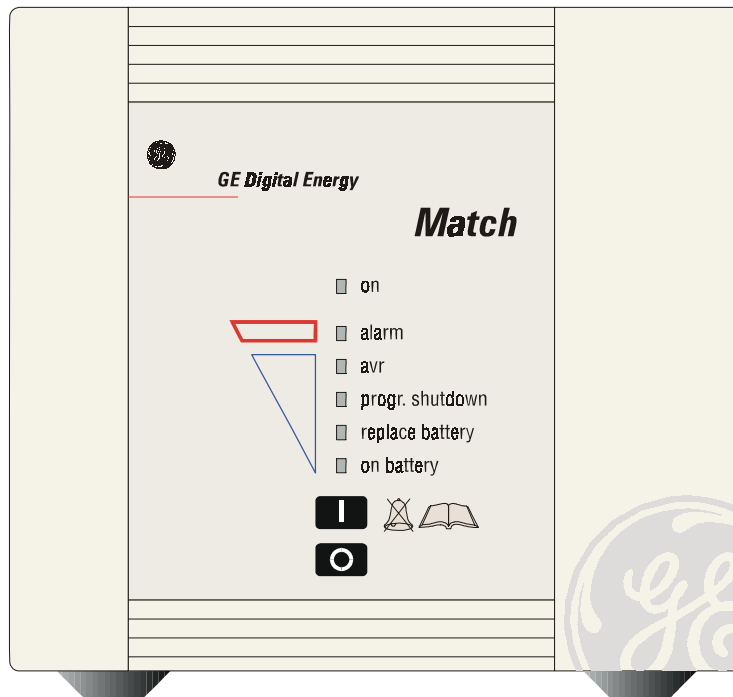




**GE Digital Energy**

# Match

*Uninterruptible Power Supply*  
500 - 1500 VA



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# USER MANUAL

## Match

### Uninterruptible Power Supply 500 - 1500 VA

Please read these instructions carefully before installation and start-up of the **Match UPS**. Keep this manual in a safe place for future reference.

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## 1 - Introduction

### 1.1 Introduction

The **GE (General Electric) Digital Energy Match UPS**, an uninterruptible power supply, protects your equipment from all forms of power interference, including complete power failures.

### 1.2 Safety Rules



**CAUTION: RISK OF ELECTRICAL SHOCK.** The UPS contains batteries. The appliance outlets may be electrically live, even when the UPS is disconnected from the mains.

The UPS contains potentially hazardous voltages. Do not open the UPS, there are no user serviceable parts inside.



All maintenance and service work, *including replacement of the batteries*, should be performed by qualified service personnel.

### 1.3 Transport / Storage

- No liability can be accepted for any transport damage when the equipment is shipped in non-original packaging.
- Store the UPS in a dry location with the batteries in a fully charged state. Storage temperature must be within -20 +45 °C. If the unit is stored for a period exceeding 3 months, optimal battery lifetime is obtained if the storage temperature does not exceed 25°C.
- If the unit is stored for an extended period of time, the batteries must be recharged periodically. Connect the unit to a wall outlet and recharge the batteries for 24 hours:
  - if the storage temperature is within -20 and +30°C: every 3 months,
  - if the storage temperature is within -20 and +45°C: every month.

## 2 - Installation

The shipping box contains a **Match UPS**, one (for **Match 500**) or two power cords, a CD ROM and this manual. After unpacking, inspect the UPS for damage. If you find any damage please immediately notify the carrier and place of purchase.

### IMPORTANT:

Before making any connection and switching on the UPS, please check the following conditions:

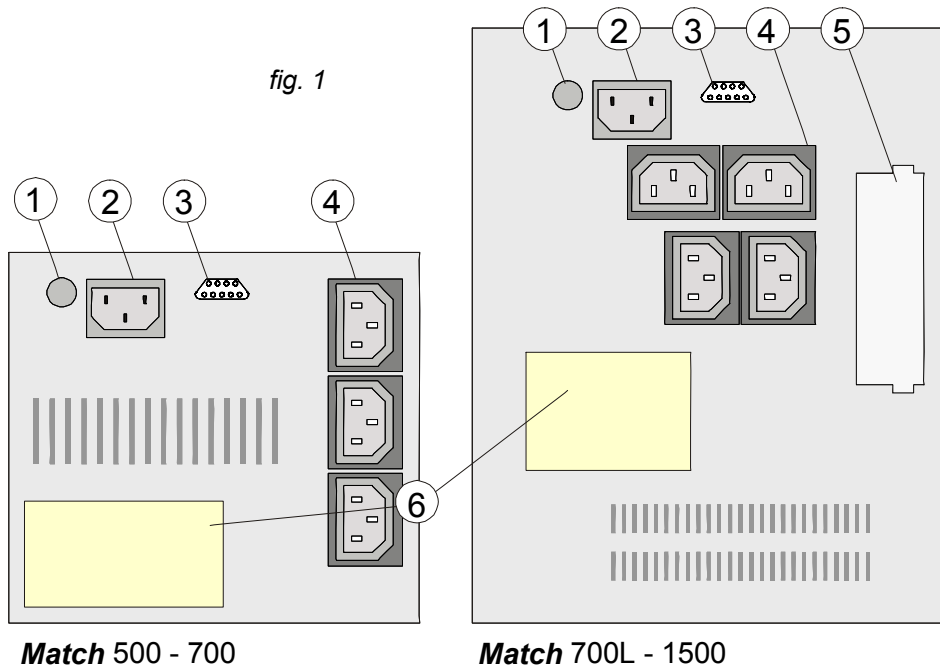
- your mains supply is 220 - 240 Volts and 50 or 60 Hz, and
- the total power demand of the connected equipment does not exceed the rated output power of the UPS (indicated on the rating label) (6, fig. 1).

### 2.1 Installation Rules

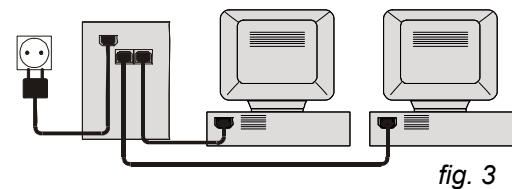
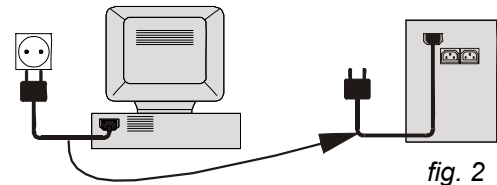
- The UPS is intended to be used in normal domestic and office situations.
- Protect the UPS, according to the wiring rules, with a 16A D-type fuse.
- The UPS must be powered from a single phase grounded wall outlet. Do not use extension cords.
- Avoid locations that are excessively humid, near water, near heat sources or in direct sunlight.
- The ambient temperature should not exceed 40°C. Optimal battery lifetime is obtained if the ambient temperature does not exceed 30°C.
- It is important that ventilation air can move freely around and through the unit. Do not block the air vents.
- Do not plug appliances such as electric heaters, toasters and vacuum cleaners into the UPS.
- Be careful when connecting laser printers: be sure that the demanded power does not exceed the capacity of the UPS.
- The sum of the leakage currents of the UPS and the connected loads should not exceed 3.5mA.



## 2.2 Installation Procedure



- 1     Switch off your computer, and unplug it from the socket-outlet.
- 2     Disconnect the power cord from the computer (rating 250Vac/10A) and connect this cord to the male input socket (2) at the rear of the UPS.
- 3     Using the output cord(s) provided, connect the computer to the appliance outlets (4) of the unit.
- 4     Connect the mains cord of the UPS to a working, grounded AC wall socket outlet. The green LED 'on' (7, fig. 5) will blink now: mains power is available and the batteries are charging. If the LED does not blink, press 'I' briefly. Probably LED 'replace battery' lights up; the LED goes out as soon as the batteries have been charged.



- 5     For best results, allow the UPS to recharge the batteries during a period of approx. 2 hours. It is acceptable to use the UPS without first charging the battery, but the runtime may be reduced.
- 6     For advanced communication possibilities, the RS232 interface port (3) can be connected to a computer system and/or optional interface cards (5) can be added. See chapter 4.



## 3 - Operation

Please refer to figure 5.

### 3.1 Start-up

#### 3.1.1 Start-up, mains available

- 1 Press keypad 'I' (13) briefly; LED 'on' (already blinking) will illuminate continuously now.
- 2 The equipment connected to the UPS can now be switched on.

#### 3.1.2 Start-up, mains not available

If the mains input is absent (power cord not connected, or mains failure):

- 1 Press keypad 'I' briefly, and then
- 2 Press keypad 'I' during 5 seconds until the buzzer sounds.  
The LEDs 'on' and 'on battery' (12) will illuminate. The UPS operates on battery: it discharges the batteries.

### 3.2 Use: Normal Operation

#### 3.2.1 Normal operation conditions:

- the mains supply is present,
- the UPS is on,
- the load does not exceed the capacity of the UPS and
- the operating temperature is below alarm level:

#### 3.2.2 Load indication (fig. 4)

- 1 During normal operation, press keypad 'I' briefly.
- 2 Yellow LEDs will blink during 3 seconds, the number is load dependent (in case of overload LED 'alarm' (8) blinks as well).

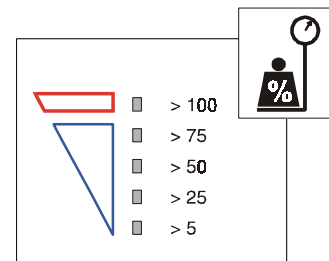


fig. 4

#### 3.2.3 Auto-off (no-load shutdown)

If this function is activated, the UPS will switch off during a mains failure when the load is less than 5% of the maximum load. In this way unnecessary discharging of the batteries is avoided. The unit will automatically turn on again when mains power is restored. The default setting of the no-load shutdown function is: activated. You can change this setting through the RS232 port, using the UPS configuration tool that came with the unit (CD ROM, see 5.4).

#### 3.2.4 Battery test

- 1 During normal operation, press keypad 'I' for one second.
- 2 The duration of the test is 4 seconds. See also 3.3.6.

#### 3.2.5 Switching off

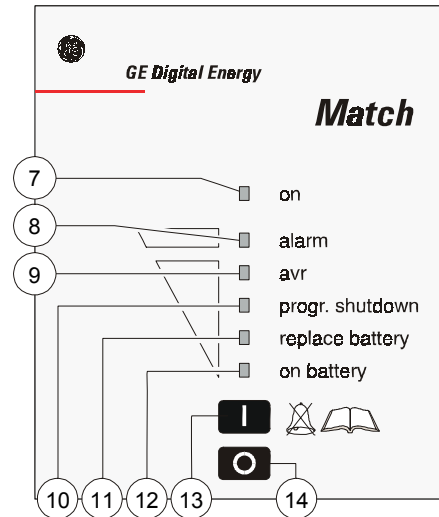
- 1 Press keypad '0' (14) briefly.
- 2 If electric isolation is required, unplug the power cord from the wall outlet.



### 3.3 Use: Status and Alarm Indications

- o status indications                    the operating mode
- ! low priority alarms                    abnormal operating situations
- !! high priority alarms                    situations in which *the actual output voltage of the UPS is no longer guaranteed*; immediate action should be taken

fig. 5



	Situation	on	alarm	avr	progr. shudt.	repl. batt.	on batt.	buzzer
o	Charger on (3.3.1)	-----						
o	Normal operation (3.3.2)	_____						
o	Automatic voltage regulation (3.3.3)	_____		-----				
!	On battery (3.3.4)	_____					_____	-----* 1x/8 s.
!!	Battery low (3.3.5)	_____	-----				_____	-----* 1x/s.
!	Replace battery (3.3.6)	_____				_____		
!!	Overload (3.3.7)	_____	-----					_____
!!	High temperature (3.3.8)	_____	-----					-----* 1x/s.
o	Progr. shutdown pending (3.3.9)	_____			-----			
o	Progr. shutdown in progress (3.3.9)	-----			_____			

Operating modes and corresponding indications, see 3.3.1. – 3.3.9.

----- = intermitting

\_\_\_\_\_ = continuous

\* = resettable: press push button 'I' > 2 secs.



**3.3.1 Charger on**

The batteries are charging, see 2.2.4

**3.3.2 Normal operation**

See 3.2.1.

**3.3.3 AVR (Automatic Voltage Regulation) active**

The quality of the incoming mains is poor, and the AVR boosts a low incoming voltage or reduces a high one (see chapter 7).

**3.3.4 On battery**

The UPS uses the energy stored in the batteries: see chapter 7 'Batteries - autonomy'. The UPS will shutdown

- after the batteries have been discharged (automatic restart), or
- if keypad 'O' is pressed (manual restart required) or
- if a 'UPS shutdown' command is given by the computer (manual restart required).

**Autonomy indication (fig. 6)**

During battery operation, press keypad 'I' briefly. The 4 yellow LEDs indicate during 3 seconds the remaining autonomy time for the actual load.

**3.3.5 Battery low (end of autonomy)**

The batteries are nearly discharged. Controlled shutdown of your computer equipment should be completed within 1 minute.

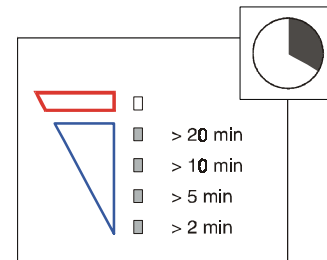


fig. 6

**3.3.6 Replace battery**

The batteries are bad. The alarm only goes out after the next battery test: if the batteries have either been sufficiently charged (discharged batteries) or replaced by a new set (worn out batteries).

**3.3.7 Overload**

The demanded power of the equipment exceeds the UPS's rated output power. If overload persists during battery operation, the UPS may shut down.

**3.3.8 High temperature**

Overtemperature shut down during battery operation can occur from:

- extreme environmental temperature,
- lack of proper ventilation,
- overload situation.

When the pre-alarm sounds, check these conditions to avoid shutdown or damage. If the temperature rises further, the UPS will

- if it runs on mains: switch off the battery charger
- if it runs on battery: switch off completely. Output voltage is no longer available!

**3.3.9 Programmed shutdown**

Probably your UPS monitoring software allows you to program a 'sleep period' of the UPS by sending two commands to the UPS:

- shut down after # minutes (blinking LED), and subsequently:
- shut down during # hours (continuous LED).

The programmed shutdown in progress can be cancelled:

- press keypad 'I' for at least 5 seconds to cancel shutdown and switch UPS on.
- press keypad 'O' for at least 5 seconds to cancel shutdown and switch UPS off.



## 4 - Communication

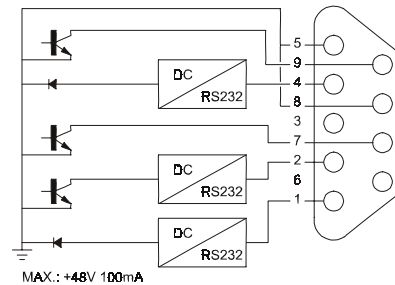
### 4.1 RS232 Port (fig. 7)

The RS 232 Port is a plug-in interface port (9-pin, Sub-D, male) which enables advanced communication between the UPS and the computer (interface kit required).

We strongly recommend to use only original **GE Digital Energy** software products in combination with the interface port.

Pin #	Function
1	RS232 input (UPS shutdown)
2	RS232 output
3	No function
4	Plug and Play
5	Common
6	No function
7	Battery low
8	UPS connected
9	Mains failure

fig. 7



### 4.2 Relay Interface Card (option)

The card is equipped with potential free change-over contacts for the following alarms:

- mains failure
- battery low

For more information please refer to the user manual that comes with the interface card.

### 4.3 SNMP Interface Card (option)

This card allows the data interface to be connected directly to an Ethernet network.

For more information please refer to the user manual that comes with the interface card.

## 5 - Maintenance

### 5.1 General

The **GE Digital Energy Match UPS** is virtually maintenance free: take care of proper environmental conditions and keep air inlets-outlets free of dust. Please read 2.1.

### 5.2 Fuses

If the AC input fuse (1, fig. 1) is defect, be sure it is replaced by a compatible fuse from the same make and type: FERRAZ TISP 5x20 or LITTLEFUSE 215 5x20 or WICKMANN 19181 5x20  
Fuse ratings: see chapter 7.

### 5.3 Batteries

The service life of the battery is up to 6 years.

As a healthy battery is critical to the UPS, keypad 'I' allows a Quick Battery Test (see 3.2.3). When the condition of the battery is critical, a 'replace battery' alarm will be generated. Have your dealer replace the batteries as soon as possible.

### 5.4 UPS Configuration Tool

With the UPS configuration software, that came with the unit on CD ROM, you are able to change the setting of the 'auto-off' function (3.2.3).

Insert the CD ROM in your computer, and

1. Select RUN from the start menu
2. Type a:\conftool (type for 'a' the appropriate drive letter)
3. Press ENTER

See also README.TXT.





## 6 - Troubleshooting

Whenever a malfunction occurs, first check external factors (e.g connections, temperature, humidity or load) to determine whether the problem is caused by the unit itself or by its environment. Subsequently check the input fuse: it may be blown. If so: replace the fuse (see 5.2) and be sure that the UPS is not overloaded.

The following chart is a simple troubleshooting checklist only. If the suggested solution does not succeed, or if the information is insufficient to solve the problem, please contact your dealer or consult [www.gedigitalenergy.com](http://www.gedigitalenergy.com).

PROBLEM	POSSIBLE CAUSE	SOLUTION
Connected equipment not operating properly, buzzer sounds continuously	Overload causes reduced output voltage	Reduce load
Blown input fuse	Output overload	Reduce load, read 5.2, replace fuse
	System failure	Contact your dealer or consult <a href="http://www.gedigitalenergy.com">www.gedigitalenergy.com</a>
UPS will not switch on to normal operation, LED 'on' remains off (charger off)	Line cord not connected	Read 2.2 'Installation' Connect line cord
	Dead socket-outlet, or mains voltage < approx. 187Vac, or mains frequency out of tolerance	Contact qualified electrician. Battery start is possible: see 3.1.2
	UPS overtemperature	Read 2.1 Allow UPS to cool down
	Blown input fuse	See above
UPS will not switch on to normal operation, LED 'on' blinks	Mains voltage between 165 - 187Vac	Contact qualified electrician
UPS will not switch to battery operation	Batteries depleted	Allow the UPS to recharge the batteries
	System failure	Contact your dealer or consult <a href="http://www.gedigitalenergy.com">www.gedigitalenergy.com</a>
UPS switched off automatically	Shut down by external (software) command	Wait until mains returns
	UPS overtemperature	Read 2.1 Allow UPS to cool down
	Mains failure, battery discharged	Wait until mains returns
	The load is < 5% of the max. load and no mains power is present. (No-load shutdown function is active, see 3.2.3)	Wait until mains returns
LED 'replace battery' illuminates, buzzer is silent	Quick Battery Test just after installation or mains failure	Allow the UPS to recharge the batteries
	Quick Battery Test shows weak battery	Read 5.3, have the batteries replaced



## 7 - Specifications

**Match model** : **500**      **700**      **700L**      **1000**      **1000L**      **1500**

**Ratings**

Voltage Amperes (VA), with computer type load : 500      700      700      1000      1000      1500  
 Watts (W) with resistive load : 300      420      420      600      600      900

**Input**

AC input voltage : 220 - 240 V  
 AC input voltage window : 165 - 275 V, mains operation  
 Maximum AC input voltage : 350V (above 275V battery operation)  
 Minimum start-up AC voltage : 187 V (at any load)  
 Input frequency : 50 Hz or 60 Hz  
 Input frequency range : nominal  $\pm$  2.5 Hz  
 No-load power consumption, normal operation : typically 7W (500-700) or 12W (700L-1500)  
 AC input current (A) : 2.8      4.0      4.0      6.0      6.0      8.0  
 AC input fuse (A) : 5      5      5      10      10      10

**Output**

AC output voltage : 230 V (suitable for 220-240 V loads)  
 AC output voltage tolerance : nominal  $\pm$  2% (battery operation, RMS value)  
 Output frequency : 50Hz or 60Hz (autosensing)  
 Output frequency in case of battery start : last detected frequency (off factory 50 Hz)  
 Output frequency stability :  $< \pm$  0.1Hz (battery operation)  
 Output waveform : sine wave  
 Power factor : 0.6 (0.7 at 90% load)  
 Transfer time : typical 4 ms.  
 Buck/Boost voltage regulation : at 165-275 V input voltage: output voltage 190-254V

**Batteries (ratings given for 25°C)**

Nominal voltage (Vdc) : 12      24      36      36      36      36  
 Number x capacity (Ah) of batteries : 1x7      2x7      3x12      3x7      3x12      3x12  
 Type : 12V, sealed lead acid, maintenance free  
 Service life : up to 6 years (depending on use)  
 Recharge current : 3 A  
 Battery recharge time for 90% capacity (hours, approximation) : 2      2      2      2      2      2

Autonomy: runtime in minutes at typical load (75%) : 7      12      40      13      28      16  
 VA / Watts  
 100/ 60 : 42      84      190      120      190      190  
 300/180 : 10      26      70      41      70      70  
 500/300 : 4      13      41      23      41      41  
 700/420 : -      8      30      15      30      30  
 1000/600 : -      -      -      8      20      20  
 1500/900 : -      -      -      -      -      10

**General**

Weight (kg) : 7.2      10.0      20.8      16.5      20.8      20.8  
 Dimensions (hwxwd, mm)  
 Match 500-700 : 144 x 155 x 350  
 Match 700L-1500 : 225 x 180 x 360  
 Enclosure / protection : steel - plastic / IP20

**Environment**

Safety : EN 50091-1-1  
 Electromagnetic compatibility : EN 50091-2  
 Ambient temperature : -10 to +40°C;  
 Sound at 1 meter : < 35 dB(A)  
 Maximum relative humidity : 95% (non-condensing)