UNINTERRUPTIBLE POWER SUPPLY SYSTEMS

Diamond*Plus*+

Where Reliability Breeds Confidence

MITSUBISHI ELECTRIC

High-performance UPS for a Wider Range of Backup Operations–

Depend on DiamondPlus+ to Provide the Reassurance and Protection you Need to Confidently Safeguard your Critical Equipment

OVERVIEW

- **Line Interactive Design**
- **Sine Wave Output Waveform**
- **Less than 4 ms Transfer Time**
- **Automatic Voltage Regulator**
- **Remote Controller / Status Display Unit**

- **Load Shedding Capability**
- **Hot-Swappable Battery**
- **Cold Start Feature**
- **Plug & Play Operation**
- **Free DiamondLink Software CD/ROM**

Superior Specifications to Meet More Diversified Needs

• High-performance line-interactive power supply

This unit employs a line-interactive power supply and is far more compact than continuous inverter power supplies, boasting a volume ratio of only 70% that of a 1kVA continuous type. Backup switchover time is a remarkably short 4 ms. The output waveform is sine wave and is suitable for use for a wide range of equipment, from high-performance servers to standard PC units.

• Adaptable to a wide range of line voltages: AVR function (Automatic Voltage Regulator)

The AVR function corrects the voltage to enable the unit to handle a wide range of line voltages, from 90VAC to 145VAC. This feature reduces the number of times backup switching is activated, cutting down on unnecessary consumption of battery power and preventing inadequate battery charging levels from causing problems when backups are necessary.

Adaptability to line voltages

	90V	103V	132V	145V
Continuous commercial power supply		↔		
Line-Interactive power supply	↔			

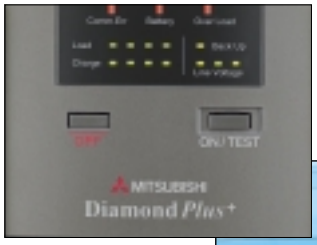
• Self-check function

The self-check function makes it extremely easy to confirm at any time whether the UPS unit is ready to provide backup power, thus supplying the assurance that it will perform to expectations in the case of a power failure. The self-test is automatically conducted every 14 days when the unit is continuously powered.

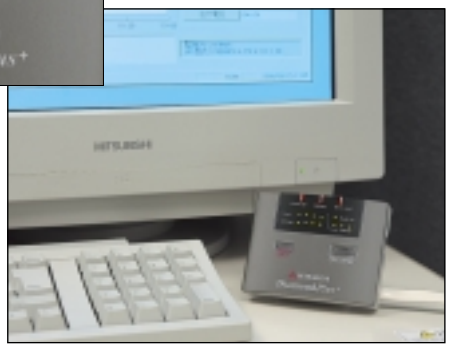
• Noise countermeasures

With its built-in noise filters and protection against lightning and power surges, the UPS protects the equipment that is being backed up by guarding against surges and noise in the power supply input.

User-friendly Remote Controller –
Control and Diagnostics at Hand



Wired remote controller



Removable wired monitoring and controller unit allows the user to perform UPS ON/OFF operations and status monitoring at close proximity on desktop. Quick glance at the display allows the operator to react quickly to any situation that may present itself and perform any corrective actions to prevent any potential data loss.

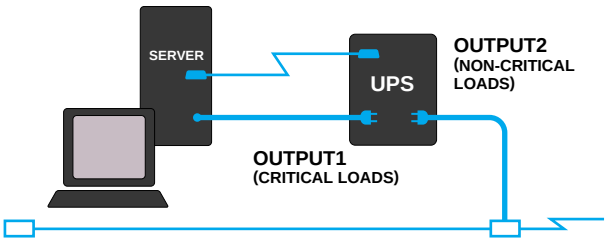
Hot-Swappable Batteries –
Battery Replacement Made Safe and Easy

Replacement of batteries is made safe and easy with the hot-swap feature. There is no need to turn the UPS off; battery change-out is performed while the unit is running.

Cold-Start Feature –
Power-Up on Demand

The UPS can be used as an emergency power source at a remote site where there is no AC commercial power available or to power up unprotected equipment after a power failure occurred. The unit will start-up directly on battery backup when this feature is chosen.

Load Shedding Capability –
Save Backup Time for Critical Loads



UPS backup power during commercial power failures can be separated into two systems via the output load receptacles. In cases where several kinds of equipment are connected, the load shedding function allows the UPS to deactivate backup support for peripherals and allocate battery power on a priority basis to critical equipment that needs to perform shutdown operations.

Select the UPS that Best Suits your Application –

Follow these Guidelines to Size the UPS According to the Power Consumption of your Equipment Loads

Selection Method

- Determine the types of equipment you wish to backup

Give top priority to protecting equipment such as servers and monitors which are in the most danger and do the most harm if they cease to operate during a power outage.

- Determine the power consumption (W) and the consumption (VA) of the equipment to be backed-up

Use both the power consumption (W) and the consumption (VA) which are displayed on the equipment. When only one parameter is displayed, calculate the other using the following formulas.

- When only the equipment's consumption (VA) is displayed; estimate the equipment's power consumption according to the power factor examples in the box below:
  Formula 1 –
  Power Consumption (W) = Consumption (VA) X Power Factor

- When only the equipment's power consumption (W) is displayed; estimate the equipment's consumption (VA) according to the power factor examples in the box below:
  Formula 2 –
  Consumption (VA) = Power Consumption (W) X Power Factor

- When only the current (A) used by the equipment is displayed; estimate the equipment's consumption (VA)
  Formula 3 –
  Consumption (VA) = Current (A) X Voltage (V) then use Formula 1 above.

Equipment power factor examples

Computers, display monitors	0.6-0.7
Compact monitors (induction motors)	0.6-0.8
Electrical heaters	1.0
Dedicated servers (input power factor controlled to 1)	1.0

- Selection on basis of results

Determine the power consumption (W) and the consumption voltage (V) of all the equipment to be connected, then select a UPS whose rated capacities in both (W) and (VA) are larger than the respective totals for all the equipment. For future anticipated growth of your equipment loads, add a 25% margin in selecting the UPS unit.

Load in the case of standard computers

In the case where the load consists of standard computers, the UPS should be selected on the basis of consumption (VA) only. However, please confirm first whether the power factor of the equipment in question is 0.6-0.7. When a mixture of various kinds of equipment is used, follow the instructions given in "Selection Method".

- Selection examples

Use a computer rated at 200W and monitor rated at 1.8A for this sizing example:

Calculating VA	Calculating W
Computer's VA: 200W ÷ 0.6 = 333VA	Computer's W: 200W
Monitor's VA: 1.8A × 120V = 216VA	Monitor's W: 180VA × 0.67 = 108W
Total VA: 333VA + 216VA = 549VA	Total W: 200W + 108W = 308W

As a result, select model DP-A12-0.7K rated at 700VA or 490W.

DiamondLink™

Linking Power and Information into ONE

Advanced UPS Power Monitoring, Management & Shutdown Software

Your data is the most important element of your company...

DiamondLink™ is an advanced user-customizable power monitoring, management and shutdown software, designed to provide information about the power conditions of the UPS. DiamondLink will monitor the health and status of your UPS and, when critical events occur, will perform a graceful, unattended shutdown.

To ensure data integrity, the user can customize DiamondLink by defining a set of actions to occur for each power event. Some of these actions include: paging, e-mail notification, shutdown, logging, broadcast messages, run command (script) files and pop up of the DiamondLink screen, if minimized.

DiamondLink includes user-customizable display screens for data viewing and power analysis and event management. By using DiamondLink with your UPS, the effects of power disturbances on a business can be significantly minimized. A UPS alone can provide system backup in the event of a power failure occurrence, however a UPS with DiamondLink can provide 100% protection of your system's data.

Features

- Automatic unattended shutdown
- User-defined actions for specific power-events
- Smart messages can be user defined
- Color coded power event logging
- Built-in graphing routines allow customized graphs to be created on-line.

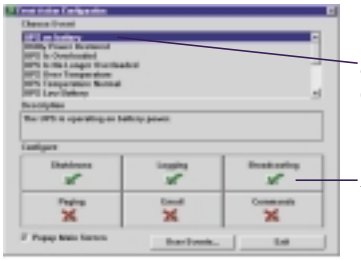
Specifics

- Power history graphs
- Custom user defined events
- Data log viewer
- E-mail configurations
- E-mail options for power events
- Event action
- Events log file
- Modem alert notification
- Pager notification
- Pager option

Operating Systems Supported

- IBM AIX for RS/6000
- Microsoft Windows
- Microsoft Windows NT
- Microsoft Windows 95
- OS/2
- Hewlett Packard (HP-UX)
- Silicon Graphics (IRIX)
- Novell NetWare
- SCO UNIX
- SCO XENIX
- SUN OS SUN 4
- Interactive UNIX
- System V Release 4
- Solaris (Intel, SPARC)

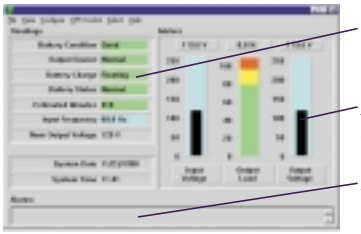
Protecting your data is our most important job.



Select the type of power event to configure with a click of the mouse.

Power event actions are easily selected.

DiamondLink event action screen allows you to select the type of power event and choose the type of action to take place when unfavorable events occur.

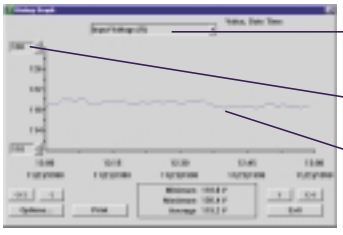


Colors of displayed values alert users to alarm conditions.

DiamondLink allows users to define threshold settintgs.

Broadcasted events are displayed in the DiamondLink alarm log.

DiamondLink's real time meters display all UPS variables and allow for user defineable threshold settings.



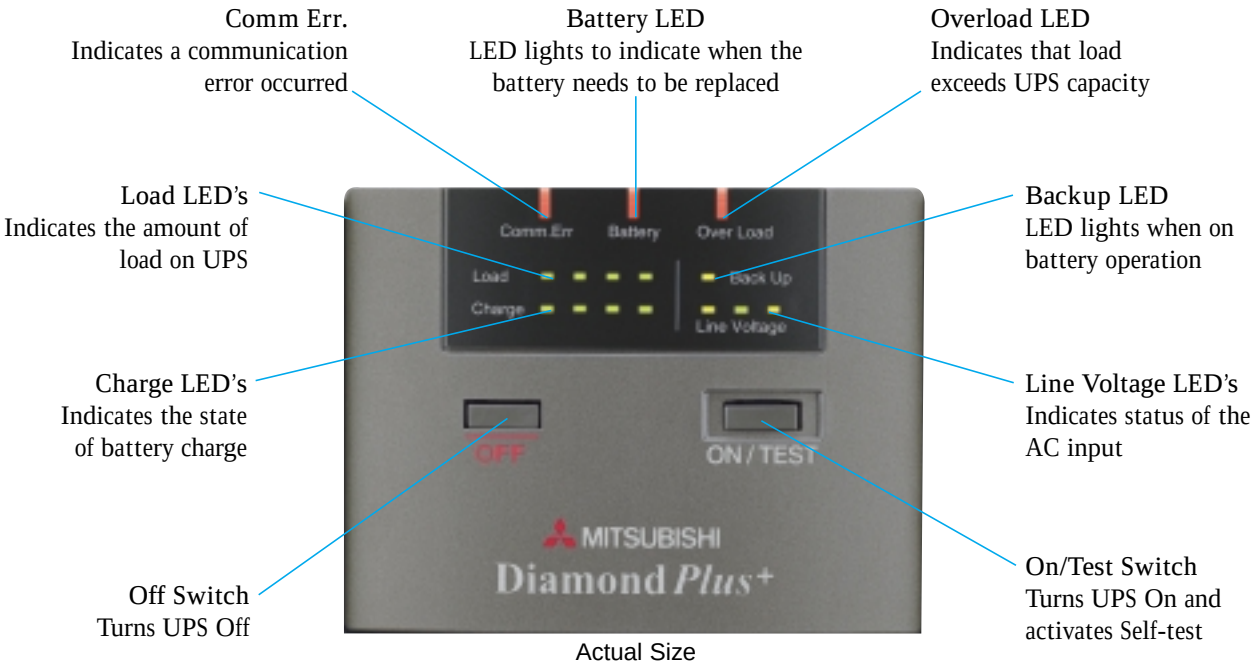
Select from multiple variables to graph.

User definable threshold options.

DiamondLink provides history graphing of user selectable variables (choose from line, bar or scatter graph formats).

DiamondLink power history line graph.

Front Panel Remote Controller Unit



Actual Size

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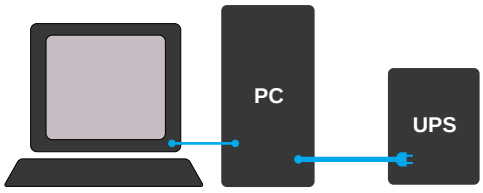
Typical System Configuration

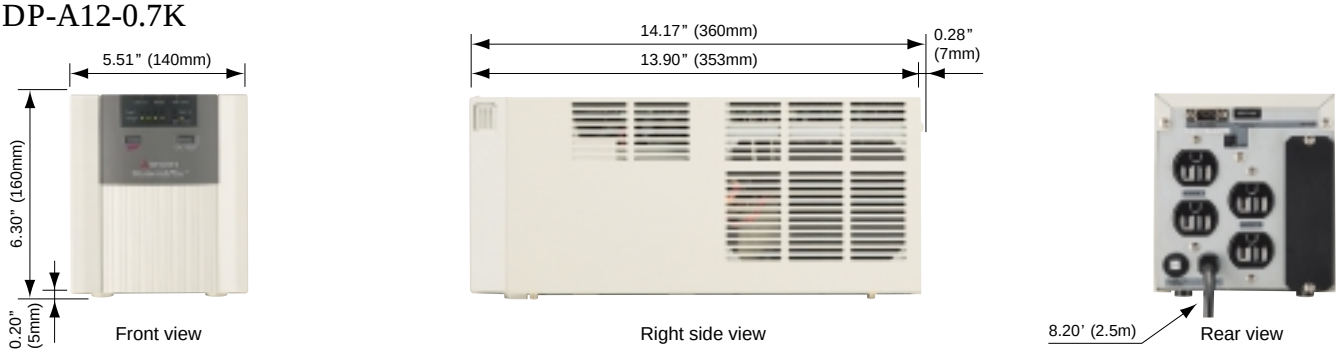


The simple system configuration shown consists of a stand alone PC and monitor to be protected by the UPS. When a power failure occurs, the UPS will supply continuous power to the PC and the monitor for the desired backup time according to the size of the UPS. Once the battery is depleted, the equipment will shutdown to preserve battery life. More complex systems, comprising of several PC's, monitors, servers and other peripheral equipment are protected by selecting a larger size UPS. Refer to the Sizing Guidelines section of this brochure to determine the minimum sized UPS required for your application.

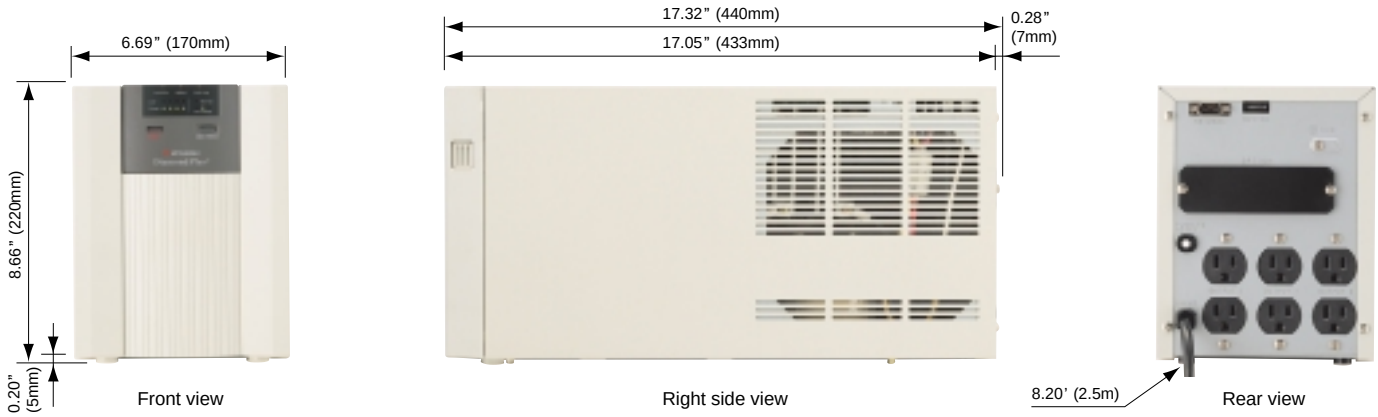
Outline Dimensions

Unit: inch (mm)

- DP-A12-0.7K



- DP-A12-1.0K and DP-A12-1.4K



- DP-A12-2.0K

Specifications

• UPS Models

Model	kVA / W	Input Line Cord	Output Receptacles	Backup Time @ Full Load	Dimensions W×D×H inch (mm)	Weight lbs (kg)
DP-A12-0.7K	0.7 / 490	8'L 5-15P	(4) 5-15R	5 min	5.51 × 14.17 × 6.30 (140 × 360 × 160)	37.5 (17)
DP-A12-1.0K	1.0 / 700	8'L 5-15P	(6) 5-15R	8 min	6.69 × 17.32 × 8.66 (170 × 440 × 220)	46.3 (21)
DP-A12-1.4K	1.4 / 980	8'L 5-15P	(6) 5-15R	7 min	6.69 × 17.32 × 8.66 (170 × 440 × 220)	57.3 (26)
DP-A12-2.0K	1.92 / 1600	8'L 5-20P	(6) 5-15R	14 min	6.69 × 21.65 × 17.32 (170 × 550 × 440)	114.7 (52)

• Standard Features

- Sine-wave output waveform
- Transfer time: less than 4ms
- Plug & Play Operation:
  - 8' long AC line cord with plug
  - Output load receptacles

• Operating Environment

- Ambient Temperature: 32-104°F (0-40°C)
- Relative Humidity: 5-95%
- Operating Altitude: 10,000 ft (3,000m)
- Noise Level: 45dB at 3 ft (1m)

• AC Input Ratings

- 120VAC (90-145VAC range)
- Frequency: 50/60Hz (±5%)

• AC Output Ratings

- 120VAC (104-132VAC range)
- 114-126VAC on backup operation
- Frequency: 50/60Hz (±0.1% on backup)

• Battery Backup Time in Minutes

Load (VA)	Load (Watts)	**DP-A12-0.7K** (minutes)	**DP-A12-1.0K** (minutes)	**DP-A12-1.4K** (minutes)	**DP-A12-2.0K** (minutes)
100	70	74	130	149	230
200	140	32	62	86	143
300	210	17	38	56	93
400	280	12	27	40	73
500	350	9	21	31	53
600	420	7	17	25	41
700	490	5	14	21	39
800	560	—	12	17	34
900	630	—	10	15	29
1000	700	—	8	13	25
1100	770	—	—	11	20
1200	840	—	—	9	19
1300	910	—	—	8	18
1400	980	—	—	7	16
1500	1050	—	—	—	15
1600	1120	—	—	—	13
1700	1190	—	—	—	12
1800	1260	—	—	—	11
1920	1344	—	—	—	10
	1600	—	—	—	6

The values given in this table are not guaranteed, but for reference purposes only. They are based on the battery's initial characteristics; fully charged and at an ambient temperature of 77°F (25°C). In practice, the backup time varies according to the charging status of the battery and the operating ambient temperature. Moreover, when the battery is approaching the end of its useful life, the backup time can decrease by as much as half. It is therefore important to allow sufficient margin when selecting your UPS. Backup time may also vary depending on the operating environment.

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