

**3.1 kVA to 7.5 kVA**

# **MD SERIES**

## Uninterruptible Power Systems

Designed to be used with linear or non-linear load applications such as:

- Networking (LAN / WAN)
- Hosts / Hubs
- Clusters
- Voice Mail
- Information Technology
- Automatic Message Dialer Services
- Telecommunications
- CAD / CAM
- Industrial Controls
- Medical Labs
- Doppler Radar Systems
- Communication Closets



**CONTROLLED POWER COMPANY**

*"World's recognized authority in power treatment"*



Controlled Power Company engineers and manufactures the industry's highest quality power conditioning equipment, capitalizing on 25 years of experience. We have an enviable reputation for quality, which is reflected in the design, workmanship, and performance of our products.

We provide the widest range of power equipment for regulating, conditioning, isolating, purifying, and distributing incoming electrical power. All products incorporate state-of-the-art technology, optimizing performance characteristics for various applications. Our products protect sensitive electronic systems from erratic operation and failure due to power line transients, noise, brownouts, sags, surges, and total power outages.

### MD Series UPS

The overall function of the **MD Series** UPS's is to take polluted, fluctuating, and erratic electrical power that exists in all areas today and purify or replace it (in the case of complete power outages) with well-regulated, computer grade power.

The **MD Series** UPS's maintain electrical power to the critical load for approximately 10 minutes to several hours. The backup time is a function of the amount of battery reserve that is purchased with the system.

### Features & Benefits

The **MD Series** products are designed to maximize backup time, protect your computer or critical load, and monitor all the key parameters of electrical power including a log of events.

#### Features include:

- Steady, Regulated Voltage to  $\pm 3\%$ , Providing Proven Performance and Extending the Life of Your Equipment
- Highest Level Performance Sine Wave Output Matches Your System's Requirements
- 100% Power Conditioning
- No-break, Continuous Power Provides Seamless Switching to Battery Backup
- Patented "Fuzzy Ranging"™ Control Extends Battery Life and Backup Time
- Optional Extended Backup Time
- Optional NetMinder UPS Communications Software and Hardware for UPS Monitoring and Network Management



### MD Series Display Monitor & Diagnostics Provide System Status:

#### Bright, 3-Digit Alpha Numeric Display

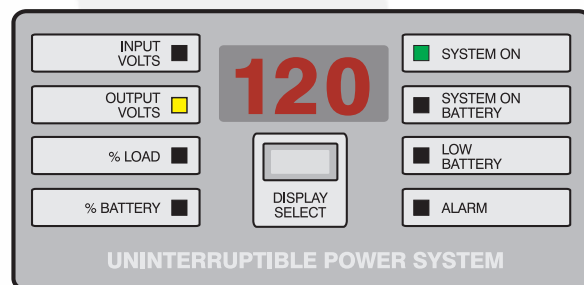
- Input Voltage
- Output Voltage
- Percent of Battery Capacity
- Percent of Load
- Percent of Battery Charged

#### LED Indicators Provide System Status

- System On (Green)
- System On Battery (Yellow)
- Low Battery Warning (Red)
- Alarm

#### Selectable

- Low Battery Warning Setting
- Auto / Manual Restart
- Start on Battery Power
- Alarm Silence



# SYSTEM DESCRIPTION

## Total Power Security

### Built-In Isolation

It is a common fact that isolation transformers provide electrical security for the load, eliminate electrical noise, and produce a new clean ground for digital and communication signals. All **MD Series** UPSs include a power purifying isolation transformer (uncommonly found in 3.1kVA to 7.5kVA UPSs), which protects your equipment from the most damaging power disturbances. This standard isolation transformer offers the user a choice of input and output voltage selections between 120 to 240 volts.

### Input Power Factor Correction With Less Than 10% Total Harmonic Distortion (THD)

The **MD Series** goes beyond the traditional UPS. Double magnetic conversion prevents damaging load-generated harmonics from backing-up into the utility lines.

### User-Friendly Full Monitoring Features

The **MD Series** has a full complement of diagnostic indicators. Metering includes: Battery Voltage, Input Voltage, Output Voltage, and % Load. Status LEDs include: System On, On Battery, Low Battery, and Alarm.

### Fuzzy Ranging™

**Fuzzy Ranging™**, a patented technology solution, uses fuzzy logic to automatically broaden the input operating range to -40% as a function of load. This feature provides added security during deep brownout conditions without battery consumption. Fuzzy Ranging assures the batteries will be at full capacity for a real emergency...a power outage.

## Product Specifications:

### Input

120, 208, or 240 VAC at 60 Hz; 220 VAC at 50 Hz

**Operating Range:** +10%, -40% typical

**Frequency Range:** ±2.5 Hz

**Power Factor:** Self-correcting to >0.95 (approaching unity)

**Input Harmonics:** <10% THD (Total Harmonic Distortion)

**Spike Attenuation:** 3000:1

### Performance

**Overload Capability:** 125% for ten minutes

**Surge Capability:** 150% of rated output without need of static bypass

**Frequency Stability:** ±0.2 Hz

**Inner Winding Capacitance:** 0.01 picofarads (primary to second coupling)

**Common Mode:** 120 dB

**Transverse Mode:** 70 dB

(-3 dB at 1 kHz; -20 dB per decade)

**Reactive Power Correction:** Load at .6 pF corrected to >.95 at input (automatically self-correcting)

**Fuzzy Ranging Plus™:** Human-like decision making to optimize usable input line voltage without use of batteries. Range extends without battery consumption to 60% of nominal input voltage.

## Output

**Sine Wave Voltage:** Typical 3% harmonic distortion, any single harmonic

**At 60 Hz:**

120 VAC; 120/208 VAC; 120/240 VAC

**At 50 Hz:**

220 VAC; 110/220 VAC

**Crest Factor:** 3.5:1

**K Factor:** 30 or better

**Power Factor:** 0.7 switch mode rated

**Harmonic Attenuation:** Load generated harmonics are attenuated 120% at the input

**Line Regulation:** Typical ±3%

**Load Regulation:** Typically better than ±3%

**Isolation:** Galvanic isolation

## Environmental

**Isolation:** NEC article 250-5d; complies with this standard that specifies a separately derived power source

**Operating Temperature:** 0°C to 40°C without derating in any mode

**Storage Temperature:** -20°C to 50°C

**Relative Humidity:** 95% non-condensing

**Elevation:** 5,000 feet, 1500 meters

## Agencies

- IEEE 587 Category B Guide for surge suppression
- IEC 555
- ANSI / IEEE C62.41 and .45 Category A and B
- FAA - G - 2100F power factor specifications
- CBEMA and ANSI C84.1, exceeds specifications and recommendations

## MTBF

**Total System:** 100,000 hours

**Transformer:** 200,000 hours

**Mean Time to Repair:** Less than one hour

## Safety

- U/L Listed 1778 Standard for UPS Equipment
- U/L Listed 544 Standard for Medical and Dental Equipment CSA Certified
- FCC Article 15, Section J, Class A, will not cause harmful interference with any other electronic devices.

# PROVEN SOLUTIONS

## MD6000 Supports Factory-Floor Data Management

A large manufacturer of steel automotive parts running a 24x7 production line, relies on its Distributed Control System (DCS) to monitor its factory-floor operations (inventory control, production / reject rates, tolerances, repeatability / reproducibility, etc). The plant's Systems Administrator needed a UPS to not only provide battery backup power to his DCS host computer, but also for the ability to effortlessly adjust his backup time and add servers to the network as the plant's capacity increased.

Controlled Power Company's MD6000 UPS was the perfect solution for his factory-floor requirements.

"I wanted 2 hours of backup time, with the ability to have unlimited backup time", explained the Systems Administrator, who lives 45 minutes from the plant. "If the power fails and the system goes to battery backup, the MD6000's Automatic Message Dialer calls my home, my cellular phone, and my beeper, and informs me. I then have enough time to get to the plant and rectify the situation before we lose valuable production time."



## MD7500 Protects Semiconductor Inspection Systems

The fast-paced semiconductor manufacturing industry demands extreme precision and quality. Clean, reliable electrical power is an important element of that demand, because not all companies are supplied with 24x7 reliable utility power. Adjacent manufacturing companies and even the electrical equipment in a plant itself cause power quality problems.

ADE Corporation, a worldwide leader in the manufacture of metrology and inspection systems for the silicon wafer and computer disk industries, improves reliability of performance of their systems by including Controlled Power Company's MD7500 UPS as part of their product shipments to their own customers.

A true win-win solution, the MD7500 protects ADE's valuable inspection systems and provides quality pass/fail selection of their customers' silicon wafers and computer disks. The MD7500 is the "proven power solution" for any manufacturer looking for ultimate electrical security.



# COMMUNICATIONS

The NetMinder UPS Management Suite and NetMinder CS121 Series of Ethernet Adapters inform of the status and condition of the UPS and the incoming electrical power, as well as protect the LAN / WAN from unwanted downtime and unnecessary maintenance costs.

## NetMinder UPS Management Suite Programs (CD)

### NetMinder UPSMAN

Performs all UPS monitoring and data logging. Executes all alarm notifications, network configurations, and server shutdown requests.

### NetMinder UPSMON

Works in conjunction with UPSMAN to give a visual display of UPS status, electrical parameters, alarm conditions, and system logs.

### NetMinder RCCMD

Client-side application that performs an orderly, unattended shutdown of servers. RCCMD can receive its shutdown instructions from either a UPSMAN server, a UNMSII server, or a CS121 web server.

### NetMinder UNMSII (basic version)

Server-side application that centralizes monitoring and e-mail alarm reporting of up to (9) Controlled Power Company UPS's, from a single terminal. Note that the full version of UNMSII includes SNMP notification, as well as the ability to monitor up to an unlimited number of UPS's. Contact Controlled Power Company for additional details.

## NetMinder CS121 Series of Ethernet Adapters

The NetMinder CS121 series of adapters provide complete integration of the UPS into an Ethernet or RS485 network, and thereby provide 24 / 7 monitoring of UPS status, electrical parameters, and notification of alarm conditions. With the ability to communicate in Ethernet TCP/IP, MODBUS TCP, and MODBUS RS485 network environments, the CS121 adapters keep system personnel informed and alerted to any critical condition. When used with NetMinder RCCMD, all CS121 adapters provide added network protection from downtime, and prevent unnecessary maintenance costs that result from data corruption and server crashes.

The NetMinder CS121 Ethernet Adapter is available in (3) unique versions:

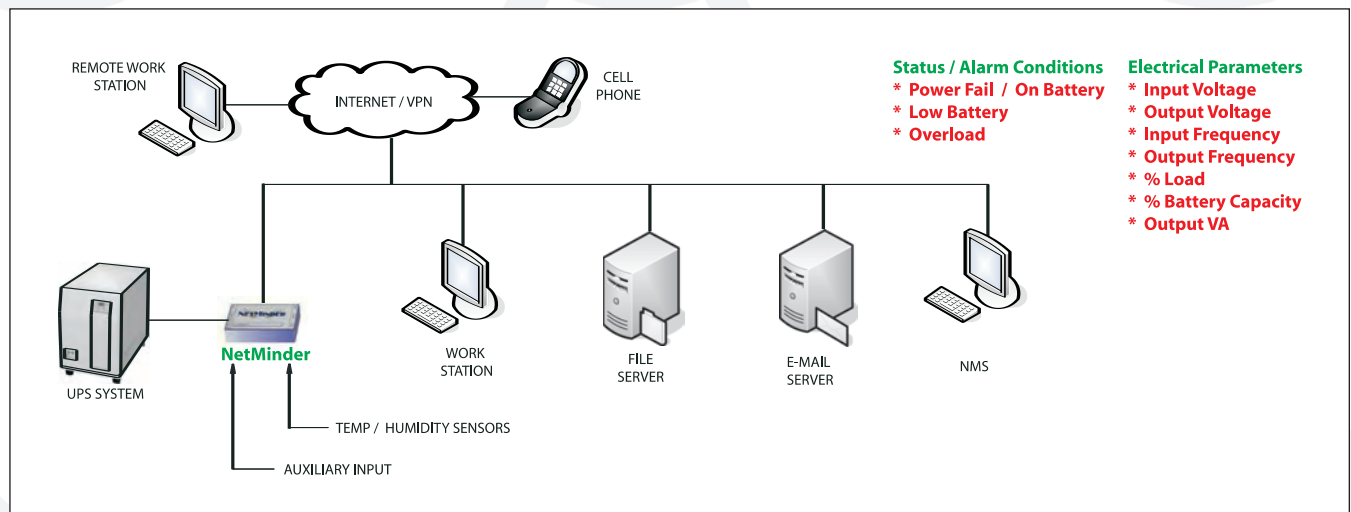
**CS121B:** Ethernet / SNMP / TCP/IP Adapter

**CS121L:** Advanced Ethernet / SNMP / TCP/IP / MODBUS TCP Adapter with facilities monitoring I/O and auxiliary contact closure inputs.

**CS121L-485:** Advanced Ethernet / SNMP / TCP/IP / MODBUS TCP / MODBUS RS485 Adapter with auxiliary contact closure inputs.

### NetMinder CS121 Features & Benefits

- Real-time Remote UPS Monitoring
- Web Server Based
- MODBUS ASCII and RTU
- Graphic Event and Data Trending
- Exportable Data and Event Logging for Trending Analysis and Troubleshooting



**Alarm and event notification via local and remote monitoring, e-mail, and cell phone text messaging.**

# MODEL SELECTION GUIDES

All seven models in the **MD Series** are packed in two basic cubicles. The input interface on the MD3100 through MD5000 is a six-foot long cord with appropriate plug. The input interface on the MD6000 through MD7500 is hard wired.

We have developed custom outlet packages for any configuration necessary to deliver power to any equipment within the output voltage range of the model selected. This includes flush mounted, field wired, or sealed cable receptacles.

PRODUCT SELECTION GUIDE											
MODEL	kVA	WATTS	EXPANDABLE TO	*FULL LOAD BATTERY RUNTIME	HALF LOAD BATTERY RUNTIME	UNIT WEIGHT	SHIPPING WEIGHT	CABINET SIZE	EFFICIENCY	BTU/HR	AUDIBLE NOISE
MD3100	3.1	2170	3.5 kVA	8 min.	19 min.	264 lbs.	290 lbs.	B2	89%	814	50dB
MD3500	3.5	2450	n/a	7 min.	17 min.	274 lbs.	300 lbs.	B2	89%	919	50dB
MD4500	4.5	3200	5.0 kVA	9 min.	21 min.	339 lbs.	365 lbs.	B2	89%	1200	50dB
MD5000	5.0	3500	n/a	9 min.	21 min.	354 lbs.	380 lbs.	B2	89%	1313	50dB
MD6000	6.0	4200	7.5 kVA	11 min.	27 min.	448 lbs.	480 lbs.	B3	90%	1432	51dB
MD7000	7.0	5000	7.5 kVA	8 min.	25 min.	468 lbs.	500 lbs.	B3	90%	1705	51dB
MD7500	7.5	5250	n/a	7 min.	21 min.	493 lbs.	525 lbs.	B3	91%	1711	51dB

\*Extended runtimes available. **CABINET SIZES:** B2 = 15" W x 29 3/4" D x 22 1/2" H  
B3 = 15" W x 29 3/4" D x 30 1/2" H

**EXPANDABILITY:** Field expandability is a special feature of the **MD Series** UPS. The chart above indicates each model's level of expandability for future requirements.

INPUT VOLTAGES ACCEPTED BY THE MD SERIES						
MODEL	INPUT VOLTS	AMPS	INPUT VOLTS	AMPS	INPUT VOLTS	AMPS
MD3100	120	28.0	208	16.4	240	14.2
MD3500	120	32.0	208	18.5	240	16.0
MD4500	120	41.0	208	23.8	240	20.6
MD5000	120	46.0	208	26.4	240	22.9
MD6000	120	55.0	208	31.7	240	27.5
MD7000	120	64.2	208	37.0	240	32.1
MD7500	120	68.8	208	39.7	240	34.4

OUTPUT VOLTAGES FROM THE MD SERIES						
MODEL	OUTPUT VOLTS	AMPS	OUTPUT VOLTS	AMPS	OUTPUT VOLTS	AMPS
MD3100	120	25.8	208	14.9	240	12.9
MD3500	120	29.2	208	16.8	240	14.6
MD4500	120	37.5	208	21.6	240	18.8
MD5000	120	41.7	208	24.0	240	20.8
MD6000	120	50.0	208	28.8	240	25.0
MD7000	120	58.3	208	33.7	240	29.2
MD7500	120	62.5	208	36.1	240	31.3

## Battery

**Runtime:** Listed at full and half load for each model number with extended runtimes available. (See Model Selection Guide above)

**Type:** Sealed, maintenance-free, gas recombinant, self-venting, suspended electrolyte with no gel contaminant

**Charger:** 3 or 5 amp depending on size, advanced two stage, temperature compensated, not to exceed 25% of the amp hour rating

**Recharge Time:** Typically 3 hours to full charge

Buss Voltage:	kVA SIZE	BUSS VOLTAGE	FLOAT	FINAL
	3.1 thru 5.0	48V	2.27 vpc	1.75 vpc
	6.0 thru 7.5	96V	2.27 vpc	1.75 vpc

**Factory Tested:** With specific inverter before shipping

**Projected Life:** 5 years service

**Capacity:** Batteries are sized with the inverter to support the load at rated kVA with a 0.7 power factor

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