TRYSTAR

EON MODEL EL3

OWNERS MANUAL

10KW - 33KW
THREE 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 Controlled Power 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.

TABLE OF CONTENTS

INTRODUCTION

Trystar engineers and manufactures the industry's highest quality centralized emergency lighting inverters, capitalizing on over 40 years of expertise. We have an enviable reputation for quality, which is reflected in the design, workmanship, and performance of our products.

Trystar's self-diagnostic, self testing EON Model EL3 centralized emergency lighting inverter is UL 924 listed as "Emergency Lighting Equipment" and "Auxiliary Lighting and Power Equipment", as well as NFPA compliant as "Life Safety Equipment".

Features and Benefits

Design Flexibility

Using existing fixtures for emergency lighting and egress assures compliance with minimum illumination code requirements. Extensive combinations of input and output voltages, timed off bus with remote "command on" control, automatic battery testing, and control device override options make the EON one of the most versatile and dependable lighting inverter systems in the market.

Single Point Operation / Maintenance

One central inverter controls many smaller circuits. Cost-effective, single-point operation provides a common battery pack, and enables all maintenance to be performed and records to be logged from a single location. Additional benefits include:

- Egress lighting integrity test.
- Hot-swappable battery replacement.
- Standard internal bypass.
- Maintenance-free, standard 1 Year full replacement, 14 year prorated batteries.

Premium Power And Voltage Regulation

Maintains proper operating voltage for HID and high-pressure sodium lighting, as well as electronic ballasts and LED lighting, resulting in:

- Voltage sag and surge protection.
- Longer wire runs without up sizing the wire. Regulated voltage source minimizes voltage drop.
- Less-frequent replacement of ballasts, LED drivers, and lamps.
- Facility egress lumens are maintained 100% (will not diminish) over the full 90 minutes of emergency power.

Generator Compatible

The EON is listed "UL 924 Auxiliary Lighting and Power Equipment", and is suitable to provide uninterrupted backup power, until a generator starts. Even with an extremely distorted input waveform, the output of the EON delivers a clean sine wave, with no more than 3% THD, without

switching to batteries. This feature also extends ballast, LED driver, and lamp life.

Reduced Utility Expense

Energy conservation continues to be a prevalent issue. The EON provides several energy-saving solutions without compromising life safety requirements. Use of our optional ZoneSaver-2™, “emergency lighting control unit”:

- Allows for local control of emergency lighting fixtures to reduce / eliminate unnecessary night-light circuits and “always on” lighting loads.
- Allows for automatic bypassing of the local control device during NFPA-mandated test periods.
- Provides multiple, independent zone sensing abilities to reduce / eliminate unnecessary multiple-floor and multiple building-wing illumination.

Full Compliance With NFPA 101

The EON meets the NFPA 101 definition of a computer based, self-testing / self-diagnostic emergency lighting system with data-logging. Both periodic and annual tests are performed automatically, and the results are logged with a date and time stamp. Both alarm and test logs provide a history of events, and the ability to generate an NFPA-compliant report. The EON’s online design allows for continuous local and remote monitoring of all internal systems. Any abnormal condition is identified, logged, and immediately communicated.

Reliability, Plus Compatibility

Reliability is the most important feature of any emergency power source! Without it, all the other features and benefits are meaningless. This is why state-of-the-art, DSP-controlled, IGBT circuitry is used for the EON’s rectifier and inverter power sections. Also essential to the design, are the fiber optic cables for control and communications. Fiber optics allow for better isolation; and faster, more accurate, noise-free signals between processors. The EON provides reliable, regulated voltage during normal and emergency power modes.

The EON is designed to be compatible with all lighting fixture types, including LED. The EON also allows for full design flexibility, used to power both normally on and normally off emergency lighting loads, in any combination. The EON’s off bus option includes user-programmable transfer on delay, transfer off delay, and a proprietary soft start feature.

Smallest Footprint

Facility floor space is hard to come by, and is always at a premium. With this in mind, the EON’s front access cabinet design and single battery cabinet configuration save space. The EON’s inverter control cabinet and battery cabinet may be installed side-by-side, and up against a wall.

Easy Installation & Low Cost Of Ownership

The EON’s 90 minute configuration requires only one (1) battery cabinet, and only batteries with front access terminals are used. This makes installation easy and less time consuming — installation is straightforward and

DC connections are easily made.

Cost of ownership is greatly reduced because of single point operation and maintenance, as well as the automatic testing, logging of results, and reporting that are performed. Also know that the EON provides the required 90 minutes run time using a lower number of batteries as compared to most competitors' products. This often results in a lower replacement cost — both time and material.

Advance Digital Monitoring — The Intellistat TS™

The EON includes a user-friendly Intellistat TS™ monitor, which 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 touchscreen display indicates all the electrical parameters, as well as the functional status of the inverter. The touchscreen 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.

- 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.
- Optional reporting of test results via e-mail / voice / webpage.
- Date and time display.
- Auto-logging of test results and abnormal events.
- Multi-layer password protection.
- Logs up to 75 events.
- Non-volatile clock and memory.
- Remote monitoring capabilities.
- Optional status notification via e-mail / cell phone.

Advance Digital Monitoring — The Intellistat TS™ Continued

Monitored Parameters

The Intellistat TS monitors 3 phase input and output parameters, and inverter status indicators:

- Voltage
- Frequency
- Current
- VA
- Power factor

- kVA and kW totals
- Output percent load L-N (% kVA)
- Output percent load total (% kVA)
- Battery voltage
- Battery charge / discharge current
- Battery time (minutes) remaining

Alarms & Status

The Intellistat TS announces multiple alarms, including:

- Input phase rotation error
- High / low input voltage
- High / low input frequency
- High / low output voltage
- High / low output frequency / time remaining
- Auto battery test failed
- Off bus status
- High battery charger current
- System normal
- IGBT fault
- Overtemp shutdown
- System in manual bypass
- System on battery
- Low battery warning
- Low battery shutdown
- Battery test in progress
- High output VA (overload)
- * Low output VA
- High / low battery voltage
- DC charger fail / DC open
- Output circuit breaker open
- REPO shutdown
- Manual restart required
- Static bypass status / alarms

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

Egress Lighting Integrity Test

This feature provides the industry's most advanced life safety system test available. 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"). The Intellistat TS then compares power consumption during the test period with user defined load capacity, analyzes the data, and advises if service is required.

Automatic System Tests

The Intellistat TS automatically performs a user defined (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".

SPECIFICATIONS

Power	
Ratings (kVA/kW)	10, 13, 14, 15, 16, 17, 20, 22, 24, 26, 28, 30, 32, 33, 40, 45, 50, 55 at 1.0 (unity) power factor
Topology	True online double-conversion, uninterruptible power

Electrical Input	
Nominal Voltage	208/120V, 480/277V or 600/347V Wye, 60Hz. Consult factory for 50Hz models
Voltage Range	+10%, -15% at full load
Operating Frequency	+/-5% from nominal
Power Factor	> .98 typical
Current Distortion	< 10% THD
System AIC Ratin	g 10k AIC standard; 65k or 100k AIC optional

Electrical Output	
Nominal Voltage	208/120V, 480/277V or 600/347V Wye, 60Hz. Consult factory for 50Hz models
Voltage Regulation	+/-3% from nominal typical
Frequency	+/-0.5% while in battery operation mode
Overload	Up to: 110% for 2 minutes, 125% for 30 seconds, 150% for 10 seconds, 400% for 4 cycles (without use of static bypass)
LED Inrush Rating	Peak overload capability of 1700% to accom modate inrush current from LED fixtures (without use of static bypass)
Voltage Distortion	3% maximum THD with a linear load
Efficiency	90% typical

Battery	
Type	Valve-regulated, sealed lead calcium, maintenance-free. Front access terminals
Testing	Manual: Password-pr tected Automatic: User-programmable
Runtimes	Standard and optional runtimes available
Nominal Voltage	Factory-programmable from 216-408 VDC, or from 132-168 VDC, kW, model, and runtime dependent
Charger	3-stage, temperature compensated
Recharge Time	UL 924 and NFPA 101, 111 compliant
Battery Replacement	Hot-swappable batteries — replaced without interrupting power to the load

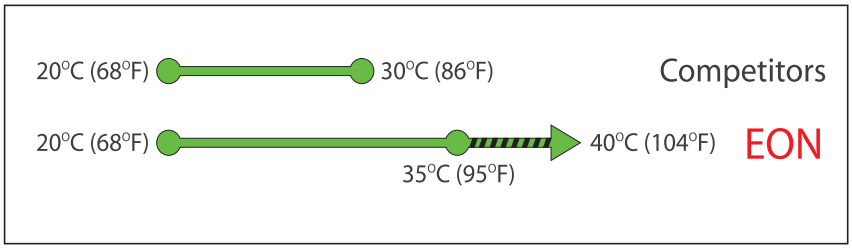
Certifications	
Safety	UL 924 Listed - Emergency Lighting Equipment C-UL Listed to CSA C22.2 No. 141-15 - Emergency Lighting Equipment UL 924 Listed - Auxiliary Lighting and Power Equipment NFPA 101, 111, NEC, and local codes
EMI Compliance	FCC Class A limits, 47 C.F.R. Part 15, Subparts A, B
Quality	ISO 9001:2015

General	
Diagnostics	Continuous system self-check, including battery health
Static Bypass	Automatic bypass on overload or system failure
Internal Bypass	Standard Make-Before-Break switch with a secur e push-to-turn function that provides an uninterrupted bypass of the inverter system
Maintenance	Wrap-around, 4pole BBM or MBB switch options
Bypass	available with a secure push-to-turn function.
Input / Output	LSI breakers are standard or optional,
Breakers	model-dependent; consult factory
Remote Emergency	Optional input relay interface allows external
Power Off (REPO)	contact closure to shut off the inverter system
Normally Off Bus	Optional standby output for use with “normally off” circuits feeding emergency lighting fixtures
Output Distribution	Optional output circuit breakers
Dimensions/Weight	See model number matrix for weights and cabinet dimensions

Communications	
LCD Display	High resolution, color touchscreen display for monitoring system status and parameters, and to access programmable inverter and battery testing
Communication Port	RS232 serial communications for factory setup and authorized field service access
Network / Web	Remote monitoring and reporting via optional BACnet/IP or BACnet MS/TP, Ethernet TCP /IP, MODBUS TCP, or MODBUS RS485.
Relay Interface	Optional potential-free isolated status and alarm contacts via hardwired terminal strip. Contacts rated for 2A at 30 VDC, or 1A at 120 VAC

Environmental	
Operating Temperature	20°C to 35°C for UL 924 Listed models and C-UL Listed models to CSA C22 .2 No. 141-15 (See illustration and note below.) Optimum battery performance and life at 25°C
Storage Temperature	Inverter at -20°C to 50°C Battery storage at 25°C for 6 months before charging is required. For each 9°C rise, reduce storage time by half
Relative Humidity	0 to 95% non-condensing
Audible Noise	< 60 dBA at 1 meter
Altitude	6600 feet (2000 meters) without derating

UL Rating Temperature Test Comparison



NOTE: To satisfy UL 924 and CSA C22.2 No. 141-15 requirements for a 35°C rating, UL testing was performed in a 40°C ambient environment, with units tested under full load and at low line input voltage.

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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.

TOOLS REQUIRED AND TORQUE RATINGS

⚠ 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

All hardware except floor mounting hardware is provided with the system.

Forklift and/or Dolly

Skid lag bolts - 1/2” socket.

Inverter / Battery Cabinet connection - 9/16” socket.

Batteries - Torque wrench, 7/16” socket (DEKA Batteries), 10MM socket (CSB and Marathon Batteries).

Input Circuit Breaker Lugs - 3/16” Allen Wrench, 5/16” Allen Wrench (28KW-33KW, 208V input only).

DC Circuit Breaker Lugs - 3/16” Allen Wrench, 5/16” Allen Wrench, Flat Head Screw Driver.

Output Circuit Breaker Lugs - 3/16” Allen Wrench.

Distribution Breakers - Din Rail Installation, Flat head or Phillips head screwdriver.

Floor Mount hardware (not provided) - Refer to local codes.

BREAKER LUG WIRE RANGES AND TORQUE RATINGS

AC Input Breaker (All Sizes except 33KW, 208V Input): #8 - 3/0 AWG. Torque 120 In/lbs.

AC Input Breaker (33KW, 208V Input Only): #4 - 4/0 AWG. Torque 120 In/lbs.

AC Output Breaker (All Sizes): #8 - 3/0 AWG. Torque 120 In/lbs.

DC Circuit Breaker -

Type EGEDC

Wire range(awg):	Torque(lb-in):
#14 - #10 AWG	35
#8 AWG	40
#6 - #4 AWG	45
#3 - 3/0 AWG	50

Type JGL

Wire range(awg): #4 - 4/0 AWG, Torque(lb-in): 225

Type HDL

Wire range(awg): #14 - 2/0 AWG, Torque(lb-in): 120

BATTERIES

Torque Ratings: **DO NOT OVER TORQUE**

DEKA	CSB	Marathon
HR7500FT – 100 in-lb	All Sizes - 120 in-lb	All Sizes - 100 in-lb
All Other Sizes – 60 in-lb		

RECEIVING THE INVERTER

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

⚠ WARNING ⚠

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

INSPECTION

Upon receipt of your 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 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 back-charges unless authorized by us in writing, before the work is performed.

STORAGE

WHILE IN STORAGE BATTERIES MUST BE CHARGED FOR 24 HOURS EVERY 6 MONTHS. WHILE IN STORAGE TURN OFF THE DC BREAKER.

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 *"Battery Installation and Wiring"* for details on installing batteries and the *"Start-up Procedure"* for turning the inverter on. **WHILE STORING TURN OFF THE DC BREAKER.** 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

CAUTION

Inverters with the distribution option can cause the unit to tip if lifted improperly. The center of gravity is very high with this option. Take great care lifting and moving the inverter. Lift only as high as necessary to remove from the skid or moving the inverter into position.

SHOCK HAZARD

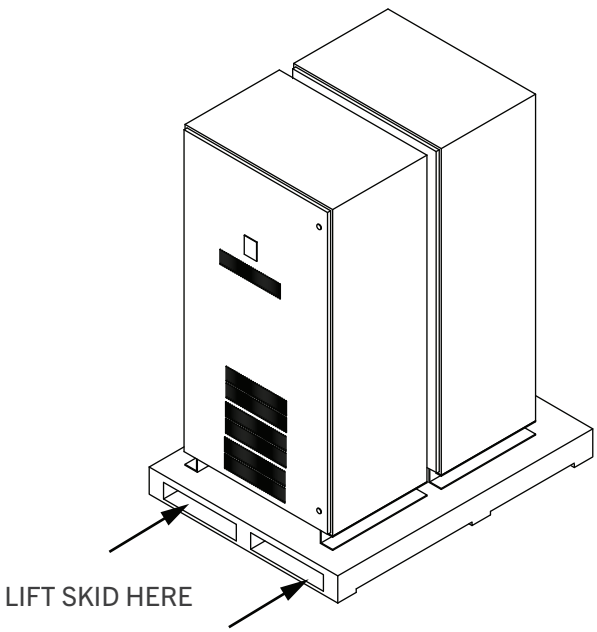
DO NOT SHORT BATTERY TERMINALS

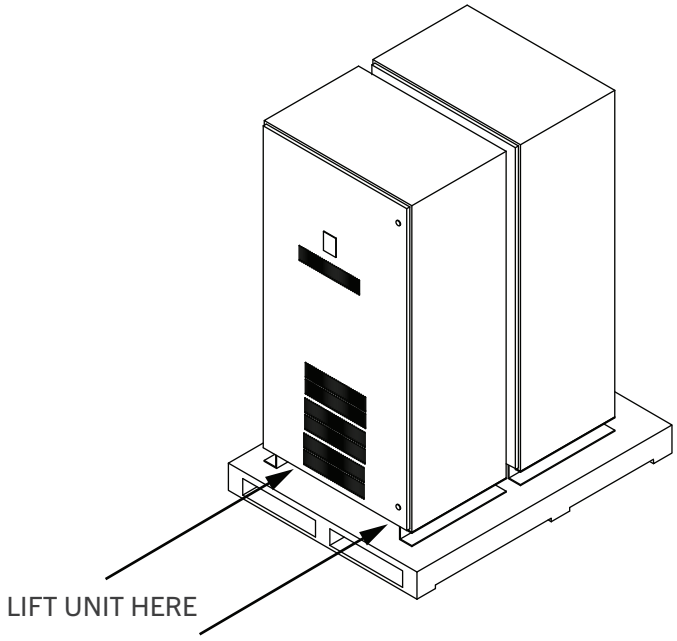
TOOLS REQUIRED:

Forklift, dolly, 1/2" socket and ratchet

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. Remove ALL lag bolts with a 1/2" socket and ratchet. See illustration below.
4. Using a forklift, place the forks securely under the lighting inverter from the front or back side.
5. Carefully lift the lighting inverter and battery cabinet from the skid. Lift only as high as necessary to remove the skid.

6. Set the cabinets down until ready for installation. **Do not remove the debris shield from the top of the unituntil ready for start up.**





PRELIMINARY INSTALLATION

INSTALLATION CONSIDERATIONS

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

Prior to installing the Lighting Inverter, be sure to take into consideration the site you have selected. Lighting inverters produce heat and therefore require ventilation as well as accessibility. Consider these factors:

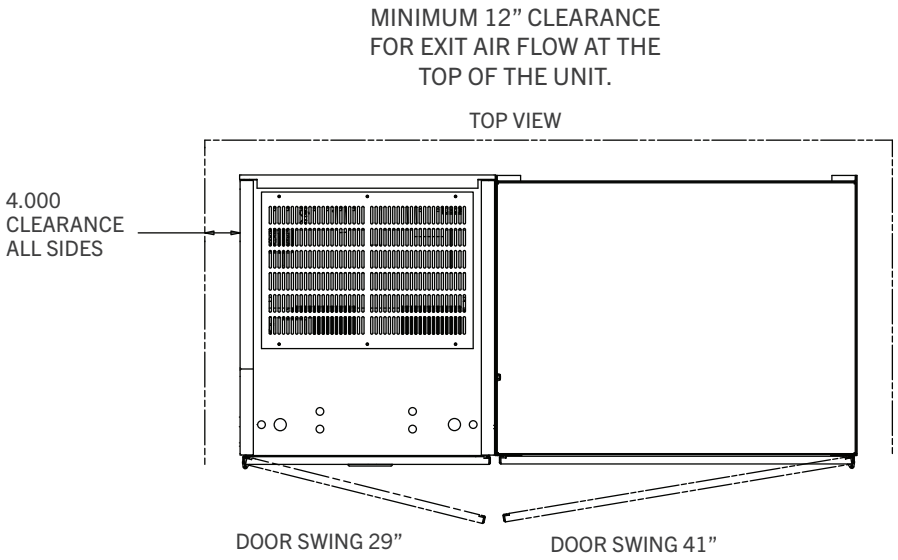
- Ventilation
- Size of the Inverter
- Weight Load
- Audible Noise Requirements
- Remote Emergency Power Off (Repo)
- Monitors
- Options
- Clean Environment
- Input Source Voltage
- Receiving Facilities
- Distribution of Power

- Room Temperature
- Clearances
- Accessibility
- Excessively Long Power Runs
- Proper Ground Techniques

CHOICE OF LOCATION

The unit has been completely inspected and extensively tested under various load conditions prior to shipment. Care to install it at a proper location will assure long trouble-free operation.

The unit is air cooled with the air intake at the bottom and exhausts at the top, front or at the sides. Therefore, it should be installed in a clean, dry place with enough clearance to allow a free flow of air. Allow enough space for maintenance at the front of the unit. See illustration below.



Shown with large battery cabinet.

See “Appendix A - Cabinet Outlines” for more information on other battery cabinet sizes.

PRELIMINARY INSTALLATION

TOOLS REQUIRED AND INSTALLATION CHECKLIST

- Flat Head Screw Driver, 3/16” Allen Wrench, 5/16” Allen Wrench (for 33KW Only).
- 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.

Reference: NEC ARTICLE 250

WEIGHT (LBS.)*														
VOLTAGE	10KW	13KW	14KW	15KW	16KW	17KW	20KW	22KW	24KW	26KW	28KW	30KW	32KW	33KW
208/120V IN 208/120V OUT	2840	3200	3350	4634	4634	4872	5702	6178	5970	6359	6359	6659	6959	7259
480/277V IN 208/120V OUT	3708	4068	4306	4416	4416	4654	5368	5844	5636	6026	6026	6326	6626	6926
480/277V IN 480/277V OUT	3120	3642	3880	4118	4118	4356	5032	5270	5000	5300	5600	5900	6200	6200

*Unit weights include the weight of the batteries for standard 90 minute runtime. Battery weights vary according to desired runtimes – consult factory for runtimes other than 90 minutes.

BTU/HR (FULL LOAD)*													
	10KW	13KW	14KW	15KW	16KW	17KW	20KW	22KW	24KW	26KW	28KW	30KW	32KW	33KW
BTU'S / HR (STANDBY - FULL LOAD)	3410	4433	4774	5115	5456	5797	6820	7502	8184	8866	9548	10230	10912	11253

*Stated full load BTU's for 480/277 VAC input – output models. Consult factory for BTU's of other models.

MINIMUM CHARGE TIME FOR FULL BATTERY CAPACITY = 48 HOURS

PRELIMINARY INSTALLATION

AC INPUT BREAKER AND CURRENTS														
INPUT VOLT-AGE	10KW	13KW	14KW	15KW	16KW	17KW	20KW	22KW	24KW	26KW	28KW	30KW	32KW	33KW
208V	50A / 60A(1)	70A	70A / 80A(2)	80A	90A	90A	110A	125A	125A / 150A(6)	150A	150A	175A	175A	175A
480V	25A	30A	35A	35A	35A / 40A(4)	40A	50A	50A	60A	60A	60A / 70A(7)	70A	70A	70A / 80A(9)
600V	20A	25A	25A / 30A(3)	30A	30A	30A / 35A(5)	40A	40A	50A	50A	50A / 60A(8)	60A	60A	60A

(1) 50A INPUT BREAKER FOR 208/120 VAC OUTPUT. 60A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

(2) 70A INPUT BREAKER FOR 208/120 VAC OUTPUT. 80A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

(3) 25A INPUT BREAKER FOR 480/277 VAC OUTPUT. 30A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

(4) 40A INPUT BREAKER FOR 208/120 VAC OUTPUT. 35A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

(5) 30A INPUT BREAKER FOR 480/277 VAC OUTPUT. 35A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

(6) 125 INPUT BREAKER FOR 480/277 VAC OUTPUT. 150A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

(7) 60A INPUT BREAKER FOR 480/277 VAC OUTPUT. 70A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

(8) 50A INPUT BREAKER FOR 480/277 VAC OUTPUT. 60A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

(9) 70A INPUT BREAKER FOR 480/277 VAC OUTPUT. 80A INPUT BREAKER UNIT WITH OTHER OUTPUT VOLTAGES.

NOMINAL INPUT CURRENT (CHARGER ON)				
KW	INPUT VOLTAGE	OUTPUT VOLTAGE		
		120/208	277/480	347/600
10	208/120	34.0	36.9	37.0
	480/277	16.0	15.5	15.6
	600/347	12.8	12.6	12.8
13	208/120	43.0	45.9	46.8
	480/277	19.6	19.3	19.6
	600/347	16.2	15.9	16.2
14	208/120	46.4	49.6	50.0
	480/277	21.2	20.8	21.0
	600/347	17.3	17.0	17.3
15	208/120	54.3	52.3	53.2
	480/277	22.8	22.0	22.4
	600/347	18.4	18.1	18.4
16	208/120	57.5	55.4	56.5
	480/277	24.2	23.3	23.7
	600/347	19.5	19.2	19.5
17	208/120	60.7	59.6	59.7
	480/277	25.5	25.1	25.1
	600/347	20.6	20.3	20.6
20	208/120	72.0	69.7	71.0
	480/277	30.3	29.3	29.8
	600/347	24.5	24.1	24.5
NOTE: Input currents alone are maximum at full load, and when batteries are in recharge mode.				

NOMINAL INPUT CURRENT (CHARGER ON)				
KW	INPUT VOLTAGE	OUTPUT VOLTAGE		
		120/208	277/480	347/600
22	208/120	78.5	76.0	78.0
	480/277	33.0	32.6	32.8
	600/347	26.8	26.5	26.8
24	208/120	85.5	83.9	85.5
	480/277	35.9	35.3	35.9
	600/347	29.6	28.8	29.6
26	208/120	92.5	90.8	92.5
	480/277	38.9	38.2	38.9
	600/347	32.0	31.2	32.0
28	208/120	97.4	95.6	99.0
	480/277	41.9	40.2	41.6
	600/347	34.2	33.4	34.2
30	208/120	104.4	102.5	104.4
	480/277	43.9	43.1	43.9
	600/347	36.1	35.8	36.1
32	208/120	111.4	109.3	111.4
	480/277	46.8	109.3	46.8
	600/347	38.5	45.9	38.5
33	208/120	115.1	112.5	114.6
	480/277	48.4	47.3	48.2
	600/347	39.6	38.9	39.6
NOTE: Input currents alone are maximum at full load, and when batteries are in recharge mode.				

LOW LINE INPUT CURRENT (CHARGER ON)					LOW LINE INPUT CURRENT (CHARGER ON)				
KW	INPUT VOLTAGE	OUTPUT VOLTAGE			KW	INPUT VOLTAGE	OUTPUT VOLTAGE		
		120/208	277/480	347/600			120/208	277/480	347/600
10	**208/120**	40.0	43.4	43.5	22	**208/120**	92.4	89.4	91.8
	480/277	18.8	18.2	18.4		**480/277**	38.8	38.4	38.6
	600/347	15.1	14.8	15.1		**600/347**	31.5	31.2	31.5
13	**208/120**	50.6	54.0	55.1	24	**208/120**	100.6	98.7	100.6
	480/277	23.1	22.7	23.1		**480/277**	42.2	41.5	42.2
	600/347	19.1	18.7	19.1		**600/347**	34.8	33.9	34.8
14	**208/120**	54.6	58.4	58.8	26	**208/120**	108.8	106.8	108.8
	480/277	24.9	24.5	24.7		**480/277**	45.8	44.9	45.8
	600/347	20.4	20.0	20.4		**600/347**	37.6	36.7	37.6
15	**208/120**	63.9	61.5	62.6	28	**208/120**	114.6	112.5	116.5
	480/277	26.8	25.9	26.4		**480/277**	49.3	47.3	48.9
	600/347	21.6	21.3	21.6		**600/347**	40.2	39.3	40.2
16	**208/120**	67.6	65.2	66.5	30	**208/120**	122.8	120.6	122.8
	480/277	28.5	27.4	27.9		**480/277**	51.6	50.7	51.6
	600/347	22.9	22.6	22.9		**600/347**	42.5	42.1	42.5
17	**208/120**	71.4	70.1	70.2	32	**208/120**	131.1	128.6	131.1
	480/277	30.0	29.5	29.5		**480/277**	55.1	54.0	55.1
	600/347	24.2	23.9	24.2		**600/347**	45.3	44.5	45.3
20	**208/120**	84.7	82.0	83.5	33	**208/120**	135.4	132.4	134.8
	480/277	35.6	34.5	35.1		**480/277**	56.9	55.6	56.7
	600/347	28.8	28.4	28.8		**600/347**	46.6	45.8	46.6
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														
OUTPUT VOLTAGE	**10KW**	**13KW**	**14KW**	**15KW**	**16KW**	**17KW**	**20KW**	**22KW**	**24KW**	**26KW**	**28KW**	**30KW**	**32KW**	**33KW**
208V	35A	45A	50A	60A	60A	60A	70A	80A	90A	100A	100A	110A	125A	125A
480V	15A	20A	25A	25A	25A	25A	30A	35A	40A	40A	50A	50A	50A	50A
600V	15A	20A	20A	20A	20A	20A	25A	30A	30A	35A	35A	40A	40A	40A

AC OUTPUT BREAKER														
OUTPUT VOLTAGE	10KW	13KW	14KW	15KW	16KW	17KW	20KW	22KW	24KW	26KW	28KW	30KW	32KW	33KW
208V	35A	45A	50A	60A	60A	60A	70A	80A	90A	100A	100A	110A	125A	125A
480V	15A	20A	25A	25A	25A	25A	30A	35A	40A	40A	50A	50A	50A	50A
600V	15A	20A	20A	20A	20A	20A	25A	30A	30A	35A	35A	40A	40A	40A

AC OUTPUT CURRENTS														
OUTPUT VOLTAGE	10KW	13KW	14KW	15KW	16KW	17KW	20KW	22KW	24KW	26KW	28KW	30KW	32KW	33KW
208/120	27.8A	36.1A	38.9A	41.7A	44.4A	47.2A	55.5A	61.1A	66.6A	72.2A	77.7A	83.3A	88.8A	91.6A
480/277	12.0A	15.6A	16.8A	18.1A	19.2A	20.4A	24.1A	26.5A	28.9A	31.2A	33.7A	36.1A	38.5A	39.7A
600/347	9.6A	12.5A	13.4A	14.4A	15.4A	16.4A	19.2A	21.2A	23.1A	25.0A	26.9A	28.9A	30.8A	31.8A

INSTALLATION

Note: IF THE INVERTER HAS THE DRIP SHIELD OPTION, BE SURE TO MAKE PROVISIONS FOR THAT DURING INSTALLATION - SEE "INSTALLATION - OPTIONAL DRIP SHIELD ASSEMBLY AND INSTALLATION".

BATTERY AND INVERTER CABINET ASSEMBLY

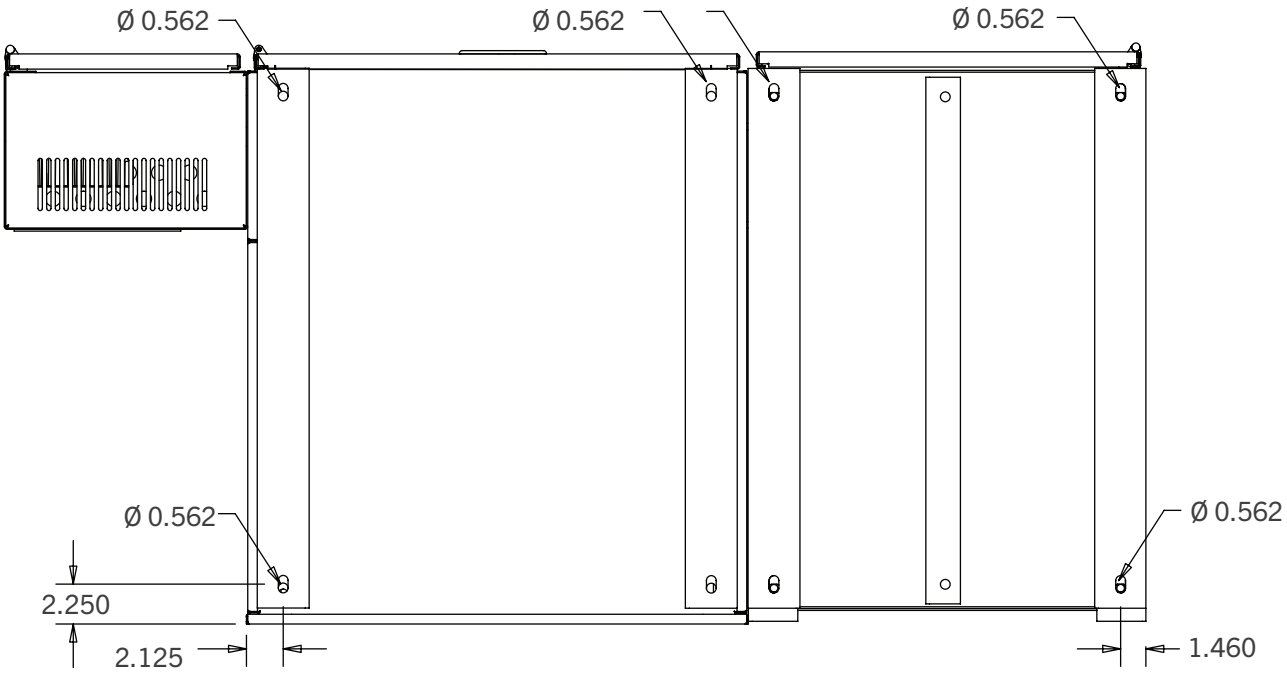
Connecting the inverter and battery cabinets is not required, however the two cabinets were designed to be next to each other with the battery cabinet on the right of the inverter. If installation requires the inverter and battery cabinets to be bolted together, this MUST be done prior to battery installation.

Connect the inverter cabinet and battery cabinet together using the 3/8" hardware supplied (typical for any size). Move the EON into place and secure it to the floor (if required) prior to battery installation.

NOTE: IF THE INVERTER HAS THE DRIP SHIELD OPTION, BE SURE TO MAKE PROVISIONS FOR THAT DURING INSTALLATION - SEE "INSTALLATION - OPTIONAL DRIP SHIELD ASSEMBLY AND INSTALLATION".

SECURING THE UNIT TO THE FLOOR

Secure the EON to the floor (if required) prior to battery installation. Secure the unit to the floor using the mounting holes as shown below. Refer to local codes for proper hardware size and type.

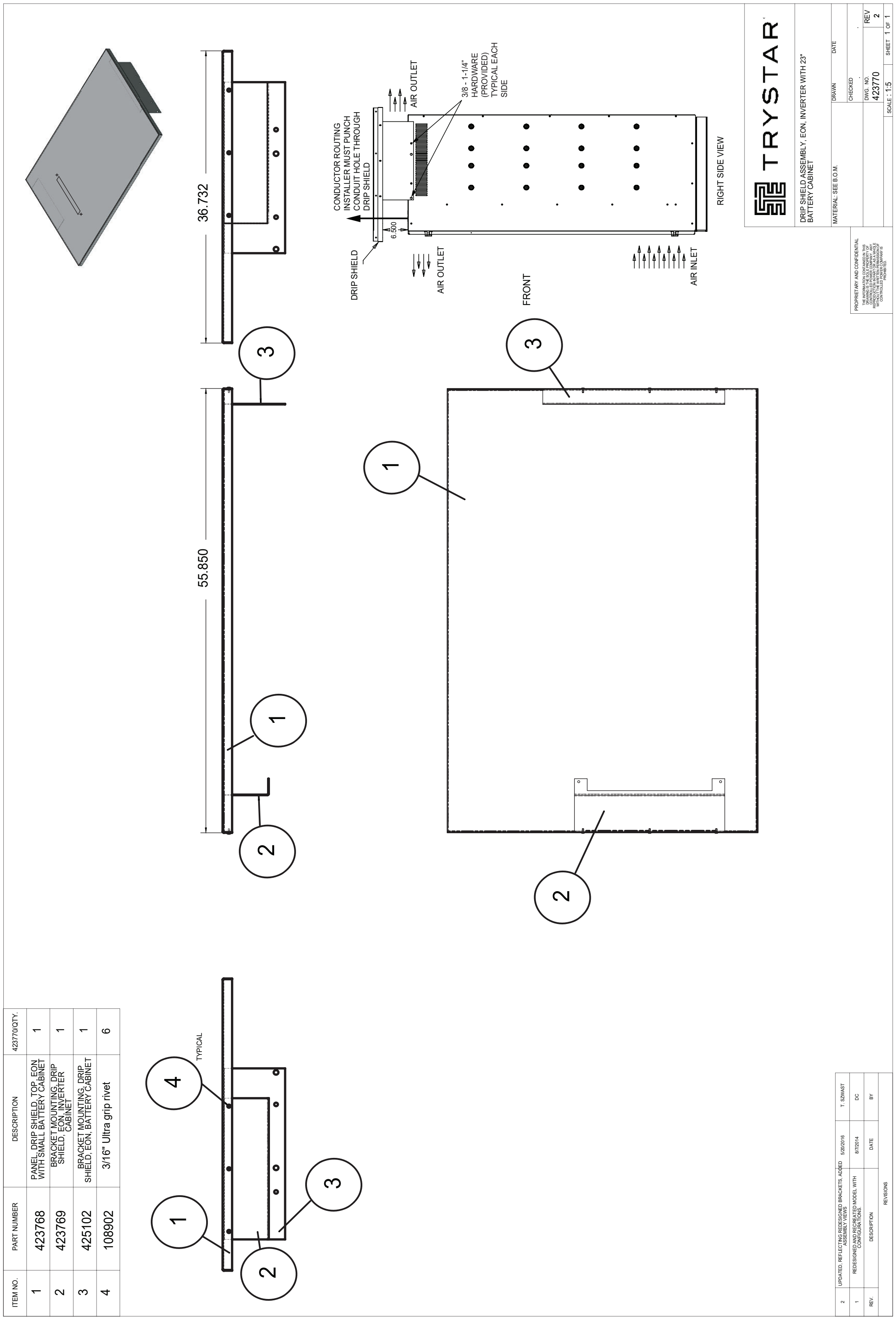


BOTTOM VIEW

TYPICAL ALL SIZES

OPTIONAL DRIP SHIELD ASSEMBLY AND INSTALLATION-

TYPICAL ASSEMBLY FOR ALL CABINET CONFIGURATIONS

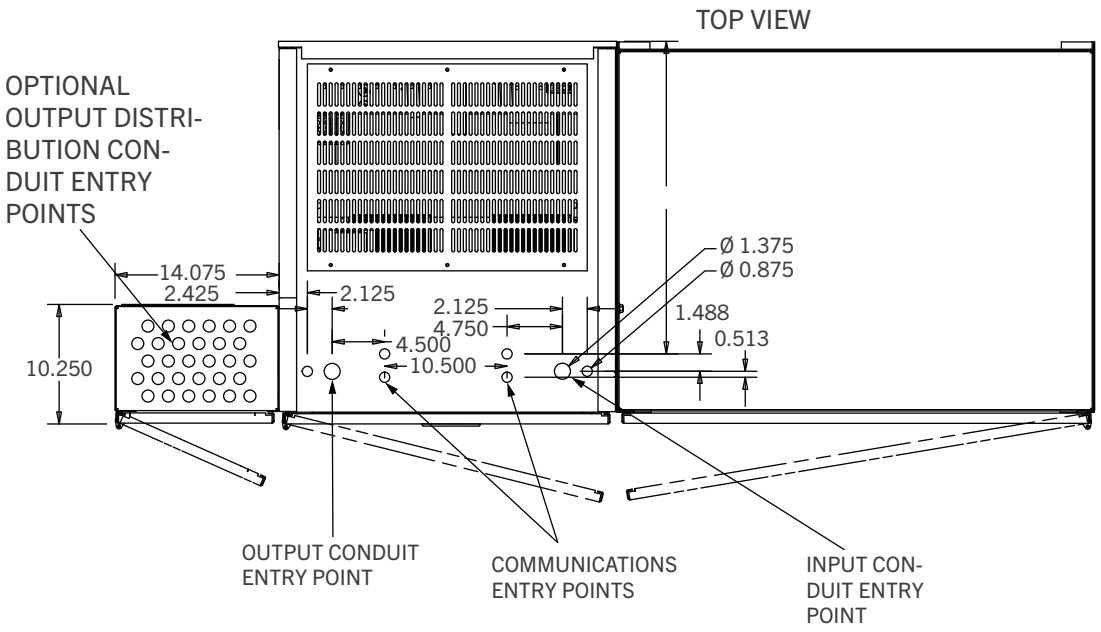


ITEM NO.	PART NUMBER	DESCRIPTION	423770/QTY.
1	423768	PANEL, DRIP SHIELD, TOP, EON WITH SMALL BATTERY CABINET	1
2	423769	BRACKET MOUNTING, DRIP SHIELD, EON, INVERTER CABINET	1
3	425102	BRACKET MOUNTING, DRIP SHIELD, EON, BATTERY CABINET	1
4	108902	3/16" Ultra grip rivet	6

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 DC CIRCUIT BREAKER IS OFF BEFORE SERVICING.



TYPICAL ALL SIZES -

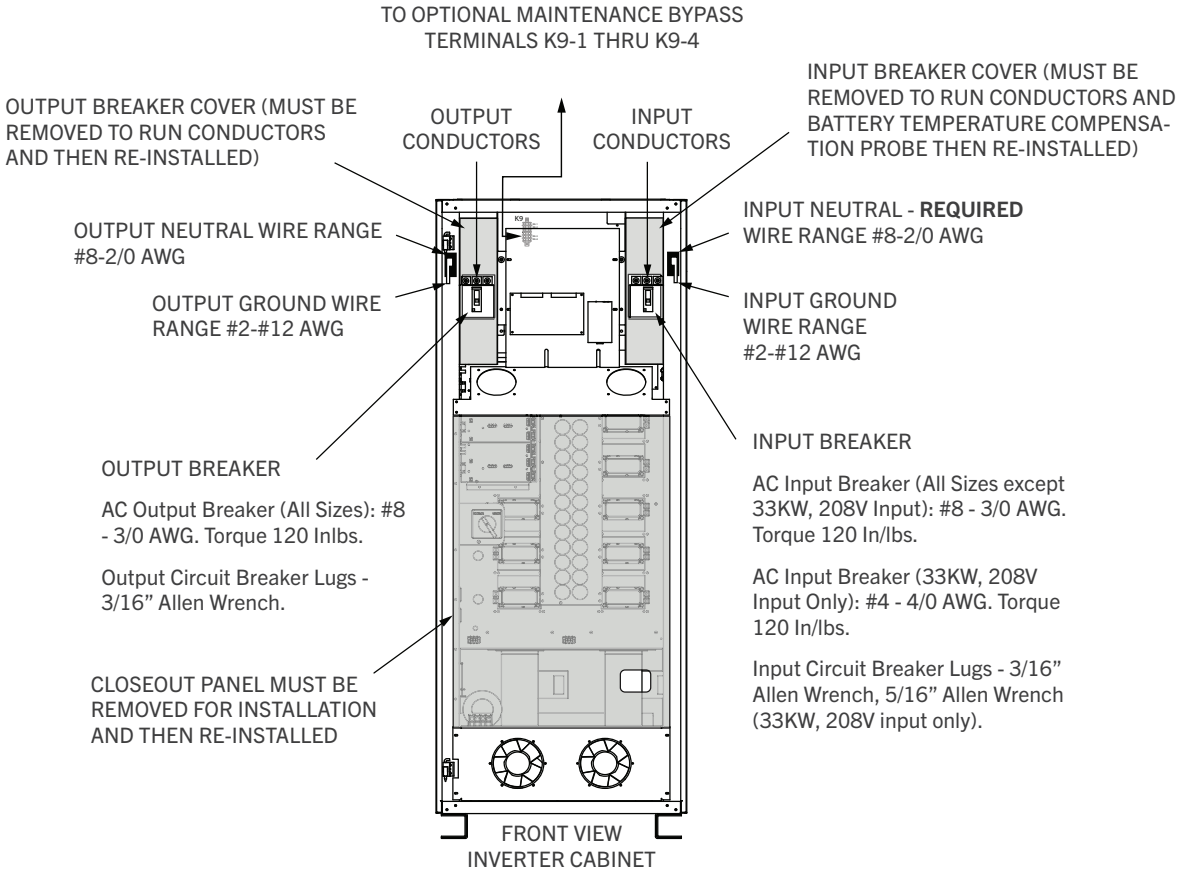
SHOWN WITH OPTIONAL DISTRIBUTION AND LARGE BATTERY CABINET

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 DC CIRCUIT BREAKER IS OFF BEFORE SERVICING.

Input wiring is terminated directly to the input circuit breaker. Output wiring is terminated directly to the output circuit breaker or to the optional output distribution circuit breakers. The input and output breaker covers must be removed to run the conductors and then re-installed when wiring is completed. Before re-installing the breaker covers, the temperature compensation probe must be fished through to the battery cabinet. See “Battery Installation and Wiring”. It is recommended that all wiring is performed according to NEC standards and local codes. Also see “Optional Maintenance Bypass Installation” prior to wiring the input and output conductors.



LOADS MUST BE AS BALANCED AS POSSIBLE

OUTPUT DISTRIBUTION CIRCUIT BREAKERS

Provided in a side-mounted, 14" wide, front access distribution cabinet, a total of 12 pole positions per phase (36 total) are available to accommodate 1, 2, and 3 pole circuit breakers fed from an inverter system output of 208/120 VAC or 480/277 VAC. These circuit breakers are located behind a secured, lockable, hinged door; and can be factorywired to the "Normally On" bus and/or "Normally Off" bus in any combination specified.

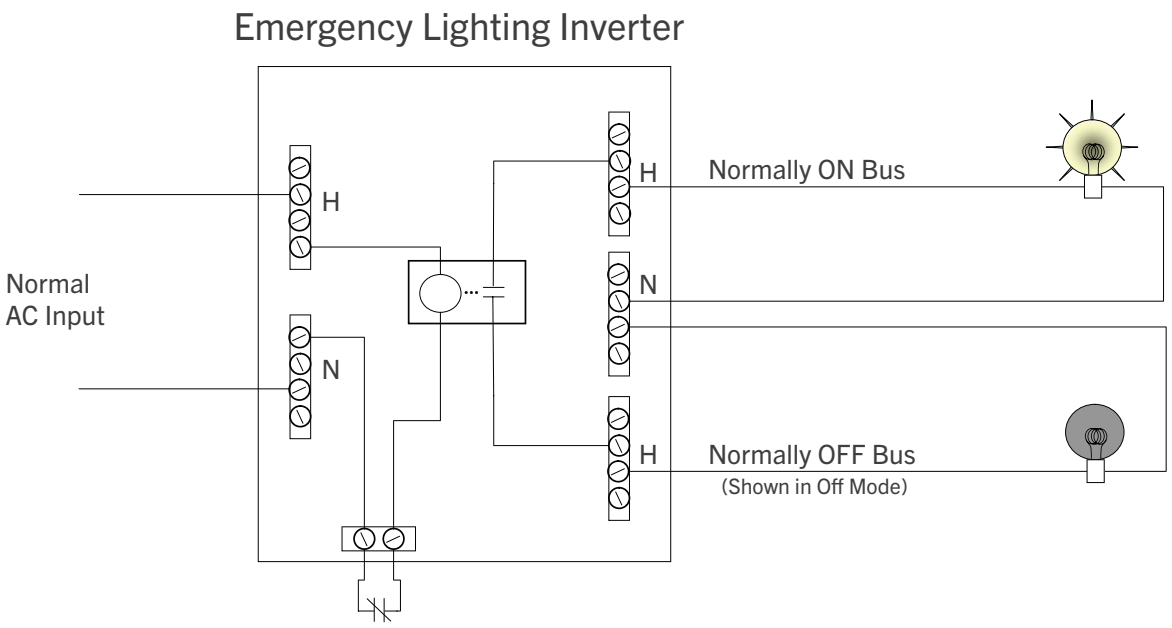
Monitored output circuit breakers are available, reducing the number of pole positions to 8 per phase (24 total). If a circuit breaker is open, the Intellistat^{TS} monitor sounds an alarm. Optional alarm relay contacts are also available.

OPTIONAL TIMED OFF BUS

DESCRIPTION

All parameters are preset at the factory. If modification of these settings is required, please contact the factory. In many lighting system applications, there are designated lights that remain off until a power outage occurs. Available on the EON is a Timed Normally Off Bus option. This option incorporates a programmable timer which controls an internal solid state switch 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 required 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.

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



Remote Command On

(Opening the contact energizes the Normally Off Bus)

Under all conditions, uninterrupted power is being fed to the Normally On lighting. When utility power is present (as depicted above), the solid state switch between the 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 solid state switch is closed and 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 solid state switch, according to the user programmed time period ("Transfer Off Delay" or "Transfer On Delay"). Once the solid state switch is de-energized, the Normally Off lighting is turned off.

OPTIONAL TIMED OFF BUS CONTINUED

TIMED NORMALLY OFF BUS "PLUS"

Provides standby power to "normally off" emergency lights. When utility power is lost or inadequate, emergency power is applied to "normally off" lights, providing a safe means of egress. The system features programmable Transfer On Delay and Transfer Off Delay settings. These are used to control the transfer of emergency power to the load during a power outage and the transition back to the Normally Off mode during resumption of utility power.

User-Programmable Settings: All parameters are preset at the factory. If modification of these settings is required, please contact the factory.

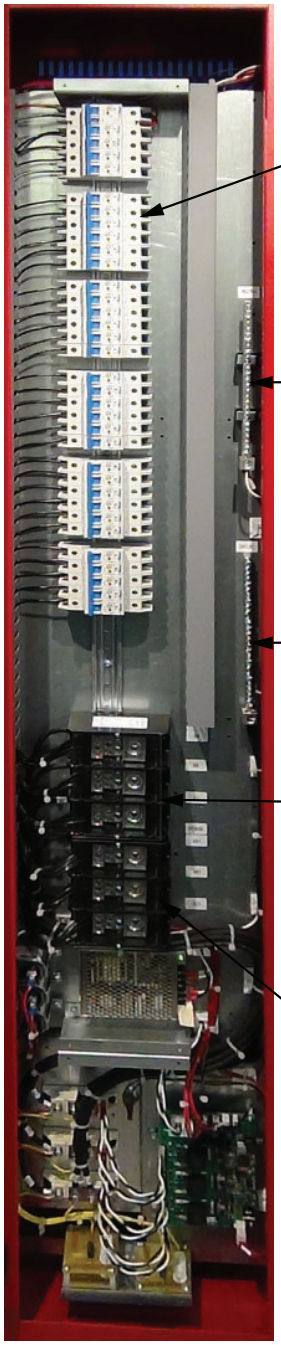
Transfer On Delay (0 – 8 seconds) - determines the amount of time the EON will wait until it switches the off bus on after a power outage or line disturbance. Factory default = 0 seconds.

Transfer Off Delay (0 – 15 minutes) - determines the amount of time the EON will wait to return the off bus output to normal status after a power outage or line disturbance has ended. Factory default = 15 minutes. Factory default = 15 minutes.

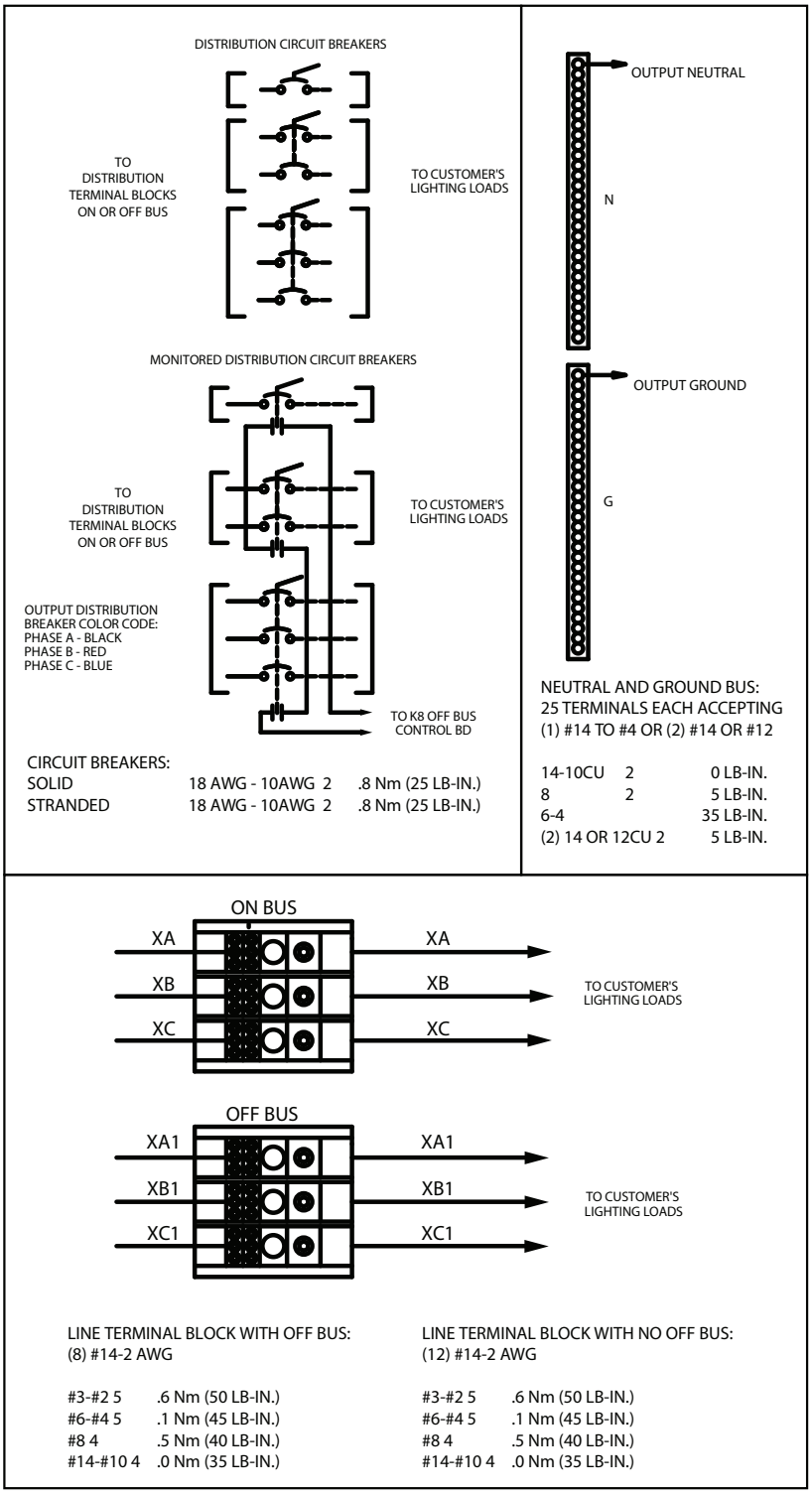
Note: The NetMinder RCCMD and UNMS II both require using the NetMinder Slot Card option. The UNMS II option will monitor the status of not only Trystar's UPS's, but also those of other manufacturers.

OPTIONAL DISTRIBUTION AND ON/OFF BUS OUTPUT WIRING

OPTIONAL OUTPUT DISTRIBUTION CIRCUIT BREAKER WIRING



LOADS MUST BE AS BALANCED AS POSSIBLE



CIRCUIT BREAKERS:

SOLID	18 AWG - 10AWG 2	.8 Nm (25 LB-IN.)
STRANDED	18 AWG - 10AWG 2	.8 Nm (25 LB-IN.)

NEUTRAL AND GROUND BUS:
25 TERMINALS EACH ACCEPTING
(1) #14 TO #4 OR (2) #14 OR #12

14-10CU	2	0 LB-IN.
8	2	5 LB-IN.
6-4		35 LB-IN.
(2) 14 OR 12CU	2	5 LB-IN.

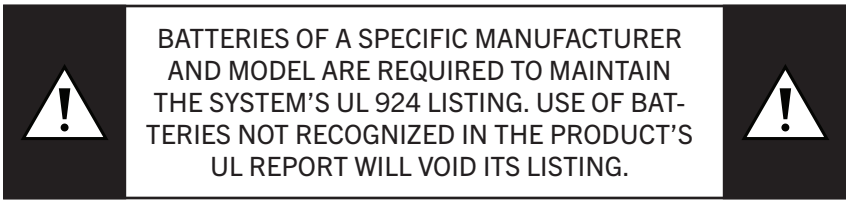
LINE TERMINAL BLOCK WITH OFF BUS:
(8) #14-2 AWG

#3-#2 5	.6 Nm (50 LB-IN.)
#6-#4 5	.1 Nm (45 LB-IN.)
#8 4	.5 Nm (40 LB-IN.)
#14-#10 4	.0 Nm (35 LB-IN.)

LINE TERMINAL BLOCK WITH NO OFF BUS:
(12) #14-2 AWG

#3-#2 5	.6 Nm (50 LB-IN.)
#6-#4 5	.1 Nm (45 LB-IN.)
#8 4	.5 Nm (40 LB-IN.)
#14-#10 4	.0 Nm (35 LB-IN.)

BATTERY REQUIREMENTS



EON BATTERY TABLE 1 – US MODELS, 90 MINUTES RUN-TIMES			
UNIT KW RATING	**INPUT/OUTPUT VOLTAGE (++)**	**BATTERY USED (QTY)MODEL-MFG**	
10kW	NNX, LNX	(20) TPL121000A–CSB	(20) M12V90FT–GNB
	NLX	(22) TPL121000A–CSB	(22) M12B90FT-GNB
	LLX	(12) M12V155FT–GNB	(11) HR7500ET-DEKA
		(12)HR5500ET-DEKA	
13kW	NNX, LNX	(18) TPL121500A–CSB (18) TPL121600-CSB	(20) M12V125FT–GNB
		(26) M12V90FT–GNB	(26) TPL121000A-CSB
	NLX	(18) TPL121500A–CSB (18) TPL121600-CSB	(20) M12V125FT–GNB
		(28) M12V90FT–GNB	(28) TPL121000A-CSB
	LLX	(12)HR7500ET-DEKA	
14kW	NNX, LNX	(20) TPL121500A–CSB (2) TPL121600-CSB	(18) M12V155FT–GNB
		(22) M12V125FT–GNB	(18) HR5500ET-DEKA
		(28) M12V90FT-GNB	(28) TPL121000A-CSB
	NLX	(20) TPL121500A–CSB (20) TPL121600-CSB	(18) M12V155FT–GNB
		(22) M12V125FT–GNB	(18) HR5500ET-DEKA
		(30) M12V90FT-GNB	(30) TPL121000A-CSB
	LLX	(13)HR7500ET-DEKA	
15kW	NNX, LNX	(22)TPL121500A–CSB (22) TPL121600-CSB	(20) M12V155FT–GNB
		(24) M12V125FT–GNB	(20) HR5500ET-DEKA
		(32) M12V90FT-GNB	(32) TPL121000A-CSB
16kW	NNX, LNX	(22) TPL121500A–CSB (22) TPL121600-CSB	(20) M12V155FT–GNB
		(24) M12V125FT-GNB	(20) HR5500ET-DEKA
		(32) M12V90FT-GNB	(32) TPL121000A-CSB
	LLX, NLX	(22) TPL121500A–CSB (22) TPL121600-CSB	(20) M12V155FT–GNB
		(26) M12V125FT-GNB	(20) HR5500ET-DEKA

17kW	NNX, LNX, LLX, NLX	(24) TPL121500A–CSB (24) TPL121600-CSB	(22) M12V155FT–GNB
		(26) M12V125FT-GNB	(22) HR5500ET-DEKA
20kW	NNX, LNX	(24) TM12V155FT-GNB	(28) TPL121500A-CSB
		(30) M12V125FT-GNB	(28) TPL121600-CSB
		(24)HR5500ET-DEKA	
	LLX, NLX	(28) TPL121500A-CSB	(26) M12V155FT-GNB
		(28) TPL121600-CSB	(20) HR7500ET-DEKA
		(32) M12V125FT-GNB	
		(26) HR5500ET-DEKA	
22kW	NNX, LNX	(30) TPL121500A-CSB (30) TPL121600-CSB	(28) M12V155FT-GNB
		(20) HR7500ET-DEKA	(28) HR5500ET-DEKA
	LLX, NLX	(28) M12V155FT-GNB	(32) TPL121500A-CSB (32) TPL121600-CSB
		(22) HR7500ET-DEKA	(28) HR5500ET-DEKA
24kW	NNX, LNX	(30) M12V155FT-GNB	(22) HR7500ET-DEKA
		(30) HR5500ET-DEKA	
	LLX, NLX	(30) M12V155FT-GNB	(24) HR7500ET-DEKA
		(30)HR5500ET-DEKA	
26kW	NNX, LNX	(32) M12V155FT-GNB	(24) HR7500ET-DEKA
		(32)HR5500ET-DEKA	
	LLX, NLX	(32) M12V155FT-GNB	(26) HR7500ET-DEKA
		(32) HR5500ET-DEKA	
28kW		(26) HR7500ET-DEKA	
30kW		(28) HR7500ET-DEKA	
32kW		(30) HR7500ET-DEKA	
33kW		(30) HR7500ET-DEKA	
		(32) HR7500ET-DEKA	

MINIMUM CHARGE TIME FOR FULL BATTERY CAPACITY = 48 HOURS

Environmental	
Operating Temperature	20°C to 35°C for UL 924 Listed models and C-UL Listed models to CSA C22.2 No. 141-15 20° C (10° C optional) to 40° C for C-UL Listed models to CSA C22.2 No. 141-15 Optimum battery performance and life at 25°C
Storage Temperature	Inverter at -20°C to 50°C Battery storage at 25°C for 6 months before charging is required. For each 9°C rise, reduce storage time by half
Relative Humidity	0 to 95% non-condensing
Altitude	6600 feet (2000 meters) without derating

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.

EON BATTERY TABLE 2 – CANADIAN MODELS, 30 MINUTE RUN-TIMES			
UNIT KW RATING	**INPUT/OUTPUT VOLTAGE (++)**	**BATTERY USED (QTY)MODEL-MFG**	
10kW	NNX, LNX, NLX	(18) TPL121500A-CSB (18) TPL121600-CSB	(18) M12V155FT-GNB
		(18) M12V125FT-GNB	(18) M12V90FT-GNB
		(18) TPL121000A-CSB	
	LLX	(11) TPL121000A-CSB	(11) M12V90FT-GNB
		(11) TPL121500A-CSB (11) TPL121600-CSB	(11) M12V155FT-GNB
		(11) M12V125FTGNB	
13kW	NNX, LNX, NLX	(18) TPL121500A-CSB (18) TPL121600-CSB	(18) M12V155FT-GNB
		(18) M12V125FT-GNB	(18) M12V90FT-GNB
		(18) TPL121000A-CSB	
	LLX	(13) TPL121000A-CSB	(12) M12V90FT-GNB
		(12) TPL121500A-CSB (12) TPL121600-CSB	(12) M12V155FT-GNB
		(12) M12V125FTGNB	
14kW	NNX, LNX, NLX	(18) TPL121500A-CSB (18) TPL121600-CSB	(18) M12V155FT-GNB
		(18) M12V125FT-GNB	(18) M12V90FT-GNB
		(18) TPL121000A-CSB	
	LLX	(14) TPL121000A-CSB	(13) M12V90FT-GNB
		(13) TPL121500A-CSB (13) TPL121600-CSB	(13) M12V155FT-GNB
		(13) M12V125FTGNB	
15kW	NNX, LNX, LLX, NLX	(20) TPL121000A-CSB	(18) M12V90FT-GNB
		(18) TPL121500A-CSB (18) TPL121600-CSB	(18) M12V155FT-GNB
		(18) M12V125FTGNB	
16kW	NNX, LNX, LLX, NLX	(20) TPL121000A-CSB	(18) M12V90FT-GNB
		(18) TPL121500A-CSB (18) TPL121600-CSB	(18) M12V155FT-GNB
		(18) M12V125FTGNB	

17kW	NNX, LNX, LLX, NLX	(20) TPL121000A-CSB	(18) M12V90FT-GNB
		(18) TPL121500A-CSB (18) TPL121600-CSB	(18) M12V155FT-GNB
		(18) M12V125FTGNB	
20kW	NNX, LNX, LLX, NLX	(20) TPL121000A-CSB	(18) M12V90FT-GNB
		(18) TPL121500A-CSB (18) TPL121600-CSB	(18) M12V155FT-GNB
		(18) M12V125FTGNB	
22kW	NNX, LNX, LLX, NLX	(22) TPL121000A-CSB	(20) M12V90FT-GNB
		(20) TPL121500A-CSB (20) TPL121600-CSB	(20) M12V155FT-GNB
		(20) M12V125FTGNB	
24kW	NNX, LNX, LLX, NLX	(24) TPL121000A-CSB	(22) M12V90FT-GNB
		(22) TPL121500A-CSB (22) TPL121600-CSB	(22) M12V155FT-GNB
		(22) M12V125FTGNB	
26kW	NNX, LNX, LLX, NLX	(26) TPL121000A-CSB	(24) M12V90FT-GNB
		(24) TPL121500A-CSB (24) TPL121600-CSB	(24) M12V155FT-GNB
		(24) M12V125FTGNB	
28kW	NNX, LNX, LLX, NLX	(28) TPL121000A-CSB	(26) M12V90FT-GNB
		(26) TPL121500A-CSB (26) TPL121600-CSB	(26) M12V155FT-GNB
		(26) M12V125FTGNB	
30kW	NNX, LNX, LLX, NLX	(30) TPL121000A-CSB	(28) M12V90FT-GNB
		(28) TPL121500A-CSB (28) TPL121600-CSB	(28) M12V155FT-GNB
		(28) M12V125FTGNB	
32kW	NNX, LNX, LLX, NLX	(32) TPL121000A-CSB	(30) M12V90FT-GNB
		(30) TPL121500A-CSB (30) TPL121600-CSB	(30) M12V155FT-GNB
		(30) M12V125FTGNB	
33kW	NNX, LNX, LLX, NLX	(32) TPL121000A-CSB	(30) M12V90FT-GNB
		(30) TPL121500A-CSB (30) TPL121600-CSB	(30) M12V155FT-GNB
		(30) M12V125FTGNB	

MINIMUM CHARGE TIME FOR FULL BATTERY CAPACITY = 48 HOURS

Environmental	
Operating Temperature	20°C to 35°C for UL 924 Listed models and C-UL Listed models to CSA C22.2 No. 141-15 20° C (10° C optional) to 40° C for C-UL Listed models to CSA C22.2 No. 141-15 Optimum battery performance and life at 25°C
Storage Temperature	Inverter at -20°C to 50°C Battery storage at 25°C for 6 months before charging is required. For each 9°C rise, reduce storage time by half
Relative Humidity	0 to 95% non-condensing
Altitude	6600 feet (2000 meters) without derating

BATTERY INSTALLATION AND WIRING

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

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 DC CIRCUIT BREAKER IS OFF BEFORE SERVICING.

SECURE THE INVERTER AND BATTERY CABINETS TOGETHER PRIOR TO BATTERY INSTALLATION. SECURE THE CABINETS TO THE FLOOR (IF REQUIRED) PRIOR TO BATTERY INSTALLATION. DO NOT ATTEMPT TO MOVE BATTERY CABINET AFTER BATTERIES HAVE BEEN INSTALLED.

SEE "SAFETY PRECAUTIONS"

TOOLS REQUIRED:

Torque wrench, 3/8 and 7/16 socket, 3/8 and 7/16 end wrench, 10mm socket and end wrench, large Phillips screw driver. Gloves and eye protection. DC meter to read up to 500V.

BATTERY INSTALLATION OVERVIEW

Use only insulated tools and protective gloves as dangerous voltages exist. Only a qualified electrician should install the batteries. Always wear eye protection. Battery cabinet should be in place and bolted to the inverter cabinet prior to battery installation. Remove the battery hold down brackets; they will be reused after the batteries are in place.

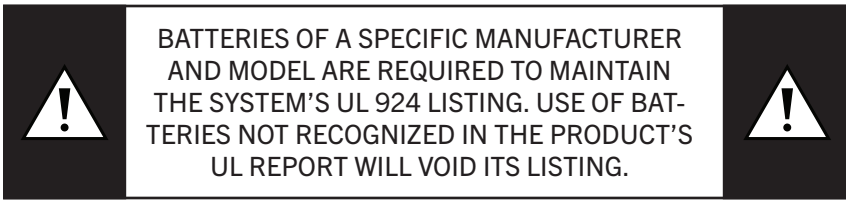
The final arrangement will be a series battery string with a nominal voltage as indicated on the battery wiring diagram on the inside of the door of the battery cabinet.

1. Verify the DC breaker in the battery cabinet is OFF and the DC Anderson connector is NOT connected to the inverter. Verify the cabinet ground wire is connected.
2. The supplied batteries may be shipped from a separate location other than the factory, confirm the number of batteries match the wiring diagram on the inside of the door of the battery cabinet.
3. Only front access batteries can be used and range from 70-150lbs. each which may require a proper lifting device to load them safely.
4. Remove the batteries from the skid being careful not to short the

terminals. For safety reasons, the battery terminals should be taped off. The batteries should be clean on all surfaces. Check each battery voltage before installing them, it should be at least 12-13vdc. If not, contact the factory for instructions.

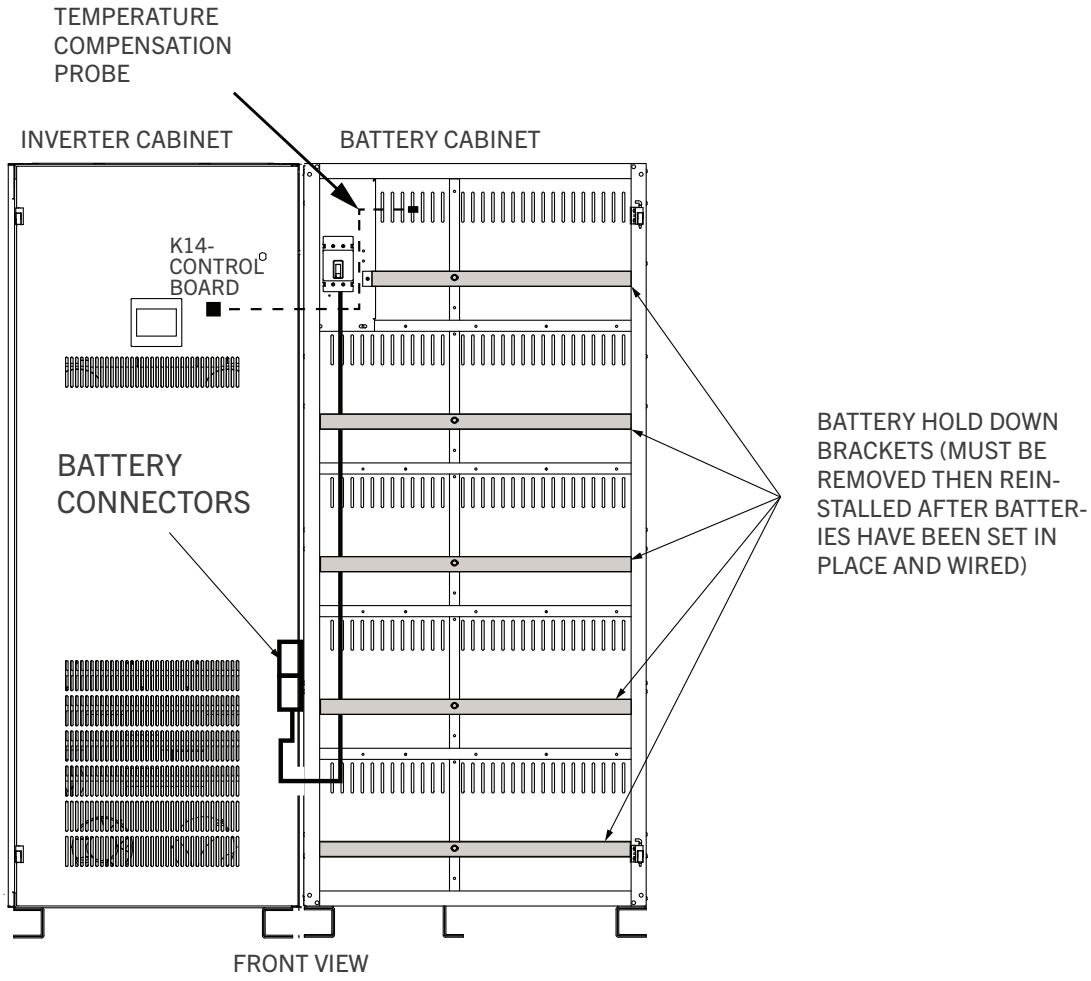
5. Loose battery jumpers and wires will be packed in the battery cabinet, verify the amount shown on the battery wiring diagram located on the battery cabinet door. Two different lengths of jumpers are used, one used between the adjacent battery ½" apart and the other one slightly longer used where the cabinet has a vertical support between two batteries.
6. Load the individual batteries one at a time maintaining ½" between any two batteries or any cabinet surface. This is important or the battery jumpers will not fit properly. Start at the bottom row of the cabinet and work towards the top being careful not to short the battery terminals. Push in the battery. Make sure the battery is in square maintaining the ½" spacing from front to back.
7. Remove the tape on the terminals one at a time during the installation. First install the negative wire lead from the bottom left battery to the DC breaker, next install the top right positive wire lead to the dc breaker. Install the battery jumpers last then re-install the battery terminal covers (if supplied) be careful to route any uninsulated exposed lugs away from the cabinet. Terminal torque information can be found in the manual but is generally 60in/lbs. for each connection. Do Not Over torque and use the terminal hardware packed by the battery manufacturer.
8. After the connections are torqued properly, read the voltage of the completed battery string to assure the individual batteries are wired correctly. The total voltage should be approximately equal to the number of batteries times the measured voltage of one battery. If the measurement is less, recheck the connections for proper voltage and polarity.
9. Re-install the battery hold down brackets one row at a time being very careful not to contact any battery terminals.
10. Lastly route the temperature sensor from the inverter and secure to the top most battery wire in the string using a ty-wrap or other insulated type fastener. This is used for the temperature compensated battery charging system which automatically compensates the charging voltage to the battery string based on the ambient temperature.

The start-up technician will verify the wiring and energize the inverter at time of startup.



QUALIFIED / AUTHORIZED PERSONNEL ONLY ***

USE INSULATED TOOLS

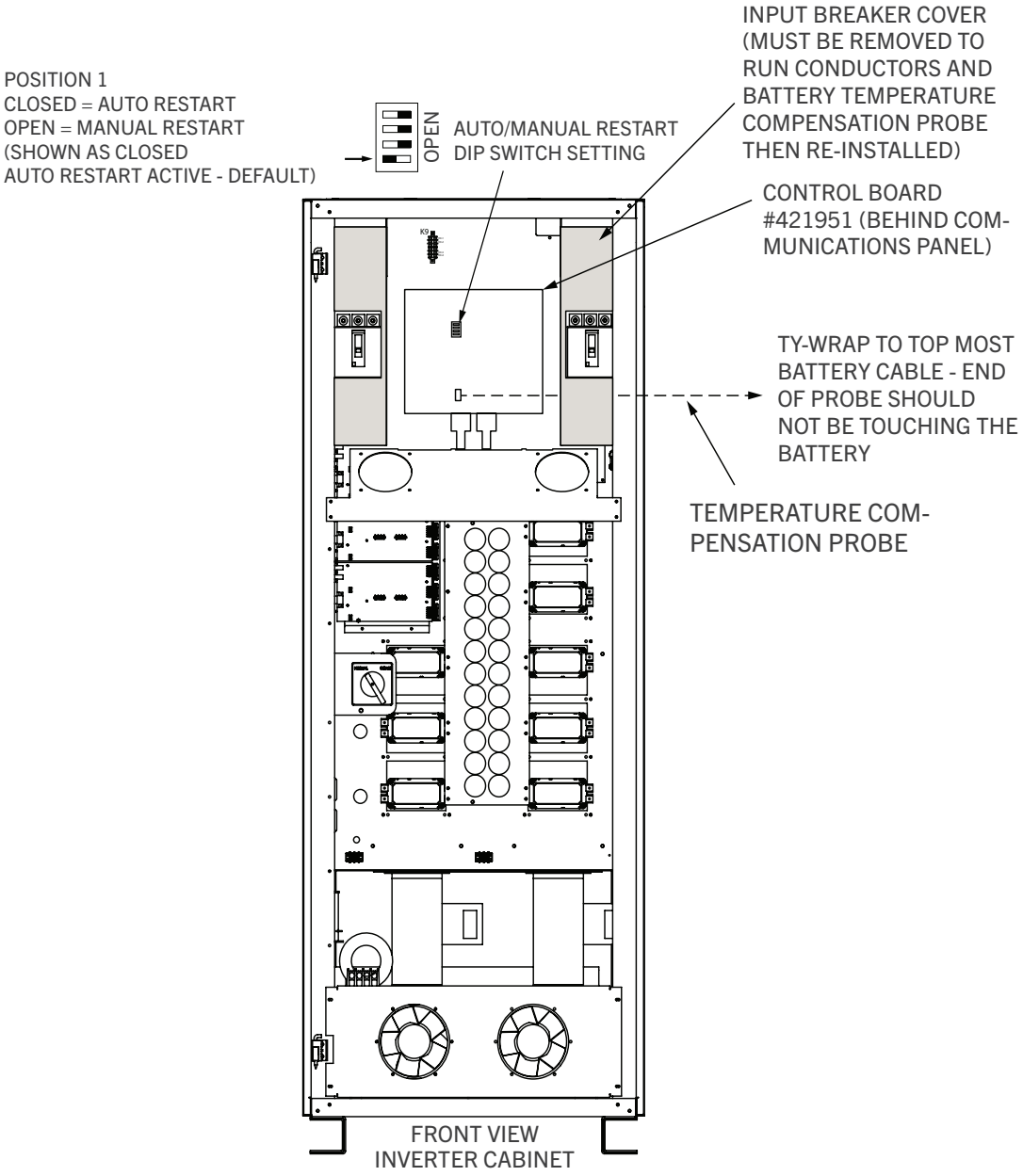


TEMPERATURE COMPENSATED CHARGING SYSTEM

AUTO / MANUAL RESTART DIP SWITCHES

The unit is equipped with an ambient compensated charging system the automatically adjusts the charging voltage dependent on the ambient temperature detected by a probe located next to the upper most battery. The probe should be ty-wrapped to the top most battery cable, the probe should not touch the battery. The probe is coiled up in the inverter cabinet near the main input circuit breaker ready to be fished through to the battery cabinet.

The probe is tied to the K14 terminal on the main control board (behind the communications panel), then to the top most battery cable in the battery cabinet, the probe should not touch the battery.

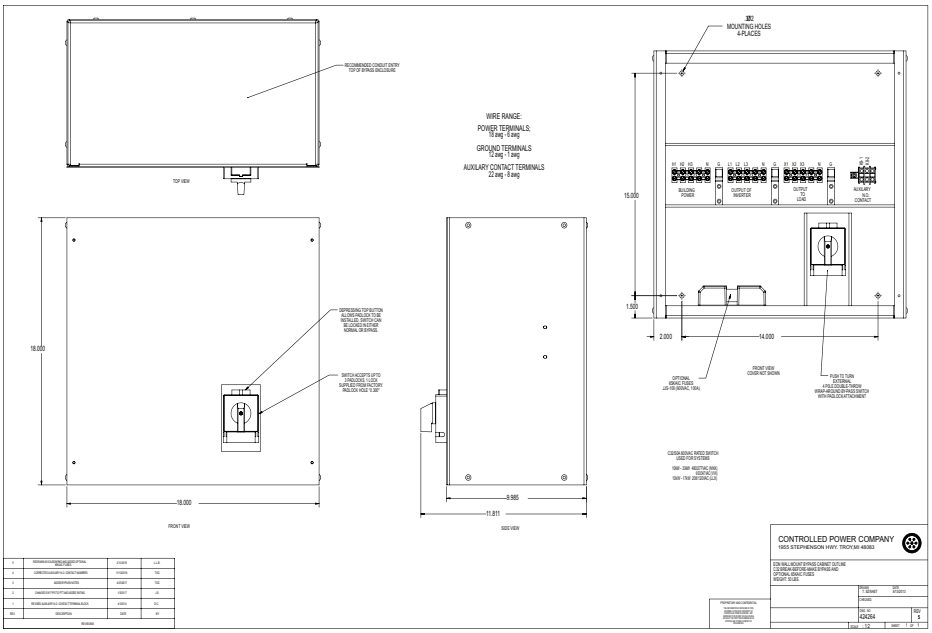


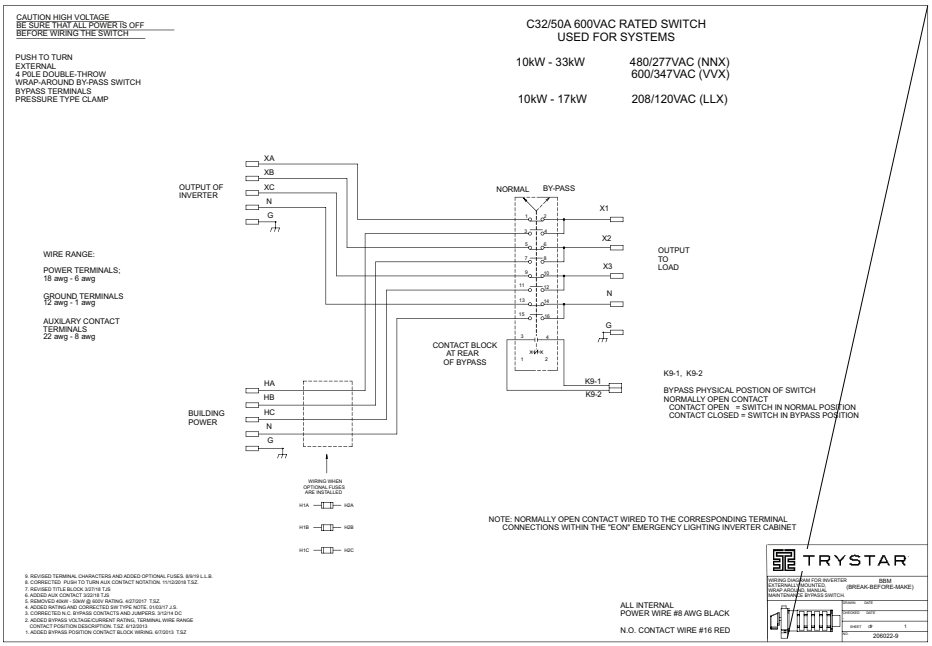
OPTIONAL MAINTENANCE BYPASS INSTALLATION

BREAK BEFORE MAKE

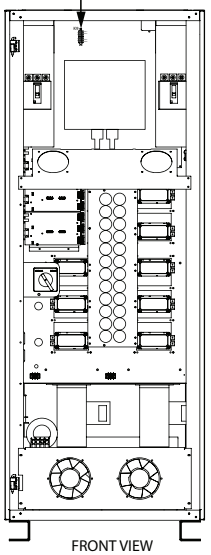
10kW-33kW (NNX, VVX) AND 10kW-17kW (LLX)

On systems in which the nominal input and output voltages are the same, an optional external, wall-mounted, pushto- turn, **Break-Before-Make** wrap around maintenance bypass switch with one set of auxiliary contacts to indicate the physical position of the switch is available. When in bypass mode, the switch bypasses the system to allow for isolation of the input and output, and to enable the inverter to be fully serviced (including the complete maintenance and replacement of circuit cards or components). See *"Bypass Operation".*





K9 TERMINAL CONNECTOR FOR OPTIONAL MAINTENANCE BYPASS



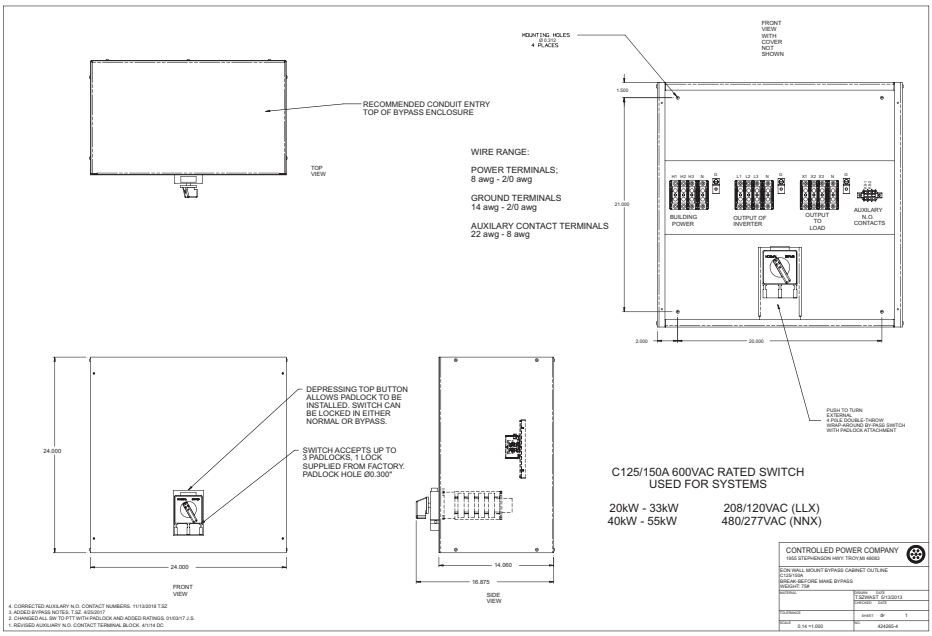
FRONT VIEW INVERTER CABINET

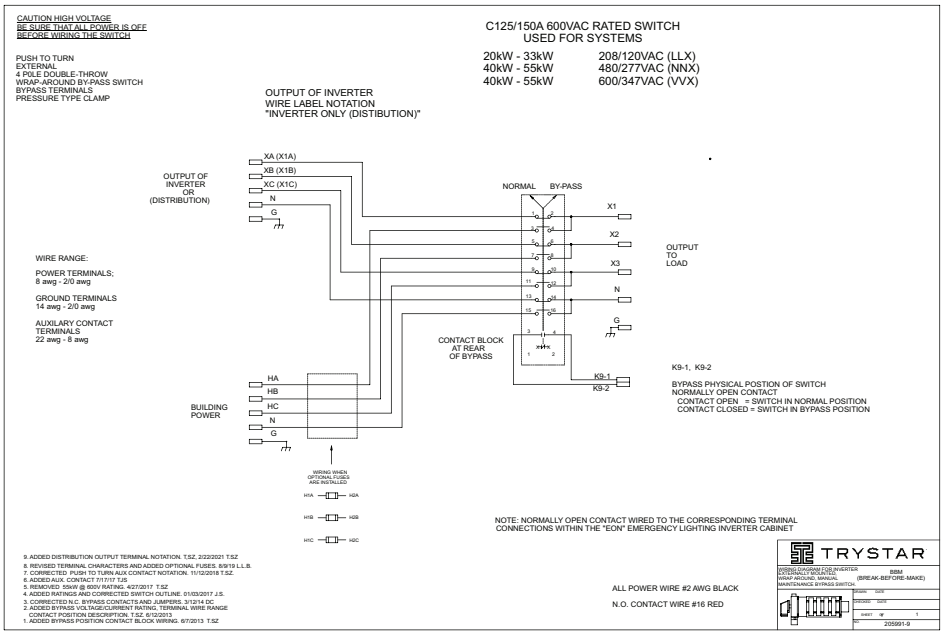
OPTIONAL MAINTENANCE BYPASS INSTALLATION

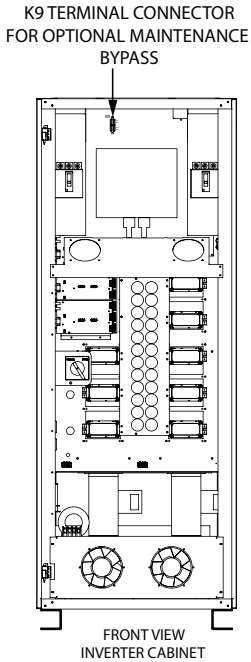
BREAK BEFORE MAKE

20kW-33kW (LLX)

On systems in which the nominal input and output voltages are the same, an optional external, wall-mounted, pushto-turn, **Break-Before-Make** wrap around maintenance bypass switch with one set of auxiliary contacts to indicate the physical position of the switch is available. When in bypass mode, the switch bypasses the system to allow for isolation of the input and output, and to enable the inverter to be fully serviced (including the complete maintenance and replacement of circuit cards or components). See *"Bypass Operation".*

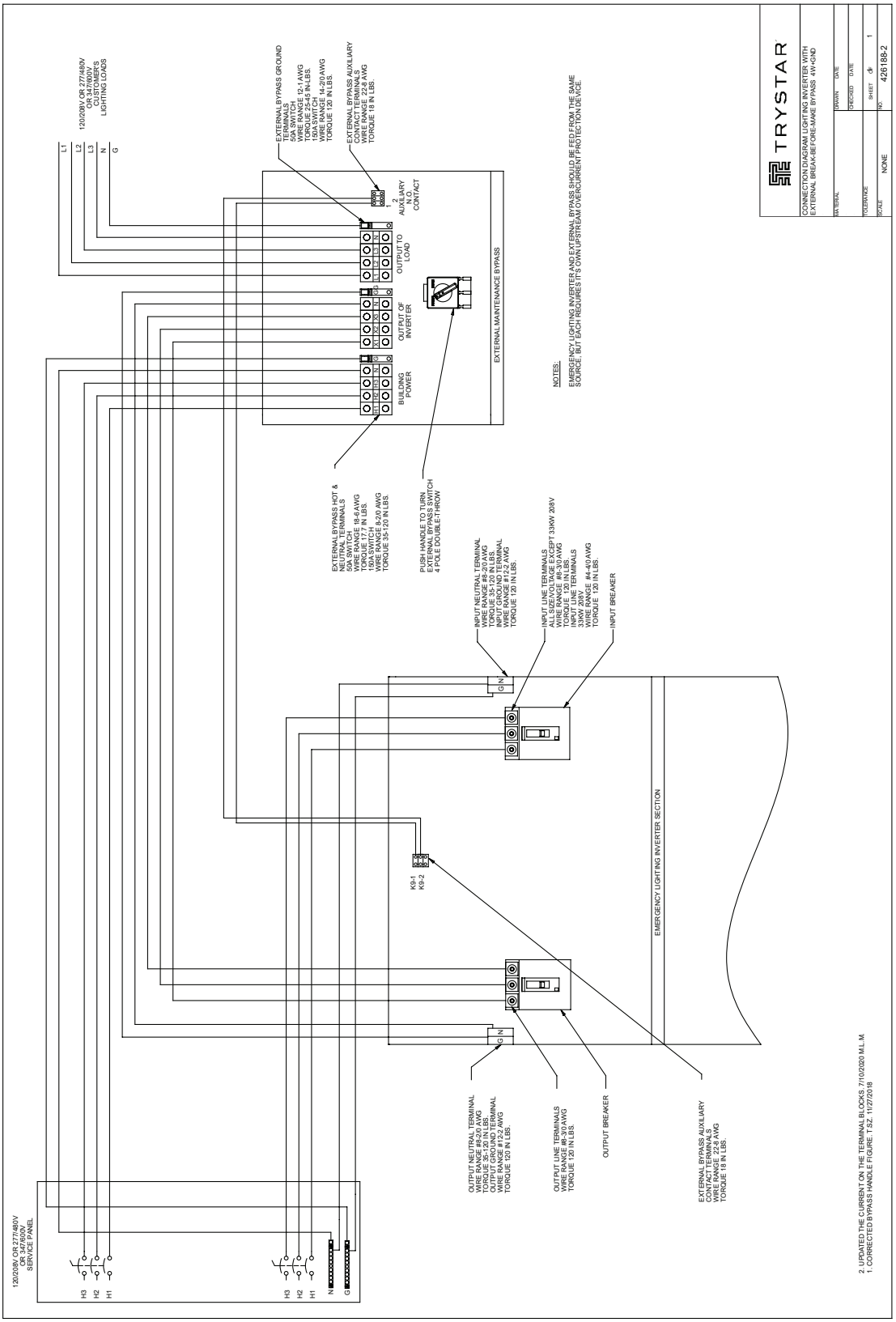






OPTIONAL MAINTENANCE BYPASS INSTALLATION

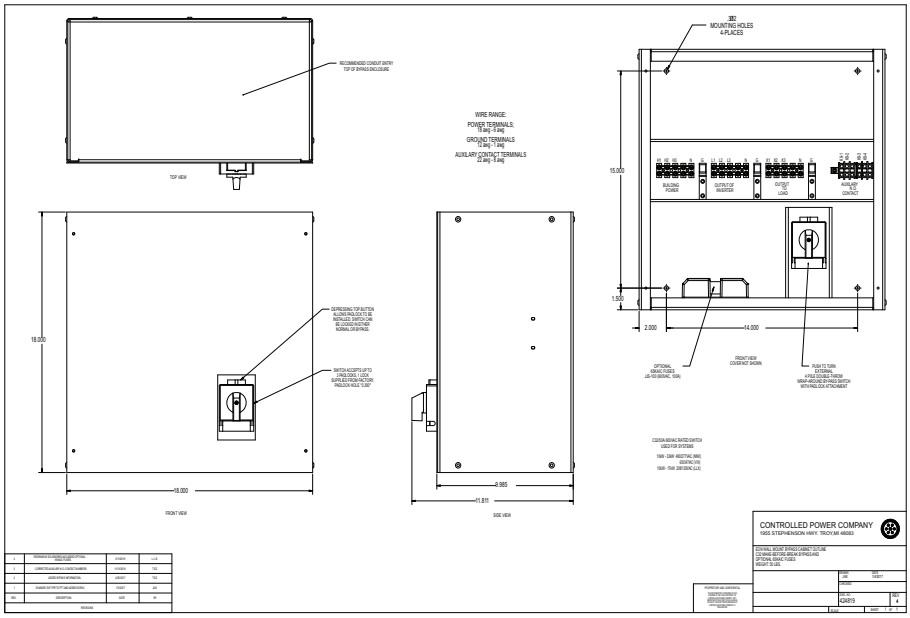
BREAK BEFORE MAKE SYSTEM WIRING DIAGRAM

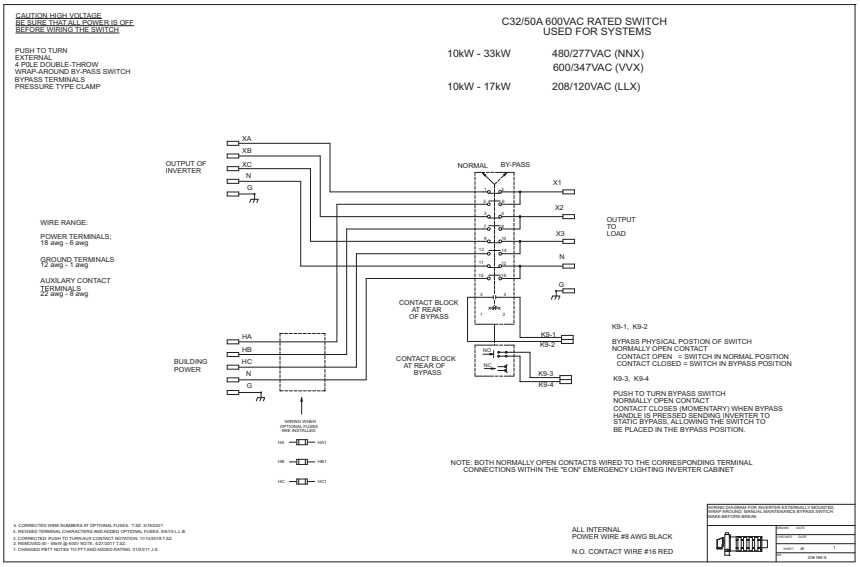


10kW-33kW (NNX, VVX) AND 10kW-17kW (LLX)

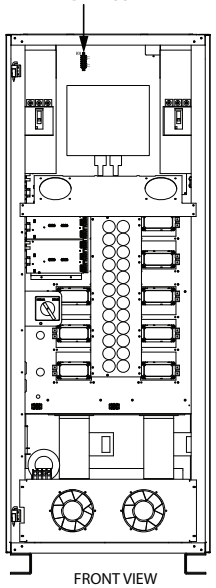
On systems in which the nominal input and output voltages are the same, an optional external, wall-mounted, pushto-turn, **Make-Before-Break** wrap around maintenance bypass switch with two sets of auxiliary contacts is available. One set of contacts is to indicate the physical position of the switch and the other set is to invoke the static bypass. When in bypass mode, the switch bypasses the system to allow for isolation of the input and output, and to enable the inverter to be fully serviced (including the complete maintenance and replacement of circuit cards or components).

The bypass switch's auxiliary contact is wired to the inverter system. This contact enables the switch's push-toturn function to invoke the static bypass before the switch is turned to the bypass position. With the static bypass engaged, no interruption of power to the load will occur during transfers and retransfers. See *"Bypass Operation".*





K9 TERMINAL CONNECTOR FOR OPTIONAL MAINTENANCE BYPASS

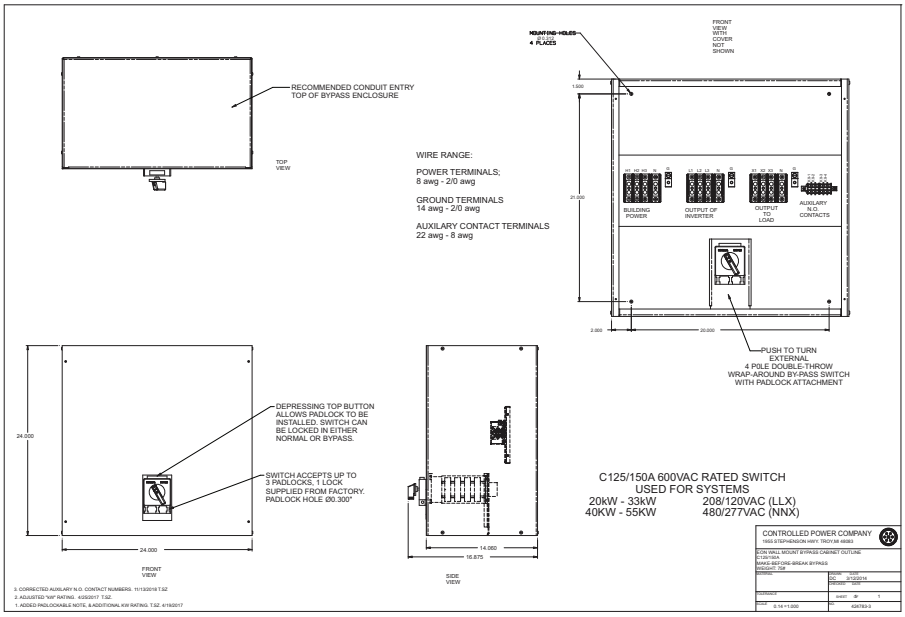


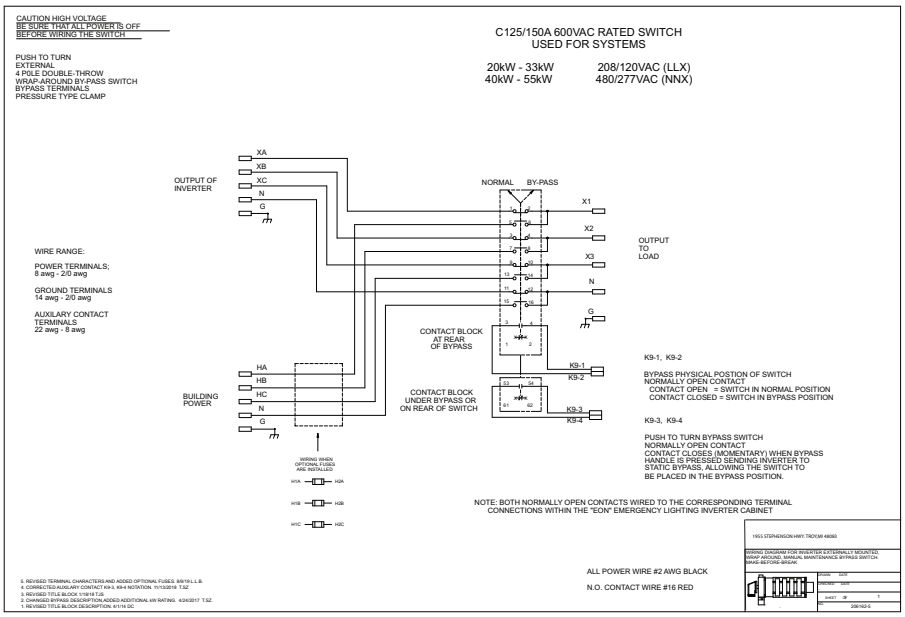
FRONT VIEW INVERTER CABINET

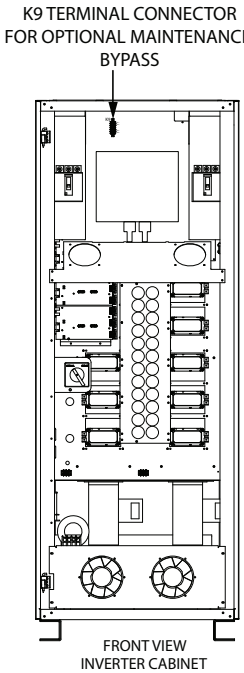
20kW-33kW (LLX)

On systems in which the nominal input and output voltages are the same, an optional external, wall-mounted, pushto- turn, **Make-Before-Break** wrap around maintenance bypass switch with two sets of auxiliary contacts is available. One set of contacts is to indicate the physical position of the switch and the other set is to invoke the static bypass. When in bypass mode, the switch bypasses the system to allow for isolation of the input and output, and to enable the inverter to be fully serviced (including the complete maintenance and replacement of circuit cards or components).

The bypass switch's auxiliary contact is wired to the inverter system. This contact enables the switch's push-toturn function to invoke the static bypass before the switch is turned to the bypass position. With the static bypass engaged, no interruption of power to the load will occur during transfers and retransfers. See *"Bypass Operation".*

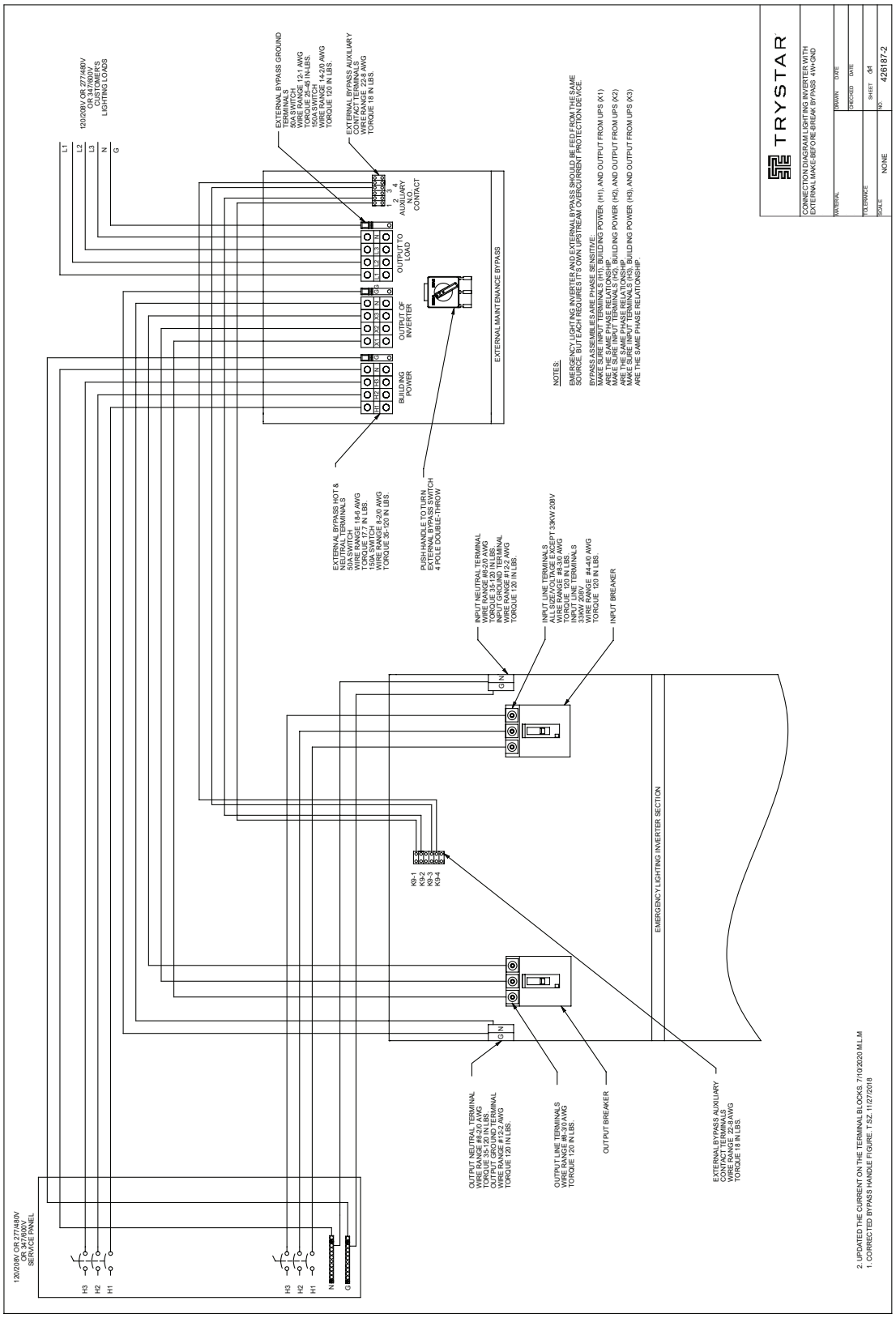






OPTIONAL MAINTENANCE BYPASS INSTALLATION

MAKE BEFORE BREAK SYSTEM WIRING DIAGRAM



NETMINDER AND INTELLISTAT TS NETWORK COMMUNICATIONS

Optional Network Communications

The NetMinder's series of adapters integrate the EON with Intellistat TS 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 EON with Intellistat TS 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.

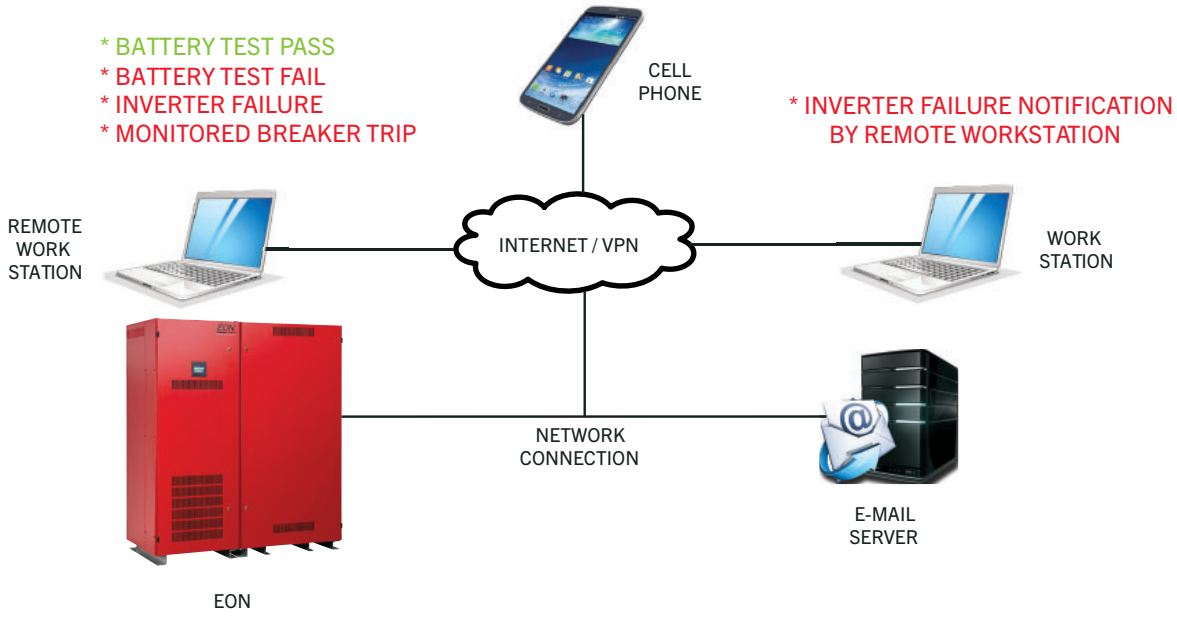
Note: The CS121 has been discontinued and replaced by the CS141. The CS121 is still supported.

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

The EON with Intellistat TS Monitor and Network Communications 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.

OPTIONAL REMOTE COMMUNICATIONS AND ALARM RELAY WIRING

STATUS / ALARM RELAY CONTACTS (OPTIONAL) - Isolated, potential free (Form C) relay contacts, rated for 2A @ 30VDC or 1A @ 120VAC, are available via a terminal strip for customers' hardwired connections to building monitoring and security systems. Status / alarm contacts include inverter on, on battery power, low battery, general alarm, in bypass, periodic or annual test activated, output circuit breaker open, battery test pass, and battery test fail. See "Installation - *Communications Panel with....."* for K3 and K4 terminal location.

REPO - Allows a remote contact signal (REPO) to power off the system. When the contact closes the system is forced off. See *"Installation - Communications Panel with..... "* for K5 terminal location.

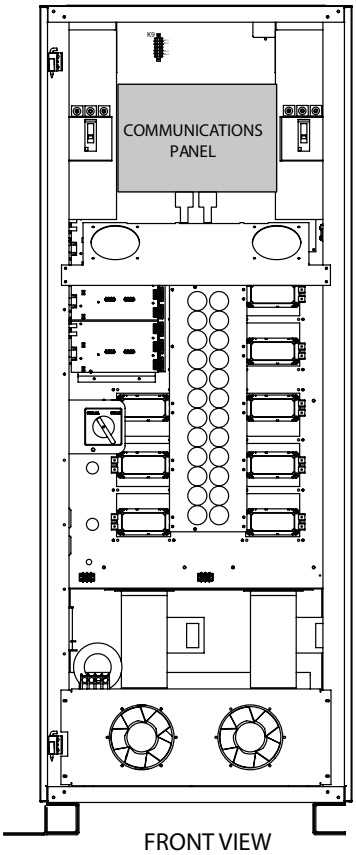
REMOTE INPUT COMMAND (OFF BUS ENABLE) (OPTIONAL) - Allows a remote contact signal to energize the "Normally Off" bus, thus illuminating the "normally off" emergency lights. When the contact opens the off bus is forced on. See *"Installation - Communications Panel with ....."* for K5 terminal location.

REMOTE ANNUNCIATOR (OPTIONAL) - The Remote Annunciator is capable of displaying status conditions of an Emergency Lighting Inverter and alarming under critical conditions. See *"Installation* - Optional Remote Annunciator Installation" and "Installation - *Communications Panel with ....."* for K6 terminal location.

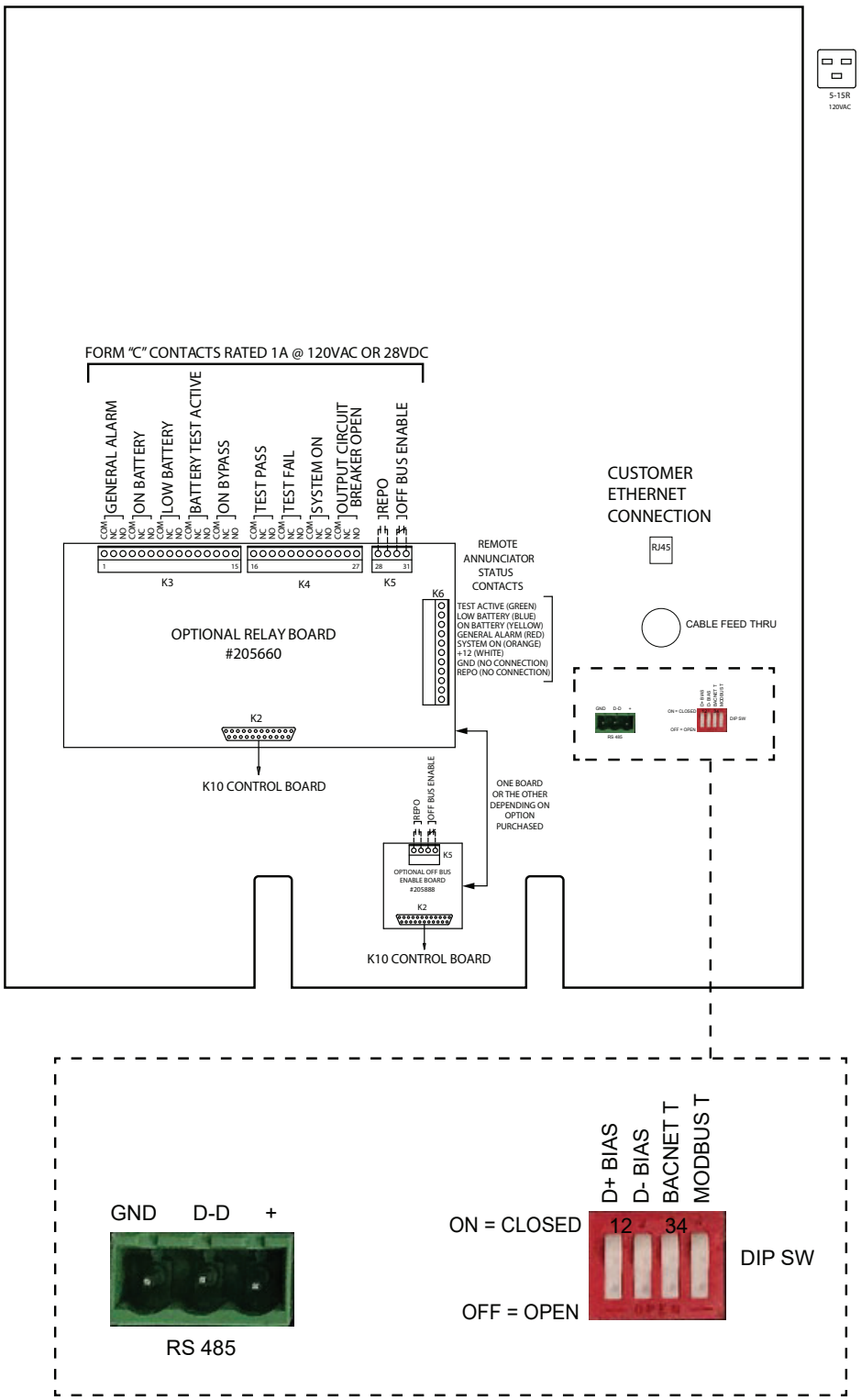
COMMUNICATIONS PANEL WITH INTELLISTAT TS NETWORK COMMUNICATION OPTION

COMMUNICATIONS PANEL WITH INTELLISTAT TS NETWORK COMMUNICATIONS OPTION

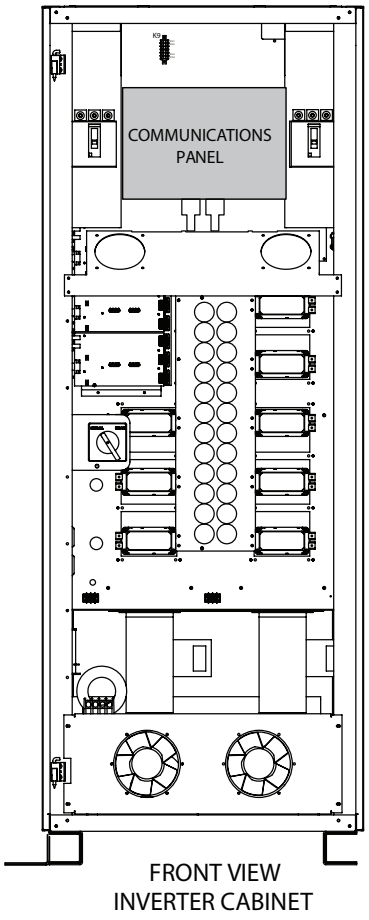
See Intellistat TS Network Communications Guide for setup instructions.



FRONT VIEW
INVERTER CABINET

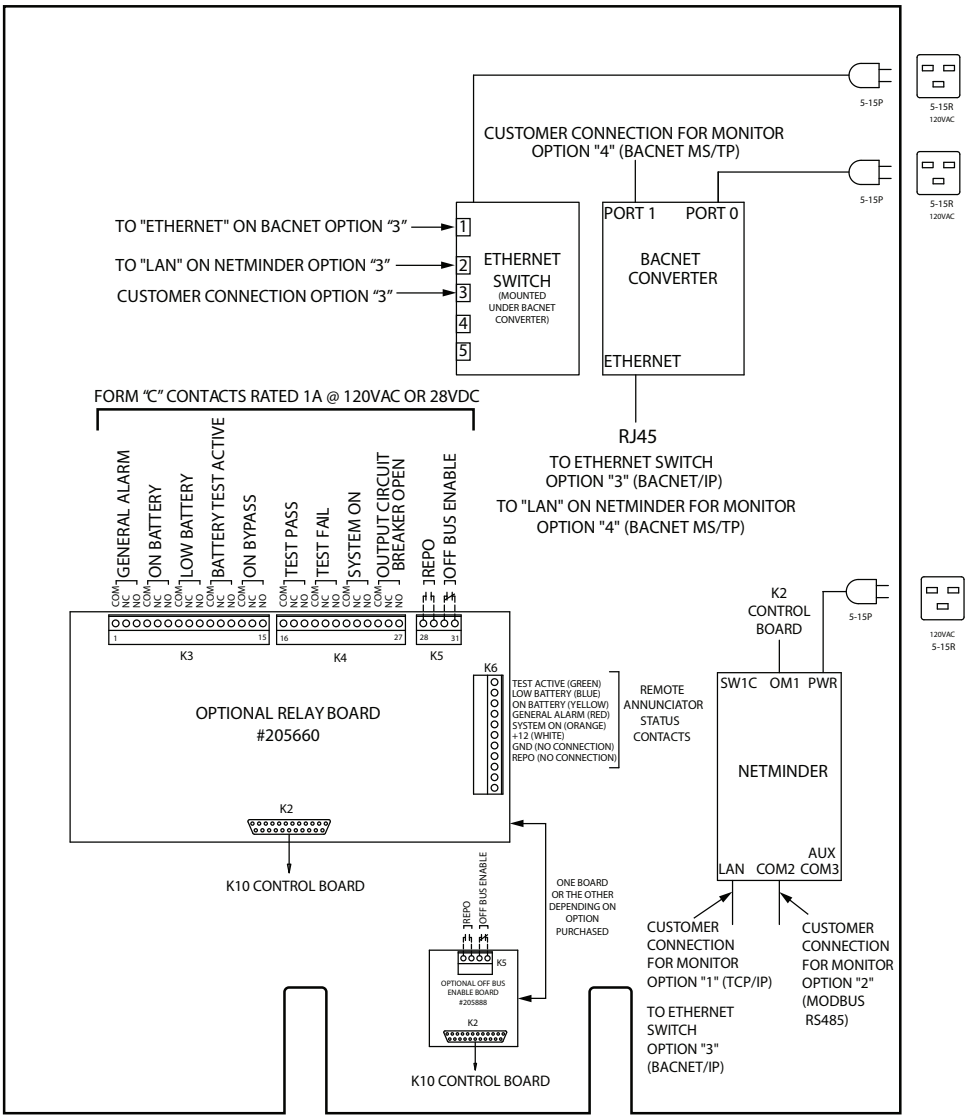


COMMUNICATIONS PANEL WITH NETMINDER COMMUNICATIONS OPTION



COMMUNICATIONS PANEL WITH NETMINDER COMMUNICATIONS OPTION

See NetMinder Remote Communications Setup Guide for instructions.



CUSTOMER INTERFACE POINTS

Device	K#	Pin(s)	Descriptions
Relay Board #205660	K3	1,2	Normally Closed Contacts for General Alarm
		1,3	Normally Open Contacts for General Alarm
		4,5	Normally Closed Contacts for On Battery
		5,6	Normally Open Contacts for On Battery
		7,8	Normally Closed Contacts for Low Battery
		7,9	Normally Open Contacts for Low Battery
		10,11	Normally Closed Contacts for Battery Test Active
		10,12	Normally Open Contacts for Battery Test Active
		13,14	Normally Closed Contacts for On Bypass
		13,15	Normally Open Contacts for On Bypass
	K4	16,17	Normally Closed Contacts for Battery Test Pass
		16,18	Normally Open Contacts for Battery Test Pass
		19,20	Normally Closed Contacts for Battery Test Fail
		19,21	Normally Open Contacts for Battery Test Fail
		22,23	Normally Closed Contacts for System On
		22,24	Normally Open Contacts for System On
		25,26	Normally Closed Contacts for Output Circuit Breaker Open
		25,27	Normally Open Contacts for Output Circuit Breaker Open
	K5	28,29	Close this to activate REPO (Normally Open)
		30,31	Open this to remotely enable the Off Bus (Normally Closed)
Off Bus Enable Board #205888	K5	1,2	Open this to remotely enable the Off Bus (Normally Closed)
		3,4	Close this to activate REPO (Normally Open)
Netminder		Ethernet Jack	Customers network connection
DIP Switch		SW1	Enable the Auto Restart: automatically starts the unit when the line returns after a low battery shutdown

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

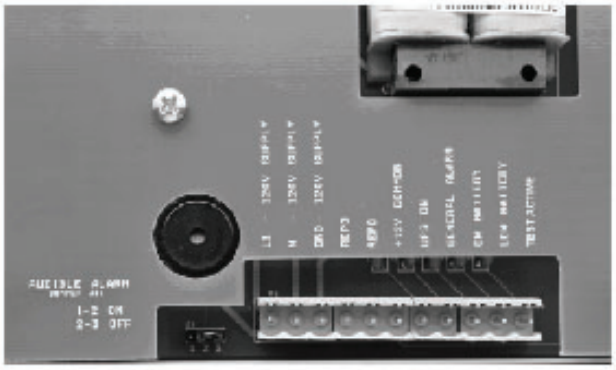


Figure 2: Rear of Remote Annunciator showing J1 and terminal header

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).

OPTIONAL REMOTE ANNUNCIATOR INSTALLATION CONTINUED

Figure 3: Connector Wiring

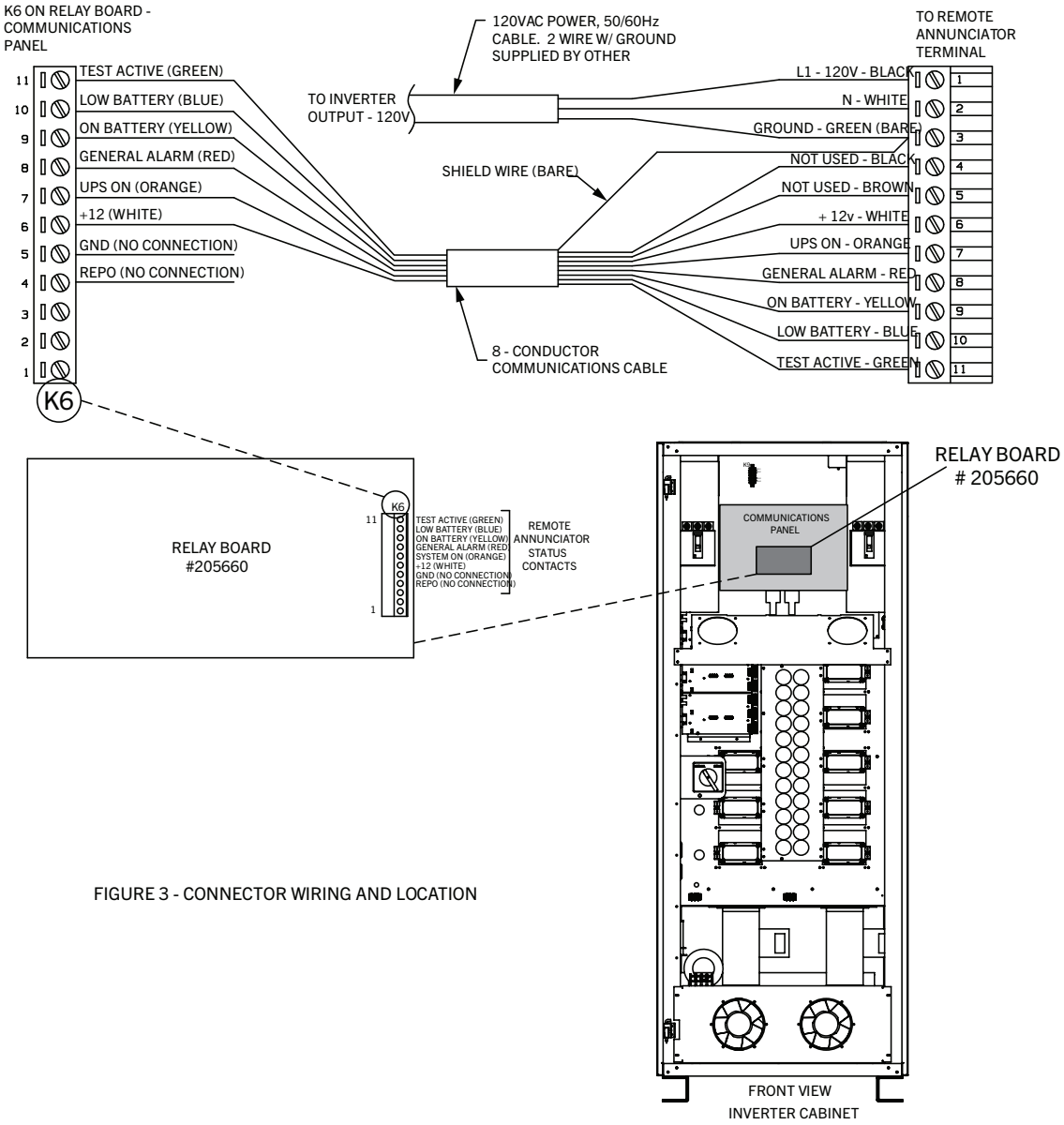


FIGURE 3 - CONNECTOR WIRING AND LOCATION

OPTIONAL REMOTE ANNUNCIATOR INSTALLATION CONTINUED

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. See *“Installation - Optional Communications and Alarm Relay Wiring”.*

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).

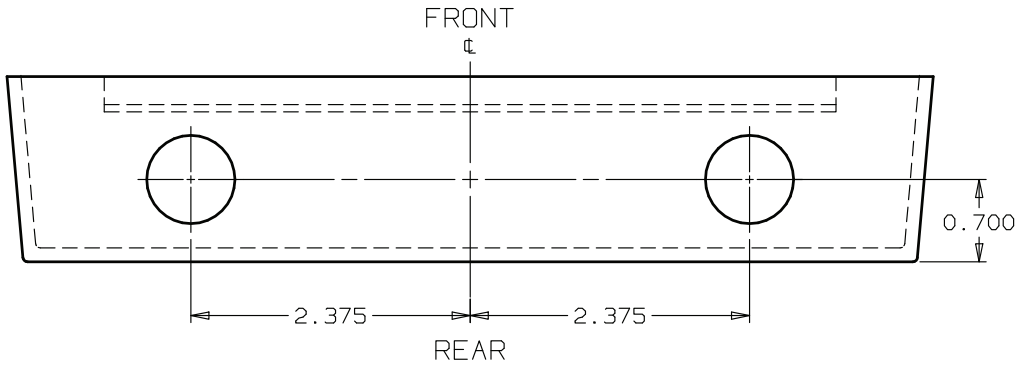


Figure 4: Drilling locations for top/bottom conduit entrance.

OPTIONAL ZONESAVER-2, “LOCAL CONTROL OVERRIDE” INSTALLATION

Specifications

Voltages 277VAC 50/60Hz

Max Load Requirements

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

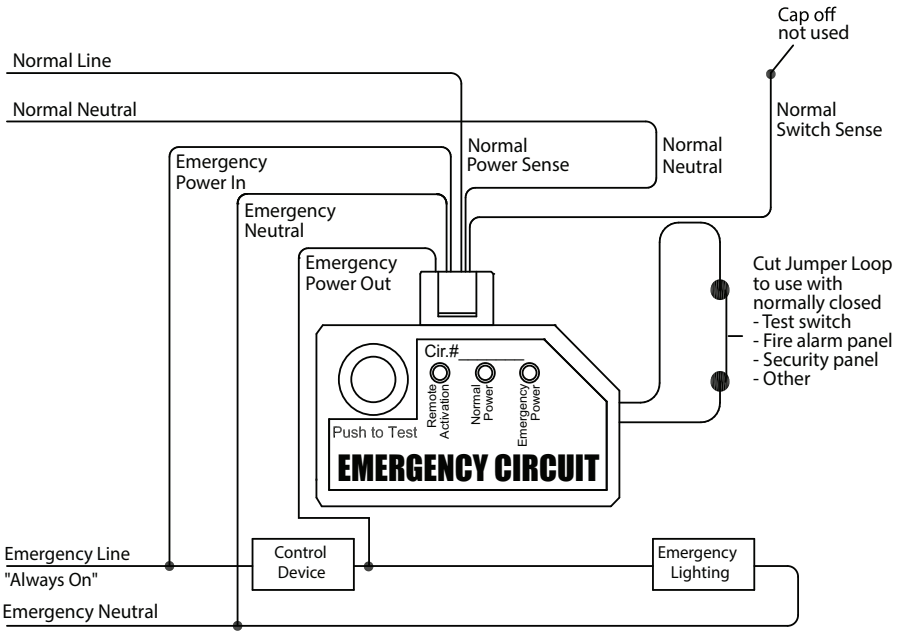
Ballast..... 20A @277VAC

Incandescent.....10A @120VAC

CONTROL DEVICE OVERRIDE

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.

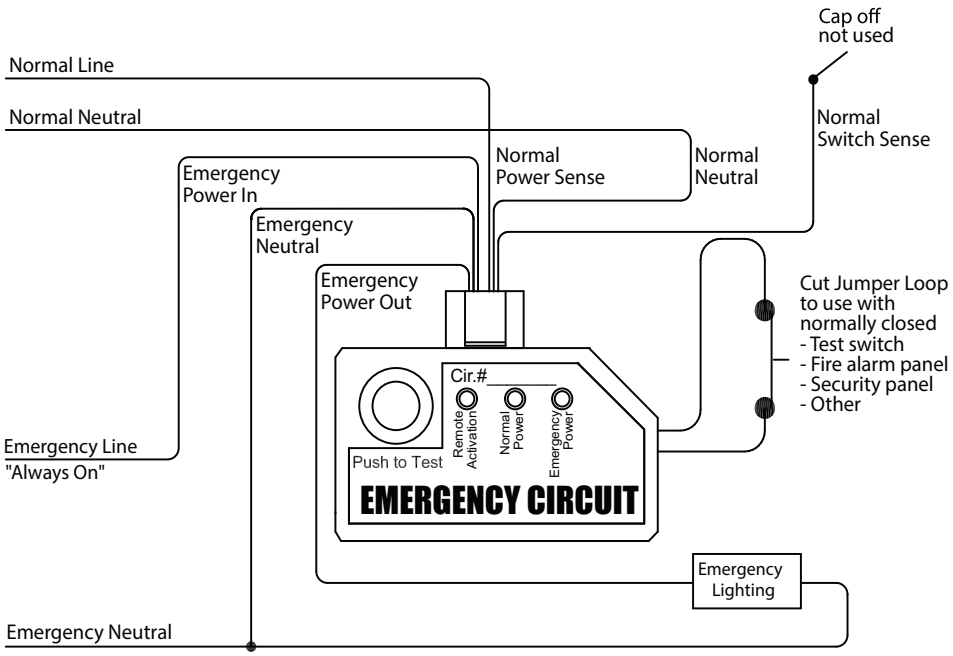
The “Remote Activation” light is illuminated under a normal condition, and turns off when the ZoneSaver-2 is activated by a signal from a fire alarm panel, a security panel, or the emergency power supply when performing an automatic “periodic” system test per NFPA 101. When activated, the local control 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.

OPTIONAL ZONESAVER-2, “ZONE SENSING” INSTALLATION

ZONE SENSING AND CONTROL OF NORMALLY OFF EMERGENCY LIGHTING

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.

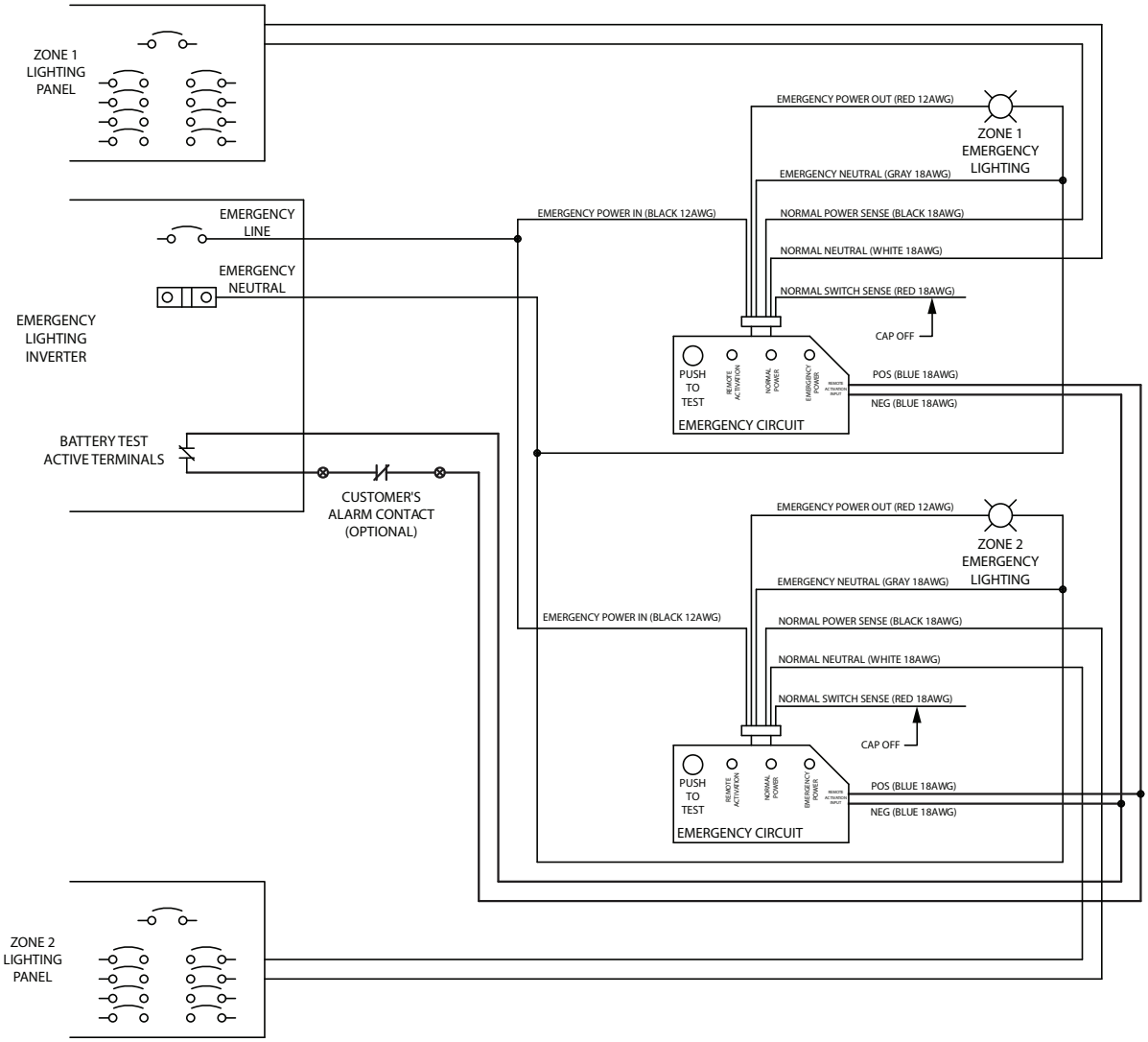


When utility voltage is available at the Normal Power Sense input, the “Normal Power” light is illuminated indicating a normal condition, and the normally off (standby) emergency lights remain off. Note that when emergency power is available at the Emergency Power input, the “Emergency Power” light is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

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



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, K3 - NORMALLY CLOSED BATTERY TEST ACTIVE CONTACTS (SEE - “COMMUNICATIONS PANEL”).

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

START UP PROCEDURE

DO NOT ATTEMPT TO OPERATE THE UNIT UNTIL ALL SET UP PROCEDURES HAVE BEEN COMPLETED

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 "OPTIONAL COMMUNICATIONS AND ALARM RELAY WIRING".*

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 90 MINUTES AND THEN AUTOMATICALLY TERMINATE. FOR UNITS WITH BATTERY TIMES OTHER THEN 90 MINUTES THE TEST WILL LAST FOR SHORTLY LESS THAN THE BATTERY TIME PURCHASED AND THEN AUTOMATICALLY TERMINATE. NOTE THAT THIS TEST COULD BE ANYWHERE FROM 5 MINUTES TO 4 HOURS DEPENDING ON THE BATTERY OPTION PURCHASED. 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 "OPTIONAL COMMUNICATIONS AND ALARM RELAY WIRING".*

MINIMUM CHARGE TIME FOR FULL BATTERY CAPACITY = 48 HOURS

INITIAL START UP (NO LOAD).

1. Verify that the Temperature Compensation Probe is run into the battery cabinet. See ***"Battery Installation and Wiring - Temperature Compensated Charging System".*** Page 26.
2. Switch the Output Breaker to the OFF position, switch the AC Input Breaker to the ON position.
3. Plug the battery connector in.
4. Switch the DC breaker to the ON position.
5. Close and lock the battery cabinet door.
6. Push in and HOLD the bypass for two seconds then turn the bypass switch to the "BYPASS" position.
7. Close and lock front door.

Display reads "ON BYPASS MODE" after monitor initializes.

8. Press "MAIN" button on display screen to enter main menu.
9. Press "On/Off" button on the display screen to enter the on/off menu.
10. Press the "ON" button.

Unit begins to initialize, the display reads "ON STATIC BYPASS", then "ON MANUAL BYPASS". The unit is initialized.

11. Press "EXIT" button to go back to main menu.
12. Press "PARAM" button.
13. Press "INPUT" button to verify the input readings.
14. Repeat step 12 pressing the "OUTPUT" button and "DC" button.
15. Press "EXIT" button to return to main menu.
16. Open the front door, push in and HOLD for two seconds then turn the bypass switch to "NORMAL" mode.

Display reads "ON STATIC BYPASS", then reads "SYSTEM NORMAL".

17. Go to the On/Off menu and press the "OFF" button.
18. Open the door and turn off the AC Input breaker to start the "START UP WITH LOAD" procedure.

START UP PROCEDURE CONTINUED

The unit is now ready to be powered on with a load. The Start Up Procedure with load will be nearly identical to the procedure with no load. As follows:

1. Start with a powered down system from the Initial Start Up.
2. Open the front door and push in the bypass and HOLD for two seconds then turn the bypass switch to the “BYPASS” position.
3. If the system includes distribution circuit breakers, leave them in the off position at this time.
4. Switch the AC Input Breaker to the ON position, switch the Output Breaker to the ON position, and switch any Normally ON distribution breakers on one at a time.

If any of the breakers trip, verify the load wiring and look for possible faults.

5. Close and lock front door.

Display reads “ON BYPASS MODE” after monitor initializes.

6. Press “MAIN” button on display screen to enter main menu.
7. Press “On/Off” button on the display screen to enter the on/off menu.
8. Press the “ON” button.

Unit begins to initialize, the display reads “ON STATIC BYPASS”, then “ON MANUAL BYPASS”. The unit is initialized.

9. Press “EXIT” button to go back to main menu.
10. Press “PARAM” button.
11. Press “INPUT” button to verify the input readings.
12. Repeat step 11 pressing the “OUTPUT” button and “DC” button.
13. Press “EXIT” button to return to main menu.
14. Open the front door, push in and HOLD for two seconds then turn the bypass switch to “NORMAL” mode.

Display reads “ON STATIC BYPASS”, then reads “SYSTEM NORMAL”.

CONTINUE IF THE SYSTEM INCLUDES A NORMALLY OFF BUS OPTION

15. Open the front door on the system and switch the INPUT CIRCUIT BREAKER to the OFF position to engage the EMERGENCY MODE and NORMALLY OFF BUS circuit.
16. Switch the normally off bus breakers to the ON position one at a time until all of breakers are on.
17. Switch the INPUT CIRCUIT BREAKER back to the ON position to have the unit come back from EMERGENCY MODE to NORMAL MODE.

18. Close and lock doors to the distribution and system cabinets.

Note: After initial start up and start up with load procedures have been completed, the system may be turned on and off without switching the bypass switch to the bypass and back to normal. The procedure above can be used omitting the steps regarding the use of the bypass switch. The display readings will change slightly since the MANUAL BYPASS MODE is not used.

Note: After initial start up and start up with load procedures have been completed, the system may be turned on and
off without switching the bypass switch to the bypass and back to normal. The procedure above can be used omitting
the steps regarding the use of the bypass switch. The display readings will change slightly since the MANUAL
BYPASS MODE is not used.

GENERATOR TEST

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

OPERATION - MONITOR OVERVIEW

MONITOR DESCRIPTION

Advance Digital Monitoring — The Intellistat TS™

The EON includes a user-friendly Intellistat TS™ monitor, which 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 touchscreen display indicates all the electrical parameters, as well as the functional status of the inverter. The touchscreen display allows the entry of the date / time values, system set points, and password information into the monitor, without the need for an external computer and cable.

- 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.
- Optional reporting of test results via e-mail / voice / webpage.
- Date and time display.
- Auto-logging of test results and abnormal events.
- Multi-layer password protection.
- Logs up to 75 events.
- Non-volatile clock and memory.
- Remote monitoring capabilities.
- Optional status notification via e-mail / cell phone.

The Intellistat TS monitors 3 phase input and output parameters, and inverter status indicators:

- Voltage
- Frequency
- Current
- VA
- Watts
- Power factor
- kVA and kW totals
- Output percent load L-N (% kVA)

- Output percent load total (% kVA)
- Battery voltage
- Battery charge / discharge current
- Battery time (minutes) remaining

Alarms & Status

The Intellistat TS announces multiple alarms, including:

- Input phase rotation error
- High / low input voltage
- High / low input frequency
- High / low output voltage
- High / low output frequency / time remaining
- Auto battery test failed
- Off bus status
- High battery charger current
- System normal
- IGBT fault
- Overtemp shutdown
- System in manual bypass
- System on battery
- Low battery warning
- Low battery shutdown
- Battery test in progress
- High output VA (overload)
- * Low output VA
- High / low battery voltage
- DC charger fail / DC open
- Output circuit breaker open
- REPO shutdown
- Manual restart required
- Static bypass status / alarms

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

MONITOR DESCRIPTION CONTINUED

Monitored Parameters

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

Egress Lighting Integrity Test

This feature provides the industry's most advanced life safety system test available. 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"). The Intellistat TS then compares power consumption during the test period with user defined load capacity, analyzes the data, and advises if service is required.

Automatic System Tests

The Intellistat TS automatically performs a user-defined (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

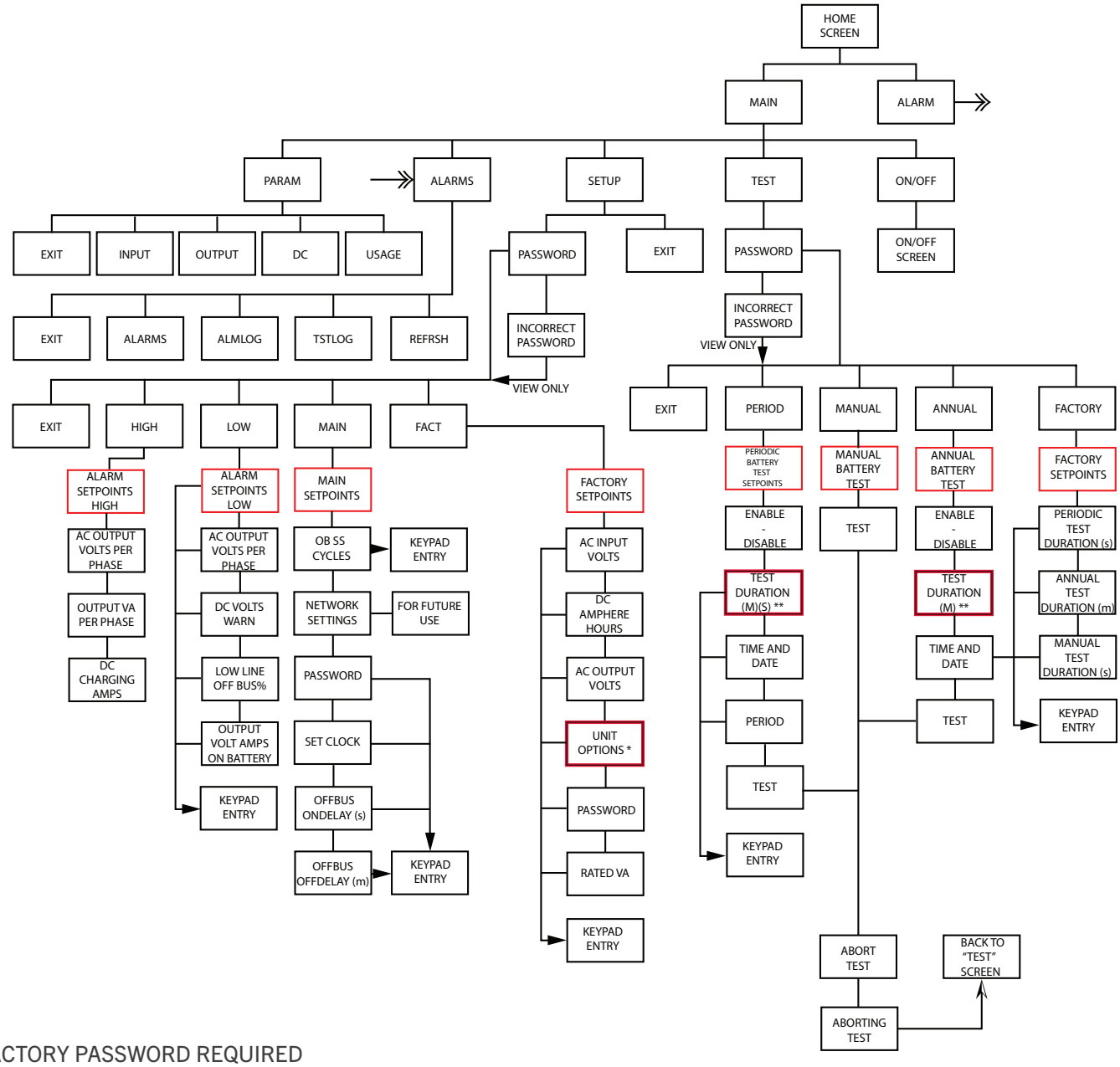
The Intellistat TS also allows the user to manually invoke a user-defined system test for 30, 60, or 90 minutes, as well as 2 or 4 hours. A 1 minute or 5 minute manual test is also available for "spot inspections".

BATTERY TEST DURATIONS

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

EON MONITOR TREE

FACTORY DEFAULT PASSWORD = 05151



* FACTORY PASSWORD REQUIRED

** NOT USER PROGRAMMABLE

*** THESE KEYPAD SCREEN ARE SLIGHTLY DIFFERENT THAN TYPICAL KEY PAD ENTRY SCREENS

MONITOR DEFINITIONS

Section	Parameter	Description
Input	Volts	AC Input Voltage Phase to Neutral (L1-N, L2-N, L3-N)
	Amps	
	Watts	
	VA	
	PF	
Output	Volts	AC Output Voltage Phase to Neutral (X1-N, X2-N, X3-N)
	Amps	AC Output Phase Current (X1, X2, X3)
	Watts	AC Output Watts per Phase (X1, X2, X3)
	VA	AC Output Volt Amps per Phase (X1, X2, X3)
	PF	AC Output Power Factor per Phase (X1, X2, X3)
	LOAD%	AC Output Load Percentage per Phase based on VA (X1, X2, X3)
DC	DC Volts	DC Voltage for the Positive Bus, Negative Bus, and the Total Battery String (C+, C-, BATT)
	DC Amps	DC Current for the Total Battery String (BATT)
	% Batt	Percentage of the total Capacity of the Total Battery String (BATT)
	m on battery	Minutes the Total Battery String has been providing power to the unit
Usage	SYSTEM ON HOURS	ACCUMULATED HOURS THE SYSTEM HAS BEEN TURNED ON
	ON BATTERY MINUTES	ACCUMULATED MINUTES THE SYSTEM HAS BEEN ON BATTERY

FACTORY PRESETS

Section	SetPoint	Default Setting	User Programmable (Y/N)	Optional (Y/N)
High	AC Output Volts Per Phase	+ 5% of Nominal	N	N
	Output VA Per Phase	1/3 of Rated VA	N	N
	DC Charging Amps	12	N	N
Low	AC Output Volts Per Phase	5% of Nominal	N	N
	Output Volt Amps On Battery	0	Y	N
	Low Line Offbus %	80%	Y	Y
	DC Volts Low	40% of Vbatt Nom, in Volts	Y	N
Main	OB SS Cycles	0	Y	Y
	Offbus On Delay (s)	0	Y	Y
	Offbus Off Delay (m)	15	Y	Y
	Password	05151	Y	N
	Set Clock	Current Time & Date	Y	N
Factory	Unit Options	w/ OffB 3, w/o 1	N	N
	AC Input Volts	120/277/347/600	N	N
	DC Amp Hours	90	N	N
	AC Output Volts	120/277/347/600	N	N
	Password	01955		
	Rated VA	VA Rating	N	N

Test	SetPoint	Default Setting	User Programmable (Y/N)
Periodic	Enabled / Disabled	Disabled	Y
	Test Duration		
	Time & Date		
	Test / Abort		
Manual	Test Duration	30s / 5 m	N
	Test / Abort	Test	Y
Annual	Enabled / Disabled	Disabled	Y
	Test Duration	Full Run Time of Batteries	N

	Time & Date	10 PM, 15th of the next month, next year	Y
	Test / Abort	Test	Y
Factory	Periodic Test Duration (s)	30 s / 5 m	N
	Manual Test Duration (s)	30s / 5 m	N
	Annual Test Duration (m)	Full Run Time of Batteries	N

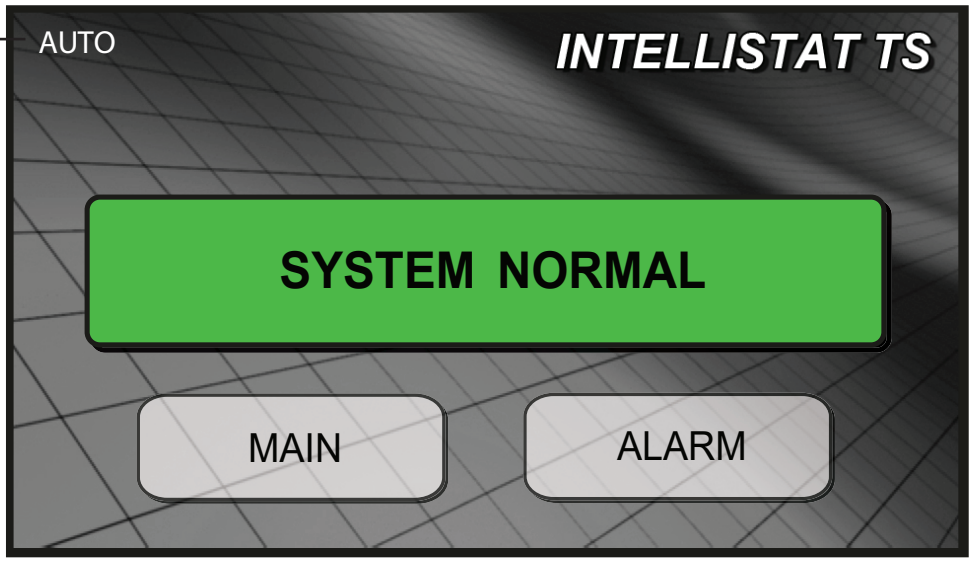
OPERATION - MONITOR

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

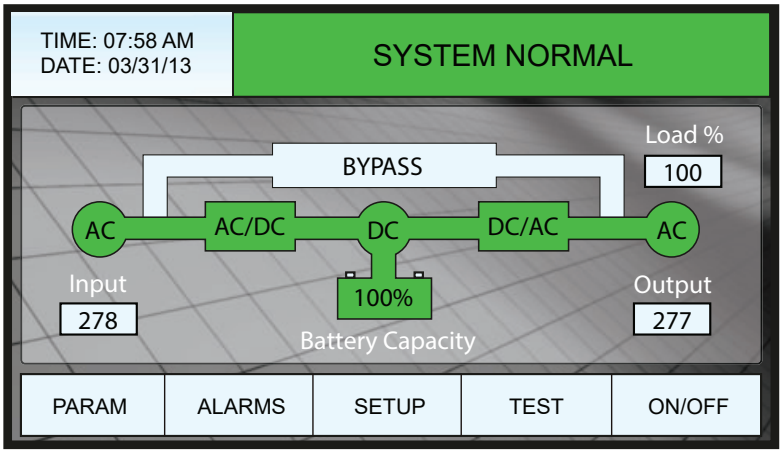
GENERAL - The system is pre-programmed at the factory specific to your unit. There should be no need to change any system parameters. Contact the factory should this become necessary.

HOME SCREEN

Indicates Auto or Manual Restart setting - Dip Switch located on main control board. See “Battery Installation and Wiring - Temperature Compensated Charging System and Auto / Manual Restart dip switches” No indication for Manual Restart.

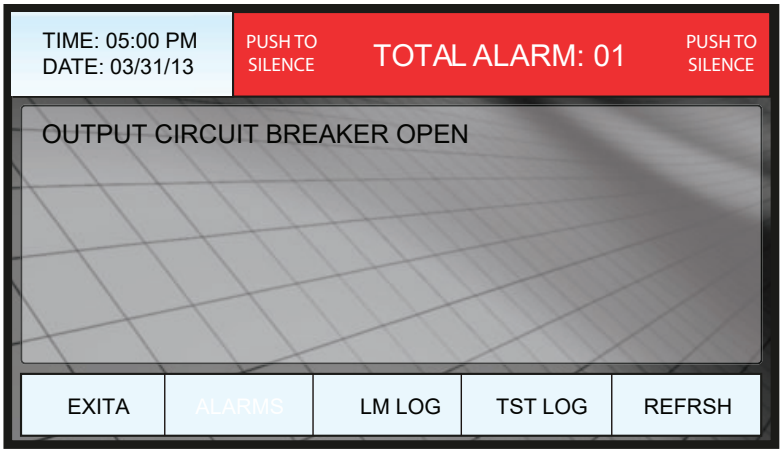


MAIN SCREEN



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

ALARM SCREEN

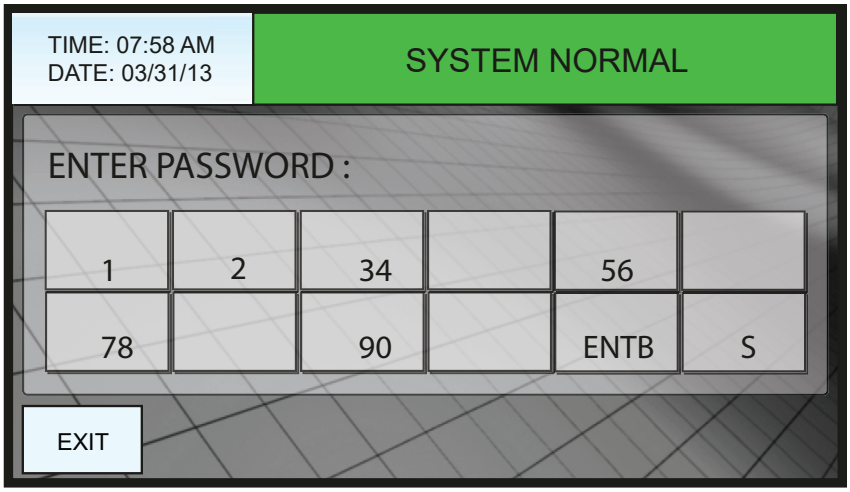


Touch the “EXIT” button to return to the HOME screen. On other screens touching “EXIT” will return to the previous screen. Touching “REFRSH” will update any alarm or test data.

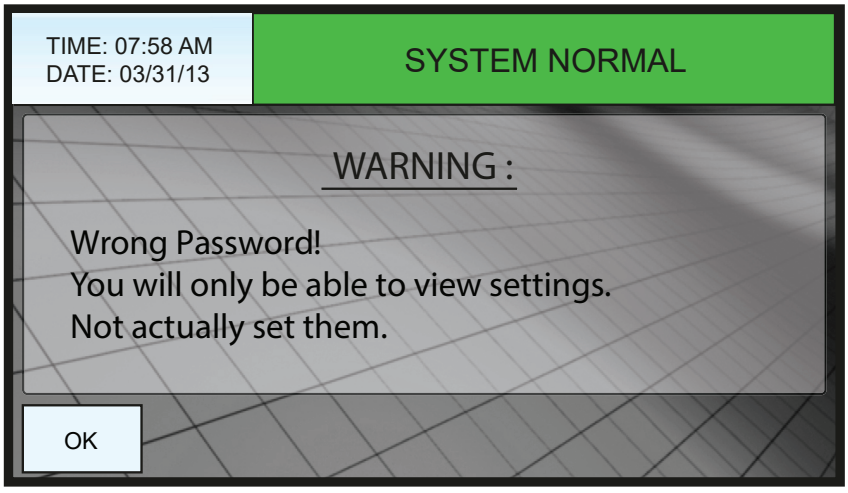
OPERATION - MONITOR

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.

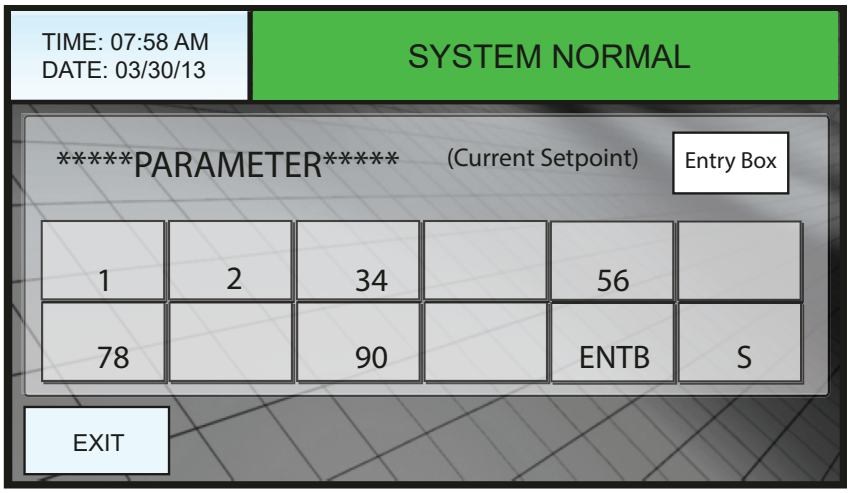


Default customer password = 05151



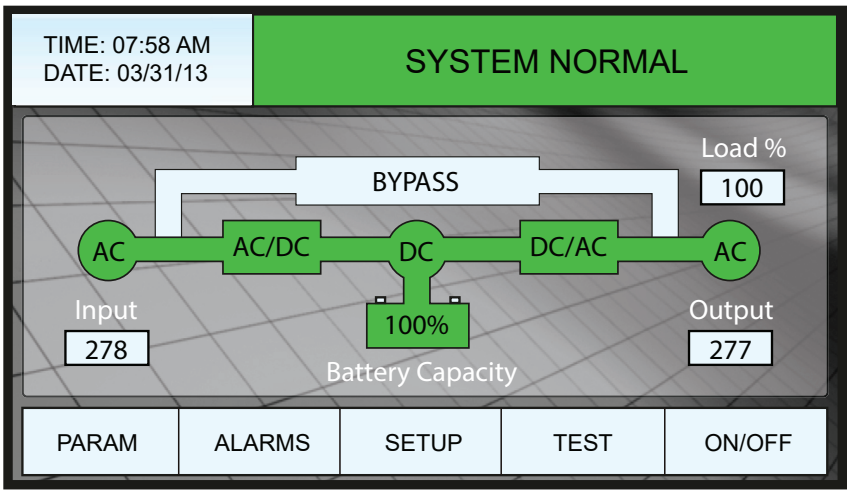
DATA ENTRY SCREENS

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. Some data entry screens such as network entry data screens are slightly different than that shown.



OPERATION - MONITOR

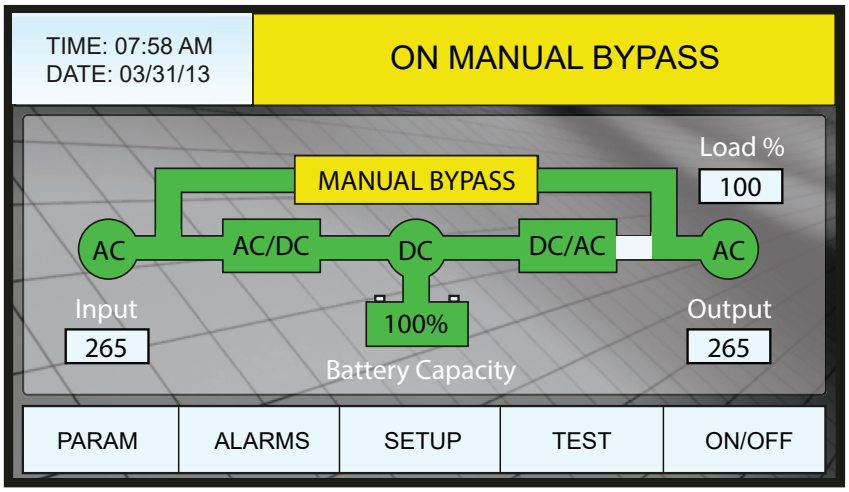
MAIN SCREEN



Typical “System Normal” Main Screen showing the percentage load for the output and the battery capacity level as well as the input and output voltages. The battery capacity and input / output 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 capacity indicator will be green under normal conditions, this will change to red when the system is on battery. The battery status indicator will also change to red under the following conditions: 1) Battery Test Fail 2) A low battery condition or 3) a weak battery is present.

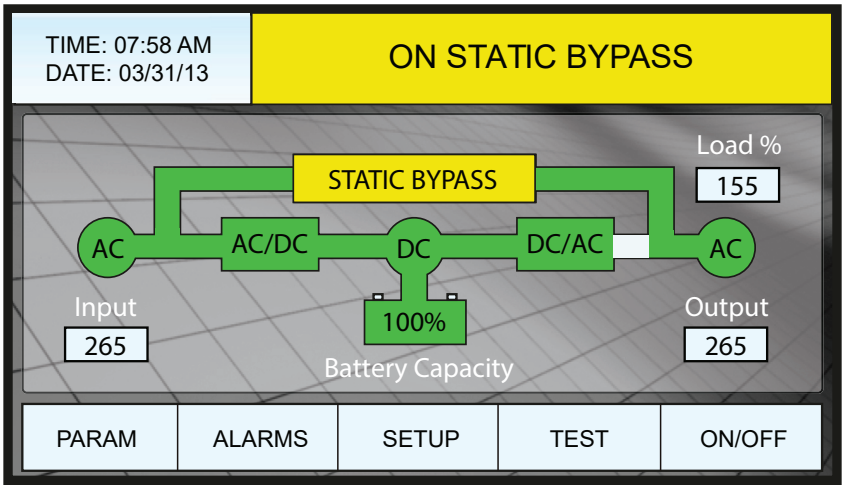
MAIN SCREEN - ON MANUAL BYPASS



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 STATIC BYPASS

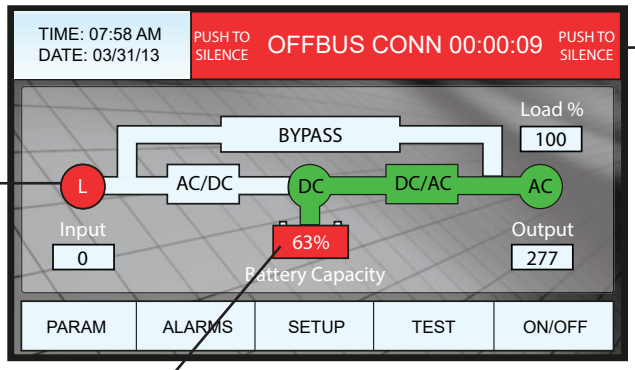


Typical ON STATIC BYPASS screen. Depending on the reason for the static bypass being active, there may or may not be an alarm indication or log event.

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

OPERATION - MONITOR

MAIN SCREEN - OFFBUS CONNECT



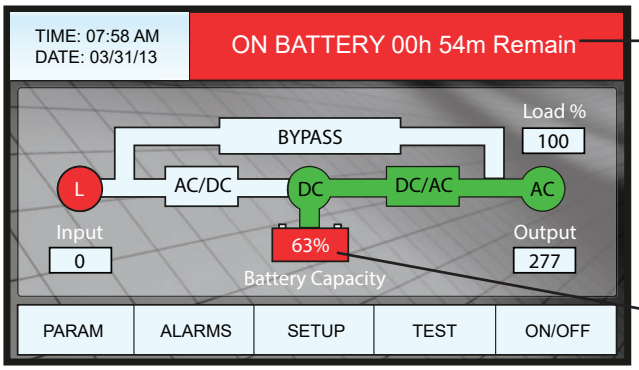
(L) Indicates a low line condition caused the inverter to switch to battery.

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

The Battery Capacity indicator will be green under normal conditions, but will change to red 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 "EON Monitor Tree" for setting location. These settings are only enabled with the timed off bus option. If no Offbus is present the system will alarm and switch to battery and alarm immediately.

MAIN SCREEN - OFFBUS CONNECT

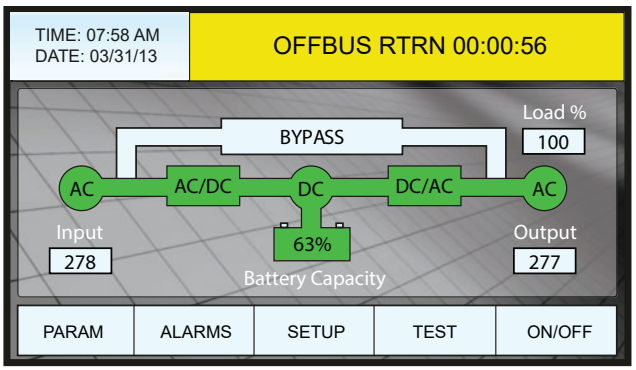


Displays calculated time remaining based on percentage of load and battery capacity. All inverter events are time stamped and stored in the alarm log.

Battery Capacity indicator will decrease while on battery.

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

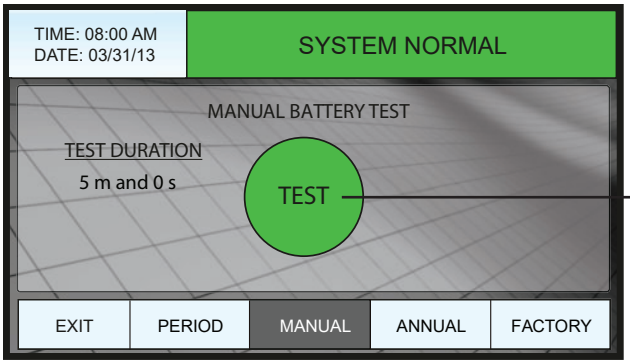
MAIN SCREEN - OFFBUS RETURN



OPERATION - MONITOR

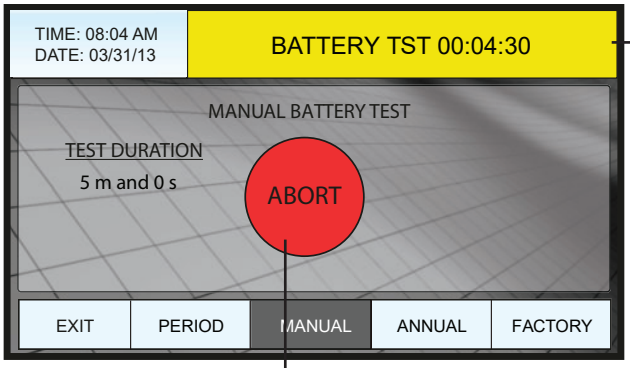
MANUAL BATTERY TESTING

Default customer password = 05151



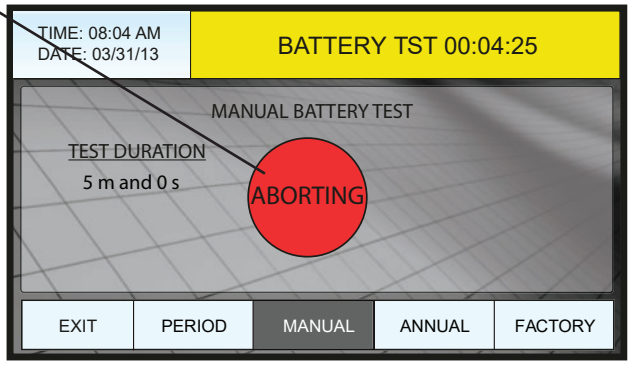
Press the “TEST” button to invoke a battery test * (Duration is dependant on battery option purchased). The duration is preset at the factory and is not user accessible. Contact the factory should the duration time need to be modified.

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



The Battery Test banner will turn yellow and indicate that the offbus is connecting (if available). 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.

While testing the button will change 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.



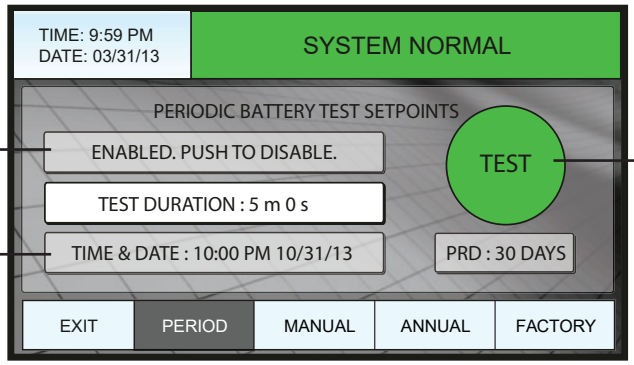
Test results can be found in the “TST LOG” Menu. If the “TST LOG” register is full the system will delete the oldest entry to make room for the new entry automatically. Aborting the test will result in a “Manual Test : Incomplete” entry in th TST LOG.

OPERATION - MONITOR

PERIODIC BATTERY TESTING

Default customer password = 05151

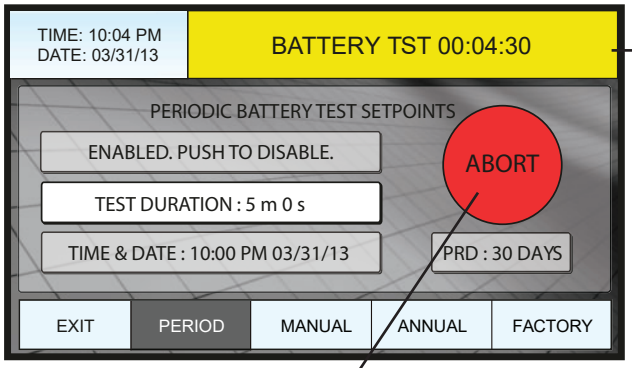
Push to enable the test. Factory preset enabled. The test will auto run at the time and date programmed for the programmed duration. The test period is factory preset for 30 days. Factory preset to the 15th of the following month from date of shipment at 10PM. Time, Date and period are user accessible.



Press the “TEST” button to invoke a battery test * (Duration is dependant on battery option purchased). The period is preset at the factory for 30 days.

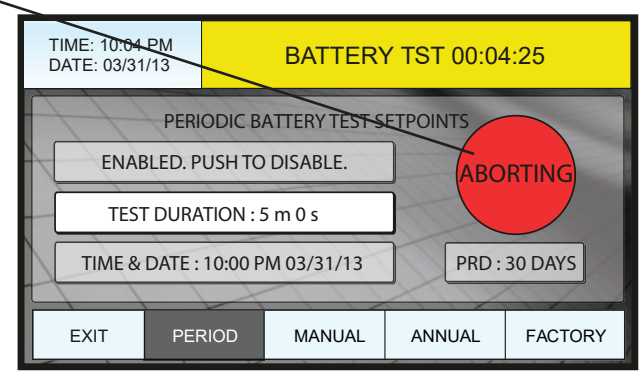
* **NOTE:** See “Battery Test Durations” at the end of the maintenance section. Contact the factory should the duration time need to be modified.

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



The Battery Test banner will indicate that the offbus is connecting (if available). 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.

While testing the button will change 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.



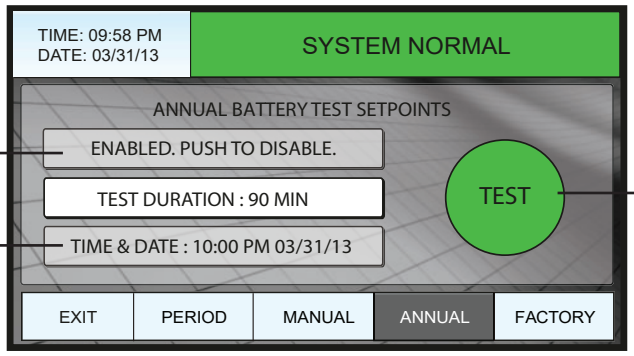
Test results can be found in the “TST LOG” Menu. If the “TST LOG” register is full the system will delete the oldest entry to make room for the new entry automatically. Aborting the test will result in a “Periodic Test : Incomplete” entry in the TST LOG.

OPERATION - MONITOR

AMANUAL BATTERY TESTING

Default customer password = 05151

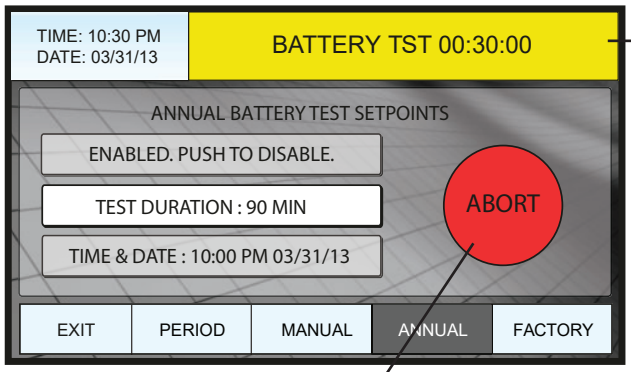
Push to enable the test on a yearly basis. Factory preset disabled. The test will auto run at the time and date programmed. Factory preset to the 15th of the following month, one year from date of shipment at 10PM. Time and Date are user accessible.



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.

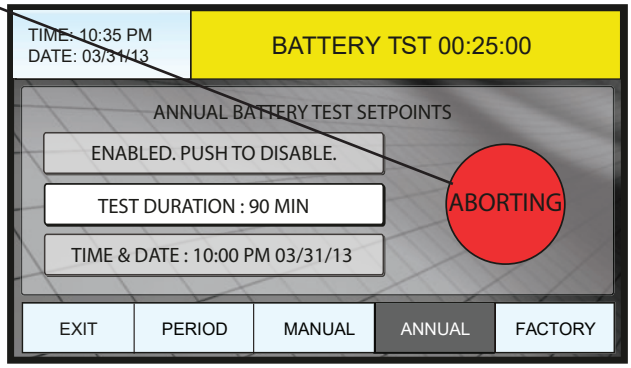
* **NOTE:** See "Battery Test Durations" at the end of the maintenance section. Contact the factory should the duration time need to be modified.

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



The Battery Test banner will indicate that the offbus is connecting (if available). 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.

While testing the button will change 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.



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.

OPERATION - MONITOR

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

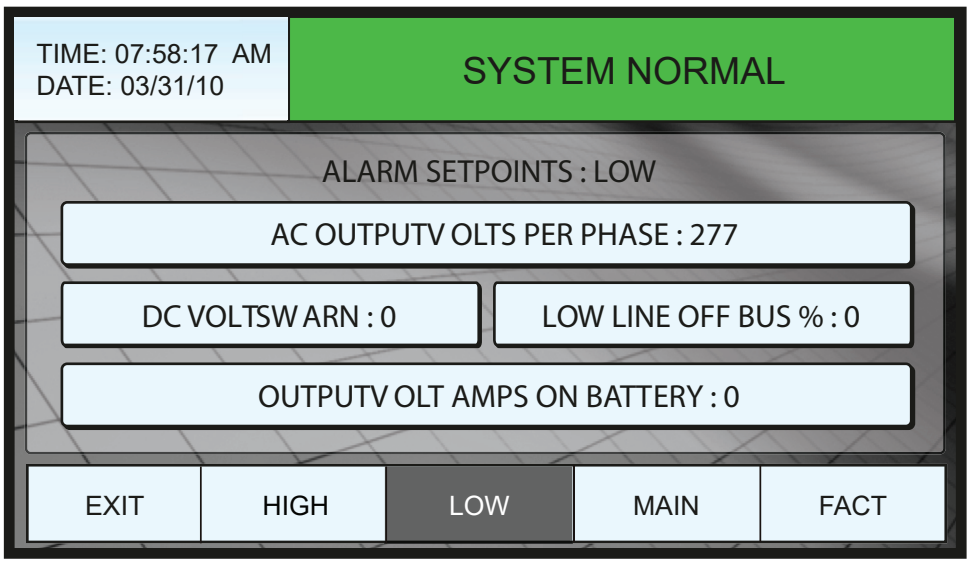
Default customer password = 05151

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

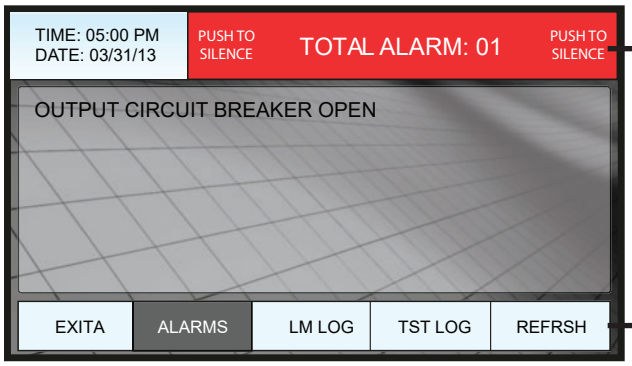


OPERATION - MONITOR

ALARMS, ALARM LOGS AND TEST LOGS

TYPICAL ALARM SCREEN

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



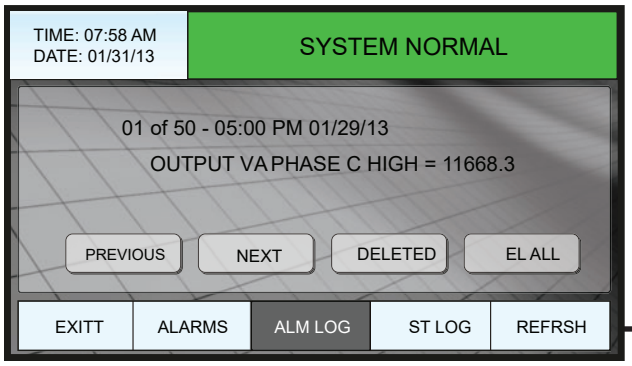
PUSH TO SILENCE

PUSH TO REFRESH ALARM CONDITIONS

*** NOT ALL ALARMS CLEAR AUTOMATICALLY - SEE "TROUBLESHOOTING"**

TYPICAL ALARM LOG SCREEN

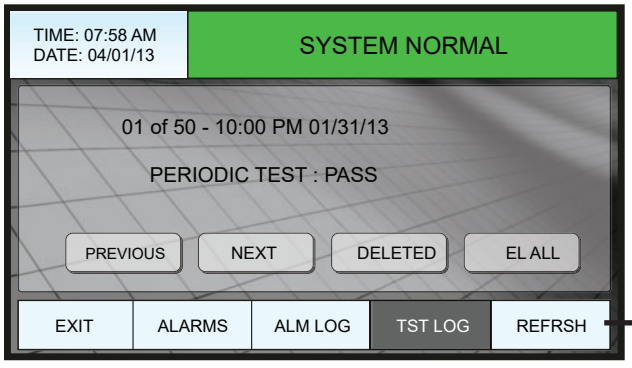
STORES UP TO 50 EVENTS.
If the ALM LOG register is full the system will delete the oldest entry to make room for the new entry automatically.



NOT FUNCTIONAL FROM THIS SCREEN

TYPICAL TEST LOG SCREEN

STORES UP TO 50 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

OPERATION - MONITOR

ALARM MESSAGES AND DEFINITIONS

Alarms indicating an issue internal to the inverter (Contact the factory for assistance 1-800-521-4792)		
LOG / CURRENT	**ALARM**	**BANNER**
AC OUTPUT VOLTS PHASE A HIGH	The Output Voltage on Phase A is higher than the Output Voltage High setpoint.	Total Alarm: 01
AC OUTPUT VOLTS PHASE B HIGH	The Output Voltage on Phase B is higher than the Output Voltage High setpoint.	Total Alarm: 01
AC OUTPUT VOLTS PHASE C HIGH	The Output Voltage on Phase C is higher than the Output Voltage High setpoint.	Total Alarm: 01
AC OUTPUT VOLTS PHASE A LOW	The Output Voltage on Phase A is below the Output Voltage High setpoint.	Total Alarm: 01
AC OUTPUT VOLTS PHASE B LOW	The Output Voltage on Phase B is below the Output Voltage High setpoint.	Total Alarm: 01
AC OUTPUT VOLTS PHASE C LOW	The Output Voltage on Phase C is below the Output Voltage High setpoint.	Total Alarm: 01
ERROR - 0001	Communication was lost between the monitor and the control board.	ERROR-001 / Total Alarm: 02
IGBT 1 OVERTEMPERATURE	Phase A Input or Output IGBT overtemped.	Total Alarm: 01
IGBT 2 OVERTEMPERATURE	Phase B Input or Output IGBT overtemped.	Total Alarm: 01
IGBT 3 OVERTEMPERATURE	Phase C Input or Output IGBT overtemped.	Total Alarm: 01
IGBT DC OVERTEMPERATURE	One of the two DC IGBTs overtemped.	Total Alarm: 01
LPO: SCR OVERTEMPERATURE	SCR Overtemp.	Total Alarm: 01
OFFBUS OVERTEMPERATURE	SCR Overtemp.	Total Alarm: 01
OFFBUS OVERTEMPERATURE	Offbus SCR Overtemp.	Total Alarm: 01
INDUCTOR OVERTEMPERATURE	Inductor Overtemp.	Total Alarm: 01
LPO: XFM OVERTEMPERATURE	Transformer Overtemp.	Total Alarm: 01
OUTPUT VA PHASE A HIGH = 12323.5	The output VA on Phase A is higher than the High Output VA set-point.	Total Alarm: 01
OUTPUT VA PHASE B HIGH = 12323.5	The output VA on Phase B is higher than the High Output VA set-point.	Total Alarm: 01
OUTPUT VA PHASE C HIGH = 12323.5	The output VA on Phase C is higher than the High Output VA set-point.	Total Alarm: 01
UNIT FAILED TO START	Initialization Error, Failure to Start. Try Starting again.	Unit Failed to Start or Total Alarm: 02
IGBT FAULT	The unit received a fault signal from an IGBT.	Total Alarm: 01
DC BUS OVERVOLTAGE!	The positive bus voltage is too high.	Total Alarm: 01
Cmm OVERVOLTAGE!	The negative bus voltage is too high.	Total Alarm: 01
DC BUS UNDERVOLTAGE!	The positive bus voltage is too low.	Total Alarm: 01
Cmm UNDERVOLTAGE!	The negative bus voltage is too low.	Total Alarm: 01
LPO: HIGH BATTERY VOLTAGE	The battery voltage is above the set limits.	Total Alarm: 01
LPO: HIGH BATTERY VOLTAGE	The battery voltage is above the set limits.	Total Alarm: 01
LPO: LOW BATTERY SHUTDOWN!	The battery voltage went below the cutoff voltage.	Total Alarm: 01

BLOWN INPUT FUSE	Blown Input Fuse.	Total Alarm: 01
CHARGER CURRENT HIGH	Charger current exceeds 12 Amps.	Total Alarm: 01
BAD TEMPERATURE SENSOR	The battery temperature compensation sensor out of range, disconnected or defective.	Total Alarm: 01
FREQUENT STATIC BYPASS	The unit went to static bypass too frequently in a given time period.	Total Alarm: 01
CHARGER FAILED	Charger is inoperable / defective.	Total Alarm: 01
BATTERY TEST FAILED	A battery test was performed and failed.	Total Alarm: 01
STATIC SHUTDOWN: Output	Output went out of range when Static Bypass was not available	Total Alarm: 01
STATIC SHUTDOWN: Battery	The Unit needed to go to battery while on Static Bypass	Total Alarm: 01
STATIC SHUTDOWN: Overload	The unit needed to go to Bypass from an overload while on battery.	Total Alarm: 01
STATIC SHUTDOWN: No Bypass	The unit needed to go to Bypass while Bypass was not availbable	Total Alarm: 01
STATIC SHUTDOWN: Frequency	Input frequency was out of range when Bypass was not available	Total Alarm: 01
STATIC SHUTDOWN: Fault	The unit Faulted while on battery	Total Alarm: 01
STATIC SHUTDOWN: Out on Batt	The output voltage went out of range while On Battery	Total Alarm: 01
Loss of Synchronization	The unit has become out of SYNC with the input	Total Alarm: 01
RSRT RQRD, PWR DN & CYCLE BRKR	Manual restart required.	Total Alarm: 01
AC INPUT VOLTS PHASE A HIGH = 315	Input out of range. Input voltage on Phase A too high.	Total Alarm: 01
AC INPUT VOLTS PHASE B HIGH = 315	Input out of range. Input voltage on Phase B too high.	Total Alarm: 01
AC INPUT VOLTS PHASE C HIGH = 315	Input out of range. Input voltage on Phase C too high.	Total Alarm: 01
AC INPUT VOLTS PHASE A LOW = 215	Input out of range. Input voltage on Phase A too low.	Total Alarm: 01
AC INPUT VOLTS PHASE B LOW = 215	Input out of range. Input voltage on Phase B too low.	Total Alarm: 01
AC INPUT VOLTS PHASE C LOW = 215	Input out of range. Input voltage on Phase C too low.	Total Alarm: 01
OUTPUT CIRCUIT BREAKER OPEN	An output circuit breaker is open	Total Alarm: 01
WRONG PHASE ROTATION	Failure to start. Input phase rotation incorrect	Total Alarm: 01
LOW LINE OFFBUSS ACTIVE	Offbus Active, Input line voltage is too low, but not low enough to go to battery.	LOW LINE OFFBUSS ACTIVE / Total Alarm: 01
LOW OUTPUT VA ON BATTERY TEST	The output VA was less than the low output va setpoint while performing a battery test.	Total Alarm: 01
BATTERY DC VOLTS LOW WARNING	The battery voltage is below the user specified low battery voltage setpoint.	Total Alarm: 01
LPO: FREQUENCY OUT OF RANGE!	The unit shut down, frequency out of range.	Total Alarm: 01
LPO: FREQUENCY OUT OF RANGE START UP	Failure to Start. Frequency out of range.	Total Alarm: 01
BYPASS NOT AVAILABLE	The bypass is not available. Input line voltage is out of range.	Total Alarm: 01

Alarms from customer interaction with the inverter (Correct the alarm condition by following the instructions noted ion the owners manual.)		
LOG / CURRENT	ALARM	BANNER
ON MANUAL BYPASS	The system is on manual bypass.	ON MANUAL BYPASS
LPO: EMERGENCY POWER OFF	The Emergency Power Off (EPO) was activated (Optional)	Total Alarm: 01
REMOTE OFFBUSS ACTIVE	Offbus remotely activated.	REMOTE OFFBUSS ACTIVE / Total Alarm: 01

TROUBLESHOOTING

Alarm	Possible Cause / Solutionw
AC INPUT VOLTS PHASE X HIGH = XXX V	1. Check that your incoming line is not high 2. System may require calibration 3. Phase X AC Sense Board may need to be replaced
AC INPUT VOLTS PHASE X LOW = XXX V	1. Check that your incoming line is not low 2. System may require calibration 3. Phase X AC Sense Board may need to be replaced
AC OUTPUT VOLTS PHASE X HIGH	1. May require program update newer than v1.33; Limits were opened up for LED inrush effects 2. Phase X AC Sense Board may need to be replaced 3. Components in phase X buck circuitry bad
AC OUTPUT VOLTS PHASE X LOW	1. May require program update newer than v1.33; Limits were opened up for LED inrush effects 2. Phase X AC Sense Board may need to be replaced 3. Components in phase X buck circuitry bad 4. A Fault Fiber Optic May be Loose or Bad
BAD FAULT FIBER OPTIC	1. One of the Fault fiber optic connectors is not connected or not transmitting 2. Ensure all fiber optic connections are properly made 3. Could be a bad circuit board
BAD TEMPERATURE SENSOR	1. Ensure the temperature sensor is connected 2. Ensure the temperature sensor is making good connection 3. Check condition of the cable for potential damage 4. Replace the temperature sensor
BATTERY PERCENTAGE LOW WARNING	1. This will occur normally while the unit is On Battery for an extended period of time 2. If received when not on battery then check that the setpoint is set properly 3. DC Sense Board may need to be replaced
BATTERY TEST FAILED	1. Batteries may not have be fully charged 2. Batteries may be weak and need replacement 3. Could need updated Control program to v1.33 or newer
BLOWN INPUT FUSE	1. Replace Blown Input Fuse
BYPASS NOT AVAILABLE	1. Ensure system is not on battery 2. Ensure input lines are not high or low 3. System may require calibration 4. An AC Sense Board may need to be replaced
BYPASS SHUTDOWN: BAT-TERY	1. The unit needed to go to Battery while the unit was in Manual Bypass 2. Alarm logs will indicate why the unit was on bypass when the outage occurred
CHARGER CURRENT HIGH	1. Check that current sensor reads properly 2. System may need calibration 3. System may need update to v1.33 or higher
CHARGER FAILED: BATT TST & BACKUP N/A	1. Ensure fiber optic connections for Q1 & Q2 on DC IGBT module & Control Bd are connected 2. Inspect charger capacitor board for damage 3. Ensure DC breaker is not tripped 4. DC Sense Board may need to be replaced 5. System may need update to v1.33 or higher
DC BUS OVERVOLTAGE or Cmm OVERVOLTAGE	1. System may require calibration 2. Other alarms could indicate the source of this alarm 3. Cmm could indicate a blown fuse 4. Could need updated Control program to v1.33 or newer

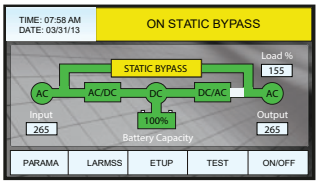
DC BUS OVERVOLTAGE or Cmm OVERVOLTAGE	1. System may require calibration 2. Other alarms could indicate the source of this alarm 3. Cmm could indicate a blown fuse 4. Could need updated Control program to v1.33 or newer
DC BUS UNDERVOLTAGE or Cmm UNDERVOLTAGE	1. There could be a blown fuse if this occurred during startup, usualy Phase A 2. System may require calibration 3. Other alarms could indicate the source of this alarm
EMERGENCY POWER OFF	1. Emergency Power Off was triggered by a user 2. If Emergency Power Off was not triggered, the unit may have a bad Control Board
ERROR - 0001	1. Ensure the monitor communications cable is plugged into both the control and monitor boards 2. Could have bad Control or Monitor Board
FREQUENCY OUT OF RANGE	1. Input or Output Frequency is or became unstable 2. Check for frequency stability, system may require a software update
FREQUENT STATIC BYPASS	1. Ensure system is not overloaded 2. Frequent Static Bypass may need to be disabled 3. Other alarms could indicate why it went to Static Bypass too often
HIGH BATTERY VOLTAGE	1. DC Sense Board may be bad 2. Number of batteries is not set properly 3. System may need calibration 4. System may need update to v1.33 or higher
IGBT DC OVERTEMPERATURE	1. Ensure enviroment is within 35 Degrees Celsius 2. Ensure blowers function 3. Ensure PC fans function 4. DC sense board may need replacement
IGBT FAULT	1. Ensure the system is not overloaded 2. Ensure there is not a short on your load 3. Oher alarms could indicate the source of this alarm 4. Could need updated Control program to v1.33 or newer
IGBT X OVERTEMPERATURE	1. Ensure enviroment is within 35 Degrees Celsius 2. Ensure blowers function 3. Ensure PC fans function 4. Phase X AC sense board may need replacement
INDUCTOR OVERTEMPERATURE	1. Ensure enviroment is within 35 Degrees Celsius 2. Ensure lower front fans function
LINE NOT DETECTED	1. Input Line was not detected when the power was applied 2. Ensure SCR connections to AC Sense Boards are correct 3. Ensure Input Line is above 90% of rated Voltage
Loss of Synchronization	1. The unit went to Battery because of a loss of synchronization with the Input Line 2. Check the stability of the Frequency of the Input Line
LOW LINE OFFBUSS ACTIVE	1. Ensure incoming line is not below the treshold for this condition 2. The Setpoint for this may need to be adjusted
LOW OUTPUT VA ON BATTERY TEST	1. Some of the lights are out that are powered by this unit 2. The Setpoint may not be set properly 3. System may require calibration
LPO: LOW BATTERY SHUTDOWN!	1. Unit may have shut down normally from being on battery from a power outage 2. If the run time was not met, batteries may not have been charged or a battery may be bad 3. Number of Batteries may not be set properly 4. If this occurs on startup, Check DC breaker is closed and Sense connection is made 5. Could be a bad DC Contactor or DC Sense Board
LPO: NORMAL	1. The Unit was last turned off using the Off Button

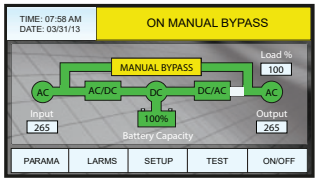
LPO: SCR OVERTEMPERATURE	1. Ensure enviroment is within 35 Degrees Celsius 2. Ensure blowers function 3. Ensure PC fans function 4. Phase X AC sense board may need replacement
LPO: XFM OVERTEMPERATURE	1. Ensure enviroment is within 35 Degrees Celsius 2. Ensure blowers function 3. Ensure PC fans function 4. DC sense board may need replacement
OFFBUS OVERTEMPERATURE	1. Ensure enviroment is within 35 Degrees Celsius 2. Check for output overload 3. Ensure offbus SCR heatsink fan functions
ON BATTERY X.X m	1. 0.0 m is the log for going to battery , the next on battery log will be from when it returned 2. Ensure there is not a low line condition on the Monitor 3. Ensure there is not loss of line on the Monitor
OUTPUT CIRCUIT BREAKER OPEN	1. Reset breaker that tripped 2. There is too much load on whichever breaker tripped 3. Logic may beed to be reversed in the Factory Settings on the Monitor Board
OUTPUT VA PHASE X > 150%	1. The System saw an overload that was greater than 150%. Check the Loads on the Unit.
OUTPUT VA PHASE X HIGH = XXXXX	1. Ensure system is not overloaded 2. May be a problem with a current sensor or board connection
OVERLOAD ON NORMAL	1. This occurs when the Unit is in Static Bypass without an Overload Condition and the Input Line is low enough and Load Current high enough that if the unit were to return to line, the increased Voltage level of our Output being applied to the Load would result in the unit being overloaded and going back to Static Bypass
POSITVE SOFT START FAIL or NEGATIVE SOFT START FAIL	1. Check F1 Fuse 2. Check Fiber Optic Connections to SCRAX on the Control Board 3. Check Fiber Optic Connections on Phase A AC Sense Board 4. There may be a bad component in the Soft Start circuitry
RSTRT RQRD, PWR DN & CYCLE BRKR	1. The unit must be powered off, the breaker must be cycled and the unit turned on again 2. This usually occurs when a condition causes the unit to be locked in Static Bypass
STATIC SHUTDOWN: BATTERY	1. The unit needed to go to Battery while the unit was in Static Bypass 2. Alarm logs will indicate why the unit was on bypass when the outage occurred
STATIC SHUTDOWN: FAULT	1. An IGBT FAULT condition ocurred when on Battery or Bypass was Not Available 2. An IGBT FAULT occurred during startup, this could be a bad IGBT driver board
STATIC SHUTDOWN: SWITCH	1. The Manual Bypass Switch was pushed in while the unit was on battery 2. The Manual Bypass Switch was pushed in while Bypass was not available
STATIC SHUTDOWN: HI DC LINK	1. Unit needed to go to Bypass due to the DC BUS being High, but Bypass was not available 2. System may need update to v1.33 or higher
STATIC SHUTDOWN: OVERTEMP	1. An Overtemperature condition ocurred when on Battery or Bypass was Not Available
STATIC SHUTDOWN: OUTPUT	1. The Output Voltage went out of range when on Battery or Bypass was Not Available
STATIC SHUTDOWN: OVERLOAD	1. The unit was Overloaded while it was On Battery or Bypass was Not Available
UNIT FAILED TO START	1. Perform a Manual Restart (Cycle Breaker) and turn the system on again
WRONG PHASE ROTATION	1. Ensure Input Phasing is correct 2. Ensure cables between control board and AC sense boards are connected properly 3. Could need updated Control program to v1.17 or newer 4. This Alarm needs to be refreshed before restarting the Unit
BUS DID NOT DISCHARGE	1. The DC Link Bus Voltage did not discharge below 75 Volts 2. This may be a bad SCR or IGBT.

INTERNAL MANUAL BYPASS OPERATION

The inverter system includes a standard push-to-turn, make-before-break bypass switch, accessible behind the front door of the inverter enclosure. Pushing the manual bypass switch will invoke the inverter's static bypass prior to turning the switch to the bypass position. The bypass switch provides complete isolation of the inverter output terminals from external circuits. When the load is supplied from the AC input power source through the bypass switch, the AC supply terminals remain energized to permit operational checking of the system. Returning to normal mode is accomplished by placing the bypass switch in its normal position via the push-to-turn function, without disrupting power to the load. It **IS NOT** a maintenance bypass. The internal bypass switch is included even when an optional wrap around maintenance bypass is supplied.

DO NOT ATTEMPT TO OPERATE THE BYPASS SWITCH IF THE SYSTEM IS OPERATING ON BATTERY POWER

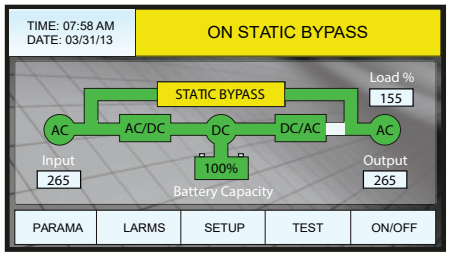




INTERNAL MANUAL BYPASS SWITCH

SWITCHING THE INVERTER TO BYPASS MODE (system active).

1. Push in and HOLD the **MANUAL BYPASS** for 2 seconds.
2. Then turn the **MANUAL BYPASS** switch clockwise to the "Bypass" position. After letting go of the switch and after a (6) six second delay the display will then read "On Manual Bypass". The system is now safely in the bypass mode.



SWITCHING BACK TO NORMAL MODE (system active).

1. Push in and HOLD the **MANUAL BYPASS** for 2 seconds.
2. Then turn the **MANUAL BYPASS** switch counter clockwise to the "Normal" position. After letting go of the switch and a (6) six second delay a "System Normal" message will appear on the screen. The unit is now running in normal mode.

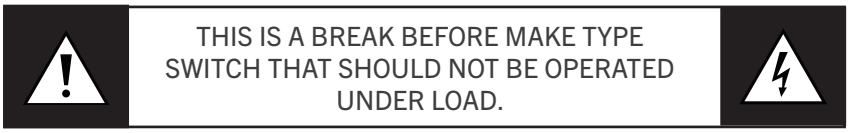
After switching to bypass mode, it is recommended that the DC Circuit Breaker be turned off. This will prevent battery discharge and possible battery damage if left in bypass mode for extended periods of time.

Be sure to turn the DC Circuit Breaker back on before returning to normal mode operation.

OPTIONAL EXTERNAL MAINTENANCE BYPASS OPERATION

The purpose of the **EXTERNAL MAINTENANCE BYPASS** switch is to connect the loads directly to utility power, and to isolate the inverter from the input supply and from the loads for safe service of the system.

EXTERNAL MAINTENANCE BYPASS (BREAK BEFORE MAKE):



SWITCHING TO BYPASS MODE (SYSTEM ACTIVE)

1. Press the “MAIN” button on the monitor display screen, then the “ON/OFF” menu button. Press “OFF” to turn the system OFF.
2. Open the inverter front door and turn OFF the AC Input and Output breakers.
3. Open the battery cabinet door and turn OFF the DC breaker.
4. Close and secure the inverter and battery cabinet doors.
5. Turn the **MAINTENANCE BYPASS** switch to the “BYPASS” position. The display will then read “On Maintenance Bypass”. The system is now safely in the bypass mode.

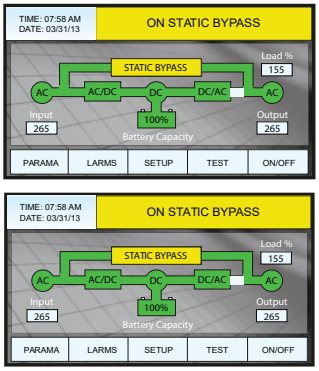
SWITCHING BACK TO NORMAL MODE (system NOT active).

1. Turn the **MAINTENANCE BYPASS** switch to the “NORMAL” position.
2. Open the battery cabinet door and turn ON the DC breaker.
3. Open the inverter front door and turn the AC Input and Output breakers ON.
4. Close and secure the inverter and battery cabinet doors.
5. Press the “MAIN” button on the monitor display screen, then the “ON/OFF” menu button. Press “ON” to turn the system ON.
6. After letting go of the switch and a (6) six second delay a “System Normal” message will appear on the screen. The unit is now running in normal mode.

EXTERNAL MAINTENANCE BYPASS (MAKE BEFORE BREAK)

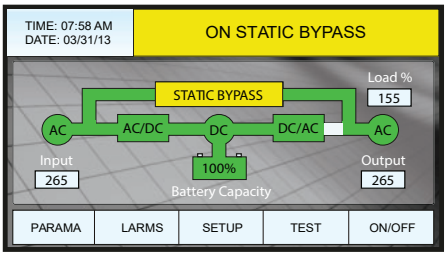
SWITCHING BACK TO NORMAL MODE (system active).

DO NOT ATTEMPT TO OPERATE THE BYPASS SWITCH IF THE SYSTEM IS OPERATING ON BATTERY POWER



SWITCHING THE INVERTER TO BYPASS MODE (system active).

1. Push in and HOLD the **MAINTENANCE BYPASS** for 2 seconds.
2. Then turn the **MAINTENANCE BYPASS** switch clockwise to the "Bypass" position. After letting go of the switch and after a (6) six second delay the display will then read "On Maintenance Bypass". The system is now safely in the bypass mode.



SWITCHING BACK TO NORMAL MODE (system active).

1. Push in and HOLD the **MAINTENANCE BYPASS** for 2 seconds.
2. Then turn the **MAINTENANCE BYPASS** switch counter clockwise to the "Normal" position. After letting go of the switch and a (6) six second delay a "System Normal" message will appear on the screen. The unit is now running in normal mode.

MAINTENANCE PROCEDURES

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 DC CIRCUIT BREAKER IS OFF BEFORE SERVICING.

SEE “SAFETY PRECAUTIONS”

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), Torque Wrench, A DMM if available (use Ohmic Meter for battery connections) and safety glasses. See *“Safety Precautions”.*

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

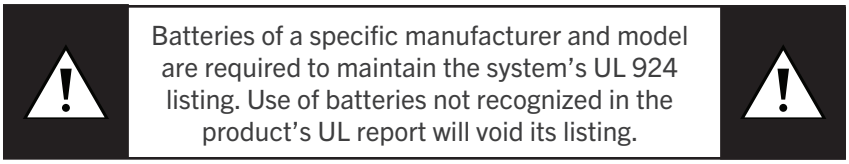
1. Open Door.
2. Turn the unit off by means of the monitor, turn both AC and DC breakers “OFF”. Turn off the main feed breaker as a precaution. **WARNING: HIGH VOLTAGE STILL PRESENT AT BATTERIES.**
3. Check for burnt, frayed, broken or loose connections. Look closely in the following areas: Input, output connections,circuit breakers and battery terminals.
4. Correct any loose connections, replace any physically burned or

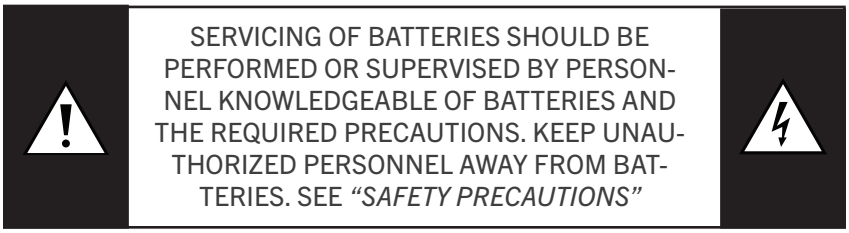
broken components. Use extreme care when replacing components to assure correct installation.

GENERATOR TEST

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

BATTERY MAINTENANCE





VOLTAGES, TEMPERATURES & OHMIC READINGS

1. Record keeping is an important part of stationary battery maintenance and warranty coverage. This information will help in establishing a life history of the battery and inform the user if and when corrective action needs to be taken. See *"Appendix A - Battery Maintenance Report".*

While it is acceptable to operate at temperatures less than 77°F (25°C), it will require longer charging time to become fully recharged. Also, the capacity will be less at operating temperatures below 77°F (25°C). After installation and when the batteries have been on float charge for one week, the following data should be recorded:

1. Battery string terminal voltage
2. Charger voltage
3. Individual battery float voltages
4. Individual battery ohmic readings
5. Ambient temperatures
6. Terminal connections should be checked to verify that the installer did torque all connections properly. Microohm readings should be taken across every connection. Refer to meter manufacturer's instructions for proper placement of probes. If any reading differs by more than 20% from its initial installation value, re-torque the connections. If the reading still remains high, clean contact surfaces as required.

ANNUAL INSPECTION

1. Conduct a visual inspection of the batteries.
2. Record the battery string voltage.
3. Record the charge voltage.
4. Record the individual battery voltages. The accuracy of the DMM (Digital Multimeter) must be .05% (on DC scale) or better. The DMM must be calibrated to NIST traceable standards. Because float readings are affected by discharge and recharges, these readings must be taken when batteries have been on continuous, uninterrupted float for at least one month. Batteries should be within +/- 0.30 volts of the average battery float voltage.
5. Record the ambient temperatures.
6. Record individual battery ohmic readings.
7. Record all interunit and terminal connection resistances. Micro-ohm readings should be taken during this inspection. If any reading differs by more then 20% from initial readings taken, retorque the connection. Recheck the micro-ohm reading. If the reading remains high, clean the contact surface accordingly.

Battery Cleaning - Batteries, cabinets, racks and modules should be cleaned with clear water or a mixture of baking soda and water. Never use solvents to clean the battery.

Capacity Testing - Capacity test should not be run unless the battery's operation is questionable. Do not discharge the batteries beyond the specified final voltage. When discharging at higher rates, extra connectors may need to be added to prevent excessive voltage drop. When performing capacity testing and recording data use IEEE 1188 instructions. Should it be determined that any individual battery(ies) or cell(s) need to be replaced, contact the factory.

DO NOT ATTEMPT TO OPERATE THE BYPASS SWITCH IF THE MONITOR DISPLAYS "BYPASS NOT AVAILABLE"

BATTERY TESTING

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 - See "Operation - *Monitor - Manual Battery Testing"*

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 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. See *"Battery Test Durations"* at the end of this section. The option to abort the test is available if required. See "Operation - 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 and Alarm Relay Wiring" also see "Optional Remote Communications"* for details.

PERIODIC BATTERY TEST - See *"Operation - Monitor - Periodic Battery Testing"*

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 and Alarm Relay Wiring"* also see "Optional Remote Communications" for details.

ANNUAL BATTERY TEST - See "Operation - Monitor - Annual Battery Testing"

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. 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 and Alarm Relay Wiring" also see "Optional Remote Communications"* for details.

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).

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).

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

BATTERY MAINTENANCE REPORT

BATTERY MAINTENANCE REPORT

INSPECTION DATE..... NO. OF UNITS/STRING.....

COMPANY..... TYPE.....

ADDRESS..... DATE NEW.....

BATTERY LOCATION AND/OR NUMBER..... DATE INSTALLED .....

INDIVIDUAL BATTERY READINGS

CHARGER OUTPUT ....AMP

TOTAL CHARGER STRING VOLTAGE.....

AMP AIR TEMPERATURE .....°F

PANEL METER VOLTS.....

UNIT #	VOLTS	OHMS OR MHOS	UNIT #	VOLTS	OHMS OR MHOS	UNIT #	VOLTS	OHMS OR MHOS	UNIT #	VOLTS	OHMS OR MHOS	UNIT #	VOLTS	OHMS OR MHOS	UNIT #	VOLTS	OHMS OR MHOS
1			41			81			121			161			201		
2			42			82			122			162			202		
3			34			83			123			163			203		
4			44			84			124			164			204		
5			45			85			125			165			205		
6			46			86			126			166			206		
7			47			87			127			167			207		
8			48			88			128			168			208		
9			49			89			129			169			209		
10			50			90			130			170			210		
11			51			91			131			171			211		
12			52			92			132			172			212		
13			53			93			133			173			213		
14			54			94			134			174			214		
15			55			95			135			175			215		
16			56			96			136			176			216		
17			57			97			137			177			217		
18			58			98			138			178			218		
19			59			99			139			179			219		
20			60			100			140			180			220		
21			61			101			141			181			221		
22			62			102			142			182			222		
23			63			103			143			183			223		
24			64			104			144			184			224		
25			65			105			145			185			225		

26			66			106			146			186			226		
27			67			107			147			187			227		
28			68			108			148			188			228		
29			69			109			149			189			229		
30			70			110			150			190			230		
31			71			111			151			191			231		
32			72			112			152			192			232		
33			73			113			153			193			233		
34			74			114			154			194			234		
35			75			115			155			195			235		
36			76			116			156			196			236		
37			77			117			157			197			237		
38			78			118			158			198			238		
39			89			119			1591			199			239		
40			80			120			160			200			240		

READINGS TAKEN BY:..... REMARKS / RECOMMENDATIONS.....

READINGS SHOULD BE TAKEN AT INSTALLATION AND ANNUALLY THEREAFTER.....

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 factory Start Up (mandatory) or 90 days from ship date; whichever comes first.**

Start Up includes all travel and living expenses. Start-Up 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 - 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 (EON) / 2 Years parts*, 1 Year On-Site Labor*, Batteries 1 Year full*, 14 year pro-rated*.

* Warranty begins from date of factory Start Up (mandatory) or 90 days from ship date; whichever comes first.

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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

Contact Trystar

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 COVERE	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.

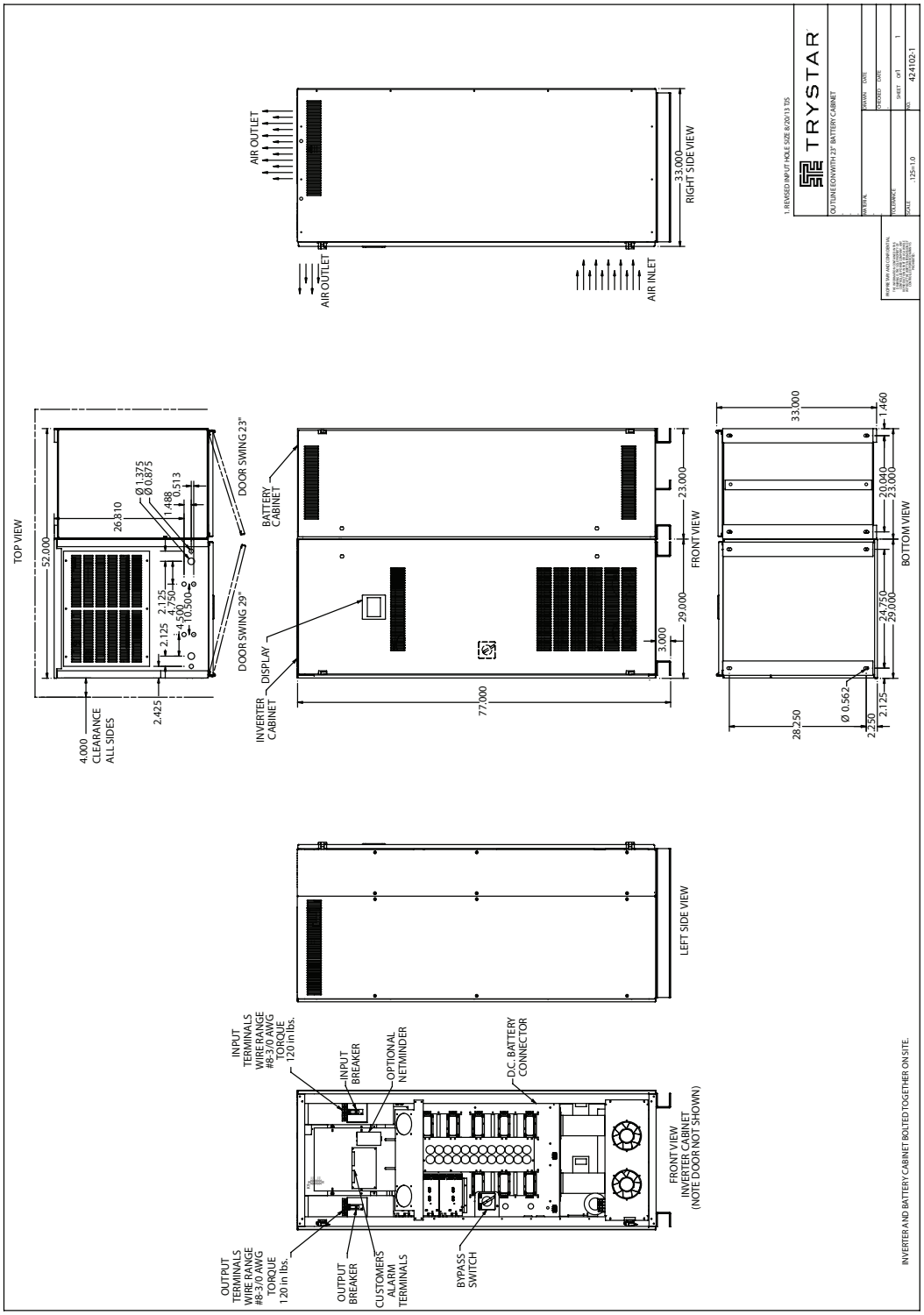
Individual components are available upon request, please contact the factory for specific part numbers and prices. See *"Appendix A - Component Location Diagrams"* for component location and description. When contacting the Parts Department, please have the unit's full model number and serial or system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

APPENDIX A

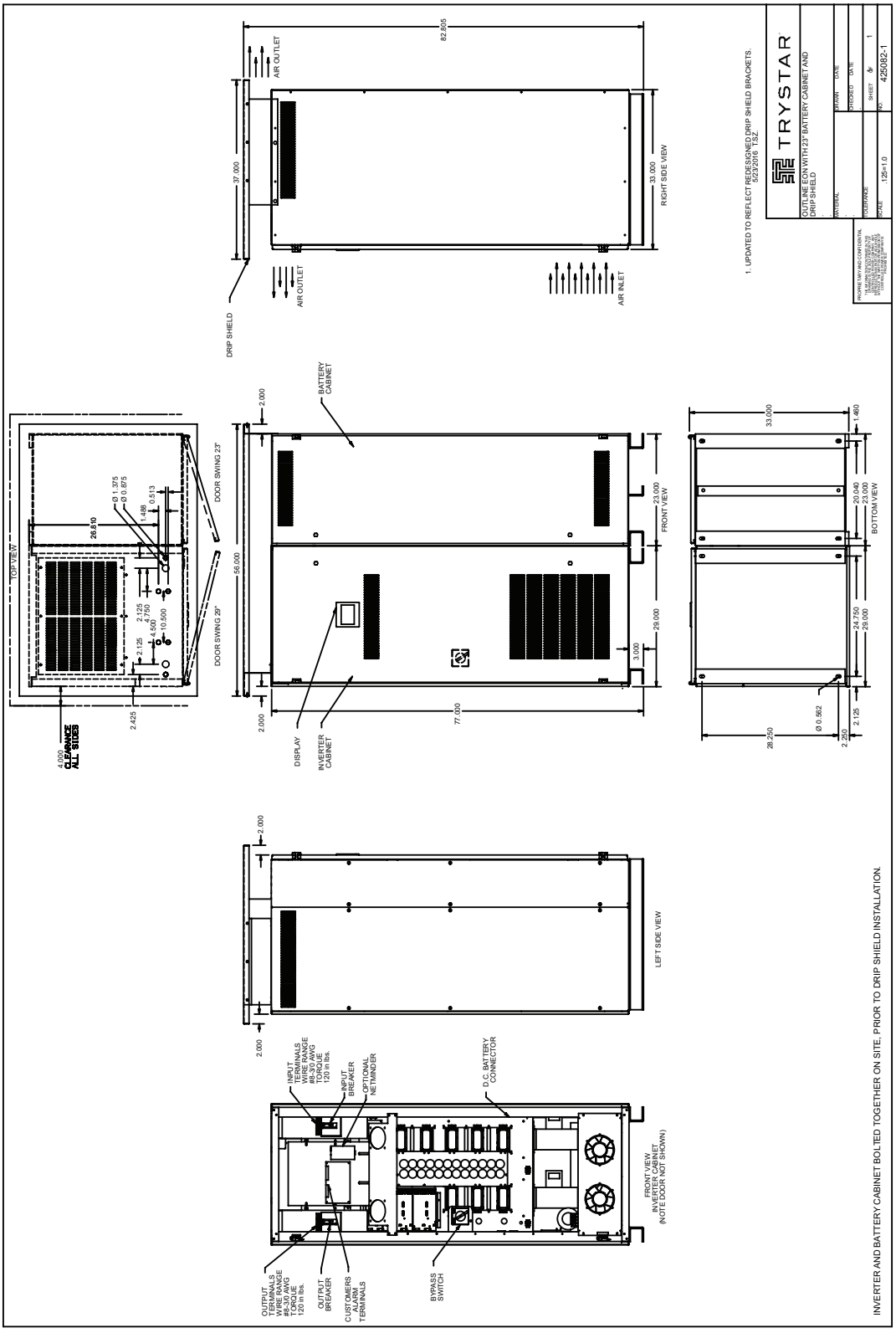
RELATIVE DRAWINGS & SCHEMATICS

CABINET OUTLINE

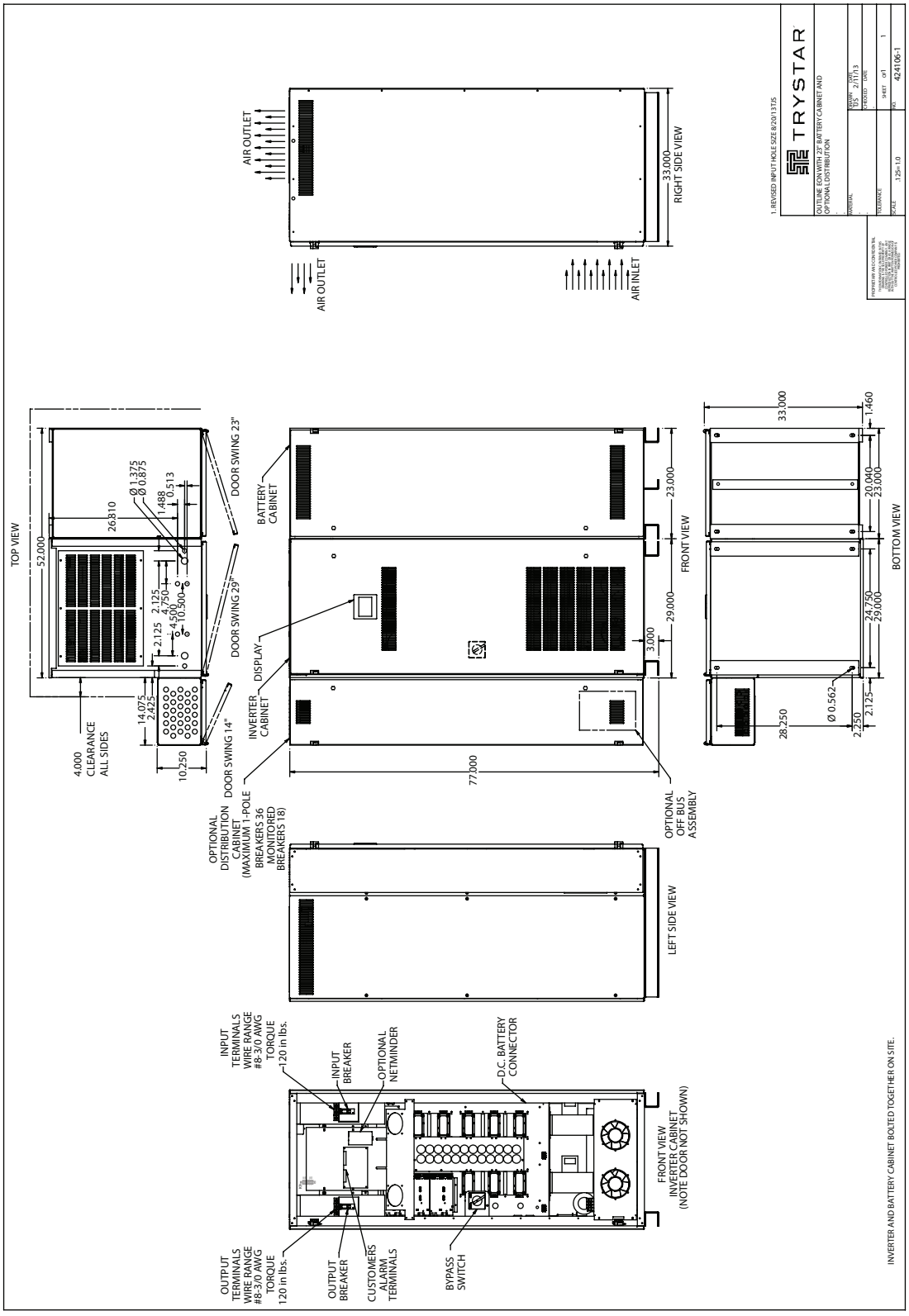
INVERTER WITH SMALL BATTERY CABINET



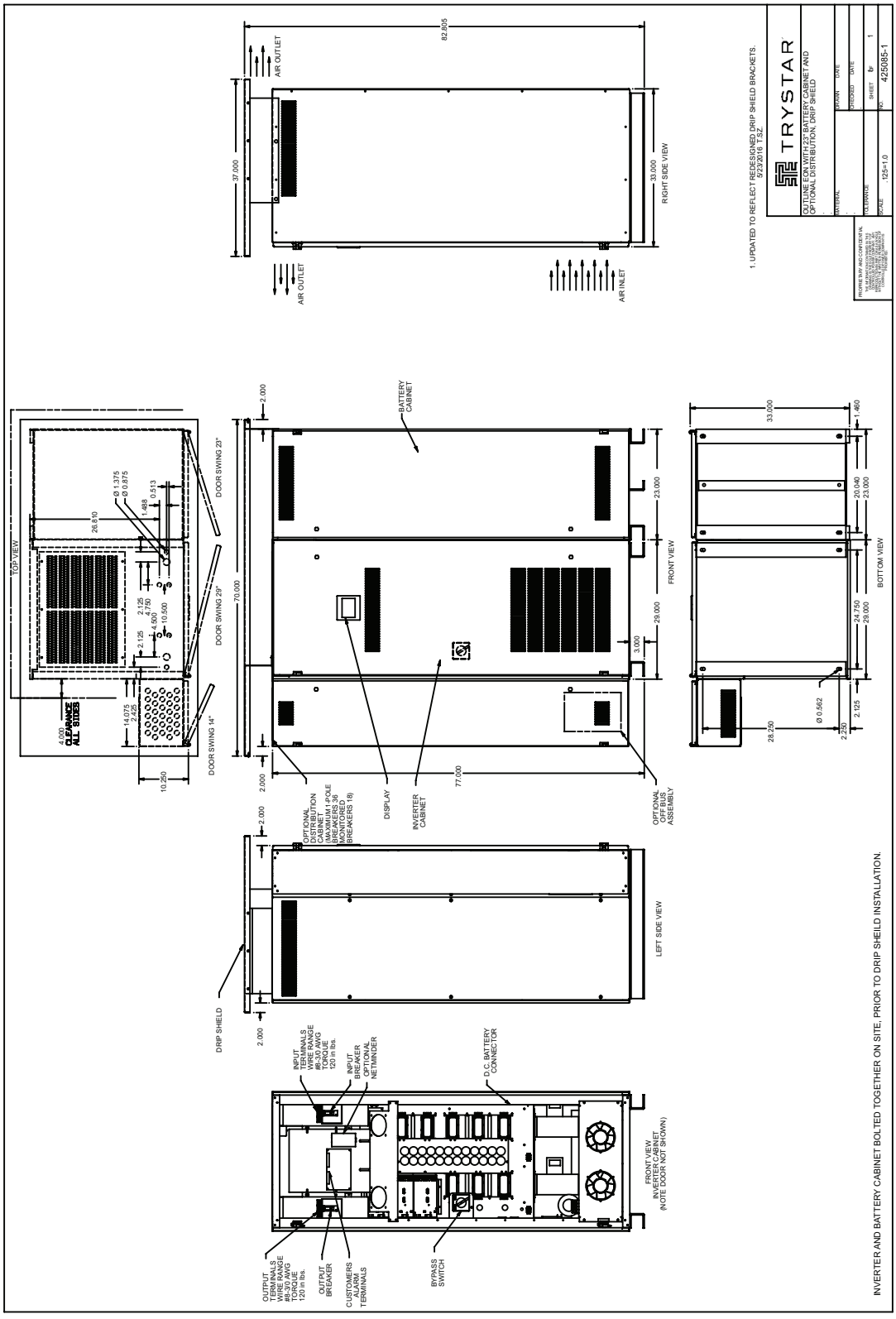
INVERTER WITH SMALL BATTERY CABINET AND DRIP SHIELD OPTION



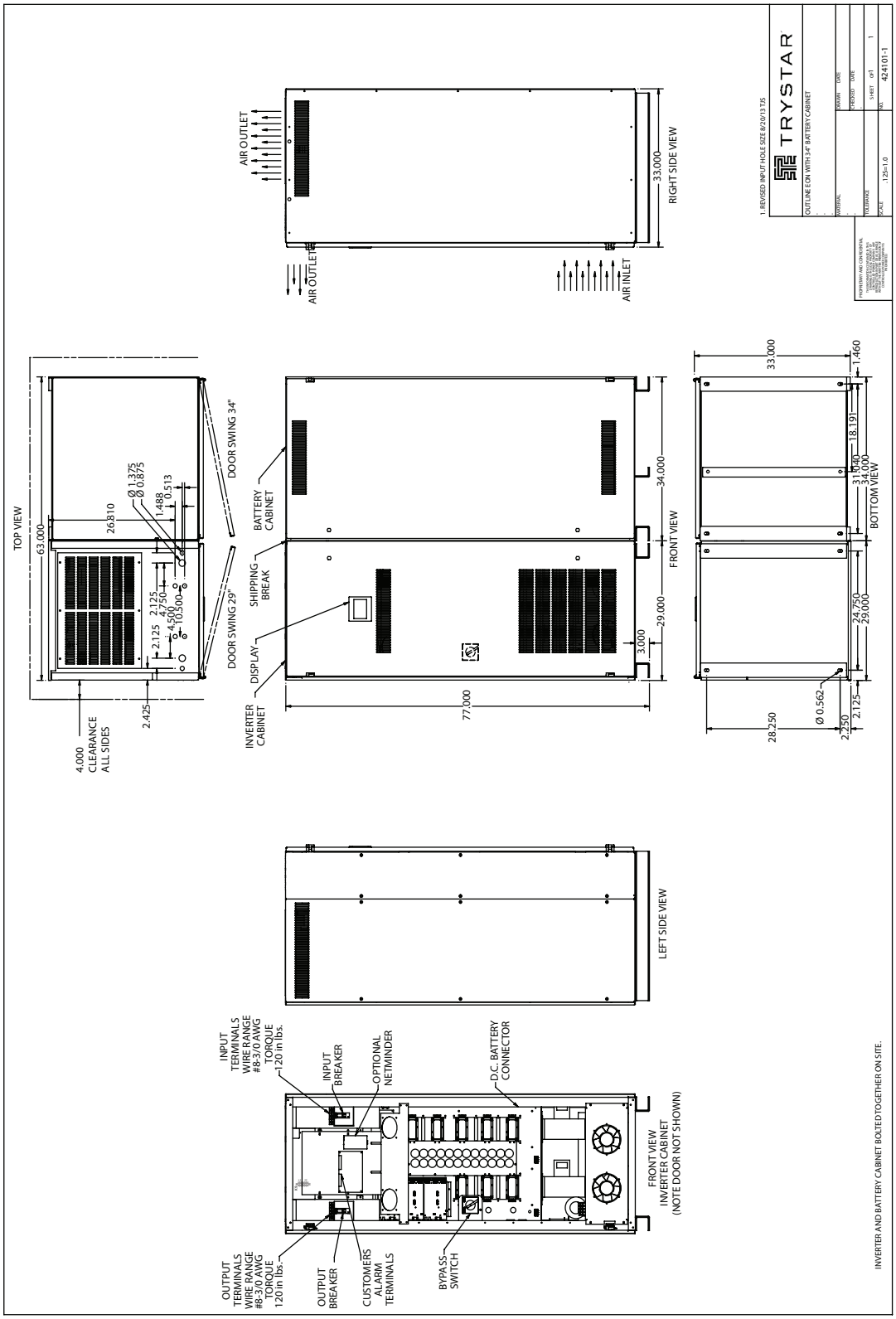
INVERTER WITH SMALL BATTERY CABINET AND DISTRIBUTION



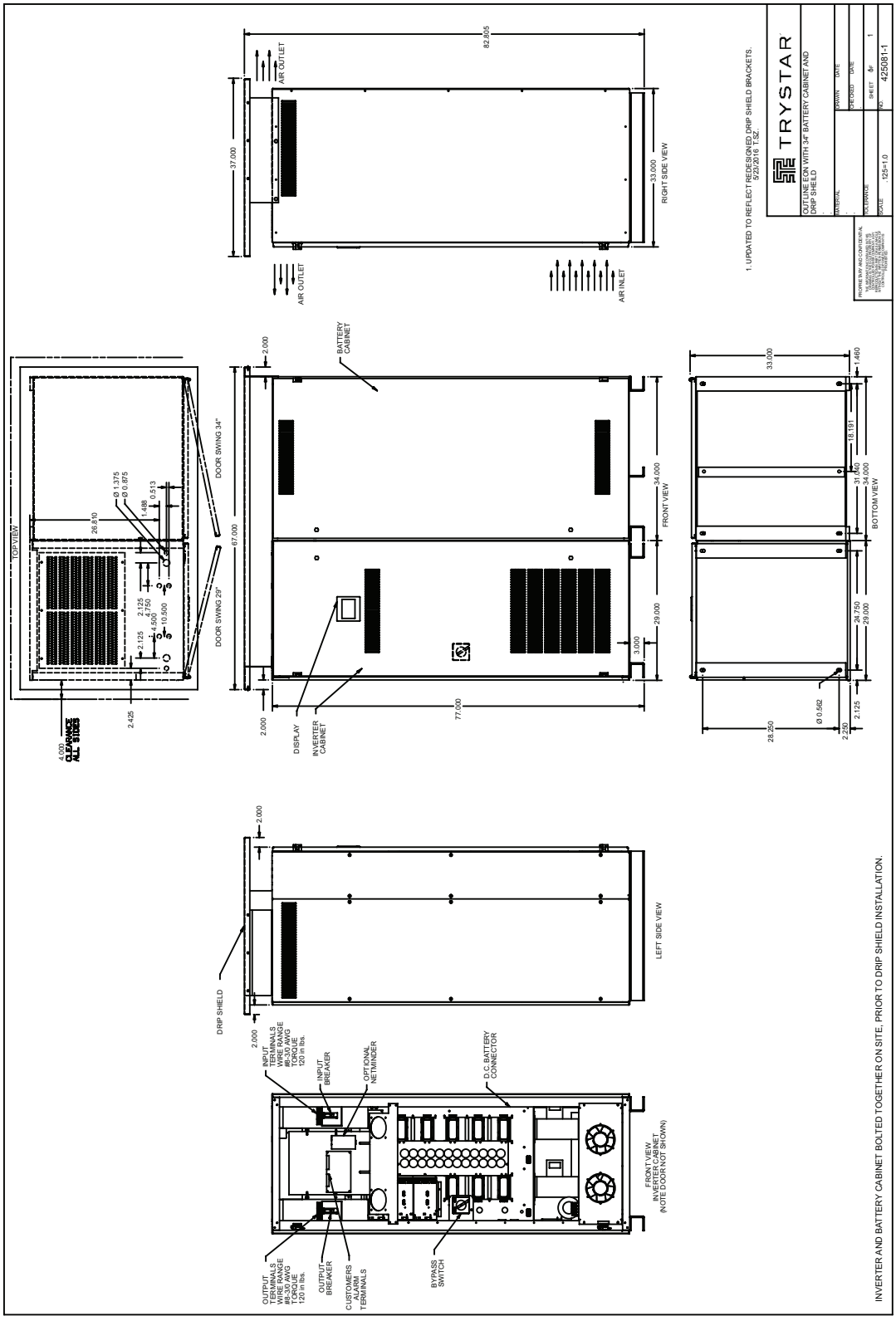
INVERTER WITH SMALL BATTERY CABINET, DISTRIBUTION AND DRIP SHIELD OPTIONS



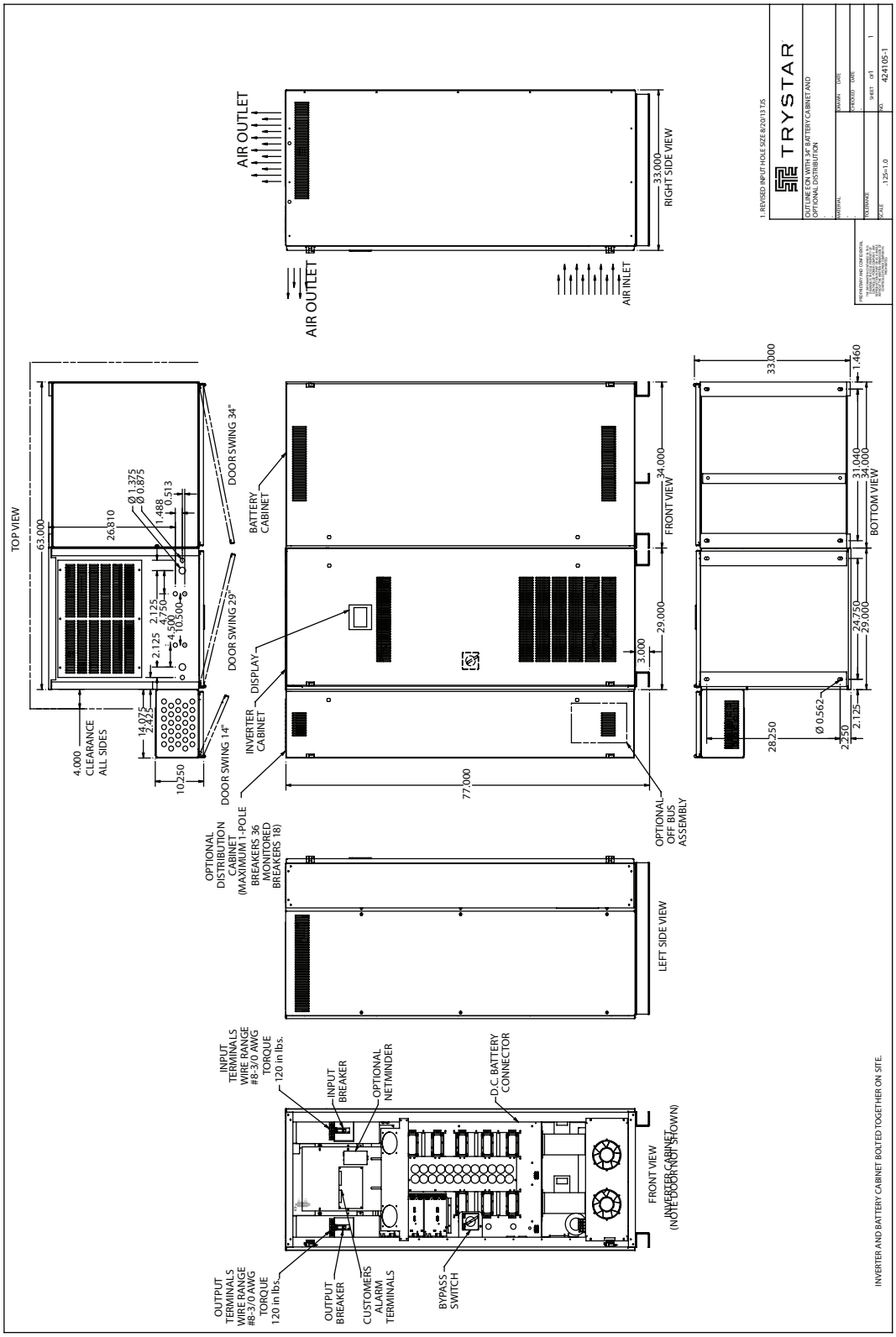
INVERTER WITH MEDIUM BATTERY CABINET



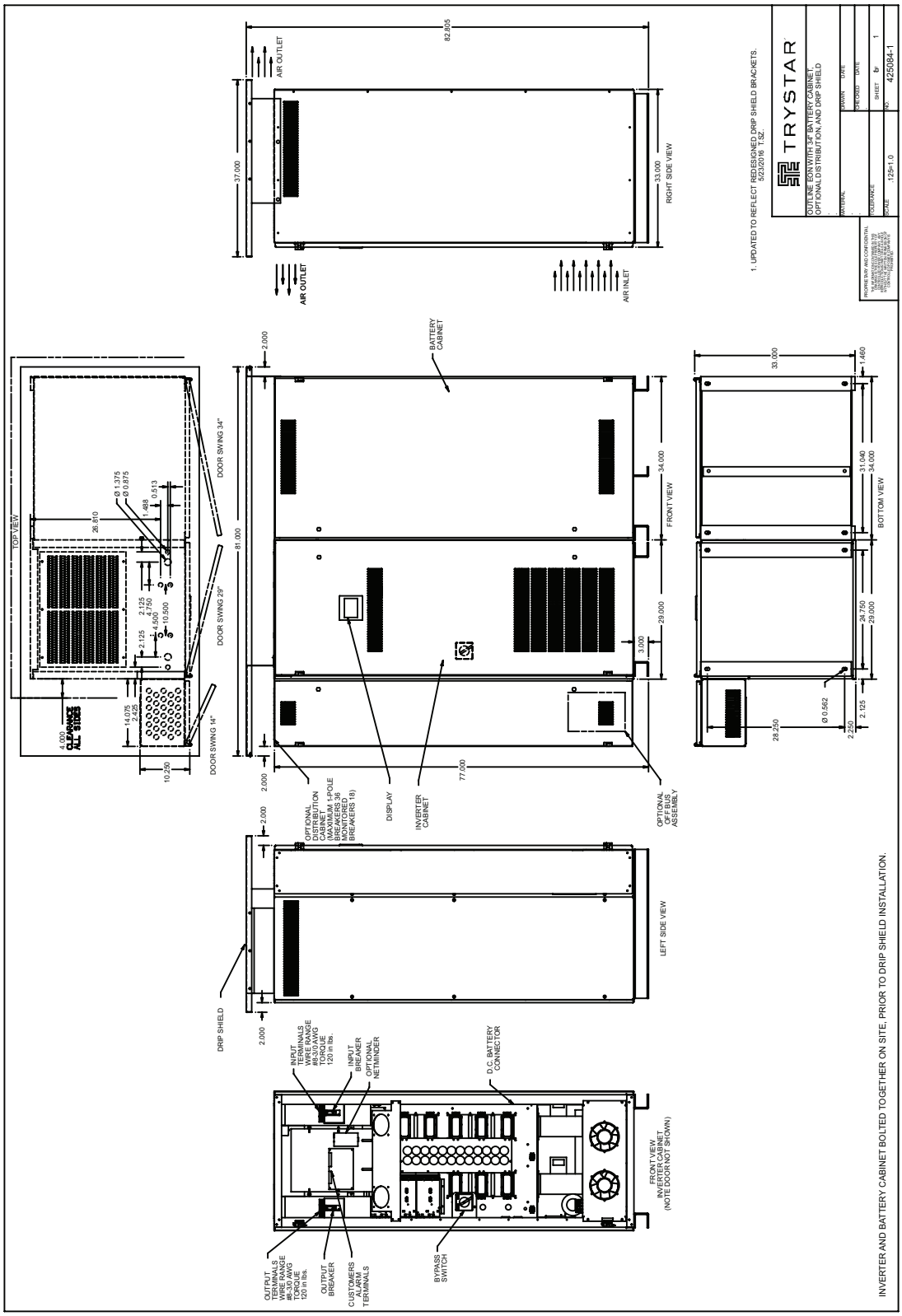
INVERTER WITH MEDIUM BATTERY CABINET AND DRIP SHIELD OPTION



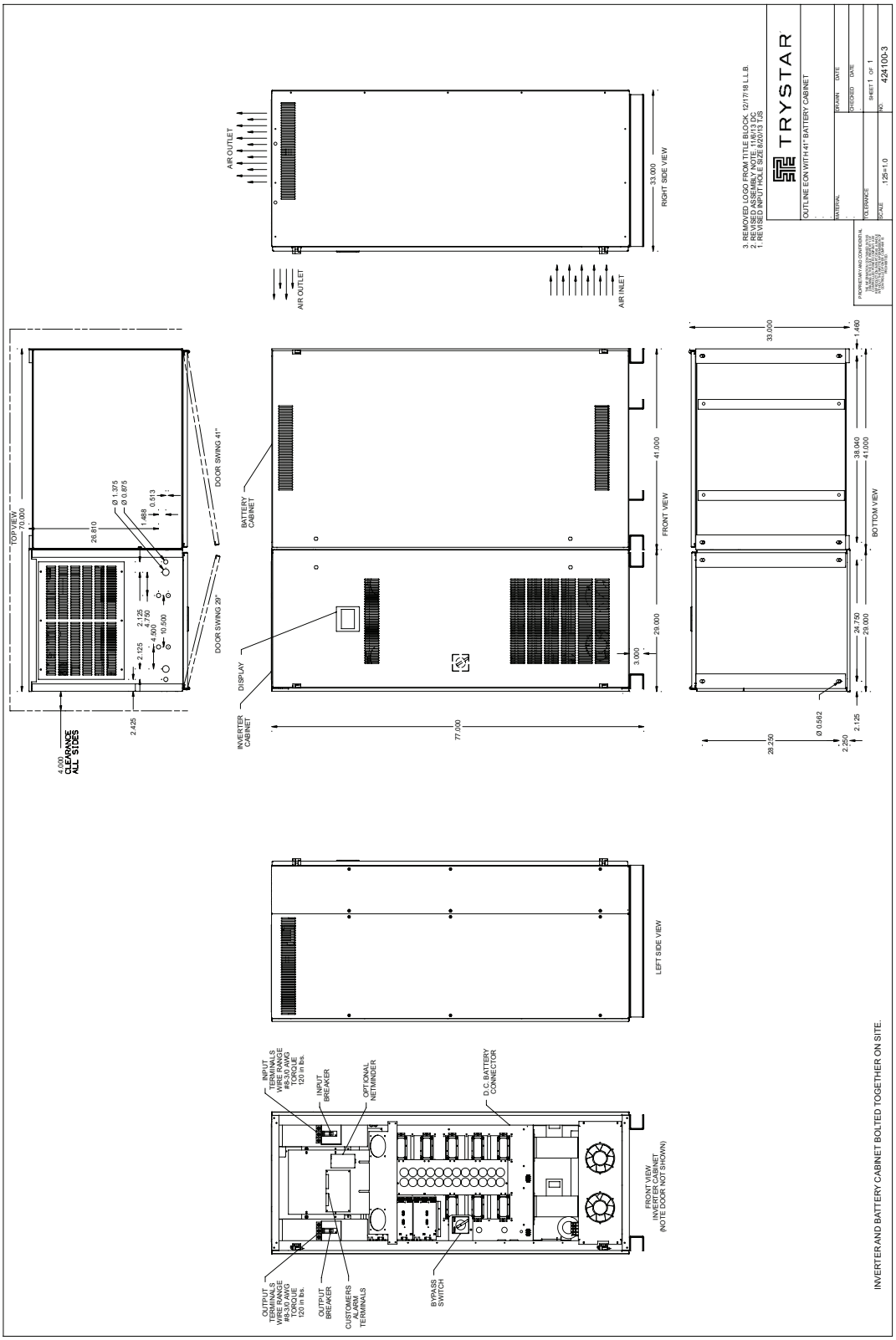
INVERTER WITH MEDIUM BATTERY CABINET AND DISTRIBUTION



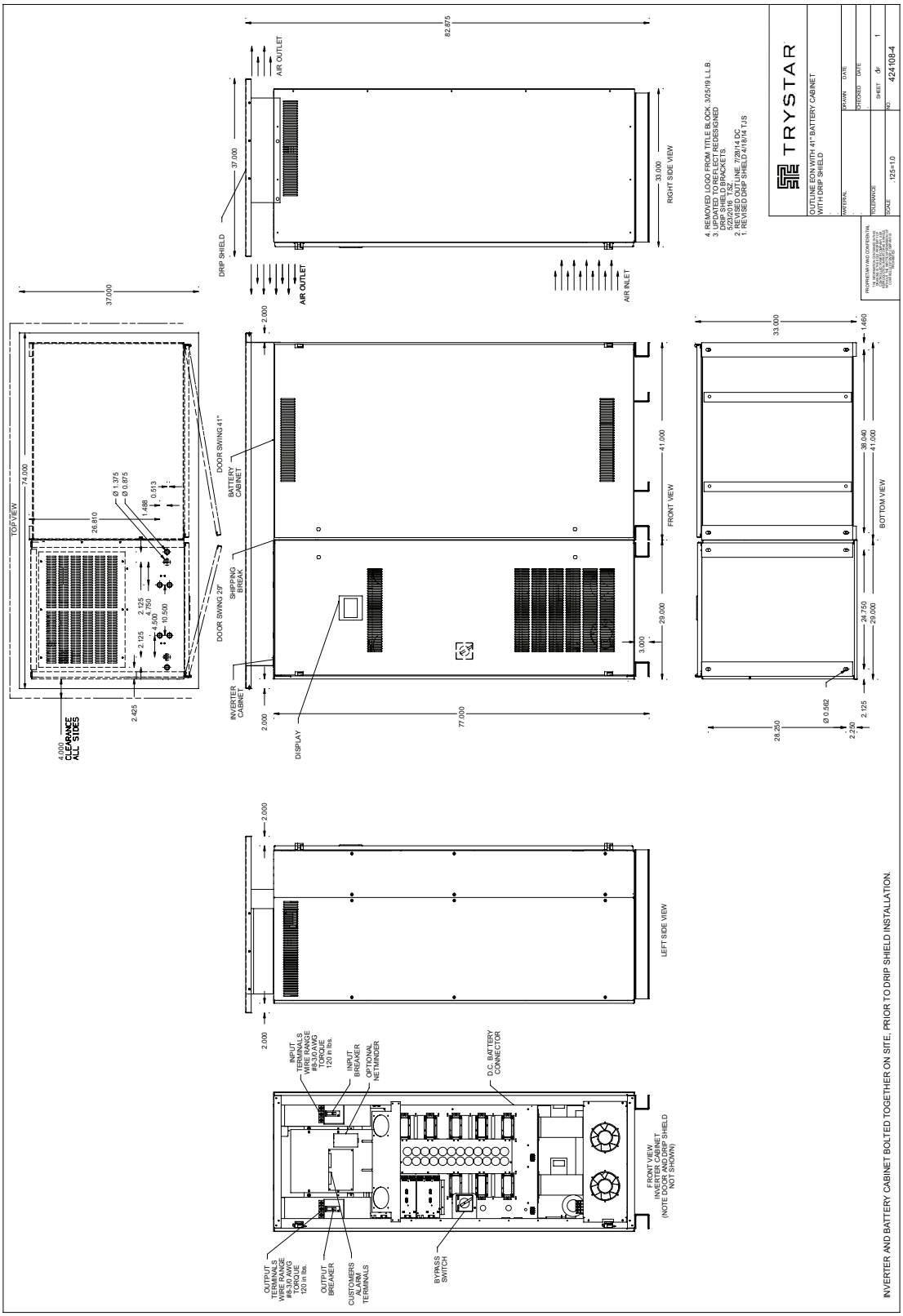
INVERTER WITH MEDIUM BATTERY CABINET, DISTRIBUTION AND DRIP SHIELD OPTIONS



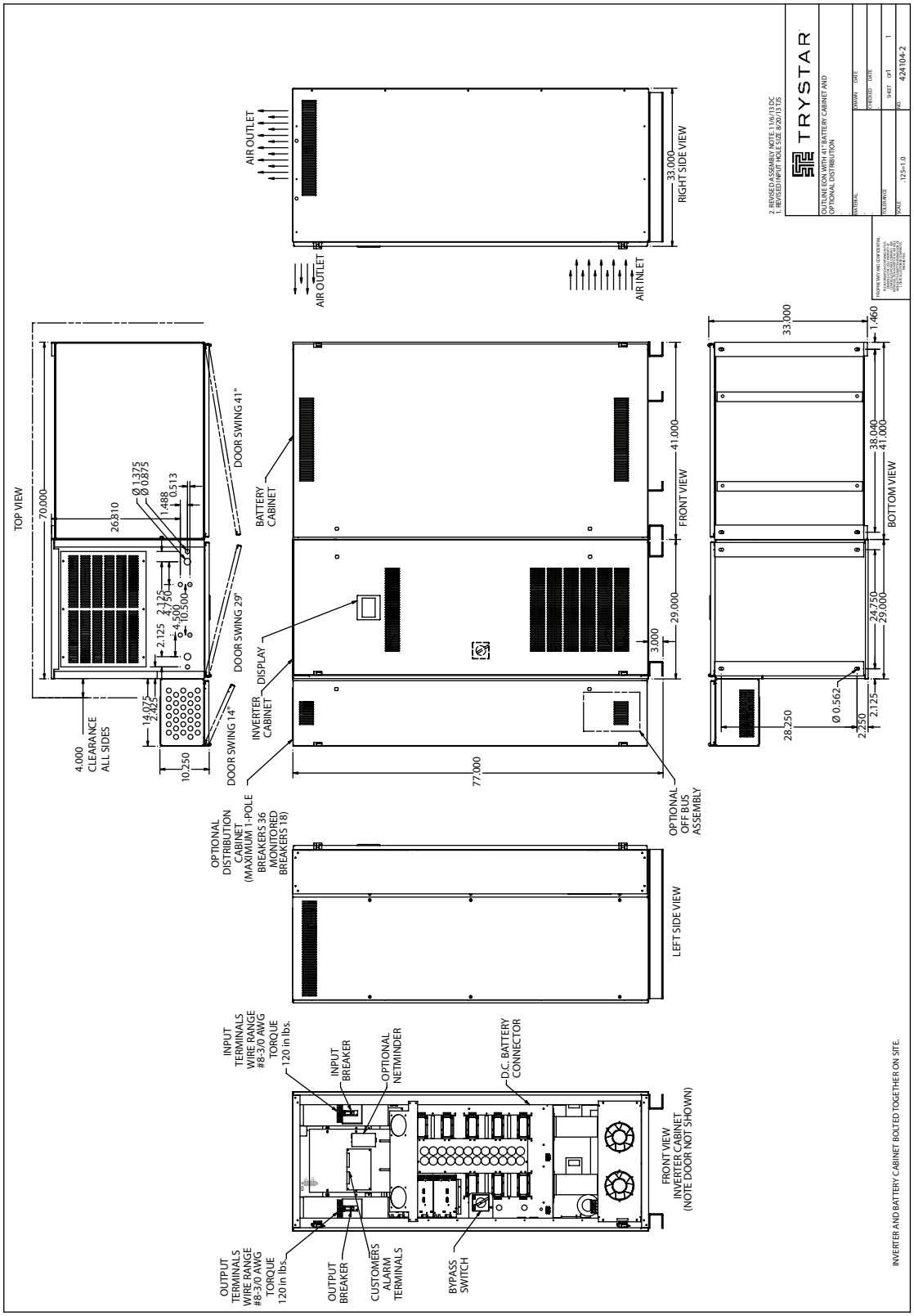
INVERTER WITH LARGE BATTERY CABINET



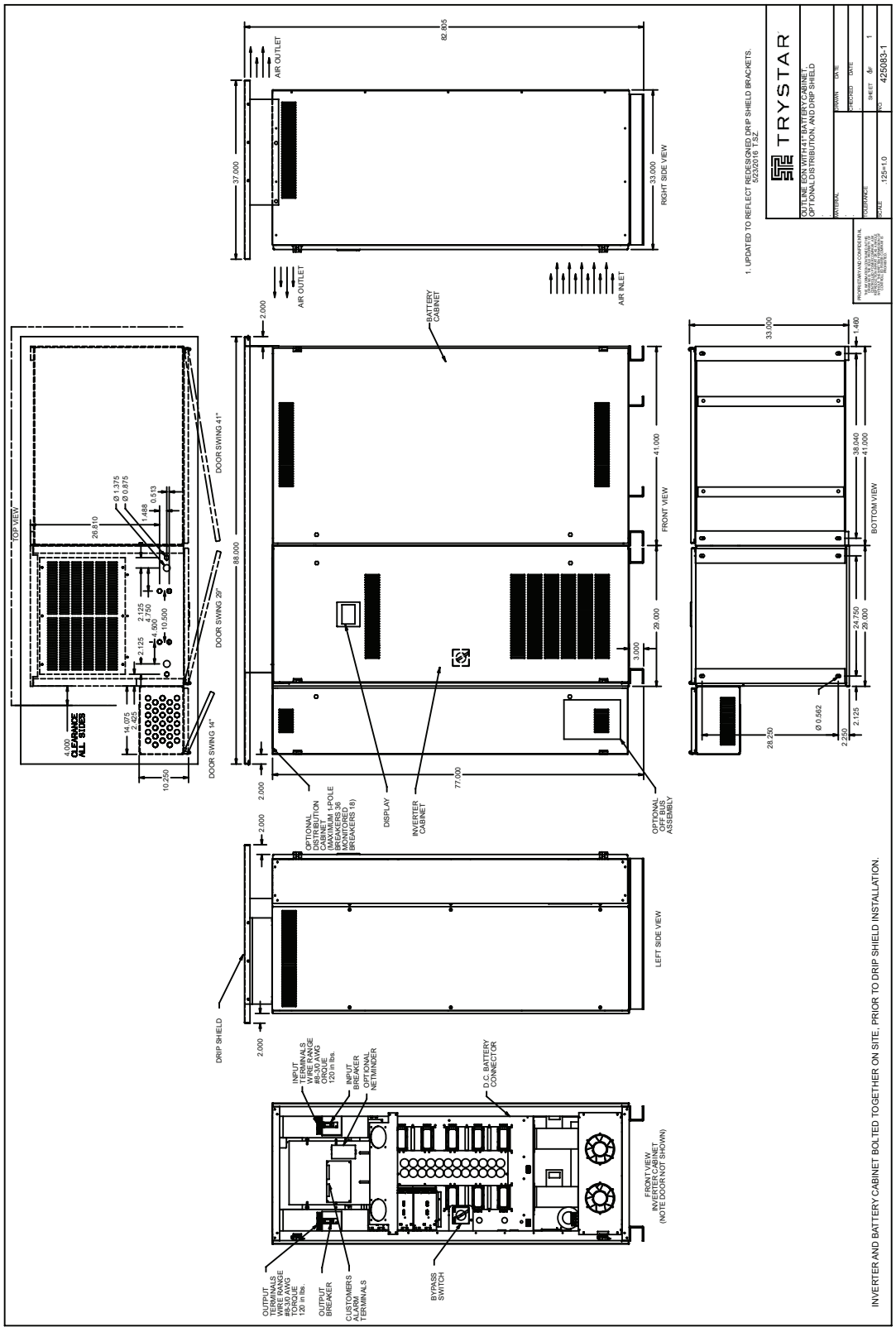
INVERTER WITH LARGE BATTERY CABINET AND DRIP SHIELD OPTION



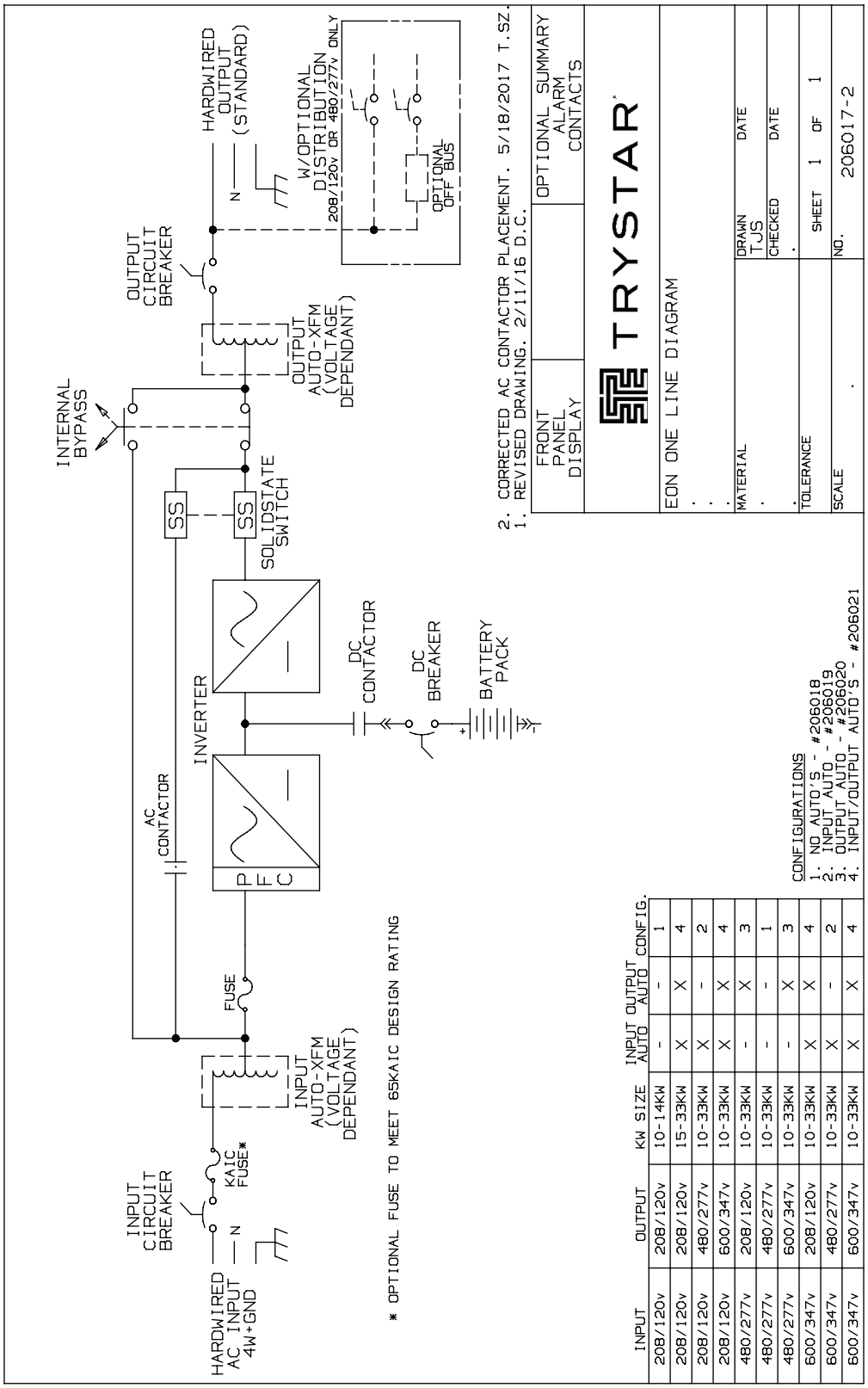
INVERTER WITH LARGE BATTERY CABINET AND DISTRIBUTION



INVERTER WITH LARGE BATTERY CABINET, DISTRIBUTION AND DRIP SHIELD OPTIONS

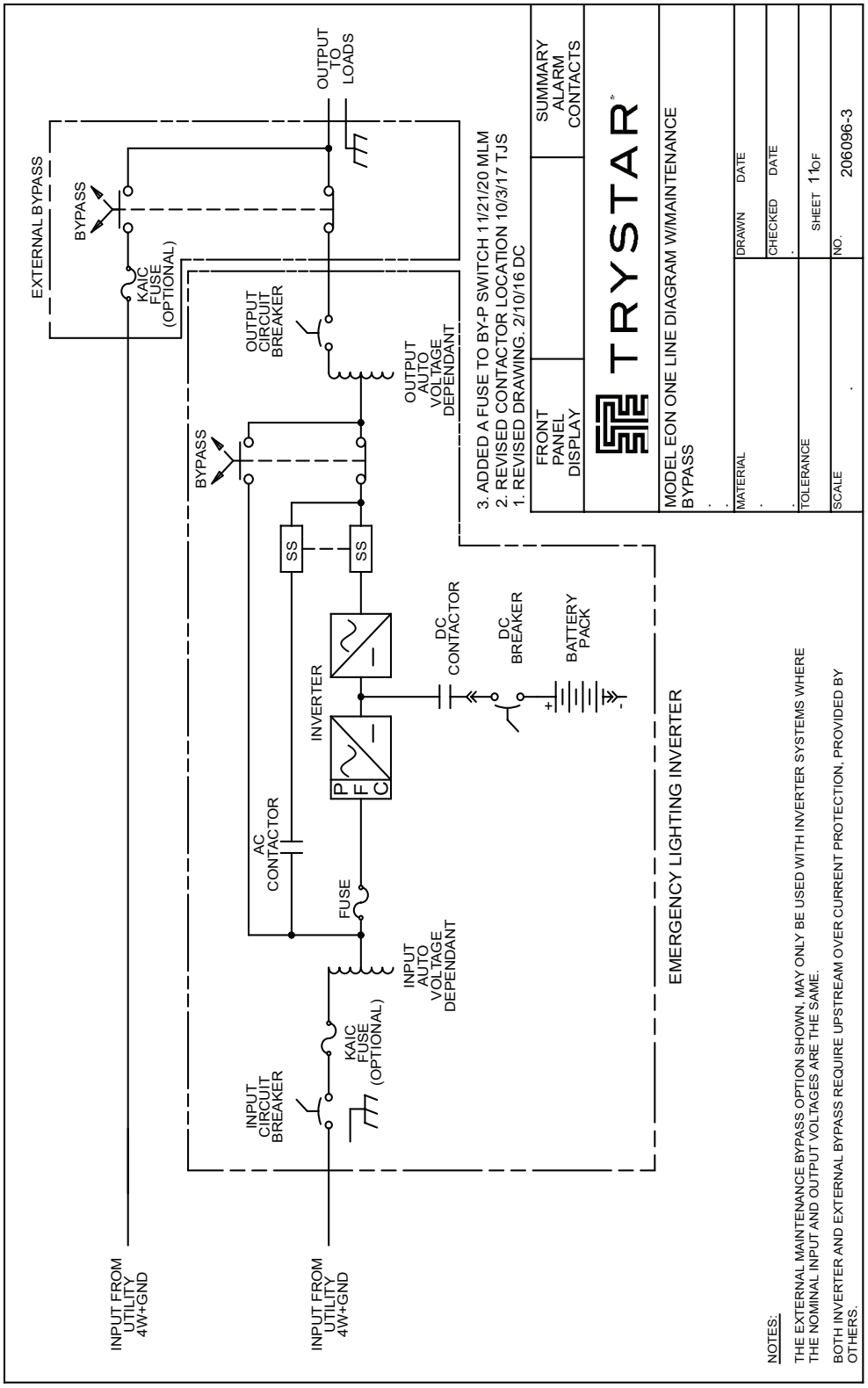


ONE LINE DIAGRAM



INPUT	OUTPUT	KW SIZE	INPUT AUTO	OUTPUT AUTO	CONFIG.
208/120v	208/120v	10-14KW	-	-	1
208/120v	208/120v	15-33KW	X	X	4
208/120v	480/277v	10-33KW	X	-	2
208/120v	600/347v	10-33KW	X	X	4
480/277v	208/120v	10-33KW	-	X	3
480/277v	480/277v	10-33KW	-	-	1
480/277v	600/347v	10-33KW	-	X	3
600/347v	208/120v	10-33KW	X	X	4
600/347v	480/277v	10-33KW	X	-	2
600/347v	600/347v	10-33KW	X	X	4

ONE LINE DIAGRAM WITH EXTERNAL BYPASS



CUSTOMER NOTES AND SETTINGS

TRYSTAR

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