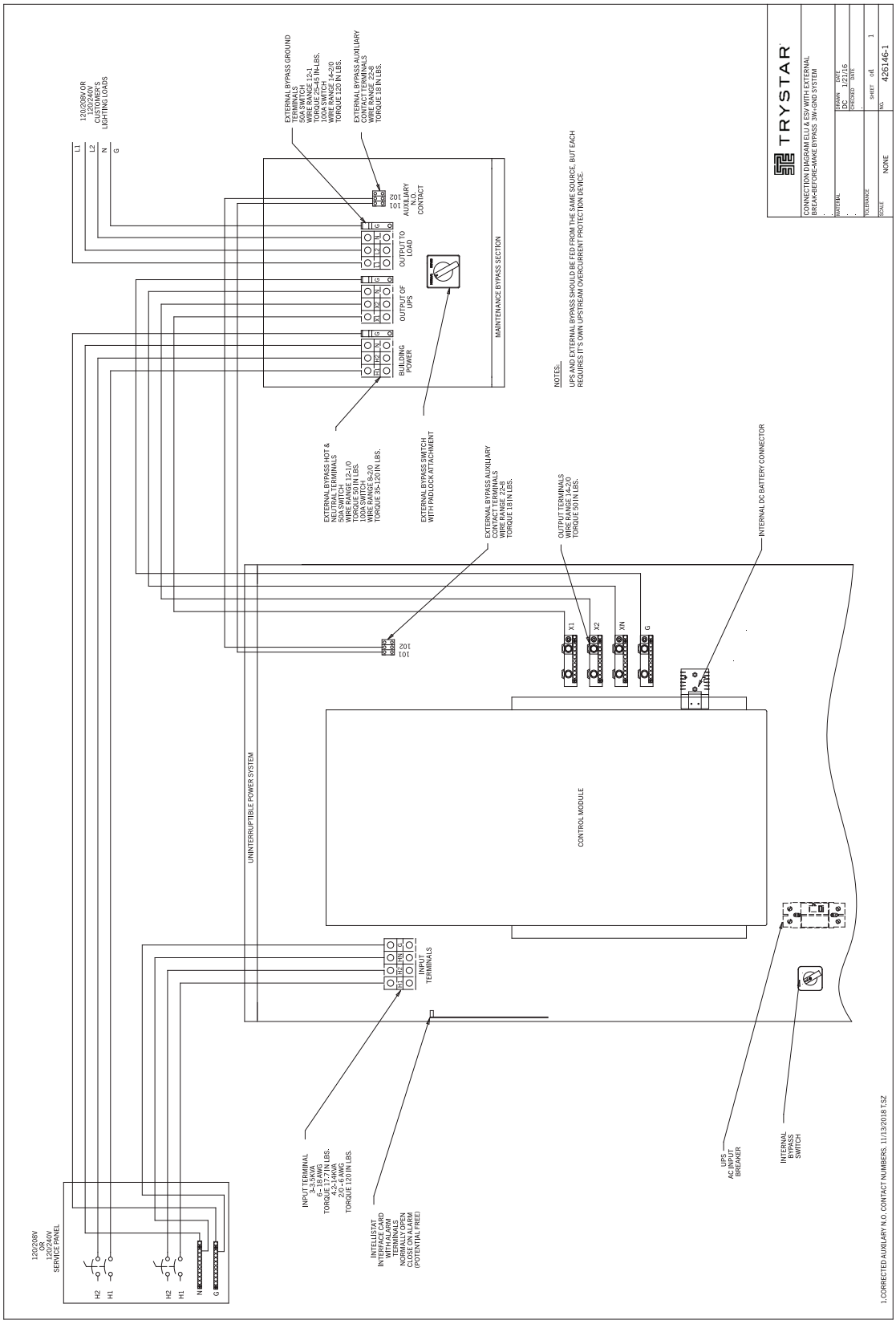


BREAK BEFORE MAKE, LLX AND GGX, 12.5KVA AND 14 KVA





BREAK BEFORE MAKE, LLX AND GGX, 12.5KVA AND 14 KVA - SYSTEM WIRING

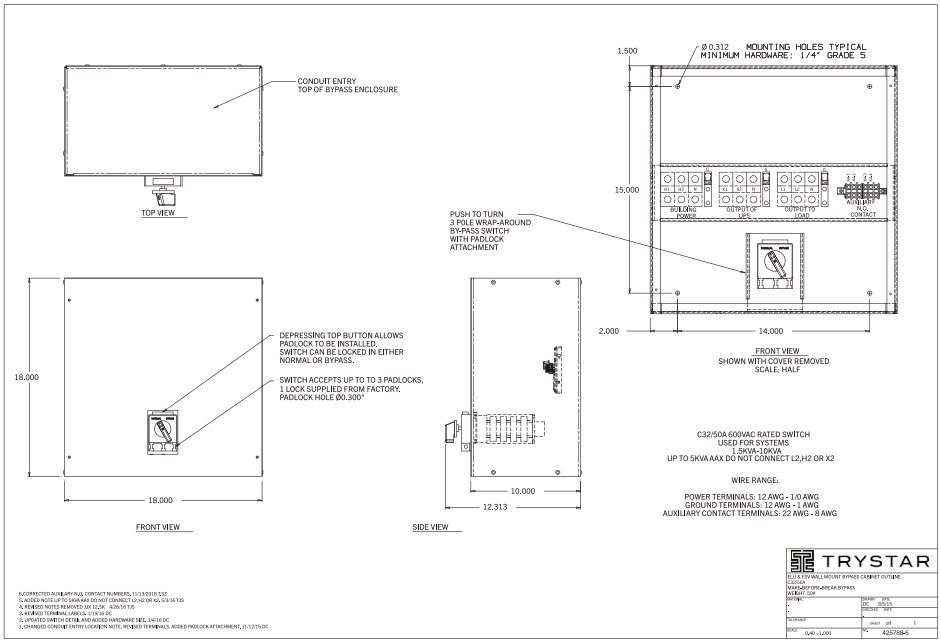


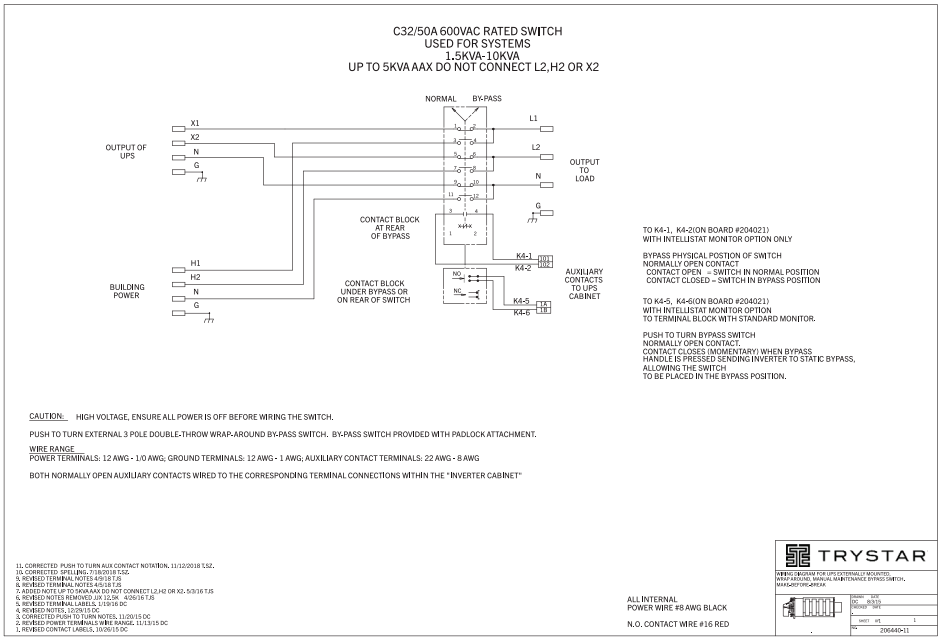
MAKE BEFORE BREAK, 1.5-10KVA

WARNING

AUTHORIZED PERSONNEL ONLY

POTENTIAL FOR BACK FEED EXISTS WHILE OPERATING THIS MAKE BEFORE BREAK SWITCH. KEEP SWITCH LOCKED-OUT AT ALL TIMES TO PREVENT UNAUTHORIZED ACCESS / OPERATION. USE PROPER LOCK-OUT / TAG-OUT PROCEDURE BEFORE OPERATING THIS SWITCH. DO NOT OPERATE THIS SWITCH WHEN THE UPS IS ON BATTERY POWER.



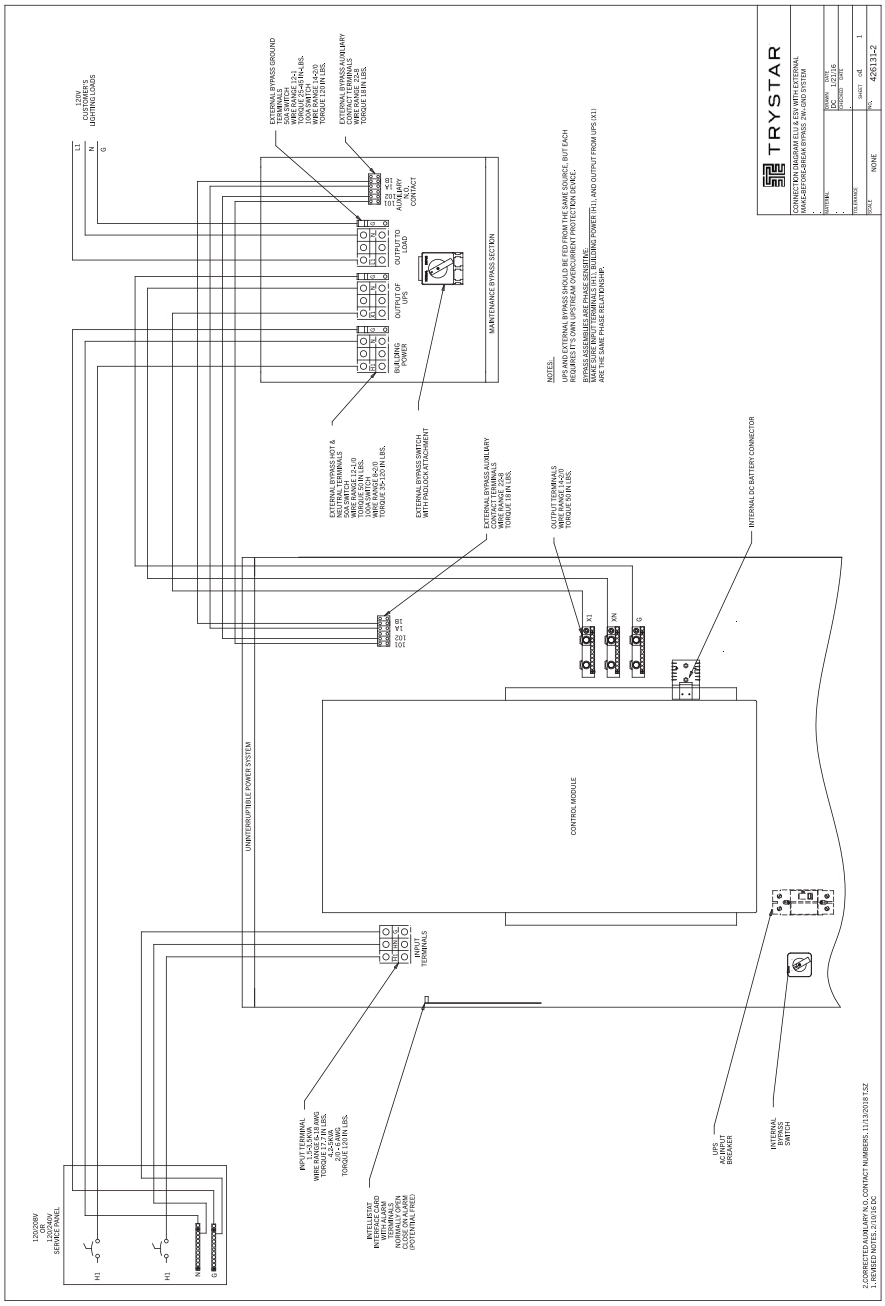


MAKE BEFORE BREAK, 1.5-10KVA - SYSTEM WIRING

WARNING

AUTHORIZED PERSONNEL ONLY

POTENTIAL FOR BACK FEED EXISTS WHILE OPERATING THIS MAKE BEFORE BREAK SWITCH. KEEP SWITCH LOCKED-OUT AT ALL TIMES TO PREVENT UNAUTHORIZED ACCESS / OPERATION. USE PROPER LOCK-OUT / TAG-OUT PROCEDURE BEFORE OPERATING THIS SWITCH. DO NOT OPERATE THIS SWITCH WHEN THE UPS IS ON BATTERY POWER.

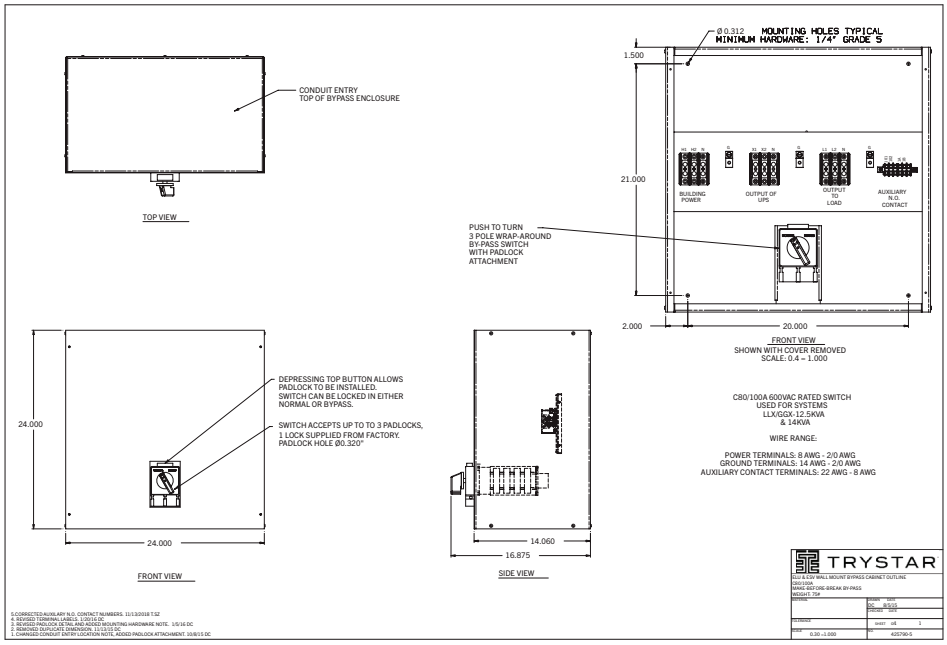


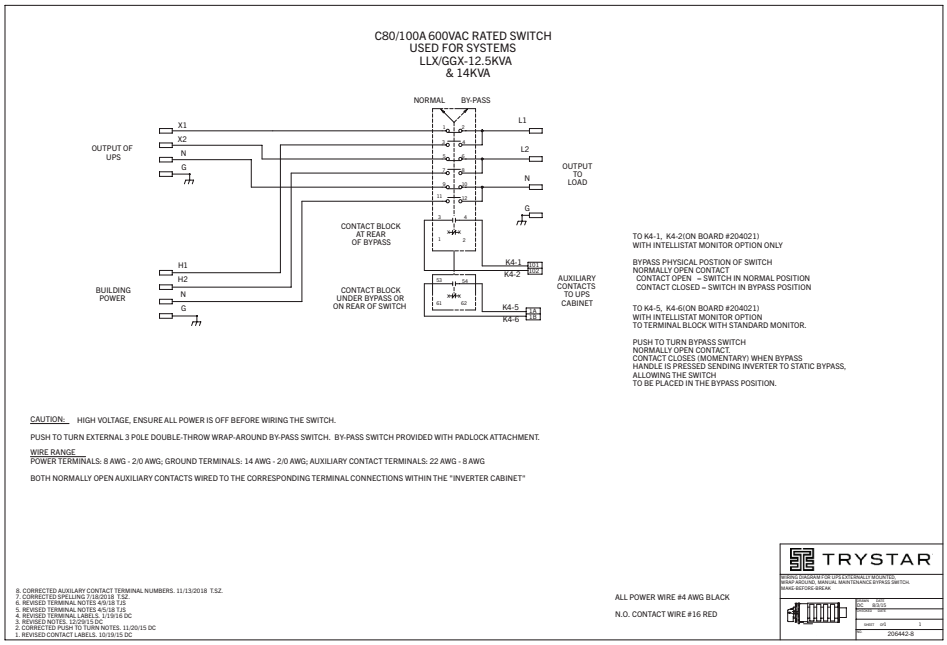
MAKE BEFORE BREAK, LLX AND GGX, 12.5KVA AND 14 KVA

WARNING

AUTHORIZED PERSONNEL ONLY

POTENTIAL FOR BACK FEED EXISTS WHILE OPERATING THIS MAKE BEFORE BREAK SWITCH. KEEP SWITCH LOCKED-OUT AT ALL TIMES TO PREVENT UNAUTHORIZED ACCESS / OPERATION. USE PROPER LOCK-OUT / TAG-OUT PROCEDURE BEFORE OPERATING THIS SWITCH. DO NOT OPERATE THIS SWITCH WHEN THE UPS IS ON BATTERY POWER.



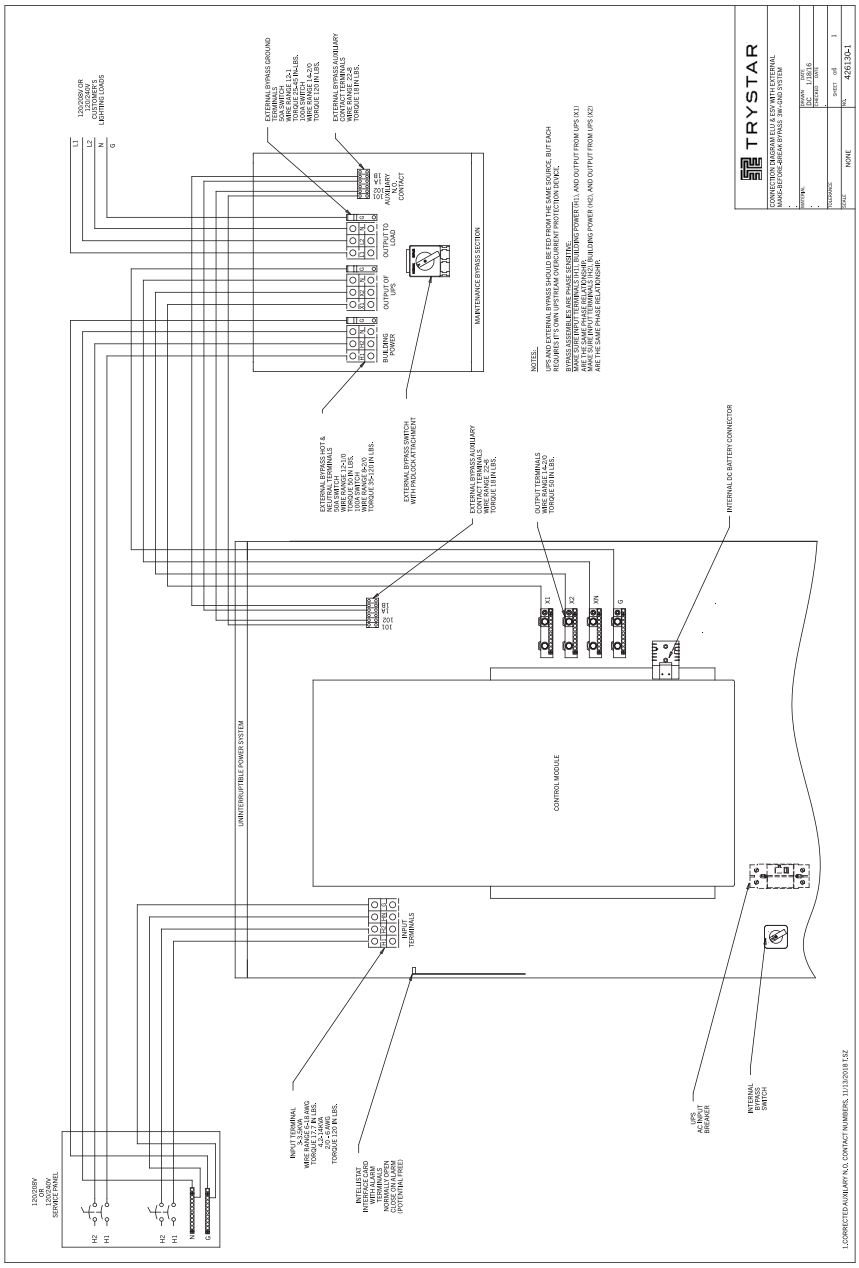


MAKE BEFORE BREAK, LLX AND GGX, 12.5KVA AND 14 KVA - SYSTEM WIRING

WARNING

AUTHORIZED PERSONNEL ONLY

POTENTIAL FOR BACK FEED EXISTS WHILE OPERATING THIS MAKE BEFORE BREAK SWITCH. KEEP SWITCH LOCKED-OUT AT ALL TIMES TO PREVENT UNAUTHORIZED ACCESS / OPERATION. USE PROPER LOCK-OUT / TAG-OUT PROCEDURE BEFORE OPERATING THIS SWITCH. DO NOT OPERATE THIS SWITCH WHEN THE UPS IS ON BATTERY POWER.



OPTIONAL ZONESAVER 2 INSTALLATION

Specifications

Voltages..... 277VAC 50/60Hz

Max Load Requirements

LED Lighting.....18A @277VAC

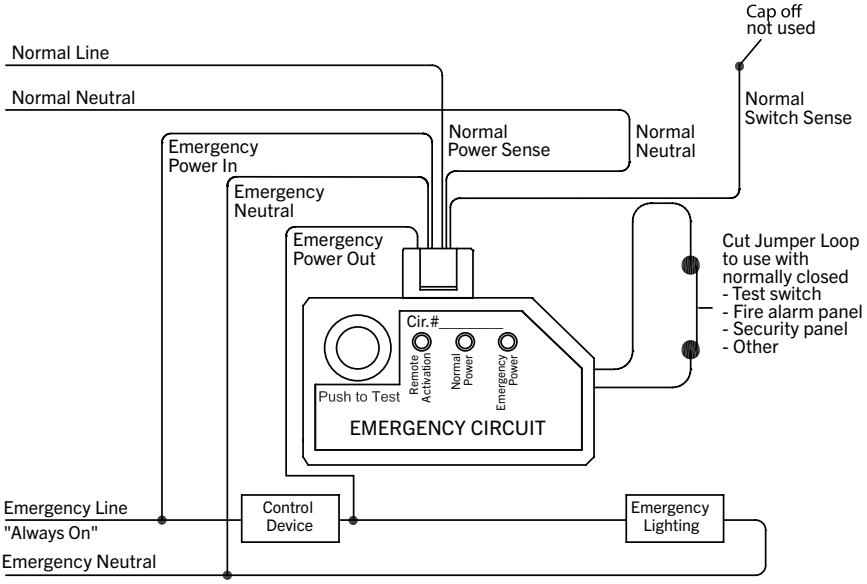
Ballast.....20A @277VAC

Incandescent.....10A @120VAC

OPTIONAL ZONESAVER-2, "LOCAL CONTROL OVERRIDE" INSTALLATION

The ZoneSaver-2 emergency lighting control unit is a UL 924 listed load control relay wired to shunt around a local control device (e.g. dimmer control, wall switch, occupancy sensor) powered from the inverter's normally on output, in order to provide emergency power to designated emergency lights upon the failure or loss of commercial AC power.

The ZoneSaver-2 is a single circuit, single pole 120 VAC or 277 VAC, control unit that allows independent control of lighting fixtures during normal power conditions. However in the event of a power failure, or if remotely activated by a signal from a fire alarm panel, security panel, or test switch, the ZoneSaver-2 will automatically override the local control of selected fixtures and ensure their full illumination for safe egress.



When utility voltage is available at the Normal Power Sense input, the "Normal Power" light is illuminated indicating a normal condition. Local control is allowed. Note that when emergency power is available at the Emergency Power input, the "Emergency Power" light is illuminated. When utility voltage is lost, the normal power light turns off. The control device is then bypassed, and emergency power is diverted to the selected

emergency fixtures. Once power returns to the Normal Power Sense input, the local control device is inserted back into the circuit and the ZoneSaver-2 indicates a normal operating condition.

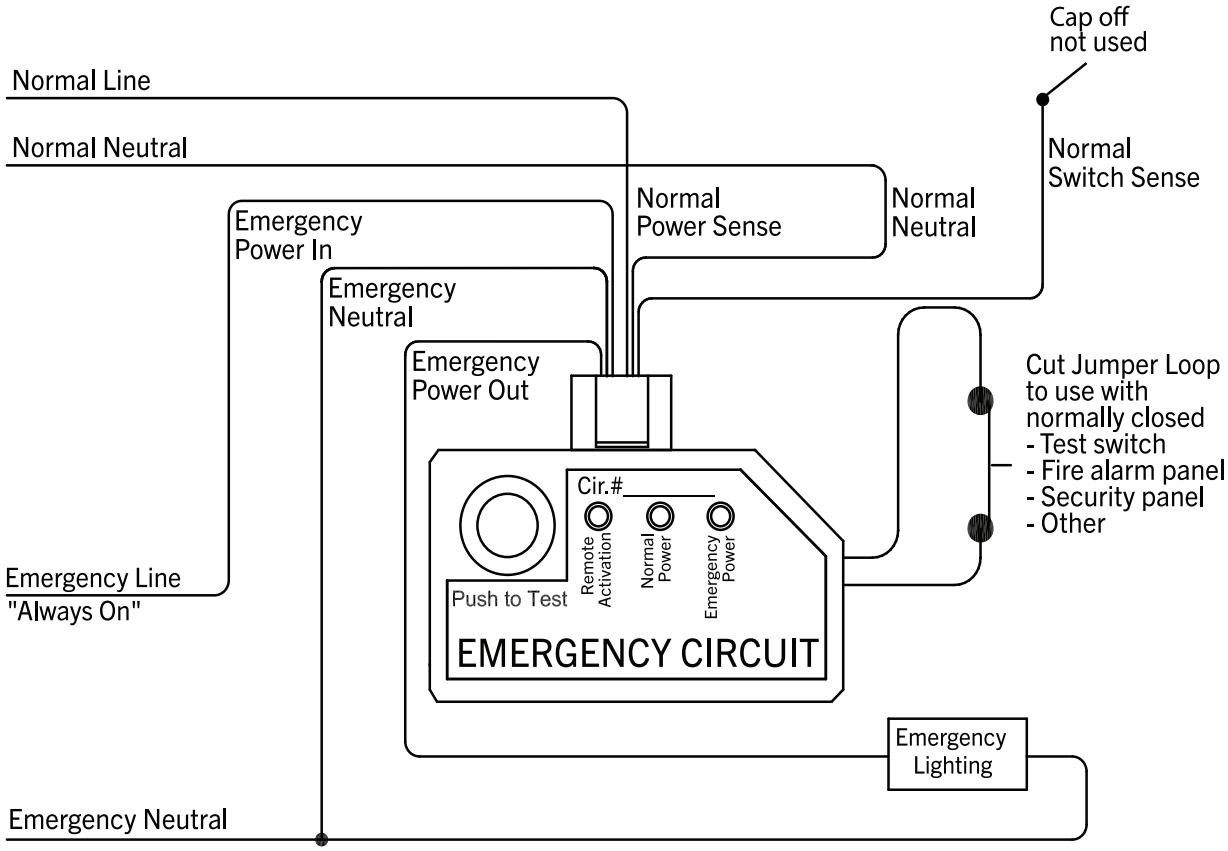
The “Remote Activation” light is illuminated under a normal condition, and turns off when the ZoneSaver-2 is activated by a signal from a fire alarm panel, a security panel, or the emergency power supply when performing an automatic “periodic” system test per NFPA 101. When activated, the local control device is then bypassed, and emergency power is diverted to the selected emergency fixtures. An integral push-to-test button is also provided to manually test the emergency circuits per NFPA 101.

Refer to the manual that accompanied this device for function, use and installation instructions.

OPTIONAL ZONESAVER-2, “ZONE SENSING” INSTALLATION

The ZoneSaver-2 emergency lighting control unit is a UL 924 listed load control relay, wired for zone sensing and independent control of normally off (standby) emergency lighting fixtures. The ZoneSaver-2 senses the voltage at an individual zone lighting panel. When a loss of normal power is detected, emergency power is made available to illuminate emergency fixtures within that specific zone.

The ZoneSaver-2 is a single circuit, single pole 120 VAC or 277 VAC, control unit that energizes normally off emergency lighting fixtures if a loss of power is detected at the normal lighting panel in that zone, or if remotely activated by a signal from a fire alarm panel, security panel, or test switch.



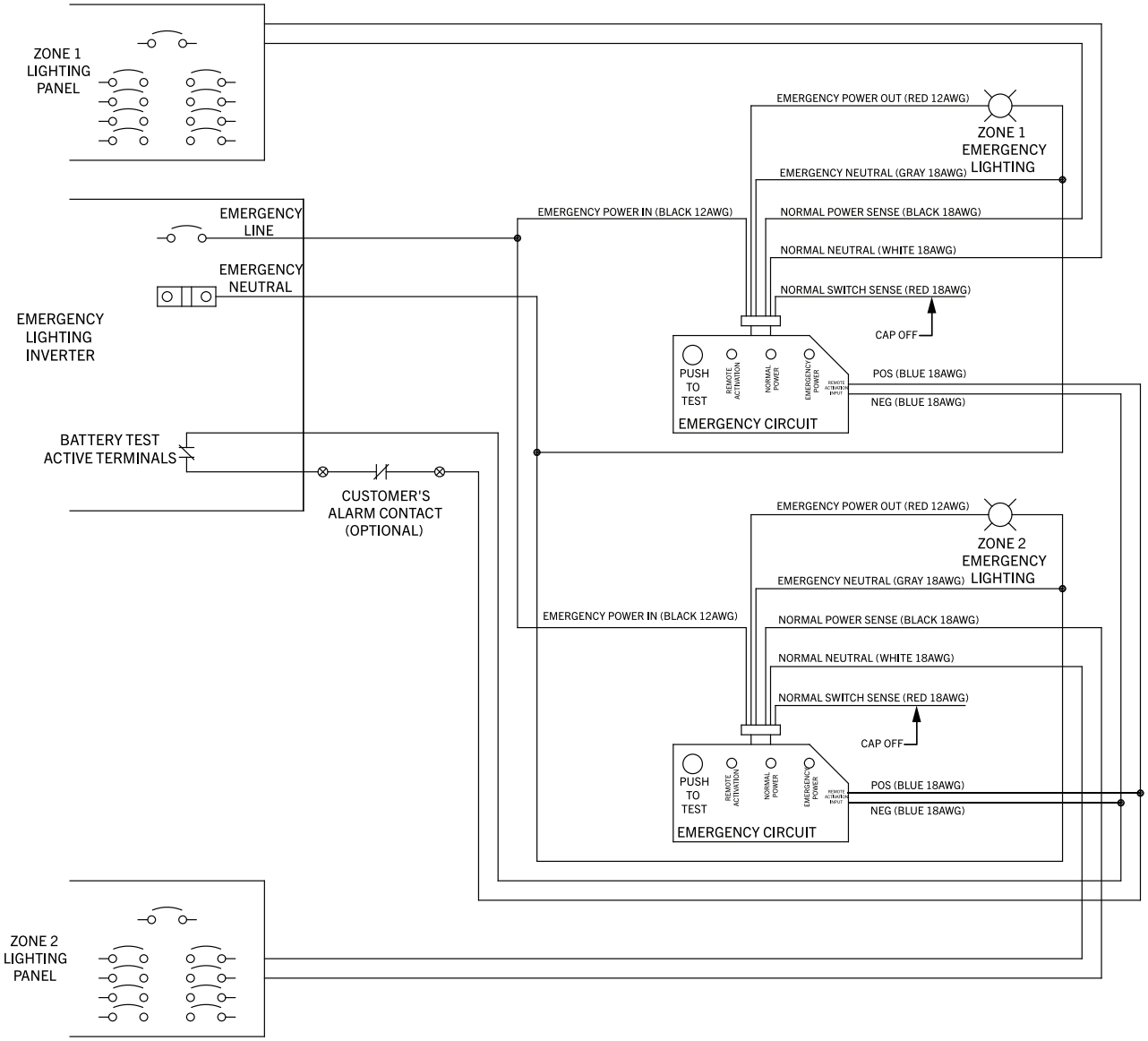
When utility voltage is available at the Normal Power Sense input, the "Normal Power" light is illuminated indicating a normal condition, and the normally off (standby) emergency lights remain off. Note that when emergency power is available at the Emergency Power input, the "Emergency Power" light is illuminated.

When utility voltage is lost, the normal power light turns off and the normally off (standby) emergency lights are energized. Once power returns to the Normal Power Sense input, the emergency lights are shut off and the ZoneSaver-2 indicates a normal operating condition.

The "Remote Activation" light is illuminated under a normal condition, and turns off when the ZoneSaver-2 is activated by a signal from a fire alarm panel, a security panel, or the emergency power supply when performing an automatic "periodic" system test per NFPA 101. When activated, emergency power energizes the normally off (standby) emergency lights. An integral push-to-test button is also provided to manually test the emergency circuits per NFPA 101.

Refer to the manual that accompanied this device for function, use and installation instructions.

MULTIPLE ZONESAVER-2 UNITS CONNECTED TO ONE INVERTER - WIRING DIAGRAM



Note:

1. UP TO 5 ZONESAVER - 2 REMOTE ACTIVATION INPUTS MAYBE BE WIRED IN PARALLEL TO THE SAME ALARM CONTACT(S). MAXIMUM WIRE RUN 500' WITH #18 AWG
2. ONLY ONE SET OF WIRES CAN BE LANDED ON THE EMERGENCY LIGHTING INVERTER'S, CUSTOMER CONTACTS TERMINAL STRIP NORMALLY CLOSED TEST ACTIVE CONTACTS. SEE "COMMUNICATIONS DESCRIPTION"

NOTES:

1. UP TO 5 ZONESAVER - 2 REMOTE ACTIVATION INPUTS MAYBE BE WIRED IN PARALLEL TO THE SAME ALARM CONTACT(S). MAXIMUM WIRE RUN 500' WITH #18 AWG
2. ONLY ONE SET OF WIRES CAN BE LANDED ON THE EMERGENCY LIGHTING INVERTER'S, CUSTOMER CONTACTS TERMINAL STRIP NORMALLY CLOSED TEST ACTIVE CONTACTS. SEE "COMMUNICATIONS DESCRIPTION"

Refer to the manual that accompanied this device for function, use and installation instructions.

OPTIONAL REMOTE ANNUNCIATOR

REMOTE ANNUNCIATOR INSTALLATION

Please read this entire instruction set before installing!Turn off all power before installing or servicing!

REMOTE ANNUNCIATOR

Trystar's Remote Annunciator is capable of displaying status conditions of an Emergency Lighting Inverter and alarming under critical conditions. The following installation instructions include operation, wiring, and mounting your Remote Annunciator.

OPERATION

During normal operation of the Inverter, the Remote Annunciator will illuminate the green Inverter On LED. During an alarm condition (unit over temperature, utility fail, etc.) the red General Alarm LED will illuminate along with other applicable LED's indicating the nature of the alarm and the audible alarm will sound. The audible alarm can be silenced by pressing the Alarm Silence button on the front of the unit. If another alarm condition occurs (i.e. low battery), the alarm will resound. The Battery Test Active LED will illuminate when the Inverter is running a Manual or Automatic, Monthly or Annual battery test, but no alarm will sound for this condition. The audible alarm can be altogether defeated by changing jumper J1 on the circuit board. See the back side of the Remote Annunciator for J1 jumper setting.

Figure 1: Remote Annunciator

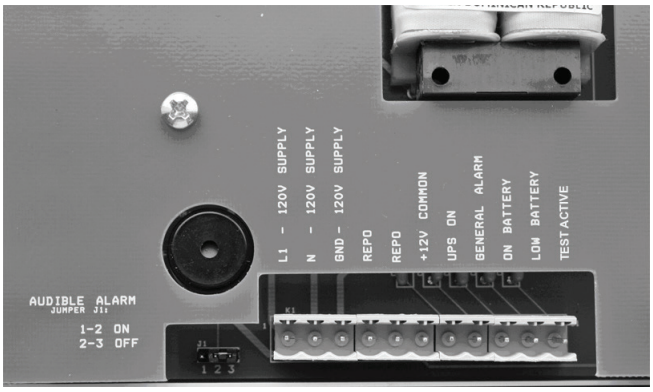


Figure 2: Rear of Remote Annunciator showing J1 and terminal header

WIRING

The wiring of the Remote Annunciator consists of two feeds. One being the communication cable supplied with the unit, and the other is 120Vac 50/60Hz from the output of the Inverter it is monitoring. The power supply can be taken directly from an output breaker on the unit, a receptacle or panel that is fed by the Inverter or a nearby emergency lighting circuit fed by the Inverter. From the Inverter, run the communication cable to the location of the Remote Annunciator. The cable may be run through conduit, walls or cable tray/raceway, but care must be taken not to pinch, cut or kink the cable. After the cable is run, trim excess cable or coil in a safe location. Both feeds, after entering the box, must be wired to the supplied connector as shown in Fig 3. Use standard 1/2" box connector clamps to anchor the wire to the box (not supplied).

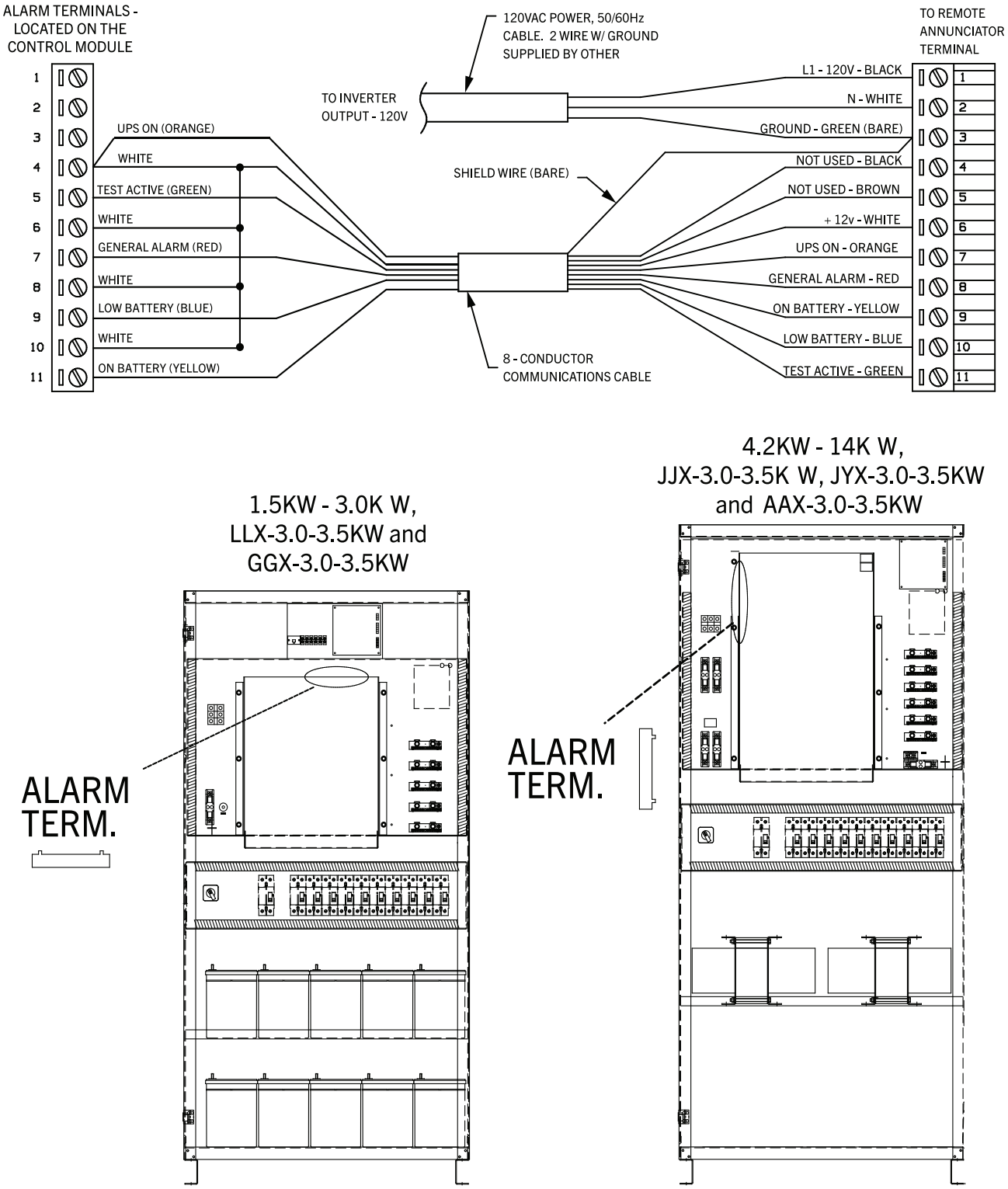


FIGURE 3 -CONNECTOR WIRING AND LOCATION

NOTES:

1. All wires to connector must be stranded, maximum 12 AWG.
2. If using solid conductor for AC power, splice in length (minimum 4”) of stranded wire to connector.
3. Strip outer sheathing and foil back minimum 2”.
4. Strip all wires 0.25”.
5. 120V supply must come from UPS/Inverter output. Power must be present in event of utility failure.
6. Connector on other end of communication cable to be factory wired.

After all cable routing and connector wiring is complete, plug Remote Annunciator connector into the terminal header. Plug prewired connector into the Alarm Terminal Strip in the Inverter.

MOUNTING

The Remote Annunciator is designed to be wall mounted with wiring inputs through the rear or top/bottom (using conduit). Flipping out the side doors, remove the four screws fastening the cover to the box. The cover is attached to the box with two plastic retaining straps. Using the four holes in the back of the box and proper anchors (not supplied), mount the unit to drywall, masonry, paneling or any other type of wall. Holes are provided for rear cable entry. If top or bottom entry is desired, holes must be drilled in recommended location for (maximum 1/2”) conduit (Fig. 4).

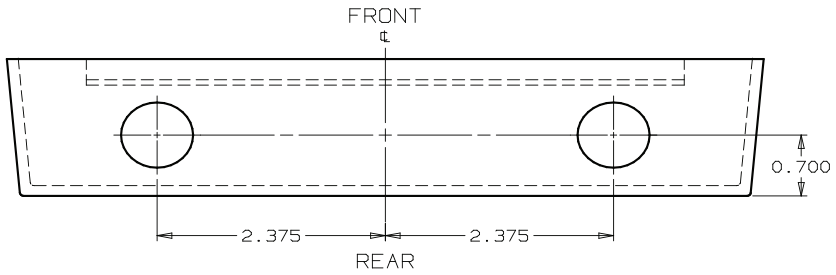


Figure 4: Drilling locations for top/bottom conduit entrance.

OTHER OPTIONAL DEVICES

OPTIONAL AUTOMATIC MESSAGE DIALER

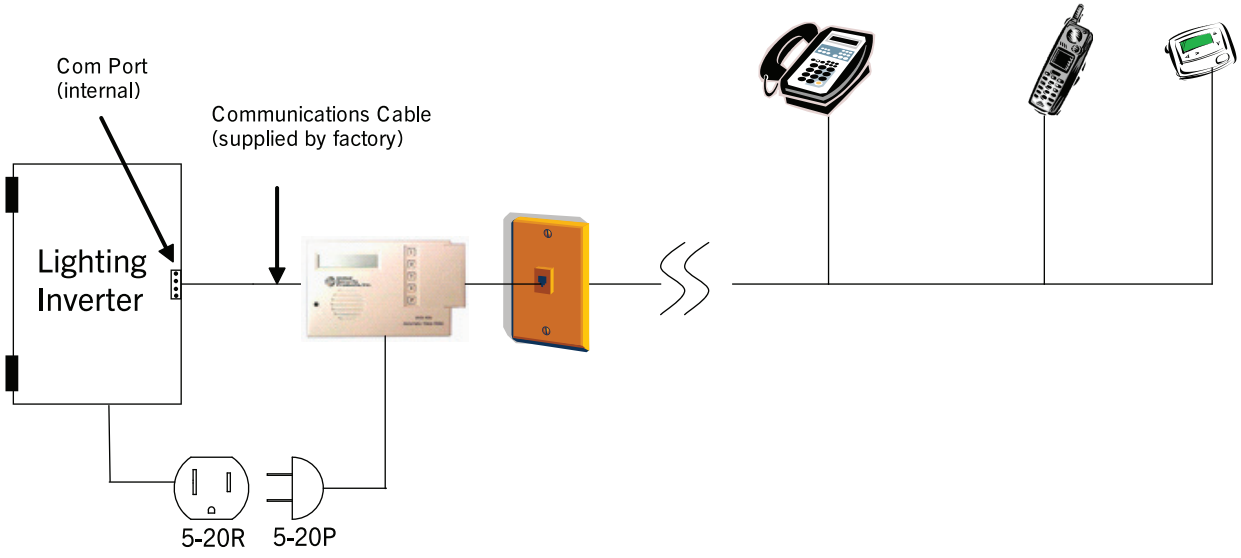
An Automatic Message Dialer is available on the Trystar line of Emergency Lighting Inverters. The Automatic Message Dialer is a device that notifies certain personnel if there is a problem with the lighting inverter via an analog phone line. The Automatic Message Dialer is a small box that plugs into the communications port of the inverter. All that is required for the device is an analog phone line and it is ready to go!

Here's how it works: If in the event that there is an alarm condition, the Automatic Message Dialer will dial up to 4 numbers; these can be landline phones or cell phones. When a call is answered or sent to voice mail, the Automatic Message Dialer will play a customer-recorded, voice message.

Here are some features of the Automatic Message Dialer:

- Dials up to 4 numbers
- Custom voice message
- Programmable delay prevents nuisance dialing
- Internal or external battery backup for memory retention
- Power supply included

Here is how it is connected:



Note: The power supply for these options MUST be taken from the output of the Inverter. A 120V receptacle (5-20R) whose supply is taken from the output of the inverter must be installed near the location of the Automatic Message Dialer. A standard phone receptacle and phone cord is also required to complete the circuit.

NOTE: The power supply for these options MUST be taken from the output of the Inverter. A 120V receptacle (5-20R) whose supply is taken from the output of the inverter must be installed near the location of the Automatic Message Dialer. A standard phone receptacle and phone cord is also required to complete the circuit.

Refer to *"Appendix A - Options Interconnection Diagram"* for proper connection to the ELU.Refer to the manual that accompanied these devices for features, function, use and installation Insructions.

OPTIONAL MULTIFUNCTION COMMUNICATIONS MODEM

Meeting NFPA standards for system testing is critical in today's business infrastructure. To assist in meeting these standards, Trystar is offering the Multifunction Communications Modem (MCM). The MCM can send a fax, an e-mail, dial a phone number and play a prerecorded message, or report system test results to a web page.

On lighting inverters with system test pass/fail contacts, the MCM records system test results and automatically sends a written test report which satisfies NFPA guidelines for stored energy emergency lighting system testing. The MCM is provided standard with 2 dry contact inputs for battery test pass/fail results, plus 6 additional input channels to optionally monitor environmental conditions or safety-related alarms. Consult factory for interface options.

The MCM is available for Trystar Lighting Inverter models provided with the Intellistat or Intellistat TS (touchscreen) monitor.

The MCM product dimensions are 14"W x 1.75"H x 7"D, and weighs 3.5 lbs. The enclosure is designed for the following mounting configurations:

Features:

1U rack-mount

Table-mount

Wall-mount (using optional flanges)

Power Source 9VDC plug in a wall adapter (120VAC)

Battery Backup: In the event of a power failure, an internal battery keeps the MCM operating for approximately 3.5 hours when fully charged and undedr normal operating conditions.

Multifuntion Communications Modem (MCM)

Note: The power supply for these options MUST be taken from the output of the Inverter. A 120V receptacle (5-20R) whose supply is taken from the output of the inverter must be installed near the location of the Automatic Message Dialer. A standard phone receptacle and phone cord is also required to complete the circuit.

NOTE: The power supply for these options MUST be taken from the output of the Inverter. A 120V receptacle (5-20R) whose supply is taken from the output of the inverter must be installed near the location of the MCM Device. A standard phone receptacle and phone cord is also required to complete the circuit.

Refer to *"Appendix A - Options Interconnection Diagram"* for proper connection to the ELU.Refer to the manual that accompanied these devices for features, function, use and installation Insructions.

OPTIONAL REMOTE COMMUNICATIONS

NETMINDER AND INTELLISTAT TS NETWORK COMMUNICATIONS

Optional Network Communications

The NetMinder's series of adapters integrate the UltraLITE with Standard Monitor into an Ethernet TCP/IP, MODBUS TCP, or MODBUS RS485 network with a specific IP address for Ethernet connected systems. See NetMinder Setup Guide. Inverters provided with the Intellistat TS Monitor offer the same network communications plus BACnet/IP or BACnet MS/TP, without the need for a NetMinder adapter. See Intellistat TS Network Communications Guide. Both options provide remote monitoring of the inverter status, battery test pass/fail results, alarm conditions, and electrical measurements via a web browser, without the need for any external software. Remote notification of alarms and status is available via SNMP, e-mail, and text messaging. Temperature and humidity sensing interface is also available if the NetMinder adapter is supplied.

The UltraLITE with Standard Monitor is available with three different versions of the NetMinder adapter:

- NetMinder CS141B – Basic Ethernet / SNMP / TCP/IP / MODBUS TCP communications.
- NetMinder CS141L – Advanced version, includes all functionality of the basic version, plus the addition of temperature and humidity sensing capability, and 4 auxiliary contact closure inputs.
- NetMinder CS141L-485 – Adds MODBUS 485 communications to the advanced version of the NetMinder CS141L. However, temperature and humidity sensing are not available in this version.

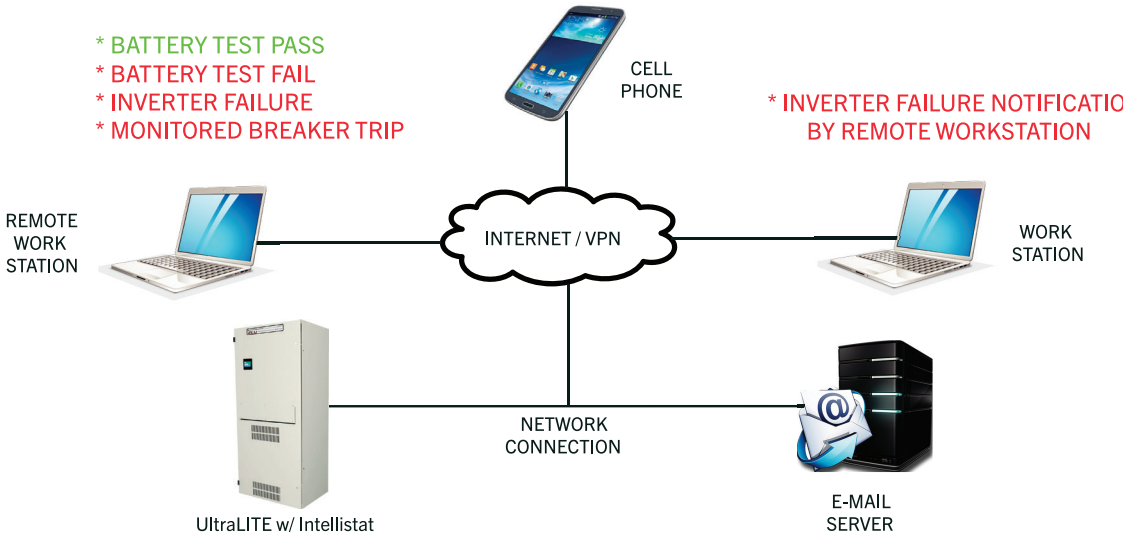
NOTE: The CS121 has been discontinued and replaced by the CS141. The CS121 is still supported.

Note: The CS121 has been discontinued and replaced by the CS141. The CS121 is still supported.

The UltraLITE with Intellistat TS is available with two different versions of network communications:

- Basic Ethernet / SNMP / TCP/IP / MODBUS TCP / BACnet/IP.
- Basic Ethernet protocols listed above, plus MODBUS RS485 and BACnet MS/TP.

Example of Ethernet Connectivity



See the accompanying Intellistat TS Network Communications Guide or NetMinder Setup Guide for setup instructions.

See "Communications Description" and "Appendix A - Options Interconnection Diagrams" for port locations.

DIP SWITCH SET UP

SETTING THE DIP SWITCHES

Dip Switch Settings (located on the top or side of the Control Module - see below or "Appendix A - Dip Switch and Alarm Terminal Locations").

Switch #1 For restart options, set these dip switches to one of the following positions. NOTE: Both switches must be set the same.

OPEN = Manual restart required. Manual restart is provided for the user that requires systematic start-up of the load. No power will be supplied to the load without manual intervention.

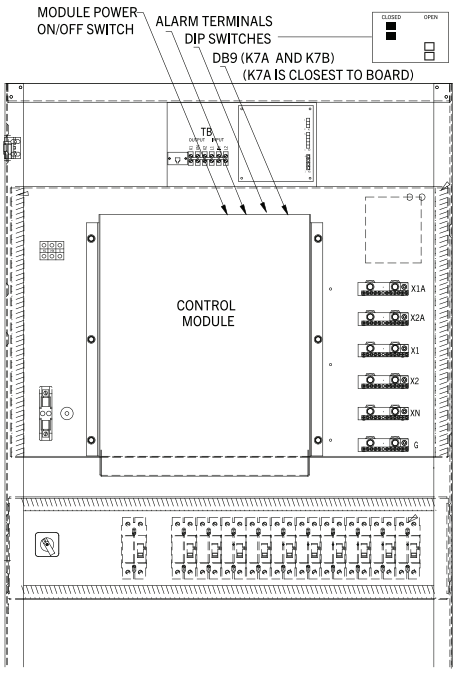
CLOSED = Automatic restart active <Default> automatic restart allows the inverter to automatically restart following a long term power outage. When the outage exceeds the back up time provided by the batteries, the Inverter will shut down to preserve the long term life of the battery. When utility power is restored, the Inverter will deliver power to the load and automatically recharge the batteries.

Switch #2 – Not used

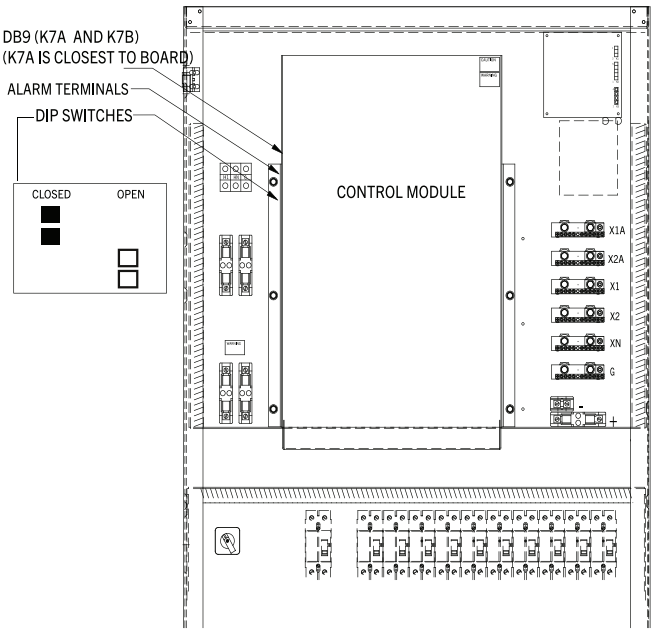
Switch #3 – Not used

Switch #4 – Not used

1.5KW - 3.0KW,
LLX-3.0-3.5KW and
GGX-3.0-3.5KW



4.2KW - 14KW,
JJX-3.0-3.5KW, JYX-3.0-3.5KW
and AAX-3.0-3.5KW



COMMUNICATIONS DESCRIPTION

STANDARD MONITOR COMMUNICATIONS FOR USE WITH STANDARD MONITOR ONLY

See “Appendix A - Dip Switch and Alarm Terminal Location Diagram” for Terminal Location.

CAUTION

Be sure that no power is applied to the Inverter while wiring internal configuration of Control Module.

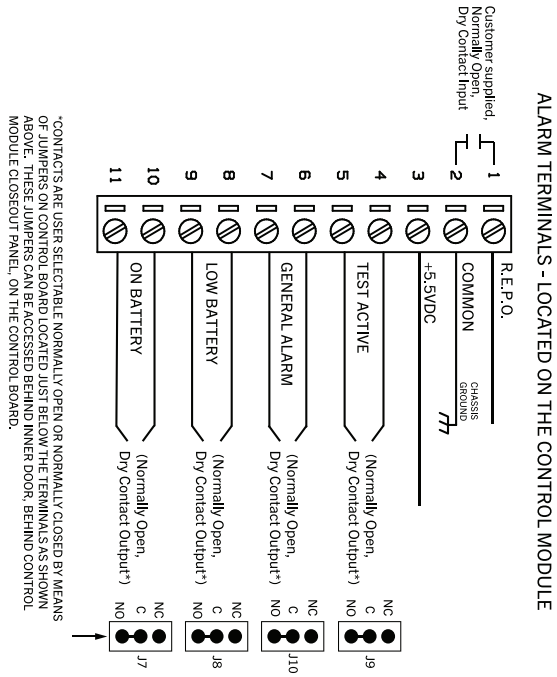
ALARM TERMINAL DESCRIPTION

FOR 125VAC DISCREET WIRING SCENARIOS

SEE “APPENDIX A - DIP SWITCH AND ALARM TERMINAL LOCATIONS”FOR ALARM TERMINAL LOCATION

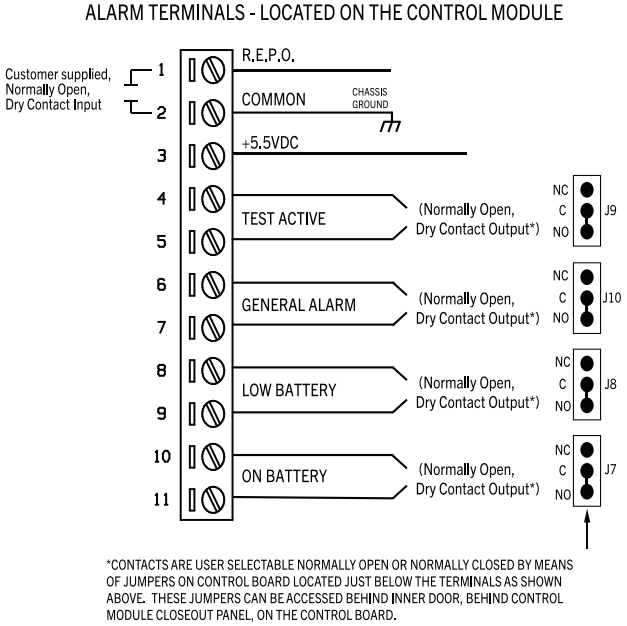
Eleven (11) position contact closure terminal. Provides R.E.P.O., Test Active, General Alarm, Low Battery and On Battery. Note: User selectable, Normally open or closed, Dry contacts rated: 125VAC @ 0.5 Amps.

1.5KW - 3.0KW,
LLX-3.0-3.5KW and
GGX-3.0-3.5KW



TOP ORIENTATION

4.2KW - 14KW,
JJX-3.0-3.5KW, JYX-3.0-3.5KW
and AAX-3.0-3.5KW



SIDE ORIENTATION

NTELLISTAT TS MONITOR COMMUNICATIONS

FOR USE WITH INTELLISTAT TS MONITOR ONLY

See *“Appendix A - Dip Switch and Alarm Terminal Location Diagram”* for Terminal Location.

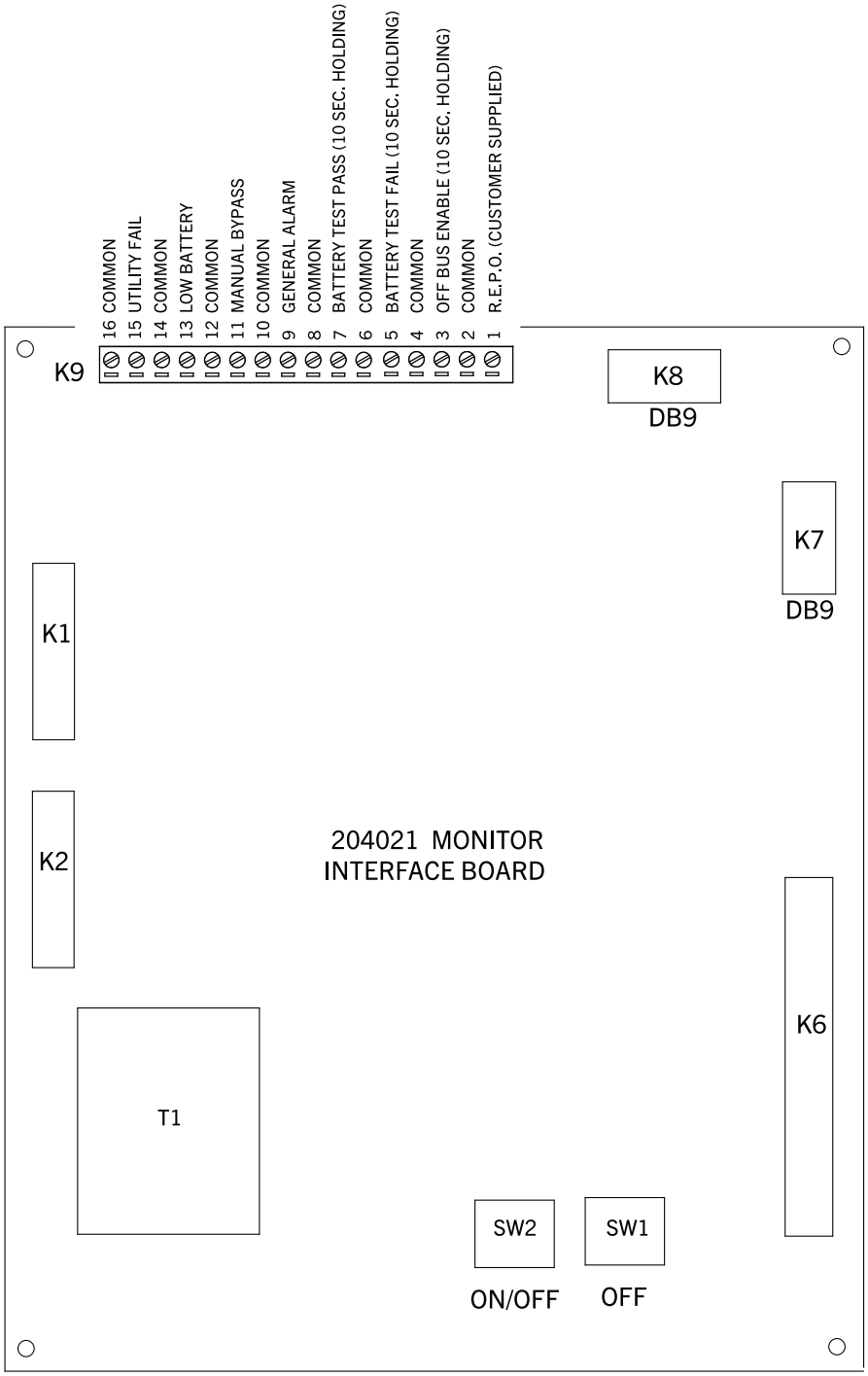
CAUTION

Be sure that no power is applied to the Inverter while wiring internal configuration of Control Module.

INTELLISTAT TS K9 ALARM TERMINAL DESCRIPTION

FOR 125VAC DISCREET WIRING SCENARIOS

Sixteen (16) position contact closure terminal (K9). Provides Utility Fail, Low Battery, Manual Bypass, General Alarm, Battery Test Pass, Battery Test Fail, Off Bus Enable and R.E.P.O. Note: Normally open, Dry contacts rated: 125VAC @ 0.5 Amps.



COMMUNICATIONS

FOR SERVICE USE ONLY

THIS TYPE OF COMMUNICATION SETUP IS TEMPORARY AND ONLY USED FOR SERVICING OF THE SYSTEM.

If a permanent method of communications is desired, there are multiple ways of accompishing this. Information can be obtained remotely with the use of optional devices such as the MCM Device the Auto Dialer and other optional software as well as by use of the alarm terminals provided. See *"Communications Description - Alarm Terminal Description"* for systems with the standard monitor or *"Communications Description - Intellistat TS K9 Alarm Terminal Description"* for systems with the Intellistat monitor. Also see *"Optional Remote Communications"*

Communicating with the inverter through the DB9 (K7A) on the Control Module will allow the user to obtain information remotely. Using the DB9 in this manner will provide information as described below. See "Appendix A - Dip Switch and Alarm Terminal Locations" for DB9 (K7A) location. See "Communications - Communications Commands" for details.

For systems with the Intellistat monitor, the existing cable plugged into the DB9 (K7A) on the control module must be removed prior to this procedure and re-installed after the communications modifcations have been completed.

MINIMUM SYSTEM REQUIREMENTS:

1. Computer/Laptop with Windows 3.1 or later.
2. "Hyperterminal" (Windows 3.1, Windows XP) or "PuTTY" for Windows Vista and Windows 7 or later. (download at http://www.putty.org/).
3. USB Port and DB9 (K7A on Control Board) to USB Null Modem Cable - Part # 111592 (NOTE: Pin 1 on cable MUST be removed), Setup USB 0.4 Drivers (Windows XP, Vista, Windows 7 and 8) and "Hyper-terminal" or "PuTTY" emulation programs. See "Appendix A - Dip Switch and Alarm Terminal Locations" for DB9 (K7A) location.

COMMUNICATIONS SETUP

The UPS provides a beneficial means to communicate with a terminal or any TTY emulation program. Communication can be established with most communications programs with the following parameters:

Baud Rate = 9600

Data Bits = 8

Parity = None

Stop Bits = 1

Flow Control = Xon / Xoff

Echo = On

COMMUNICATIONS COMMANDS

Once communication has been established with the UPS, system data can be obtained by sending a series of characters to the UPS. Below is a list of the character commands. Note: Command entry is case sensitive. All characters must be entered as shown. NOTE: Cable MUST be null modem. NOTE: Pin 1 on cable MUST be removed.

ss = System Parameters

pp = System Set Points

ll = Log Functions

e = End Memory Modification

tt = UPS Time and Date

cc = Set UPS Time and Date

e = End Battery Test Setup

ww = Last 5 Shut Downs

rr = Battery Test Parameters

bb = Battery Test Setup

BB = Battery Test Logs

mm = System Memory Modification – Consult Factory

See *"Communications - System Parameters"* for an explanation of system setpoints.

COMMUNICATIONS PROCEDURES

1. Connect the DB9 to USB Null Modem Conversion cable from K7A (DB9) on the Control Board (For units with the Intellistat Monitor the existing connection plugged into K7A on control board will have to be removed - must be reconnected when done) to the USB port on a computer. See "Appendix A - Dip Switch and Alarm Terminal Locations" for DB9 (K7A) location. Null Modem Cable Part # 111592. **NOTE: Pin 1 on cable MUST be removed.**
2. Make sure the UPS in ON and running.
3. Start Windows on the computer, access "All Programs" then "Accessories" then "Communications" then "Hyper Terminal" for Windows 3.1 or Windows XP. Or launch "PuTTY" for Windows Vista and Windows 7 or 8.
4. In the Hyperterminal "Connection Description" window, enter any name then choose any icon - Click OK. For "PuTTY" users, Connection type = Serial, Serial Line = Com Port of computer being used, Speed = 9600. "PuTTY" users can name and save the session for later use. "PuTTY" users skip to step 7.
5. In the Hyperterminal "Connect To" window, choose "Connect Using" and select the comport you are using, Click OK.
6. In the Hyperterminal "COM Port Settings" window, set the following parameters: 9600 Baud, 8 data bits, 0 parity, 1 stop bit, flow control = xon/xoff, Echo=On, then click OK.

Note: Pin 1 on cable MUST be removed.

7. Once communication has been established with the Inverter, system data can be obtained by sending a series of characters to the Inverter. See “Communications Commands” above. See “Communications - System Parameters” for an explanation of system setpoints.

SYSTEM PARAMETERS

To access system parameters, send a lower case “ss” to the Inverter from the terminal.

Sample Display	Description	Explanation
Input Voltage(L1-L2) = 240	AC Volts input measured from Line 1 to Line 2	The input voltage the Inverter is receiving
Output Voltage(L1-N) = 120	AC Volts output measured from Line 1 to Neutral	The output voltage the Inverter is sending to the loads
Output Voltage(L2-N) = 120	AC Volts output measured from Line 2 to Neutral	The output voltage the Inverter is sending to the loads
Output Voltage(L1-L2) = 240	AC Volts output measured from Line 1 to Line 2	The output voltage the Inverter is sending to the loads
Output Current(L1-N) = 5	AC Amps output measured from Line 1 to Neutral	The output current the Inverter is supplying to the loads
Output Current(L2-N) = 5	AC Amps output measured from Line 2 to Neutral	The output current the Inverter is supplying to the loads
Output Watts(L1-N) = 600	AC Watts output measured from Line 1 to Neutral	The amount of true power the load is consuming
Output Watts(L2-N) = 600	AC Watts output measured from Line 2 to Neutral	The amount of true power the load is consuming
Output Watts(L1-L2) = 1200	AC Watts output measured from Line 1 to Line 2	The total true power the load is consuming
Output VA(L1-N) = 650	AC Volt-Amps output measured from Line 1 to Neutral	The amount of apparent power that the load is consuming
Output VA(L2-N) = 650	AC Volt-Amps output measured from Line 2 to Neutral	The amount of apparent power that the load is consuming
Output VA(L1-L2) = 1300	AC Volt-Amps output measured from Line 1 to Line 2	The total apparent power that the load is consuming
Output Load(L1-N) = 46	Percentage load measured from Line 1 to Neutral	Percentage of the maximum rated load
Output Load(L2-N) = 46	Percentage load measured from Line 2 to Neutral	Percentage of the maximum rated load
Battery Voltage = 135	Battery Voltage	Battery voltage measured in Volts
DC Charging Current = 5	Output current of the charger	Current measured in Amps that the charger is delivering to the batteries
Output Frequency = 60	Frequency of the output waveform	Frequency in Hertz (Hz) of the output of the Inverter
System Synchronized	Inverter has attained inverter to line synchronization	The Inverter has successfully synchronized itself with the incoming waveform

Note: Not necessarily in order shown.

SYSTEM SETPOINTS

To access system set points, send a lower case "pp" to the Inverter from the terminal. **NOTE: Not necessarily in order shown.**

Sample Display	Description	Explanation
Output VA = 3.0	AC volt-amps output of the unit	Setting which informs the Control Module of the output apparent power
Input nominal (L1-L2) = 240/208	Input voltage setting from Line 1 to Line 2	Setting which informs the Control Module of the input voltage
Input nominal (L1-N) = 120	Input voltage setting from Line 1 to Neutral	Setting which informs the Control Module of the input voltage
Output nominal (L1-L2) = 240/208	Output voltage setting from Line 1 to Line 2	Setting which informs the Control Module of the output voltage
Output nominal (L1-N) = 120	Output voltage setting from Line 1 to Neutral	Setting which informs the Control Module of the output voltage
Low battery(%) = 40	Low battery percentage	Percentage of battery at which the UPS displays "Low Battery"
Sag switch point(%) = 00	Setting at which the UPS will switch to battery (1)	Setting which tells the UPS the type of ranging it uses to determine when to switch to battery when the voltage sags below normal
Surge switch point(%) = 112	Setting at which the UPS will switch to battery	Setting which tells the UPS the type of ranging it uses to determine when to switch to battery when the voltage surges above normal
Battery Amperes Hours	Amp – hour of the batteries being used (3)	Setting which tells the UPS the amp-hour of the batteries being used
Output Voltage - 0 = 120, 1 = 208, 2 = 240, 3 = 277, 4 = 277/120, 5 = 347/120	Output Voltage Setting	Setting which informs the UPS of the output voltage
Input Voltage - 0 = 120, 1 = 208, 2 = 240, 3 = 277, 4 = 347, 5 = 480, 6 = 600	Input Voltage Setting	Setting which informs the UPS of the input voltage
Monitor (Y/N) (0/1)	With or Without Monitor	"0 = Standard 1 = Intellistat

(1) The options for sag switch are: 00 = "Fuzzy" ranging and the actual sag input voltage percentage of the nominal input.

(2) The value for this set point depends on the type of batteries, and the number of battery modules.

LOG FUNCTIONS

To access a log of the outages and overloads, send a lower case “ll” (L) to the Inverter from the terminal.

Sample Display	Description
Number of outages = 4	Indicates number of power outages
Power outage was at: 11:12:51 Date 03/16/02	Date and time of power outage
Number of overloads = 1	Indicates number of overloads
Overload was at: 11:12:51 Date 03/16/02	Date and time of overload
Do you want to clear log (y/n)?	If “yes” is entered, all information in the log will be deleted

To access the battery test log, enter an upper case “BB”.

SYSTEM MEMORY MODIFICATION

If system memory modification (mm) becomes necessary, please consult the factory.

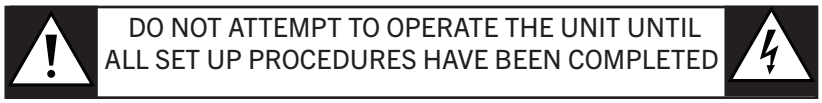
TIME AND DATE

To view the system time and date, send a lower case “tt” to the Inverter from the terminal.

To change the system time and date, send a lower case “cc” to the Inverter from the terminal.

<table>
<tr><th colspan="3">Time Format = HH:MM, XM, D
Example - 08:39, A, W (8:39AM, Wed)</th></tr>
<tr><th>HH:MM</th><th>XM</th><th>D</th></tr>
<tr><td>Hours:Minutes</td><td rowspan="2">A or P</td><td>U = Sunday</td></tr>
<tr><td>Example - 08:39</td><td>M = Monday</td></tr>
<tr><td colspan="2" rowspan="5">Date Format: MM/DD/YY
Month/Date/Year
Example - 04/23/09</td><td>T = Tuesday</td></tr>
<tr><td>W = Wednesday</td></tr>
<tr><td>H = Thursday</td></tr>
<tr><td>F = Friday</td></tr>
<tr><td>S = Saturday</td></tr>
</table>

START UP PROCEDURE



NORMAL MODE START UP

THIS PRODUCT IS SHIPPED WITH THE PERIODIC AUTOMATIC BATTERY TEST ENABLED FOR EVERY 30 DAYS STARTING WITH THE 15th DAY OF THE FOLLOWING MONTH FROM THE ACTUAL SHIP DATE AT 10 P.M.NOTE THAT THE UNIT WILL GO INTO THE AUTOMATIC BATTERY TEST UPON INITIAL START UP IF THE START UP DATE IS AFTER THE 15TH OF THE MONTH, ONE MONTH AFTER THE ORIGINAL SHIP DATE. SEE “BATTERY TEST DURATIONS” AT THE END OF THE MAINTENANCE SECTION. THE NEXT AUTOMATIC BATTERY TEST WILL BE EXACTLY 30 DAYS (DATE AND TIME) AFTER THE FIRST PERIODIC AUTOMATIC BATTERY TEST. REFER TO THE FOLLOWING SECTIONS IN THIS MANUAL FOR FURTHER INFORMATION: “OPERATION”, “MAINTENANCE PROCEDURES - BATTERY TESTING” AND “COMMUNICATIONS”.

CAUTION - DO NOT PLACE UNIT IN BYPASS WHILE BATTERY TESTING IS IN PROGRESS.

THIS PRODUCT IS SHIPPED WITH THE ANNUAL AUTOMATIC BATTERY TEST DISABLED. HOWEVER, THE TEST IS PRESET TO RUN TWELVE (12) MONTHS FROM THE DATE OF SHIPMENT, STARTING WITH THE 15th DAY OF THE MONTH, ONE YEAR FROM THE ACTUAL SHIP DATE AT 10 P.M. IF ENABLED, THE TEST WILL LAST FOR MAXIMUM OF 90 MINUTES DEPENDING ON THE BATTERY OPTION PURCHASED AND THEN AUTOMATICALLY TERMINATE. THE NEXT ANNUAL AUTOMATIC BATTERY TEST WILL BE ONE YEAR (DATE AND TIME) AFTER THE FIRST AUTOMATIC BATTERY TEST IF ENABLED. REFER TO THE FOLLOWING SECTIONS IN THIS MANUAL FOR FURTHER INFORMATION: *“OPERATION”, “MAINTENANCE PROCEDURES - BATTERY TESTING” AND “COMMUNICATIONS”.*

MINIMUM CHARGE TIME FOR FULL BATTERY CAPACITY = 24 HOURS

CAUTION - DO NOT PLACE UNIT IN BYPASS WHILE BATTERY TESTING IS IN PROGRESS.

1. Remove the debris shield from the top of the unit and discard.
2. Turn off all AC input and output circuit breakers. Verify that there are not any shorts on the input and output cables.
3. Verify the bypass switch is in the “Normal” position.
4. Check the battery connector for proper voltage and polarity.
5. Verify for correct voltage at the input terminals (H1, H2, HN). This should match the information on the specification tag on the unit.
6. Connect the battery connector into the inverter module.

7. Turn on the AC input breaker.
8. **STANDARD MONITOR** - Press the "On" button located on the front display. The "Normal Line Voltage" and "Battery" lights will illminate followed by the "Bypass" light. After a few seconds, the "Bypass" light will turn off and the unit will power up. See *"Operation - Standard Monitor Operation".*

   INTELLISTAT TS™ MONITOR - Press the "On/Off" button located on the Intellistat TSTM monitor. After an approximate 10 second delay, the unit will power up. See "Operation - Intellistat TSTM Monitor Operation".
9. Check for correct output voltage at the output terminal (X1, X2, X1A, X2A, XN).

OUTPUT

120/208V	X1-XN=120V	X2-XN=120V	X1-X2=208V
120/240V	X1-XN=120V	X2-XN=120V	X1-X2=240V
120/277V	X1-XN=120V	X2-XN=277V	
120/347V	X1-XN=120V	X2-XN=347V	

OFF BUS OUTPUT

120/208V	X1A-XN=120V	X2A-XN=120V	X1A-X2A=208V
120/240V	X1A-XN=120V	X2A-XN=120V	X1A-X2A=240V
120/277V	X1A-XN=120V	X2A-XN=277V	
120/347V	X1A-XN=120V	X2A-XN=347V	

Note: Output voltage information is located on the specification tag.

Note: If the "Off Bus" option is included, a power outage must be simulated first for voltage to be present at the off bus terminal. Toggle the AC input breaker off and check for voltage at the off bus terminals.

Note 1: Output voltage information is located on the specification tag.

Note 2: If the "Off Bus" option is included, a power outage must be simulated first for voltage to be present at the off bus terminal. Toggle the AC input breaker off and check for voltage at the off bus terminals.

10. Turn "**OFF**" the input breaker and verify the system on battery power.
11. Turn "**ON**" the breaker and verify the system returns to normal power.

BEFORE TURNING LOADS ON.

12. Turn bypass switch to Bypass Mode -See "Bypass Switch Operation".

Note : The module will switch to static bypass. This is normal, wait until the unit returns from static bypass **BEFORE** proceeding. This can be verified by checking the display.

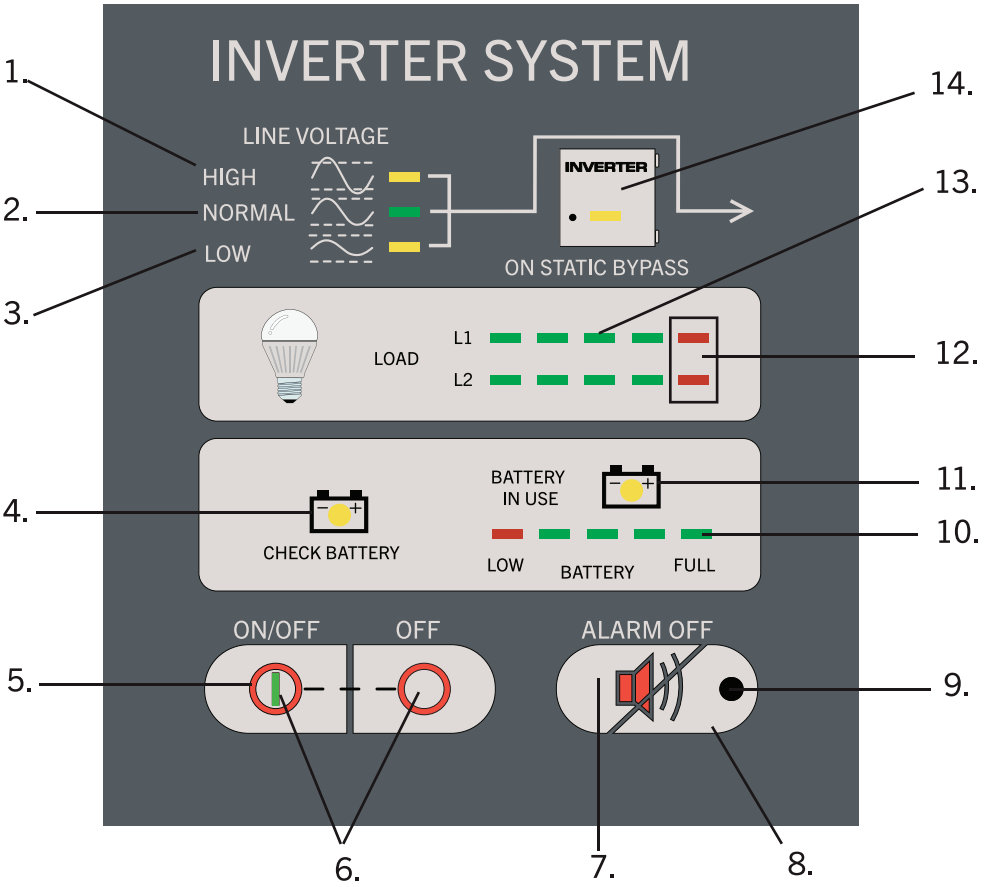
13. Once the unit is out of static bypass, turn on load breakers one at a time. Verify all output voltages and currents. If output voltages are correct, turn **"OFF"** all load breakers.
14. Turn the bypass switch back to normal mode.

Note : The module will switch to static bypass. This is normal, wait until the unit returns from static bypass **BEFORE** proceeding. This can be verified by checking the display.

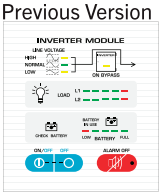
15. Once the unit is out of static bypass, turn the output load breakers on one at a time and verify that the amount of load does not exceed the system rating as indicated by the percentage load shown on the front display.

OPERATION

STANDARD MONITOR OPERATION



Previous Version



1. LED indicates that high input voltage is present (+10%).
2. LED indicates that the input line voltage is nominal.
3. LED indicates that low input line voltage is present (-10%).
4. LED indicates the detection of weak batteries,Check Battery Condition.
5. Pushing this button will turn the system “ON”.
6. Pushing and holding both buttons will turn the system “OFF”.
7. Push to silence the alarm.
8. Pushing and holding this button for 3 seconds will generate a system battery test - See “Maintenance Procedures - Manual Battery Test” for test durations.

9. LED indicates that the system alarm is “ON”.
10. This scale indicates the charge / discharge level of the batteries. *
11. Yellow LED indicates that the Inverter is on battery power.
12. These LED’s indicate an overload condition for L1 and/or L2 (100.01%).
13. This scale indicates % load levels.
14. Yellow LED indicates that the Inverter is in Static Bypass Mode.

NOT SHOWN - Optional Circuit Breaker Tripped Indicator - Will illuminate when an output circuit breaker has opened. See “Appendix A - Component Location Diagram” for location.

*NOTE: When performing a power outage test or the inverter has been on battery for a few minutes and returns to normal power, the battery indicator lights may only display one indicator light, this is normal. Wait approximately 15 minutes and the battery indicator lights should return to full.

Note: When performing a power outage test or the inverter has been on battery for a few minutes and returns to normal power, the battery indicator lights may only display one indicator light, this is normal. Wait approximately 15 minutes and the battery indicator lights should return to full.

AUDIBLE ALARM CONDITIONS

The following are conditions that will cause an audible alarm. Some audible alarm have a corresponding LED Indication on the display. Refer to “*Operation - Standard Monitor Operation*”.

Condition	Possible Cause	Action
System on Battery	Input voltage or frequency is out of the required specifications.	Test the AC input power source to the Lighting Inverter, repair if required.
	Automatic battery testing is taking place	Verify that the “Check Battery” indicator in not illuminated during or after the test. If it is, verify battery condition and replace battery if required.
Low Battery	Weak batteries	Check batteries.
		Check charging circuit - contact factory.
	Lighting Inverter has been in Inverter Mode for an extended period of time.	Consider controlled shutdown of system - see “Check Battery” indication on display - also see battery charge/discharge level indication on display.
Check Battery	Weak or bad batteries	Check batteries - replace as required - see “Check Battery” indication on display.
Over Temperature	Defective thermal sensor.	Thermal is not accessible - Contact factory.
	Defective fan motor.	Check fan motor - replace as required.
	Blocked air intake.	Remove debris from air intake.
Inverter Overload	System is overloaded.	Reduce the load from the output to within the output ratings of the unit.
Inverter On Static Bypass	System is overloaded.	Reduce the load from the output to within the output ratings of the unit.
	Defective Power Board	Contact the Factory
	Defective Control Board	Contact the Factory
	Overtemp	See “Over Temperature” Condition.

INTELLISTAT TS MONITOR OPERATION

ADVANCED DIGITAL MONITORING - The user-friendly Intellistat TSTM monitor provides quick, full access to all of the monitor features, and also allows all programming to be done directly from the monitor. An easy to read LCD indicates all the electrical parameters, as well as the functional status of the inverter. A virtual keypad allows the entry of date / time values, system setpoints and password information into the monitor, without the need for an external computer and cable.

The Intellistat TS™ - Intelligent status monitoring an emergency lighting inverter's operational status is critical for maintaining the building's operational efficiency, as well as for monitoring the power feeding the lighting systems. With this in mind, Trystar designed the model ***"ELU"*** with state of the art monitoring features to provide complete system diagnostics and testing with access to all electrical system parameters.

FEATURES

- LCD display of all electrical parameters.
- NFPA compliant automatic battery testing and logging.
- User programmable automatic system testing.
- System alarm annunciation.
- Audible alarm with alarm silence.
- Alarm status display.
- Email / Cell phone status notification.
- Optional fax / email / voice / web page reporting of test results.
- Date and time display.
- Auto logging of test results / events.
- Multi layer password protection.
- Remote monitoring capabilities.
- Programmable local interfaces.
- Logs up to 50 events.
- Non volatile clock and memory.
- Programmable alarm set points.

INVERTER STATUS AND ALARM INDICATORS

- High / Low Input Voltage
- High / Low Output Voltage
- High Output Volt-Amperes
- High / Low Output Frequency
- High / Low Battery Voltage
- High Battery Charge Current
- System Normal
- General Alarm

- System on Battery
- Low Battery Warning
- Low Battery Shutdown
- Battery Test in Process
- Auto Battery Test Failed / Passed
- Off Bus Status
- Output Circuit Breaker Open
- Charger Fail / DC Open Circuit
- System in Static or Manual Bypass
- REPO Active
- Low Output Volt-Amperes* (Egress Lighting Integrity Test)

* User-programmable limit referenced during automatic battery testing, to verify integrity of egress lighting.

MEASURED PARAMETERS

- Input Voltage
- Output Voltage
- Output Current
- Output Volt-Amperes
- Output Watts
- Output Power Factor
- Output Percent Load
- Output Frequency
- Battery Voltage
- Battery Charger Current
- Battery Capacity Remaining

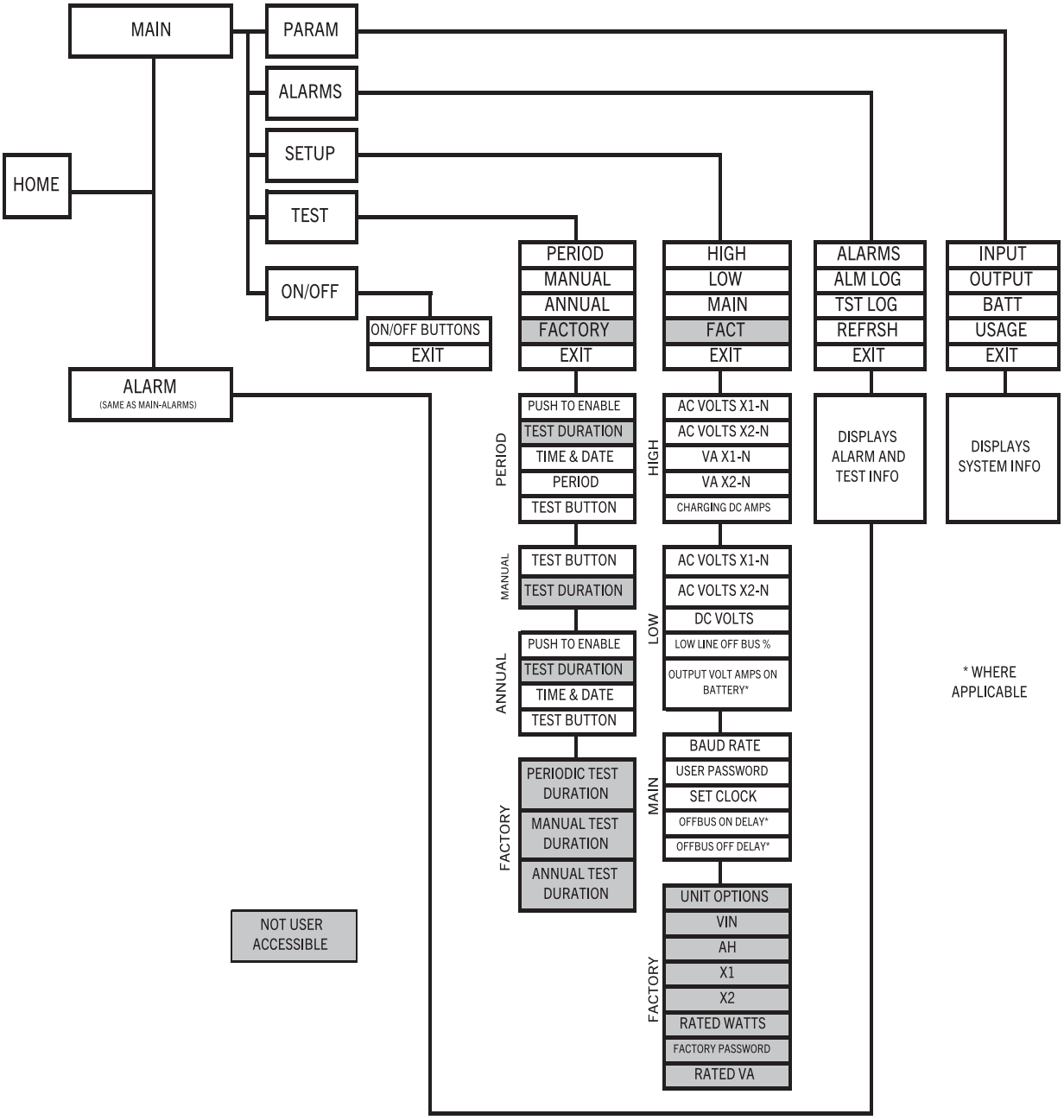
AUTOMATIC SYSTEM TESTS - The Intellistat TS™ Monitor automatically performs a user defined (date and time) 5 minute system test every 30 or 90 days; as well as a user defined (date and time) annual 30, 60 or 90 minute system test. For all of these tests, the Intellistat TS™ Monitor logs the test results with the date and time, as well as a “pass” or “fail” indication.

MANUAL SYSTEM TESTS - The Intellistat TS™ Monitor also allows the user to manually invoke a user defined system test for 30, 60, or 90 minutes. A 1 or 5 minute manual test is also available for “spot inspections”.

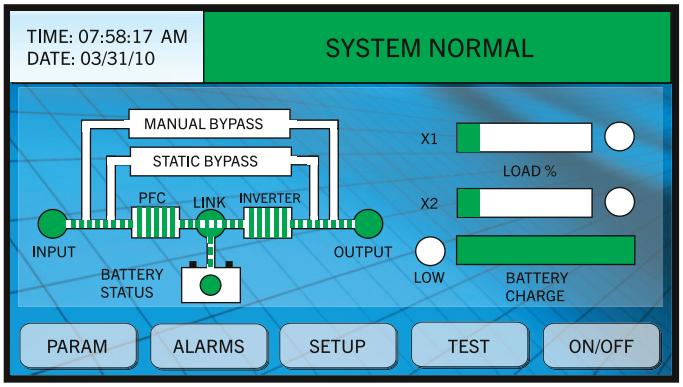
INTELLISTAT TS MONITOR OPERATION MONITOR TREE

CAUTION

IT IS RECOMMENDED THAT ALL PAREMETERS BE LEFT AT FACTORY PRESET LEVELS. IF MODIFICATION OF SYSTEM PARAMETERS AND ALARM LEVELS IS REQUIRED PLEASE CONTACT THE FACTORY PRIOR TO MODIFICATION. IMPROPERLY SETTING ALARM LEVELS MAY RESULT IN NUISANCE ALARMS.



INTELLISTAT TS MONITOR OPERATION PARAMETER DEFINITIONS



PARAMETERS			
MENU	**SUB MENU**	**MEANS**	**TERM**
PARAMETERS	INPUT	INPUT VOLTAGE FROM L1 TO L2	AC VOLTS L1-L2
		INPUT VOLTAGE FROM L1 TO N	AC VOLTS L1-N
		INPUT VOLTAGE FROM L2 TO N	AC VOLTS L2-N
	OUTPUT	OUTPUT VOLTAGE X1 TO N	AC VOLTS X1-N
		OUTPUT CURRENT X1 TO N	AC AMPS X1-N
		OUTPUT WATTS X1 TO N	WATTS X1-N
		OUTPUT VA X1 TO N	VA X1-N
		OUTPUT LOAD % X1 TO N	LOAD % X1-N
		OUTPUT VOLTAGE X2 TO N	AC VOLTS X2-N
		OUTPUT CURRENT X2 TO N	AC AMPS X2-N
		OUTPUT WATTS X2 TO N	WATTS X2-N
		OUTPUT VA X2 TO N	VA X2-N
		OUTPUT LOAD % X2 TO N	LOAD % X2-N
		TOTAL POWER FACTOR	P.F.
		TOTAL LOAD PERCENTAGE	TOTAL LOAD %
		TOTAL VA	TOTAL VA
		TOTAL WATTS	TOTAL WATTS
		OUTPUT FREQUENCY	FREQ
	BATT	BATTERY VOLTAGE	DC VOLTS BATT
		BATTERY CURRENT	DC AMPS BATT
		PERCENTAGE BATTERY REMAINING	% BATTERY
	USAGE	ACCUMULATED HOURS THE SYSTEM HAS BEEN TURNED ON	SYSTEM ON HOURS
		ACCUMULATED MINUTES THE SYSTEM HAS BEEN ON BATTERY	ON BATTERY MINUTES
ALARMS	ALARMS	CURRENT ALARMS LISTING	-----
	ALM LOG	ALARM LOG LISTING	-----
	TST LOG	TEST LOG LISTING	-----
	REFRESH	REFRESH DATA	-----

INTELLISTAT TS MONITOR OPERATION PARAMETER DEFINITIONS

PARAMETERS			
MENU	**SUB MENU**	**MEANS**	**TERM**
SETUP	**HIGH**	HIGH OUTPUT VOLTAGE X1 TO N ALARM LEVEL	AC VOLTS X1-N
		HIGH OUTPUT VOLTAGE X2 TO N ALARM LEVEL	AC VOLTS X2-N
		HIGH VA X1 TO N ALARM LEVEL	VA X1-N
		HIGH VA X2 TO N ALARM LEVEL	VA X2-N
		HIGH CHARGER CURRENT ALARM LEVEL	CHARGING DC AMPS
	LOW	LOW OUTPUT VOLTGE X1 TO N ALARM LEVEL	AC VOLTS X1-N
		LOW OUTPUT VOLTGE X2 TO N ALARM LEVEL	AC VOLTS X2-N
		LOW BATTERY VOLTAGE ALARM LEVEL	DC VOLTS
		LOW LINE OFF BUS PERCENTAGE	LOWLINE OFFBUS %
		OUTPUT VA ON BATTERY TEST ALARM LEVEL	OUTPUT VA ON B
	MAIN	BAUD RATE OF COMMUNICATIONS	BAUD RATE
		USER PASSWORD	USER PASSWORD
		SET CLOCK	SYSTEM CLOCK
		ON DELAY FOR OFF BUS	OFF BUS ON DELAY
		OFF DELAY FOR OFF BUS	OFF BUS OFF DELAY
	FACT	OFFBUS AND LOW VA ON BATTERY OPTIONS	UNIT OPTIONS
	NOT USER ACCESSIBLE	THE INPUT VOLTAGE RATING OF THE UNIT	VIN
		THE AH RATING OF THE BATTERIES ON THE UNIT	AH
		THE OUTPUT VOLTAGE RATING X1-N	X1
		THE OUTPUT VOLTAGE RATING X2-N	X2
		THE WATT RATING OF THE UNIT	UNIT RATED WATTS
		FACTORY PASSWORD	FACTORY PASSWORD
		THE VA RATING OF THE UNIT	UNIT RATED VA
TEST	**PERIOD**	THE TEST IS ENABLED OR DISABLED	ENABLED (DISABLED)
		DURATION OF TEST	AUTOMATIC TEST DURATION
		START TIME AND DATE OF NEXT TEST	TIME & DATE
		TIME BETWEEN TESTS	PERIOD
	MANUAL	BUTTON TO START TEST	TEST
		DURATION OF TEST	MANUAL TEST DURATION
	ANNUAL	THE TEST IS ENABLED OR DISABLED	ENABLED (DISABLED)
		DURATION OF TEST	ANNUAL TEST DURATION
		START TIME AND DATE OF NEXT TEST	TIME & DATE
	FACTORY	SET DURATION OF PERIODIC TEST	PERIODIC TEST DURATION
	NOT USER ACCESSIBLE	SET DURATION OF MANUAL TEST	MANUAL TEST DURATION
		SET DURATION OF ANNUAL TEST	ANNUAL TEST DURATION
ON/OFF		TURN UNIT ON	ON
		TURN UNIT OFF	OFF

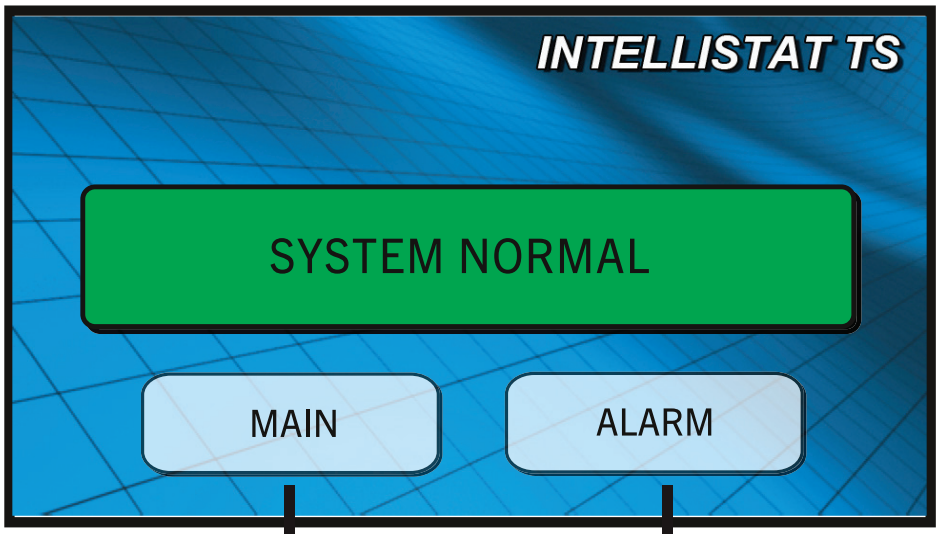
INTELLISTAT TS MONITOR OPERATION

This section will give you a basic understanding of the Intellistat TS™ Monitor, its menu items and functions. All parameters are preset at the factory.

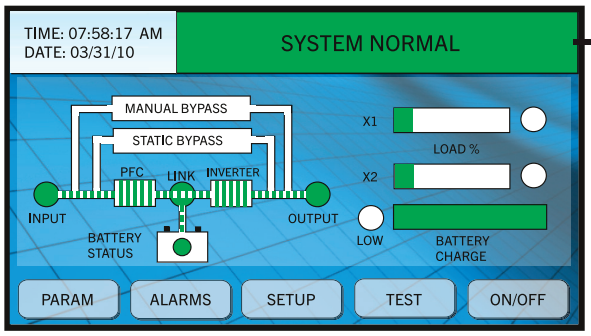
GENERAL

The system is pre-programmed at the factory specific to your unit. There should be no need to change any system parameters. Contact the factory should this become necessary.

HOME SCREEN

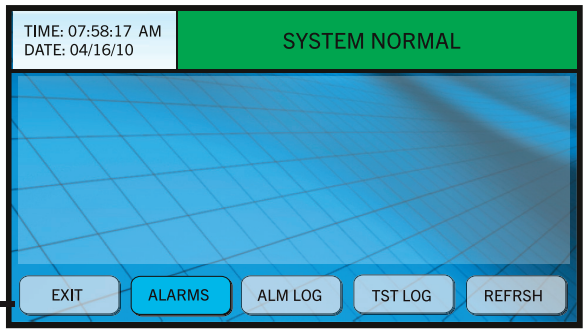


MAIN SCREEN



Touch the “SYSTEM NORMAL” box to return to the HOME screen. Only active from the MAIN screen.

ALARM SCREEN

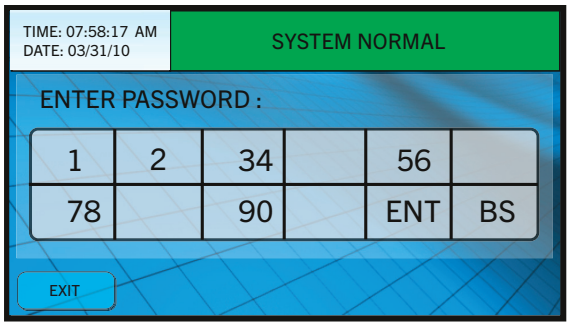


Touch the “EXIT” button to return to the HOME screen. On other screens touching “EXIT” will return to the previous screen. Touching “REFRSH” will update any alarm or test data.

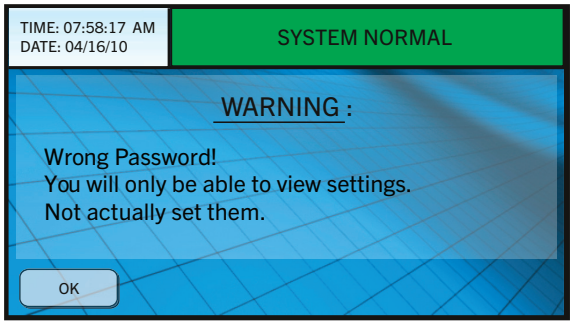
INTELLISTAT TS MONITOR OPERATION COMMON SCREENS

PASSWORD SCREENS

Passwords are required to access certain screens. A typical password screen is shown below. Enter the desired number using the key pad. The number selected will appear next to the “Enter Password” area. When the numbers desired are fully entered, select “ENT” to execute the entry and move to the next screen. BS = Back Space. “Exit” will return to the previous screen. Entering an incorrect password will still allow you to view settings but not change them. You must return to the Main Screen and start over should this happen. Default customer password = 05151. Contact the factory if you change this password and should lose it.

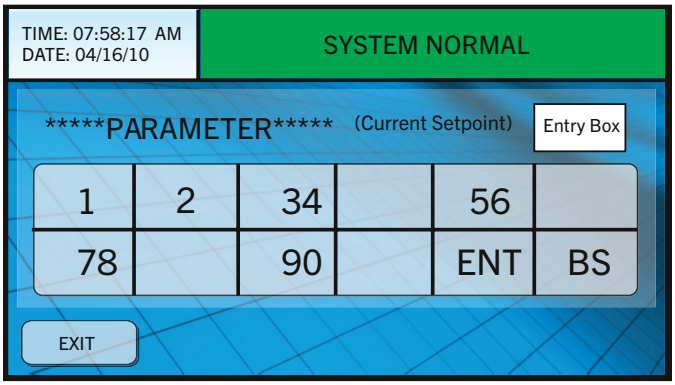


Default customer password = 05151



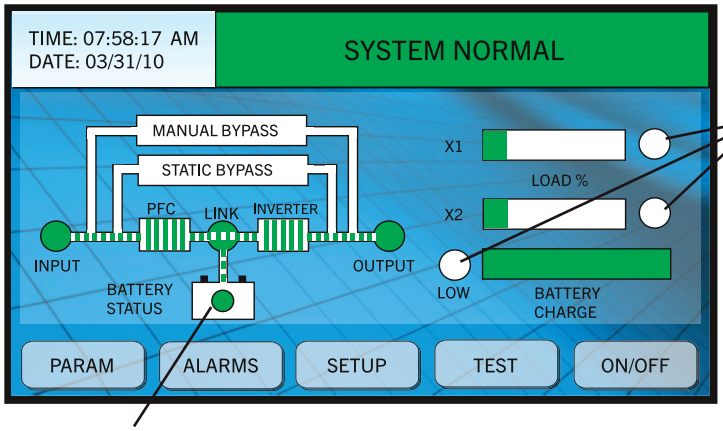
DATA ENTRY SCREENS

There are many keypad type screens in the following menus. The number selected will appear in the “Entry Box”. Note the “Current Setpoint” to the left of the entry box and the current parameter being modified. Enter the desired number using the key pad. When the numbers desired are fully entered, select “ENT” to execute the entry and move to the next screen. BS = Back Space. “Exit” will return to the previous screen.



INTELLISTAT TS MONITOR OPERATION

MAIN SCREEN

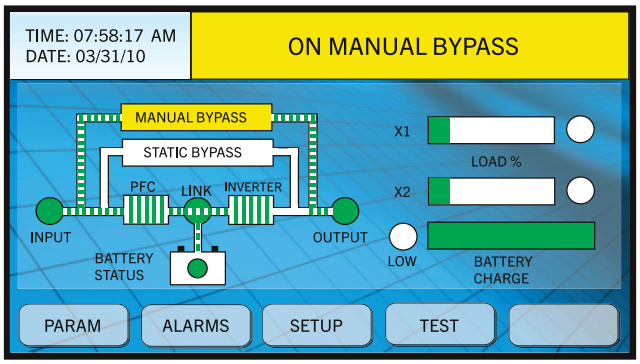


Typical “System Normal” Main Screen showing the percentage load for each output and the battery charge level. The Low Battery and output overload indicators will change to red if the levels reach the programmed low set points (factory set) and the “System Normal” area will change to an alarm message which will be recorded in the alarm log.

The Battery Status indicator will be green under normal conditions, but will change to yellow when the system is on battery. The battery status indicator will change to red under the following conditions: 1) Battery Test Fail 2) A low battery condition or 3) a weak battery is present.

TYPICAL BYPASS SCREENS

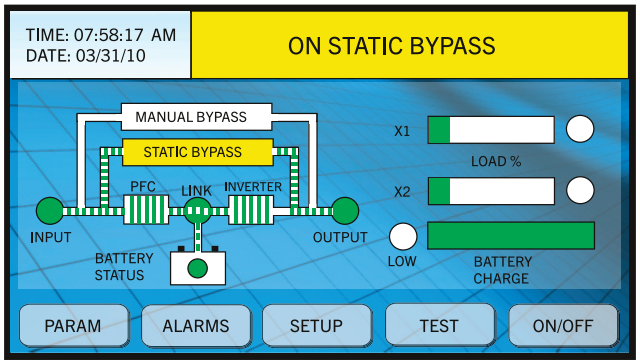
MAIN SCREEN - ON MANUAL BYPASS



Typical ON MANUAL BYPASS screen. There is no alarm indication or logging with this type of event.

The screen will return to the SYSTEM NORMAL screen when the bypass condition is cleared by the user.

MAIN SCREEN - ON MANUAL BYPASS



Typical ON STATIC BYPASS screen. There is no alarm indication or logging with this type of event.

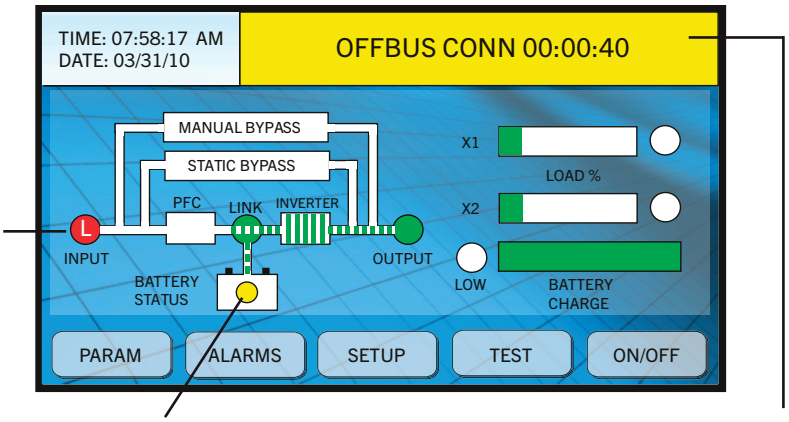
The screen will return to the SYSTEM NORMAL screen when the bypass condition is corrected.

INTELLISTAT TS MONITOR OPERATION ON INVERTER SCREENS

MAIN SCREEN - OFF BUS CONNECT

(L) Indicates a low line condition caused the inverter to switch to battery.

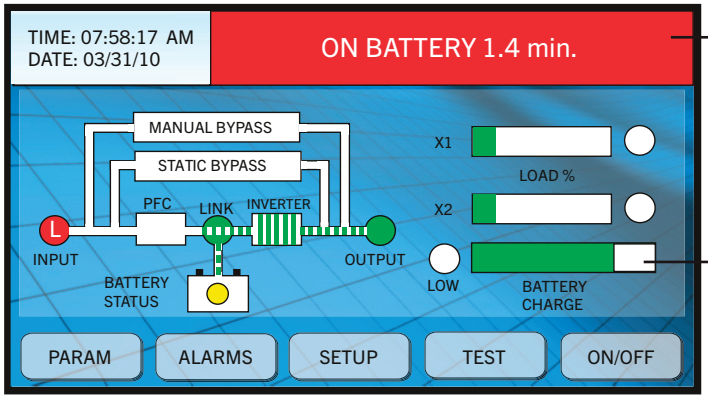
(H) indicates a high line condition caused the inverter to go to battery.



The Battery Status indicator will be green under normal conditions, but will change to yellow when the system is on battery. The battery status indicator will change to red under the following conditions: 1) Battery Test Fail 2) A low battery condition or 3) a weak battery is present.

There will be no audible alarm or alarm indication until the optional Offbus On Delay times out. **Factory settings: Offbus On Delay = 0 Sec. Offbus Off Delay = 15 Min. Low Line Off Bus = 80%.** These settings can be modified through the setup menu. See "Monitor Tree" for setting location. These settings are only enabled with the timed off bus option. If no Off Bus is present the system will alarm and switch to battery and alarm immediately.

MAIN SCREEN - ON INVERTER

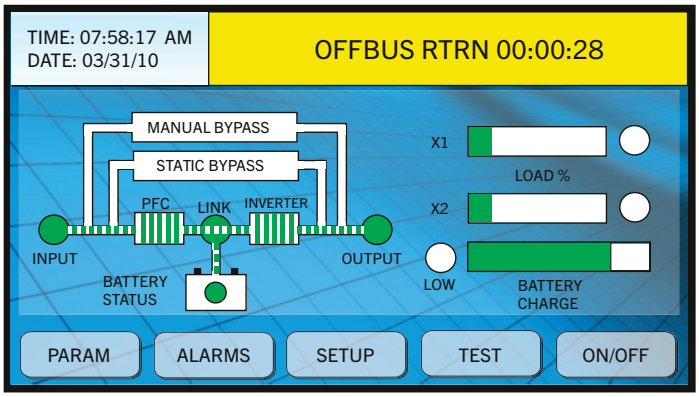


Displays elapsed time on battery. All inverter events are time stamped and stored in the alarm log.

Battery charge indicator will decrease while on battery.

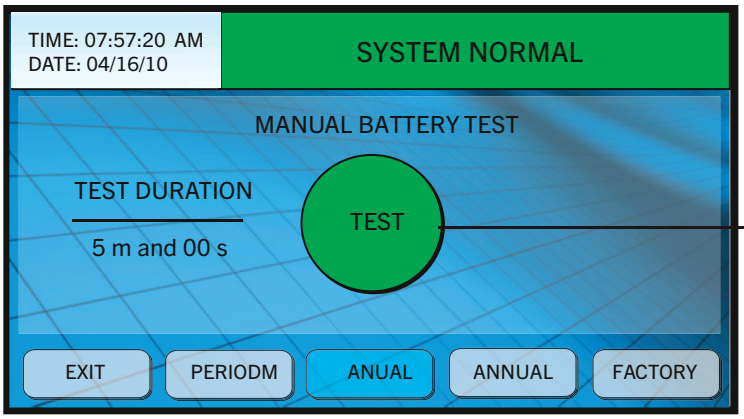
The system will return to utility power when the proper conditions are present. If no Off Buss is present the system will return to utility power immediately upon acceptable conditions being present.

MAIN SCREEN - OFF BUS RETURN



INTELLISTAT TS MONITOR OPERATION MANUAL BATTERY TESTING

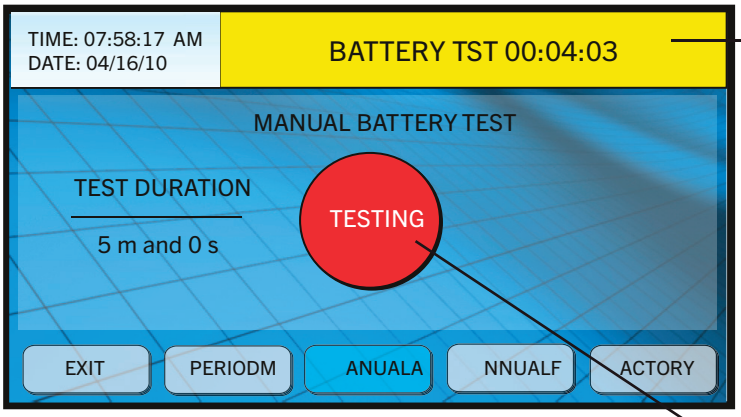
Default customer password = 05151



Press the "TEST" button to invoke a battery test * (Duration is dependant on battery option purchased). The duration is preset at the factory and is not user accessible. Contact the factory should the duration time need to be modified.

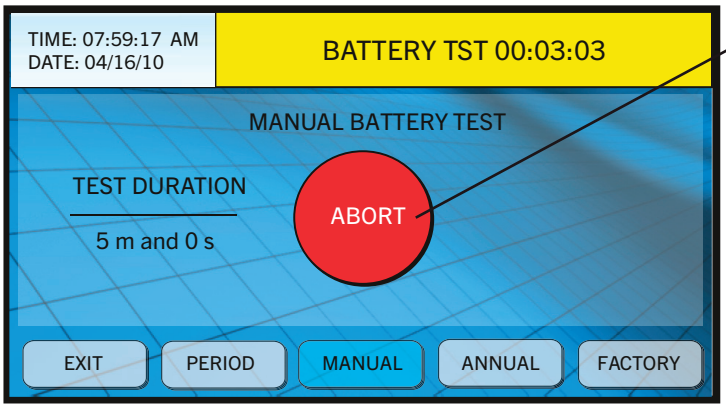
Note: See "Battery Test Durations" at the end of the maintenance section. Contact the factory should the duration time need to be modified.

*** NOTE:** See *"Battery Test Durations"* at the end of the maintenance section. Contact the factory should the duration time need to be modified.



The timer will count down until the test is complete and then terminate the test automatically. Test results can be found in the "TST LOG" Menu.

Test results can be found in the "TST LOG" Menu. If the "TST LOG" register is full the system will delete the oldest entry to make room for the new entry automatically. Aborting the test will result in a "Manual Test : Incomplete" entry in the TST LOG.

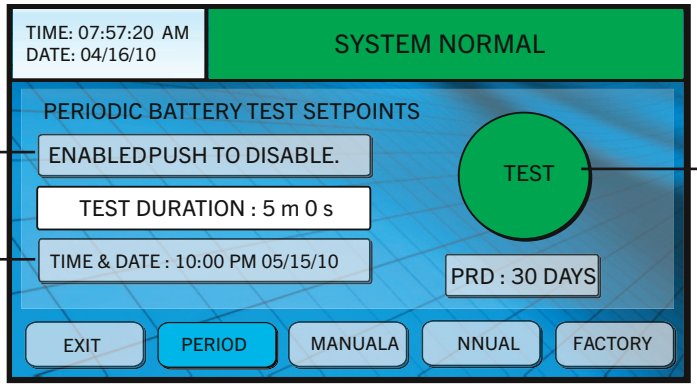


While testing the button will change from "TESTING" to "ABORT". Press the "ABORT" button should you want to terminate the test immediately. The button will then change to "ABORTING" then again back to the original green "TEST" button.

INTELLISTAT TS MONITOR OPERATION AUTOMATIC PERIODIC BATTERY TESTING

Default customer password = 05151

Push to enable the test. Factory preset enabled. The test will auto run at the time and date programmed for the programmed duration. The test period is factory preset for 30 days. Factory preset to the 15th of the following month from date of shipment at 10PM. Time, Date and period are user accessible.



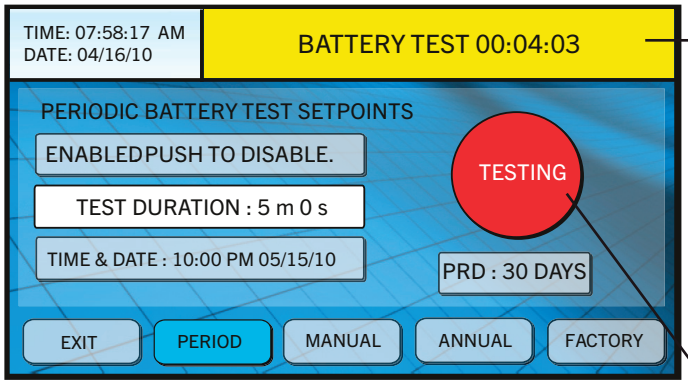
Press the "TEST" button to invoke a battery test * (Duration is dependant on battery option purchased). The duration is preset at the factory and is not user accessible. Contact the factory should the duration time need to be modified.

Note: See "Battery Test Durations" at the end of the maintenance section. Contact the factory should the duration time need to be modified.

* **NOTE:** See *"Battery Test Durations"* at the end of the maintenance section. Contact the factory should the duration time need to be modified.

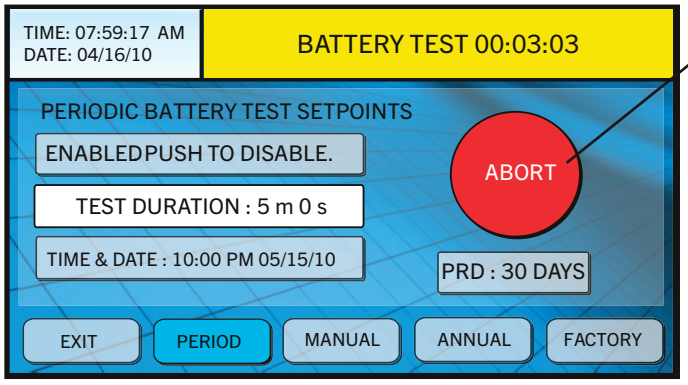
Pushing the test button will invoke the test regardless if the enable/disabled button is enabled or not.

NOTE : Invoking a test by pressing the "TEST" button will automatically change the date and time of the Periodic Test to the date and time that the test button is pushed. The auto test will commence exactly 30 days later on the same date and time the test button was initially pushed (if enabled).



The timer will count down until the test is complete and then terminate the test automatically. Test results can be found in the "TST LOG" Menu.

Test results can be found in the "TST LOG" Menu. If the "TST LOG" register is full the system will delete the oldest entry to make room for the new entry automatically. Aborting the test will result in a "Periodic Test : Incomplete" entry in the TST LOG.

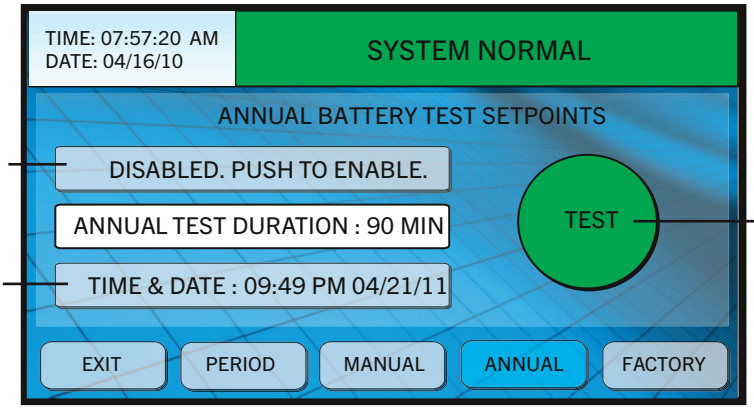


While testing the button will change from "TESTING" to "ABORT". Press the "ABORT" button should you want to terminate the test immediately. The button will then change to "ABORTING" then again back to the original green "TEST" button.

INTELLISTAT TS MONITOR OPERATION AUTOMATIC ANNUAL BATTERY TESTING

Default customer password = 05151

Push to enable the test on a yearly basis. Factory preset disabled. The test will auto run at the time and date programmed. Factory preset to the 15th of the following month, one year from date of shipment at 10PM. Time and Date are user accessible.



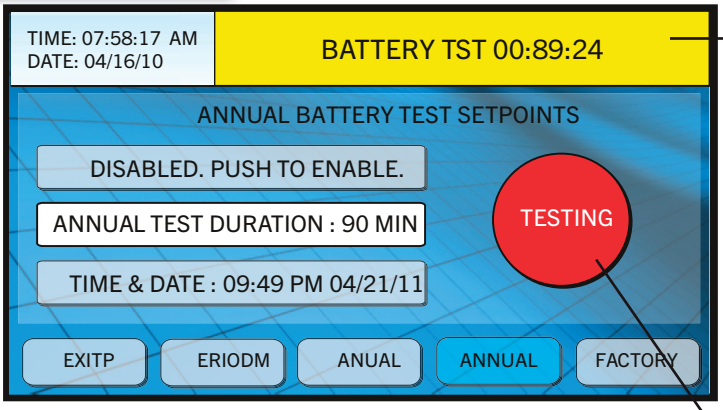
Press the "TEST" button to invoke a battery test * (Duration is dependant on battery option purchased). The duration is preset at the factory and is not user accessible. Contact the factory should the duration time need to be modified.

Note: See "Battery Test Durations" at the end of the maintenance section. Contact the factory should the duration time need to be modified.

* **NOTE:** See *"Battery Test Durations"* at the end of the maintenance section. Contact the factory should the duration time need to be modified.

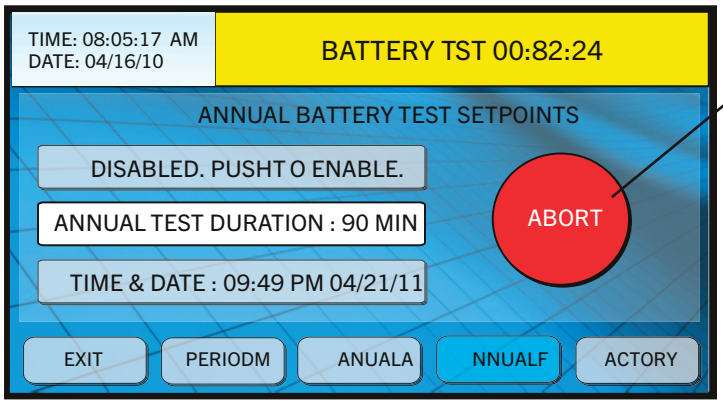
Pushing the test button will invoke the test regardless if the enable/disabled button is enabled or not.

NOTE : Invoking a test by pressing the "TEST" button will automatically change the date and time of the Annual Test to the date and time that the test button is pushed. The auto test will commence exactly one year later on the same date and time the test button was initially pushed (if enabled).



The timer will count down until the test is complete and then terminate the test automatically. Test results can be found in the "TST LOG" Menu.

Test results can be found in the "TST LOG" Menu. If the "TST LOG" register is full the system will delete the oldest entry to make room for the new entry automatically. Aborting the test will result in a "Annual Test : Incomplete" entry in the TST LOG.



While testing the button will change from "TESTING" to "ABORT". Press the "ABORT" button should you want to terminate the test immediately. The button will then change to "ABORTING" then again back to the original green "TEST" button.

EGRESS LIGHTING INTEGRITY TEST (OUTPUT VOLT AMPS ON BATTERY - FACTORY DEFAULT = 0)

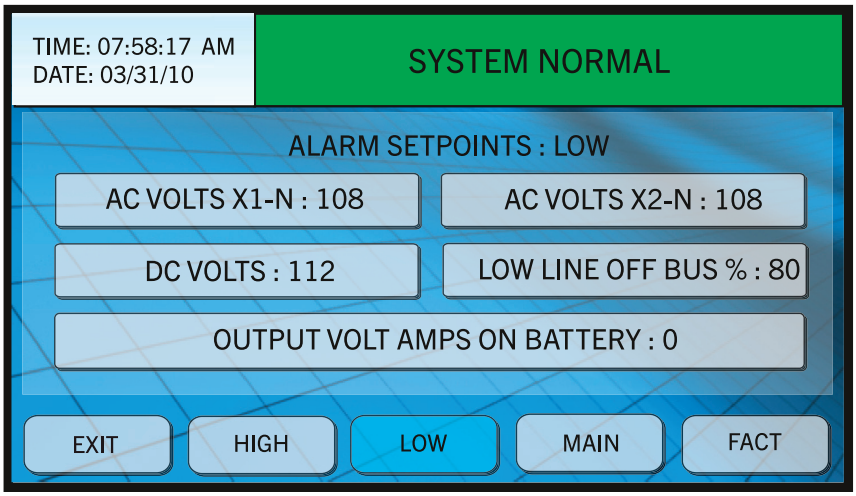
Default customer password = 05151

To satisfy NFPA-mandated periodic and annual requirements, the Intellistat TS automatically initiates the testing of all life safety circuits, regardless of egress lighting design (“always on” or “normally off”). This automatic test checks the inverter system and batteries, as well as the individual circuits leading to the emergency fixtures. The Intellistat compares power consumption during the test period with user-defined load capacity, and analyzes the data. If service is required, the Intellistat will provide a “low output VA” alarm.

This sets the level for the Egress Lighting Integrity Test. If while performing a battery test, the total egress lighting load level drops below this level (VA value entered), a Low Output VA alarm will be given. In order to properly set the Low Output VA alarm level, the user should verify that all emergency egress lights are ON during the battery test. The Low Output VA alarm level should then be set at a minimum of 200 VA less than the total egress lighting load. If the total load goes below this set value during a battery test, it indicates that some emergency light fixtures have been removed or are no longer working, and the source of this issue should be investigated.

If there is not a consistent emergency egress lighting load level (VA) when on battery (during periodic testing or an actual power outage), then this test cannot be used properly. In this case the setting should be left at the factory default level of 0 VA.

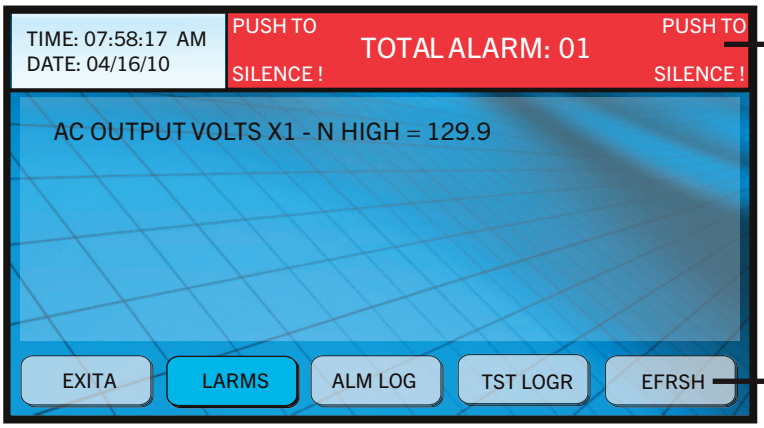
SCREEN PATH : MAIN / SETUP / ALARM SETPOINTS LOW / OUTPUT VOLT AMPS ON BATTERY



INTELLISTAT TS MONITOR OPERATION ALARMS, ALARM LOGS AND TEST LOGS

TYPICAL ALARM SCREEN

ALARMS CLEAR AUTOMATICALLY AFTER EVENT IS CORRECTED AND ARE RECORDED IN ALARM LOG



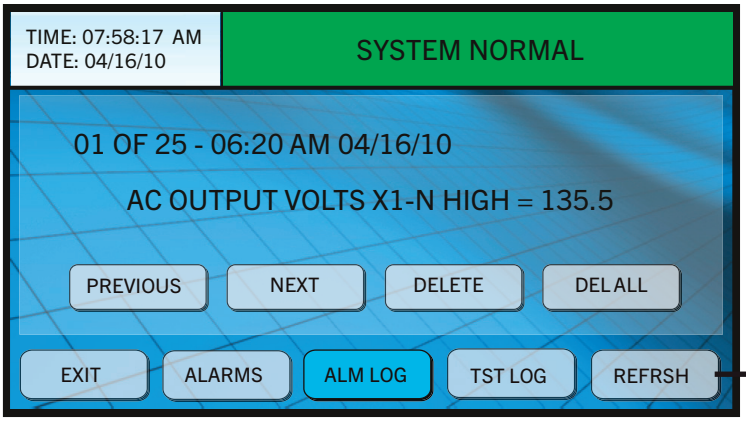
PUSH TO SILENCE

PUSH TO REFRESH ALARM CONDITIONS

TYPICAL ALARM LOG SCREEN

STORES UP TO 25 EVENTS.

If the ALM LOG register is full the system will delete the oldest entry to make room for the new entry automatically.

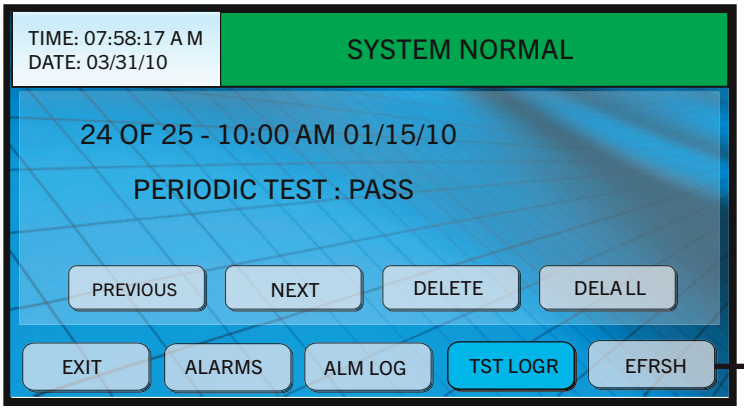


NOT FUNCTIONAL FROM THIS SCREEN

TYPICAL TEST LOG SCREEN

STORES UP TO 25 EVENTS.

If the TST LOG register is full the system will delete the oldest entry to make room for the new entry automatically.



NOT FUNCTIONAL FROM THIS SCREEN

WARRANTY

INTELLISTAT TS MONITOR OPERATION ALARM MESSAGES AND DEFINITIONS

LOG / CURRENT / RS232	ALARM	BANNER
AC OUTPUT VOLTS X1-N HIGH = 121.3	THE OUTPUT VOLTAGE ON LINE 1 IS ABOVE THE OUTPUT VOLTAGE HIGH SETPOINT.	TOTAL ALARM: 01
AC OUTPUT VOLTS X2-N HIGH = 121.3	THE OUTPUT VOLTAGE ON LINE 2 IS ABOVE THE OUTPUT VOLTAGE HIGH SETPOINT.	TOTAL ALARM: 01
DC CHARGER FAIL	THE BATTERY CHARGER HAS FAILED.	TOTAL ALARM: 01
AC OUTPUT AMPS X1-N HIGH = 13.2	THE OUTPUT CURRENT ON LINE 1 IS ABOVE THE OUTPUT CURRENT HIGH SETPOINT.	TOTAL ALARM: 01
AC OUTPUT AMPS X2-N HIGH = 13.2	THE OUTPUT CURRENT ON LINE 2 IS ABOVE THE OUTPUT CURRENT HIGH SETPOINT.	TOTAL ALARM: 01
OUTPUT VA X1-N HIGH = 1200.2	THE OUTPUT VA ON LINE 1 IS ABOVE THE OUTPUT VA HIGH SETPOINT.	TOTAL ALARM: 01
OUTPUT VA X2-N HIGH = 1200.2	THE OUTPUT VA ON LINE 2 IS ABOVE THE OUTPUT VA HIGH SETPOINT.	TOTAL ALARM: 01
OUTPUT FREQUENCY HIGH = 66.2	THE OUTPUT FREQUENCY IS ABOVE 62.5 HZ.	TOTAL ALARM: 01
UNIT FAILED TO START	THE UNIT FAILED TO PROPERLY TURN ON.	UNIT FAILED TO START
BATTERY DC VOLTS HIGH = 155.2	THE BATTERY VOLTAGE IS ABOVE 150 VDC.	TOTAL ALARM: 01
BATTERY DC AMPS HIGH = 32.2	THE BATTERY CHARGING CURRENT IS ABOVE THE CHARGING CURRENT HIGH SETPOINT.	TOTAL ALARM: 01
HIGH TOTAL OUTPUT VA = 2400.4	THE TOTAL VA IS ABOVE THE UNIT RATING.	TOTAL ALARM: 01
AC OUTPUT VOLTS X1-N LOW = 99.2	THE OUTPUT VOLTAGE ON LINE 1 IS BELOW THE OUTPUT VOLTAGE LOW SETPOINT.	TOTAL ALARM: 01
AC OUTPUT VOLTS X2-N LOW = 99.2	THE OUTPUT VOLTAGE ON LINE 2 IS BELOW THE OUTPUT VOLTAGE LOW SETPOINT.	TOTAL ALARM: 01
OUTPUT FREQUENCY LOW = 54.3	THE OUTPUT FREQUENCY IS BELOW 57.5 HZ.	TOTAL ALARM: 01
BATTERY DC VOLTS LOW = 113.2	THE BATTERY VOLTAGE IS BELOW THE BATTERY VOLTAGE LOW SETPOINT.	TOTAL ALARM: 01
AC INPUT VOLTS L1-N HIGH = 134.2	THE INPUT VOLTAGE IS 9% ABOVE THE RATED INPUT VOLTAGE.	TOTAL ALARM: 01
AC INPUT VOLTS L1-N LOW = 99.2	THE INPUT VOLTAGE IS 12% BELOW THE RATED INPUT VOLTAGE.	TOTAL ALARM: 01
OUTPUT CIRCUIT BREAKER OPEN	OUTPUT CIRCUIT BREAKER HAS TRIPPED	TOTAL ALARM: 01
ON MANUAL BYPASS	SYSTEM IS ON MANUAL BYPASS.	ON MANUAL BYPASS
REMOTE OFFBUS ACTIVE	THE OFFBUS HAS BEEN REMOTELY ACTIVATED	OFF BUS ACTIVE
LOW LINE OFFBUS ACTIVE	OFFBUS IS ACTIVATED FROM A LOWLINE CONDITION.	LOW LINE OFFBUS ACTIVE
ON BATTERY 1.3 MIN	SYSTEM IS ON BATTERY	ON BATTERY 1.3 MIN
LOW OUTPUT VA ON BATTERY TEST = 100.2	VA IS TOO LOW DURING A BATTERY TEST	TOTAL ALARM: 01
LAST POWER OFF: USER REPO	SYSTEM SHUTDOWN DUE TO USER REPO	TOTAL ALARM: 01
LAST POWER OFF: OVERTEMPERATURE	SYSTEM SHUTDOWN DUE TO AN OVER TEMPERATURE	TOTAL ALARM: 01

INTELLISTAT TS MONITOR OPERATION ALARM MESSAGES AND DEFINITIONS

LOG / CURRENT / RS232	ALARM	BANNER
OVERTEMPERATURE WARNING	THERE IS AN OVER TEMPERATURE WARNING	TOTAL ALARM: 01
LAST POWER OFF: DC BUS VOLTAGE HIGH	SYSTEM SHUTDOWN DUE TO AN OVERVOLTAGE ON THE DC BUS.	TOTAL ALARM: 01
DC BUS VOLTAGE HIGH WARNING	THERE IS A DC BUS TOO HIGH WARNING.	TOTAL ALARM: 01
LAST POWER OFF: OVERLOAD	SYSTEM SHUTDOWN DUE TO AN OUTPUT OVERLOAD.	TOTAL ALARM: 01
OVERLOAD WARNING	THERE IS AN OVERLOAD WARNING.	TOTAL ALARM: 01
LAST POWER OFF: DC BATTERY DC VOLTS LOW	SYSTEM SHUTDOWN DUE TO A BATTERY CUT OFF.	TOTAL ALARM: 01
BATTERY DC VOLTS LOW WARNING	BATTERY IS CLOSE TO CUT OFF.	TOTAL ALARM: 01
LAST POWER OFF: NORMAL	UNIT WAS SHUT OFF BY USER.	-
-	UNIT IS STARTING UP.	STARTING UP
-	ON BATTERY TEST.	BATTERY TST 00:11:35
-	OFFBUS CONNECTING.	OFFBUS CONN 00:11:35
-	OFFBUS IS RETURNING.	OFFBUS RTRN 00:11:35
-	THE SYSTEM IS ON MANUAL BYPASS AND BATTERY.	ON MANL BYP & BTTRY
-	THE SYSTEM IS ON STATIC BYPASS.	ON STATIC BYPASS
-	THE SYSTEM IS NORMAL, NO ALARMS OR CONDITIONS.	SYSTEM NORMAL
-	SYSTEM IS TURNED OFF.	CONTROL MODULE OFF

BYPASS SWITCH - STANDARD MONITOR

The purpose of the bypass switch is to connect the loads to utility power in case of inverter failure. The bypass function is a push to turn mechanical switch.

⚠ CAUTION

DO NOT switch to bypass mode if the Inverter is on battery or the "On Bypass" light on the display DOES NOT illuminate when the bypass switch is initially pushed in. DO NOT PLACE UNIT IN BYPASS WHILE BATTERY TESTING IS IN PROGRESS.

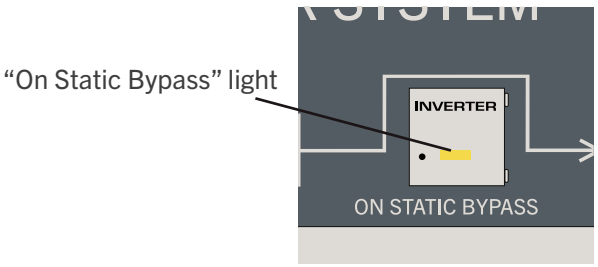
⚠ CAUTION

INTERNAL HIGH VOLTAGES PRESENT WHEN IN BYPASS. Servicing should be performed or supervised by personnel knowledgeable of electrical systems, batteries and the required precautions.

THIS PROCEDURE IS ONLY APPLICABLE WHEN THE SYSTEM IS ACTIVE. THE BYPASS MAY BE SWITCHED AT ANYTIME ONLY IF THE SYSTEM IS COMPLETELY SHUT DOWN.

SWITCHING THE INVERTER TO BYPASS MODE (system active).

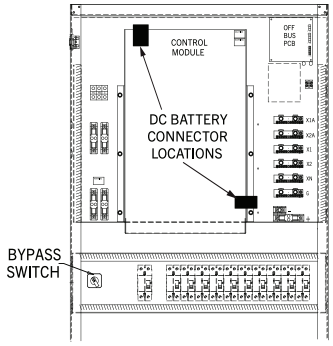
1. Push the knob in all the way and wait until the "On Static Bypass" active mode light on the standard monitor illuminates. For inverters with the Intellistat TSTM Monitor, the screen will show "On Static Bypass". **DO NOT continue if the "On Static Bypass" light does NOT Illuminate or with the Intellistat TSTM Monitor the screen DOES NOT read "On Static Bypass", doing so may cause severe damage.**
2. Then turn the knob clockwise to the "Bypass" position. The "On Static Bypass" active mode light on the Standard monitor will turn off. For inverters with the Intellistat TS™ Monitor, the screen will read "On Manual Bypass".



SWITCHING BACK TO NORMAL MODE (system active).

1. Push the knob in all the way and wait until the “On Static Bypass” active mode light on the Standard Monitor illuminates. For inverters with the Intellistat TS™ Monitor the screen will show “On Static Bypass”. **DO NOT continue if the “On Static Bypass” light does NOT Illuminate or with the Intellistat TSTM Monitor the screen DOES NOT read “On Static Bypass”, doing so may cause severe damage.**
2. Then turn the knob counter clockwise to the “Normal” position. The “On Static Bypass” active mode light on the Standard monitor will turn off. For inverters with the Intellistat TS™ Monitor, the screen will read “System Normal”.

After switching to bypass mode, it is recommended that the DC battery connector be disconnected from the control module. This will prevent battery discharge and possible battery damage if left in bypass mode for extended periods of time. Be sure to reconnect the DC battery connector before returning to normal mode operation.



BYPASS SWITCH - INTELLISTAT MONITOR

BYPASS SWITCH OPERATION - The purpose of the bypass switch is to connect the loads to utility power in case of inverter failure. The bypass function is a push to turn mechanical switch.

CAUTION

DO NOT switch to bypass mode if the Inverter is on battery or the “On Bypass” light on the display DOES NOT illuminate when the bypass switch is initially pushed in. DO NOT PLACE UNIT IN BYPASS WHILE BATTERY TESTING IS IN PROGRESS.

CAUTION

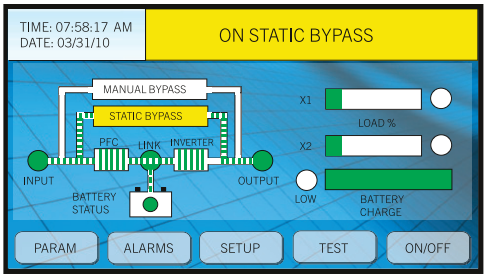
INTERNAL HIGH VOLTAGES PRESENT WHEN IN BYPASS. Servicing should be performed or supervised by personnel knowledgeable of electrical systems, batteries and the required precautions.

THIS PROCEDURE IS ONLY APPLICABLE WHEN THE SYSTEM IS ACTIVE. THE BYPASS MAY BE SWITCHED AT ANYTIME ONLY IF THE SYSTEM IS COMPLETELY SHUT DOWN.

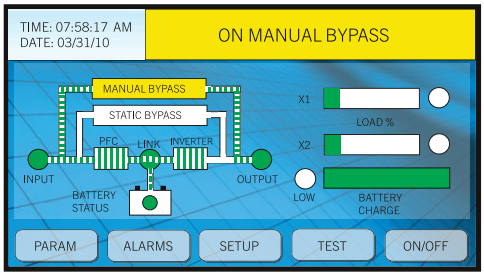
BYPASS SWITCH

SWITCHING THE INVERTER TO BYPASS MODE (system active).

1. Push the knob in all the way and wait until the “On Static Bypass” message appears on the display.



2. Then turn the knob clockwise to the “Bypass” position. “On Manual Bypass” will then be displayed on the monitor. The system is now safely in the bypass mode.



SWITCHING BACK TO NORMAL MODE (system active).

1. Push the knob in all the way and wait until the “Static Bypass” bar illuminates on the display (Note: The “On Manual Bypass” banner at the top of the screen will not change).
2. Then turn the knob counter clockwise to the “Normal” position. A “System Normal” message will appear on the screen. The unit is now running in normal mode.

After switching to bypass mode, it is recommended that the DC battery connector be disconnected from the control module. This will prevent battery discharge and possible battery damage if left in bypass mode for extended periods of time. Be sure to reconnect the DC battery connector before returning to normal mode operation.

MAINTENANCE PROCEDURES

GENERAL MAINTENANCE

The best preventive maintenance is to operate the lighting inverter in a clean environment with proper ventilation and no restrictions on air intakes and cooling fan outputs.

Battery connections should be tightened annually by qualified electrical personnel. Batteries should be replaced as indicated by battery testing.

The lighting inverter should be checked monthly for battery operation. Take precautions to have the lighting load in a mode that could tolerate a shut down. See “Maintenance - Battery Testing” for instructions.

COMPLETE MAINTENANCE CHECK

PREPARATION - A shutdown period must be scheduled to perform maintenance. The lighting loads should be available to test the lighting inverter with a loss of power simulation.

EQUIPMENT - Wire brush or other cleaning device (for battery connections), insulated tools (for battery connections) and safety glasses.

SYSTEM OPERATION

1. With power on, check display functions of unit for proper operation.
2. Turn the AC input breaker off, the unit will go into inverter mode.
3. Turn the AC input breaker back on, and the unit will return to normal mode.

VISUAL INSPECTION

1. Open Door.
2. Turn the unit off by means of the monitor and disconnect the battery connector. Then turn off the main input breaker on the unit and the main feed breaker.
3. Check for burnt, frayed, broken or loose connections. Look closely in the following areas: Input and Output connections, circuit breakers, and battery terminals.
4. Correct any loose connection s, replace any physically burned or broken componentsw. Use extreme care when replaceing components to assure correct installation.

GENERATOR TEST

1. If a generator is backing up the inverter, check to be sure the inverter operates properly with the generator.

A. Check the generator operation with no load. The unit should

switch to inverter when the generator turns on. After a minute or so the lighting inverter should switch back to normal mode and run off the generator

B. Check the generator with the loads.

BATTERY MAINTENANCE

Batteries of a specific manufacturer and model are required to maintain the system's UL 924 listing. Use of batteries not recognized in the product's UL report will void its listing.

WARNING

Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries. SEE *"INSTALLATION PRECAUTIONS"*

Accidental shorts will cause severe arcing, burning or battery explosion - wear eye protection and use insulated tools when servicing batteries. Remove all jewelry.

NOTE: Never mix batteries with a different brand or size. Never mix old and new batteries. Dispose of batteries properly. Do not open, mutilate or dispose in a fire.

1. Visually inspect all battery connections. If there is any sign of corrosion - disconnect that battery and clean with a wire brush. Tighten all other battery connections. Make sure the batteries are not swollen or cracked. If they are, contact the factory.
2. If batteries must be replaced, contact the factory or see "Installation - Battery Installation" and *"Installation - Battery Wiring".*

BATTERY TESTING - STANDARD MONITOR

CAUTION - DO NOT PLACE UNIT IN BYPASS WHILE BATTERY TESTING IS IN PROGRESS.

PREPARATION - Proper precautions must be taken when performing battery testing. The lighting load(s) should be available to test on inverter, in a loss of power simulation. Be sure also to take precautions to have the lighting load in a mode that could tolerate a shut down. If the battery test fails the system may shutdown and all of the lighting loads connected to it will lose power.

It is recommended that batteries are periodically inspected for corroded and loose connections. Battery connections should be tightened annually by qualified electrical personnel. Batteries should be checked as indicated by monthly battery testing.

MANUAL BATTERY TEST - STANDARD MONITOR

1. On the front display, press and hold the "Alarm Silence" button for three (3) seconds. This will force the inverter into battery mode.

2. The unit will stay in battery mode for the programmed duration, then return to normal mode. See “Battery Test Durations” at the end of this section.
3. After the test has elapsed, if the check battery light is illuminated, there may be weak batteries. If this conditionexists, contact the factory.
4. If the low battery condition is reached for longer than 10 seconds, then the battery test will stop and the “Check Battery” light will illuminate.

AUTOMATIC PERIODIC BATTERY TEST - STANDARD MONITOR

GENERAL - The inverter is preset at the factory for automatic monthly testing enabled and takes place on the programmed calendar date. Starting with the 15th day of the following month from the actual ship date at 10 P.M. See *“Battery Test Durations”* at the end of this section. During this time, the battery discharge rate is evaluated to determine the health of the battery string. Since the inverter is operating from battery power during the test, a general alarm condition will exist. The date, time and the interval (none, 1day, 30 days or 90 days) of the test can be modified by the user. See *“Changing Battery Test Parameters”* for details. Test durations are pre-programmed at the factory and are not user accessible.

If the health of the battery string is suspect, the “Check Battery” indicator light located on the local monitor will illuminate and the general alarm will continue to exist after the battery test is complete. A contact closure signal is also provided as a result of the general alarm status. This general alarm signal may be used for external / remote communications. See *“Communications Description”* and *“Communications”* for details. Also See *“Optional Remote Communication”.*

AUTOMATIC ANNUAL BATTERY TEST - STANDARD MONITOR

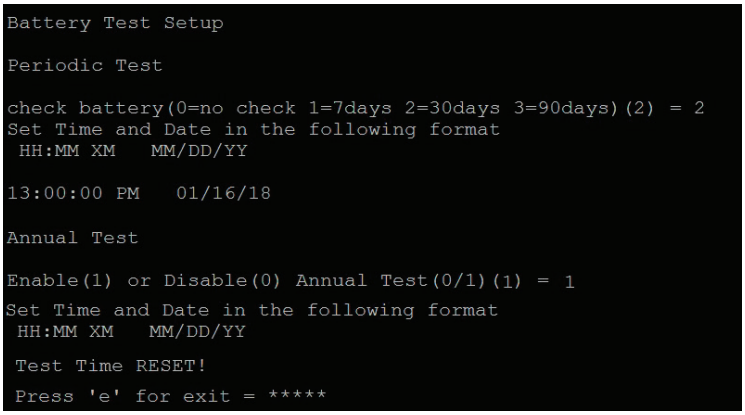
GENERAL - The inverter is preset at the factory for automatic annual testing disabled. The test duration is determined by the amount of back up time purchased and is pre-programmed at the factory and takes place on the programmed calendar date. Twelve (12) months from the date of shipment, starting with the 15th day of the month, one year from the actual ship date at 10 P.M. During this time, the battery discharge rate is evaluated to determine the health of the battery string. Since the inverter is operating from battery power during the test, a general alarm condition will exist. The date and time of the test can be modified by the user. See *“Changing Battery Test Parameters”* for details. Test durations are pre-programmed at the factory and are not user accessible.

If the health of the battery string is suspect, the “Check Battery” indicator light located on the local monitor will illuminate and the general alarm will continue to exist after the battery test is complete. A contact closure signal is also provided as a result of the general alarm status. This general alarm signal may be used for external / remote communications. See *“Communications Description”* and *“Communications”* for details. Also See *“Optional Remote Communications”.*

CHANGING BATTERY TEST PARAMETERS - STANDARD MONITOR

SETUP - By using any TTY emulation program, the battery test

parameters can be modified. See *"Communications"*. Follow the instructions in that section to access the memory. Type a lower case "bb" the following will appear on the screen:



⚠ CAUTION ⚠

DO NOT PLACE UNIT IN BYPASS WHILE BATTERY TESTING IS IN PROGRESS.

The inverter will now perform the Periodic and Automatic battery tests at the interval, time and date set.

Extreme caution should be taken when changing system parameters - contact the factory prior to doing so. Type in the value desired and the next set of parameters will be displayed. If no change is desired simply hit return to scroll to the next set of parameters. When finished enter a lower case "e" to exit the System Memory Modification. See "Communications - System Parameters" for an explanation of system setpoints. The following is a list of commands available to modify the System Memory: **Note: All characters must be entered as shown.**

Note: All characters must be entered as shown.

ss = System Parameters

e = End Memory Modification

e = End Battery Test Setup

bb = Battery Test Setup

pp = System Set Points

tt = UPS Time and Date

ww = Last 5 Shut Downs

BB = Battery Test Logs

ll = Log Functions

cc = Set UPS Time and Date

rr = Battery Test Parameters

mm = System Memory Modification – Consult Factory **Units shipped after**

April 1st, 2009 also have the following available:

FF = Calibration Menu

ww = Last 5 Shut Downs

rr = Next Scheduled Battery Test (if enabled)

cc = Set Inverter Time and Date

To display the Inverter Time and Date - Enter a lower case “tt”.

To change the Inverter Time and Date - Enter a lower case “cc”. Enter the desired time and date as indicated below.

Time = Military Format

Date = MM/DD/YY

Units shipped after April 1st, 2009 have the following Time/Date format:

<table>
<tr><th colspan="3">Time Format = HH:MM, XM, D
Example - 08:39, A, W (8:39AM, Wed)</th></tr>
<tr><th>HH:MM</th><th>XM</th><th>D</th></tr>
<tr><td>Hours:Minutes</td><td rowspan="2">A or P</td><td>U = Sunday</td></tr>
<tr><td>Example - 08:39</td><td>M = Monday</td></tr>
<tr><td colspan="2" rowspan="5">Date Format: MM/DD/YY
Month/Date/Year
Example - 04/23/09</td><td>T = Tuesday</td></tr>
<tr><td>W = Wednesday</td></tr>
<tr><td>H = Thursday</td></tr>
<tr><td>F = Friday</td></tr>
<tr><td>S = Saturday</td></tr>
</table>

DO NOT CHANGE ANY OTHER PARAMETERS WITHOUT CONSULTING THE FACTORY FIRST.

BATTERY TEST DURATIONS - ALL MONITORS			
Battery Time	**Periodic Test Duration**	**Annual Test Duration**	**Manual Test Duration**
=> 90 Minutes	5 Minutes	<= Total Battery Time*	5 Minutes
60-89 Minutes	5 Minutes	<= Total Battery Time	5 Minutes
30-59 Minutes	1 Minute	<= Total Battery Time	1 Minute
=< 29 Minutes	30 Seconds	<= Total Battery Time	30 Seconds
* 4 Hours Maximum			

BATTERY TESTING - INTELLISTAT TS MONITOR

CAUTION - DO NOT PLACE UNIT IN BYPASS WHILE BATTERY TESTING IS IN PROGRESS.

PREPARATION - Proper precautions must be taken when performing battery testing. The lighting load(s) should be available to test on inverter, in a loss of power simulation. Be sure also to take precautions to have the lighting load in a mode that could tolerate a shut down. If the battery test fails the system may shutdown and all of the lighting loads connected to it will lose power.

It is recommended that batteries are periodically inspected for corroded and loose connections. Battery connections should be tightened annually by qualified electrical personnel. Batteries should be checked as indicated by monthly battery testing.

MANUAL BATTERY TEST - INTELLISTAT TS MONITOR

GENERAL - The inverter is preset at the factory for manual battery testing. See *"Battery Test Durations"* at the end of this section. Check your display for the programmed battery test time (TEST MENU). During this time, the battery discharge rate is evaluated to determine the health of the battery string.

Testing Procedure:

1. On the Intellistat TS™ Monitor, select "Test" from the Main Menu. Enter the required password to continue. Select "MANUAL" from the menu and when the next sreen appears push the green TEST button. This will force the inverter into battery mode for the programmed duration.
2. The unit will stay in battery mode for the pre-programmed duration and then return to normal mode. You will have the option to abort the test if required. See *"Operation - Intellistat TS™ Monitor - Manual Battery Testing".*
3. If the health of the battery string is suspect, a general alarm will exist on the Intellistat TS™ monitor and the general alarm will continue to exist after the battery test is complete. By going to the ALM LOG screen on the Intellistat TS™ Monitor a BATTERY TEST FAIL indication will be displayed in the TST LOG screen. A contact closure signal is also provided as a result of the general alarm status. The general alarm signal may be used for external / remote communications. See *"Communications Description" and "Communications" for details. Also See "Optional Remote Communications".*

AUTOMATIC PERIODIC BATTERY TEST - INTELLISTAT TS MONITOR

GENERAL - The inverter is preset at the factory for automatic monthly testing enabled and takes place on the programmed calendar date. See *"Battery Test Durations"* at the end of this section. The programmed test date is on the 15th of the following month from date of shipment at 10PM. Check your display for the programmed battery test time (TEST MENU). During this time, the battery discharge rate is evaluated to determine the health of the battery string. The results of the test will be located in the TST LOG screen.

If the health of the battery string is suspect, a general alarm will exist on

the Intellistat TS™ monitor and the general alarm will continue to exist after the battery test is complete. By going to the ALM LOG screen on the Intellistat TS™ monitor a BATTERY TEST FAIL indication will be displayed in the TST LOG screen. A contact closure signal is also provided as a result of the general alarm status. The general alarm signal may be used for external / remote communications. See *"Communications Description"* and *"Communications" for details. Also See "Optional Remote Communications".*

Note: Invoking a test by pressing the "TEST" button will automatically change the date and time of the Periodic Test to the date and time that the test button is pushed. The auto test will commence exactly 30 days (depending on the period set) later on the same date and time the test button was initially pushed (if enabled).

NOTE - Invoking a test by pressing the "TEST" button will automatically change the date and time of the Periodic Test to the date and time that the test button is pushed. The auto test will commence exactly 30 days (depending on the period set) later on the same date and time the test button was initially pushed (if enabled).

To force a periodic test:

1. On the Intellistat TS™ Monitor, select "Test" from the Main Menu. Enter the required password to continue. Select "PERIOD" from the menu and when the next screen appears push the green TEST button. This will force the inverter into battery mode for the programmed duration.
2. The unit will stay in battery mode for the pre-programmed duration and then return to normal mode. You will have the option to abort the test if required. See *"Operation - Intellistat TS™ Monitor - Periodic Battery Testing".*
3. If the health of the battery string is suspect, a general alarm will exist on the Intellistat TS™ monitor and the general alarm will continue to exist after the battery test is complete. By going to the ALM LOG screen on the Intellistat TS™ Monitor a BATTERY TEST FAIL indication will be displayed in the TST LOG screen. A contact closure signal is also provided as a result of the general alarm status. The general alarm signal may be used for external / remote communications. See *"Communications Description" and "Communications" for details. Also See "Optional Remote Communications".*

AUTOMATIC ANNUAL BATTERY TEST - INTELLISTAT TS MONITOR

GENERAL - The inverter is preset at the factory for automatic annual testing disabled. The duration time is preset at the factory in accordance with the battery option purchased. See *"Battery Test Durations"* at the end of this section. Check your display for the programmed battery test time (TEST MENU). During this time, the battery discharge rate is evaluated to determine the health of the battery string.

If the health of the battery string is suspect, a general alarm will exist on the Intellistat TS™ monitor and the general alarm will continue to exist after the battery test is complete. By going to the ALM LOG screen on the Intellistat TS™ Monitor a BATTERY TEST FAIL indication will be displayed in the TST LOG screen. A contact closure signal is also provided as a result of the general alarm status. The general alarm signal may be used for external / remote communications. See *"Communications Description"* and *"Communications"* for details. Also See *"Optional Remote Communications".*

NOTE : Invoking a test by pressing the "TEST" button will automatically

Note: Invoking a test by pressing the "TEST" button will automatically change the date and time of the Annual Test to the date and time that the test button is pushed. The auto test will commence exactly one year later on the same date and time the test button was initially pushed (if enabled).

change the date and time of the Annual Test to the date and time that the test button is pushed. The auto test will commence exactly one year later on the same date and time the test button was initially pushed (if enabled).

To force an annual test:

1. On the Intellistat TS™ Monitor, select "Test" from the Main Menu. Enter the required password to continue. Select "ANNUAL" from the menu and when the next sreen appears push the green TEST button. This will force the inverter into battery mode for the programmed duration. See *"Battery Test Durations"* at the end of this section.
2. The unit will stay in battery mode for the pre-programmed duration and then return to normal mode. You will have the option to abort the test if required. See *"Operation - Intellistat TS™ Monitor - Annual Battery Testing".*
3. If the health of the battery string is suspect, a general alarm will exist on the Intellistat TS™ monitor and the general alarm will continue to exist after the battery test is complete. By going to the ALM LOG screen on the Intellistat TS™ Monitor a BATTERY TEST FAIL indication will be displayed in the TST LOG screen. A contact closure signal is also provided as a result of the general alarm status. The general alarm signal may be used for external / remote communications. See *"Communications Description"* and *"Communications"* for details. Also See *"Optional Remote Communications".*

BATTERY TEST DURATIONS - ALL MONITORS			
Battery Time	**Periodic Test Duration**	**Annual Test Duration**	**Manual Test Duration**
=> 90 Minutes	5 Minutes	<= Total Battery Time*	5 Minutes
60-89 Minutes	5 Minutes	<= Total Battery Time	5 Minutes
30-59 Minutes	1 Minute	<= Total Battery Time	1 Minute
=< 29 Minutes	30 Seconds	<= Total Battery Time	30 Seconds
* 4 Hours Maximum			

WARRANTY

This Warranty applies only to the original purchaser who must properly register the product within thirty (30) days of receipt.

https://www.trystar.com/services/warranty-information/

Trystar warrants that our products and their components will remain free from defects in material and workmanship for the duration of the respective warranty period* from the date of shipment and agrees to replace, F.O.B. its factory, any parts which fault through defect in material or workmanship during such period. Non payment for the product to either the reseller, rep, distributor or the factory direct will result in revocation of warranty, technical support and service contracts. **Warranty begins from date of shipment unless a factory Start-Up Plus is purchased, then the warranty begins from date of Start Up or 90 days from ship date; whichever comes first.**

If a Start-Up Plus is purchased with the unit(s) or within 30 days from original ship date, the 1st year warranty is upgraded to include onsite labor and expenses during normal business hours (Monday - Friday, 8AM - 4PM). Start-Up Plus includes all travel and living expenses. Start-Up Plus description: Testing all emergency circuitry - Calibration - Inspection - Exercising all circuit breakers - Cooling fan check - Input and output parameter check - Air intake / exhaust check - Complete battery inspection and testing (where applicable) - Re-torque all high current terminals - Battery certification report (where applicable) - Input/Output verification - Written report. User training to be done at time of start up (no return visits). Product installation is required to be complete before start up can be scheduled.

Products:

- Emergency Lighting Inverters (ELU) / 2 Years parts only*, Batteries 1 Year full, 14 year pro-rated.

  * From original shipment date / Excludes on site labor and expenses unless otherwise noted.

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1. This Warranty shall be effective only if and so long as the system is installed and operated in the manner specified in the manual which accompanied the product, and is operated within the ratings on the nameplate of the system.
2. This Warranty shall be effective provided the purchaser pays the cost of transporting the faulty component(s) to and from Trystar's factory at the purchaser's own expense, unless the item covered under service contract with Trystar. There is no cost for installation of the replacement component(s) when done at the factory. Otherwise installation of the replacement component(s) are the responsibility of the purchaser, unless the item is covered under service contract with

Trystar. If after inspection the faulty component has been caused by misuse or abnormal conditions in the judgment of Trystar, the purchaser will be charged for repairs based on parts and labor required. This Warranty does not cover fuses, light bulbs, and other normally expendable items. Trystar service personnel are not included in this warranty unless covered by a Trystar service contract.

3. This Warranty shall be void if any alteration is made to the system, or any of its components are altered by anyone other than an authorized Trystar service person, without the written permission of Trystar.
4. This Warranty is in lieu of all other warranties, expressed or implied. Trystar neither assumes, nor authorizes any person to assume for it, any liability other than that specifically set forth in this Warranty. Except for its obligations, Trystar assumes no liability or responsibility for personal injury, loss of life, consequential or other damages resulting from defects in, or failure of, the system or any of its components.

https://www.trystar.com/services/warranty-information/

CUSTOMER SUPPORT

Trystar NATIONWIDE CUSTOMER SUPPORT

Trystar offers total customer support that assures your critical equipment is maintained properly for trouble free operation.

WHAT A CUSTOMER SUPPORT PLAN OFFERS:

HOT LINE: 24 hour toll free 1-800-521-4792.

REMEDIAL MAINTENANCE: Covers all on-site repairs, parts, freight, labor and travel expenses.

RESPONSE: Immediate 24 hour phone support. If problem is not solved Controlled Power will make every effort to have your system running within 48 hours.

BATTERIES: Batteries are covered under a 15 year pro-rate schedule, beginning from the shipment date. The battery pro-rate does not cover labor, freight, battery disposal, travel or living expenses.

PREVENTIVE MAINTENANCE: Optional preventive maintenance includes the following:

Annual battery run down certification for 90 minutes per NFPA 101 Life Safety Code, Section 5- 9.3 and NFPA 70 (N.E.C. 70) National Electric Code.

- Testing all emergency circuitry
- Inspection
- Exercising all circuit breakers
- Input and output parameter check
- Complete battery inspection and testing
- Re-torque all high current terminals

- Calibration
- Clean internal and external
- Cooling fan check
- Air intake / exhaust check
- Written report
- **Battery certification report**

START UP: Includes installation inspection (wired properly, location, environment), Unit inspection (internal and external), Unit power up, Operation verification including options. One visit, includes all travel expenses.

PLAN	ON SITE COVERAGE	PARTS COVERED	FIELD REPAIR LABOR COVERED	FACTORY REPAIR LABOR COVERED	FREIGHT COVERED	TRAVEL EXPENSES COVERED
SILVER	NONE	YES	NO	YES	NO	NO
GOLD	M-F 8AM-4PM	YES	YES	YES	YES	YES
PLATINUM	24-7	YES	YES	YES	YES	YES

TRAINING AND PARTS

For Customers who maintain their own equipment, Controlled Power offers hands on training at our training facility and part kits. For more information, contact Controlled Power Customer Support Department at 1-800-521-4792.

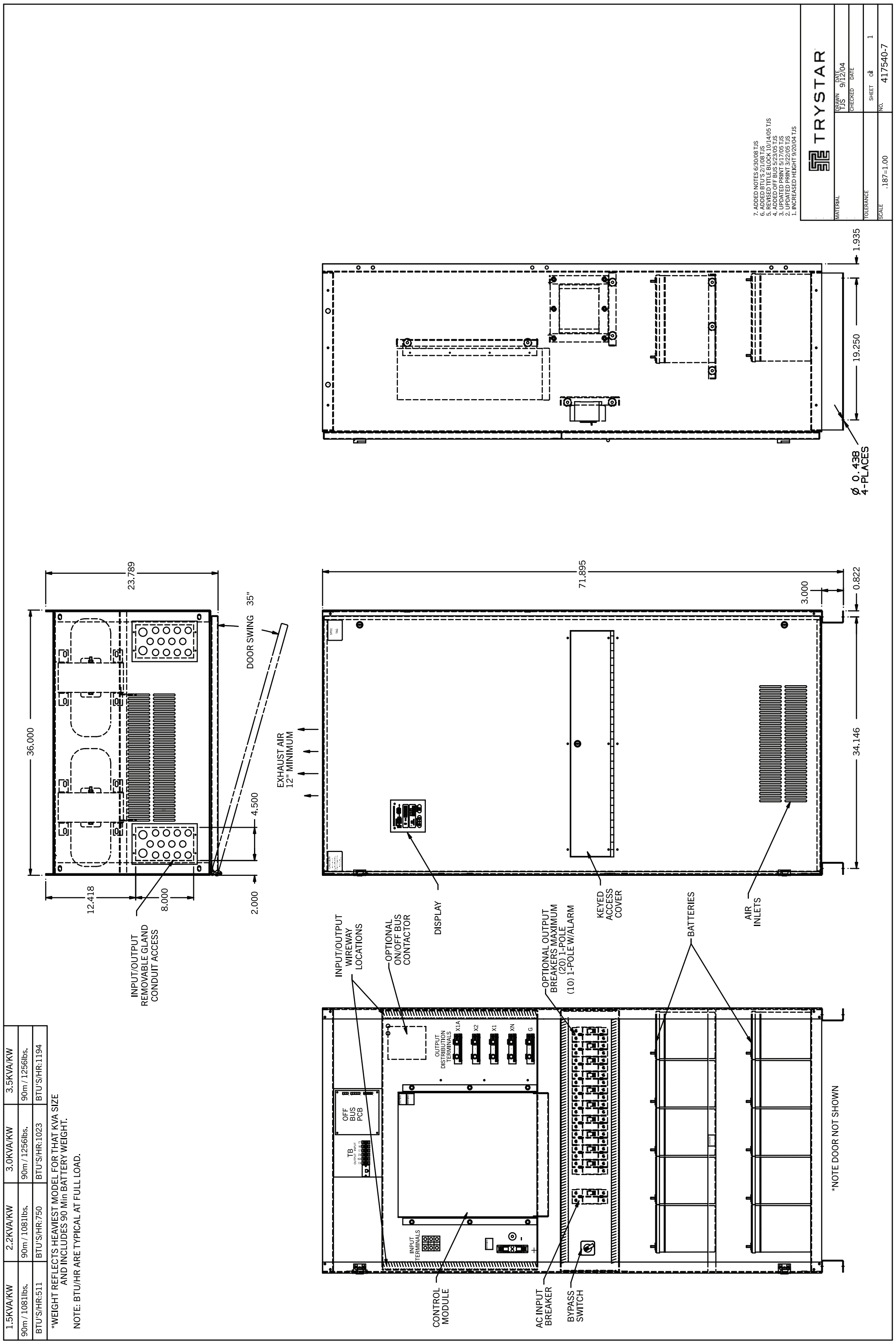
Individual components are available upon request, please contact the factory for specific part numbers and prices. See *"Appendix A - Component Location Diagrams"* for component location and description. When contacting the Parts Department, please have the unit's full model number and serial or system number. Call 1-800-521-4792.

APPENDIX A

APPENDIX A
RELATIVE DRAWINGS
&
SCHEMATICS

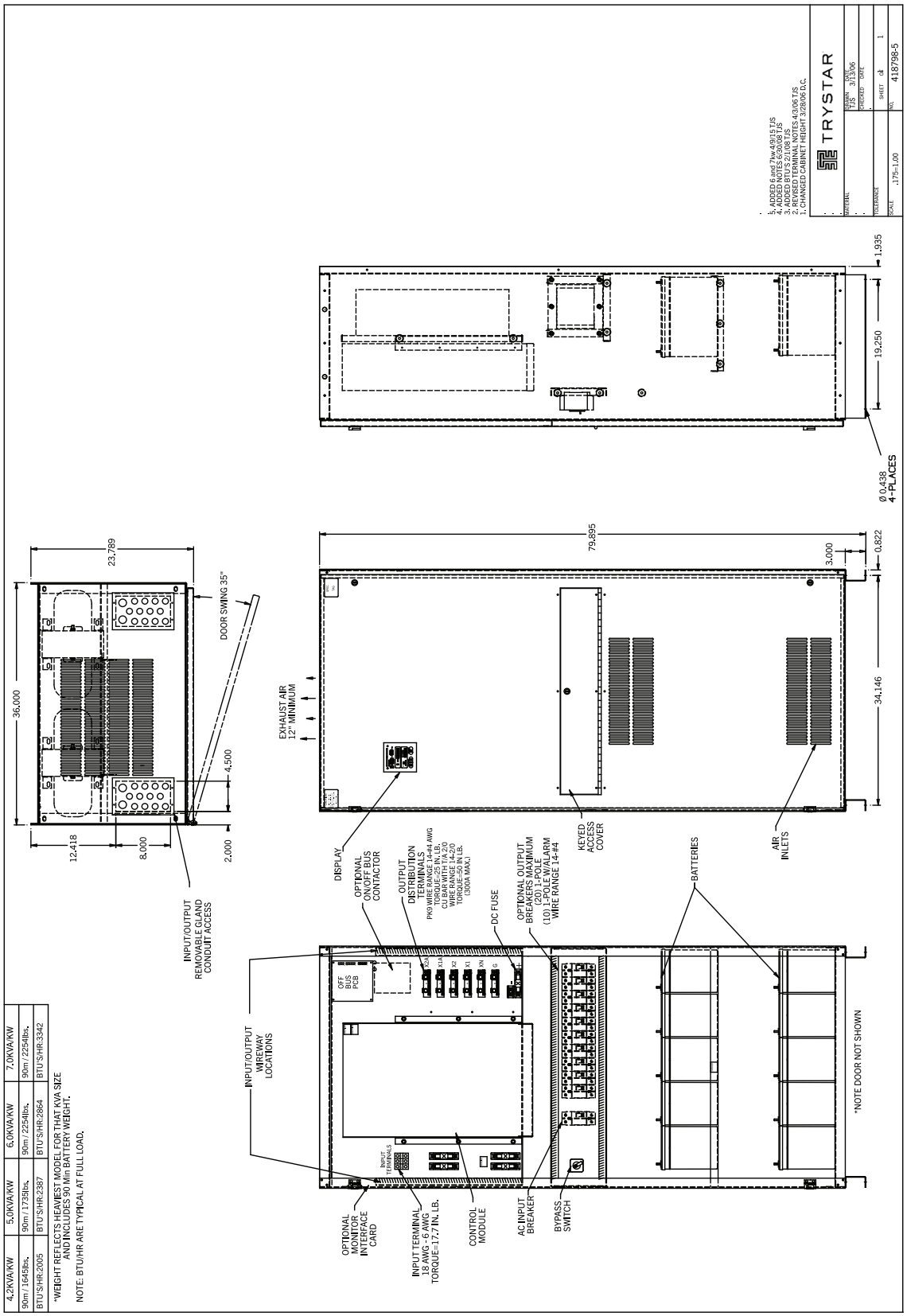
CABINET OUTLINE

1.5KW - 3.5KW



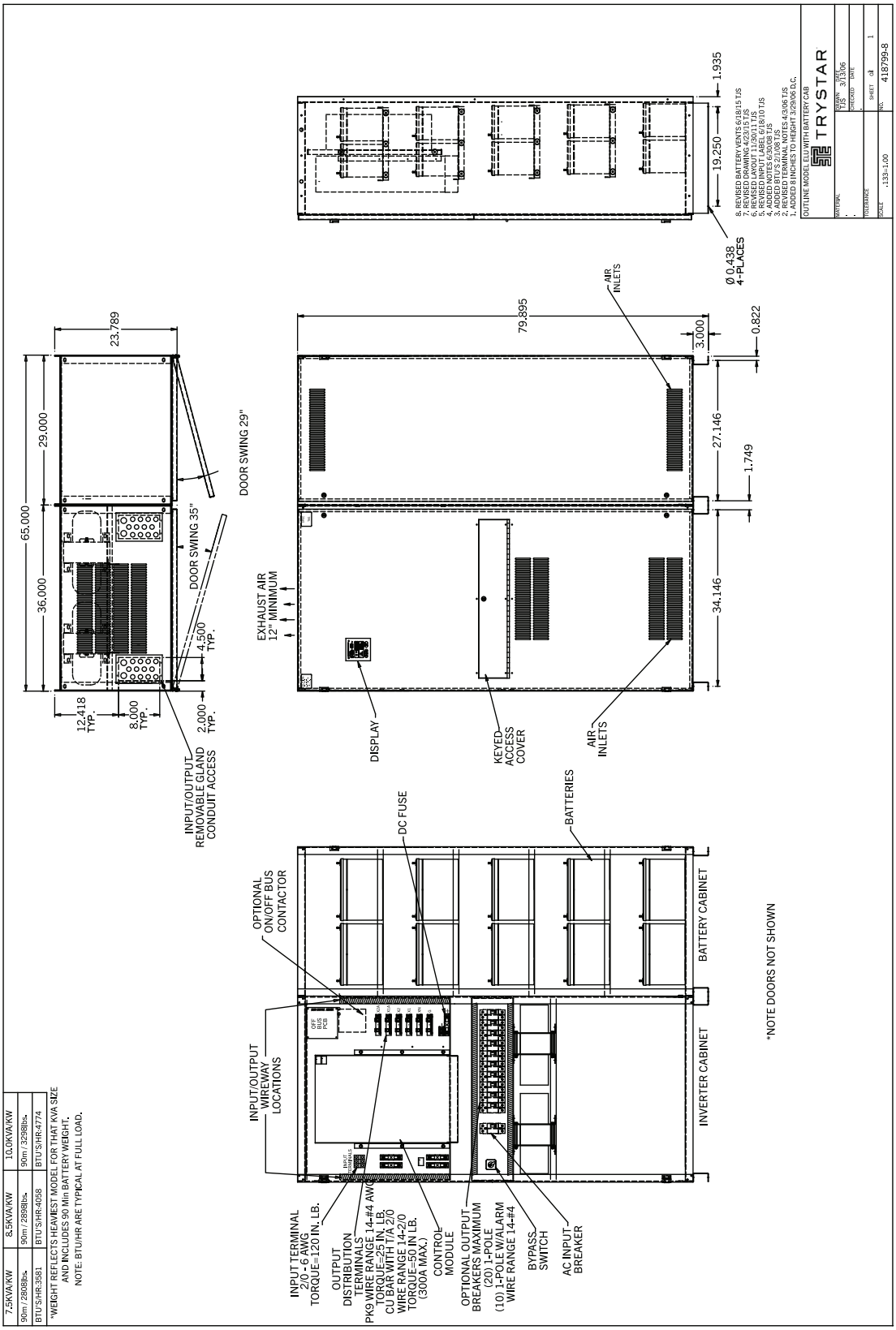
CABINET OUTLINE

4.2KW - 7KW



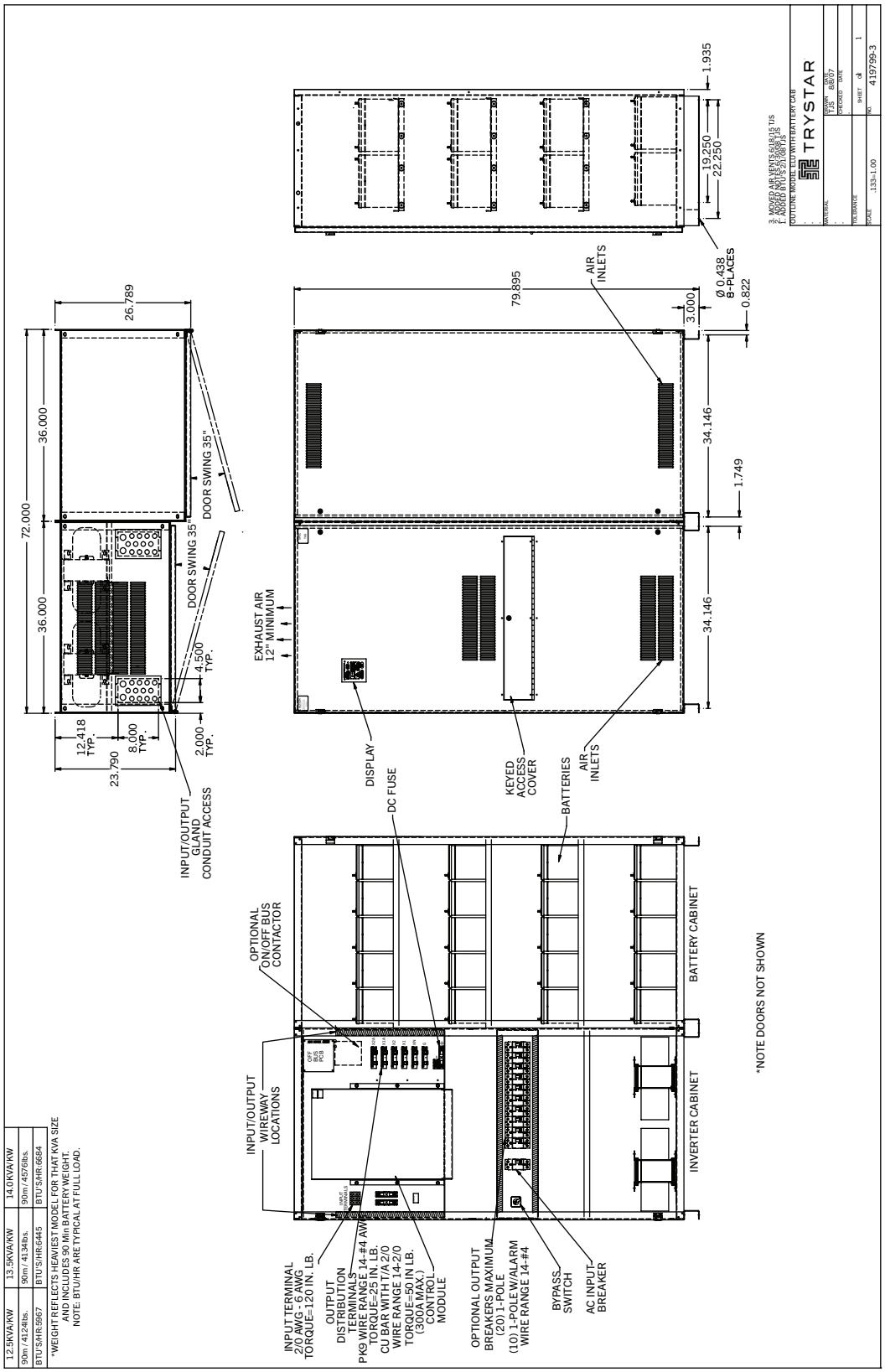
CABINET OUTLINE

7.5KW - 10KW WITH EXTERNAL BATTERY CABINET



CABINET OUTLINE

12.5KW - 14KW WITH EXTERNAL BATTERY CABINET

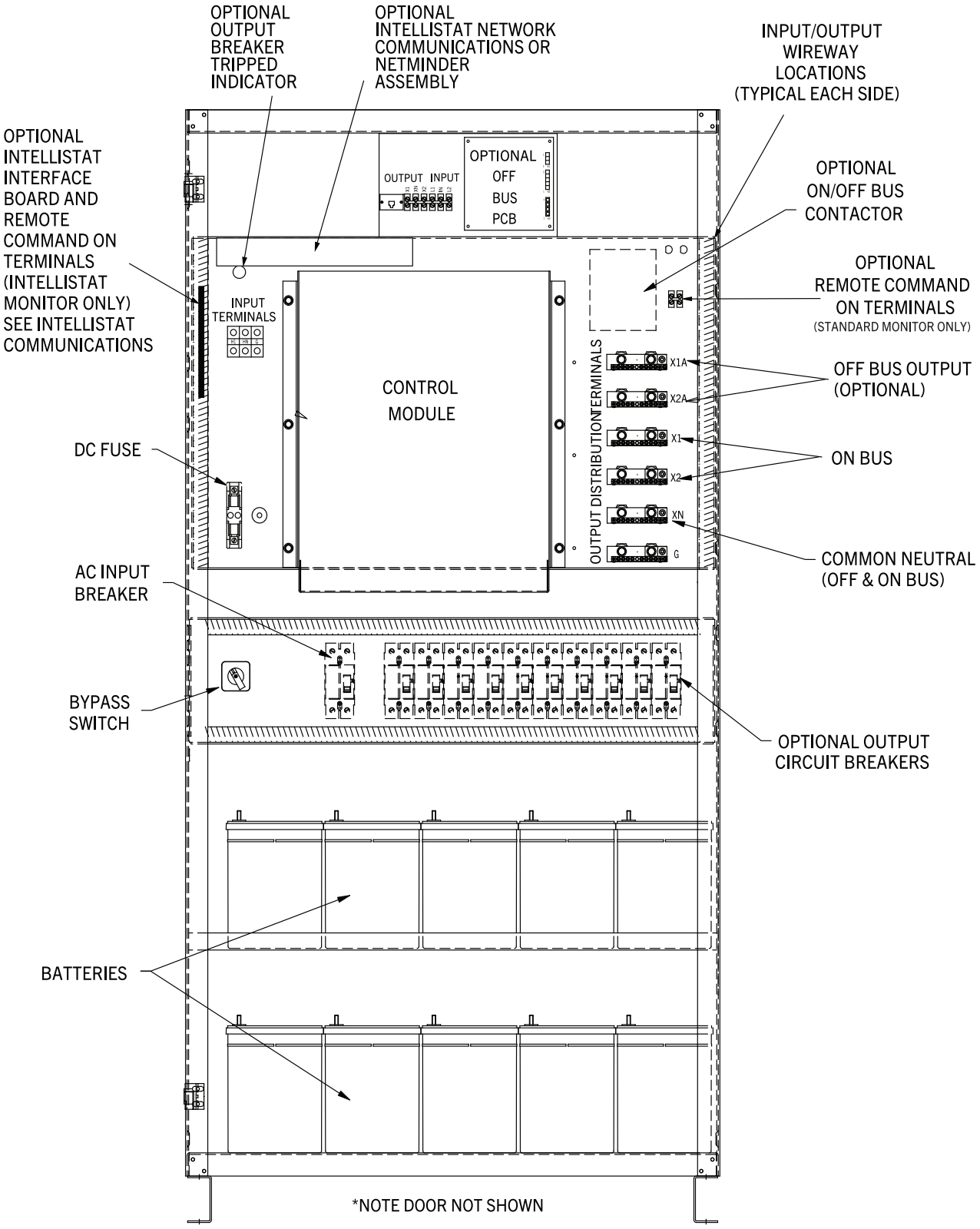


12.5KVA/KW	13.5KVA/KW	14.0KVA/KW
90m / 412lbs.	90m / 413lbs.	90m / 457lbs.
BTU'S/HR:5967	BTU'S/HR:6445	BTU'S/HR:6684

*WEIGHT REFLECTS HEAVIEST MODEL FOR THAT KVA SIZE AND INCLUDES 90 Min BATTERY WEIGHT.
NOTE: BTU/HR ARE TYPICAL AT FULL LOAD.

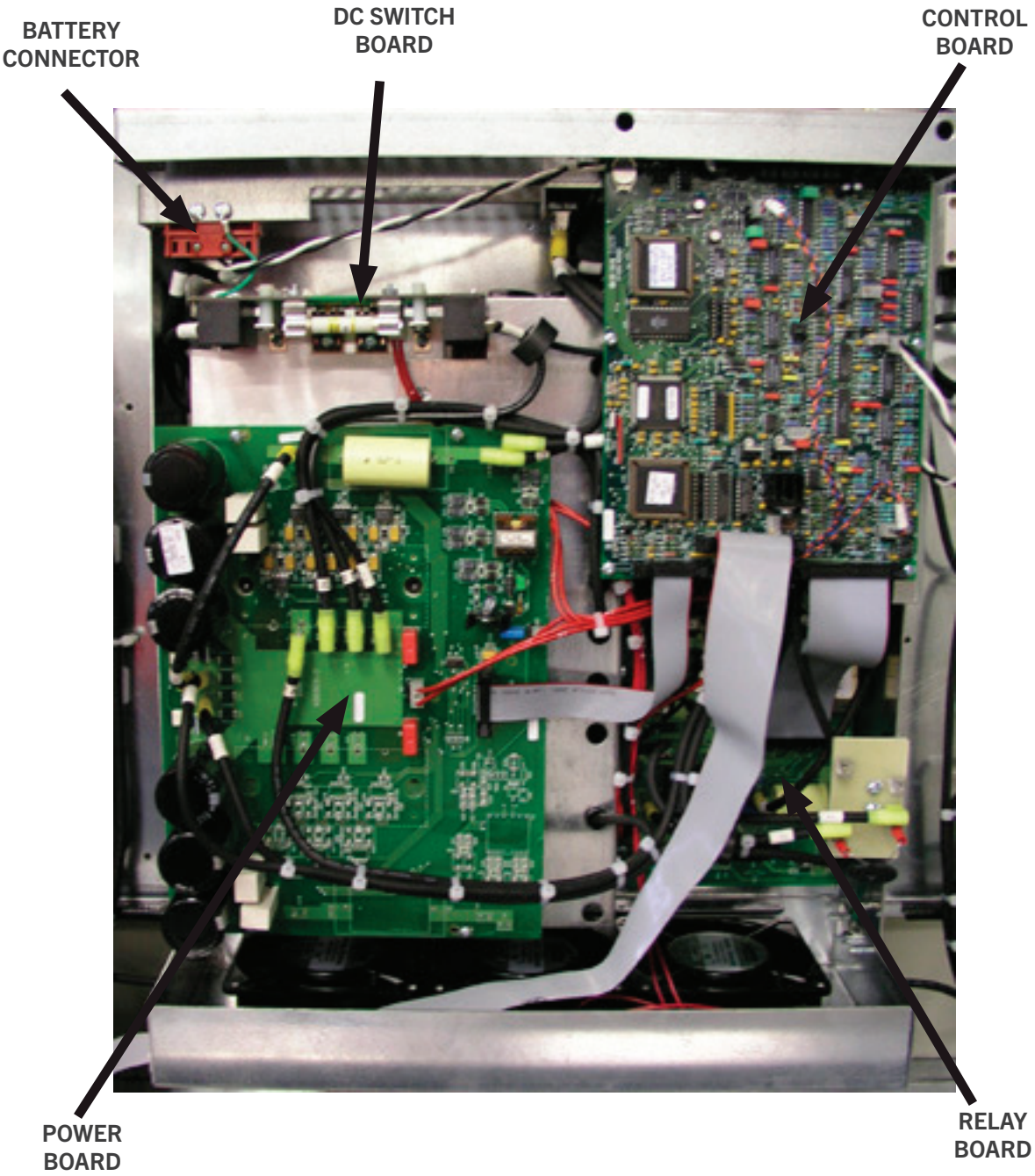
COMPONENT LOCATION DIAGRAM

1.5KW - 3.5KW



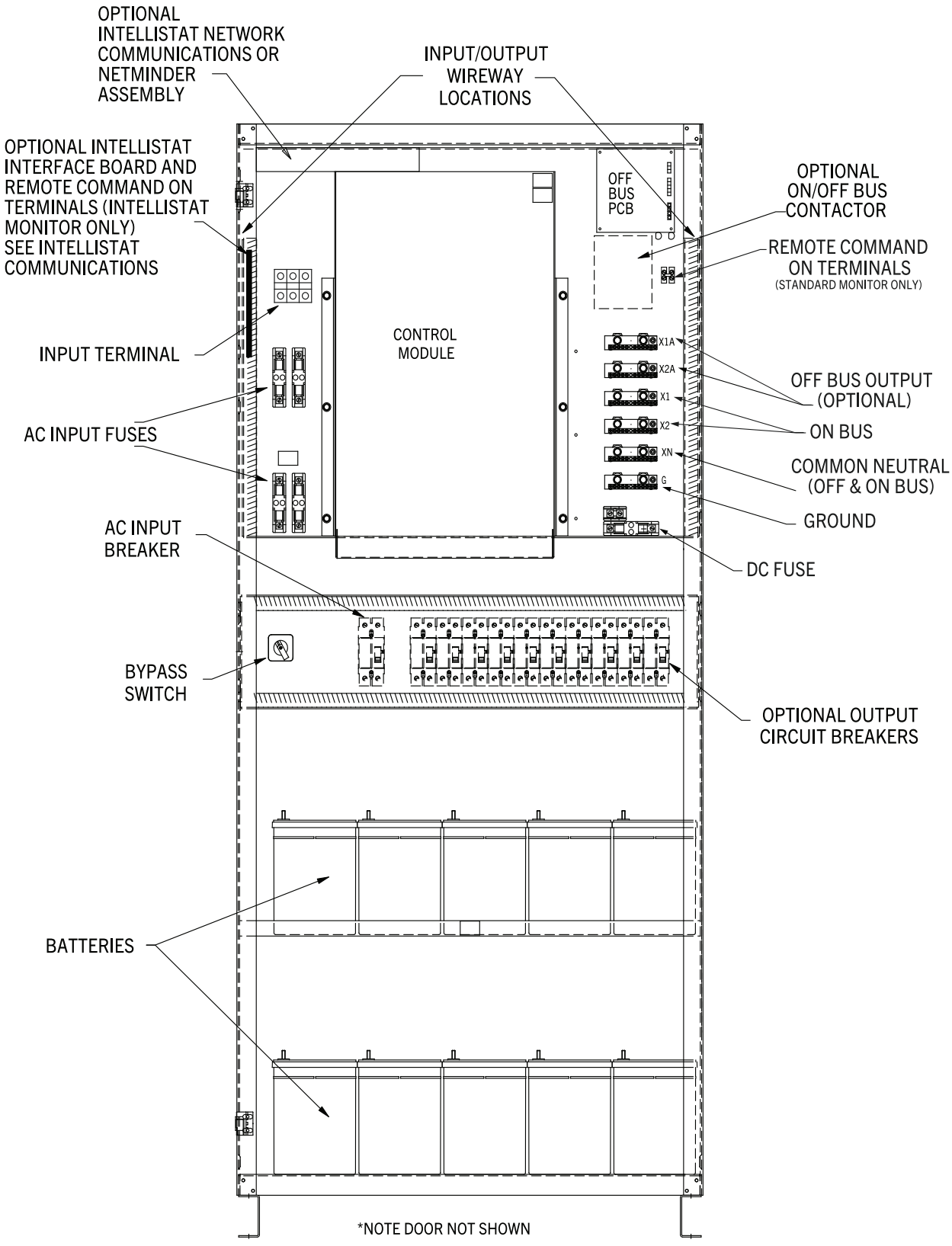
COMPONENT LOCATION DIAGRAM

CONTROL MODULE - 1.5KW - 3.0KW, LLX-3.5KW and GGX-3.5KW



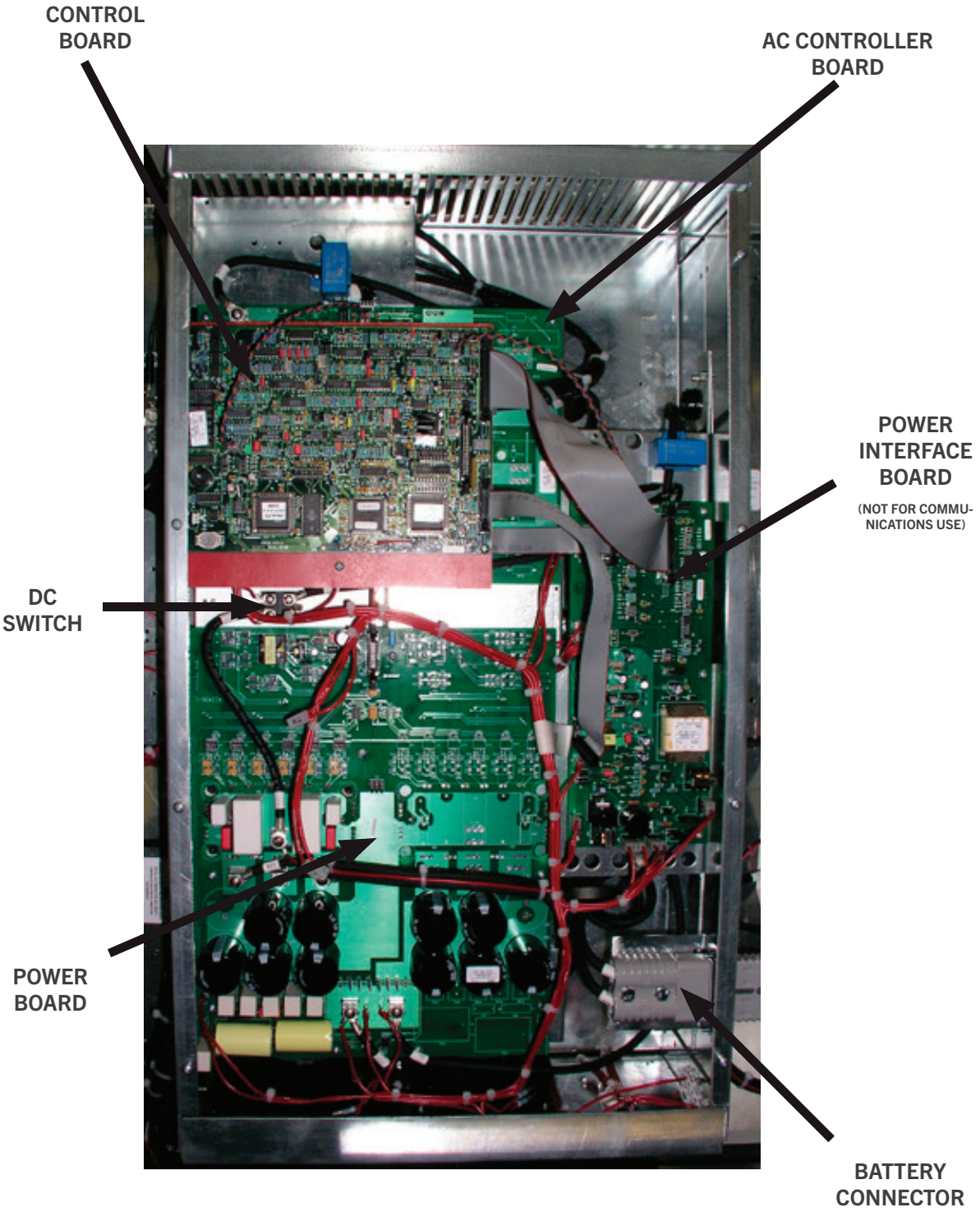
COMPONENT LOCATION DIAGRAM

4.2KW - 14KW

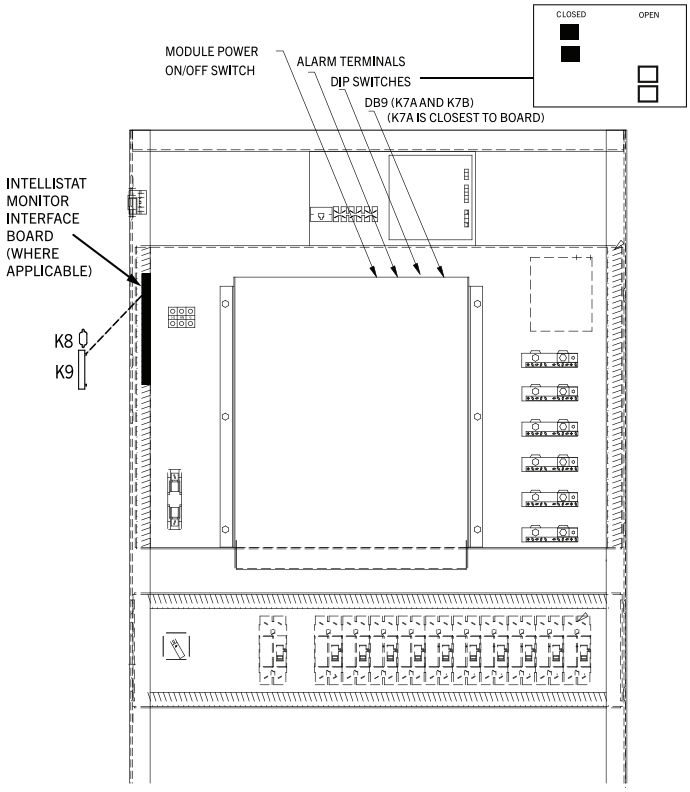


COMPONENT LOCATION DIAGRAM

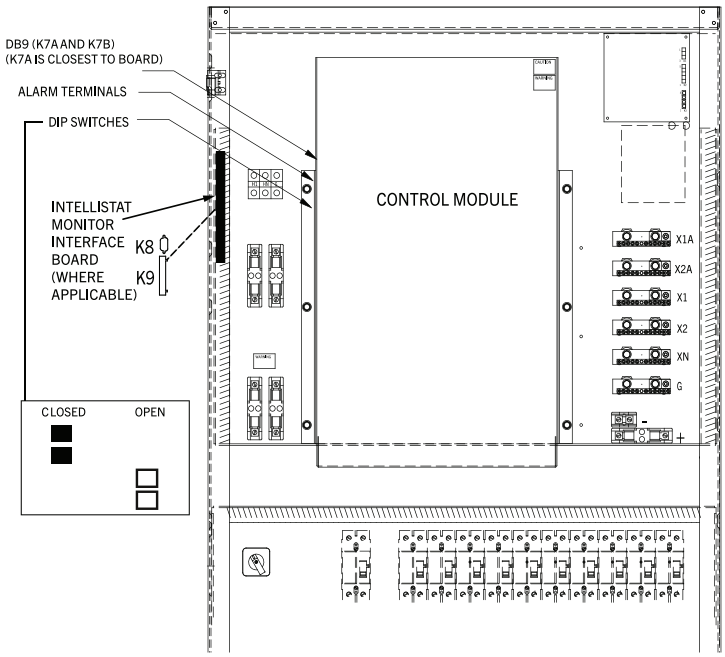
CONTROL MODULE - 4.2KW - 14KW, JJX-3.5KW and JYX-3.5KW



DIP SWITCH AND ALARM TERMINAL LOCATIONS



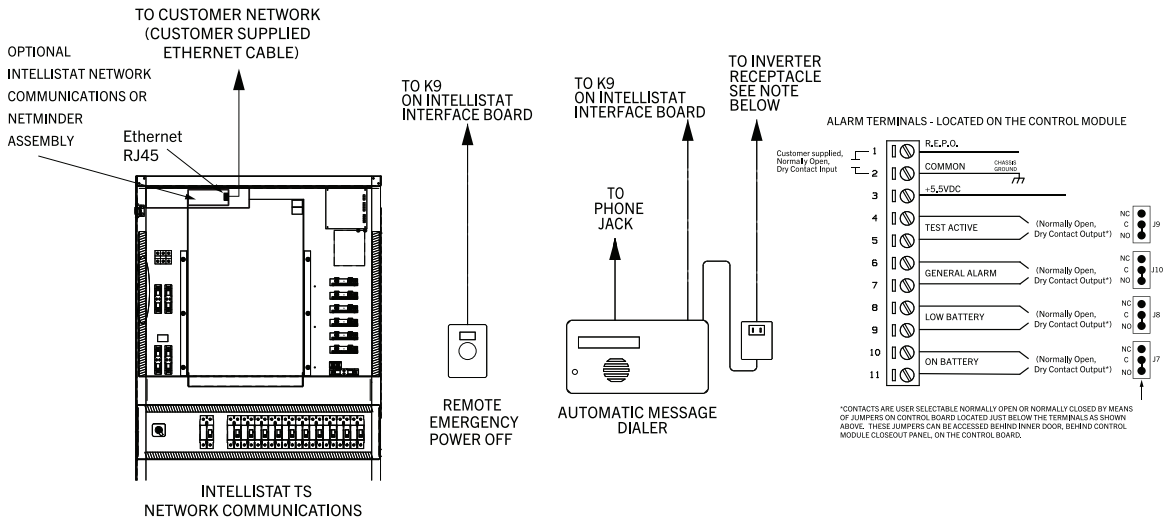
1.5KW - 3.0K W,
LLX-3.0-3.5KW and
GGX-3.0-3.5KW

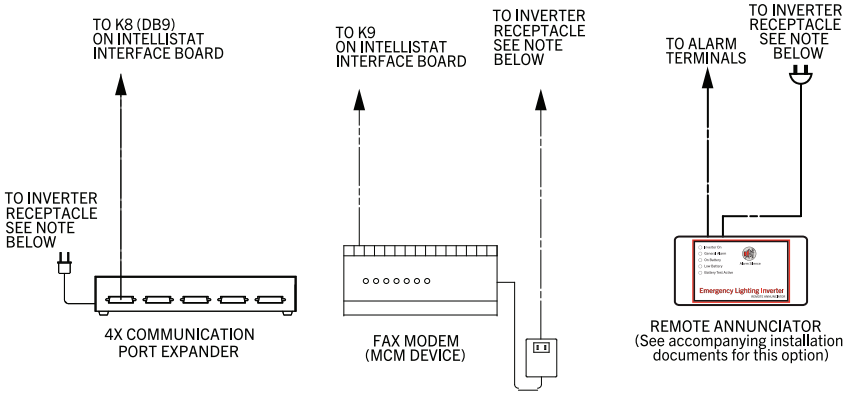


4.2KW - 14K W,
JJX-3.0-3.5K W, JYX-3.0-3.5KW
and AAX-3.0-3.5KW

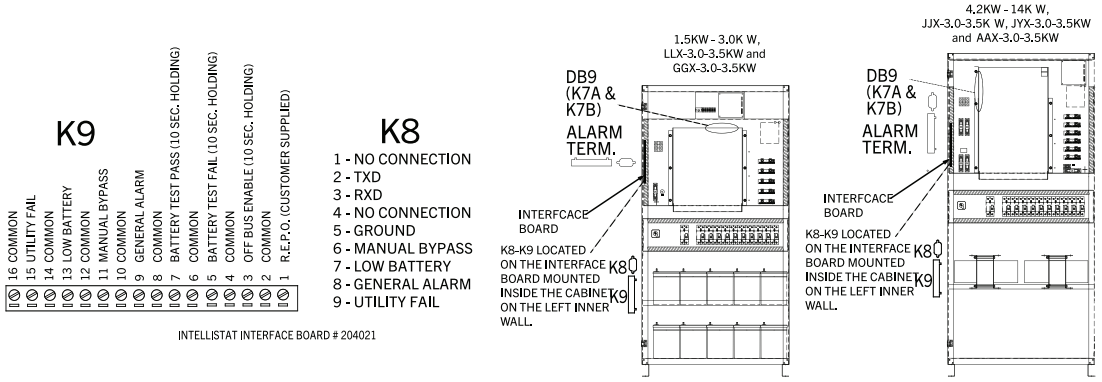
OPTIONS INTERCONNECTION DIAGRAM

FOR USE WITH INTELLISTAT TS MONITOR ONLY



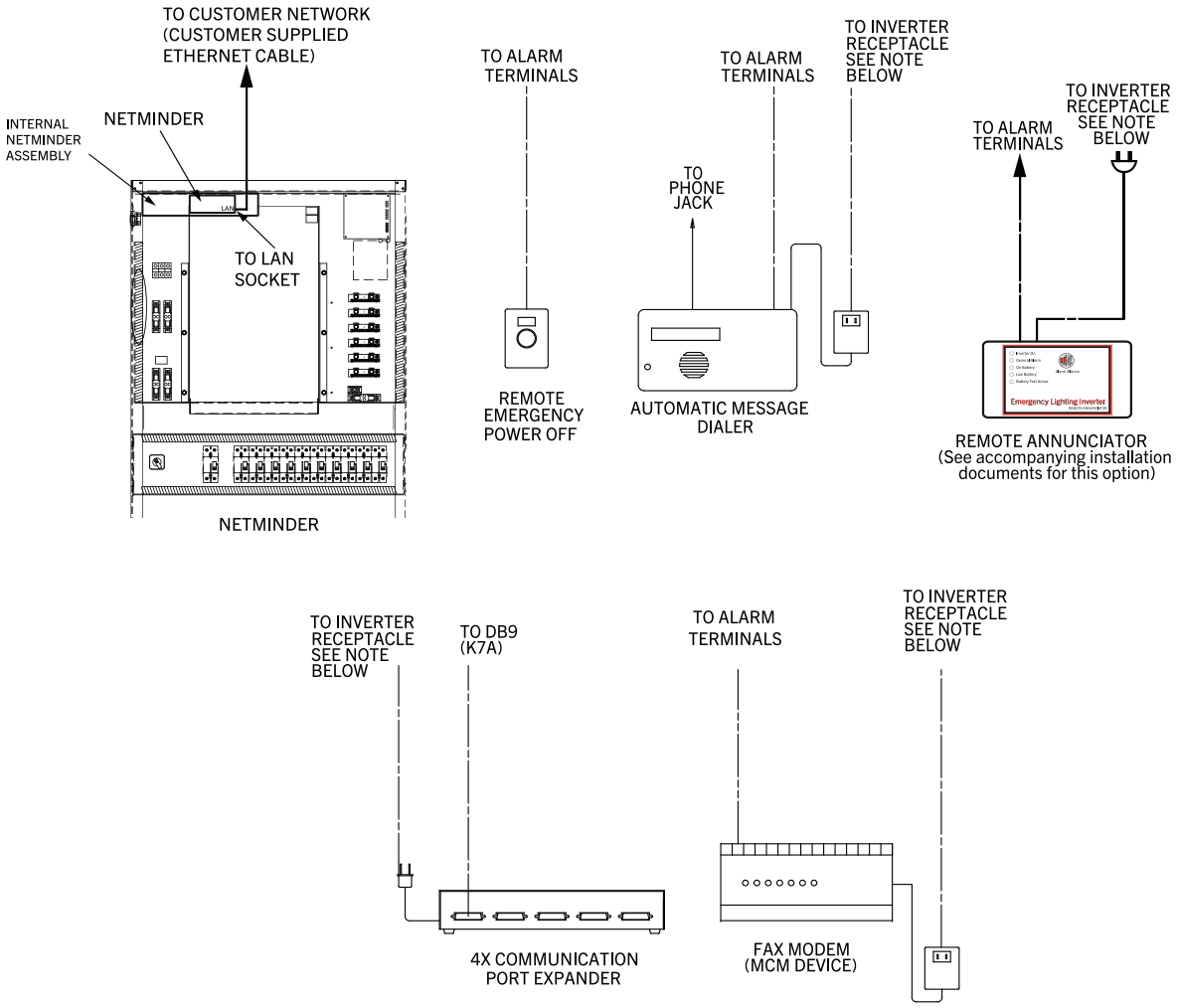


NOTE: THE POWER SUPPLY FOR DEVICES, EXCLUDING THE REMOTE EMERGENCY POWER OFF, MUST BE TAKEN FROM THE OUTPUT OF THE INVERTER. A 120V RECEPTACLE (5-20R) WHOSE SUPPLY IS TAKEN FROM THE OUTPUT OF THE INVERTER MUST BE INSTALLED NEAR THE LOCATION OF THE DEVICE.



FOR USE WITH STANDARD MONITOR ONLY

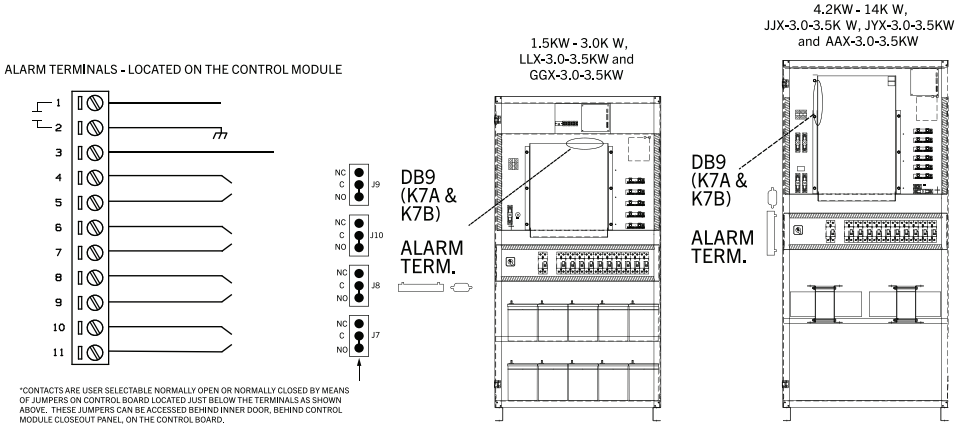
FOR USE WITH STANDARD MONITOR ONLY



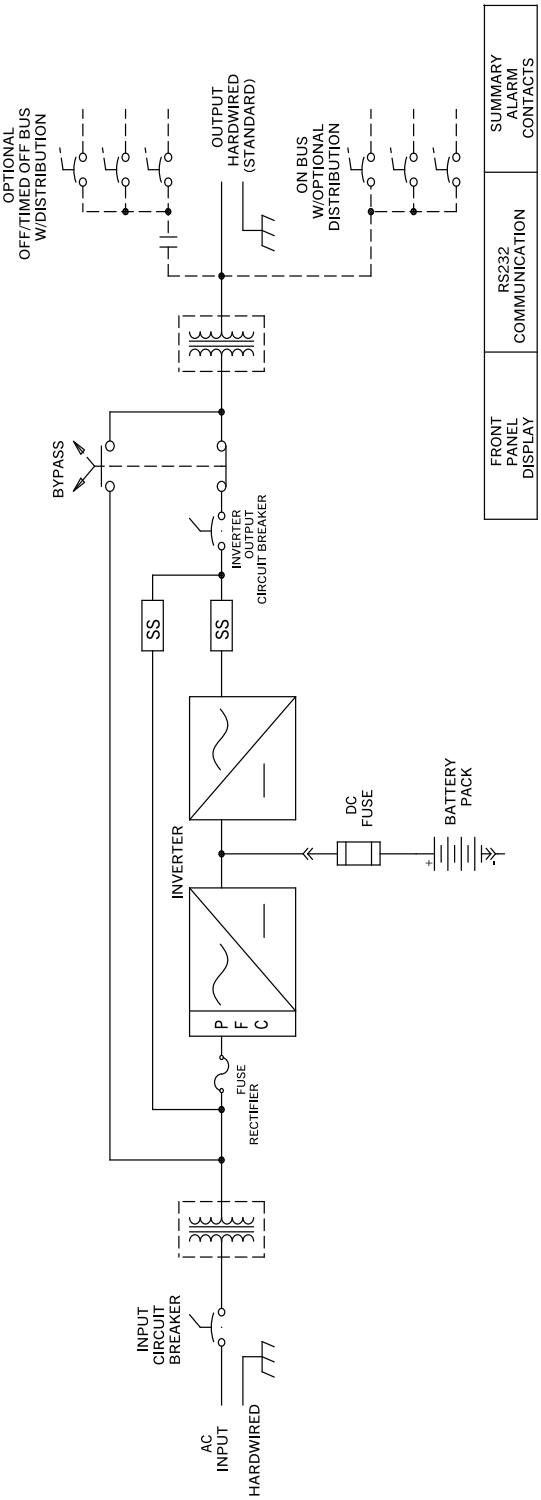
NOTE: THE POWER SUPPLY FOR DEVICES, EXCLUDING THE REMOTE EMERGENCY POWER OFF, MUST BE TAKEN FROM THE OUTPUT OF THE INVERTER. A 120V RECEPTACLE (5-20R) WHOSE SUPPLY IS TAKEN FROM THE OUTPUT OF THE INVERTER MUST BE INSTALLED NEAR THE LOCATION OF THE DEVICE.

DB9 (K7A) for
Computer Interface

Pin 1: EEPO (Elect.
Emerg. Power Off)
Pin 2: TXD
Pin 3: RXD
Pin 4: No connection
Pin 5: Ground
Pin 6: Test Active
Pin 7: Low Battery
Pin 8: Alarm
Pin 9: On Battery



ONE LINE DIAGRAM



NOTE: Not all units have input and/or output tranformers.

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