

UNITY/I™

User Manual

UT3K, UT4K, UT5K, and UT8K
Single-Phase Uninterruptible Power Systems



IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

IF THE UPS IS SOUNDING AN ALARM and you need to know what the alarm means and how to respond, turn to [Section 204](#). To silence the audible alarm, press the [CANCEL] key. *Silencing* the audible alarm does not correct the condition that caused the alarm.

This manual contains important instructions for your UNITY/I UPS.

The installation and use of this product must comply with all national, federal, state, municipal or local codes that apply. If you need help, please have your UPS model and serial number and call Best Power's Worldwide Service at 1-800-356-5737 (U.S.A. or Canada) or 1-608-565-2100. Outside of the U.S.A. and Canada, you can also call the nearest Best Power office for more information.

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 **CAUTION!**

All uninterruptible power systems (UPS) units contain dangerous voltages.

The unit can provide power from its batteries. To avoid possible personal injury or equipment damage, assume that hazardous voltage is present at the unit's output any time AC input power or DC battery voltage is applied. To make certain there is no output voltage, turn the unit off, unplug the unit, and disconnect all DC sources.

For units with line cords, the power supply cord is intended to serve as the disconnect device. The socket-outlet shall be near the equipment and shall be easily accessible.

Before maintenance or repair, all connections must be removed. Before maintenance, repair, or shipment, the unit must be completely switched off and unplugged or disconnected.

 **VORSICHT!**

Vorsicht: Alle USV-Einheiten beinhalten gefährliche Spannungen.

Wenn der "Ein/Aus"-Schalter der USV eingeschaltet ist, kann an den Steckdosen der USV gefährliche Spannung anliegen. Die Batterie der USV liefert selbst dann Strom, wenn die USV nicht ans Netz angeschlossen ist.

Bei Modellen mit Netzstecker wird zum Abschalten des Geräts der Stecker aus der Steckdose gezogen; bei anderen Modellen muß der Wechselstrom-Trennschalter benutzt werden. Die Steckdose muß sich in der Nähe des Gerätes befinden und bequem erreichbar sein.

Achtung: Vor einer Wartung oder Instandsetzung müssen alle Anschlußleitungen entfernt werden. Vor einer Wartung, Instandsetzung oder Transport muß die USV komplett abgeschaltet und abgesteckt werden.



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Introduction

The UNITY/I™ UPS is easy to start and operate. Once you start the UPS, it provides continuous, computer-grade power to your equipment. The UPS keeps you informed of its status with its front panel lights, four-digit display, and audible signals (beeper). Using the display and front panel keys, you can display UPS information and program some features.

This manual tells you how to start and operate the UNITY/I UPS. Begin with [Section 100](#), “Starting the UNITY/I UPS,” which will help you determine whether you need to do any installation before you start the UPS.

001 Storing the UNITY/I UPS

If you are not going to use the UPS right away, store it between -20° and +40° Celsius (-4° to +104° F). If you remove the batteries and store them separately, you can store the UPS at -20° to +60° Celsius (-4° to +140° F). Batteries have a longer shelf life if you store them below 25° Celsius (77° F). **Recharge stored batteries every 90 to 120 days.**

002 If You Have a Question

Best Power is committed to outstanding customer service. Worldwide Service is happy to help you with your problems or questions. A service technician is available 24 hours a day, 365 days a year. Just call Worldwide Service or the nearest [Best Power office](#), or send a fax to the Worldwide Service fax number. Please have your unit’s serial number available when you call; this number is inside the front door of the UPS.

If you prefer to contact Best Power via computer, you can use Bulletin Board Service, CompuServe, or Best Power’s World Wide Web site to get more product information.

Best Power’s toll-free Fax-on-Demand service is also available 24 hours a day to give you access to technical notes and product information.

Worldwide Service:	1-800-356-5737 (U.S., Canada) or 1-608-565-2100
Worldwide Service FAX:	1-608-565-7642 or 1-608-565-2509
Bulletin Board Service	1-608-565-7424
CompuServe:	Go BEST at any ! prompt.
World Wide Web Site:	http://www.bestpower.com
Fax on Demand:	1-800-487-6813 (U.S. and Canada)

100 Starting the UNITY/I UPS

If your UNITY/I UPS does not have an input line cord and plug, it is a hardwired unit and must be installed by a qualified electrician (see the *UNITY/I Installation Manual*). After a qualified electrician has installed the UPS, or if the UPS has an input plug, follow the instructions in this section to start the unit.

Make sure that the UPS is near the equipment it will protect. Leave at least 4 inches (100 mm) space on top of and behind the UPS for ventilation. Do not put the UPS near a source of heat.

Make sure that the temperature is 0° to 40° Celsius (32° to 104° Fahrenheit) and the relative humidity is 0 to 95% without condensation. The air must be free of dust, chemicals that corrode or other contaminants. Air must be free to move around the unit. **The batteries' service life is longer if the operating ambient temperature stays below 25° C (77° F).**

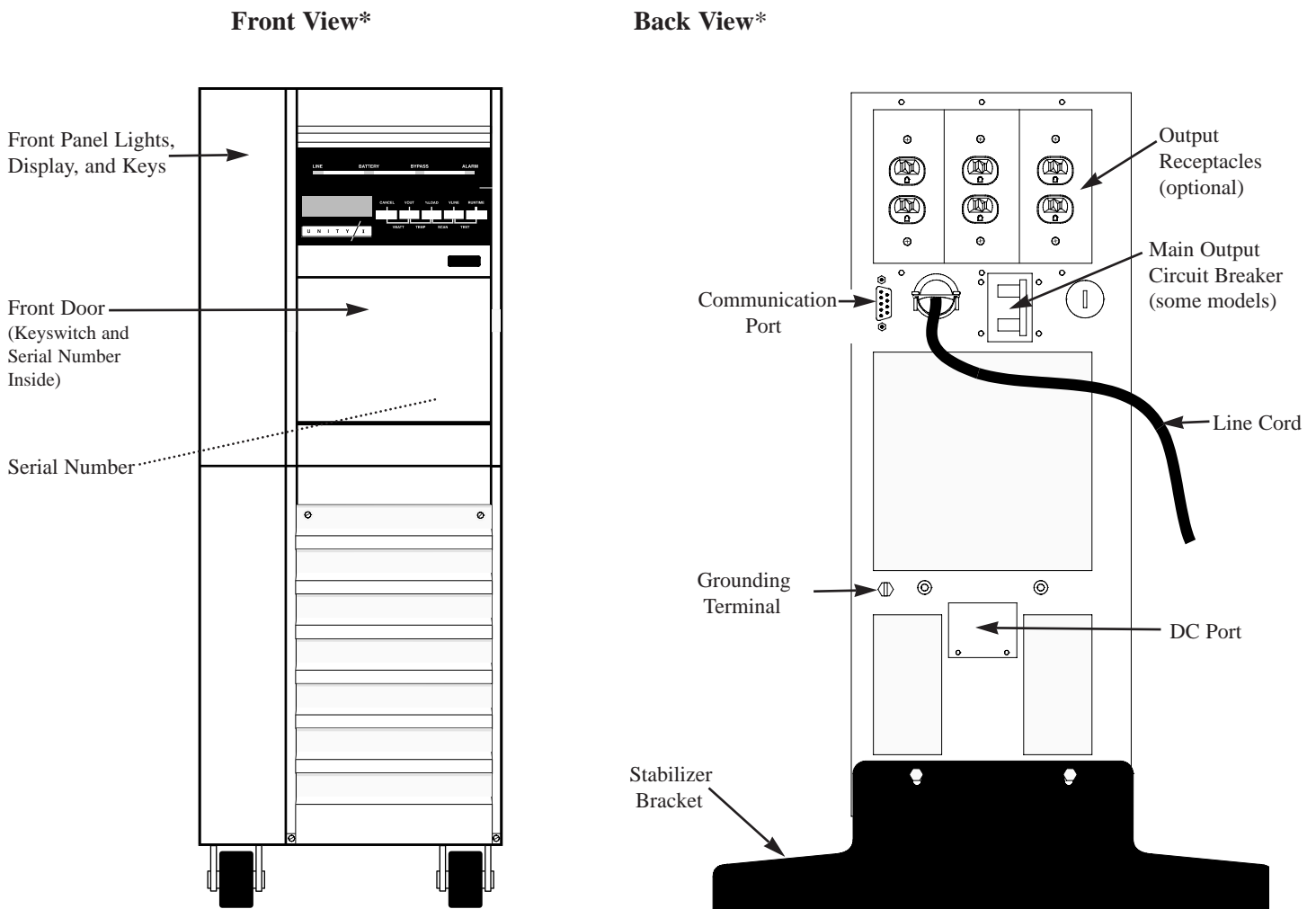


Figure 1

* The drawings in Figure 1 show a UT3K, UT4K or UT5K. The UT8K is similar in appearance.

1 If you have a **UT3K, UT4K or UT5K**: Attach the stabilizer bracket to the back of the UPS (see [Appendix B](#)).

2 Open the UPS' front door by pulling the top of the door toward you (see [Figure 1](#) to find the door). Make sure that the keyswitch inside the front door is turned to "Off" (see [Figure 2](#)).

3 If your **UNITY/I** has an **input line cord and plug**: Plug in the UPS. If the plug does not match the wall outlet, have a qualified electrician install the proper wiring and outlet.

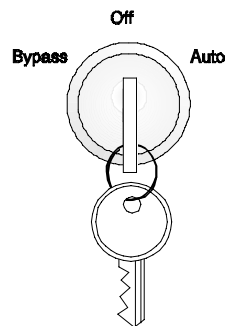


Figure 2

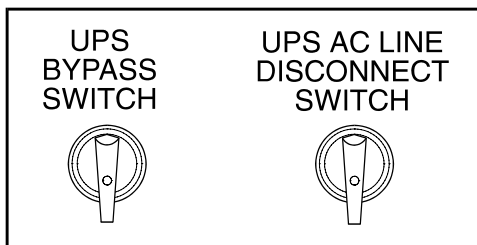


Figure 3

If your **UNITY/I** is **hardwired (does not have an input line cord and plug)**, an electrician should have installed the UPS. An external bypass/AC disconnect switch should be mounted on the wall nearby (see [Figure 3](#)). Turn the UPS AC LINE DISCONNECT SWITCH to "ON" and the UPS BYPASS SWITCH to "OFF."

4 If you have an **external battery pack(s)** (see [Figure 4](#)), refer to the installation instructions that came with your battery pack(s). Then continue with the steps below:

- a. After completing the battery pack installation, hold down the Precharge switch on the front of the battery cabinet for five seconds (see [Figure 5](#)).
- b. Insert the key into the main DC switch on the front of the battery cabinet. Turn it clockwise, then pull the switch out toward you. The ON-LINE light will light on the battery pack cabinet.



Figure 4

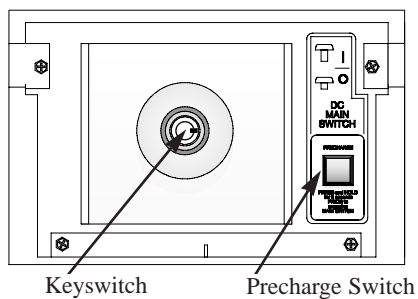


Figure 5

5 Turn the keyswitch inside the front door of the UPS to "Auto" (see [Figure 6](#)). The yellow BATTERY light will turn on briefly, then the green LINE light will turn on.

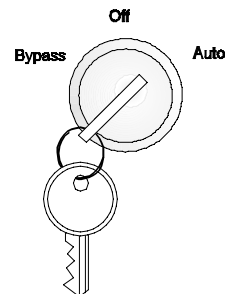


Figure 6

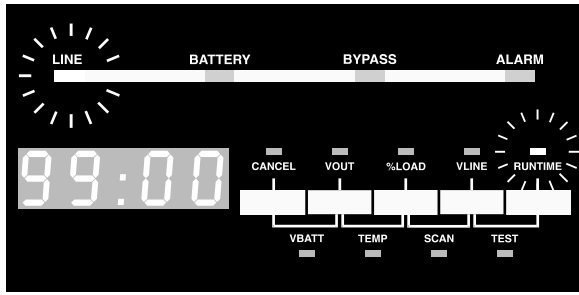


Figure 7

The four-digit display will show the estimated runtime in minutes and seconds (see Figure 7). For now, the estimated runtime is high because there is no equipment drawing power from the UPS. **If the red ALARM light is on**, see [Section 204](#) before you go on.

Note: Do not continue until the green LINE light is on. The UPS is set at the factory to automatically select its output frequency; to do this, the UPS *must* run on AC line. If the UPS does not run on AC line the first time you start it, you must either set parameters 14 and 15 or wait until the green LINE light comes on before you switch on the connected equipment. To set the parameters, see [Section 302](#).

6 Once you switch on the unit and the LINE light comes on, the UPS will begin to charge the batteries. If this is the first time you have started the UPS, let the UPS run on line for at least 24 hours to charge the batteries. You may use the UPS right away; however, its battery runtime will be reduced until it fully charges the batteries.

7 **If your UNITY/I has receptacles on the back**, switch off the equipment you want to connect to the UPS. Then, plug the equipment into the receptacles on the back of the UPS and switch on the equipment. If the red ALARM light comes on, see [Section 204](#).

If your UNITY/I does not have receptacles on the back, the electrician who installed the UNITY/I should have connected your equipment to it. Turn the UPS BYPASS SWITCH (see [Figure 3](#)) to “UPS.” Then, switch on the equipment connected to the UPS. If the red ALARM light comes on, see [Section 204](#).

The UNITY/I UPS is now providing continuous, computer-grade power to your equipment and is ready to provide battery backup power when needed.

Note: You may occasionally hear short “clicking” sounds inside the unit; these clicks are a normal part of unit operation.

8 If you plan to use CheckUPS software, connect the interface cable from the UPS to the computer system, with the “UPS” end connected to the UNITY/I.

Using CheckUPS with Windows 95: Shut down your computer and insert the CheckUPS CD. Restart the computer. Follow the instructions in the CheckUPS package.

Using CheckUPS without Windows 95: Start the computer and follow the instructions in the CheckUPS package.

9 Fill out the warranty registration card in this manual and return it to Best Power. Please return the registration card within ten days of installation.

102 Setting the Time and Date

The UPS stores the time, date, and year in *parameters* that you can program (see [Section 300](#) for more about parameters). These parameters must be programmed correctly so that the UPS can store accurate information in its alarm and system logs. Whenever the UPS has been shut down, you should reset the time and date after you restart the UPS. To set the time, date, and year parameters, follow the steps below.

Note: When the unit is in parameter mode, the functions of the front panel keys change. The label inside the front door of the unit explains what the keys do when the UPS is in parameter mode. The label also shows a “Programming Template” with different key names for parameter mode.

1. To enter the parameter mode, hold down the [CANCEL] and [RUNTIME] keys together. Release the keys when the display changes to *P-00* (for parameter 0).
2. Enter the user password (377) by following these steps:
 - a. Press [CANCEL]. The display should show *0* (the value of parameter 0).
 - b. Use the [%LOAD] key to change the display to *377*. If you accidentally scroll past 377, use the [VOUT] key to go back.

Note: If you *hold down* the [%LOAD] **or** the [VOUT] key, the display will scroll more quickly after a few seconds.

- c. Press [RUNTIME]. The display should show *1* to show you have entered the user password.
 - d. Press [CANCEL]. The display should show *P-00*.
3. Set the year (parameter 91) by following these steps:
 - a. Use the [%LOAD] key to change the display to *P-91*.
 - b. Press [CANCEL]. The display should show a year.
 - c. Use the [%LOAD] **or** the [VOUT] key to change the display to the correct year.
 - d. Press [RUNTIME]. The display should show the correct year.
 - e. Press [CANCEL]. The display should show *P-91*.

4. Set the date (parameter 90) by following these steps:
 - a. Use the [VOUT] key to change the display to *P - 9 0*.
 - b. Press [CANCEL]. The display should show a date formatted as mm.dd (month.day).
 - c. Use the [%LOAD] or [VOUT] key to change the display reading to the correct month and day. For example, if the date were March 27, you should enter "0327."
 - d. Press [RUNTIME]. The display should show the correct date (mm.dd).
 - e. Press [CANCEL]. The display should show *P - 9 0*.
5. Set the time (parameter 89) by following these steps:
 - a. Use the [VOUT] key to change the display to *P - 8 9*.
 - b. Press [CANCEL]. The display should show a time formatted as hh:mm (hour:minute).
 - c. Use the [%LOAD] or [VOUT] key to change the display reading to the correct time **in 24-hour time**. For times from 1 p.m. to 11:59 p.m., add twelve to the hour. For example, 2:30 p.m. would be 14:30.
 - d. Press [RUNTIME]. The display should show the correct time (in 24-hour time).
 - e. Press [CANCEL]. The display should show *P - 8 9*.
6. To escape the parameter mode, press [VLINE] twice.

200 Operation

Once you start the UNITY/I UPS, it operates automatically. The UNITY/I keeps you informed of its status with its front panel lights and four-digit display. If you wish, you can also use the front panel keys and four-digit display to view information about the UPS. In addition, the UPS has alarms that will alert you to UPS conditions that require your attention.

201 Front Panel Lights

The lights on the front panel tell you several things about the operating status of the UPS. The four lights at the top of the front panel are explained below. For an explanation of the nine small lights by the front panel keys, see [Section 202](#).



LINE Light (Green)

When the LINE light is on, the UPS is filtering and regulating AC line power to provide computer-grade power to your equipment.

When the LINE light is off, the UPS is not receiving adequate AC input power to run on line (because of a power outage or a severe power problem). In most cases, when the LINE light is off, the BATTERY light will be on.



BATTERY Light (Yellow)

When the BATTERY light is on, the UPS is providing power from its batteries.



BYPASS Light (Yellow)

When the BYPASS light is on, the unit is in internal bypass mode. Either the front keyswitch has been turned to “Bypass,” or parameter 63 has been enabled (see [Section 300](#)).

When the UPS is in bypass mode, it continues to power your connected equipment, but the UPS does not regulate the AC power going to the connected equipment, and the UPS **will not provide battery backup power**. The UPS does continue to provide lightning protection, noise protection, and isolated output.

Note: If the BYPASS light is on even though the UPS keyswitch is turned to “Auto” and the unit is not indicating an A-16 alarm, the UPS may have automatically placed itself in bypass mode because it detected a problem with its circuitry. Call Best Power’s Worldwide Service (see [Section 402](#)).



ALARM Light (Red)

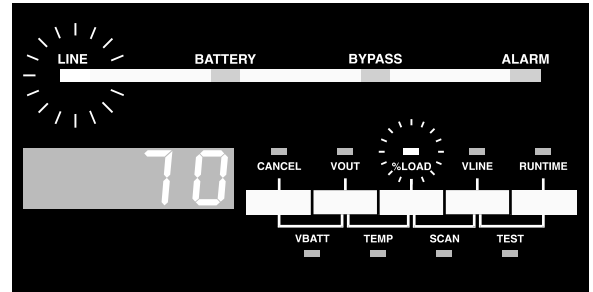
When the ALARM light is on, the UPS is alerting you to an alarm condition. See [Section 204](#).

202 Front Panel Keys and Display

The front panel keys and four-digit display make it easy for you to display information about the UPS.

The word above each key tells you what information the UPS will display if you press that key. The words below the keys tell you what information the UPS will display if you press the two keys at the same time.

When you use the keys to display information, a small green light near the key(s) you pressed lights to tell you what information is currently displayed (Figure 8). The information remains on the display until you press another key.



Example: If you press the %LOAD key, the percent load displays and the %LOAD light comes on.

Figure 8

Table 1 explains what the keys do when the UPS is in its normal display mode. *When you are displaying parameters or alarm and system logs, the keys have different functions; see Table 3 in Section 302 and Table 6 in Section 403.*

Table 1: Front Panel Key Functions (When parameters and logs are NOT displayed)

Key(s) Pressed	Result
CANCEL	Silences any alarm that is currently sounding. If the UPS detects a new alarm condition later, it will restart the alarm beep. Silencing an alarm does not correct the condition that caused it (see Section 204). Cancels a battery test if one is in progress. Holding the key down for two seconds clears an alarm. The alarm will restart if the condition that caused it still exists. If the UPS has shut down because of an alarm condition, holding the key down for two seconds restarts the UPS if the problem that caused the alarm has been solved and the unit is not in bypass mode.
%LOAD	Displays the percentage of the UPS' total power capacity that your equipment is using.
VLINE	Displays the AC input line voltage that the UPS is presently receiving.
RUNTIME	Displays the estimated runtime remaining (in minutes and seconds). Note: The runtime display is most accurate when the UPS is running on battery power.
VBATT	Displays the present battery voltage (nominal is 48 V).
TEMP	Displays the internal ambient temperature of the UPS in degrees Celsius.
SCAN	Starts the scan mode. In scan mode, the UPS scrolls through a display of VBATT, VOUT, TEMP, %LOAD, VLINE and RUNTIME. Each value displays for two seconds, and the small green lights tell you which value is currently displayed.
TEST	Holding down this pair of keys for two seconds starts a test of the front panel lights (except BYPASS) and four-digit display. Note: If Parameter 77 (Test on Demand) is enabled, the unit will also test the batteries. If parameter 77 is enabled and parameter 62 (Nominal Input Voltage) is set, the unit will also test the BYPASS light by briefly switching to internal bypass mode. See Section 300.

203 Inside the Front Door

The UPS' front door is below the front panel keys (see Figure 1 in [Section 100](#)). To open the door, pull the top of the door toward you. The keyswitch and Emergency Power Off (EPO) reset button are inside the front door. In addition, the labels inside the door contain useful reference information. See Figure 9.

Best Power		UT4K <input type="checkbox"/>	UT4K/15C <input type="checkbox"/>
Input	Volts	48 Vdc, 200-240 Vac, 50/60 Hz, 1Ø	
	Amps AC (Max)	22	31
	Amps DC	98	
Output	Volts	100 -120 Vac / 200 -240 Vac, 50/60 Hz	
	Amps AC (Max)	40 / 20	
Input/Output Pf		0.8 Lag - 0.6 Leading/Distortion	
TVSS Rating		0.400 kV	

CAUTION: RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL. FOR USE IN A CONTROLLED ENVIRONMENT. REFER TO MANUAL FOR ENVIRONMENTAL CONDITIONS.

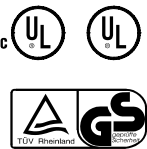
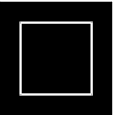

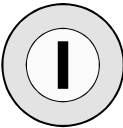
ATTENTION: RISQUE DE CHOCS ÉLECTRIQUES; NE PAS RETIRER LE COUVERCLE. LES PIÈCES SE TROUVANT À L'INTÉRIEUR NE PEUVENT ÊTRE REPLACÉES PAR L'UTILISATEUR. L'ENTRETIEN DOIT ÊTRE EFFECTUÉ PAR UN PERSONNEL QUALIFIÉ. EN CAS D'UTILISATION EN ATMOSPHÈRE CONTRÔLÉE, CONSULTER LA NOTICE TECHNIQUE.

ACHTUNG: GERÄT STEHT UNTER SPANNUNG. BITTE ENTFERNEN SIE DIE ABDECKUNG NICHT. DAS GERÄT DARF NUR DURCH QUALIFIZIERTE ELEKTROFACHKRÄFTE GEÖFFNET WERDEN. BEI BETRIEB IN KLIMATISIERTER UMGEBUNG BEACHTEN SIE BITTE DIE BEDIENUNGSANLEITUNG.

PATENT PENDING

LISTED 35N9 AS AN UNINTERRUPTIBLE POWER SUPPLY ALSO LISTED AS A TRANSIENT VOLTAGE SURGE SUPPRESSOR.

Off
Bypass Auto




SN: 
UT4K00000

Figure 9

The Keyswitch

Using the keyswitch, you can put the UPS in auto mode, shut the unit off, or put the unit in internal bypass mode.

- **Auto:** When the keyswitch is turned to “Auto,” the UPS provides computer-grade power to your equipment. Usually, the UPS operates on AC line power, filtering and regulating utility power. When necessary, the UPS switches to battery power.
- **Off:** When the keyswitch is turned to “Off,” the UPS is off and does not provide power to the connected equipment. See [Section 206](#) for information on completely shutting down the UPS.
- **Bypass:** When the keyswitch is turned to “Bypass,” the unit provides power to your connected equipment, but the UPS does not regulate this power, and the UPS cannot provide battery backup power. However, the UPS does provide lightning protection, noise protection, and isolated output.

The EPO Reset Button

If the UPS shuts down because of an Emergency Power Off (EPO) signal sent to its communication port, use this button to restart the unit. After an EPO shutdown, the UPS' four-digit display scrolls *E P O*. The EPO reset button does not serve as a reset button for any other purpose. See [Appendix A](#) for more information on EPO.

204 Alarms: What They Mean and What to Do About Them

The UNITY/I alerts you to some UPS conditions. If the UPS detects an alarm condition, it:

- lights the red ALARM light.
- sounds an audible alarm.
- shows an alarm code on the four-digit display (see Figure 10).

Codes A-08 (Low Battery) and A-16 (Auto Bypass) are not alarm conditions. When either of these codes are displayed, the red ALARM light will not be on and the UPS will not sound an audible alarm.

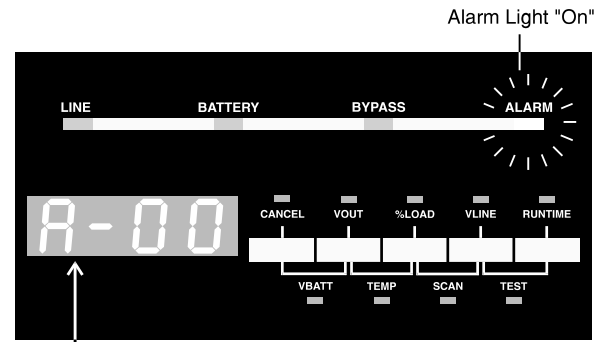


Figure 10

Here's how to react:

1. **If you want to silence the audible alarm**, press and release the [CANCEL] key. Note that silencing the audible alarm does not correct the condition that caused it; the ALARM light stays lit to remind you that the alarm condition still exists. If the UPS detects a new alarm condition, it will sound a new audible alarm.
2. Read the alarm code(s) on the four-digit display. If more than one alarm condition exists, the four-digit display will show each alarm code, one at a time. If the display shows a dot moving from right to left, press any of the front panel keys to display the alarm code(s).
3. Find the alarm(s) in Table 2. The table tells what the alarm means and gives a possible solution. If the table tells you to phone Best Power's Worldwide Service, phone the nearest [Best Power office](#) (in the U.S.A. and Canada, call 1-800-356-5737). Please have the UPS serial number available when you call; you will find this number inside your unit's front door. Call from a telephone that is as near the UPS as possible.

Table 2: Alarms

Alarm Code	Alarm	What It Means	What to Do
A-00	Low Runtime	The UPS is running on battery power and the runtime remaining is low. (At the factory, the UPS is programmed to sound this alarm when 2 minutes of runtime are left). The UPS display switches between the alarm code (A-00) and the estimated runtime.	Do an orderly shutdown of your equipment. You do not need to shut off the UPS. The UPS will automatically shut itself down, but it will leave its microprocessor on. This means that when adequate AC input power returns, the UPS can automatically restart and begin to recharge its batteries (unless you have set Parameter 03 to disable the auto restart feature).
A-01	Overload	Your equipment is drawing more power than the UPS is designed to provide.	Press the [%LOAD] key. Shut off the equipment connected to the UPS <i>one piece at a time</i> until the %LOAD display shows 100 or less. Remove the equipment that you shut off. If you need help, call Best Power's Worldwide Service or the nearest Best Power office .

Table 2: Alarms (continued)

Alarm Code	Alarm	What It Means	What to Do
A-02	Circuit Breaker Warning/Shutdown*	There is a high output current from the UPS. This usually happens because the equipment connected to the UPS is overloading it.	The UPS will shut down. Shut off all of the equipment connected to the UPS. Then, restart the UPS by holding down the [CANCEL] key for two seconds. Next, press the [%LOAD] key. Then, watch the %LOAD display as you switch on the load equipment <i>one piece at a time</i> . Once the %LOAD reaches “100,” the unit is fully loaded and you should not start any additional equipment connected to the UPS. If you need help, call Best Power’s Worldwide Service or the nearest Best Power office .
A-03	High Ambient Temperature	The temperature inside the UPS is high.	If you can identify a source of heat outside of the UPS (such as an unusually high room temperature), correct the cause of the high temperature. Also, make sure that nothing outside the UPS is blocking the vents on the front and back of the unit. If the alarm continues, phone Best Power’s Worldwide Service or the nearest Best Power office .
A-04	Check Battery	The UPS has detected a possible problem with the batteries.	Phone Best Power’s Worldwide Service or the nearest Best Power office . If you have an external battery cabinet, first make sure that the DC switch on the battery cabinet is switched on.
A-05	Check Inverter	The UPS has detected a possible problem with the inverter.	Phone Best Power’s Worldwide Service or the nearest Best Power office .
A-06	Memory Error	On startup, the unit has failed its automatic memory test.	Shut the unit down and restart it. If the alarm sounds again, hold down the Cancel key for about 3 seconds. If the alarm does not stop, phone Best Power’s Worldwide Service or the nearest Best Power office ; the UPS must be recalibrated.
A-07	High Battery	Battery voltage is too high. There may be a problem with the parameter settings, batteries, or charging circuit.	Phone Best Power’s Worldwide Service or the nearest Best Power office .

* In this case, “Circuit Breaker” does not refer to the circuit breaker(s) on the output receptacles panels of some UNITY/I models. Instead, the alarm refers to the UPS’ software-controlled overcurrent protection, which operates like a circuit breaker.

Table 2: Alarms (continued)

Alarm Code	Alarm	What It Means	What to Do
A-08	Low Battery (Advisory Condition)	Battery voltage is too low for the UPS to operate on battery power.	Before this code is displayed, you should have received a “00” (Low Runtime) alarm to warn you to shut down your equipment. When acceptable AC input power returns, the UPS will automatically restart (unless you have set parameter 03 to disable the auto restart feature). When the UPS restarts, it will temporarily run in a bypass (nonregulating) mode (see A-16). Codes A-08 and A-16 will display until the battery voltage returns to above 48VDC for 2 minutes. Runtimes will remain low until the unit fully recharges the batteries.
A-09	Check Fan	The fan inside the UPS is not functioning properly.	Phone Best Power’s Worldwide Service or the nearest Best Power office .
A-10	Reserved	—	—
A-12	Tap Regulator Alarm	There is a problem inside the unit.	Phone Best Power’s Worldwide Service or the nearest Best Power office . Note: If the UPS begins running on battery power, monitor the runtime so that you may do an orderly shutdown of your equipment if runtime gets low.
A-13	Low AC Out Shutdown	The UPS AC output voltage is low.	Phone Best Power’s Worldwide Service or the nearest Best Power office .
A-14	High AC Out Warning/Shutdown	The UPS AC output voltage is high.	The UPS will shut down. Phone Best Power’s Worldwide Service or the nearest Best Power office .
A-15	Check MOVs	The UPS has detected a problem with a MOV (Metal Oxide Varistor) inside the unit.	Phone Best Power’s Worldwide Service or the nearest Best Power office .
A-16	Auto Bypass (Advisory Condition)	The UPS is in internal bypass mode. If AC line is present, the UPS continues to provide power to the connected equipment, but it does not regulate the power going to the connected equipment, and it will not provide battery backup power.	If the UPS also has an A-08 alarm , see A-08, Low Runtime, in this table. If the UPS is in internal bypass (battery maintenance) mode because parameter 63 has been enabled, the UPS will display A-16 until you reset parameter 63 to “0.”
A-17	Check Fuse Board	The UPS has detected a possible problem with the fuse board.	Phone Best Power’s Worldwide Service or the nearest Best Power office .
A-18	Reserved	—	—
A-19	Check Power Supply	The unit has detected a possible problem with the internal power supply.	Phone Best Power’s Worldwide Service or the nearest Best Power office .

205 If You Have an Extended Power Outage

If a power outage lasts a long time, the UNITY/I continues to provide power for your equipment until it reaches the end of its runtime. You can check how much runtime remains by pressing the [RUNTIME] key on the front panel. At a set number of minutes before the end of the runtime (factory default is two minutes), the UPS sounds a “Low Runtime” alarm (A-00). When the UPS gives this alarm, do an orderly shutdown of your equipment. However, do not shut off the UPS. The UPS will shut itself down, but it will leave its microprocessor on. As soon as normal AC line power returns, the UPS will automatically restart itself (unless you have set [parameter 03](#) to disable the auto restart feature) and begin recharging its batteries. If you know that the power outage will be long (for example, a day or longer), you may wish to shut down the UPS. See Section 206.

206 Shutting Down the UNITY/I UPS

Usually, you do not need to shut down the UPS, even if your equipment will be shut down for several days. There may be times, however, when you want to shut down the UPS, such as when you will not be using the UPS for an extended period of time, when the UPS is being serviced, or before you move the UPS. Best Power does not recommend shutting down the UNITY/I on a daily basis. To shut down the unit, follow the instructions below.

Note: While the UPS is shut off, recharge the batteries every 90 to 120 days. You can do this by restarting the UPS for 24 hours.

1. **If your UNITY/I does not have an external bypass switch**, switch off the protected equipment.

If your UNITY/I has a “Break Before Make” external bypass switch (the words above the UPS BYPASS SWITCH read, *in this order*, “LINE” “OFF” “UPS”), turn off the protected equipment. Then, turn the UPS BYPASS SWITCH to “LINE.” Switch the protected equipment back on.

CAUTION

Before switching an external make-before-break (MBB) bypass switch to the LINE position, the BYPASS light on the UPS front panel **must** be lit. If you operate an external MBB bypass switch while the UPS is operating on line power or on battery power, equipment damage may result. Refer to Best Power publication “TIP 410” for proper bypass switch operating instructions.

If your UNITY/I has a “Make Before Break” external bypass switch (the words above the UPS BYPASS SWITCH read, *in this order*, “LINE” “UPS” “OFF”): Turn the UPS BYPASS SWITCH to “LINE.”

2. Turn the keyswitch inside the unit’s front door to “Off.”
3. **If your UPS does not have an external bypass switch**, disconnect the UPS by shutting off its circuit breaker or by unplugging the UPS. *Shutting off the circuit breaker is preferred, but if other pieces of equipment are connected to the same breaker, you may want to leave the breaker on and unplug the UPS.*

If your UPS has an external bypass switch, turn the UPS AC LINE DISCONNECT SWITCH to “OFF.”

4. If you have an external battery pack, push in the main DC switch on the front of the cabinet.
5. When you are ready to restart the UPS, follow the entire startup procedure in [Section 100](#).

300 Parameters

The UPS uses some of its parameters to keep track of information, operating conditions, and power conditions. Other parameters allow you to program some of the unit's features. This section explains how to display and change some UNITY/I parameters.

301 Displaying Parameters

This section explains how to display parameters using the front panel keys and four-digit display. The table in [Section 303](#) contains more information about what many of the parameters mean.

Note: When the unit is in parameter mode, the front panel keys have different functions. See the label inside the UPS front door for an explanation of the key functions in parameter mode. The label also shows a “Programming Template” with different key names for parameter mode.

1. To enter the parameter mode, hold down the [CANCEL] and [RUNTIME] keys together for two seconds. Release the keys when the four-digit display changes to $P-00$.

$P-00$ is a parameter number. The first column of the parameter table in [Section 303](#) contains the parameter numbers.

2. Whenever a parameter number ($P-XX$) is displayed, you can use the following keys to go to the parameter that you wish to display:
 - Press [%LOAD] to go to the next parameter number.
 - Press [VOUT] to go back to the previous parameter number.

Note: To scroll through the parameter numbers quickly, *hold down* the [%LOAD] or [VOUT] key.

3. Press [CANCEL] to display the parameter's *value*. Example: Parameter 7 is the Low Runtime Alarm setpoint. To display the setpoint, first display parameter 7 by following steps 1 and 2 above. Then, with $P-07$ on the display, press [CANCEL] to display the value. If the value is 2, the UPS will sound a Low Runtime alarm when two minutes of runtime are left. The parameter table in [Section 303](#) describes the information you can find in some UNITY/I parameters.
4. Press [CANCEL] to return to the parameter number ($P-XX$). Note that the [CANCEL] key allows you to switch between the parameter number and parameter value.
5. If you wish to display additional parameters, repeat steps 2-4.
6. To escape parameter mode, press [VLINE] twice.

302 Changing Parameter Values

You can set some of the parameter values to program certain UPS features. The table in Section 303 describes many of the parameters.

Make sure that you FULLY understand a parameter before you try to change the value. If you set certain parameters improperly, the UPS may not operate correctly.

1. Hold down the [CANCEL] and [RUNTIME] keys at the same time for two seconds. Release the keys when the display changes to $P-00$. Then, press [CANCEL]. The display should show 0 .
2. As the table in [Section 303](#) shows, you will need a password to change parameters. The user password is 377. To enter it, follow the steps below.

- a. Use the [%LOAD] **or** the [VOUT] key to change the display to 377 .

Note: To scroll the display more quickly, *hold down* the [%LOAD] or [VOUT] key.

- b. Press [RUNTIME] to enter the password. The display should read 1 (for password level 1).

You may now change parameters that require a user password. For password requirements, see the third column of the parameter table in [Section 303](#).

Note: If no keys are pressed for five minutes, the UPS password level goes back to level “0,” and you must re-enter the user password.

3. Press [CANCEL] to return to the parameter number display ($P-XX$). Note that the [CANCEL] key lets you switch between the parameter number and parameter value.
4. Use the [%LOAD] **or** the [VOUT] key to go to the parameter that you wish to change. Then press [CANCEL] to display the parameter value.
5. Whenever a parameter value is displayed, use these keys to change the setting:
 - Press [%LOAD] to increase the setting.
 - Press [VOUT] to decrease the setting.

Note: In step 1, you entered the user password. If a parameter requires a higher password for changes, the UPS will not let you change that parameter.

6. To enter the new value, press [RUNTIME]. The UPS beeps to confirm that the new value has been entered. If you wish *not* to save a change that you have made, press [VLINE] and the value will remain at its original setting.
7. If you wish to change additional parameters, repeat steps 3-6.
8. To escape parameter mode, press [VLINE] twice.

Table 3 explains what each of the keys does when a parameter number or parameter value is displayed.

Table 3: Parameter Mode Key Functions

Key	Programming Template Key Name	When a Parameter Number is Displayed	When a Parameter Value is Displayed
CANCEL	#	Switches to the parameter value.	Switches to the parameter number.
VOUT	—	Goes back to the previous parameter number.	Decreases the parameter setting.
%LOAD	+	Goes to the next parameter number.	Returns to the parameter number display without saving any changes made to the parameter value.
VLIN	ESC	Escapes parameter mode.	Returns to the parameter number display without saving any changes made to the parameter value.
RUNTIME	←	This key has no function when the parameter number is displayed.	Enters the new parameter setting.

303 Parameter Table

The parameter table, Table 4, explains many of the unit’s parameters. See Sections 301 and 302 for information on displaying and changing parameters.

Note: Some parameters are not listed. These parameters are used only in special circumstances or are intended to help qualified service personnel troubleshoot, adjust, and calibrate the UPS.

Table 4: Parameters

Parameter Number	Parameter Name	Password Level Required to Change Setting	Sample Parameter Value	Parameter Description
P-00	Password	None	0	Allows you to enter a password. See Section 302.
P-03	Auto Restart	User	1	When the UPS shuts itself down, this parameter determines whether the UPS restarts automatically. If set to “1,” the UPS restarts itself when conditions allow. If set to “0,” you must manually restart the UPS by turning the keyswitch to “Off” and back to “Auto.” Choices: 0 (Disable) or 1 (Enable).
P-05	Nominal Output Voltage	User	240	Sets the nominal output voltage. This setting should equal the output voltage wired at the factory or by your electrician. Call Best Power’s Worldwide Service or the nearest Best Power office before you try to change this setting. Range of values: 180-260.
P-07	Low Runtime Alarm Setpoint	User	2	If the UPS is running on battery power, it sounds a Low Runtime alarm (H-00) when the amount of battery runtime remaining (in minutes) is equal to or less than this value. Range of values: 1-99.
P-13	Frequency	Change not allowed	50.0	The frequency that the UPS is now supplying to your equipment.

Table 4: Parameters (continued)

Parameter Number	Parameter Name	Password Level Required to Change Setting	Sample Parameter Value	Parameter Description
P-14	Nominal Frequency	User	1	If parameter 15 = 0, this parameter allows you to choose the unit's nominal output frequency. If the UPS is in auto frequency mode (parameter 15 = 1), this parameter shows the nominal frequency that the unit has selected. <i>Choices:</i> 0 (50 Hz) or 1 (60 Hz).
P-15	Auto Frequency Enable	User	1	Enables auto frequency mode if set to "1." In auto frequency mode, the UPS automatically selects the nominal frequency based on the input frequency. <i>Choices:</i> 0 (Disable) or 1 (Enable). Note: If auto frequency mode is enabled, the unit automatically selects the frequency, then automatically resets the maximum frequency (parameter 16) to the auto-selected frequency + 3 Hz and resets the minimum frequency (parameter 17) to the auto-selected frequency – 3 Hz.
P-16	Maximum Frequency	User	65.0	Sets the maximum input frequency for operation on AC line. The value must be greater than the nominal frequency (see parameters 14 and 15). <i>Range of values:</i> 50.5-65.0. Note: If you manually set maximum frequency, disable auto frequency mode (parameter 15).
P-17	Minimum Frequency	User	45.0	Sets the minimum input frequency for operation on AC line. The value must be less than the nominal frequency (see parameters 14 and 15). <i>Range of values:</i> 45.0-59.5. Note: If you manually set minimum frequency, disable auto frequency mode (parameter 15).
P-26	PhonTek™ Copies	User	0	In units with software version 1.04 or higher, this parameter starts PhonTek transmission and sets the number of copies to be sent. If you need to use PhonTek, Best Power's Worldwide Service will provide more instructions. <i>Range of values:</i> 0-98 copies. 99 = continuous.
P-33	Runtime	Change not allowed	15:00	The estimated battery runtime (in minutes and seconds). When the UPS is running on battery power and this value reaches a preset limit (see parameter 07), the UPS sounds a Low Runtime alarm (A-00). Note: The estimated runtime display is most accurate when the UPS is running on battery power.
P-34	Percent Load	Change not allowed	70	The percent of the UPS' total capacity that the connected equipment is currently using.
P-35	Power Factor	Change not allowed	1.00	The power factor of your equipment (the difference in the way it draws voltage and current). Power factor = kW out (parameter 36) divided by kVA out (parameter 37). Note: If no load equipment is applied to the UPS, parameter 35 shows "0.00."

Table 4: Parameters (continued)

Parameter Number	Parameter Name	Password Level Required to Change Setting	Sample Parameter Value	Parameter Description
P-36	kW out	Change not allowed	4.00	The total power (in kilowatts) that your equipment is drawing from the UPS.
P-37	kVA out	Change not allowed	4.00	The total “apparent power” (in kilovolt-amperes) that your equipment is drawing from the UPS.
P-50	Beeper Enable	User	1	This parameter lets you enable or silence <i>all</i> present and future audible alarms and the “on battery power” beep. <i>Choices:</i> 0 (Silence) or 1 (Enable).
P-62	Nominal Input Voltage	User	0	This parameter sets the UPS for the proper nominal input voltage when you use parameter 63. Note: If parameter 62 is set and parameter 77 is enabled, the UPS will test the BYPASS light during a front panel key TEST (see Section 202). <i>Range of values:</i> 200-240.
P-63	Battery Maintenance Mode	User	0	Setting this parameter to “1” puts the UPS into battery maintenance mode. In this mode, the UPS continues to power the connected equipment but does not regulate the power going to the connected equipment and will not provide battery backup power. The unit does continue to provide noise protection, lightning protection, and isolated output. See parameter 62 before setting parameter 63. <i>Choices:</i> 0 (Disable) or 1 (Enable). This parameter is meant to be used during battery maintenance. Battery maintenance must be done by qualified service personnel only. For help, phone Best Power’s Worldwide Service or the nearest Best Power office .
P-89	Time	User	0:00	The time of day in 24-hour time, formatted as hh:mm (hour:minute). <i>Range of values:</i> 0:00-23:59.
P-90	Date	User	1.01	The date formatted as mm.dd (month.day). <i>Range of values:</i> 1.01-12.31.
P-91	Year	User	1997	The year. <i>Range of values:</i> 1994-2130.
P-92	System Hours	Change not allowed	1	The number of hours the system has operated. Changes to “0” every 8760 hours (1 year). See also parameter 93.
P-93	System Years	Change not allowed	0	The number of years the system has operated.
P-128	Software version	Change not allowed	1.08	The ROM version.

BATTERY TEST PARAMETERS (Parameters 73-77)

During a battery test, the UPS shuts off the battery charger, waits two seconds, and checks the battery voltage. If the UPS detects low battery voltage, it stops the test and starts a Check Battery alarm (A-04). If battery voltage is not low, the UPS switches itself to battery power for a set length of time (parameter 75). If the UPS detects a possible weak battery, it switches back to AC line power and starts a Check Battery alarm (A-04). You can tell the UPS how often to test the batteries (parameter 74) and at what time of day (parameter 73). You can also program the UPS to “test on demand” (parameter 77), which allows you to test the batteries on demand by pressing the front panel TEST keys. If you prefer, you can tell the UPS not to perform a periodic battery test (parameter 76). See Sections 301 and 302 for more information on displaying and changing parameter settings.

Note: If the UPS microprocessor loses power (because, for example, the unit is switched off), the battery test parameters will return to their factory default settings.

Table 4: Battery Test Parameters

Parameter Number	Parameter Name	Password Level Required to Change Setting	Sample Parameter Value	Parameter Description
P-73	Battery Test Time	User	0.00	The time of day (in 24-hour time) that the battery test begins. Make sure that you also set the Time (parameter 89). <i>Range of values:</i> 00:00-23:59.
P-74	Battery Test Interval	User	7	The number of days between battery tests. <i>Range of values:</i> 1-28.
P-75	Battery Test Length	User	15	The length of time that the UPS runs on battery power during the battery test, expressed as a percentage of the Low Runtime alarm setpoint (parameter 07). For example, the default Battery Test Length is 15% of 2 minutes (P-07 default), which equals 0.3 minutes (18 seconds). <i>Range of values:</i> 5-25.
P-76	First Day of Battery Test	User	0.00	The date on which the first battery test will start, formatted as mm.dd (month.day). Make sure that you also set the Date (parameter 90). Setting parameter 76 to “0.00” disables the periodic battery test. <i>Range of values:</i> 0.00 (Disable periodic battery test) or 01.01-12.31 (Date of first test).
P-77	Test on Demand	User	0	If this parameter is set to “0,” it disables two parts of the front panel key TEST: the battery test, and the internal bypass test. If this is set to “1,” you can test the batteries on demand by pressing the front panel TEST keys. See Section 202 for a complete description of the front panel key TEST. <i>Choices:</i> 0 (Disable) or 1 (Enable).

400 Maintenance and Service

This section discusses what kind of maintenance the UNITY/I UPS needs, tells how to contact Best Power's Worldwide Service, and explains how to read the unit's alarm and system logs.

401 Regular Maintenance

Best Power designed the UNITY/I UPS to provide years of trouble-free operation. You will probably find that the UNITY/I requires less maintenance than your other computer peripherals. Nevertheless, the UPS does require some attention in order to provide you with excellent service. Best Power recommends that you schedule a Preventative Maintenance check at least every six months. At this check, a **qualified technician** should inspect and clean the unit, check the batteries, check the AC and DC meter functions, and perform a power outage test. **Important safety precautions must be observed while performing these checks.** For more information on Preventative Maintenance checks, or to schedule a Preventative Maintenance with a Best Power-authorized field service representative, call Best Power's Worldwide Service. We'll be happy to help you.

402 Worldwide Service

Best Power has an outstanding customer service department. Please feel free to call or write if you have a problem or question about your UNITY/I UPS. When you call or write, please have the following information available:

- The UPS model number and serial number (inside the front door of the unit).
- A brief description of the problem or question.

Note: In some cases, the phone technician may ask you to access information from the unit's software parameters. If possible, call from a telephone that is near the UPS.

Before returning a unit for any reason, contact the nearest Best Power office for instructions and an RMA (Return Materials Authorization) number.

In the U.S.A. and Canada, call Best Power's Worldwide Service at 1-800-356-5737. Elsewhere, contact the nearest Best Power office. Customers anywhere can call 1-608-565-2100 to reach Best Power's Worldwide Service. See the inside front cover of this manual for the telephone numbers and addresses of [Best Power offices](#). In the U.S.A., send correspondence to:

Worldwide Service
Best Power
P.O. Box 11
Necedah, Wisconsin 54646 U.S.A.
FAX: 1-608-565-7642

403 Accessing the Alarm and System Logs

The UNITY/I stores information in two logs: the alarm log and the system log. The alarm log stores the 16 most recent alarm conditions. The system log stores up to 20 UPS events. You can use the logs to keep track of UPS events, and a technician can use the logs to help troubleshoot the UPS. This section explains how to access and read the alarm and system logs using the unit's front panel keys and four-digit display.

Note: When you display the alarm and system logs, the front panel keys have different functions. Table 6 below explains what the keys do when you are displaying the alarm and system logs. (The keys have similar functions when you display parameters; see Table 3 in [Section 302](#) and the Programming Template inside the unit's front door.)

Table 6: Key Functions While Displaying Alarm and System Logs

Key	Programming Template Key Name	Key Function (while viewing alarm and system logs)
CANCEL	#	Switches between the log number and the information in the log entry.
VOUT	—	When a log number is displayed, this key goes back to the previous log number.
%LOAD	+	When a log number is displayed, this key goes to the next log number.
VLIN	ESC	Escapes to parameter 00 (P-00).
RUNTIME	5	This key has no function while the logs are displayed.

To access and read the UPS alarm and system logs, follow the instructions below.

1. Simultaneously hold down the [CANCEL] and [RUNTIME] keys. Release the keys when the display shows P-00.
2. Press [VOUT]. The display should show P134.
3. Press [%LOAD]. The display should show AL 1. (If your UPS has never had an alarm condition, the display should show SL 1.)

Notes: AL stands for “alarm log.” The unit stores a maximum of 16 alarm events.

SL stands for “system log.” The unit stores a maximum of 20 system events.

The lower the log number, the more recent the log entry. Log “1” is the most recent entry. Once the alarm or system log is full, the newest entry is added as log number “1” and the oldest entry is dropped.

4. With the log number AL XX or SL XX displayed, you can use the [%LOAD] and [VOUT] keys to step up and down through the log numbers. If you step past the last system log entry (to P-00), repeat steps 2 and 3 to display the logs again.

5. Once you have accessed the log number that you wish to display (for example, *SL 1*), press the [CANCEL] key to display the information in that log entry. The display will scroll through the six pieces of information shown in Table 7 below.

Table 7: Information in the Alarm and System Logs

Information in Log Entry	Sample Display	
	Alarm Log	System Log
Log number ¹	<i>AL 4</i>	<i>SL 20</i>
Event code (alarm code or system event code) ²	<i>A 00</i>	<i>IN</i>
Date that the event began (month and day, mm.dd)	<i>01.25</i>	<i>01.25</i>
Year that the event began	<i>1997</i>	<i>1997</i>
Time that the event began (in 24-hour time)	<i>13:21</i>	<i>13:07</i>
Length of the event (in hours and minutes, hh:mm) ³	<i>00:01</i>	<i>00:15</i>

¹ If an event is currently active, the log number display will show a decimal point after the “AL” or “SL” (i.e., a display of *AL . 1* indicates that the event recorded in Alarm Log 1 is active).

² For alarm codes, see Section 204. For system event codes, see the table below.

³ A display of *0* means that the event duration was less than one minute. A display of *----* means that the event lasted more than 18 hours, 12 minutes (18:12).

In the table above, the sample logs read as follows:

- **Alarm Log 4:** The unit had an *A 00* alarm beginning on January 25, 1997 (*01.25 1997*) at 1:21 p.m. (*13:21*). The alarm lasted for one minute (*00:01*).
- **System Log 20:** The unit ran on inverter (battery power) beginning on January 25, 1997 (*01.25 1997*) at 1:07 p.m. (*13:07*). The unit ran on inverter for 15 minutes (*00:15*).

6. Press [CANCEL] to return to the log number. Then, repeat steps 4 and 5 to display other log entries.

7. To escape the alarm and system logs, press [VLINE] twice.

Table 8: System Log System Event Codes

Displayed Code	What It Means
<i>IN</i>	The UPS ran on battery power (inverter).
<i>SLP</i>	The UPS shut down, but the microprocessor stayed active (also referred to as “sleep” mode).
<i>TEST</i>	The UPS did a battery test.
<i>NRG</i>	The unit was not regulating power (for example, after a Low Battery shutdown).
<i>MAINT</i>	The unit was placed into battery maintenance mode (see parameter 63), or the unit tested the BYPASS light by briefly switching to internal bypass mode during a front key TEST (see Section 202).
<i>BADL</i>	Corrupted log.
<i>EPO</i>	The UPS shut down due to an Emergency Power Off signal sent to the unit’s DB9 port.
<i>OFF</i>	The unit’s keyswitch was turned off, or the unit sounded a Check Power Supply alarm (<i>A-19</i>).

500 Specifications

Table 9: Specifications (Standard Product)

Model Number	UT3K	UT4K	UT5K	UT8K
Capacity	3 kVA/3 kW	4 kVA/4 kW	5 kVA/5 kW	8 kVA/8 kW
Nominal AC Input Voltage ²	200, 208, 220, 230, 240			
AC Input Current ³				
200 V input	17 amps	22 amps	28 amps	45 amps
208 V input	17 amps	22 amps	27 amps	43 amps
220 V input	16 amps	20 amps	25 amps	41 amps
230 V input	15 amps	20 amps	24 amps	39 amps
240 V input	14 amps	19 amps	23 amps	38 amps
AC Input Frequency ⁴	50/60 Hz \pm 3 Hz.			
Efficiency on AC Line ⁵	95%	96%	96%	96%
Maximum Heat Output (on AC Line)	539 BTU/hour 0.158 kW/hour	569 BTU/hour 0.167 kW/hour	711 BTU/hour 0.208 kW/hour	1138 BTU/hour 0.333 kW/hour
Audible Noise on AC Line at 1 meter	40 dBA			
Typical Runtime ⁶				
Full Load:	19 minutes	12 minutes	9 minutes	13 minutes
75% Load:	26 minutes	17 minutes	13 minutes	19 minutes
50% Load:	43 minutes	28 minutes	21 minutes	31 minutes
Weight (with Batteries)	215 lbs. 98 kgs.	280 lbs. 127 kgs.	295 lbs. 134 kgs.	490 lbs. 222 kgs.
Dimensions (H x W x D)	29 in. x 10.5 in. x 25.75 in. 737 mm x 267 mm x 654 mm			32 x 13 x 33 in. 813 x 330 x 838 mm

¹ For UT5K units with an optional L6-30 input plug and 200 V input, capacity is 4.55 kVA/ 4.55 kW.

For UT5K units with an optional L6-30 input plug and 208 V input, capacity is 4.75 kVA/4.75 kW.

² The unit will operate on AC line at input voltages of 147 V to 276 V (at the default parameter settings).

³ For models with a standard battery charger.

⁴ Programmable range is 45 to 65 Hz. See Sections 302 and 303, parameters 16 and 17.

⁵ At 75% resistive load, batteries at full charge.

⁶ At 0.75 power factor.

AC Output

Voltage Regulation: Regulates steady state output voltage to \pm 5% of nominal on line and on battery at the default parameter settings. Exceeds the CBEMA voltage regulation guideline for computing equipment under any line, load or battery condition, excluding bypass mode.

Sine Wave Power: Provides sine wave, computer-grade power with five percent or less total harmonic distortion at full resistive load on battery power. Meets or exceeds CSA C22.2 No. 107.1. Output wave form is essentially the same as line on AC line.

Output Frequency: 50 Hz or 60 Hz ± 0.15 Hz on battery. Same as line on AC line within programmable limits. (See [Section 303](#), parameters 13-17).

Output Protection: Provides automatic current and overvoltage protection. The unit has high AC and low AC output voltage alarms, as well as circuit breaker warning/shutdown and overload alarms. Optional output receptacle panels protected by fuses or circuit breakers.

Lightning, Surge, and Noise Protection

Lightning/Surge Protection: Passes ANSI/IEEE C62.41 Categories A3 (6000 volt, 200 amp ring-wave test) and B3 (6000 volt, 500 amp ring-wave and 6000 volt, 3000 amp combination-wave). UL 1449 listed. Meets IEC 801-5. Zero Surge Clamping Response Time.

Surge Voltage Let-Through: 0.7% of peak (typical) in ANSI/IEEE C62.41 1991 Category A3 test.

Surge Suppressor Rating: 300 Joules.

Noise (RF) Isolation: Advanced, compound filter elements provide up to 90 dB attenuation in normal mode from 100 KHz to 10 MHz and up to 50 dB attenuation in common mode from 100 KHz to 10 MHz.

Isolation: Input isolated from output. Output neutral bonded to ground.

Environment

Ventilation: Air around the UPS must be free of dust, chemicals, or other materials that corrode or contaminate. Air must be free to move around the UPS. Do not place the UPS in a sealed room or container.

Operating Environment: 0° to +40° Celsius (+32° to +104° F). 0 to 95% relative humidity (noncondensing). Battery service life is longer if the operating temperature stays below 25° Celsius (77° F).

High Altitude Operation: The maximum operating ambient temperature drops 1° Celsius per 300 meters (2° Fahrenheit per 1000 feet) above sea level, with the maximum operating elevation being 3000 meters (10,000 feet).

Storage Temperature: Batteries: -20° to +40° Celsius (-4° to +104° F). UPS without batteries: -20° to +60° Celsius (-4° to +140° F).

Batteries and Battery Charger

Batteries: Batteries are sealed, maintenance-free, gas recombinant, lead-acid type, specially designed for UPS use. Nominal battery voltage is 48 VDC. Batteries are UL 924 recognized.

Battery Charger: The standard battery charger is a three-state charger (Maintenance, Constant Current and Constant Voltage). Recharge time to 85% is 4 to 6 hours typical.

Third Party Compliance and Standards

Safety/EMC Compliance: UL listed, cUL listed to Canadian standards, TÜV/GS certified, FCC Part 15: Class A (includes Class A limits specified in the Radio Interference Regulations of the Canadian Department of Communication), Vfg 243/1991, Vfg 46/1992, CISPR 22.

Applicable Standards: UL 1778, UL 1449, CSA Standard C22.2 No. 107.1-M91, BSI EN 60950, EN 50082-2, EN 50091-1.

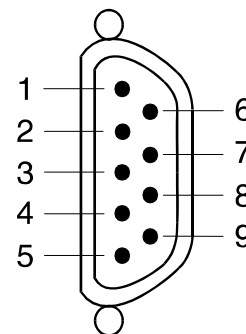
Communication Connections

DB 9 Port Pinouts (Default Settings)

Contacts consist of isolated open collector circuits capable of switching up to 40 VDC 50 mA resistive load.

Table 10: Specifications for Models with Optional 380/400/415 VAC Input

Pin	Function
1	RS232 RD: The UNITY/I receives data at the programmed baud rate (default is 1200 baud), 8 bits, no parity, 1 stop bit, and no handshaking.
2	RS232 TD: The UNITY/I transmits data at the programmed baud rate (default is 1200 baud), 8 bits, no parity, 1 stop bit, and no handshaking.
3	Inverter Normally Open Contact: Closes to indicate that the UPS is on battery power (programmable contact 1).
4	Common: Signal ground for all interface signals and contacts.
5	Low Runtime Normally Open Contact: Closes to indicate that battery runtime is low (programmable contact 0).
6	Inverter Normally Closed Contact: Opens to indicate that the UPS is on battery power (programmable contact 2).
7	Remote Emergency Power Off: Short to ground to turn the UPS off. Apply +12 VDC to turn the UPS back on or connect to Pin 8 (current limited).
8	Unregulated +18 VDC Nominal Source: An unregulated +18 VDC nominal source protected by a 1000 ohm source impedance.
9	Internal Bypass Normally Open: Closes to indicate that the UPS is in internal bypass mode. (Note: Does not close for the A-16 condition that occurs after a low battery shutdown. See Section 204 .)



Specifications: Models with Optional 380/400/415 VAC Input

Specifications for models with optional 380/400/415 VAC input are the same as for standard models except for the following:

Table 11: Specifications for Models with Optional 380/400/415 VAC Input

Model Number	UT3K	UT4K	UT5K	UT8K
Nominal AC Input Voltage¹	380, 400, 415			
AC Input Current² 380 V Input 400 V input 415 V input	9.1 amps 8.6 amps 8.3 amps	12 amps 11 amps 11 amps	15 amps 14 amps 13 amps	24 amps 23 amps 22 amps
Efficiency on AC Line³	92%			
Maximum Heat Output (on AC Line)	891 BTU/hour 0.260 kW/hour	1186 BTU/hour 0.347 kW/hour	1485 BTU/hour 0.434 kW/hour	2377 BTU/hour 0.695 kW/hour
Weight with Batteries	242 lbs. 110 kgs.	322 lbs 146 kgs.	337 lbs. 153 kgs.	546 lbs. 248 kgs.

¹ The unit will operate on AC line at input voltages of 280 V to 524 V (at the default parameter settings).

² For models with a standard battery charger.

³ At 75% resistive load, batteries at full charge.

600 Options

Best Power offers a number of options for the UNITY/I. The list below describes these options. If you would like more information, please contact the nearest [Best Power office](#) or dealer.

Bypass Switches:

If your UPS does not have a plug, an external bypass switch lets you conveniently transfer your protected equipment to direct AC input power when the UPS needs service. The nearest [Best Power office](#) can tell you if an external bypass switch is recommended for your UPS.

Environmental Monitoring:

EnviroCom™ I monitors many UPS and environmental conditions and phones you when there is a problem.

Extended Runtime:

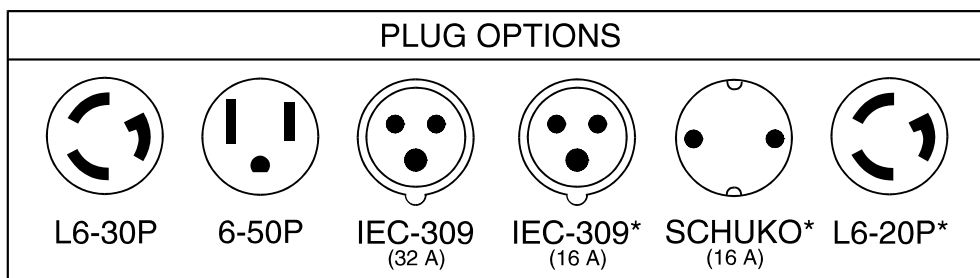
If you want extended runtime, call Best Power for information on adding additional battery capacity.

Interface Kits:

For computers that include their own UPS monitoring and shutdown software, Best Power offers interface cables and assemblies for a number of computer systems. These let your computer's software shut down your protected equipment safely during an extended power outage.

Plugs:

The following input plugs are available for new UT3K*, UT4K and UT5K units:

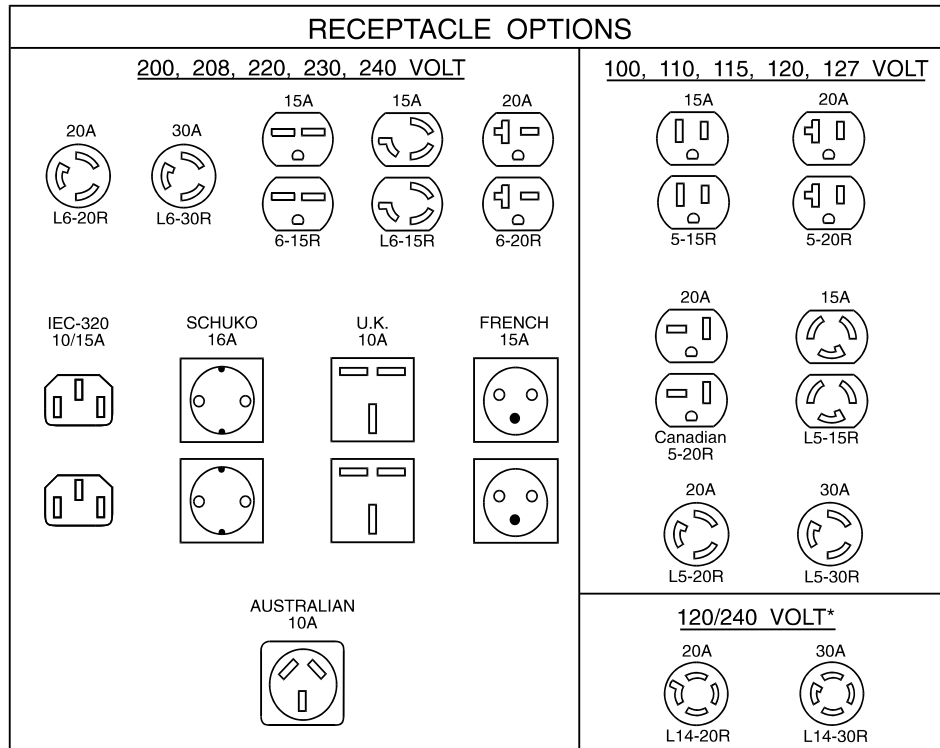


* IEC-309 (16 A), SCHUKO, and L6-20P plugs available on UT3K only.

Figure 11

Receptacles:

The following output receptacles are available for new units:



*L14-20R and L14-30R available for 120/240 volts only.

Figure 12

Warranties: Besides the standard two-year warranty, Best Power offers Warranty Enhancement Plans to meet your service and maintenance needs. Call the nearest [Best Power office](#) for more information.

Appendix A: Remote Emergency Power Off (EPO)

Computer rooms often have an emergency shutdown switch (sometimes referred to as a “panic button”). This switch shuts off the power that runs the equipment in the computer room. If the UPS’ AC input source is connected to the switch, the switch will shut off the **input** power to the UPS. However, the UPS will interpret this as a power outage and will continue to provide **output** power to the equipment it protects until its batteries run down. To make sure that your emergency shutdown switch can shut off the UPS’ **output** power, use the unit’s remote Emergency Power Off (EPO) feature.

CAUTION

Shut down the UPS (see [Section 206](#)) and disconnect AC power to the UPS before making connections to the UPS’ communication port.

- Your computer room’s emergency shutdown switch must have a set of **dedicated** contacts that can short pin 7 to pin 4 on the UNITY/I unit’s communication port. Use a shielded, single twisted pair cable to connect the emergency shutdown switch to the UPS communication port. See Figure 11.
- When the UPS’ pin 7 is shorted to pin 4, the UPS’ **output** power is shut off. When an EPO shutdown of the UPS occurs, the UPS scrolls EPO on its four-digit display.
- To restart the UPS after an EPO shutdown, press the EPO Reset Button inside the front door of the UPS.

NOTE: The UPS cannot be restarted if the EPO signal is still asserted on pin 7.

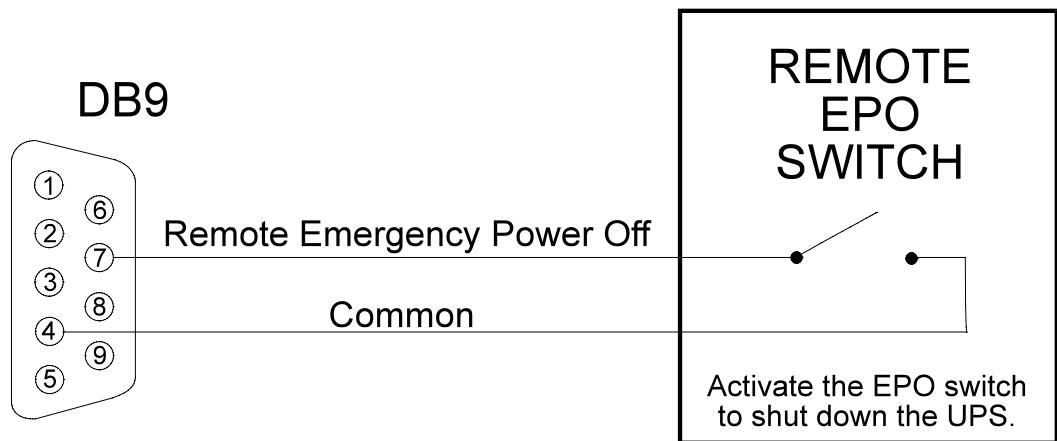


Figure 13

Appendix B: Attaching the Stabilizer Bracket

A stabilizer bracket is included with all UT3K, UT4K, and UT5K units. Installation of the stabilizer bracket is required to meet TÜV requirements, per standards EN 60 950 and EN 50091-1.

To attach the stabilizer bracket, follow the instructions below.

1. The UPS is easier to move without the stabilizer bracket attached, so first move the UPS to its permanent location.
2. Place the stabilizer bracket flat against the back panel of the UPS. The base of the stabilizer bracket will rest on the floor.
3. Use the bolts to secure the brackets to the UPS (see Figure 14).

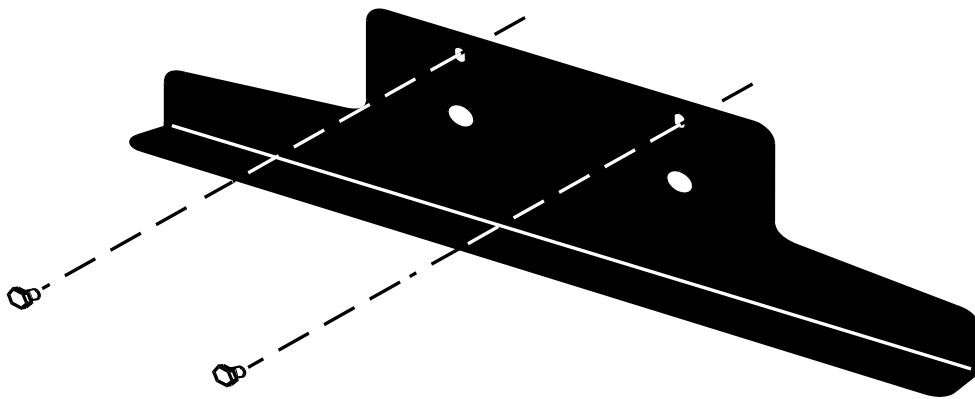


Figure 14

Warranty

LIMITED TWO YEAR WARRANTY Standard Warranty For All Purchases

BEST POWER, a division of General Signal Power Systems, Inc. (“BEST POWER”) warrants that each product sold by BEST POWER is compatible with existing commercially available computer equipment with enclosed power supplies and is free from defects in materials and workmanship under normal use and service. This warranty is applicable only to the initial retail purchaser (PURCHASER), and is not transferable. The duration of this warranty is two (2) years from the date of the first retail sale or the date of delivery to the PURCHASER, whichever occurs first, subject to the following conditions.

If the PURCHASER discovers within the duration of this warranty a failure of the product to perform compatibly with presently existing computer equipment or a defect in material or workmanship, the PURCHASER must promptly notify BEST POWER in writing within the duration of the warranty or not later than one month after expiration of the warranty. BEST POWER’s obligation under this warranty is limited to the replacement or repair, subject to the conditions specified below, of such product returned intact to BEST POWER which shall appear to BEST POWER, upon inspection, to have been either incompatible or defective. Replacement or repair will be made at BEST POWER’s Worldwide Service, Highway 80, Necedah, Wisconsin 54646, U.S.A. Such repair or replacement shall be at BEST POWER’s expense. This warranty does not cover any taxes which may be due in connection with replacement or repair, nor any installation, removal, transportation or postage costs. These expenses will be paid by PURCHASER. If BEST POWER is unable to repair or replace the product to conform to this warranty after a reasonable number of attempts, BEST POWER will refund the purchase price. Remedies under this warranty are expressly limited to those specified above.

TO THE EXTENT ALLOWED BY LAW, BEST POWER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY. TO THE EXTENT ALLOWED BY LAW, BEST POWER SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, INJURIES TO PROPERTY, LOSS OF USE OF THE PRODUCT OR ANY ASSOCIATED EQUIPMENT.

Some states do not allow limitations on how long an implied warranty lasts, so that the above limitation on duration of implied warranties may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. You are advised to consult applicable state laws.

No warranty is made with respect to other products sold by BEST POWER which do not bear the name BEST POWER, and no recommendation of such other product shall imply or constitute any warranty with respect to them. This warranty does not cover repair or replacement because of damage from unreasonable use (for example only, damage from road hazard, accident, fire or other casualty, misuse, negligence, or incorrect wiring) and any use or installation not in conformance with instructions furnished by BEST POWER, or repairs or replacements needed because of modifications or parts not authorized or supplied by BEST POWER.

LIMITED WARRANTY

Transient Voltage Surge Suppression Circuitry (For U.S. and Canadian Purchasers Only)

BEST POWER, a division of General Signal Power Systems, Inc. (“BEST POWER”) hereby warrants the transient voltage surge suppression circuitry in each FERRUPS®, FORTRESS®, PATRIOT®, UNITY/I™, CITADEL®, or SPIKEFREE™ product (hereinafter called “Product”) sold by it for installation in the United States of America and Canada to be free from defects in material and workmanship under normal use and service for the lifetime of the Product, beginning with the date of sale to the initial retail purchaser, subject to the following conditions. This warranty is applicable only to the initial retail purchaser (hereinafter called PURCHASER), is not transferable, and is limited to the following remedies:

1. The replacement or repair of the transient voltage surge suppression circuitry in each Product that is returned intact to BEST POWER and which shall appear to BEST POWER upon inspection to have been defective in material or workmanship or to have been damaged through normal use;
2. The reimbursement to the PURCHASER of up to \$25,000 per occurrence of documented physical damage to specified computer equipment connected to a Product where such damage could have been prevented by transient voltage surge suppression circuitry as detailed in BEST POWER’s specification for the Product sold.

This warranty is made in addition to BEST POWER’s Limited Two Year Warranty.

This warranty does not include any taxes which may be due in connection with replacement or repair nor any installation, transportation or postage costs. These expenses will be paid by PURCHASER. Replacement or repair will be made at BEST POWER’s Worldwide Service, Highway 80, Necedah, Wisconsin 54646, U.S.A.

This warranty does not cover repair or replacement because of damage from unreasonable use (damage from road hazards, accident, fire or other casualty, misuse, negligence, incorrect wiring) and any use or installation not in conformance with instructions furnished by BEST POWER, or repairs or replacements needed because of modifications or parts not authorized or supplied by BEST POWER.

This warranty is operable only upon the written acceptance by BEST POWER of an application by the PURCHASER on BEST POWER’s standard form for the above warranty coverage for the Product sold. In such application, the PURCHASER shall represent that the Product sold has been properly installed and grounded in accordance with instructions received from BEST POWER, and the PURCHASER shall also specify the computer equipment to which the Product sold has been connected and the location of the computer equipment. This warranty will not apply to any equipment not specified in the application by the PURCHASER as protected equipment.

EXCEPT AS EXPRESSLY SET FORTH IN THIS WARRANTY AND BEST POWER’S LIMITED TWO YEAR WARRANTY, BEST POWER MAKES NO OTHER WARRANTIES, AND TO THE EXTENT ALLOWED BY LAW, BEST POWER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

REMEDIES UNDER THIS WARRANTY ARE EXPRESSLY LIMITED TO THE REPAIR OR REPLACEMENT OF PRODUCTS AND THE REIMBURSEMENT SPECIFIED ABOVE, AND TO THE EXTENT ALLOWED BY LAW ANY CLAIMS FOR LOSS ARISING OUT OF THE FAILURE OF PRODUCTS TO PERFORM FOR ANY PERIOD OF TIME, OR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR OTHER ECONOMIC LOSS ARE EXPRESSLY EXCLUDED.

Some states do not allow limitations on how long an implied warranty lasts, so that the above limitation on duration of implied warranties may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. You are advised to consult applicable state laws.

For Users in the United States Only

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

For Users in Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

If your UNITY/I UPS has an input plug and line cord:

The UPS ground (earth) conductor carries the leakage current from the load devices in addition to any leakage current that the UPS generates. This UPS generates no more than 0.75 mA of leakage current. To limit the total leakage to 3.5 mA, the load leakage current must be limited to 2.75 mA. If you do not know the load leakage current:

1. To provide a safe path for leakage current, plug the UPS into a three-wire receptacle that has a good (low- impedance) ground (protective earth) connection, and
2. Replace the UPS power cord with one that has a locking type plug (such as an IEC-309) rated at a minimum of 32 A.

Modellen mit Netzstecker:

Bei UNITY/I-Modellen mit einem Eingangsstecker führt der Erdanschluß (die Erdableitung) zusätzlich zum etwaigen, von der USV erzeugten Leckstrom außerdem den Leckstrom von den angeschlossenen Geräten. Diese USV erzeugt einen Leckstrom von maximal 0,75 mA. Um den gesamten Leckstrom auf 3,5 mA zu beschränken, darf der Leckstrom der angeschlossenen Geräte nicht mehr als 2,75 mA betragen. Wenn Ihnen der Leckstrom nicht bekannt ist, tauschen Sie das Netzkabel der USV gegen ein Kabel aus, das einen Klemmstecker mit einem Mindestnennwert von 10 A hat (wie z.B. IEC 309). Falls Sie keine passende Steckdose hierfür haben, lassen Sie die entsprechende Steckdose von einem Elektriker installieren. Die Dreileitersteckdose, an die Sie die USV anschließen, muß einen guten (niederohmigen) Erdanschluß (Erdungsschutz) haben, um einen ungefährlichen Stromweg für den Leckstrom zu bieten.

Best Power reserves the right to change specifications without prior notice.

ALARM CODES

A-00	Low Runtime	A-10	Reserved
A-01	Overload	A-11	Batteries Disconnected
A-02	Circuit Breaker Warning/ Shutdown	A-12	Tap Regulator Alarm
A-03	High Ambient Temperature	A-14	High AC Out Warning/ Shutdown
A-04	Check Battery	A-15	Check MOVs
A-05	Check Inverter	A-16	Auto Bypass
A-06	Memory Error	A-17	Check Fuse Board
A-07	High Battery	A-18	Reserved
A-08	Low Battery	A-19	Check Power Supply
A-09	Check Fan		

To silence the audible alarm, press the [CANCEL] key.

If the display shows a dot moving from right to left, press any key to display the alarm code

For more information about alarms, see [Section 204](#).