

MODEL ES

OWNERS MANUAL



4.5KVA - 15.5KVA
UNINTERRUPTIBLE POWER SUPPLY

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.

Click on the  at the top of each page to return to the Table of Contents.



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INTRODUCTION



Controlled Power Company engineers and manufactures the industry's highest quality **uninterruptible power systems**, capitalizing on 40 years of expertise. We have an enviable reputation for quality, which is reflected in the design, workmanship, and performance of our products.

Our true online, double conversion UPS design is a field-proven Controlled Power Company standard, with a solid track record of protecting mission critical applications and preventing downtime. For you, this translates into trusted performance and reliability.

From its aesthetically-pleasing innovative design ... to its ease of installation and user-friendly operation, the “**Model ES**” UPS is the right choice to provide conditioned, continuous back-up power to today's mission critical applications.

Advanced Digital Monitoring --- The Intellistat TS™

The full-featured, user-friendly Intellistat TS monitor provides quick and easy access to the “**Model ES**” UPS's electrical parameters, system status, and event logs. The monitor displays operational conditions including system normal percent battery time remaining, and battery test in progress. Alarm conditions are displayed on the screen, together with an audible alarm.

A color, TFT, high-resolution touchscreen display allows the entry of date / time values, system setpoints, alarm threshold settings and password information into the monitor. The Intellistat TS provides complete system diagnostics, including user-programmable automatic battery testing and date / time stamped login of the results.

The Intellistat TS is an industry-leading UPS monitor and display that is information-rich easy to use, and a welcome departure from mechanical pushbuttons, and traditional 2-row LED displays.

Standard Communications

For standard communications, the “**Model ES**” includes a hardwired terminal strip interface for remote indication of UPS on battery, low battery warning, on static bypass, and general alarm conditions. Relay contacts are potential-free, user selectable normally open or normally closed, and rated for 120 VAC, 0.5 amps. These status and alarm contacts may be wired to a factory-provided “Remote Annunciator” panel with status LEDs and an audible alarm.

Additionally, standard RS232 communications (via a USB port) allow access to electrical parameters, system status, alarms, system setpoint programming, and the test / alarm logs.

Optional NetMinder™ Communications

The NetMinder Slot Card integrates the “**Model ES**” into an Ethernet TCP/IP, MODBUS TCP, or MODBUS RS485 network with a specific IP address. The NetMinder offers you remote monitoring of the UPS 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 are available to you via SNMP, e-mail, and network broadcast messaging. Temperature and humidity sensing interface are also available.

True Online Double Conversion With Static Bypass

The “**Model ES**” is a true on-line double conversion UPS. AC input power is converted to DC power to keep system batteries charged, then converted back to AC power to feed your mission critical equipment. Because the double conversion system reproduces its own regulated sinewave output, your equipment is no longer at the mercy of the input voltage distortions, frequency variations, voltage sags, surges, under-voltages, and power failures.

The UPS topology assures a true no-break transfer to and from battery operation, eliminating the concern about transfer times and the reliability of stand-by circuits. In the event of an overload condition or a detected problem within the UPS, a static bypass switch automatically activated. Mission critical equipment is 100% protected.



INTRODUCTION CONTINUED

Adaptive Input Range

Adaptive Input Range technology is used to automatically broaden the input operating range as a function of load. This feature provides added security during deep brownout conditions, without battery consumption. Dependent on the percentage of load, the input voltage can drop as low as 50% of nominal before restoring to battery power, thus increasing battery life. In addition, **Adaptive Input Range** assures that the batteries will be at full capacity for a real emergency...a power outage.

Internal Shielded Computer-Grade Isolation Transformer

The specially-designed **internal shielded computer-grade isolation transformer** is available to protect your mission critical equipment from voltage spikes, transients, and the detrimental effects of common mode noise. The transformer generates a new ground for your system; maintaining the integrity of a clean, noise-free reference for your critical loads, even in bypass.

Internal transformer options are available to step line voltage up or down, and to convert 3-wire and 4-wire input configurations to match the exact needs of your protected equipment and satisfy output distribution requirements. An isolated output option of 240/208/120 VAC is available throughout the kVA range of the product line. Also note that a single 120 VAC, 2-wire plus ground output can supply up to 11000 VA of uninterruptible power!

Input Power Factor Correction With Less Than 5% THD

The “**Model ES**” goes beyond a traditional double conversion UPS. The advanced bi-directional **input power factor correction** circuitry and independently-generated sine wave reference, guarantee that the input current is free of harmonics regardless of input voltage distortion.

Secure Maintenance Bypass System

Maintenance bypass systems ensure that critical loads are never disrupted during maintenance or in an emergency. Traditionally, maintenance bypass switches are activated manually; connecting the critical load directly to an alternate power source without synchronization. Activating an out-of-sync bypass may drop or damage the load, and cause damage to the UPS.

The **secure maintenance bypass** system, exclusive to the “**Model ES**”, automatically invokes a synchronization command that forces the UPS to activate the static bypass first, before continuing to maintenance bypass mode. This system bypasses around the UPS electronics and controls, allowing for maintenance to be performed without shutdown or disruption of power to the load. If an internal isolation transformer is provided, the transformer is kept in the power circuit so that system isolation, voltage transformation, and power conditioning are maintained. The “**Model ES**” secure maintenance bypass system brings large system UPS features to mid-sized applications.

NetMinder RCCMD Shutdown Software (CD)

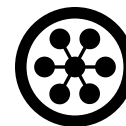
The NetMinder RCCMD is a client-side application that performs the orderly, unattended shutdown of your critical computers or servers.

NetMinder UNMS II UPS Network Management System (CD)

The NetMinder UNMS II is a Windows-based, server-side application that allows you to view and manage multiple, network-connected UPS's from a single computer. Using the Basic Version, you can monitor up to (9) UPS's ... the Enterprise Version monitors even more UPS's, as well as environmental sensors or alarm contacts, and features a customizable graphical interface.

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 Controlled Power Company's UPS's, but also those of other manufacturers.

RECEIVING THE UPS



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



INSPECTION

Upon receipt of the UPS, 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.

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

IMPORTANT NOTICE

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

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

FOR ALL SHIPMENTS DAMAGED IN TRANSIT

Leave the items, packing material and carton "AS IS". Notify your carrier's local office and ask for immediate inspection of the carton and contents.

After inspection has been made by the carrier, and you have received acknowledgment in writing as to the damage, notify our Customer Service Department to make any required repair arrangements.

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

Please note that we cannot be responsible for any service work or 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
DISCONNECT THE BATTERY CONNECTOR FROM THE INVERTER.**



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 turning the UPS on and allowing it to run. See "Start-up Procedure" for turning the UPS on. **While storing disconnect the battery connector from the UPS.** Make sure proper ventilation is available any time the inverter is on.

Warranty does not cover any defects or damages caused by failure to properly store the Product before installation, including the charge of batteries if not in use (charged) for more than 6 months. Battery storage temperature when not in use is 25°C for 6 months. For each 9°C rise, reduce storage time by half.



RECEIVING THE UPS CONTINUED

REMOVING THE UPS FROM THE PALLET

CAUTION

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

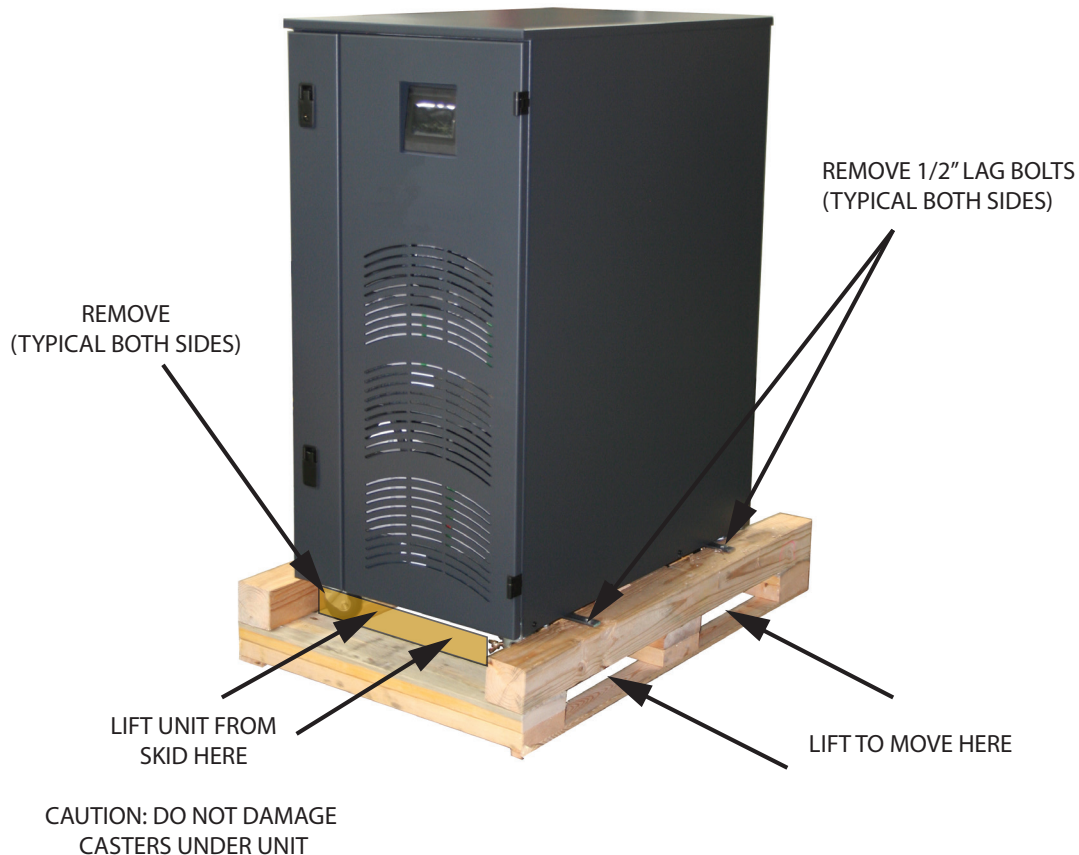
*****SHOCK HAZARD*****

DO NOT SHORT BATTERY TERMINALS

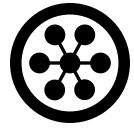
TOOLS REQUIRED:

1/2" Socket, Forklift, dolly.

1. Remove the plastic wrapping and banding and discard.
2. To remove the UPS from the pallet, first remove the four 1/2" lag bolts that are securing the UPS cabinet to the pallet and remove the piece of wood in the front and back of the UPS that blocks fork lift entry.
3. Using a forklift, place the forks securely under the UPS as shown below.
4. Carefully lift the UPS from the skid.
5. Set the UPS down until you are ready for installation.



INSTALLATION 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 SHOWN ON THE FOLLOWING PAGES. BE SURE TO WIRE
BATTERIES PROPERLY. IMPROPER WIRING CAN CAUSE DAMAGE TO THE BATTERIES. WIRING
SHOULD ONLY BE PERFORMED BY AUTHORIZED PERSONNEL.**

- FOLLOW ALL STANDARD AND LOCAL ELECTRICAL CODES.
- BE SURE INPUT POWER TO UPS IS PROPERLY GROUNDED.
- DO NOT ALLOW WATER OR FOREIGN OBJECTS TO GET INSIDE UPS.
- DO NOT PLACE OBJECTS OR LIQUIDS ON TOP OF THE UPS.
- DO NOT LOCATE UPS NEAR RUNNING WATER OR WHERE THERE IS EXCESSIVE HUMIDITY.
- DO NOT USE OUTDOORS.
- DO NOT MOUNT NEAR GAS OR ELECTRIC HEATERS.
- EQUIPMENT SHOULD BE MOUNTED IN LOCATIONS AND AT HEIGHTS WHERE IT WILL NOT READILY
BE SUBJECTED TO TAMPERING BY UNAUTHORIZED PERSONNEL.
- THE USE OF ACCESSORY EQUIPMENT NOT RECOMMENDED BY THE MANUFACTURER MAY CAUSE
AN UNSAFE CONDITION.
- DO NOT USE THIS EQUIPMENT FOR OTHER THAN INTENDED USE.
- SERVICING OF BATTERIES SHOULD BE PERFORMED OR SUPERVISED BY PERSONNEL
KNOWLEDGEABLE OF BATTERIES AND THE REQUIRED PRECAUTIONS.
- KEEP UNAUTHORIZED PERSONNEL AWAY FROM BATTERIES.
- DO NOT SHORT BATTERY TERMINALS.
- DO NOT DISPOSE OF BATTERY OR BATTERIES IN A FIRE. THE BATTERY MAY EXPLODE.
- ONLY REPLACE BATTERIES WITH IDENTICAL SPECIFICATION OF ORIGINAL BATTERIES SUPPLIED
WITH THE SYSTEM.
- DO NOT OPEN OR MUTILATE THE BATTERY OR BATTERIES. RELEASED ELECTROLYTE IS HARMFUL
TO THE SKIN AND EYES. IT MAY BE TOXIC.
- READ AND FOLLOW ALL SAFETY INSTRUCTIONS. SAVE THESE INSTRUCTIONS.

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



PRELIMINARY INSTALLATION

TOOLS REQUIRED AND INSTALLATION CHECKLIST



***** CAUTION *****



To reduce risk of fire, connect only to maximum input current rated, branch circuit overcurrent protection (see input breaker from table below) in accordance with National Electrical Code, ANSI/NFPA 70.”

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- _____ Phillips Head Screw Driver, 3/16” Allen wrench (for input/output terminal blocks).
- _____ For field wiring size, based on amperage and breaker sizes in table below. Units are rated for operation up to 40 deg. C. Amb. Refer only to the matrix below for the service panel AC breaker size. The unit comes standard with terminals for hard wire installation.
- _____ Uninterruptible power systems 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 UPS should be of good integrity and dedicated to the UPS. The run should be as short as possible. Conduit cannot be used for the grounding of the circuit.

Reference: NEC ARTICLE 250

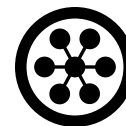
AC INPUT BREAKER AND CURRENT MATRIX

INPUT MATRIX (KVA)												
INPUT VOLTAGE	4.5 KVA		5.5 KVA		6.5 KVA		7.5KVA		8.3 KVA		9.0 KVA	
	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER
120V	53A	60A	62A	70A	---	---	---	---	---	---	---	---
208V	30A	35A	36A	40A	41A	50A	46A	60A	51A	60A	54A	70A
208/120V	26A	35A	31A	40A	36A	50A	40A	60A	44A	60A	47A	70A
220V (50Hz)	29A	35A	34A	40A	39A	45A	43A	60A	48A	60A	51A	60A
230V (50Hz)	28A	35A	32A	40A	37A	45A	42A	50A	46A	60A	49A	70A
240V	26A	30A	31A	35A	36A	45A	40A	50A	44A	60A	47A	60A
240/120V	26A	30A	31A	35A	36A	45A	40A	50A	44A	60A	47A	60A
347V	18A	20A	21A	25A	25A	30A	28A	35A	30A	35A	33A	40A
380V (50Hz)	17A	20A	20A	25A	22A	30A	25A	30A	28A	40A	30A	35A
400V (50Hz)	16A	20A	19A	25A	21A	25A	24A	30A	26A	35A	28A	35A
415V (50Hz)	15A	20A	18A	20A	21A	25A	23A	30A	25A	35A	27A	35A
480V	13A	15A	15A	20A	18A	20A	20A	25A	22A	30A	23A	30A
600V	11A	15A	12A	15A	14A	20A	16A	20A	18A	20A	19A	25A

INPUT MATRIX (KVA)												
INPUT VOLTAGE	10.0 KVA		11.0 KVA		12.0 KVA		13.5KVA		14.5 KVA		15.5 KVA	
	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER	INPUT CURRENT	INPUT BREAKER
120V	---	---	---	---	---	---	---	---	---	---	---	---
208V	59A	70A	65A	80A	70A	90A	78A	100A	83A	125A	89A	125A
208/120V	52A	70A	56A	80A	61A	90A	68A	100A	72A	125A	77A	125A
220V (50Hz)	56A	70A	61A	80A	66A	90A	74A	100A	79A	100A	84A	125A
230V (50Hz)	54A	70A	59A	80A	63A	80A	71A	90A	75A	100A	80A	100A
240V	52A	70A	56A	70A	61A	80A	68A	90A	72A	90A	77A	100A
240/120V	52A	70A	56A	70A	61A	80A	68A	90A	72A	90A	77A	100A
347V	36A	50A	39A	50A	42A	60A	47A	60A	50A	70A	53A	70A
380V (50Hz)	33A	40A	35A	50A	38A	50A	43A	60A	46A	60A	48A	70A
400V (50Hz)	31A	40A	34A	40A	36A	50A	41A	60A	43A	60A	46A	60A
415V (50Hz)	30A	35A	32A	40A	35A	50A	39A	50A	42A	60A	44A	60A
480V	26A	30A	28A	35A	30A	40A	34A	45A	36A	45A	38A	50A
600V	21A	25A	22A	30A	24A	30A	27A	35A	29A	40A	31A	40A

NOTE: 240/120V or 208/120V input MUST have 2 hots, neutral and ground for proper operation and to prevent possible damage.

Based on breaker size and derating factor of 0.88 per NEC Table 310.16. The wire bending space on the “S” cabinet is 2” (i.e. maximum conductor of 3 AWG) and on the “T” cabinet is 7” (maximum conductor of 500 kcmil allowed – the terminal supports up to 2/0). **NOTE: Input currents alone are maximum at full load, and when batteries are in recharge mode.**



AC OUTPUT CURRENT MATRIX

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

OUTPUT MATRIX (KVA)

	4.5 KVA	5.5 KVA	6.5 KVA	7.5KVA	8.3 KVA	9.0 KVA
OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT
120V	37.5	45.8	----	----	----	----
220V	20.5	25	29.5	34.1	----	----
230V	19.6	23.9	28.3	32.6	----	----
120/208V	21.6	26.4	31.3	36.1	39.9	43.3
120/240V	18.8	22.9	27.1	31.3	34.6	37.5
120/208/240V	37.5 / 21.6 / 18.8	45.8 / 26.4 / 22.9	54.2 / 31.3 / 27.1	62.5 / 36.1 / 31.3	69.2 / 39.9 / 34.6	75.0 / 43.3 / 37.5
480V	9.4	11.5	13.5	15.6	17.3	18.8

OUTPUT MATRIX (KVA)

	10.0 KVA	11.0 KVA	12.0 KVA	13.5KVA	14.5 KVA	15.5 KVA
OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT	OUTPUT CURRENT
120V	----	----	----	----	----	----
220V	----	----	----	----	----	----
230V	----	----	----	----	----	----
120/208V	48.1	52.9	57.7	64.9	69.7	74.5
120/240V	41.7	45.8	50	56.3	60.4	64.6
120/208/240V	83.3 / 48.1 / 41.7	91.7 / 52.9 / 45.8	50.0 / 57.7 / 50.0	56.3 / 64.9 / 56.3	60.4 / 69.7 / 60.4	64.6 / 74.5 / 64.6
480V	20.8	22.9	25	28.1	30.2	32.3

When output breaker options are not purchased, overcurrent protection and disconnection means shall be provided by others.

Based on breaker size and derating factor of 0.88 per NEC Table 310.16. The wire bending space on the “S” cabinet is 2” (i.e. maximum conductor of 3 AWG) and on the “T” cabinet is 7” (maximum conductor of 500 kcmil allowed – the terminal supports up to 2/0).

AC OUTPUT WIRE SIZING

Per the NEC, Table 310.16, for a 40° C ambient, the wire sizes are as follows:

Without Distribution:

Cabinet S - 4 AWG
Cabinet T - 1 AWG

With Distribution (for all cabinets):

100A - 2 AWG
90A - 2 AWG
80A - 3 AWG
70A - 4 AWG
60A - 4 AWG
50A - 6 AWG
40A - 8 AWG
30A - 10 AWG
20A - 12 AWG
15A - N/A



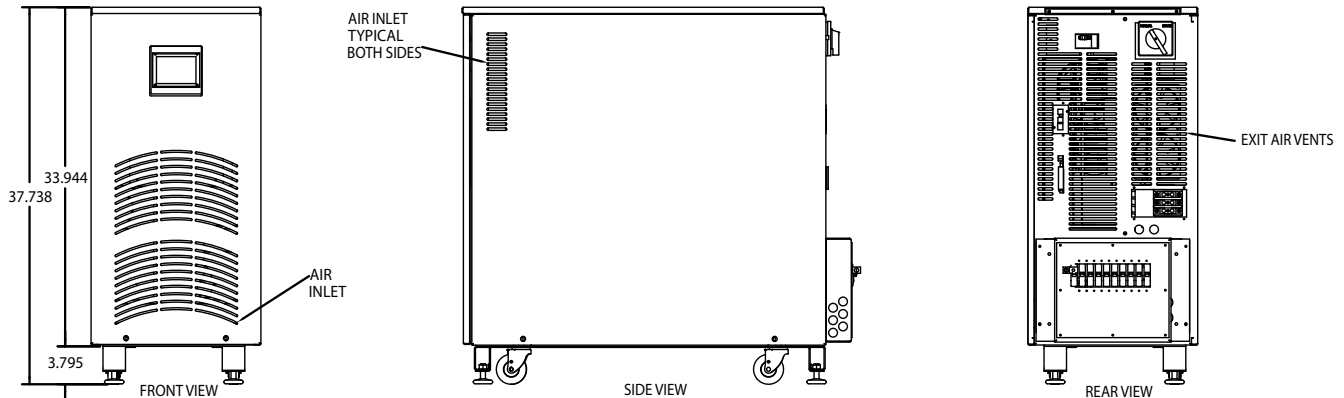
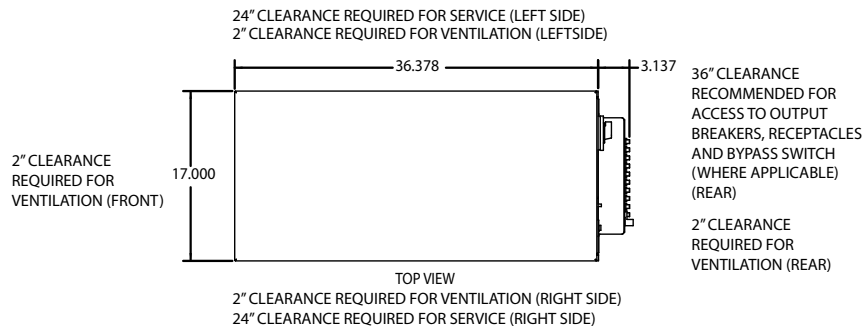
PRELIMINARY INSTALLATION CONTINUED

4.5 KVA - 11.0 KVA, "S" CABINET WITH INTERNAL BATTERIES CABINET DIMENSIONS AND CLEARANCES

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

UPS PLACEMENT

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



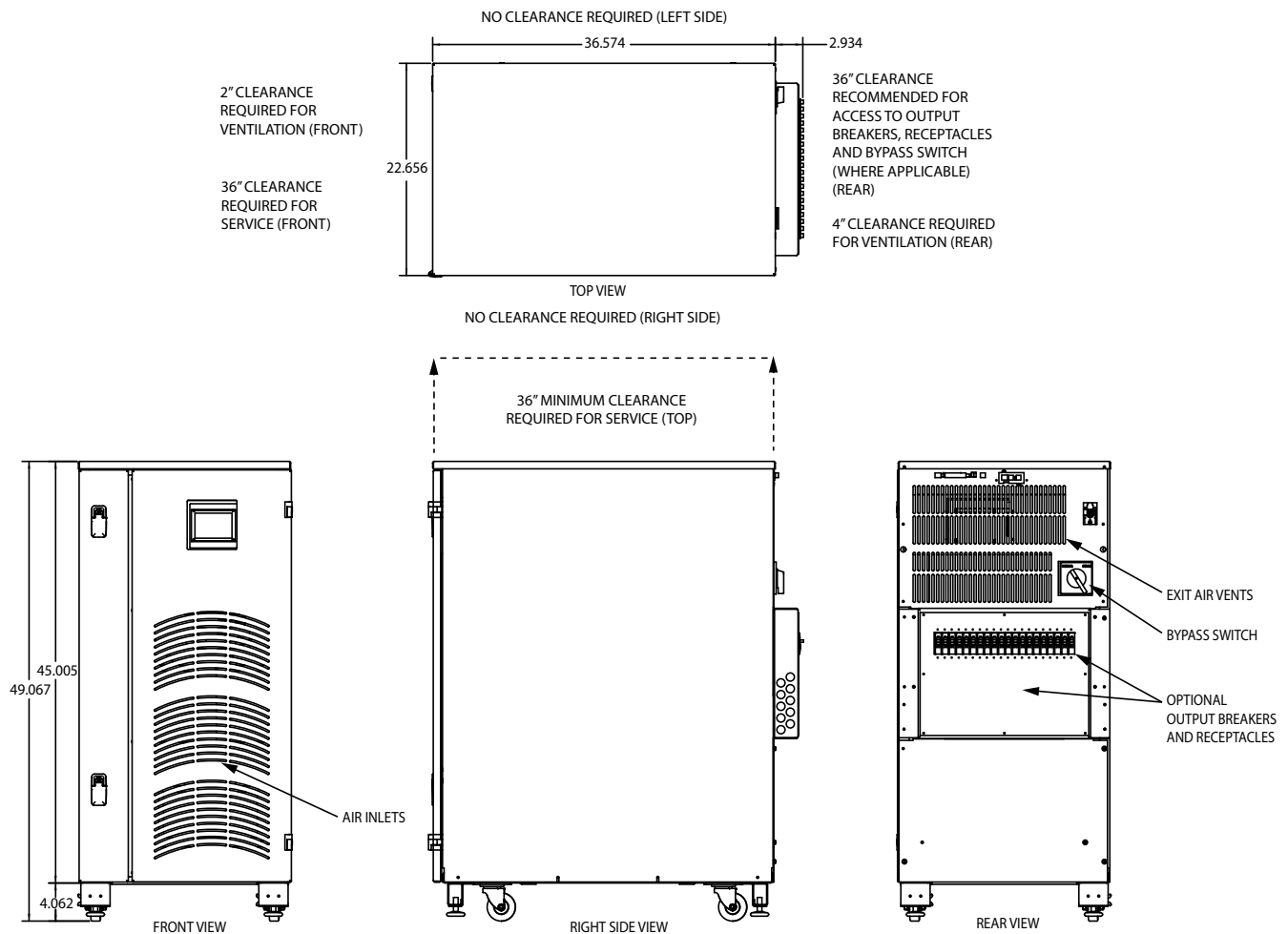


4.5 KVA - 15.5 KVA, "T" CABINET WITH INTERNAL BATTERIES CABINET DIMENSIONS AND CLEARANCES

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

UPS PLACEMENT

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





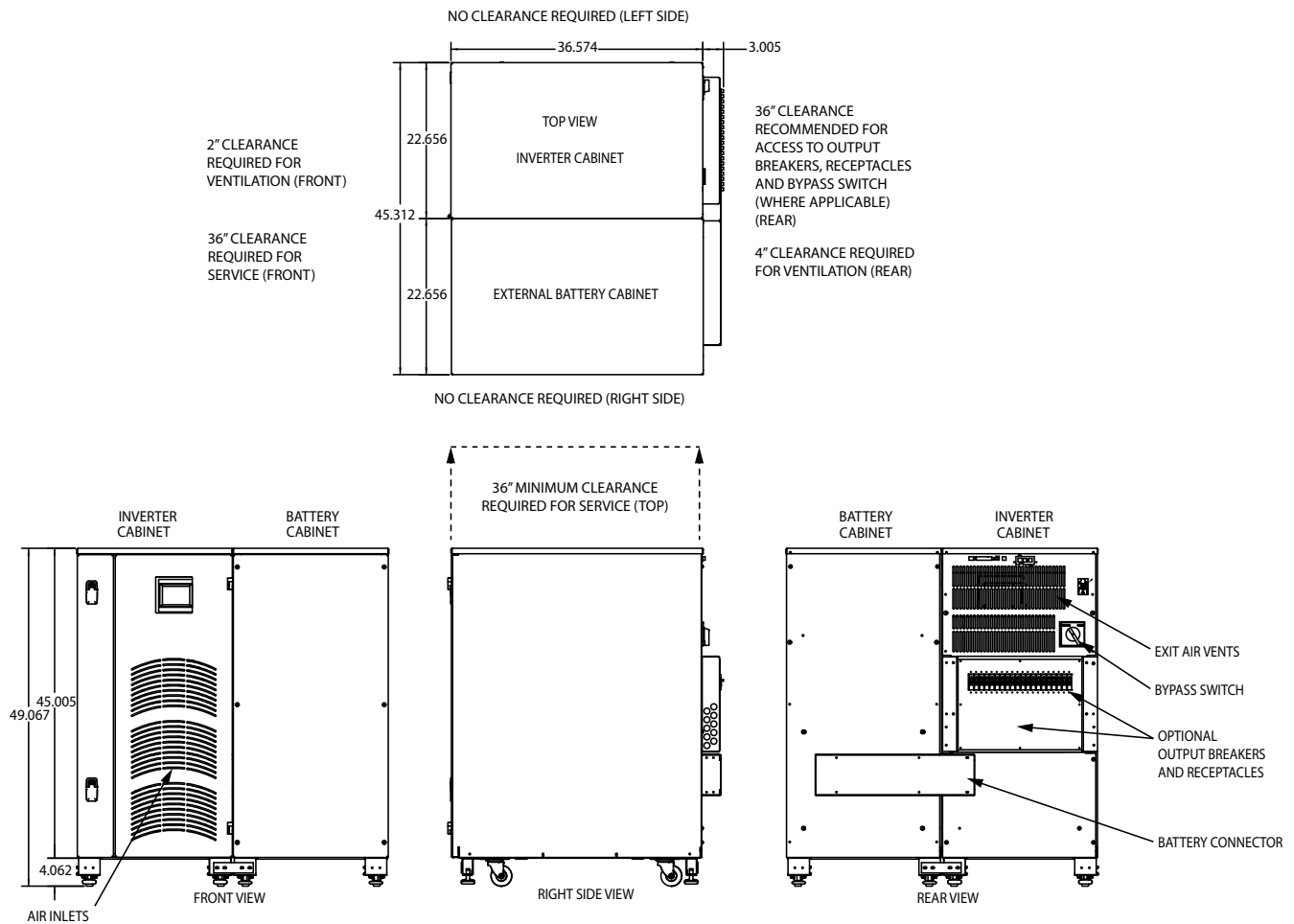
PRELIMINARY INSTALLATION CONTINUED

4.5 KVA - 15.5 KVA, "T" CABINET WITH EXTERNAL BATTERIES CABINET DIMENSIONS AND CLEARANCES

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

UPS PLACEMENT

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





INPUT AND OUTPUT CONDUIT ENTRY POINTS AND TERMINAL LOCATIONS



***** WARNING *****

RISK OF ELECTRICAL SHOCK

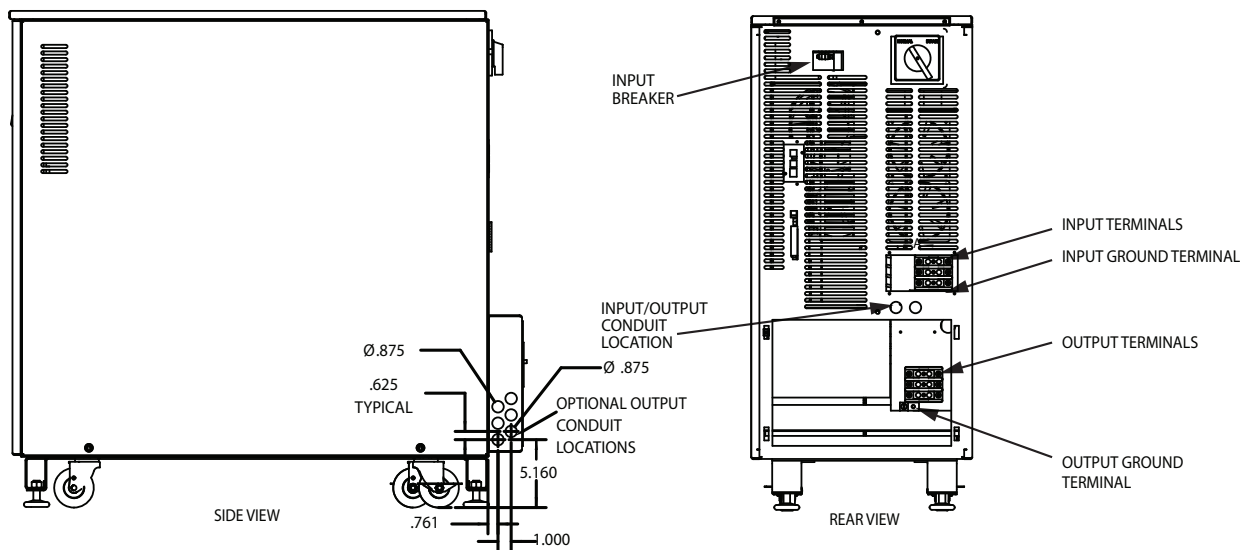
THE UPS RECEIVES POWER FROM MORE THAN ONE SOURCE.

BE SURE ALL UTILITY CIRCUIT BREAKERS ARE IN THE OFF POSITION AND

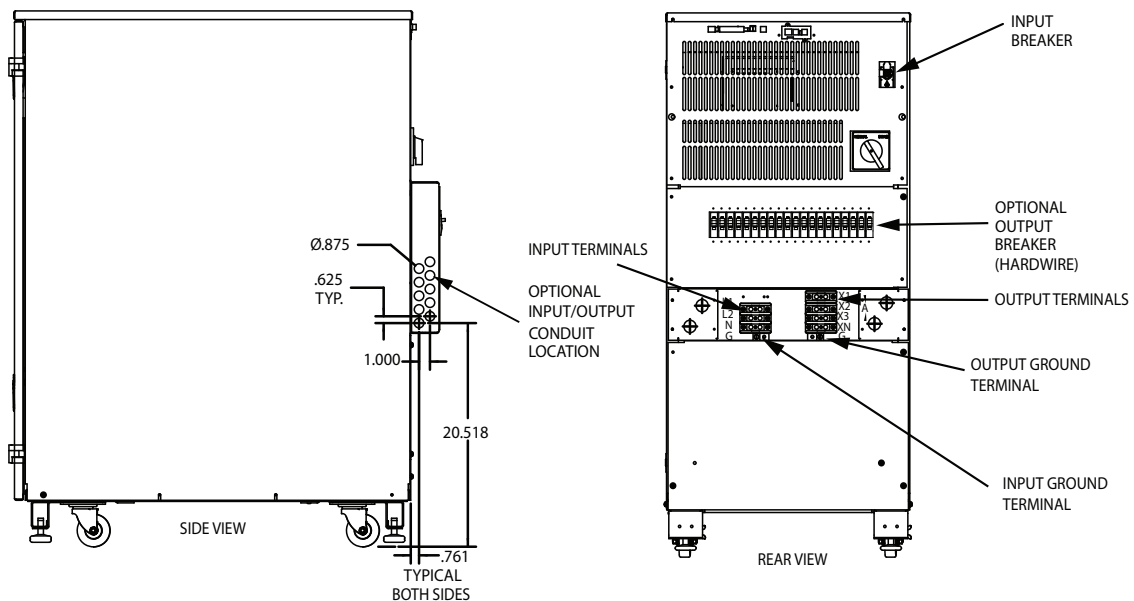
THE BATTERY CONNECTOR IS UNPLUGGED BEFORE INSTALLATION OR SERVICING.



"S" CABINET



"T" CABINET





INSTALLATION CONTINUED

INPUT WIRING

*** WARNING ***



RISK OF ELECTRICAL SHOCK

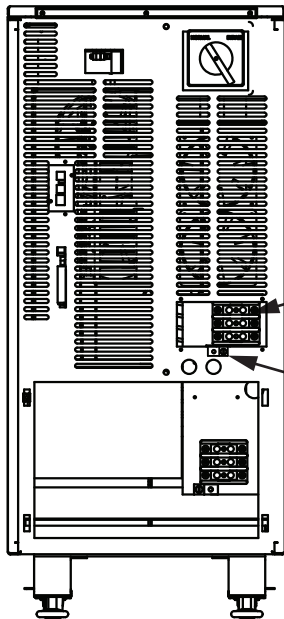
THE UPS RECEIVES POWER FROM MORE THAN ONE SOURCE.
BE SURE ALL UTILITY CIRCUIT BREAKERS ARE IN THE OFF POSITION AND
THE BATTERY CONNECTOR IS UNPLUGGED BEFORE INSTALLATION OR SERVICING.

Input Wiring

Input wiring is performed at the input terminal block. It is recommended that all wiring is performed according to NEC standards and local codes.

Input hardwire terminals, Torque = 110 Inch Lbs.

"S" CABINET

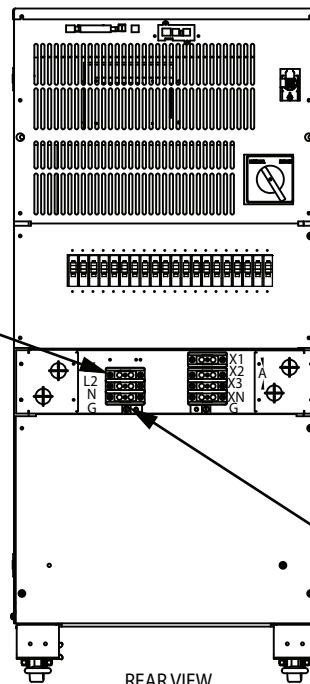


REAR VIEW

INPUT TERMINALS

INPUT GROUND TERMINAL

"T" CABINET

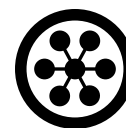


REAR VIEW

INPUT TERMINALS

INPUT GROUND
TERMINAL

NOTE: 240/120V or 208/120V input MUST have 2 hots, neutral and ground for proper operation and to prevent possible damage.



OUTPUT WIRING - "S" CABINET

Output Wiring

Output wiring is performed at the output terminal block or at the load side (bottom) of the optional distribution breakers on the rear panel or plugged in directly to the optional output receptacles. See Illustration below. It is recommended that all wiring is performed according to NEC standards and local codes. **NOTE: On units with 120/208V or 120/240V outputs the loads must be split evenly between X1 - XN and X2 - XN.**

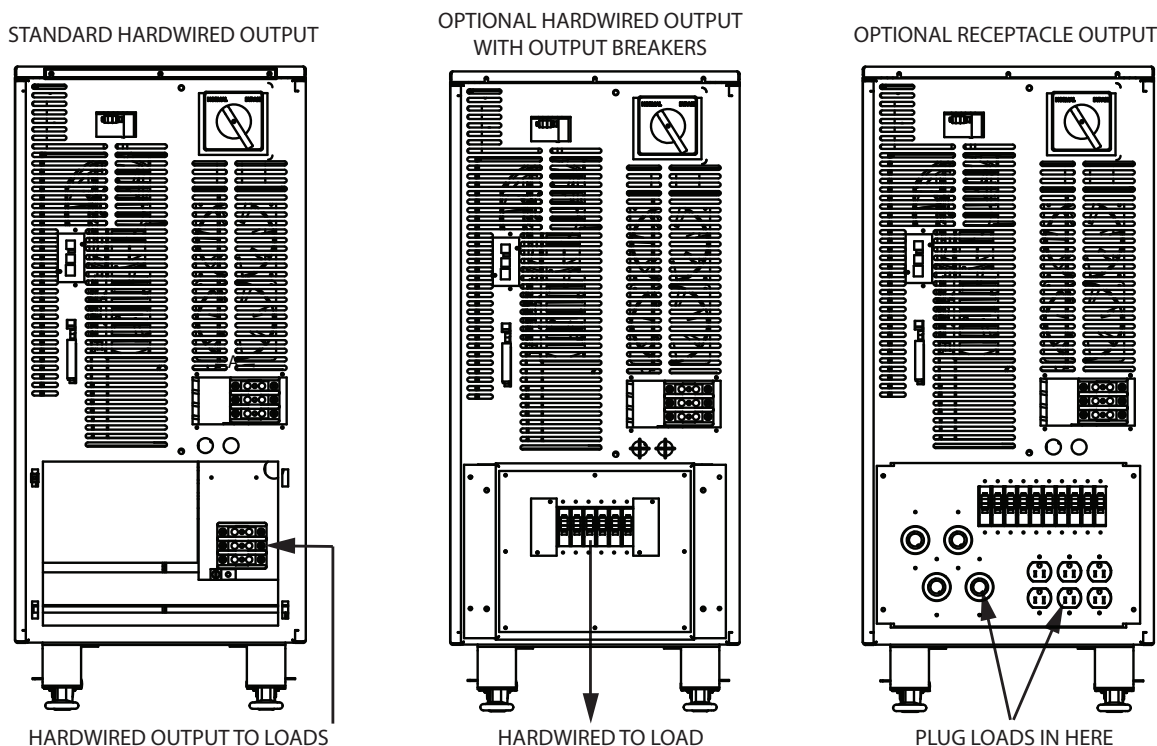
Output hardwire terminals, Torque = 110 Inch Lbs.

Per the NEC, Table 310.16, for a 40° C ambient, the wire sizes are as follows:

Without Distribution: Cabinet "S" - 4 AWG

With Distribution (for all cabinets):

100A - 2 AWG	90A - 2 AWG	80A - 3 AWG	70A - 4 AWG	60A - 4 AWG
50A - 6 AWG,	40A - 8 AWG	30A - 10 AWG	20A - 12 AWG	15A - N/A



REAR VIEW - "S" CABINET OUTPUT CONFIGURATIONS

When output breaker options are not purchased, overcurrent protection and disconnection means shall be provided by others.

Based on breaker size and derating factor of 0.88 per NEC Table 310.16. The wire bending space on the "S" cabinet is 2" (i.e. maximum conductor of 3 AWG) and on the "T" cabinet is 7" (maximum conductor of 500 kcmil allowed – the terminal supports up to 2/0).

OUTPUT DISTRIBUTION

"S" CABINET

Breaker with Receptacle: Maximum of (3) Non-Locking Receptacles, or Maximum of (4) Locking Receptacles.

Breaker Only Option for Hardwire Connection: Maximum of (8) Poles up to 30A, Maximum of (6) Poles up to 60A, Maximum of (12) poles up to 100A.



INSTALLATION CONTINUED

OUTPUT WIRING - "T" CABINET

Output Wiring

Output wiring is performed at the output terminal block or at the load side (bottom) of the optional distribution breakers on the rear panel or plugged in directly to the optional output receptacles. See Illustration below. It is recommended that all wiring is performed according to NEC standards and local codes. **NOTE: On units with 120/208V or 120/240V outputs the loads must be split evenly between X1 - XN and X2 - XN.**

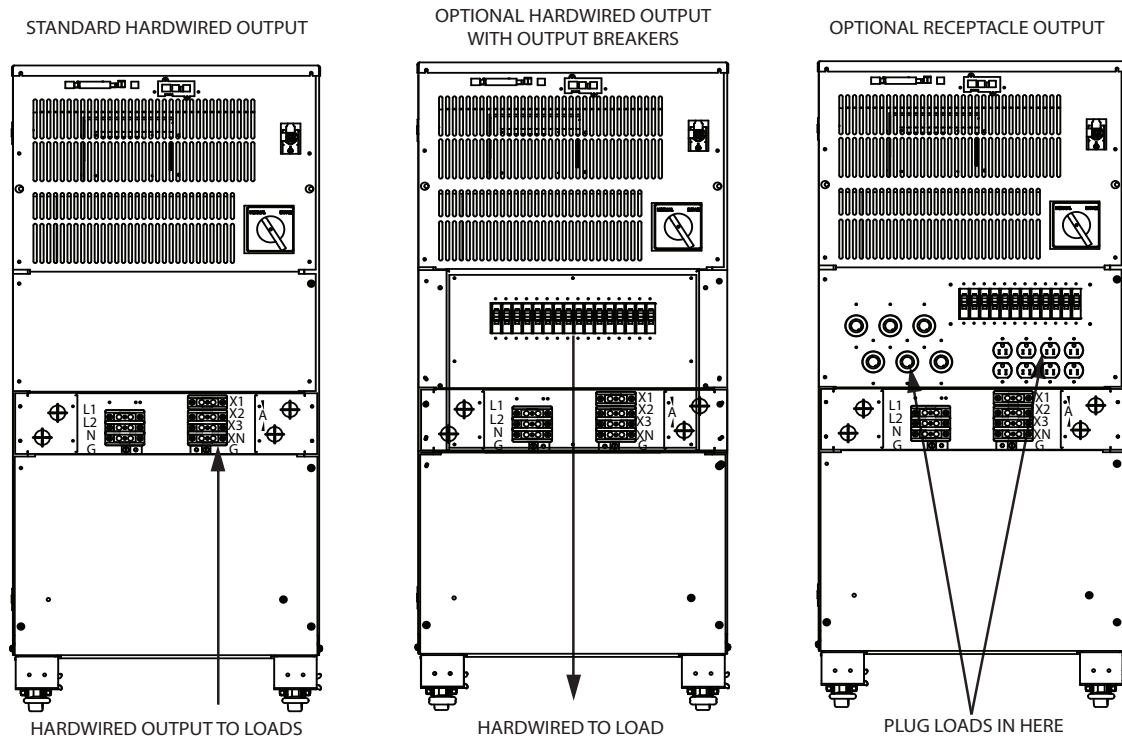
Output hardwire terminals, Torque = 110 Inch Lbs.

Per the NEC, Table 310.16, for a 40 C ambient, the wire sizes are as follows:

Without Distribution: Cabinet "T" - 1 AWG

With Distribution (for all cabinets):

100A - 2 AWG	90A - 2 AWG	80A - 3 AWG	70A - 4 AWG	60A - 4 AWG
50A - 6 AWG	40A - 8 AWG	30A - 10 AWG	20A - 12 AWG	15A - N/A



REAR VIEW - "T" CABINET OUTPUT CONFIGURATIONS

When output breaker options are not purchased, overcurrent protection and disconnection means shall be provided by others.

Based on breaker size and derating factor of 0.88 per NEC Table 310.16. The wire bending space on the "S" cabinet is 2" (i.e. maximum conductor of 3 AWG) and on the "T" cabinet is 7" (maximum conductor of 500 kcmil allowed – the terminal supports up to 2/0).

OUTPUT DISTRIBUTION

"T" CABINET

Breaker with Receptacle: Maximum of (4) Non-Locking Receptacles or Maximum of (6) Locking Receptacles.

Breaker Only Option for Hardwire Connection: Maximum of (16) Poles up to 30A, Maximum of (14) poles up to 60A, Maximum of (12) Poles up to 100A.

CHANGING THE INPUT VOLTAGE



AVAILABLE ONLY ON THE LARGE "T" CABINET - 4.5 - 15.5KVA

***** WARNING *****



RISK OF ELECTRICAL SHOCK

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

***** CAUTION *****



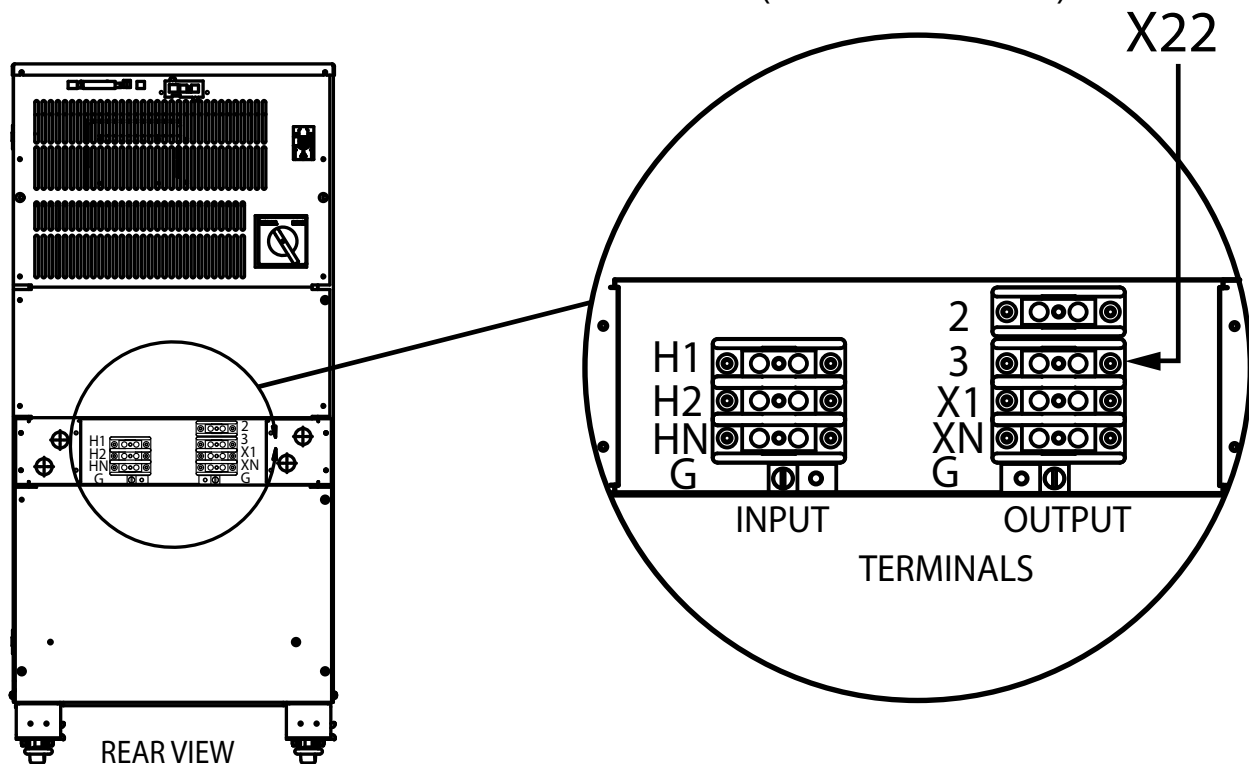
THE FOLLOWING PROCEDURE MUST BE COMPLETED WHEN A CHANGE IN THE
SYSTEMS INPUT VOLTAGE IS REQUIRED. FAILURE TO COMPLETE THE PROCEDURE
WILL RESULT IN IMPROPER MONITOR READINGS AND UNIT FUNCTION.

STEP 1 - INPUT VOLTAGE SELECTION

MOVE THE X22 WIRE TO THE CORRESPONDING TERMINAL
FOR THE DESIRED INPUT VOLTAGE

X22 TO TERMINAL 2 FOR 208V INPUT

X22 TO TERMINAL 3 FOR 240V INPUT (FACTORY SETTING)





CHANGING THE INPUT VOLTAGE CONTINUED

STEP 2 - SET MONITOR PARAMETERS

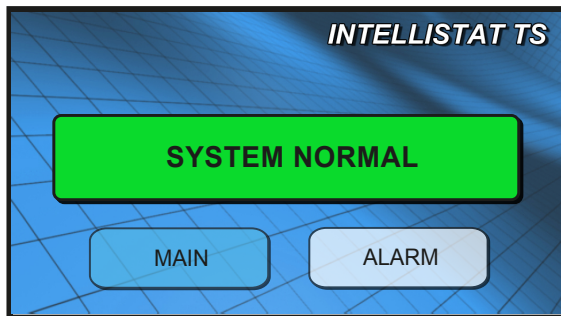


***** CAUTION *****

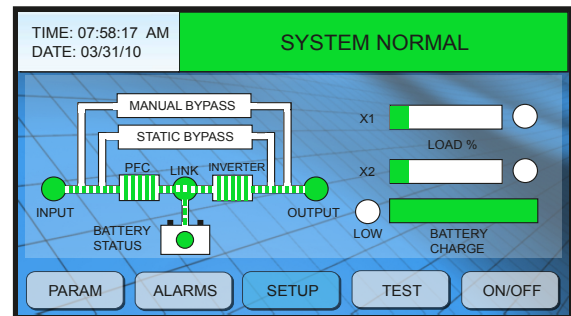


THE FOLLOWING PROCEDURE MUST BE FOLLOWED EXACTLY. DO NOT ALTER ANY OTHER PARAMETERS. THE PASSWORD GIVEN ALLOWS YOU TO MODIFY ALL FACTORY SETTINGS AND SHOULD BE KEPT FROM UNAUTHORIZED PERSONEL.

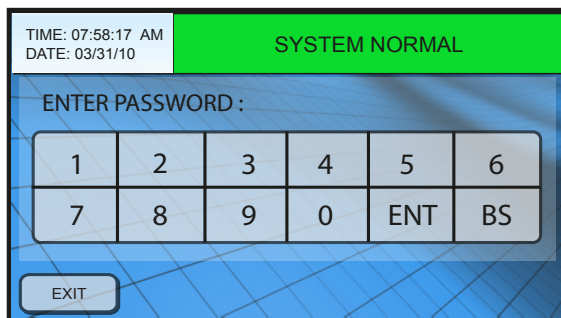
1. From the home screen, select the "MAIN" button.



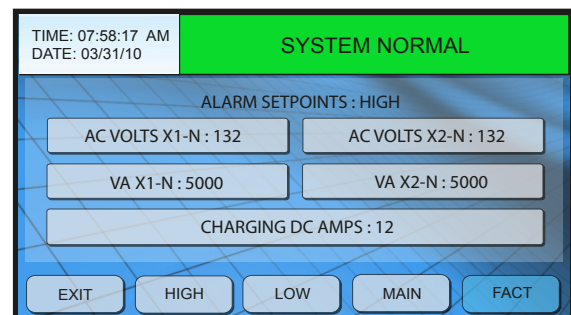
2. The main screen will appear, select "SETUP" button.



3. The "PASSWORD" screen will appear, enter 01955 as the password and then select "ENT".

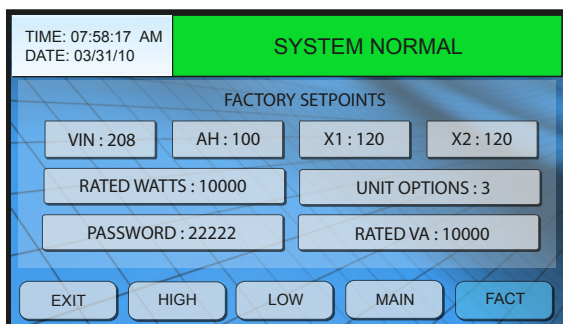


4. The "ALARM SETPOINTS - HIGH" screen will appear, select "FACT".



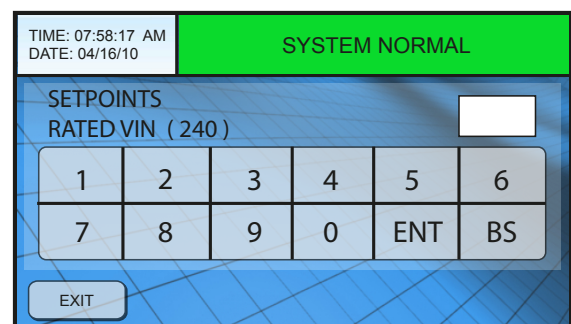
5. The "FACTORY SETPOINTS" screen will appear, select the "VIN" box.

WARNING - DO NOT CHANGE ANY OTHER PARAMETERS.



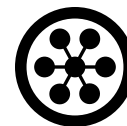
6. The data entry screen for "VIN" will appear, enter the desired input voltage (208 or 240 ONLY) into the data entry screen and select "ENT".

WARNING - DO NOT CHANGE ANY OTHER PARAMETERS.



7. The monitor is now set for the proper input voltage, select the "EXIT" key on each screen until you get all the way back to the "MAIN" screen.

CHANGING THE INPUT VOLTAGE CONTINUED



STEP 3 - SETTING INTERNAL PARAMETERS (SYSTEM MEMORY MODIFICATION)



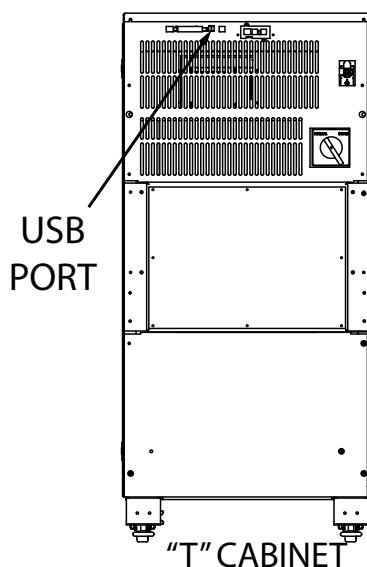
***** CAUTION *****



THE FOLLOWING PROCEDURE MUST BE FOLLOWED EXACTLY.
DO NOT ALTER ANY OTHER PARAMETERS.

Tools required: USB Cable with a type “B” plug, Computer (Windows XP or Vista operating systems only), USB Installation CD and instructions (on CD).

1. Install USB Drivers on the computer. Follow the installation instructions provided on the installation CD.
2. Connect the USB cable to the computer and the USB port on the rear of the ES.



REAR VIEW OF INVERTER CABINET

The ES provides a beneficial means to communicate with a terminal or any TTY emulation program such as **Hyper Terminal**. Communication can be established with most communications programs with the following parameters:

Baud Rate = 9600
Parity = None
Flow Control = Xon / Xoff

Data Bits = 8
Stop Bits = 1
Echo = On

Once communication has been established with the Inverter, system data can be obtained by sending a series of characters to the Inverter. Below is a list of the character commands. **Note: Command entry is case sensitive. All characters must be entered as shown.**

ss = System Parameters
e = End Memory Modification
e = End Battery Test Setup
bb = Battery Test Setup

pp = System Set Points
tt = Inverter Time and Date
ww = Last 5 Shut Downs
BB = Battery Test Logs

ll = Log Functions
cc = Set Inverter Time and Date
rr = Battery Test Parameters
ESC = Scroll Down

mm = System Memory Modification



CHANGING THE INPUT VOLTAGE CONTINUED

3. Once communication has been established, type “mm” (System Memory Modification).
4. Hit the “escape” key to scroll to the desired parameter to be changed, in this case stop when you get to **“Module-Input Nominal L1-L2”**.
5. There are two parameters that need to be changed under the **“Module-Input Nominal L1-L2”** parameter. Go to the **“Change Voltage L1-L2”** parameter and enter the same voltage as the input on the unit you have chosen.
6. Repeat step 5 for the **“Change Output X1-X2”** parameter and enter the same voltage again, as in step 5. **(DO NOT ENTER THE UNITS OUTPUT VOLTAGE - THESE CHANGES PERTAIN TO THE UNITS INTERNAL CIRCUITRY, NOT THE INPUT OR OUTPUT VOLTAGES TO THE UNIT ITSELF).**
7. Hit the “escape” key again until you get to the **“System Input Voltage”** parameter. Enter a “1” for 208V or enter a “2” for 240V, this value must also match the voltage chosen in the previous steps.
8. Finally enter an “e” to save and end the system memory modification. The system is now set and ready for use.

DIP SWITCH SET UP



SETTING THE DIP SWITCHES (SW1)

SW1 Dip Switch Settings (located on the rear panel near the top left - see below).

Switch #1 - For restart options, set this dip switch to one of the following positions.

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

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

Switch #2 – Not used

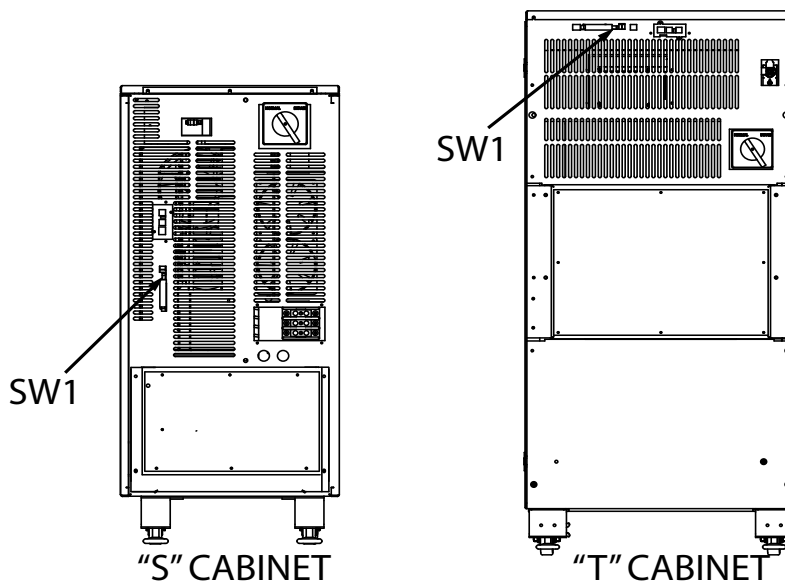
Switch #3 – Not used

Switch #4 – Not used

SW1 DIP SWITCHES

OFF (OPEN)

ON (CLOSED)



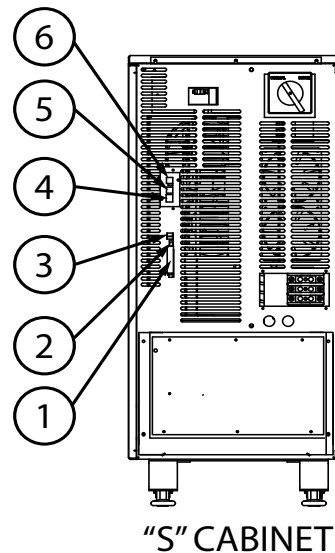
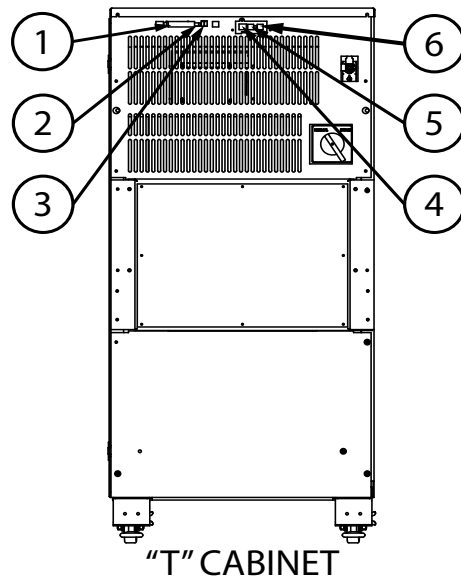
REAR VIEW OF INVERTER CABINET



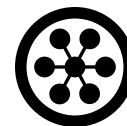
Eleven (11) position contact closure terminal. Provides R.E.P.O., Test Active, General Alarm, Low Battery and On Battery. Note: User selectable, Normally open or closed, Dry contacts rated: 125VAC @ 0.5 Amps.

① K6 ALARM TERMINAL ② SW1 DIP SWITCHES ③ USB PORT (FOR SERVICE USE ONLY)

④ NETMINDER ETHERNET PORT ⑤ RS232 PORT (NOT USED) ⑥ AUX. PORT (NOT USED)



OPTIONAL REMOTE ANNUNCIATOR INSTALLATION



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



REMOTE ANNUNCIATOR

Controlled Power Company's Remote Annunciator is capable of displaying status conditions of an Uninterruptible Power Supply and alarming under critical conditions. The following installation instructions include operation, wiring, and mounting your Remote Annunciator.

OPERATION

During normal operation of the UPS, the Remote Annunciator will illuminate the green UPS 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 UPS 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

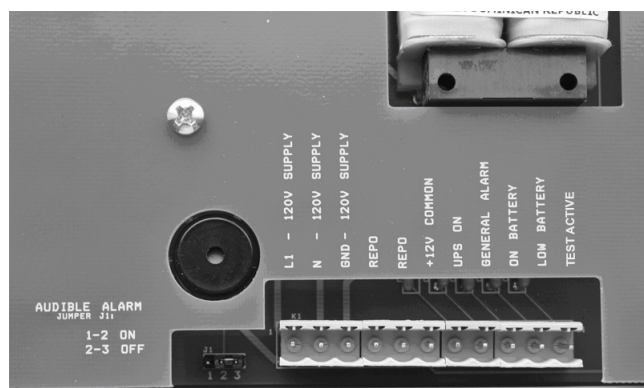


Figure 2: Rear of Remote Annunciator showing J1 and terminal header

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 UPS 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 UPS or a nearby emergency lighting circuit fed by the UPS. From the UPS, 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

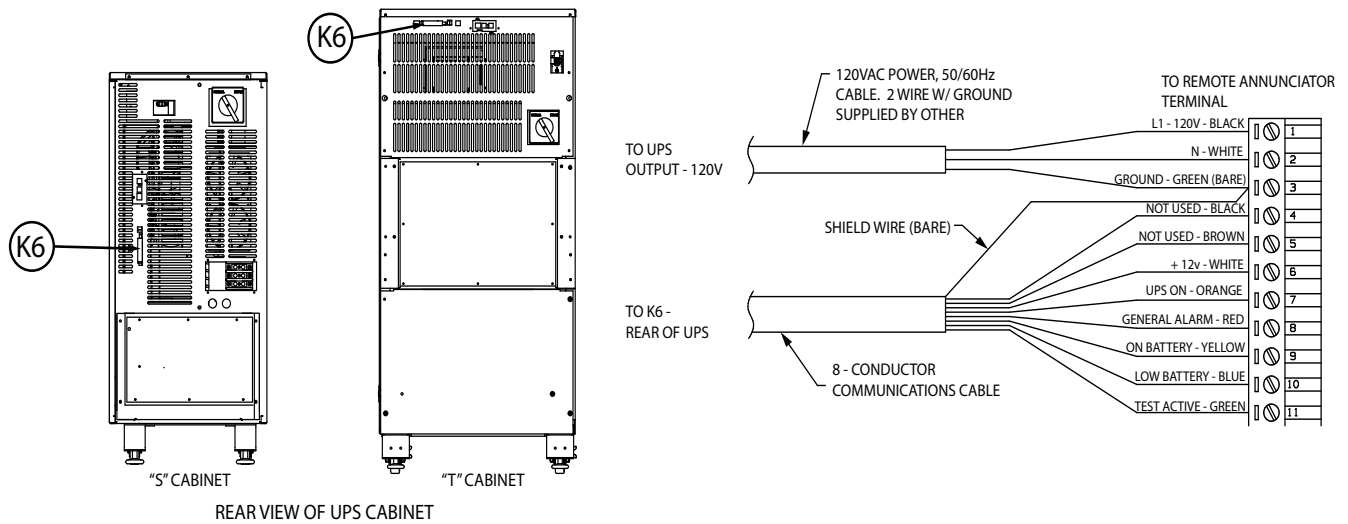


FIGURE 3 - CONNECTOR WIRING AND LOCATION

NOTES:

1. All wires to connector must be stranded, maximum 12 AWG.
2. If using solid conductor for AC power, splice in length (minimum 4") of stranded wire to connector.
3. Strip outer sheathing and foil back minimum 2".
4. Strip all wires 0.25".
5. 120V supply must come from UPS 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 UPS.

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).

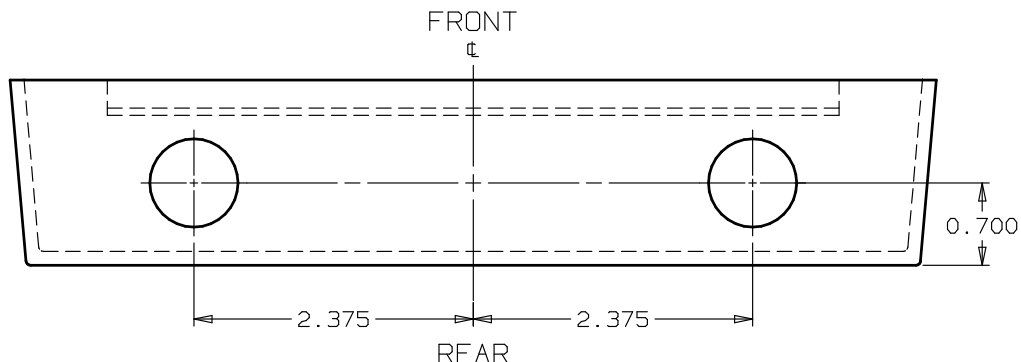
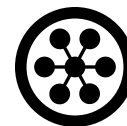


Figure 4: Drilling locations for top/bottom conduit entrance.



NETMINDER REMOTE COMMUNICATIONS

NetMinder Slot Card

The NetMinder Slot Card integrates the “Model ES” into an Ethernet TCP/IP, MODBUS TCP, or MODBUS RS485 network with a specific IP address. The NetMinder offers you remote monitoring of the UPS 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 are available to you via SNMP, e-mail, and network broadcast messaging. Temperature and humidity sensing interface are also available.

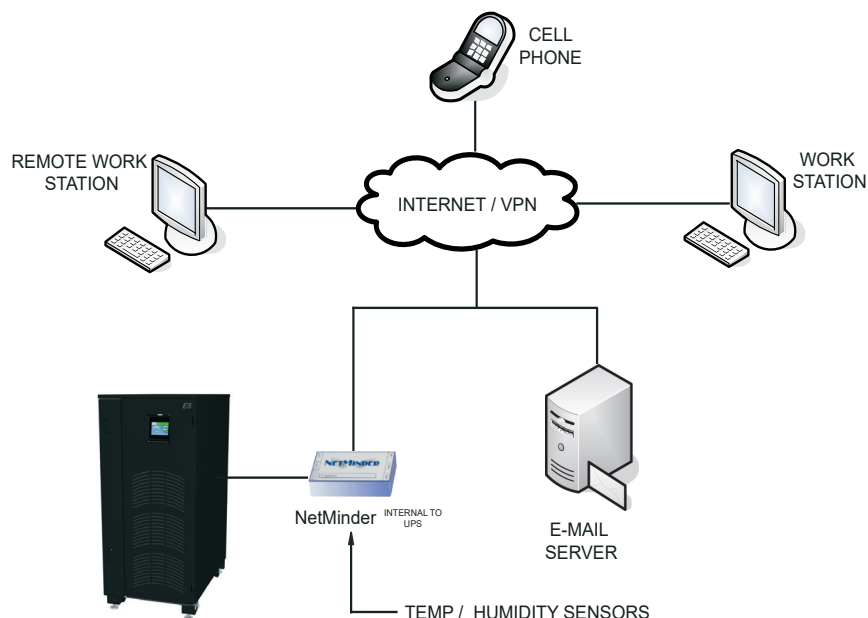
NetMinder RCCMD Shutdown Software

The NetMinder RCCMD is a client-side application that performs the orderly, unattended shutdown of your critical computers or servers.

NetMinder UNMS II UPS Network Management System

The NetMinder UNMS II is a Windows-based, server-side application that allows you to view and manage multiple, network-connected UPS's from a single computer. Using the Basic Version, you can monitor up to (9) UPS's... the Enterprise Version monitors even more UPS's, as well as environmental sensors or alarm contacts, and features a customizable graphical interface.

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 Controlled Power Company's UPS's, but also those of other manufacturers.

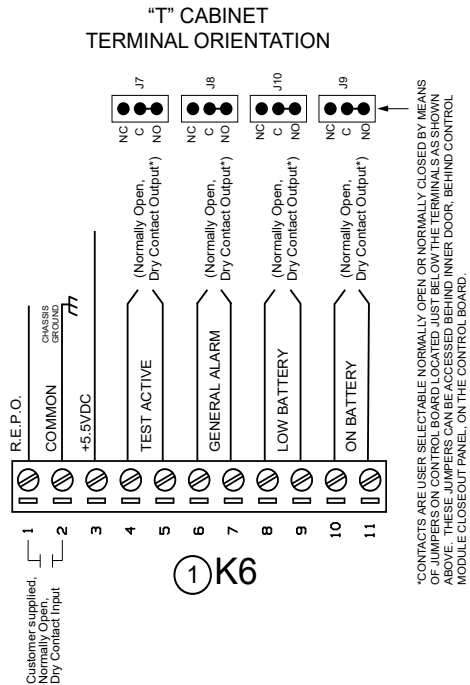


See the accompanying communications manual for setup instructions.

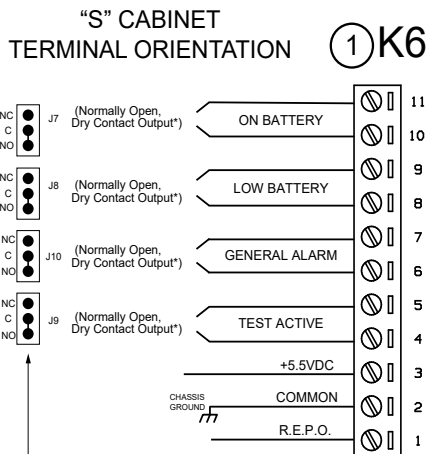
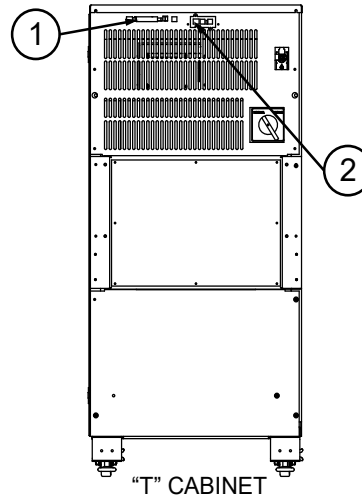
See “Communications Description” and “Options Interconnection Diagrams” for port locations.



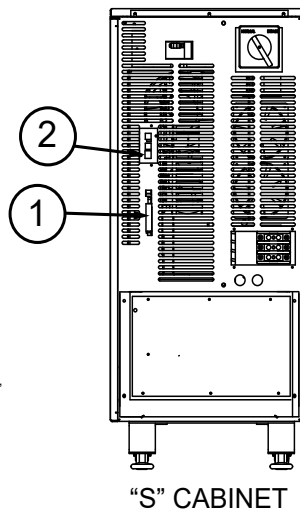
OPTION INTERCONNECTION DIAGRAM



REAR VIEW OF INVERTER CABINET



REAR VIEW OF INVERTER CABINET



TO ETHERNET

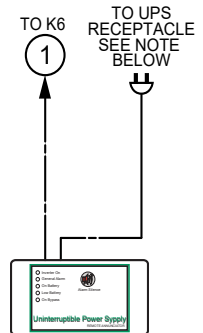


NETMINDER
ADAPTER
(Internal to System)
(See NetMinder
quick start guide
for set up
instructions).

TO K6 PINS 1 - 2



REMOTE
EMERGENCY
POWER OFF
(See
accompanying
installation
documents
for this option)

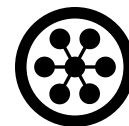


REMOTE ANNUNCIATOR
(See accompanying installation
documents for this option)

Refer to the manual or installation documents that accompanied these devices
for function, use and set up instructions.

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

START UP PROCEDURE



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



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

1. Turn off all AC input and output circuit breakers. Verify that there are not any shorts on the input and output cables.
2. Verify the bypass switch is in the “Normal” position.
3. Check the battery connector for proper voltage and polarity.
4. Verify for correct voltage at the input terminals (H1, H2, HN). This should match the information on the specification tag on the unit.
5. Connect the battery connector (see “*Appendix A - Cabinet Outlines*” for location).
6. Turn on the AC input breaker.
7. Press the “On/Off” button located on the Intellistat TS™ monitor. After an approximate 10 second delay, the unit will power up. See “*Operation - Intellistat TS™ Monitor Operation*”.
8. Check for correct output voltage at the output terminal (X1, X2, XN).

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

9. Turn “**OFF**” the input breaker and verify the system on battery power.
10. Turn “**ON**” the breaker and verify the system returns to normal power.

BEFORE TURNING LOADS ON.

11. Turn the bypass switch to Bypass Mode -See “*Bypass Switch Operation*”. **DO NOT SWITCH WHILE IN BATTERY MODE.**

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

12. Once the unit is out of static bypass, turn on load breakers one at a time. Verify all output voltages and currents. If output voltages are correct, turn “**OFF**” all load breakers.
13. Turn the bypass switch back to normal mode. **DO NOT SWITCH WHILE IN BATTERY MODE.**

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

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



INTELLISTAT TS™ MONITOR DESCRIPTION

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

The Intellistat TS™ - Intelligent status monitoring a UPS's operational status is critical for maintaining operational efficiency, as well as for monitoring the power feeding the computer systems. With this in mind, Controlled Power Company designed the model “ES” with state of the art monitoring features to provide complete system diagnostics and testing with access to all electrical system parameters.

FEATURES

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

INVERTER STATUS AND ALARM INDICATORS

- | | | |
|-------------------------------|---------------------------|-------------------------------------|
| - High / Low Input Voltage | - System Normal | - Auto Battery Test Failed / Passed |
| - High / Low Output Voltage | - General Alarm | - Output Circuit Breaker Open |
| - High Output Volt-Amperes | - System on Battery | - Charger Fail / DC Open Circuit |
| - High / Low Output Frequency | - Low Battery Warning | - System in Static or Manual Bypass |
| - High / Low Battery Voltage | - Low Battery Shutdown | - REPO Active |
| - High Battery Charge Current | - Battery Test in Process | |

MEASURED PARAMETERS

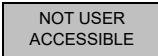
- | | | | |
|------------------|-----------------------|-----------------------|------------------------------|
| - Input Voltage | - Output Volt-Amperes | - Output Percent Load | - Battery Charger Current |
| - Output Voltage | - Output Watts | - Output Frequency | - Battery Capacity Remaining |
| -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

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

MANUAL SYSTEM TESTS - The Intellistat TS™ Monitor also allows the user to manually invoke a user defined system test for 30 seconds.

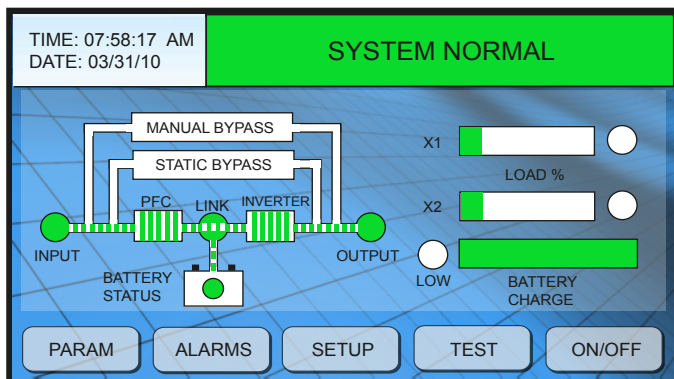
***** CAUTION *****

* WHERE APPLICABLE





INTELLISTAT TS™ MONITOR OPERATION PARAMETER DEFINITIONS



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



INTELLISTAT TS™ MONITOR OPERATION PARAMETER DEFINITIONS

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



OPERATION CONTINUED

INTELLISTAT TS™ MONITOR OPERATION

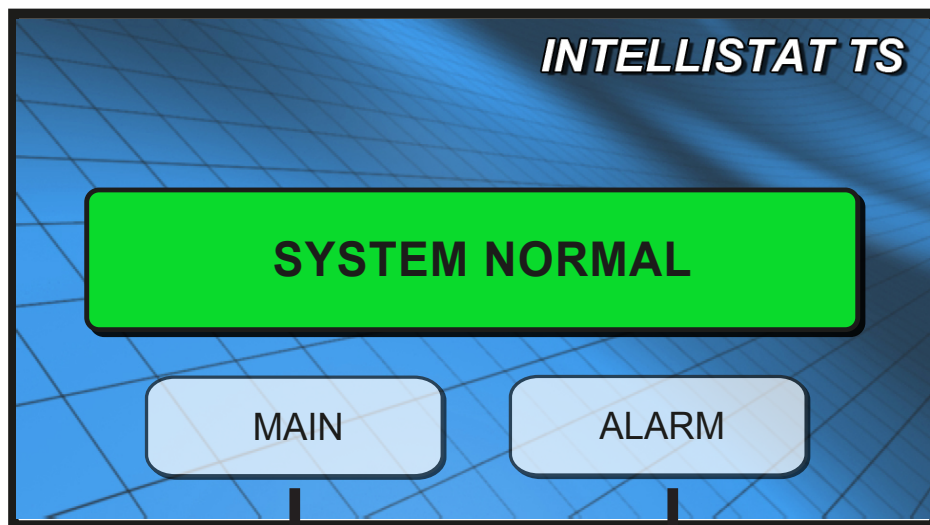


This section will give you a basic understanding of the Intellistat TS™ Monitor, its menu items and functions. All parameters are preset at the factory.

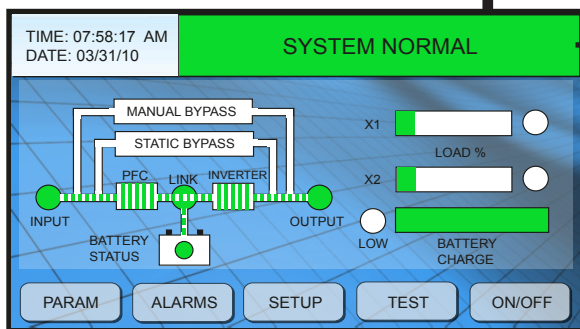


GENERAL - The system is pre-programmed at the factory specific to your unit. There should be no need to change any system parameters. Contact the factory should this become necessary.

HOME SCREEN

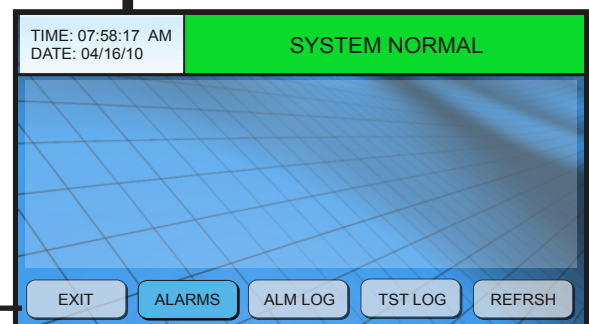


MAIN SCREEN

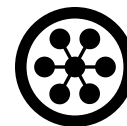


Touch the "SYSTEM NORMAL" box to return to the HOME screen. Only active from the MAIN screen.

ALARM SCREEN



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



INTELLISTAT TS™ MONITOR OPERATION COMMON SCREENS

PASSWORD SCREENS

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

Default customer password = 05151

DATA ENTRY SCREENS

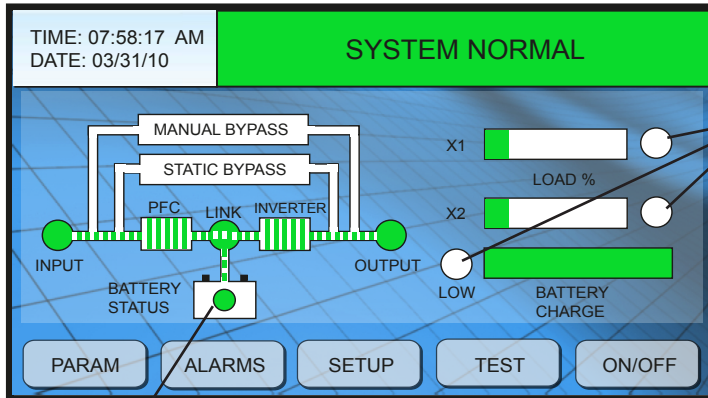
There are many keypad type screens in the following menus. The number selected will appear in the “Entry Box”. Note the “Current Setpoint” to the left of the entry box and the current parameter being modified. Enter the desired number using the key pad. When the numbers desired are fully entered, select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



OPERATION CONTINUED

INTELLISTAT TS™ MONITOR OPERATION

MAIN SCREEN



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

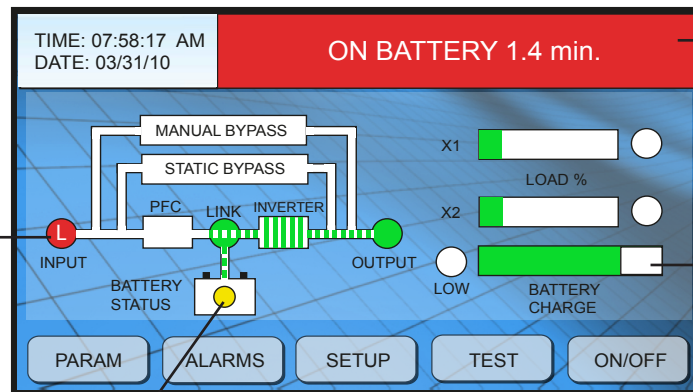
The Battery Status indicator will be green under normal conditions, but will change to yellow when the system is on battery. The battery status indicator will change to red under the following conditions: 1) Battery Test Fail 2) A low battery condition or 3) a weak battery is present.

MAIN SCREEN - ON INVERTER

The system will return to utility power when the proper conditions are present.

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

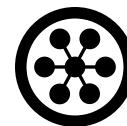
(H) indicates a high line condition caused the inverter to go to battery.



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

Battery charge indicator will decrease while on battery.

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

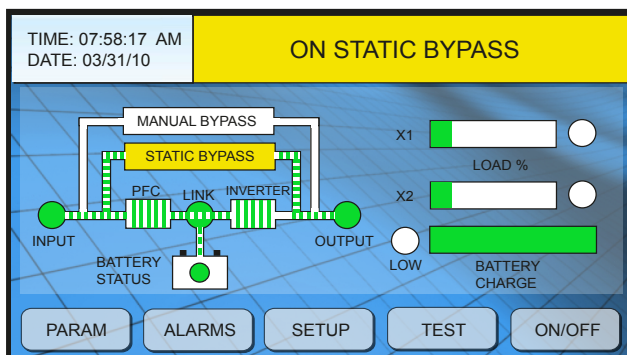


INTELLISTAT TS™ MONITOR OPERATION

TYPICAL BYPASS SCREENS

MAIN SCREEN - ON STATIC BYPASS

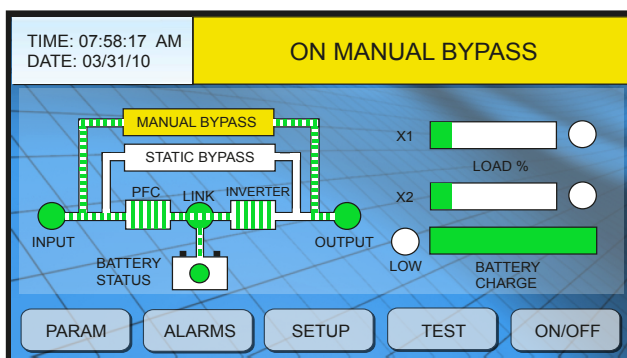
Typical ON STATIC BYPASS screen. There is no alarm indication or logging with this type of event.



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

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.

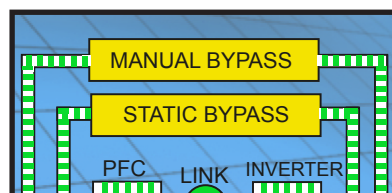
BYPASS SWITCH

SWITCHING THE INVERTER TO BYPASS MODE (system active).

1. Push the knob in all the way and wait until the "On Static Bypass" message appears on the display.
2. Then turn the knob clockwise to the "Bypass" position. "On Manual Bypass" will then be displayed on the monitor. The system is now safely in the bypass mode.

SWITCHING BACK TO NORMAL MODE (system active).

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

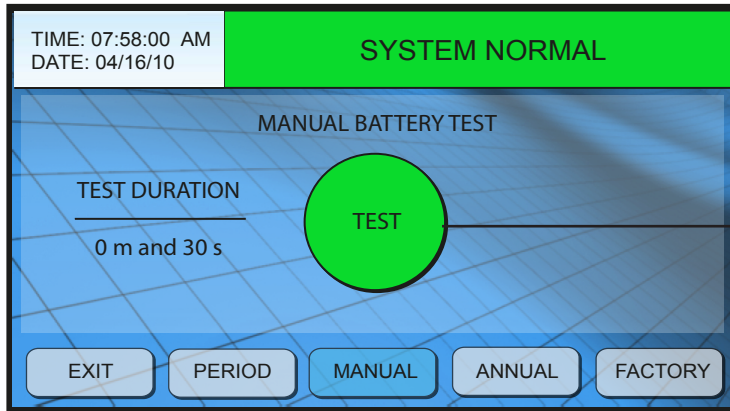




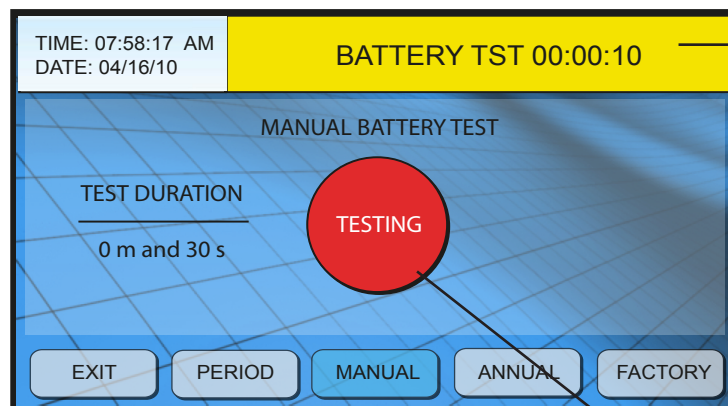
OPERATION CONTINUED

INTELLISTAT TS™ MONITOR OPERATION MANUAL BATTERY TESTING

Default customer password = 05151

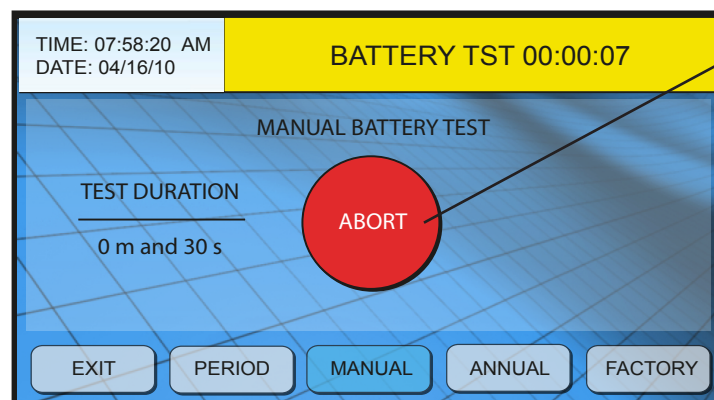


Press the “TEST” button to invoke a battery test (Duration = 30 Seconds). The duration is preset at the factory and is not user accessible. Contact the factory should the duration time need to be modified.



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

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



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



INTELLISTAT TS™ MONITOR OPERATION PERIODIC BATTERY TESTING

Default customer password = 05151

Push to enable the test. Factory preset disabled. 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 = 30 seconds). The duration is preset at the factory and is not user accessible. Contact the factory should the duration time need to be modified.

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

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

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

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

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



OPERATION CONTINUED

INTELLISTAT TS™ MONITOR OPERATION ANNUAL BATTERY TESTING

Default customer password = 05151

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

Press the “TEST” button to invoke a battery test (Duration = 60 seconds). The duration is preset at the factory and is not user accessible. Contact the factory should the duration time need to be modified.

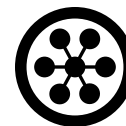
Pushing the test button will invoke the test regardless if the enable/disabled button is enabled or not.

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

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

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

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



INTELLISTAT TS™ MONITOR OPERATION ALARMS, ALARM LOGS AND TEST LOGS

TYPICAL ALARM SCREEN

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

TIME: 07:58:17 AM DATE: 04/16/10	PUSH TO SILENCE!	TOTAL ALARM: 01	PUSH TO SILENCE!
AC OUTPUT VOLTS X1 - N HIGH = 129.9			
EXIT	ALARMS	ALM LOG	TST LOG
		REFRSH	

PUSH TO
SILENCE

PUSH TO
REFRESH
ALARM
CONDITIONS

TYPICAL ALARM LOG SCREEN

STORES UP TO 25
EVENTS.

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

TIME: 07:58:17 AM DATE: 04/16/10	SYSTEM NORMAL		
01 OF 25 - 06:20 AM 04/16/10			
AC OUTPUT VOLTS X1-N HIGH = 135.5			
PREVIOUS	NEXT	DELETE	DEL ALL
EXIT	ALARMS	ALM LOG	TST LOG
		REFRSH	

NOT
FUNCTIONAL
FROM THIS
SCREEN

TYPICAL TEST LOG SCREEN

STORES UP TO 25
EVENTS.

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

TIME: 07:58:17 AM DATE: 03/31/10	SYSTEM NORMAL		
24 OF 25 - 10:00 AM 01/15/10			
PERIODIC TEST : PASS			
PREVIOUS	NEXT	DELETE	DEL ALL
EXIT	ALARMS	ALM LOG	TST LOG
		REFRSH	

NOT
FUNCTIONAL
FROM THIS
SCREEN



INTELLISTAT TS™ MONITOR OPERATION ALARM MESSAGES AND DEFINITIONS

LOG / CURRENT / RS232	ALARM	BANNER
AC OUTPUT VOLTS X1-N HIGH = 121.3	THE OUTPUT VOLTAGE ON LINE 1 IS ABOVE THE OUTPUT VOLTAGE HIGH SETPOINT.	TOTAL ALARM: 01
AC OUTPUT VOLTS X2-N HIGH = 121.3	THE OUTPUT VOLTAGE ON LINE 2 IS ABOVE THE OUTPUT VOLTAGE HIGH SETPOINT.	TOTAL ALARM: 01
DC CHARGER FAIL	THE BATTERY CHARGER HAS FAILED.	TOTAL ALARM: 01
AC OUTPUT AMPS X1-N HIGH = 13.2	THE OUTPUT CURRENT ON LINE 1 IS ABOVE THE OUTPUT CURRENT HIGH SETPOINT.	TOTAL ALARM: 01
AC OUTPUT AMPS X2-N HIGH = 13.2	THE OUTPUT CURRENT ON LINE 2 IS ABOVE THE OUTPUT CURRENT HIGH SETPOINT.	TOTAL ALARM: 01
OUTPUT VA X1-N HIGH = 1200.2	THE OUTPUT VA ON LINE 1 IS ABOVE THE OUTPUT VA HIGH SETPOINT.	TOTAL ALARM: 01
OUTPUT VA X2-N HIGH = 1200.2	THE OUTPUT VA ON LINE 2 IS ABOVE THE OUTPUT VA HIGH SETPOINT.	TOTAL ALARM: 01
OUTPUT FREQUENCY HIGH = 66.2	THE OUTPUT FREQUENCY IS ABOVE 62.5 HZ.	TOTAL ALARM: 01
UNIT FAILED TO START	THE UNIT FAILED TO PROPERLY TURN ON.	UNIT FAILED TO START
BATTERY DC VOLTS HIGH = 155.2	THE BATTERY VOLTAGE IS ABOVE 150 VDC.	TOTAL ALARM: 01
BATTERY DC AMPS HIGH = 32.2	THE BATTERY CHARGING CURRENT IS ABOVE THE CHARGING CURRENT HIGH SETPOINT.	TOTAL ALARM: 01
HIGH TOTAL OUTPUT VA = 2400.4	THE TOTAL VA IS ABOVE THE UNIT RATING.	TOTAL ALARM: 01
AC OUTPUT VOLTS X1-N LOW = 99.2	THE OUTPUT VOLTAGE ON LINE 1 IS BELOW THE OUTPUT VOLTAGE LOW SETPOINT.	TOTAL ALARM: 01
AC OUTPUT VOLTS X2-N LOW = 99.2	THE OUTPUT VOLTAGE ON LINE 2 IS BELOW THE OUTPUT VOLTAGE LOW SETPOINT.	TOTAL ALARM: 01
OUTPUT FREQUENCY LOW = 54.3	THE OUTPUT FREQUENCY IS BELOW 57.5 HZ.	TOTAL ALARM: 01
BATTERY DC VOLTS LOW = 113.2	THE BATTERY VOLTAGE IS BELOW THE BATTERY VOLTAGE LOW SETPOINT.	TOTAL ALARM: 01
AC INPUT VOLTS L1-N HIGH = 134.2	THE INPUT VOLTAGE IS 9% ABOVE THE RATED INPUT VOLTAGE.	TOTAL ALARM: 01
AC INPUT VOLTS L1-N LOW = 99.2	THE INPUT VOLTAGE IS 12% BELOW THE RATED INPUT VOLTAGE.	TOTAL ALARM: 01
OUTPUT CIRCUIT BREAKER OPEN	OUTPUT CIRCUIT BREAKER HAS TRIPPED	TOTAL ALARM: 01
ON MANUAL BYPASS	SYSTEM IS ON MANUAL BYPASS.	ON MANUAL BYPASS
ON BATTERY 1.3 MIN	SYSTEM IS ON BATTERY	ON BATTERY 1.3 MIN
LAST POWER OFF: USER REPO	SYSTEM SHUTDOWN DUE TO USER REPO	TOTAL ALARM: 01
LAST POWER OFF: OVERTEMPERATURE	SYSTEM SHUTDOWN DUE TO AN OVER TEMPERATURE	TOTAL ALARM: 01
OVERTEMPERATURE WARNING	THERE IS AN OVER TEMPERATURE WARNING	TOTAL ALARM: 01
LAST POWER OFF: DC BUS VOLTAGE HIGH	SYSTEM SHUTDOWN DUE TO AN OVERVOLTAGE ON THE DC BUS.	TOTAL ALARM: 01
DC BUS VOLTAGE HIGH WARNING	THERE IS A DC BUS TOO HIGH WARNING.	TOTAL ALARM: 01
LAST POWER OFF: OVERLOAD	SYSTEM SHUTDOWN DUE TO AN OUTPUT OVERLOAD.	TOTAL ALARM: 01
OVERLOAD WARNING	THERE IS AN OVERLOAD WARNING.	TOTAL ALARM: 01
LAST POWER OFF: DC BATTERY DC VOLTS LOW	SYSTEM SHUTDOWN DUE TO A BATTERY CUT OFF.	TOTAL ALARM: 01
BATTERY DC VOLTS LOW WARNING	BATTERY IS CLOSE TO CUT OFF.	TOTAL ALARM: 01
LAST POWER OFF: NORMAL	UNIT WAS SHUT OFF BY USER.	-
-	UNIT IS STARTING UP.	STARTING UP
-	ON BATTERY TEST.	BATTERY TST 00:11:35
-	THE SYSTEM IS ON MANUAL BYPASS AND BATTERY.	ON MANL BYP & BTTRY
-	THE SYSTEM IS ON STATIC BYPASS.	ON STATIC BYPASS
-	THE SYSTEM IS NORMAL, NO ALARMS OR CONDITIONS.	SYSTEM NORMAL
-	SYSTEM IS TURNED OFF.	CONTROL MODULE OFF

OPERATION CONTINUED

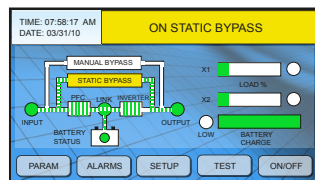


BYPASS SWITCH OPERATION - The purpose of the bypass switch is to connect the loads to utility power in case of inverter failure. The bypass function is a push to turn mechanical switch.

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

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

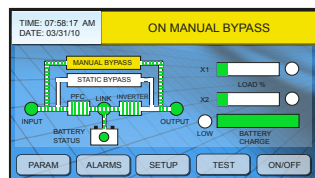
THIS PROCEDURE IS ONLY APPLICABLE WHEN THE SYSTEM IS ACTIVE. THE BYPASS MAY BE SWITCHED AT ANYTIME ONLY IF THE SYSTEM IS COMPLETELY SHUT DOWN.



BYPASS SWITCH

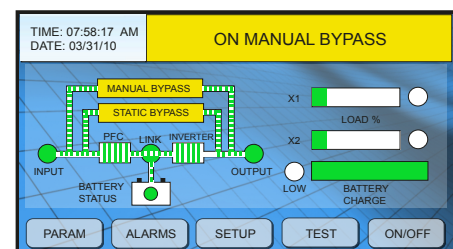
SWITCHING THE INVERTER TO BYPASS MODE (system active).

1. Push the knob in all the way and wait until the “On Static Bypass” message appears on the display.
2. Then turn the knob clockwise to the “Bypass” position. “On Manual Bypass” will then be displayed on the monitor. The system is now safely in the bypass mode.



SWITCHING BACK TO NORMAL MODE (system active).

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



After switching to bypass mode, it is recommended that the DC battery connector be disconnected from the control module. This will prevent battery discharge and possible battery damage if left in bypass mode for extended periods of time. The DC Connector is located inside the front door on large units - on smaller cabinets; top and left side panel removal is required. See “Appendix A - Cabinet Outlines” for location.

Be sure to reconnect the DC battery connector before returning to normal mode operation.



MAINTENANCE PROCEDURES



***** DANGER - HIGH VOLTAGE *****



GENERAL MAINTENANCE

The best preventive maintenance is to operate the ups 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 UPS should be checked monthly for battery operation. Take precautions to have the 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 loads should be available to test the UPS with a loss of power simulation.

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

SYSTEM OPERATION

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

VISUAL INSPECTION

1. Remove top, front panel (or open door) and remove side panels.
2. Turn the unit off by means of the monitor and disconnect the battery connector. Then turn off the main input breaker on the unit and the main feed breaker.
3. Check for burnt, frayed, broken or loose connections. Look closely in the following areas: Input, 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.
 - A. Check the generator operation with no load. The unit should switch to inverter when the generator turns on. After a minute or so the UPS should switch back to normal mode and run off the generator.
 - B. Check the generator with the loads.

BATTERY MAINTENANCE



BATTERY MAINTENANCE

***** WARNING *****



Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions.

Keep unauthorized personnel away from batteries.

SEE "INSTALLATION PRECAUTIONS"



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

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



*** DANGER - HIGH VOLTAGE ***



Optimum battery performance and life is at 25°C. Warranty does not cover batteries used and operated above 40°C for any length of time.

Warranty does not cover any defects or damages caused by failure to properly store the Product before installation, including the charge of batteries if not in use (charged) for more than 6 months. Battery storage temperature when not in use is 25°C for 6 months. For each 9°C rise, reduce storage time by half.

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



MANUAL BATTERY TESTING

BATTERY TESTING

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

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

GENERAL - The inverter is preset at the factory for a 30 second manual battery test. During the test, 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 (30 seconds).
2. The unit will stay in battery mode for the pre-programmed duration and then return to normal mode. You will have the option to abort the test if required. See *“Operation - Intellistat TS™ Monitor - Manual Battery Testing”*.
3. If the health of the battery string is suspect, a general alarm will exist on the Intellistat TS™ monitor and the general alarm will continue to exist after the battery test is complete. By going to the ALM LOG screen on the Intellistat TS™ Monitor a BATTERY TEST FAIL indication will be displayed in the TST LOG screen. A contact closure signal is also provided as a result of the general alarm status. The general alarm signal may be used for external / remote communications. See *“Dip Switch and Alarm Terminal Setup”* or *“Option Interconnection Diagram”* for details.

AUTOMATIC MONTHLY BATTERY TESTING



AUTOMATIC PERIODIC (MONTHLY) BATTERY TEST

GENERAL - The inverter is preset at the factory for automatic monthly testing disabled. The inverter is preset at the factory for a 30 second periodic (monthly) battery test and takes place on the programmed calendar date (if enabled). 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 the test, 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 *“Dip Switch and Alarm Terminal Setup”* or *“Option Interconnection Diagram”* for details.

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

To force a periodic test:

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



AUTOMATIC ANNUAL BATTERY TESTING

AUTOMATIC ANNUAL BATTERY TEST

GENERAL - The inverter is preset at the factory for a 60 second annual battery test and takes place on the programmed calendar date (if enabled) Factory default = disabled. The programmed test date is on the 15th of the following month one year from date of shipment at 10PM. Check your display for the programmed battery test time (TEST MENU). During the test, 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.

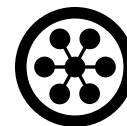
If the health of the battery string is suspect, a general alarm will exist on the Intellistat TS™ monitor and the general alarm will continue to exist after the battery test is complete. By going to the ALM LOG screen on the Intellistat TS monitor a BATTERY TEST FAIL indication will be displayed in the 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 *"Dip Switch and Alarm Terminal Setup"* or *"Option Interconnection Diagram"* 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 (depending on the period set) later on the same date and time the test button was initially pushed (if enabled).

To force an annual test:

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

SPECIFICATIONS



Performance Specifications

- Input Voltage: (120*)(208)(208/120)(220)(240)(240/120)(347)(480)(600) VAC. *120 VAC up to 5500 VA.
- Input Voltage Range: +12% to -15% at full load without battery usage. Note: For input voltage excursions within +12 to -50%, UPS will incorporate Adaptive Input Range control, in conjunction with the load percentage, to accept this range without using battery, still maintaining specified output voltage regulation.
- Input Frequency Range: 57 Hz to 63 Hz. Generator compatible.
- Input Power Factor: Self corrected to >.98 (approaching unity).
- Input Current Harmonics: < 5% THD (Total Harmonic Distortion).
- Output VA Rating: (4500) (5500) (6500) (7500) (8300) (9000) (10000) (11000) (12000) (13500) (14500) (15500) VA.
- Output Voltage: (120*)(208/120)(240/120)(240/208/120**) VAC. *120 VAC up to 5500 VA.
**Full rated load from a single 120VAC output (4500 VA through 11000 VA)
- Output Voltage Distortion: Sinewave with less than 3% THD under linear load.
- Output Frequency: 60 Hz +/- 0.5% under full load during battery mode of operation.
- Voltage Regulation: +/- 1.5%, no load to full load.
- Output Power Rating: VA at 0.90 power factor. VA x PF = Watts.
- Battery Time: Battery run times are specified at full rated output watts.
- Battery Type: Integral, valve regulated, sealed lead calcium, maintenance free with 10 year design life.
- Charger Type: Integral, 4 stage, temperature compensated.
- Charger Ratings: 5 amp for battery options A and B and all 6500VA units. 10 amp for battery options C through J.
- Recharge Time: <10 times the discharge period to 90% capacity.
- DC Bus Voltage: 120 VDC
- Overload Rating for system: 125% for 2 minutes, 150% for 30 seconds, 200% for 15 cycles when fed from an AC power source.
- On Battery Overload Rating: 125% for 30 cycles, 150% for 3 cycles.
- Common Mode Attenuation: 70 dB minimum (models with internal shielded isolation transformer).
- Transverse Mode Attenuation 60 dB minimum at 100KHz (models with internal shielded isolation transformer).
- Reactive Power Correction: Load @ .6PF automatically corrected to >.98 at input.
- Efficiency: 87% at full load typical.



WARRANTY

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

<https://controlledpwr.com/customer-support/warranty-registration/>

Limited Warranty

General:

Controlled Power Company ("CPC") offers with this product a Three Year Warranty Against Defects in Material and Workmanship. Please read your Warranty carefully. This Warranty explains the responsibilities of CPC should you encounter a defect. Contact the CPC service department at 1-800-521-4792 to request Warranty service. This Warranty is valid only in the United States and Canada.

Three Year Limited Warranty Against Defects in Material and Workmanship

Covered Product:

Model ES Uninterruptible Power System (UPS), 4.5kva – 15.5kva

Terms of Warranty:

The Model ES Uninterruptible Power System's electronics and controls are warranted to be free of defects in material and workmanship for a period of thirty-six (36) months from the date of product shipment from the factory, but in no case to exceed thirty-nine (39) months from the date of product shipment from the factory. Under the terms of this Warranty, on-site labor is provided during normal business hours (Monday through Friday, 8am-4PM) for the first ninety (90) days from the date of product shipment from the factory, but in no case to exceed fifteen (15) months from the date of product shipment from the factory. The batteries supplied by CPC with the UPS are warranted for twenty-four (24) months from the date of shipment from the factory, covering the full replacement of defective batteries. Battery coverage is extended to a thirty-six (36) month pro-rate if under a customer support plan. If any portion of the system fails to conform to the Warranty within the period of coverage offered by the Warranty, CPC shall, at its option, repair or replace the product or components with new or factory remanufactured products or parts. Replacement parts shall be covered under this Warranty for the duration of the original Warranty as it applies to the original purchase of the product. The Warranty commencement and on-site labor coverage are dependent on the purchase of CPC factory "Start-Up Plus" service as described below.

Products Purchased WITH Factory Start-Up Plus:

CPC shall cover the cost of replacement parts, shipping parts, and on-site labor (Monday through Friday, 8am-4PM) for a period of twelve (12) months from date of Warranty commencement. Warranty begins on the date of start-up by a factory authorized service representative, or 90 days from date of product shipment from the factory, whichever occurs first. In no case shall labor coverage exceed fifteen (15) months from the date of product shipment from the factory. All replaced products or components become the property of CPC.

Products Purchased WITHOUT Factory Start-Up Plus:

CPC shall cover the cost of replacement parts that are found to be defective within the Warranty period. During the first ninety (90) days from the date of product shipment from the factory, on-site labor will be covered during normal business hours (Monday through Friday, 8am-4PM). During this same 90 day period, CPC will cover the shipping cost of replacement parts.

The Warranty period on the UPS's electronics and controls shall not exceed thirty-six (36) months from the date of product shipment from the factory. The Warranty period on the batteries supplied by CPC with the UPS shall not exceed twenty-four (24) months from the date of shipment from the factory. Battery coverage is extended to a thirty-six (36) month pro-rate if under a customer support plan. After ninety (90) days from the date of product shipment from the factory, the purchaser may choose to return defective product or components to CPC for repair or replacement, freight prepaid, or provide CPC with a valid purchase order or credit card number for the full cost of the replacement parts, shipping of parts, and on-site labor. In either case, upon return of the product or components to the factory, CPC will inspect the returned product or components. If the product or components are found to be defective, CPC shall cover the cost of replacement parts, and in-house labor for repairs or replacement. The cost of on-site labor and shipping of defective and replacement components to and from CPC is the responsibility of the purchaser, and shall be billed against the purchase order or credit card provided by the purchaser. If after factory inspection, the product or component failure has been caused by misuse or abnormal conditions in the judgment of Controlled Power Company, the purchaser shall be charged for repairs based on parts and labor required. All replaced products or components become the property of CPC.

What This Warranty Does NOT Cover:

Products and components are not covered by the Warranty if damage or defect to the product or component is caused by misuse, improper installation, improper application, negligence, inadequate electrical current or connection, Acts of God, exposure to the elements, civil unrest, corrosive atmosphere, freight damage, tampering, or alterations made by personnel NOT authorized by CPC and without prior written consent of a CPC officer.

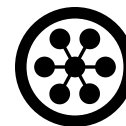
Warranty of the battery is void if the battery is allowed to discharge below the minimum battery voltage cut-off point. To prevent a discharge such as this, DO NOT leave the batteries connected while the product is off or in the bypass mode for more than 72 hours. Batteries not in use or in storage must be charged every 6 months, beginning from the original date of shipment from the factory. Warranty of the battery is void if the battery is used in an environment such that the temperature exceeds 104° F (40° C) for any length of time.

Limitations:

This Warranty is in lieu of all other warranties, expressed or implied. CPC neither assumes, nor authorizes any person to assume for it, any liability other than specifically set forth in this Warranty. Except for its obligations, CPC assumes no liability or responsibility for personal injury, loss of life, consequential or other damages including, but not limited to, loss of profits, loss of data, or interruptions in business, resulting from defects in, or failure of, the product or any of its components.

No salesperson, employee or agent of CPC is authorized to add to or vary the terms of this Warranty. Warranty terms may not be modified without a writing signed by a CPC officer.

<https://controlledpwr.com/customer-support/warranty-registration/>



Contact Controlled Power Company.

Controlled Power Company offers total Customer Support that assures your critical equipment is maintained properly for trouble free operations.

WHAT A CUSTOMER SUPPORT PLAN OFFERS:

Hotline: 24 hour toll free 1-800-521-4792.

Response Time: 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: Battery changes, installation, freight, travel and disposal are covered under a 36 month pro-rate schedule when enrolled in a service plan, beginning from the original date of shipment or battery installation date. Batteries are not covered if they were not supplied by Controlled Power Company.

Preventative Maintenance: Scheduled preventative maintenance includes the following:

- Inspection
- Exercising all circuit breakers
- Input and output parameter check
- Complete battery inspection and testing
- Re-tighten all high current terminals and connectors
- Testing all emergency circuitry
- Calibration
- Clean internal and external
- Written report

Start Up Plus : If a Start-Up Plus is purchased with the unit(s) or within 30 days from original ship date, the 1st year warranty is upgraded to include onsite labor and expenses during normal business hours. Warranty begins from date of shipment unless a factory start-up is purchased then the warranty begins from date of Start-Up 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 (where applicable) - Re-torque all high current terminals - Battery certification report (where applicable) - Input/Output verification - Written report. User training to be done at time of start up (no return visits). Product installation is required to be complete before start up can be scheduled.

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

TRAINING AND PARTS

For Customers who maintain their own equipment, Controlled Power offers hands on training at our 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. 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

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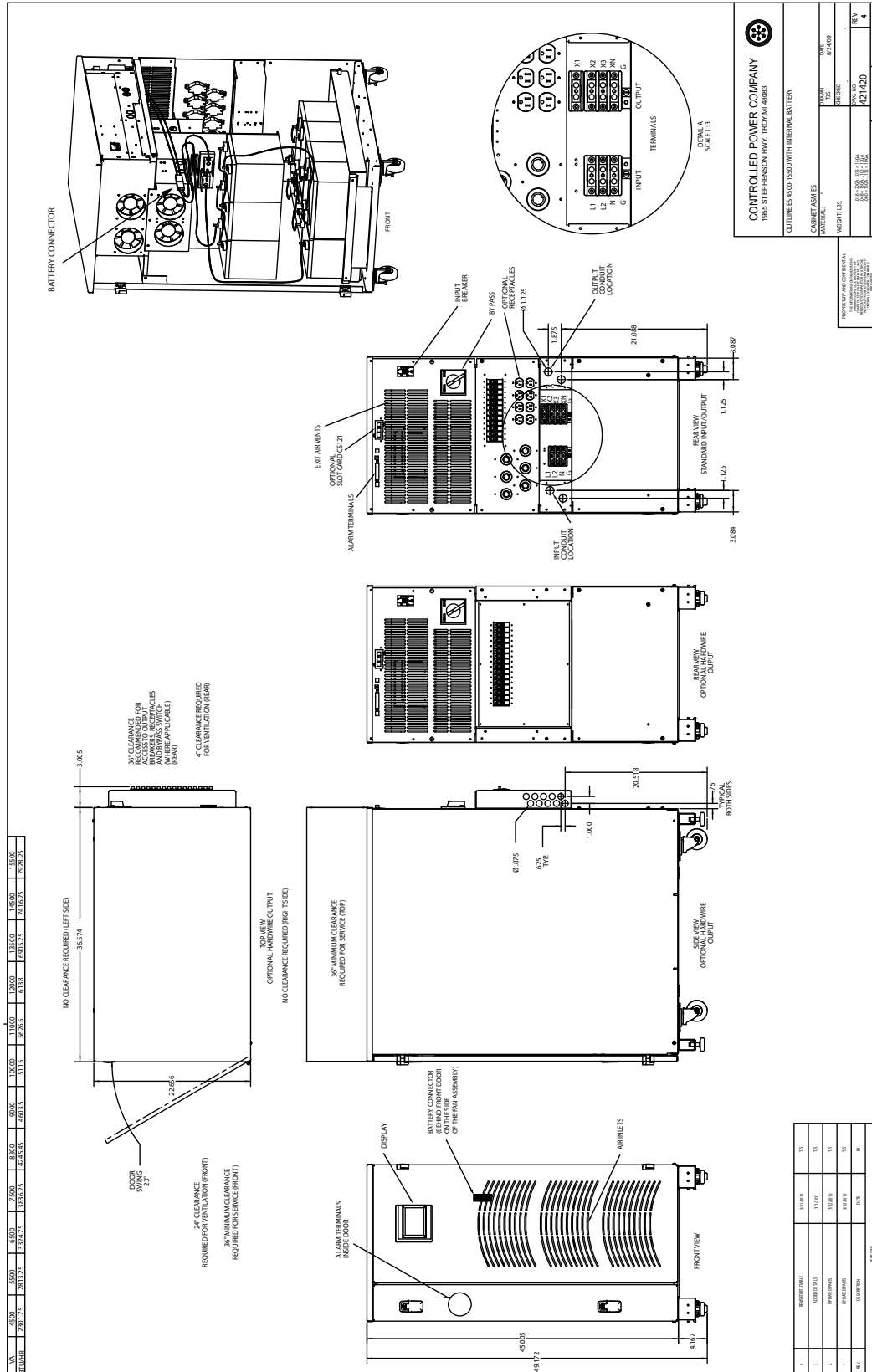
SCHEMATICS

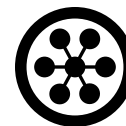




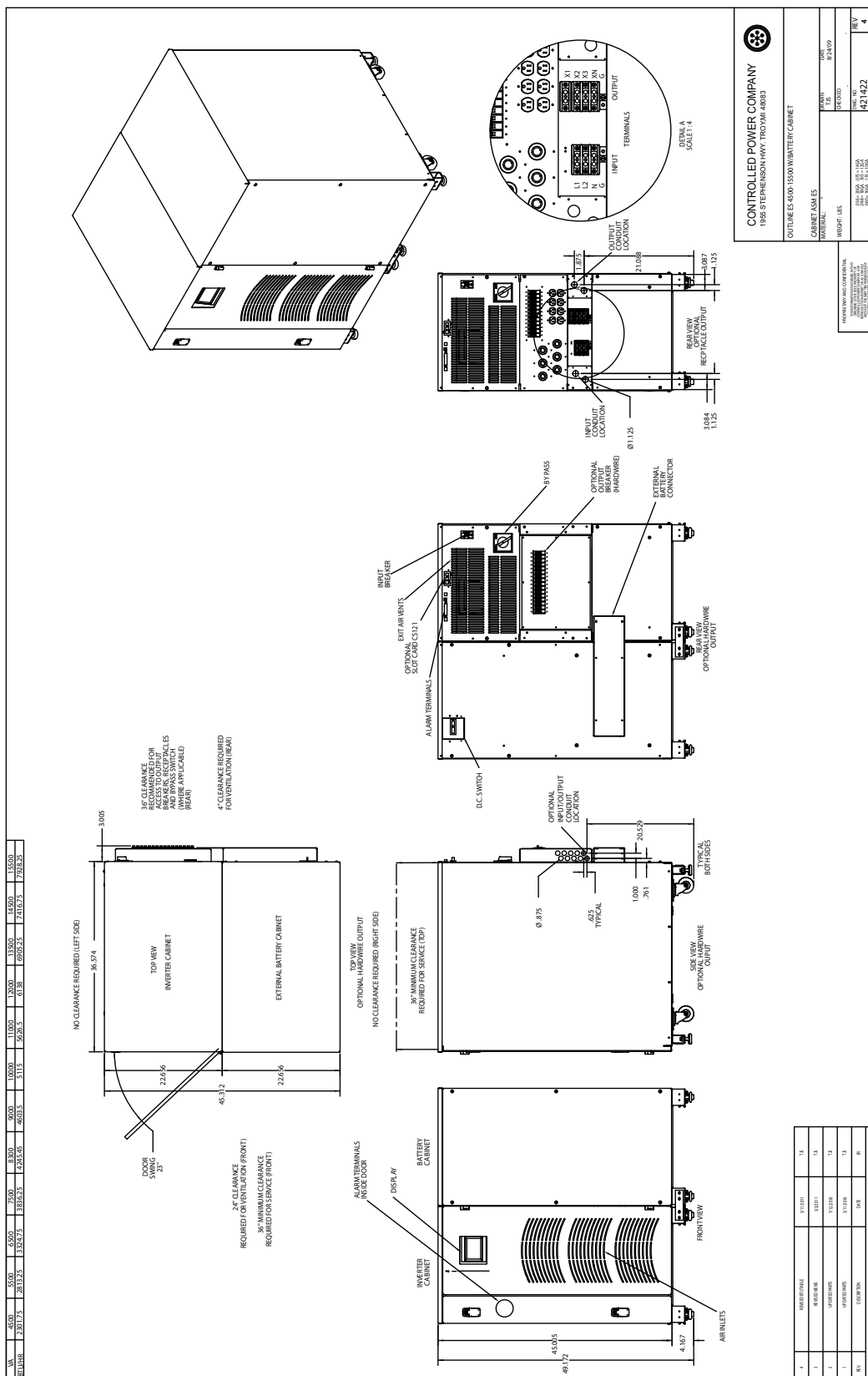
CABINET OUTLINE

12.0 KVA - 15.5 KVA WITH INTERNAL BATTERIES





4.5 KVA - 15.5 KVA WITH EXTERNAL BATTERIES





BATTERY REQUIREMENTS



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



BATTERIES FOR ES	
MANUFACTURER	BATTERY MODEL NUMBER
Energys	NP24-12
CSB	GP12400
East Penn Deka	U1HR1500
East Penn Deka	24HR3000
East Penn Deka	45HR2000
GNB Sprinter	HR3000
GNB Sprinter	S12V120/F
GNB Sprinter	S12V170/F
C&D Technologies	S12V285/F
C&D Technologies	UPS12-150MR
C&D Technologies	UPS12-210MR
C&D Technologies	UPS12-300MR
C&D Technologies	UPS12-350MR
C&D Technologies	UPS12-400MR
Northstar	NSB-40
Northstar	NSB-75

**** WARNING ****



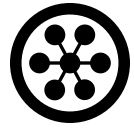
**BATTERY MAINTENANCE, INSTALLATION AND OR REPLACEMENT
SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY**



**CAUTION - HIGH VOLTAGE EXISTS, CAUTION MUST BE TAKEN WHEN
WORKING NEAR THE BATTERY TERMINALS. POWER IS SUPPLIED BY MORE THAN
ONE SOURCE. MAKE SURE AC CIRCUIT BREAKER IS OFF AND THE INPUT PLUG
IS DISCONNECTED FROM BUILDING POWER BEFORE OPENING THE ENCLOSURE.**



BATTERY INSTALLATION



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



**** WARNING ****



BATTERY MAINTENANCE, INSTALLATION AND OR REPLACEMENT SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY



CAUTION - HIGH VOLTAGE EXISTS, CAUTION MUST BE TAKEN WHEN WORKING NEAR THE BATTERY TERMINALS. POWER IS SUPPLIED BY MORE THAN ONE SOURCE. MAKE SURE AC CIRCUIT BREAKER IS OFF AND THE INPUT PLUG IS DISCONNECTED FROM BUILDING POWER BEFORE OPENING THE ENCLOSURE.



WARNING - USE THE FOLLOWING GUIDE WHEN HANDLING AND DISPOSING OF BATTERIES:

- **Do** replace batteries with the size and type specified. Remove and replace all batteries from the UPS at the same time.
- **Do** store batteries in a cool, dry place at normal room temperature.
- **Do** dispose of batteries according to the local laws and regulations of your region. Some batteries may be recycled, and may be accepted for disposal at your local recycling center. If you are not able to identify the applicable rules in your area, please check the instructions of the battery manufacturer.
- **Do** contact Controlled Power Company Customer Support if you have questions about proper handling of batteries. Batteries may present a risk of fire, explosion, or chemical burn if mistreated.
- **Do not** disassemble, puncture, modify, drop, throw, or cause other unnecessary shocks to batteries.
- **Do not** dispose of batteries in a fire or trash incinerator, or leave batteries in hot places such as a automobile under direct sunlight. Do not store batteries near an oven, stove, or other heat source.
- **Do not** connect batteries directly to an electrical source, such as a building outlet or automobile power-point.
- **Do not** place batteries into a microwave oven, or into any other high-pressure container.
- **Do not** immerse batteries in water or otherwise get them wet.
- **Do not** short circuit batteries; for example, do not carry loose batteries in a pocket or purse with other metal objects, which may inadvertently cause a battery to short circuit.
- **Do not** use batteries, or charge rechargeable batteries, that appear to be leaking, discolored, rusty, deformed; emit an odor; or are otherwise abnormal.
- **Do not** touch leaking batteries directly; wear protective material to remove the batteries and dispose of them properly immediately.
- **Do not** reverse the polarity (positive and negative terminals) of batteries.
- **Do not** mix used and new batteries, or install used batteries in other equipment.
- **Do not** charge non-rechargeable batteries, or use unspecified charging instructions or equipment for rechargeable batteries.
- **Do not** continue to charge batteries beyond the specified time.
- **Do not** give batteries to young children, or store batteries where children may access them.

