



# Powerware

## Powerware® Power Conditioners

Product Focus

Powerware's ferroresonant products are proven technology. In 1938, we were awarded the first patent for ferroresonant power conditioners: the constant voltage transformer. Since then, our technology has remained at the forefront of ferroresonant power conditioning.

Today, Powerware's ferroresonant power conditioners supply sinewave output, which is especially important for computer applications.

Whether you purchase a model 200, 210 or 26 voltage regulator, you can count on an average of 25 years service from your unit.

Every ferroresonant power conditioner is manufactured to exacting specifications and is subject to rigorous quality control.

The ferroresonant power conditioners protect equipment from all power problems, other than the complete loss of power. They excel at tightly regulating the voltage, providing superior noise attenuation and are ruggedly designed to withstand the harshest electrical environments.

Possessing no moving parts, ferroresonant power conditioners are virtually maintenance free.

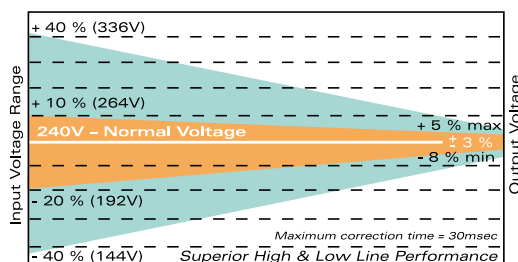
### What is Ferroresonance?

Simply put, ferroresonance is the property of a transformer design in which the transformer contains two (2) separate magnetic paths with limited coupling between them.

reduce the changes in supply voltage and provide more constant voltage to the load.

A magnetic device is non linear. Its reluctance changes abruptly above a certain magnetic flux density. At this point, the magnetic device is defined as being in saturation.

The design of the ferroresonant transformer allows one magnetic path to be in saturation, while the other is not.



Typical Model 200 or 210 Performance

The output contains a parallel resonant tank circuit and draws power from the primary to replace the power delivered to the load.

Note that "resonance" in ferroresonance is similar to that in linear circuits with series or parallel inductors and capacitors, where the impedance peaks at a particular frequency. In a non linear circuit, such as a ferroresonant transformer, "resonance" is used to

As a result, further change in the primary voltage will not translate into changes in the saturated, or secondary voltage, and voltage regulation results.

### Features and Benefits

- **Superior Low Line Performance**  
Specified performance is maintained for all loads 0 - 100% of nominal rating.
- **Switchmode Computer Load Compatibility**  
Able to support typical computer loads when input supply mains voltage is 50% below nominal.
- **240 Volt, 230 Volt or 220 Volt Models**  
Separate models to suit different nominal supplies or particular nominal output voltage requirements.
- **200% Overload Rated**  
Suitable for use with computer start up overloads. Units are output short circuit proof.
- **On Site Configuration**  
7.5 to 18kVA units can be site configured as Single Phase or Three Phase operation, if required.
- **Selectable Voltages**  
Hardwired 26 Series units have selectable input and output voltages.
- **5 Year Warranty**  
Exceptional MTBF (Mean Time Between Failure), an optimum combination of performance to cost effective power conditioning.

# Powerware® 200/210 Power Conditioners

## 500VA to 2500VA Portable



Designed and manufactured in Australia, the Powerware 200/210 portable power conditioner provides smooth stepless control of output voltage to your computer or electronic system, whilst attenuating harmful impulses, surges and other power line disturbances.

The Powerware 200/210 incorporates improved surge withstand capabilities, as specified by ANSI/IEEE C62.41-1980 and is covered by the SECV Certificate of Suitability Number CS84292V.

| SPECIFICATIONS                      |  |
|-------------------------------------|--|
| <b>INPUT</b>                        |  |
| Voltage:                            | 220 or 240 Volt AC   |
| Frequency:                          | 50 Hz  |
| Input Voltage Range:                | + 10%, -20% ( 40%)   |
| Protection:                         | ANSI/IEEE C62.41-1980<br>A and B waveforms suppressed to safe levels.              |
| <b>OUTPUT</b>                       |  |
| Nominal Voltage:                    | 220 or 240 Volt AC   |
| Frequency:                          | 50 Hz  |
| Voltage Regulation:                 | 3% for +10%, -20% input.<br>+5%, -8% for 40% input.                                |
| Control:                            | AC on/off switch   |
| <b>POWER</b>                        |  |
| Efficiency:                         | 90%  |
| Response/Correction Time:           | Return to regulation envelope within 30 msec.                                      |
| Dynamic Response:                   | Continuous and smooth correction for input voltage fluctuations.                   |
| <b>OVERLOADS</b>                    |  |
|                                     | 200% of rated load for 10 seconds without damage. 500% of rated load for 10 msec.  |
| <b>ELECTRICAL NOISE ATTENUATION</b> |  |
| Transverse Mode:                    | 60 dB typical, (80 dB max.) 4kHz to 20 MHz   |
| Common Mode:                        | 120 dB typical, (140 dB max.) 2kHz to 1 MHz  |
| <b>OUTPUT HARMONIC DISTORTION</b>   |  |
|                                     | Less than 3% THD on linear loads.<br>No greater than 5% on typical computer loads. |
| <b>ENVIRONMENTAL</b>                |  |
| Operating Ambient:                  | -20°C to +50°C   |
| Relative Humidity:                  | 0 to 95% non-condensing  |
| Ventilation:                        | Natural Convection Cooled  |
| <b>STATUS INDICATION</b>            |  |
| Power On:                           | Amber lamp   |
| <b>OVERLOAD PROTECTION</b>          |  |
|                                     | Output short circuit protection  |
| <b>WARRANTY</b>                     |  |
|                                     | 5 years  |

### Built to protect

- Programmable logical controls (PLC)
- Photographic equipment
- Remote computer peripherals
- Copiers and laser printers
- Process control equipment
- CNC machinery
- Entire installations

### ORDERING DETAILS

#### 240 VOLT IN/OUT

| Rated Output VA | Part Number    | Current AMPS (Cont.) | Output Receptacles | Weight (kg) | Enclosure Size (Note 3) |
|-----------------|----------------|----------------------|--------------------|-------------|-------------------------|
| 500             | 210-26-650-00  | 2.08                 | 2                  | 23          | 3                       |
| 1000            | 210-26-710-00  | 4.16                 | 3                  | 36          | 4                       |
| 2000            | 210-26-720-00  | 8.33                 | 3                  | 55          | 4                       |
| 2500            | 210-26-725-00* | 10.41                | 3                  | 66          | 4                       |

#### 220 VOLT IN/OUT HARDWIRED UNITS

| Rated Output VA | Part Number | Current AMPS (Cont.) | Weight (kg) | Enclosure Size (Note 3) |
|-----------------|-------------|----------------------|-------------|-------------------------|
| 500             | 200-44-650  | 2.27                 | 23          | 3                       |
| 1000            | 200-44-710  | 4.55                 | 36          | 4                       |
| 2000            | 200-44-720  | 9.09                 | 55          | 4                       |
| 2500            | 200-44-725  | 11.36                | 66          | 4                       |

Notes:

1. 240 Volt Hardwired options available to order
2. Special voltage configurations available to order
3. Enclosure sizes (mm) Size 3: 195 (H) x 210 (W) x 328 (D)  
Size 4: 252 (H) x 280 (W) x 421 (D)
4. \* Input lead fitted with 15 Amp plug top (all other units fitted with 10 Amp plug tops)
5. Specific input leads and output sockets can be fitted to order

# Powerware® 200 Power Conditioners 3kVA to 22kVA



| SPECIFICATIONS                      |  |
|-------------------------------------|--|
| <b>INPUT</b>                        |  |
| Voltage:                            | 220 or 240 Volt AC (Refer "Ordering Details" for configuration options)            |
| Frequency:                          | 50 Hz  |
| Input Voltage Range:                | + 10%, -20% ( 40%)   |
| Protection:                         | ANSI/IEEE C62.41-1980<br>A and B waveforms suppressed to safe levels.              |
| <b>OUTPUT</b>                       |  |
| Nominal Voltage:                    | 220 or 240 Volt AC   |
| Frequency:                          | 50 Hz  |
| Voltage Regulation:                 | 3% for +10%, -20% input.<br>+5%, -8% for 40% input.                                |
| Control:                            | AC on/off switch   |
| <b>POWER</b>                        |  |
| Efficiency:                         | 90%  |
| Response/Correction Time:           | Return to regulation envelope within 30 msec.                                      |
| Dynamic Response:                   | Continuous and smooth correction for input voltage fluctuations.                   |
| <b>OVERLOADS</b>                    |  |
|                                     | 200% of rated load for 10 seconds without damage. 500% of rated load for 10 msec.  |
| <b>ELECTRICAL NOISE ATTENUATION</b> |  |
| Transverse Mode:                    | 60 dB typical, (80 dB max.)<br>4kHz to 20 MHz                                      |
| Common Mode:                        | 120 dB typical, (140 dB max.)<br>2kHz to 1 MHz                                     |
| <b>OUTPUT HARMONIC DISTORTION</b>   |  |
|                                     | Less than 3% THD on linear loads.<br>No greater than 5% on typical computer loads. |
| <b>ENVIRONMENTAL</b>                |  |
| Operating Ambient:                  | -20°C to +50°C   |
| Relative Humidity:                  | 0 to 95% non-condensing  |
| Ventilation:                        | Natural Convection Cooled  |
| <b>STATUS INDICATION</b>            |  |
| Power On:                           | Amber lamp   |
| <b>OVERLOAD PROTECTION</b>          |  |
|                                     | Output short circuit protection  |
| <b>WARRANTY</b>                     |  |
|                                     | 5 years  |

The extension of Powerware ferroresonant power conditioners continues through to 22kVA. These units are mostly suited to hardwired, fixed installation applications for providing smooth stepless control of the output voltage, attenuation of harmful impulses or surges and other power line disturbances. Powerware 200 power conditioners are ideally suited to provide protection in computer rooms, regulation for scientific instrumentation, plus protection and regulated power to sophisticated computer based factory process equipment. To simplify installation, all units are free standing and fitted with castors (excluding 22kVA) and jacking feet. Connections are provided at the rear via a base plate cable entry to an isolation switch.

The flexibility of Powerware 200 power conditioners is increased on units between 7.5kVA and 18kVA. These units can be field configured for single phase or three phase operation with 230 Volt taps provided as standard on 240 Volt In/Out models. Powerware 200 power conditioners (3 to 22kVA) incorporate approved surge withstand capabilities, as required by ANSI/IEEE C62.41-1980.

## Built to protect

- Remote computer peripherals
- Copiers and laser printers
- Process control equipment
- CNC machinery
- Programmable logical controls (PLC)
- Photographic equipment
- Entire installations

| ORDERING DETAILS |                  |               |             |                         |
|------------------|------------------|---------------|-------------|-------------------------|
| Rated Output kVA | *Part Number     | Configuration | Weight (kg) | Enclosure Size (Note 5) |
| 3                | 200-26-730       | 1 Phase only  | 100         | 1                       |
| 3                | 200-26-730-00**  | 1 Phase only  | 100         | 1                       |
| 5                | 200-26-750       | 1 Phase only  | 155         | 2                       |
| 5                | 200-26-750-HO*** | 1 Phase only  | 155         | 2                       |
| 7.5              | 200-26-775****   | 1 or 3 Phase  | 215         | 2                       |
| 9                | 200-26-790****   | 1 or 3 Phase  | 270         | 2                       |
| 12               | 200-26-812M****  | 1 or 3 Phase  | 360         | 3                       |
| 15               | 200-26-815****   | 1 or 3 Phase  | 420         | 3                       |
| 18               | 200-26-818****   | 1 or 3 Phase  | 520         | 3                       |
| 22.5             | 200-46-822****   | 3 Phase only  | 595         | 4                       |

### Notes:

- \* For units with nominal input/output voltage of 220 specify -44-, as in 200-44-730
- \*\* Units fitted with WIP 15 plug and 4 x 10/15 Amp screw sockets
- \*\*\* Units fitted with input terminal block and 4 x 10/15 amp screw sockets
- To avoid nuisance tripping of input circuit breakers, we recommend the use of Heinemann CF1 (curve 1) type for single phase units and Heinemann CF3 (curve 1) for three phase units. Current rating should be at least one size larger than input current stated on unit data plate. See manual or consult your Sales Representative for further details.
- Enclosure Sizes (mm):  
Size 1: 600 (H) x 400 (W) x 440 (D)  
Size 2: 995 (H) x 525 (W) x 550 (D)  
Size 3: 990 (H) x 800 (W) x 550 (D)  
Size 4: 1236 (H) x 800 (W) x 550 (D)
- \*\*\*\* 3 Phase loads to be star connected only. Power Conditioners **NOT** to be used for Delta loads.

# Powerware® 26 Multivolt Power Conditioners

## Multi-Voltage, Hardwired for Industrial Applications



### SPECIFICATIONS

#### INPUT

Voltage: 120-5000VA Models: Field selectable  
110/120V or 220/240 or 380/415V  
7.5-15kVA Models: Field selectable 220/240V  
or 380/415V

Frequency: 50 Hz (60Hz available)

#### OUTPUT

Voltage: Field Selectable - 110/120/220/240 Volts AC  
Voltage Regulation: 5% for an input line variation of 15%. +  
5%, -8% for 40% input.

#### OUTPUT HARMONIC DISTORTION

Less than 3% THD on linear loads. No  
greater than 5% on typical computer loads.

#### EFFICIENCY

85% at full load.

#### DROPOUT

No loss of output for line loss of 3 msec.

#### ELECTRICAL NOISE REJECTION

Transverse Mode: > 60 dB  
Common Mode: > 120 dB

#### OPERATING TEMPERATURE

-20°C to +50°C

#### WARRANTY

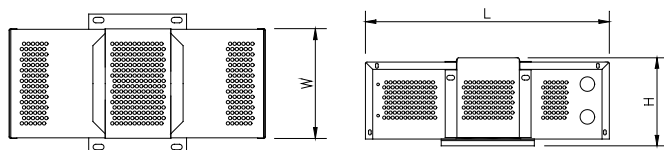
5 years

Frequently, power transformers are incorporated with process equipment to provide specific voltages for sensitive equipment. Unfortunately, outside interferences will vary the output from these transformers, causing the sensitive equipment to malfunction or fail. The Powerware 26 range of power conditioners provide an immediate answer to this inconvenience, by suppressing and isolating power line interference and regulating the output voltage to  $\pm 5\%$ . These hardwired power conditioners provide the unique feature of selectable input tap for greater versatility and output voltage taps are also provided. These features make the Powerware 26 power conditioner the ideal choice for a regulated power supply where a three phase source is provided without a neutral line.

The Powerware 26 power conditioner provides superior noise rejection, exceeding 120 dB common mode and 60 dB transverse mode noise rejection. By nature of design, this product is a true, ultra isolation device. The Powerware 26 is available from 120VA through to 15kVA as a panel mounting, hardwired unit.

### Built to protect

- Remote computer peripherals
- Copiers and laser printers
- Process control equipment
- CNC machinery
- Programmable logical controls (PLC)
- Photographic equipment
- Entire installations



Typical Single Module Arrangement

### ORDERING DETAILS

| Rated Output VA | Part Number | Height (H) (mm) | Width (W) (mm) | Length (L) (mm) | Weight (kg) |
|-----------------|-------------|-----------------|----------------|-----------------|-------------|
| 500             | 2605-0500M  | 162             | 200            | 362             | 18          |
| 1000            | 2605-1000M  | 170             | 200            | 460             | 28          |
| 2000            | 2605-2000M  | 244             | 288            | 467             | 51          |
| 3000            | 2605-3000M  | 244             | 288            | 501             | 73          |
| 5000            | 2605-5000M  | 244             | 288            | 736             | 110         |
| *10000          | 2605-10kM   | 244             | 630            | 736             | 221         |
| *15000          | 2605-15kM   | 244             | 987            | 736             | 350         |

\*Multi Module Units

In the interests of continual product improvement all specifications are subject to change without notice.

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